UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

☒

For the fiscal year ended December 31, 2024

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

☐

For the transition period from _____ to _____

Commission File Number 1-37816

ALCOA CORP ORATION

(Exact name of registrant as specified in its charter)

Delaware	**81-1789115**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
201 Isabella Street , Suite 500 , Pittsburgh , Pennsylvania	**15212-5858**
(Address of principal executive offices)	**(Zip Code)**

(Registrant's telephone number, including area code): 412 - 315-2900

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common Stock, par value $0.01 per share	AA	New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☑ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☑

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☑ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☑ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☑

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☑

The aggregate market value of the registrant's voting stock held by non-affiliates at June 28, 2024 was approximately $

7.1

billion, based on the closing price per share of Common Stock on June 28, 2024 of $39.78 as reported on the New York Stock Exchange.

Indicate the number of shares outstanding of each of the registrant's classes of stock, as of the latest practicable date.

Title or Class	Outstanding Shares as of February 14, 2025
Common Stock, par value $0.01 per share	258,884,337
Series A Convertible Preferred Stock, par value $0.01 per share	4,041,989

DOCUMENTS INCORPORATED BY REFERENCE

Part III of this Form 10-K incorporates by reference certain information from the registrant's Definitive Proxy Statement for its 2025 Annual Meeting of Stockholders to be filed pursuant to Regulation 14A.

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Note on Incorporation by Reference

In this Form 10-K, selected items of information and data are incorporated by reference to portions of Alcoa Corporation's Definitive Proxy Statement for its 2025 Annual Meeting of Stockholders (Proxy Statement), which will be filed with the Securities and Exchange Commission within 120 days after the end of Alcoa Corporation's fiscal year ended December 31, 2024. Unless otherwise provided herein, any reference in this Form 10-K to disclosures in the Proxy Statement shall constitute incorporation by reference of only that specific disclosure into this Form 10-K.

PART I

Item 1. Business.

(dollars in millions, except per-share amounts, average realized prices, and average cost amounts)

The Company

Alcoa Corporation, a Delaware corporation (Alcoa or the Company), is active in all aspects of the upstream aluminum industry with bauxite mining, alumina refining, and aluminum smelting and casting. The Company has direct and indirect ownership of 26 operating locations across nine countries on six continents.

The Company's operations are comprised of two reportable business segments: Alumina and Aluminum. The Alumina segment primarily consists of the Company's bauxite mines and alumina refineries, which generally includes the mining of bauxite and other aluminous ores, as well as the refining, production, and sale of smelter grade and non-metallurgical alumina. The Aluminum segment consists of the Company's aluminum smelting and casting operations along with most of the Company's energy production assets.

On August 1, 2024, Alcoa completed the acquisition of Alumina Limited, which primarily consisted of the acquisition of Alumina Limited's noncontrolling interest in the Alcoa World Alumina and Chemicals (AWAC) joint venture (described below). Prior to the acquisition, the Alumina segment primarily consisted of a series of affiliated operating entities held in AWAC. Upon completion of the acquisition by Alcoa, Alumina Limited and, as a result, the operations held by the AWAC joint venture, became wholly-owned by Alcoa Corporation.

Aluminum, as an element, is abundant in the earth's crust, but a multi-step process is required to manufacture finished aluminum metal. Aluminum metal is produced by refining alumina oxide from bauxite into alumina, which is then smelted into aluminum and can be cast into many shapes and forms.

Alcoa smelts and casts aluminum in various shapes and sizes for global customers, including developing and creating various alloy combinations for specific applications.

Aluminum metal is a commodity traded on the London Metal Exchange (LME) and priced daily. Additionally, alumina is subject to market pricing through the Alumina Price Index (API), which is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price, Platts Metals Daily Alumina PAX Price, and FastMarkets Metal Bulletin Non-Ferrous Metals Alumina Index. As a result, the prices of both aluminum and alumina are subject to significant volatility and, therefore, influence the operating results of Alcoa.

Alcoa Corporation became an independent, publicly traded company on November 1, 2016, following its separation (the Separation Transaction) from its former parent company, Alcoa Inc. References herein to "ParentCo" refer to Alcoa Inc. and its consolidated subsidiaries through October 31, 2016, at which time it was renamed Arconic Inc. and since has been subsequently renamed Howmet Aerospace Inc.

Business Strategy

Alcoa's business strategy is designed to create stockholder value while aligning with our purpose, vision, and values.

Over the past five years, the Company has made significant progress in reducing complexity and optimizing its portfolio of mining, refining, and smelting assets. In 2024, Alcoa safely curtailed the Kwinana alumina refinery in Australia, acquired Alumina Limited and subsequently benefited from the increased alumina exposure, and announced the sale of its 25.1% ownership in the Saudi Arabia joint venture. In the near term, Alcoa will focus on maintaining operational stability while strategically managing its portfolio to maximize profitability and value creation, including advancing Australia mine approvals, improving the long-term outlook for the San Ciprián operations (Spain), and completing the Alumar smelter (Brazil) restart while maintaining operational stability.

To strengthen our competitive position, Alcoa has identified priorities that address both immediate and long-term opportunities:

Achieving Safety Performance and Operational Excellence

- While strong today, the Company aims for a step change in safety performance, creating a workplace where risk is minimized, and employees thrive.
- Alcoa is committed to operational excellence by optimizing processes and modernizing the Alcoa Business System, a methodology used by Alcoa to improve its operating processes.

Building a High-Performance Culture

- A high-performance culture, where pursuit of continuous improvement is a core element, is key to achieving our strategic objectives. This includes leveraging new talent across the organization, setting clear and solid objectives, providing constructive feedback, and implementing a refreshed behavior model.

Disciplined Capital Allocation

- Alcoa seeks to utilize its capital allocation framework to maintain a strong balance sheet and sustain and improve existing operations while deploying excess cash effectively, focusing on returning capital to stockholders, transforming the portfolio, and executing on targeted investments in growth opportunities.

Targeted Growth

- Alcoa plans to pursue pragmatic growth opportunities, organically and inorganically, when returns exceed the cost of capital and deliver value to its stockholders.
- The Company plans to continue to invest in breakthrough technologies at a measured pace, respecting the time required for research, development, and commercialization efforts, as well as the Company's investment capacity.
- The Company seeks to increase value from a strong sustainability position, which includes the industry's most comprehensive suite of products made with lower carbon emissions. The Sustana™ brand includes EcoDura™ aluminum (recycled content), EcoLum™ aluminum (low carbon), and EcoSource™ alumina (also low carbon).

With an emphasis on safety, operational excellence, and continuous improvement, Alcoa's portfolio of assets is well positioned to deliver stockholder value across business cycles. By following disciplined capital allocation and making pragmatic growth investments, the Company is prepared to adapt and thrive in an evolving industry landscape.

See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Business Update for more information.

Joint Ventures

Saudi Arabia Joint Venture

In December 2009, Alcoa entered into a joint venture with the Saudi Arabian Mining Company (Ma'aden), which was formed by the government of Saudi Arabia to develop its mineral resources and create a fully integrated aluminum complex in Saudi Arabia. Ma'aden is listed on the Saudi Stock Exchange (Tadawul). The joint venture complex includes a bauxite mine with estimated capacity of 5 million dry metric tons per year; an alumina refinery with a capacity of 1.8 million metric tons per year (mtpy); and an aluminum smelter with a capacity of 804,000 mtpy.

The joint venture is currently comprised of two entities: the Ma'aden Bauxite and Alumina Company (MBAC) and the Ma'aden Aluminium Company (MAC). Ma'aden owns a 74.9% interest in the joint venture. Alcoa owns a 25.1% interest in MAC, which holds the smelter; AWAC, which became wholly-owned by Alcoa upon its completion of the Alumina Limited acquisition, holds a 25.1% interest in MBAC, which holds the mine and refinery. The refinery and smelter are located within the Ras Al Khair industrial zone on the east coast of Saudi Arabia.

On September 15, 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture, comprised of MBAC and MAC, to Ma'aden in exchange for issuance by Ma'aden of approximately 86 million shares and $150 in cash. The shares of Ma'aden will be subject to transfer and sale restrictions, including a restriction requiring Alcoa to hold its Ma'aden shares for a minimum of three years, with one-third of the shares becoming transferable after each of the third, fourth, and fifth anniversaries of closing of the transaction. The transaction is subject to regulatory approvals, approval by Ma'aden's shareholders, and other customary closing conditions and is expected to close in the first half of 2025.

ELYSIS

ELYSIS™ Limited Partnership (ELYSIS) is between wholly-owned subsidiaries of Alcoa (48.235%) and Rio Tinto Alcan Inc. (Rio Tinto) (48.235%), respectively, and Investissement Québec (3.53%), a company wholly-owned by the Government of Québec, Canada. The purpose of ELYSIS is to advance larger scale development and commercialization of its patent-protected technology that eliminates direct greenhouse gas emissions from the traditional aluminum smelting process and, instead, emits oxygen. Alcoa first developed the inert anode technology for the aluminum smelting process that served as the basis for the formation of ELYSIS in 2018. Development scale quantities of aluminum produced by ELYSIS have been sold for commercial purposes, including to Ball Corporation for its low-carbon aluminum cup launched at the World Economic Forum in Davos, Switzerland and to Nexans, producing the world's first cable containing metal from this breakthrough technology. Further progress on ELYSIS technology was announced in 2024 with Rio Tinto's plans to launch the first industrial-scale demonstration of the breakthrough technology, which includes 10 ELYSIS smelting pots operating at 100 kiloamperes (kA), a size similar to those operating at smaller-scale commercial smelters. Alcoa has the right to purchase up to 40 percent of the metal produced from the demonstration, allowing for Alcoa customers to benefit from ELYSIS's carbon-free electrolytic process early in the technology development cycle. The target for first production is by 2027.

Alcoa World Alumina and Chemicals (AWAC)

On August 1, 2024, Alcoa completed the acquisition of all of the ordinary shares of Alumina Limited (Alumina Shares) through a wholly-owned subsidiary, AAC Investments Australia 2 Pty Ltd. At acquisition, Alumina Limited, a company previously listed on the Australian Securities Exchange, held a 40% ownership interest in the AWAC joint venture.

Under the Scheme Implementation Deed entered into in March 2024, as amended in May 2024, holders of Alumina Shares received 0.02854 Alcoa CHESS Depositary Interests (CDIs) for each Alumina Share (the Agreed Ratio), except that i) holders of Alumina Shares represented by American Depositary Shares, each of which represented 4 Alumina Shares, received 0.02854 shares of Alcoa common stock and ii) a certain shareholder received, for certain of their Alumina Shares, 0.02854 shares of Alcoa non-voting convertible preferred stock. The Alcoa CDIs are quoted on the Australian Stock Exchange.

At closing, Alumina Shares outstanding of 2,760,056,014 and 141,625,403 were exchanged for 78,772,422 and 4,041,989 shares of Alcoa common stock and Alcoa preferred stock, respectively. Based on Alcoa's closing share price as of July 31, 2024, the Agreed Ratio implied a value of A$1.45 per Alumina Share and aggregate purchase consideration of approximately $2,700 for Alumina Limited.

The transaction consisted in substance of the acquisition of Alumina Limited's noncontrolling interest in AWAC, the assumption of Alumina Limited's indebtedness, the recognition of deferred tax assets primarily related to Alumina Limited's prior net operating losses and the tax allocation of the fixed asset valuation to individual assets, and the acquisition of cash and other current liabilities. The transaction was accounted for as an equity transaction where net assets acquired and transaction costs were reflected as an increase to Additional capital.

Prior to Alcoa's acquisition of Alumina Limited, Alcoa Corporation and Alumina Limited owned 60% and 40%, respectively, of AWAC, an unincorporated global joint venture consisting of a number of affiliated entities that own, operate, or have an interest in bauxite mines and alumina refineries, as well as an aluminum smelter, in seven countries. The scope of AWAC generally includes the mining of bauxite and other aluminous ores; the refining, production, and sale of smelter grade and non-metallurgical alumina; and the production of certain primary aluminum products. Upon completion of the acquisition on August 1, 2024, Alumina Limited and, as a result, the operations held by the AWAC joint venture, became wholly-owned by Alcoa Corporation.

AWAC Operations

In 2024, AWAC entities' assets included the following interests:

- 100% of the bauxite mining and alumina refining operations of Alcoa's affiliate, Alcoa of Australia Limited (AofA);
- 100% of the Juruti bauxite deposit and mine in Brazil;
- 45% interest in Halco (Mining) Inc., a bauxite consortium that owns a 51% interest in Compagnie des Bauxites de Guinée (CBG), a bauxite mine in Guinea;
- 39.96% interest in the São Luís refinery in Brazil;
- 55% interest in the Portland, Australia smelter that AWAC manages on behalf of the joint venture partners;
- 25.1% interest in the mine and refinery in Ras Al Khair, Saudi Arabia;
- 100% of the refinery and alumina-based chemicals assets at San Ciprián, Spain;
- 100% of Alcoa Steamship Company LLC, a company that procures ocean freight and commercial shipping services for Alcoa in the ordinary course of business;
- 100% of the assets at the closed, former alumina refining facility in Point Comfort, Texas, United States; and,
- 100% interest in various assets formerly used for mining and refining in the Republic of Suriname (Suriname).

Others

The Company is party to several other joint ventures and consortia. See additional details within each business segment discussion below.

The Aluminerie de Bécancour Inc. (ABI) smelter is a joint venture between Alcoa and Rio Tinto located in Bécancour, Québec. Alcoa owns 74.95% of the joint venture through its 50% equity investment in Pechiney Reynolds Quebec, Inc., which owns a 50.1% share of the smelter, and two wholly-owned Canadian subsidiaries, which own 49.9% of the smelter. Rio Tinto owns the remaining 25.05% interest in the joint venture through its 50% ownership in Pechiney Reynolds Quebec, Inc.

CBG is a joint venture between Boké Investment Company (51%) and the Government of Guinea (49%) for the operation of a bauxite mine in the Boké region of Guinea. Boké Investment Company is owned 100% by Halco (Mining) Inc.; Alcoa World Alumina LLC (AWA LLC) holds a 45% interest in Halco (Mining) Inc. AWA LLC is part of the AWAC group of companies, which became wholly-owned by Alcoa upon its completion of the Alumina Limited acquisition.

On April 30, 2022, Alcoa completed the sale of its investment in Mineração Rio Do Norte (MRN) for proceeds of $10. An additional $30 in cash could be paid to the Company in the future if certain post-closing conditions related to future MRN mine development are satisfied. Related to this transaction, the Company recorded an asset impairment of $58 in the first quarter of 2022 in Restructuring and other charges, net on the Statement of Consolidated Operations. In addition, the Company entered into several bauxite offtake agreements with South32 Minerals S.A. (South32) to provide bauxite supply for existing long-term supply contracts.

Alumar is an unincorporated joint venture for the operation of a refinery, smelter, and casthouse in Brazil. The refinery is owned by AWAB (39.96%), Rio Tinto (10%), Alcoa Alumínio (14.04%), and South32 (36%). AWAB is part of the AWAC group of companies, which became wholly-owned by Alcoa upon its completion of the Alumina Limited acquisition. With respect to Rio Tinto and South32, the named company or an affiliate thereof holds the interest. The smelter and casthouse are owned by Alcoa Alumínio (60%) and South32 (40%).

Strathcona calciner is a joint venture between affiliates of Alcoa and Rio Tinto located in Alberta, Canada. Calcined coke is used as a raw material in aluminum smelting. The calciner is owned by Alcoa (39%) and Rio Tinto (61%).

Hydropower

Machadinho Hydro Power Plant (HPP) is a consortium located on the Pelotas River in southern Brazil in which the Company has a 27.3% ownership interest through Alcoa Alumínio. The remaining ownership interests are held by unrelated third parties.

Barra Grande HPP is a joint venture located on the Pelotas River in southern Brazil in which the Company has a 42.2% ownership interest through Alcoa Alumínio. The remaining ownership interests are held by unrelated third parties.

Estreito HPP is a consortium between Alcoa Alumínio, through Estreito Energia S.A. (25.5%) and unrelated third parties located on the Tocantins River, northern Brazil.

Serra do Facão HPP is a joint venture between Alcoa Alumínio (35%) and unrelated third parties located on the Sao Marcos River, central Brazil.

Manicouagan Power Limited Partnership (Manicouagan) is a joint venture between affiliates of Alcoa and Hydro-Québec. Manicouagan owns and operates the 335 megawatt McCormick hydroelectric project, which is located on the Manicouagan River in the Province of Québec, Canada. Alcoa owns 40% of the joint venture.

Alumina

This segment consists of the Company's worldwide refining system, including the mining of bauxite, which is then refined into alumina, a compound of aluminum and oxygen that is the raw material used by smelters to produce aluminum metal. Bauxite is the principal raw material used to produce alumina and contains various aluminum hydroxide minerals, the most important of which are gibbsite and boehmite. Bauxite is refined into alumina using the Bayer process. The Company obtains bauxite from its own resources as well as through long-term and short-term contracts and mining leases. Tons of bauxite are reported on a zero-moisture basis in millions of dry metric tons (mdmt) unless otherwise stated.

Alcoa's alumina sales are made to customers globally and are typically priced by reference to published spot market prices. The Company produces smelter grade alumina and non-metallurgical grade alumina. The Company's largest customer for smelter grade alumina is its own aluminum smelters, which in 2024 accounted for approximately 32 percent of its total alumina shipments. A small portion of the alumina (non-metallurgical grade) is sold to third-party customers who process it into industrial chemical products. This segment also includes Alcoa's 25.1% share of MBAC. In September 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture. See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Business Update for more information.

In 2024, Alcoa-operated mines, mines operated by partnerships in which Alcoa has equity interests, and bauxite offtake agreements supplied 85 percent of bauxite volume to Alcoa refineries and the remaining 15 percent was sold to third-party customers. Alcoa-operated mines produced 33.7 mdmt of bauxite and mines operated by partnerships produced 4.6 mdmt of bauxite on a proportional equity basis, for a total Company bauxite production of 38.3 mdmt.

On April 30, 2022, Alcoa completed the sale of its investment in MRN. The Company entered into several bauxite offtake agreements with South32 to provide bauxite supply for existing long-term supply contracts.

Based on the terms of its bauxite supply contracts, the amount of bauxite Alcoa purchases from its minority-owned joint ventures, MRN (until its sale in April 2022) and CBG, differ from its proportional equity in those mines. Therefore, in 2024, Alcoa had access to 41.3 mdmt of production from its portfolio of bauxite interests and bauxite offtake and supply agreements and sold 6.4 mdmt of bauxite to third parties; 34.9 mdmt of bauxite was delivered to Alcoa refineries.

The Company primarily sells alumina through contracts containing two pricing components: (1) the API price basis and (2) a negotiated adjustment basis that takes into account various factors, including freight, quality, customer location, and market conditions, as well as through fixed price spot sales. In 2024, approximately 95 percent of the Company's smelter grade alumina shipments to third parties were sold on an adjusted API price or fixed price spot basis.

Information regarding the Company's bauxite mining properties and bauxite mineral resources and reserves is included in Part 1 Item 2 of this Form 10-K.

Alcoa's alumina refining facilities and its worldwide alumina capacity stated in metric tons per year (mtpy) as of December 31, 2024 are shown in the following table:

Country	Facility	Nameplate Capacity[1] (000 mtpy)	Alcoa Corporation Consolidated Capacity[1] (000 mtpy)
Australia (AofA)	Kwinana	2,190	2,190
	Pinjarra	4,700	4,700
	Wagerup	2,879	2,879
Brazil	Poços de Caldas	390	390
	São Luís (Alumar)	3,860	2,084
Spain	San Ciprián	1,600	1,600
TOTAL		15,619	13,843

Equity Interests:

Country	Facility	Nameplate Capacity[1] (000 mtpy)	Alcoa Corporation Consolidated Capacity[1] (000 mtpy)
Saudi Arabia	Ras Al Khair (MBAC)	1,800	452

(1) Nameplate Capacity is an estimate based on design capacity and normal operating efficiencies and does not necessarily represent maximum possible production. Alcoa Corporation Consolidated Capacity represents our share of production from these facilities.

As of December 31, 2024, Alcoa had approximately 3,204,000 mtpy of idle capacity relative to total Alcoa consolidated capacity of 13,843,000 mtpy. The idle capacity includes: 2,190,000 mtpy at the Kwinana refinery, 800,000 mtpy at the San Ciprián refinery, and 214,000 mtpy at the Poços de Caldas facility.

In October 2024, the Company completed its five-year strategic portfolio review to improve cost positioning, or curtail, close, or divest 4 million metric tons of refining capacity. The Company exceeded its target for refining capacity with the decision to curtail the Kwinana refinery in January 2024. The Company continues to evaluate assets for opportunities for improvement to remain profitable throughout business cycles.

In June 2024, the Company completed the full curtailment of the Kwinana refinery, as planned, which was announced in January 2024. As of March 2024, the refinery had approximately 780 employees and this number was reduced to approximately 250 through the fourth quarter of 2024 to manage certain processes that are expected to continue until about the fourth quarter of 2025. At that time, the employee number will be further reduced to approximately 50. In addition to the employees separating as a result of the curtailment, approximately 290 employees have terminated through the productivity program announced in the third quarter of 2023 or redeployed to other Alcoa operations.

In 2022, production at the San Ciprián refinery was reduced to approximately 50 percent of the 1.6 million metric tons of annual capacity to mitigate the financial impact of high natural gas costs. In October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS Equity Holdings, SL (IGNIS EQT), the majority shareholder in the IGNIS Group of Companies, a vertically integrated energy company based in Spain, to support the continued operation of the San Ciprián complex. Alcoa would continue as the managing operator of the San Ciprián operations, with IGNIS EQT holding 25 percent ownership. In January 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed a memorandum of understanding (MoU) that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations and focuses on the key areas of cooperation.

Aluminum

This segment currently consists of (i) the Company's worldwide smelting and casthouse system and (ii) a portfolio of energy assets in Brazil, Canada, and the United States. The smelting operations produce molten primary aluminum, which is then formed by the casting operations into either common alloy ingot (e.g., t-bar, sow, standard ingot) or into value add ingot products (e.g., foundry, billet, rod, and slab). The energy assets supply power to external customers in Brazil and the United States, as well as internal customers in the Aluminum segment (Baie-Comeau (Canada) smelter and Warrick (Indiana) smelter) and, to a lesser extent, the Alumina segment (Brazilian refineries). This segment also includes Alcoa's 25.1% share of MAC, the smelting joint venture company in Saudi Arabia. In September 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture. See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Business Update for more information.

Smelting and Casting Operations

Contracts for primary aluminum vary widely in duration, from multi-year supply contracts to spot purchases. Pricing for primary aluminum products is typically comprised of three components: (i) the published LME aluminum price for commodity grade P1020 aluminum, (ii) the published regional premium applicable to the delivery locale, and (iii) a negotiated product premium that accounts for factors such as shape and alloy.

Alcoa's primary aluminum facilities and its global smelting capacity stated in metric tons per year (mtpy) as of December 31, 2024 are shown in the following table:

Country	Facility	Nameplate Capacity[1] (000 mtpy)	Alcoa Corporation Consolidated Capacity[1] (000 mtpy)
Australia	Portland	358	197
Brazil	Poços de Caldas[2]	N/A	N/A
	São Luís (Alumar)	447	268
Canada	Baie Comeau, Québec	324	324
	Bécancour, Québec	467	350
	Deschambault, Québec	287	287
Iceland	Fjarðaál	351	351
Norway	Lista	95	95
	Mosjøen	200	200
Spain	San Ciprián	228	228
United States	Massena West, NY	130	130
	Evansville, IN (Warrick)	215	215
TOTAL		3,102	2,645

Equity Interests:

Country	Facility	Nameplate Capacity[1] (000 mtpy)	Alcoa Corporation Consolidated Capacity[1] (000 mtpy)
Saudi Arabia	Ras Al Khair (MAC)	804	202

(1) Nameplate Capacity is an estimate based on design capacity and normal operating efficiencies and does not necessarily represent maximum possible production. Alcoa Corporation's consolidated capacity is its share of Nameplate Capacity based on its ownership interest in the respective smelter.

(2) The Poços de Caldas facility is a casthouse and does not include a smelter.

As of December 31, 2024, Alcoa had approximately 374,000 mtpy of idle smelting capacity relative to total Alcoa consolidated capacity of 2,645,000 mtpy. The idle capacity includes: 214,000 mtpy at the San Ciprián smelter, 54,000 mtpy at the Warrick smelter, 42,000 mtpy at the Alumar smelter, 33,000 mtpy at the Portland smelter, and 31,000 mtpy at the Lista smelter.

In October 2024, the Company completed its five-year strategic portfolio review to improve cost positioning, or curtail, close, or divest 1.5 million metric tons of smelting capacity. The Company reached approximately 93 percent of its target for smelting capacity with the decision to restart capacity at the Warrick smelter completed in the first quarter 2024. The Company continues to evaluate assets for opportunities for improvement to be profitable throughout business cycles.

During 2024, the Company maintained the controlled pace for the restart of the Alumar smelter in São Luís, Brazil and continued actions to improve the smelter's overall performance. The site was operating at approximately 84 percent of the site's total annual capacity of 268,000 mtpy (Alcoa share) as of December 31, 2024.

In the fourth quarter of 2024, the Company completed the restart of 16,000 mtpy of previously curtailed capacity at the Portland smelter in Australia that began in the fourth quarter of 2023. The site was operating at approximately 83 percent of the site's total annual capacity of 197,000 mtpy (Alcoa share) as of December 31, 2024.

In the first quarter of 2024, the Company completed the restart of 54,000 mtpy of capacity at the Warrick smelter (Indiana) that began in the fourth quarter of 2023.

The San Ciprián smelter was curtailed in January 2022, as a result of an agreement with the workers' representatives in December 2021. In February 2023, under the terms of an amended viability agreement, Alcoa agreed to a phased restart of the smelter beginning in January 2024, to operate an initial complement of approximately 6 percent of total pots, to restart all pots by October 1, 2025 and to maintain 75 percent of the annual capacity of 228,000 mtpy from October 1, 2025 until the end of 2026. In March 2024, the Company completed the restart of approximately 6 percent of total pots at the San Ciprián smelter. In October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS EQT to support the continued operation of the San Ciprián complex. Alcoa would continue as the managing operator of the San Ciprián operations, with IGNIS EQT holding 25 percent ownership. In January 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed an MoU that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations and focuses on the key areas of cooperation.

Energy Facilities and Sources

In 2024, energy comprised approximately 24 percent of the Company's total alumina refining production costs and electric power comprised approximately 22 percent of the Company's primary aluminum production costs.

Electricity markets are regional and are limited by physical and regulatory constraints, including the physical inability to transport electricity efficiently over long distances, the design of the electric grid, including interconnections, and the regulatory structure imposed by various federal and state entities.

Electricity contracts may be short-term (real-time or day ahead) or years in duration, and contracts can be executed for immediate delivery or years in advance. Pricing may be fixed, indexed to an underlying fuel source or other index such as LME, cost-based, or based on regional market pricing. In 2024, Alcoa generated approximately 10 percent of the power used at its smelters worldwide and generally purchased the remainder under long-term arrangements.

The following table sets forth the electricity generation capacity and 2024 generation of facilities in which Alcoa Corporation has an ownership interest. See also the Joint Ventures section above.

Country	Facility	Alcoa Corporation Consolidated Capacity (MW)	2024 Generation (MWh)
Brazil	Barra Grande	150	1,315,259
	Estreito	155	1,360,074
	Machadinho	126	1,105,950
	Serra do Facão	60	525,600
Canada	Manicouagan	133	1,164,467
United States	Warrick	657	2,838,977
TOTAL		**1,281**	**8,310,327**

The figures in this table are presented in megawatts (MW) and megawatt hours (MWh), respectively.

Each facility listed above generates hydroelectric power except the Warrick facility, which generates substantially all of the power used by the Warrick smelting facility from the co-located Warrick power plant using coal purchased from third parties at nearby coal reserves. In 2024, Alcoa ceased using coal from the Alcoa-owned Liberty Mine, which was operated by a third-party coal company. In 2024, approximately 31 percent of the generation from the Warrick power plant was sold into the market under its current operating permits. Alcoa Power Generating Inc., a subsidiary of the Company, also owns certain Federal Energy Regulatory Commission (FERC)-regulated transmission assets in Indiana, Tennessee, New York, and Washington.

The consolidated capacity of the Brazilian energy facilities shown above in MW is the assured energy, representing approximately 53 percent of hydropower plant nominal capacity. The Brazilian hydroelectric facilities produce energy which is transmitted across the national grid to Alcoa's refineries in Brazil and the excess generation capacity is sold into the market.

Below is an overview of our external energy for our smelters and refineries.

		External Energy Source
Region	**Electricity**	**Natural Gas**
North America	*Québec, Canada* Alcoa's smelter located in Baie-Comeau, Québec, purchases approximately 25 percent of its electricity needs from Manicouagan Power Limited Partnership under an agreement that expires in February 2036. Otherwise, all electricity consumed by the three smelters in Québec is purchased under contracts with Hydro-Québec that expire on December 31, 2029. The Baie-Comeau contract has an automatic renewal through February 2036. *Massena, New York (Massena West)* The Massena West smelter in New York purchases power from the New York Power Authority (NYPA) pursuant to a contract between Alcoa and NYPA that expires in March 2026.	Alcoa generally procures natural gas on a competitive bid basis from a variety of sources, including natural gas producers and independent gas marketers. Contract pricing for gas is typically based on a published industry index such as the New York Mercantile Exchange (NYMEX).
Australia	*Portland* This smelter purchases power from the National Electricity Market (NEM) variable spot market in the state of Victoria and has fixed-for-floating swap contracts with AGL Hydro Partnership, Origin Energy Electricity Limited, and Alinta Energy CEA Trading Pty Ltd, for a combined 587 MW that expire on June 30, 2026. In August 2023 and September 2024, the smelter entered into nine-year fixed-for-floating swap contracts with AGL Hydro Partnership for a combined 587 MW effective July 1, 2026. Each of these swap contracts manage exposure to the variable energy rates from the NEM spot market under long-term power purchase agreements, which may include purchases of power from renewable energy sources.	*Western Australia* AofA uses gas to co-generate steam and electricity for its alumina refining processes at the Kwinana (see below), Pinjarra, and Wagerup refineries, and to fuel the calcination furnaces at each site. The Kwinana refinery was fully curtailed in June 2024, and the Company is evaluating alternatives to resell, swap or redeploy the gas secured for the Kwinana refinery. Prior to 2022, AofA secured a significant portion of gas supplies through 2032. On a combined basis, these gas supply arrangements are expected to cover approximately 90 percent of the Pinjarra and Wagerup refineries' gas requirements through 2027, with decreasing percentages thereafter through 2032. In 2024, AofA contracted for a portion of the additional gas supplies required starting in 2028 for a 10-year period.

	External Energy Source	
Region	**Electricity**	**Natural Gas**
Europe	*San Ciprián, Spain* Since March 2024, when Alcoa completed the restart of approximately 6 percent of capacity, the San Ciprián smelter has been exposed to the electricity spot market. In 2022, Alcoa entered into two long-term power purchase agreements (PPAs) with renewable energy providers that are expected to supply up to 50 percent of the smelter's power needs at its full capacity. The supply of energy will continue to depend on the permitting and development of the windfarms included in the PPAs. In October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS EQT to support the continued operation of the San Ciprián complex. Alcoa would continue as the managing operator of the San Ciprián operations, with IGNIS EQT holding 25 percent ownership. In January 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed an MoU that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations and focuses on the key areas of cooperation. *Mosjøen, Norway* Alcoa has several long-term power purchase agreements securing approximately 80 percent of the necessary power for the smelter through 2035. The remaining power at the smelter is purchased at spot rates. *Lista, Norway* Alcoa had several power purchase agreements securing approximately 90 percent of the necessary power for the smelter through 2024, and has a power purchase agreement securing approximately 80 percent of the necessary power for the smelter for 2025 through 2027. The remaining power at the smelter is purchased at spot rates. Financial compensation of the indirect carbon emissions costs passed through in the electricity bill is received in accordance with European Union (EU) Commission Guidelines and the Norwegian compensation regime. Beginning in 2024, 40 percent of the compensation is conditional on decarbonization investment by Alcoa in Norway. Complying with the additional condition can be achieved over multiple years, but not later than 2034. Compensation received for approved decarbonization investment is expected to be recognized over the useful lives of the related assets. *Iceland* Landsvirkjun, the Icelandic national power company, supplies competitively priced electricity from a hydroelectric facility to the smelter under a 40-year power contract, which expires in 2047 with a price renegotiation effective from 2028.	*Spain* The San Ciprián refinery has been operating at 50 percent of its capacity since the third quarter of 2022. The San Ciprián refinery has access to an adequate supply at Spanish (PVB) spot gas rates.

	External Energy Source	
Region	**Electricity**	**Natural Gas**
South America	*Alumar* The Alumar smelter was operating at 84 percent of the site's total annual capacity of 268,000 mtpy (Alcoa share) as of December 31, 2024, following the restart that was announced in September 2021. The Alumar smelter purchases power under several long-term power purchase agreements that expire in 2038. Long-term power secured is from renewable sources.	

Sources and Availability of Raw Materials

The Company believes that the raw materials necessary to its business are and will continue to be available and that the sources and availability of such raw materials are currently adequate. Generally, materials are purchased from third-party suppliers under competitively priced supply contracts or bidding arrangements. Substantially all of the raw materials required to manufacture our products are available from more than one supplier. Some sources of these raw materials are located in countries that may be subject to unstable political and economic conditions, which could disrupt supply or affect the price of these materials.

Certain raw materials, such as caustic soda and calcined petroleum coke, may be subject to significant price volatility which could impact our financial results.

Alcoa sources bauxite from its own resources and believes its present sources of bauxite on a global basis are sufficient to meet the forecasted requirements of its alumina refining operations for the foreseeable future.

Certain alumina refineries generate electricity through the digestor process that meets or exceeds their power needs, while others purchase electricity from third-party suppliers.

For each metric ton (mt) of alumina produced, Alcoa consumes the following amounts of the identified raw material inputs (approximate range across relevant facilities):

Raw Material	Units	Consumption per mt of Alumina
Bauxite	mt	2.2 – 4.0
Caustic soda	kg	80 – 130
Electricity	MWh	0.17 to 0.30 total consumed
Fuel oil and natural gas	GJ	6 – 10.5
Lime (CaO)	kg	6 – 50

For each metric ton of aluminum produced, Alcoa consumes the following amounts of the identified raw material inputs (approximate range across relevant facilities):

Raw Material	Units	Consumption per mt of Primary Aluminum
Alumina	mt	1.91 – 1.94
Aluminum fluoride	kg	12.2 – 27.2
Calcined petroleum coke	mt	0.26 – 0.40
Cathode blocks	mt	0.003 – 0.007
Electricity	MWh	13.27 – 16.77
Liquid pitch	mt	0.08 – 0.12
Natural gas	mcf	2.1 – 4.9

Certain aluminum we produce includes alloying materials. Because of the number of different types of elements that can be used to produce various alloys, providing a range of such elements would not be meaningful. With the exception of a very small number of internally used products, Alcoa produces its aluminum alloys in adherence to an Aluminum Association (of which Alcoa is an active member) standard, which uses a specific designation system to identify alloy types. In general, each alloy type has a major alloying element other than aluminum but will also include lesser amounts of other constituents.

Competition

Alcoa is subject to highly competitive conditions in all aspects of the aluminum supply chain in which it competes. Our business segments operate in key markets globally, and we are able to meet customer demand in North America, South America, Europe, the Middle East, Australia, China, and other parts of Asia.

We compete with a variety of both U.S. and non-U.S. companies in all major markets across the aluminum supply chain. Competitors include bauxite miners who supply to the third-party bauxite market, alumina suppliers, commodity traders, aluminum producers, and producers of alternative materials such as steel, titanium, copper, carbon fiber, composites, plastic, and glass.

With the Sustana brand, including EcoDura aluminum (recycled content), EcoLum aluminum (low carbon), and EcoSource alumina (also low carbon), the Company is well positioned to compete with others.

Alumina

We are the largest alumina producer outside of China and the largest supplier of third-party alumina outside of China. The alumina market is global and highly competitive, with many active suppliers, producers, and commodity traders. The majority of our product is sold in the form of smelter grade alumina. Our main competitors in the third-party alumina market are Aluminum Corporation of China, South32, Hangzhou Jinjiang Group, Rio Tinto, and Norsk Hydro ASA. In recent years, there has been significant growth in alumina refining in China and Indonesia.

Key factors influencing competition in the alumina market include cost position, price, reliability of bauxite supply, quality, and proximity to customers and end markets. We had an average cost position in the first quartile of global alumina production in 2024, as determined by CRU independent commodity intelligence. Increased production costs in 2024 caused by lower bauxite grades in Australia could place Alumina in the second quartile until new mine regions are accessed. Our refineries are strategically located near low-cost bauxite mines, which provide a long-term supply of bauxite to our refineries. Our alumina refineries include sophisticated refining technology to maximize efficiency with the bauxite grades from these internal mines.

We are among the world’s largest bauxite miners. The majority of bauxite mined globally is converted to alumina for the production of aluminum. In 2024, Alcoa-operated mines, mines operated by partnerships, and bauxite offtake agreements supplied approximately 85 percent of bauxite volume to Alcoa refineries and approximately 15 percent of Alcoa’s bauxite shipments were sold to third-party customers.

Our principal competitors in the third-party bauxite market include Rio Tinto and multiple suppliers from Guinea, Australia, and Brazil, among other countries. We compete largely based on bauxite quality, price, and logistics, as well as strategically located long-term bauxite resources in Brazil and Guinea, which is home to the world’s largest reserves of high-quality metallurgical grade bauxite.

Aluminum

In our Aluminum segment, competition is dependent upon the type of product we are selling.

The market for primary aluminum is global, and demand for aluminum varies widely from region to region. We compete with commodity traders, such as Glencore, Trafigura, J. Aron and Gerald Group, and aluminum producers, such as Emirates Global Aluminum, Norsk Hydro ASA, Rio Tinto, Century Aluminum, and Vedanta Aluminum Ltd.

Several of the most critical competitive factors in our industry are product quality, production costs (including source, reliability of supply, and cost of energy), price, access and proximity to raw materials, customers and end markets, timeliness of delivery, customer service (including technical support), product innovation, and breadth of offerings. Where aluminum products compete with other materials, the characteristics of aluminum are also a significant factor, particularly its light weight, strength, and recyclability.

The strength of our position in the primary aluminum market is largely attributable to: our integrated supply chain and regional presence in key markets, primarily North America and Europe; long-term energy arrangements; the ability of our casthouses to provide customers with a diverse product portfolio in terms of shapes and alloys, while meeting high product quality standards; and low carbon footprint for the majority of our production, as approximately 87 percent of the aluminum smelting portfolio operated by the Company was powered by renewable (primarily hydropower) energy sources in 2024. Renewable energy is derived from natural processes that are replenished constantly, such as sunlight, wind, and hydropower. The Company intends to continue to focus on optimizing value add product capacity utilization.

Patents, Trade Secrets, and Trademarks

The Company believes that its domestic and international patent, trade secret, and trademark assets provide it with a competitive advantage. The Company's rights under its intellectual property, as well as the technology and products made and sold under them, are important to the Company as a whole and, to varying degrees, important to each business segment. Alcoa's business as a whole is not, however, materially dependent on any single patent, trade secret or trademark. As a result of product development and technological advancement, the Company continues to pursue patent protection in jurisdictions throughout the world. As of December 31, 2024, Alcoa's worldwide patent portfolio consisted of approximately 360 granted patents and approximately 200 pending patent applications. The Company also has a number of domestic and international registered trademarks that have significant recognition within the markets that are served, including the name "Alcoa" and the Alcoa symbol. Patents may exist for 20 years from filing date, and trademarks may have an indefinite life based upon continued use.

Government Regulations and Environmental Matters

Alcoa's global operations subject it to compliance with various types of government laws, regulations, permits, and other requirements which often provide discretion to government authorities and could be interpreted, applied, or modified in ways to make the Company's operations or compliance activities more costly. These laws and regulations include those relating to safety and health, environmental protection and compliance, tailings management, data privacy and security, anti-corruption, human rights, competition, and trade, such as tariffs or other import or export restrictions that may increase the cost of raw material or cross-border shipments and impact our ability to do business with certain countries or individuals. Though we cannot predict the collective potential adverse impact of the expanding body of laws, regulations, and interpretations, we believe that we are in compliance with such laws and regulations in all material respects and do not expect that continued compliance with such regulations will have a material effect upon capital expenditures, earnings, or our competitive position. For a discussion of the risks associated with certain applicable laws and regulations, see Part I Item 1A of this Form 10-K.

Environmental

Alcoa is subject to extensive federal, state/provincial, and local environmental laws and regulations and other requirements in the U.S. and abroad, including those relating to the release or discharge of materials into the air, water, and soil; waste management, pollution prevention measures; the generation, storage, handling, use, transportation, and disposal of hazardous materials; and the exposure of persons to hazardous materials.

Alcoa is committed to the Global Industry Standard on Tailings Management (GISTM), an integrated approach to the management and operations of our tailings storage facilities to enhance the safety of these facilities. In August 2023, Alcoa's impoundments with very high or extreme consequence classification were audited by an independent third party and assessed as in conformance with GISTM as required by the International Council on Mining and Metals Conformance Protocol. This represents the first phase of implementation with lower consequence impoundment conformance required by August 2025.

Additionally, we are and may become subject to various laws and regulations related to the disclosures of emissions, the impact of climate change to our business, and plans to reduce such emissions. Recent laws and regulations pertaining to climate change and greenhouse gas emissions have been implemented or are being considered. In addition, as regulators and investors increasingly focus on climate change and other sustainability issues, we are subject to new disclosure frameworks and regulations. For example, the EU adopted the European Sustainability Reporting Standards (ESRS) and the Corporate Sustainability Reporting Directive (CSRD) that will require disclosure of the risks and opportunities arising from social and environmental issues and the impact of companies' activities on people and the environment. The CSRD applies not only to local operations in the EU, but under certain circumstances, to global companies with operations in the EU. The CSRD is applicable to Alcoa operations for 2025 with reporting in 2026. Further, in 2024 Australia passed legislation to mandate climate-related financial disclosures applicable to Alcoa effective for 2025 with reporting in 2026. We continue to monitor the development and implementation of such laws and regulations and continue to assess the extent of potential disclosures or other reporting requirements.

We maintain remediation and reclamation plans for various sites, and we manage environmental assessments and cleanups at approximately 60 locations, which include currently owned or operated facilities and adjoining properties, previously owned or operated facilities and adjoining properties, and waste sites, such as U.S. Superfund (Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)) sites. In 2024, capital expenditures for new or expanded facilities for environmental control were $131 and approximately $170 is expected in 2025. See Part II Item 8 of this Form 10-K in Note S to the Consolidated Financial Statements under caption Contingencies for additional information.

Safety and Health

We are subject to a broad range of foreign, federal, state, and local laws and regulations relating to occupational health and safety, and our safety program includes measures required for compliance. We have incurred, and will continue to incur, capital expenditures to meet our health and safety compliance requirements, as well as to continually improve our safety systems.

For a discussion of the risks associated with certain applicable laws and regulations, see Part I Item 1A of this Form 10-K.

Human Capital Resources

Our core values – Act with Integrity, Operate with Excellence, Care for People, and Lead with Courage – guide us as a company, including our approach to human capital management. We believe that our people are our greatest asset. The success and growth of our business depend in large part on our ability to attract, develop, and retain talented, qualified, and highly skilled employees at all levels of our organization, including the individuals who comprise our global workforce, our executive officers, and other key personnel.

Alcoa's vision is to provide trusting workplaces that are safe, respectful, and inclusive and that reflect the communities in which we operate. Our aim is to build a more inclusive culture where employees feel valued, empowered, and respected. We continue to execute against our strategy, which is driven by our three pillars: (i) strengthen foundations; (ii) build awareness; and, (iii) drive accountability.

Our Company policies, including the Code of Conduct and Ethics, Harassment and Bullying Free Workplace Policy, and EHS Vision, Values, Mission, and Policy, support our mission to advance our Company culture and core values. Alcoa maintains a Human Rights Policy that applies globally to the Company, its partnerships, and other business associates, which incorporates international human rights principles encompassed in the Universal Declaration of Human Rights, the International Labor Organization’s Declaration on Fundamental Principles and Rights at Work, the United Nations Global Compact, and the United Nations Guiding Principles on Business and Human Rights.

The safety and health of our employees, contractors, temporary workers, and visitors are top priorities and key to our ability to attract and retain talent. We aspire to consistently work safely across our locations. We integrate our temporary workers, contractors, and visitors into our safety programs and data. We strive to foster a culture of hazard and risk awareness, speaking up and proactive incident reporting, and knowledge sharing.

Our safety programs and systems are designed to prevent loss of life and serious injury at our locations and include rigorous safety standards and controls, periodic risk-based audits, a formal and standardized process for investigating fatal and serious injury incidents (including potential incidents), management of critical risks and safety hazards, and efforts to eliminate hazards or implement controls to prevent and mitigate risks. We have operating standards based on human performance, which teach employees how to anticipate and recognize situations where errors are likely to occur, which help enable us to predict, reduce, manage, and prevent fatalities and injuries.

As of December 31, 2024, Alcoa had approximately 13,900 employees in 17 countries. As of December 31, 2024, women comprised approximately 20 percent of our global workforce. Approximately 10,300 of our global employees are covered by collective bargaining agreements with certain unions and varying expiration dates, including approximately 1,000 employees in the U.S., 1,900 employees in Europe, 1,400 employees in Canada, 3,500 employees in South America, and 2,500 employees in Australia.

The three collective bargaining agreements with le Syndicat des Métallos (FTQ) representing about 1,000 hourly employees at the Bécancour smelter in Québec, Canada expires on July 19, 2025. ABI is preparing to negotiate new collective bargaining agreements.

Available Information

The Company's internet website address is https://www.alcoa.com. Alcoa makes available free of charge on or through its website its Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports as soon as reasonably practicable after the Company electronically files such material with, or furnishes it to, the Securities and Exchange Commission (the SEC). These documents can be accessed on the investor relations portion of our website, https://www.alcoa.com/investors. This information can also be found on the SEC's internet website, https://www.sec.gov. The information on the Company's website is included as an inactive textual reference only and is not a part of, or incorporated by reference in, this Annual Report on Form 10-K.

Dissemination of Company Information

Alcoa Corporation intends to make future announcements regarding Company developments and financial performance through its website, https://www.alcoa.com, as well as through press releases, filings with the SEC, conference calls, media broadcasts, and webcasts.

Information about our Executive Officers

The names, ages, positions, and areas of responsibility of the executive officers of the Company as of February 14, 2025, are listed below.

William F. Oplinger, 58, has served as President and Chief Executive Officer of Alcoa Corporation since September 24, 2023. Mr. Oplinger served as Executive Vice President and Chief Operations Officer of the Company from February 2023 until his appointment as President and Chief Executive Officer. From November 2016 through January 2023, Mr. Oplinger was Executive Vice President and Chief Financial Officer of the Company. Prior to this, Mr. Oplinger served as Executive Vice President and Chief Financial Officer of ParentCo from April 1, 2013 to November 2016. Mr. Oplinger joined ParentCo in 2000, and through 2013 held key corporate positions in financial analysis and planning and also served as Director of Investor Relations. Mr. Oplinger also held principal positions in the ParentCo's Global Primary Products division, including as Controller, Operational Excellence Director, Chief Financial Officer, and Chief Operating Officer.

Molly S. Beerman, 61, has served as Executive Vice President and Chief Financial Officer of Alcoa Corporation since February 1, 2023. Prior to this, Ms. Beerman was Senior Vice President and Controller of the Company from November 2019 through January 2023 and Vice President and Controller from December 2016 through October 2019. Ms. Beerman was Director, Global Shared Services Strategy and Solutions from November to December 2016. In 2016, Ms. Beerman held a consulting role with the Finance Department of ParentCo. From 2012 to 2015, Ms. Beerman served as Vice President, Finance and Administration for a non-profit organization focused on community issues. Prior to that, Ms. Beerman was employed by ParentCo from 2001 to 2012, having held several roles in the finance function and eventually becoming the director of global procurement center of excellence from 2008 to 2012. Ms. Beerman is a certified public accountant.

Renato Bacchi, 48, has served as Executive Vice President and Chief Commercial Officer of Alcoa Corporation since August 1, 2023. He leads the Company's sales and trading, marketing, supply chain, commercial operations, and procurement and oversees the Company's global energy assets and innovation and technology programs. Mr. Bacchi was Executive Vice President and Chief Strategy and Innovation Officer of Alcoa Corporation from February 2023 to August 2023. Previously, he was Executive Vice President and Chief Strategy Officer from February 2022 through January 2023, Senior Vice President and Treasurer from November 2019 through January 2022, and Vice President and Treasurer from November 2016 through October 2019. Prior to the Separation Transaction, Mr. Bacchi served as the Assistant Treasurer of ParentCo from October 2014 through October 2016 and the Director, Corporate Treasury from 2012 to 2014. Prior to this time, Mr. Bacchi held various roles of increasing responsibility in areas including finance, strategy, procurement, energy and sales. Mr. Bacchi joined ParentCo in Brazil in 1997.

Nicol A. Gagstetter, 46, has served as Executive Vice President and Chief External Affairs Officer of Alcoa Corporation since October 1, 2023. Ms. Gagstetter is responsible for global external affairs, communications, and sustainability, and she oversees the Alcoa Foundation. Ms. Gagstetter was the Global Head of Environment and Social, Copper Industrial Assets at Glencore International AG, a commodity trading and mining company, from August 2021 through September 2023. Ms. Gagstetter was a Senior Marketing Manager at Rio Tinto, a metals and mining company, from 2018 to 2021, and she previously held a variety of leadership roles and positions across external affairs, sustainability, and marketing in Rio Tinto's Commercial, Minerals, and Copper groups from 2008 to 2018.

Andrew Hastings, 50, has served as Executive Vice President and General Counsel of Alcoa Corporation since September 1, 2023. Mr. Hastings has overall responsibility for the Company's global legal, compliance, governance, and security matters. Prior to joining the Company, Mr. Hastings was Senior Vice President and General Counsel at Lundin Mining Corporation, a mine owner and operator, from February 2019 through August 2023. Previously, Mr. Hastings held progressive legal and commercial roles at Barrick Gold Corporation, a mining company, most recently as Vice President, Joint Venture Governance from May 2018 to February 2019.

Tammi A. Jones, 45, has served as Executive Vice President and Chief Human Resources Officer of Alcoa Corporation since April 1, 2020. Ms. Jones oversees all aspects of human resources management, including talent and recruitment, compensation and benefits, inclusion, training and development, and labor relations. Ms. Jones served as Vice President, Compensation and Benefits of Alcoa Corporation from January 2019 through March 2020 and was the Director, Organizational Effectiveness from April 2017 to December 2018. From April 2015 through March 2017, Ms. Jones served as Human Resources Director, Aluminum (at ParentCo until the Separation Transaction), and she served as Human Resources Director for ParentCo Wheels and Transportation Products from April 2013 to April 2015. Ms. Jones joined ParentCo in 2006 and held a variety of human resource positions at ParentCo, including Human Resources Director, Europe Building & Construction and Human Resources Director, UK and Ireland in ParentCo's Building and Construction Systems division.

Matthew T. Reed, 52, has served as Executive Vice President and Chief Operations Officer of Alcoa Corporation since January 1, 2024. Mr. Reed is responsible for the daily operations of the Company's global bauxite, alumina, aluminum, and transformation assets. Mr. Reed was previously Vice President Operations, Australia and President, Alcoa of Australia from June 2023, when he joined the Company, through December 2023. Prior to joining Alcoa, Mr. Reed was the Operations Executive (Chief Operations Officer) of OZ Minerals Limited, a mining company based in South Australia, from September 2021 through May 2023. He was General Manager, Projects at OZ Minerals Limited from January 2021 through August 2021. Previously, Mr. Reed was the Executive Managing Director (Chief Operating Officer) at SIMEC Mining, a mining company based in South Australia, from September 2017 through December 2020.

Item 1A. Risk Factors.

There are inherent risks associated with Alcoa's business and industry. In addition to the factors discussed elsewhere in this report, the following risks and uncertainties could have a material adverse effect on our business, financial condition, or results of operations, including causing Alcoa's actual results to differ materially from those projected in any forward-looking statements. Although the risks are organized by heading, and each risk is described separately, many of the risks are interrelated. While we believe we have identified and discussed below the key risk factors affecting our business, there may be additional risks and uncertainties that are not presently known to Alcoa or that Alcoa currently deems immaterial that also may materially adversely affect us in future periods. See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under the caption Forward-Looking Statements.

Industry and Global Market Risks

The aluminum industry and aluminum end-use markets are highly cyclical and are influenced by several factors, including global economic conditions, the Chinese market, and overall consumer confidence.

The nature of the industries in which our customers operate causes demand for our products to be cyclical, creating potential uncertainty regarding future profitability. The demand for aluminum is sensitive to, and impacted by, demand for the finished goods manufactured by our customers in industries, such as the commercial construction, transportation, and automotive industries, which may change as a result of factors beyond our control. The demand for aluminum is also highly correlated to economic growth, and we could be adversely affected by large or sudden shifts in the global inventory of aluminum and the resulting market price impacts.

We believe the long-term prospects for aluminum and aluminum products are positive; however, we are unable to predict the future course of industry variables or the strength of the global economy and the effects of government intervention. Our business, financial condition, and results of operations may be materially affected by the conditions in the global economy generally, including inflationary and recessionary conditions, and in global capital markets, including in the end markets and geographic regions in which we and our customers operate. Many of the markets in which our customers participate are also cyclical in nature and experience significant fluctuations in demand for their products based on economic and geopolitical conditions, consumer demand, raw material and energy costs, foreign exchange rates, and government actions. Many of these factors are beyond our control.

The Chinese market is a significant source of global demand for, and supply of, commodities, including aluminum. Chinese production rates of aluminum, both from new construction and installed smelting capacity, can fluctuate based on Chinese government policy, such as the level of enforcement of production capacity limits and/or licenses and environmental policies. In addition, industry overcapacity, a sustained slowdown in Chinese aluminum demand, or a significant slowdown in other markets, that is not offset by decreases in supply of aluminum or increased aluminum demand in emerging economies, such as India, Brazil, and several Southeast Asian countries, could have an adverse effect on the global supply and demand for aluminum and aluminum prices. Also, changes in the aluminum market can cause changes in the alumina and bauxite markets, which could also materially affect our business, financial condition, or results of operations. As a result of these factors, our profitability is subject to significant fluctuation.

A decline in consumer and business confidence and spending, severe reductions in the availability and cost of credit, and volatility in the capital and credit markets could adversely affect the business and economic environment in which we operate and the profitability of our business. We are also exposed to risks associated with the creditworthiness of our suppliers and customers. If the availability of credit to fund or support the continuation and expansion of our customers' business operations is curtailed or if the cost of that credit is increased, the resulting inability of our customers or of their customers to either access credit or absorb the increased cost of that credit could adversely affect our business by reducing our sales or by increasing our exposure to losses from uncollectible customer accounts. These conditions and a disruption of the credit markets could also result in financial instability of some of our suppliers and customers. The consequences of such adverse effects could include the interruption of production at the facilities of our customers, the reduction, delay or cancellation of customer orders, delays or interruptions of the supply of raw materials we purchase, and bankruptcy of customers, suppliers, or other creditors. Any of these events could adversely affect our business, financial condition, and results of operations.

We have in the past and could in the future be materially adversely affected by volatility and declines in aluminum and alumina demand and prices, including global, regional, and product-specific prices, or by significant changes in production costs which are linked to LME or other commodities.

The overall price of primary aluminum consists of several components: (i) the underlying base metal component, which is typically based on quoted prices from the LME; (ii) the regional premium, which comprises the incremental price over the base LME component that is associated with the physical delivery of metal to a particular region (e.g., the Midwest premium for metal sold in the United States); and (iii) the product premium, which represents the incremental price for receiving physical metal in a particular shape (e.g., foundry, billet, slab, rod, etc.) and/or alloy. Each of the above three components has its own drivers of variability.

The LME price volatility is typically driven by macroeconomic factors (including geopolitical instability), global supply and demand of aluminum (including expectations for growth, contraction, and the level of global inventories), and trading activity of financial investors. In 2024, LME cash prices reached a high of $2,695 per metric ton in May 2024 and a low of $2,110 per metric ton in January 2024.

While global inventories remained at historically low levels in 2024, high inventories could lead to a reduction in the price of aluminum and declines in the LME price have had a negative impact on our business, financial condition, and results of operations. Regional premiums tend to vary based on the supply of and demand for metal in a particular region, associated transportation costs, and import tariffs. Product premiums generally are a function of supply and demand for a given primary aluminum shape and alloy combination in a particular region. Periods of industry overcapacity may also result in a weak aluminum pricing environment.

A sustained weak LME aluminum pricing environment, deterioration in LME aluminum prices, or a decrease in regional premiums or product premiums could have a material adverse effect on our business, financial condition, or results of operations. Similarly, our operating results are affected by significant changes in key costs of production that are linked to LME or other commodities.

Most of our alumina contracts contain two pricing components: (1) the API price basis and (2) a negotiated adjustment basis that takes into account various factors, including freight, quality, customer location, and market conditions. Because the API component can exhibit significant volatility due to market exposure, revenues associated with our alumina operations are exposed to market pricing.

Market-driven balancing of global aluminum supply and demand may be disrupted by non-market forces.

In response to market-driven factors relating to the global supply and demand of aluminum and alumina, including energy prices and environmental policies, other industry producers have independently undertaken to reduce or increase production. Changes in production may be delayed or impaired by the ability to secure, or the terms of long-term contracts, to buy energy or raw materials.

The impact of non-market forces on global aluminum industry capacity, such as political instability or pressures or governmental policies in certain countries relating to employment, trade, the environment, or maintaining or further developing industry self-sufficiency, may affect overall supply and demand in the aluminum industry. For example, the ongoing conflict between Russia and Ukraine could adversely impact macroeconomic conditions and result in heightened economic sanctions from international communities in a manner that adversely affects our industry. The disruption of the market-driven balancing of the global supply and demand of aluminum, a resulting weak pricing environment, and margin compression may adversely affect our business, financial condition, and results of operations.

Our participation in increasingly competitive and complex global markets exposes us to risks, including legal and regulatory risks and changes in conditions beyond our control, that could adversely affect our business, financial condition, or results of operations.

We have operations or activities in numerous countries and regions outside the United States, including Australia, Brazil, Canada, Europe, Guinea, and Saudi Arabia. The risks associated with the Company's global operations include:

- Geopolitical risks, such as political instability, coup d'états, civil unrest, strikes and work stoppages, expropriation, nationalization of properties by a government, imposition of sanctions, changes to import or export regulations and fees, renegotiation, revocation or nullification of existing agreements, leases, licenses, and permits, and changes to mining royalty rules or laws;
- Economic and commercial instability risks, including those caused by sovereign and private debt default, corruption, and changes in local government laws, regulations, and policies (including fiscal policies), such as those related to tariffs and trade barriers, trade tensions, taxation, exchange controls, employment regulations, carbon dioxide compensation support, and repatriation of earnings;
- Weakening macroeconomic conditions;
- Decreasing manufacturing activity, especially in the global automotive sector;
- War or terrorist activities;
- Major public health issues, such as a pandemic or epidemic, which could cause disruptions in our operations, supply chain, or workforce;
- Information systems failures or disruptions, including due to cyber attacks;
- Difficulties enforcing intellectual property and contractual rights, or limitations in the protection of technology, data, and intellectual property, in certain jurisdictions; and,
- Unexpected events, accidents, or environmental incidents, including natural disasters.

We have experienced some of these events, and while the impact of any of the foregoing factors is difficult to predict, any one or more of them could adversely affect our business, financial condition, or results of operations. Existing insurance arrangements may not provide sufficient coverage or reimbursement for significant costs that may arise from such events.

Unexpected or uncontrollable events or circumstances in any of the foreign markets in which we operate, including actions by foreign governments such as changes in foreign policy or fiscal regimes, termination of our leases or agreements with such foreign governments, increased government regulation, or forced curtailment or continuation of operations, could materially and adversely affect our business, financial condition, or results of operations.

We have in the past been and may in the future be unable to obtain, maintain, or renew permits or approvals necessary for our mining operations, which could materially adversely affect our operations and profitability.

Our mining operations are subject to extensive permitting and approval requirements. These include permits and approvals issued by various government agencies and regulatory bodies at the federal, state, and local levels of governments in the countries in which we operate. The permitting and approval rules are complex, are often subject to interpretations by regulators, which may change over time, and may be impacted by heightened levels of regulatory oversight and stakeholder focus on addressing environmental and social impacts of mining activities.

Changing expectations and increased information required by regulators has in the past and could in the future make our ability to comply with the applicable requirements more difficult, inhibit or delay our ability to timely obtain the necessary approvals, if at all, result in approvals being conditioned in a manner that may restrict the Company's ability to efficiently and economically conduct its mining activities, require us to adjust our mining plans, or preclude the continuation of certain ongoing operations and mining activities or the development of future mining operations. Failure to obtain, maintain, or renew permits or approvals, or permitting or approval delays, restrictions, or conditions has in the past and may in the future impact the quality of the bauxite we are able to mine and could increase our costs and affect our ability to efficiently and economically conduct our operations, potentially having a materially adverse impact on our results of operations and profitability.

In addition, the permitting processes, restrictions, and requirements imposed by conditional permits or approvals, and associated costs and liabilities, have in the past and may in the future be extensive, which can delay or prevent commencing or continuing exploration or production operations. This has in the past adversely affected and could in the future adversely affect the Company's mining operations and production, as well as our refining and smelting operations, and has in the past and could in the future require us to curtail, close, or otherwise modify our production, operations, and sites. In addition, these processes, restrictions, and requirements have in the past resulted and could in the future result in the Company's mining permits being rescinded or modified, or adjustment to our mining plans, to mitigate against adverse impacts to sites within or near our mining areas that have environmental, biodiversity, or cultural significance. Such actions have in the past had and could in the future have a material adverse impact on our results of operations and profitability. For example, the Company seeks annual approvals from the Western Australia government for rolling five-year mine plans to maintain operations at the Huntly and Willowdale bauxite mines. This statutory annual mine approvals process for the Company's 2023-2027 Mining and Management Program (MMP) took longer than it had taken historically due to increased requirements and expectations from stakeholders with respect to certain environmental matters. As a result of the prolonged approval process, the Company began mining lower grade bauxite in April 2023, which impacted the Company's refineries and cost structures by increasing the use of caustic, energy, and bauxite and decreasing alumina output. The Company's 2023-2027 MMP and 2024-2028 MMP were approved, subject to certain conditions, which amongst other requirements, accelerates cash spend of approximately $40 during the period from 2024 through 2027 from asset retirement obligations already recorded.

Our operations and profitability have in the past and could in the future be impacted by rising energy costs and interruptions or uncertainty in energy supplies.

Our refineries and smelters consume substantial amounts of natural gas and electricity in the production of alumina and aluminum. The prices for and availability of energy have in the past and could in the future be impacted by volatile market conditions resulting from factors beyond our control such as weather, political, regulatory, and economic conditions. For example, the San Ciprián refinery and smelter incurred substantial losses in 2024 and in prior years as a result of a challenging economic environment, primarily due to the high cost of energy. In October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS Equity Holdings, SL (IGNIS EQT), the majority shareholder in the IGNIS Group of Companies, a vertically integrated energy company based in Spain, to support the continued operation of the San Ciprián complex. Alcoa would continue as the managing operator of the San Ciprián operations, with IGNIS EQT holding 25 percent ownership. In January 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed a memorandum of understanding that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations and focuses on the key areas of cooperation.

Though we have ownership in certain hydroelectricity assets, we also rely on third parties for our supply of energy resources consumed in the manufacture of our products. Energy supply contracts for our operations vary in length and market exposure, and we have been and could be negatively impacted by:

- Significant increases in LME prices, or spot electricity, fuel oil and/or natural gas prices;
- Unavailability of or interruptions or uncertainty in energy supply or unplanned outages due to political instability, droughts, hurricanes, earthquakes, wildfires, other natural disasters, equipment failure, or other causes;
- Unavailability of long-term energy from renewable sources in particular locations or at competitive rates;
- Curtailment of one or more refineries or smelters due to the inability to extend energy contracts upon expiration, negotiate new arrangements on cost-effective terms, or the unavailability of energy at competitive rates; and,
- Curtailment of one or more facilities due to high energy costs that render their continued operation uneconomic, discontinuation of power supply interruptibility rights granted to us under a regulatory regime in the country in which the facility is located, or due to a determination that energy arrangements do not comply with applicable laws, thus rendering the operations that had been relying on such country's energy framework uneconomic.

Events, such as those listed above, have in the past and could in the future result in high energy costs, the disruption of an energy source, finding a replacement energy source at a higher cost, the requirement to repay all or a portion of the benefit we received under a power supply interruptibility regime or carbon dioxide compensation schemes, or the requirement to remedy any non-compliance of an energy framework to comply with applicable laws. These events have disrupted our operations and resulted in production curtailments that could have a material adverse effect on our business, financial condition, or results of operations.

Our operations and profitability have been and could continue to be adversely affected by unfavorable changes in the cost, quality, or availability of raw materials or other key inputs, or by disruptions in the supply chain.

Our business, financial condition, and results of operations have been and could continue to be negatively affected by unfavorable changes in the cost, quality, or availability of energy, raw materials, including carbon products, caustic soda, and other key inputs, such as bauxite, as well as freight costs associated with transportation of raw materials and key inputs to refining and smelting locations. We may not be able to fully offset the effects of higher raw material or energy costs through price increases, productivity improvements, cost reduction programs, or reductions or curtailments to production at our operations. A decrease in the quality of raw materials or key inputs has in the past and could continue to cause increased production costs, which also has in the past and could continue to result in lower production volumes. For example, the Company is currently mining and processing lower grade bauxite in Western Australia, which has caused increased production costs. Changes in the costs of bauxite, alumina, energy, and other inputs during a particular period may not be adequate to offset concurrent sharper decreases in the price of alumina or aluminum and could have a material adverse effect on our operating results.

In addition, due to global supply chain disruptions, we may not be able to obtain sufficient supply of our raw materials, energy, or other key inputs in a timely manner, including due to shortages, inflationary cost pressures, trade policies, or transportation delays, which could cause disruption in our operations or production curtailments. Though we have been able to source our raw materials and other key inputs in adequate amounts from other suppliers or our own stockpiles to date, there can be no guarantee that our operations or profitability will not be adversely affected in the future. Our suppliers, vendors, and customers could experience similar constraints that could impact our operations and profitability.

Global Operational and Regulatory Risks

Our global operations expose us to risks related to economic, political, and social conditions, including the impact of trade policies, tariffs, and adverse industry publicity, which may negatively impact our business and our ability to operate in certain locations.

We are subject to risks associated with doing business internationally, including foreign or domestic government fiscal and political crises, political and economic disputes and sanctions, social requirements and conditions, the imposition of tariffs and other actions taken by governments, and adverse industry publicity. These factors, among others, bring uncertainty to the markets in which we compete, and may adversely affect our business, financial condition, and results of operations.

In the United States, the U.S. government has taken actions with respect to the implementation of significant changes to certain trade policies, including import tariffs and quotas, modifications to international trade policy, the withdrawal from or renegotiation of certain trade agreements, and other changes that have affected U.S. trade relations with other countries, any of which may require us to significantly modify our current business practices or may otherwise materially and adversely affect our business or those of our customers. The U.S. government continues to review trade policies and negotiate new agreements with countries globally that could impact the Company. To the extent that further agreements are reached on a broader range of imports, or these tariffs and other trade actions result in a decrease in international demand for aluminum produced in or imported into the United States or otherwise negatively impact demand for our products, our business may be adversely impacted, and could further exacerbate aluminum and alumina price volatility and overall market uncertainty. While the U.S. government has recently established or threatened to establish new tariffs on imports of Mexican-, Canadian- and Chinese-origin and on certain raw materials of any country of origin, including aluminum, the status of any such tariffs is fluid and the ultimate impact on the Company will be based on a number of variables that are not known at this time. The impact on the Company will be based on the final tariffs imposed, which we are not able to predict at this time.

In addition, we operate in communities around the world, and social issues in the communities where we operate have affected and could continue to affect our operations; furthermore, incidents related to our industry have generated and could continue to generate negative publicity and impact the social acceptability of our operations in such locations, including by damaging our reputation, our relationships with stakeholders, and our competitive position. Growing expectations of hosting communities as well as increasing social activism pose additional challenges to our operations and our ability to expand our business. For example, community and stakeholder concerns in Juruti, Brazil have affected our ability to access certain mining areas at times. In certain jurisdictions, there are increasing regulatory developments to protect minority groups, such as Indigenous people in Australia. This could have an adverse effect on our ability to secure expansions to our operations at all or in the expected timeframe, could significantly increase our cost of doing business, and could disrupt our operations.

We may be exposed to significant legal proceedings, investigations, or changes in foreign and/or U.S. federal, state, or local laws, regulations, or policies.

Our results of operations or liquidity in a particular period could be affected by new or increasingly stringent laws, regulatory requirements or interpretations, or outcomes of significant legal proceedings or investigations adverse to the Company. We may become subject to unexpected or rising costs associated with business operations, compliance measures, or provision of health or welfare benefits to employees due to changes in laws, regulations, or policies. We are also subject to a variety of legal and compliance risks, including, among other things, potential claims relating to health and safety, environmental matters, intellectual property rights, governance, employment practices, employee and retiree benefit matters, product liability, data privacy, taxes and compliance with U.S. and foreign export, anti-bribery, and competition laws, and sales and trading practices. We could be subject to fines, penalties, interest, or damages (in certain cases, treble damages). In addition, if we violate the terms of our agreements with governmental authorities, we may face additional monetary sanctions, costs, clawbacks, and other impacts.

While we believe we have adopted appropriate risk management and compliance programs to address and reduce these risks, the global and diverse nature of our operations means that these risks continue to exist, and additional legal proceedings and contingencies may arise from time to time. In addition, various factors or developments can lead the Company to change current estimates of liabilities or make estimates for matters previously not susceptible of reasonable estimates, such as a significant judicial ruling, judgment, or settlement, or significant regulatory developments or changes in applicable law. A future adverse ruling or settlement or unfavorable changes in laws, regulations or policies, or other contingencies that the Company cannot predict with certainty could have a material adverse effect on our results of operations or cash flows in a particular period. See Part I Item 3 of this Form 10-K and Part II Item 8 of this Form 10-K in Note S to the Consolidated Financial Statements under caption Contingencies.

Changes in tax laws or exposure to additional tax liabilities could affect our future profitability.

We are subject to income taxes in both the United States and various non-U.S. jurisdictions. Changes in foreign and domestic tax laws, regulations, or policies, or their interpretation and application by regulatory bodies, or exposure to additional tax liabilities could affect our future profitability. For example, in October 2021, a new framework for international tax was agreed to by 137 member countries and jurisdictions of the Organisation for Economic Co-operation and Development (OECD), including the two-pillar solution for a global minimum level of taxation. While the future of Pillar One remains uncertain, the global minimum tax under Pillar Two is fully effective or is expected to be fully effective in 2025 in most of the countries in which we operate. The implementation of the Pillar Two Framework in these countries did not have a material impact during 2024, but they could in the future should the Company's tax profile change. We continue to monitor any additional guidance released by the OECD, along with the pending and adopted legislation in the countries in which we operate.

Our domestic and international tax liabilities are dependent upon the distribution of profits among the different jurisdictions in which we operate. Our tax expense includes estimates of additional tax that may be incurred for tax exposures and reflects various estimates and assumptions. The assumptions include assessments of future earnings of the Company that could impact the valuation of our deferred tax assets. Our future results of operations could be adversely affected by changes in the effective tax rate as a result of a change in the mix of earnings in countries with differing statutory tax rates, changes in the overall profitability of the Company, changes in tax legislation and rates, changes in generally accepted accounting principles, and changes in the valuation of deferred tax assets and liabilities. Significant changes to tax laws or regulations and the positions of taxing authorities could have a substantial impact, positive or negative, on our effective tax rate, cash tax expenditures and cash flows, and deferred tax assets and liabilities. For example, in December 2023, the U.S. Treasury Department clarified that commercial grade aluminum can qualify for Section 45X of the Advanced Manufacturing Tax Credit, enacted as part of the Inflation Reduction Act (IRA). Section 45X provides a tax credit for certain costs incurred in the production of critical minerals, including aluminum. In the fourth quarter of 2023, the Company recorded a full year benefit of $36 related to its Massena West (New York) smelter and its Warrick smelter. On October 24, 2024, the U.S. Treasury finalized the Proposed Regulations under Section 45X with important modifications including the ability to include the cost of certain direct and indirect materials in the cost base of the credit. The Proposed Regulation on the definition of aluminum was not finalized; the U.S. Treasury has indicated it will finalize the definition at a later date. In 2024, the Company recorded benefits of $71 related to its Massena West smelter and its Warrick smelter, including $30 for the full year 2023 and 2024 benefit resulting from the October update.

We are subject to tax audits by various tax authorities in many jurisdictions, such as Australia, Brazil, Canada, and Norway. For example, in July 2020, AofA received Notices of Assessment from the Australian Taxation Office (ATO) related to the pricing of certain historic third-party alumina sales, and the ultimate resolution of this matter is uncertain at this time. We regularly assess the potential outcomes of examinations by tax authorities in determining the adequacy of our provision for income taxes. The results of tax audits and examinations of previously filed tax returns or related litigation and continuing assessments of our tax exposures could materially affect our financial results. See Part II Item 8 of this Form 10-K in Notes Q and S to the Consolidated Financial Statements under captions Unrecognized tax benefits and Contingencies, respectively.

Climate change, climate change legislation or regulations, and efforts to reduce greenhouse gases (GHG) and build operational resilience to extreme weather conditions may adversely impact our operations and markets.

Several governments or regulatory bodies in areas where we operate, such as in the United States, Australia, Brazil, Canada, and the EU, have introduced or are contemplating legislative and regulatory change in response to the potential impacts of climate change, which could result in changes to the margins of GHG intensive assets and energy-intensive assets. These regulatory mechanisms relating to carbon may be either voluntary or legislated and the inconsistency of associated regulations may impact our operations directly or indirectly through customers or our supply chain. Assessments of the potential impact of future climate change legislation, regulation, and international treaties and accords are uncertain, given the wide scope of potential regulatory change in countries in which we operate and the diversity in the scope and development of such regulations. For example, in 2021, the European Commission proposed a Carbon Border Adjustment Mechanism (CBAM) as a levy on carbon-intensive imports, which was provisionally approved in December 2022. In October 2023, the CBAM entered into application of its transitional phase, which applies to aluminum, with the first reporting period for importers ending January 31, 2024, and full implementation of CBAM will begin on January 1, 2026. We may realize increased capital expenditures, costs, or taxes resulting from required compliance with revised or new legislation or regulations, including costs to purchase or profits from sales of allowances or credits under a carbon credit/pricing or “cap and trade” system, increased insurance premiums and deductibles as new actuarial tables are developed to reshape coverage, a change in competitive position relative to industry peers, and changes to profit or loss arising from increased or decreased demand for goods produced by the Company and, indirectly, from changes in costs of goods sold.

Though we are investing in technology to reduce the production of GHG in the manufacture of our products, such as our ELYSIS partnership aluminum smelting technology and other technologies that are designed to limit the production of carbon in alumina refining, in certain aspects of our operations, our ability to reduce our GHG emissions is also dependent on the actions of third parties, especially energy providers, and our ability to make significant changes in our GHG emissions. As a result, we could face additional costs associated with any new regulation of GHG emissions, and our ability to modify our operations to avoid these costs may be limited in the near term.

We also have operations in jurisdictions that have implemented or are developing regulations covering a variety of environmental and social topics, including GHG emissions, such as the European Union’s Corporate Sustainability Reporting Directive, and similar regulations under consideration in U.S. states and other countries in which we operate, which contain new and extensive disclosure requirements that may require additional resources and costs associated with compliance. If we fail to comply with the various reporting frameworks, we could face scrutiny from stakeholders and regulators, incur monetary penalties and reputational harm, and could become subject to litigation or result in other material impacts to our business.

In addition, regulations to combat climate change could impact the competitiveness of the Company, including the attractiveness of the locations of some of the Company’s assets. The global focus on climate is raising awareness in all countries, such as the agreement at the 26th United Nations Climate Change Conference of the Parties (COP26) by many governments of countries where the Company operates to combat deforestation, which could adversely affect our ability to mine and operate in sensitive areas like the Jarrah Forest and the Amazon.

The potential physical impacts of climate change or extreme weather conditions on the Company’s operations are highly uncertain, could be significant, and will be particular to the geographic circumstances. These may include changes in rainfall patterns, wildfires, heat waves, shortages of water or other natural resources, changing sea levels, changing storm patterns, flooding, increased frequency and intensities of storms, and changing temperature levels. Any of these may disrupt our operations, hinder transportation of products to us or of our products to customers, interrupt energy supplies, prevent access to our facilities, negatively impact our suppliers’ or customers’ operations and their ability to fulfill contractual obligations to us, and/or cause damage to our facilities, all of which may increase our costs, reduce production, and adversely affect our business, financial condition, or results of operations. Measures to mitigate or adapt our assets, including current operations, closed or curtailed locations, and impoundment structures, to the potential physical climate-related risks may increase costs. In addition, we rely on our customers and suppliers to assess their own potential physical impacts of climate change and implement appropriate mitigation or adaptation actions. Thus, we may not be able to influence the resiliency of our suppliers or customers to potential physical impacts of climate change.

Our business, financial condition, and results of operations could be adversely affected by disruptions in the global economy caused by ongoing regional conflicts.

The global economy has been negatively impacted by ongoing regional conflicts, such as the conflict between Russia and Ukraine and the conflict in the Middle East. Such adverse and uncertain economic conditions have exacerbated supply chain disruptions and increased our costs for certain raw materials and energy, particularly in Spain which impacted the viability of the San Ciprián operations. Additionally, in 2022, in response to the conflict between Russia and Ukraine, we ceased purchasing raw materials from and selling our products to Russian businesses. Furthermore, governments in the U.S., United Kingdom, and European Union have each imposed export controls on certain products and financial and economic sanctions on certain industry sectors and parties in Russia. To date, these actions and other ongoing regional conflicts and responses have not had a material adverse impact on the Company's business, but they could have material negative impacts if the conflicts continue and global sales of our products are affected.

Increased trade barriers or restrictions on global trade, or retaliatory measures taken in response, as well as the destabilizing effects of regional conflict, could also adversely affect our business, financial condition, and results of operations by limiting sales, restricting access to required raw materials, or raising costs thereof. Destabilizing effects that these ongoing regional conflicts may pose for the global oil and natural gas markets could also adversely impact our operations by further increasing our energy costs. In addition, further escalation of geopolitical tensions related to such conflicts could result in loss of property, cyber attacks, additional supply disruptions, an inability to obtain key supplies and materials, reduced production and sales, and/or operational curtailments, and adversely affect our business and our supply chain.

We are exposed to fluctuations in foreign currency exchange rates and interest rates, as well as inflation and other economic factors in the countries in which we operate.

Economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, competitive factors in the countries in which we operate, and volatility or deterioration in the global economic and financial environment, have in the past and could in the future affect our business, financial condition, and results of operations. Changes in the valuation of the U.S. dollar against other currencies, particularly the Australian dollar, Brazilian real, Canadian dollar, euro, and Norwegian kroner, which are the currencies of certain countries in which we have operations, may affect our profitability, as some important inputs are purchased in other currencies, while our products are generally sold in U.S. dollars. As the U.S. dollar strengthens, the cost curve shifts down for smelters outside the United States, but costs for our U.S. smelting portfolio may not decline.

We face significant competition globally within and beyond the aluminum industry, which may have an adverse effect on profitability.

We compete with a variety of both U.S. and non-U.S. aluminum industry competitors as well as with producers of other materials, such as steel, titanium, plastics, composites, ceramics, and glass, among others. Use of such materials could reduce the demand for aluminum products, which may reduce our profitability and cash flow. Factors affecting our ability to compete include increased competition from overseas producers, our competitors' pricing strategies, the introduction or advancement of new technologies, equipment by our competitors or our customers, government regulation or support of certain material production, changes in our customers' strategy or material requirements, and our ability to maintain the cost-efficiency of our facilities. Certain competitors possess financial, technical, and management resources to develop and market products that may compete favorably against our products, and consolidation among our competitors may also allow them to compete more effectively. In addition, our competitive position depends, in part, on our ability to operate as an integrated aluminum value chain, leverage innovation expertise across businesses and key end markets, and access an economical power supply to sustain our operations in various countries. See Part I Item 1 of this Form 10-K under caption Competition.

We may not achieve our strategies or expectations relating to environmental, social, and governance considerations, which could expose us to potential liabilities, increased costs, reputational harm, and other adverse effects on our business.

We have established strategies and expectations relating to certain environmental, social, and governance considerations, including regarding reducing GHG emissions, reducing water usage, reducing waste, improving safety performance, and managing social risks across our operations. These strategies and expectations reflect our current plans and aspirations, and there is no guarantee that they will be achieved. Our ability to achieve any such strategies or expectations is subject to numerous factors and conditions, some of which are outside of our control. Examples of such factors include, but are not limited to, evolving legal, regulatory, and other standards, processes, and assumptions, the pace of scientific and technological developments, increased costs, the availability of requisite suppliers, energy sources, or financing, and changes in carbon markets. Failures or delays (whether actual or perceived) in achieving our strategies or expectations related to these matters could expose us to potential liabilities, increased costs, reputational harm, and other adverse effects on our business.

Furthermore, many governments, regulators, investors, employees, customers, media outlets, and other stakeholders are increasingly focused on environmental, social, and governance considerations relating to businesses, and in some cases have divergent views on these issues, including relating to climate change and GHG emissions, biodiversity, and human capital strategies and programs. Our business may face increased scrutiny from such stakeholders and if our strategies relating to environmental, social, and governance considerations do not meet stakeholder expectations and standards, which continue to evolve and may differ across jurisdictions in which we operate, our business, financial condition, results of operations, and reputation could be adversely impacted. Similarly, our failure or perceived failure to pursue or fulfill our strategies and manage expectations; comply with federal, state, regional, or international ethical, environmental, or other standards, regulations, or expectations; adhere to public statements; satisfy reporting standards; or meet evolving and varied stakeholder expectations within the timelines we announce, or at all, could have adverse operational, reputational, financial, and legal impacts.

We are subject to a broad range of health, safety, and environmental laws, regulations, and other requirements in the jurisdictions in which we operate that may expose us to substantial claims, costs, and liabilities.

Our operations worldwide are subject to numerous complex and increasingly stringent federal, state, local and foreign laws, regulations, policies, and permitting, licensing, and other requirements, including those related to health, safety, environmental, and waste management and disposal matters, which may expose us to substantial claims, costs, and liabilities. We may be subject to fines, penalties, and other damages, such as natural resource or community damages and the costs associated with the investigation and cleanup of soil, surface water, groundwater, and other media under laws such as CERCLA (commonly known as Superfund) or similar U.S. and foreign regulations. These laws, regulations, policies, and permitting, licensing, and other requirements could change or could be, and have been, applied or interpreted in ways that could (i) require us to enjoin, curtail, close, or otherwise modify our operations and sites, including the implementation of corrective measures, the installation of additional equipment or structures, or the undertaking of other remedial actions, or (ii) subject us to enforcement risk or impose on or require us to incur additional capital expenditures, compliance or other costs, fines, penalties, or damages, any of which could adversely affect our results of operations, cash flows and financial condition, and the trading price of our common stock.

The costs of complying with such laws, regulations, policies, and other requirements, including participation in assessments, remediation activities, and cleanups of sites, as well as internal voluntary programs, are significant and will continue to be so for the foreseeable future. Environmental laws may impose cleanup liability on owners and occupiers of contaminated property, including previously owned, non-operational, or divested properties, regardless of whether the owners and occupiers caused the contamination or whether the activity that caused the contamination was lawful at the time it was conducted. As a result, we may be subject to claims arising from current or former conditions at sites that we own or operate currently, as well as at sites that we owned or operated in the past, and at contaminated sites that have always been owned or operated by third parties, regardless of whether we caused the contamination or whether the activity that caused the contamination was lawful at the time it was conducted. Liability may be without regard to fault and may be joint and several, so that we may be held responsible for more than our share of the contamination or other damages, or even for the entire share.

In addition, because environmental laws, regulations, policies, and other requirements are constantly evolving, we will continue to incur costs to maintain compliance and such costs could increase materially and prove to be more limiting and costly than we anticipate. Evolving standards and expectations can result in increased litigation and/or increased costs, all of which can have a material and adverse effect on our business operations, earnings, and cash flows. Future compliance with environmental, health, and safety legislation and other regulatory requirements or expectations may prove to be more limiting and costly than we anticipate and may disrupt our business operations and require significant expenditures. Our business, financial condition, or results of operations in a particular period could be materially affected by certain health, safety, or environmental matters, including remediation costs and damages related to certain sites.

Our operations include impoundment structures, which could impact the environment or cause exposure to hazardous substances or other damage, which could result in material liabilities to us.

Some of our operations generate waste and other byproducts, which we contain in tailing facilities, residue storage areas, and other structural impoundments that are subject to extensive regulation and increasingly strict industry standards. Failure of storage areas caused by extreme weather events, erosion, or unanticipated structural failure of impoundments could result in severe, and in some cases catastrophic, damage to the environment, natural resources, or property, or personal injury and loss of life. The impact that our operations may have on the environment, as well as exposures to hazardous substances or wastes associated with our operations, could result in significant costs, civil or criminal damages, fines or penalties, and enforcement actions issued by regulatory or judicial authorities enjoining, curtailing, or closing operations or requiring corrective measures, any of which could have a material adverse effect on Alcoa.

The secondary listing of the Alcoa common stock on the Australian Stock Exchange (ASX) via CDIs could lead to price variations and other impacts on the price of Alcoa common stock.

Alcoa common stock is listed as CDIs on the ASX in addition to its existing primary listing on the New York Stock Exchange (NYSE).

Dual listing may result in price variations between Alcoa's securities listed on the different exchanges due to a number of factors, including that Alcoa common stock listed on the NYSE is traded in U.S. dollars and CDIs listed on the ASX are traded in Australian dollars, inherently introducing exchange rate volatility, and differences between the trading schedules and time zones of the two exchanges, among other factors. A decrease in the price of Alcoa's securities in one market may result in a decrease in the price of Alcoa's securities in the other market. Dual listing also presents the Company with the opportunity to raise additional funds through the issuance of CDIs, which could cause dilution to stockholders.

We may not be able to obtain or maintain adequate insurance coverage.

We maintain various forms of insurance, including insurance covering claims related to our properties and risks associated with our operations. Our existing property and liability insurance coverages contain exclusions and limitations on coverage. In connection with renewals of insurance, we have experienced, or could experience in the future, additional exclusions and limitations on coverage, significantly increased self-insured retentions and deductibles, and significantly higher premiums. We may not be able to procure adequate insurance coverage for certain risks, if at all, and existing insurance arrangements may not provide sufficient coverage or reimbursement for significant costs that may arise. As a result, in the future our insurance coverage may not cover claims to the extent that it has in the past and the costs that we incur to procure insurance may increase significantly, either of which could have an adverse effect on our results of operations.

Business Strategy Risks

We have incurred, and may incur in the future, significant costs associated with our strategy to reduce complexity and optimize our portfolio of mining, refining, and smelting assets, and we may not be able to realize the anticipated benefits from announced plans, programs, initiatives relating to our portfolio, capital investments, and developing technologies.

We are executing a strategy to achieve safety performance and operational excellence, build a high performance culture, maintain a disciplined approach to capital allocation, and pursue targeted growth opportunities by implementing productivity and cost-reduction initiatives, optimizing our portfolio of assets, and investing in technology development. We have been taking decisive actions to reduce complexity and optimizing our portfolio of assets by safely curtailing the Kwinana (Australia) refinery, acquiring Alumina Limited, and announcing the sale of our 25.1% ownership in the Saudi Arabia joint venture.

We have taken actions and may continue to plan and execute other actions to grow or streamline our portfolio. There is no assurance that anticipated benefits of our strategic actions will be realized. With respect to portfolio optimization actions such as divestitures, curtailments, closures, and restarts, we may face barriers to exit from unprofitable businesses or operations, including high exit costs or objections from various stakeholders, the lack of availability of buyers willing to purchase such assets at prices acceptable to us, delays due to any regulatory approvals or government intervention, continuing environmental obligations, and third parties unwilling to release us from guarantees or other credit support provided in connection with the sale of assets. In addition, we may retain liabilities from such transactions, have ongoing indemnification obligations, and incur unforeseen liabilities for divested entities if a buyer fails to honor all commitments.

Our business operations are capital intensive, and portfolio optimization actions such as the curtailment or closure of operations or facilities may include significant costs and charges, including asset impairment or restructuring charges and other measures. There can be no assurance that such actions will be undertaken or completed in their entirety as planned at the anticipated cost or will result in being beneficial to the Company. The effect of closures, curtailments, and divestitures over time will reduce the Company's cash flow and earnings capacity and result in a less diversified portfolio of businesses, and we will have a greater dependency on remaining businesses for our financial results. Additionally, curtailing certain existing facilities, whether temporarily or permanently, may require us to incur curtailment and carrying costs related to those facilities, as well as further increased costs should production be resumed at any curtailed facility, which could have an adverse effect on our business, financial results, and results of operations.

In October 2024, we completed our five-year strategic portfolio review to improve cost positioning, or curtail, close, or divest 1.5 million and 4 million metric tons of smelting and refining capacity, respectively. We reached approximately 93 percent of our target for smelting capacity with the decision to restart capacity at the Warrick smelter completed in the first quarter 2024, and exceeded our target for refining capacity with the decision to curtail the Kwinana refinery in January 2024. We continue to evaluate assets for opportunities for improvement to remain profitable throughout business cycles. Our announced technologies under development to support our long-term goal of being one of the lowest carbon-producing alumina refineries and aluminum smelters includes investments to develop, implement, and commercialize new technologies to reduce carbon emissions in the aluminum production

process. We may not be able to implement, fully or in a cost-effective or timely way, the actions necessary to achieve this strategy and goal, which actions could include capturing, maintaining and/or expanding margins from new products, continued product innovation investment in research and development projects and new technologies, successful deployment and commercialization of effective new technologies, and cost-effective long-term energy solutions. We may not achieve the expected results from technology innovation or other benefits, including certain emissions or environmental-related goals, or expected profitability associated with this strategy. In addition, even if we are able to cost effectively develop our technologies, alternatives to technologies may be more acceptable to the market. Executing these actions also diverts senior management time and resources from our regular business operations, each of which could adversely affect the Company's business, financial condition, and results of operations.

Joint ventures, other strategic alliances, and strategic business transactions may not achieve intended results. We may experience operational challenges in integrating or segregating assets for such a venture or transaction, and such a venture or transaction could increase the number of our outstanding shares or amount of outstanding debt and affect our financial position.

We participate in joint ventures, including some instances where the Company is a minority owner and does not operate the assets, have formed strategic alliances, including some instances with governments, and may enter into other similar arrangements in the future. For example, Alcoa is minority owner of a joint venture with the Saudi Arabian Mining Company (Ma'aden). Although the Company has sought to protect our interests, joint ventures and strategic alliances inherently involve special risks and may not achieve the intended results. Whether or not the Company holds majority interests or maintains operational control in such arrangements, our joint venture and other business partners may take certain actions and positions, or experience difficulties that may negatively impact the Company and/or its reputation, such as:

- Advancing economic, political, social, or business interests or goals that are inconsistent with, or opposed to those of, the Company and our stakeholders;
- Exercising veto rights to block actions that we believe to be in our or the joint venture's or strategic alliance's best interests;
- Taking action contrary to our policies or objectives with respect to our investments; and,
- As a result of financial or other difficulties, be unable or unwilling to fulfill their obligations under the joint venture, strategic alliance, or other agreements, such as contributing capital to expansion or maintenance projects.

We continuously evaluate and may in the future enter into additional strategic business transactions. For example, in October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS EQT to support the continued operation of the San Ciprián complex. Any such transactions could happen at any time, could be material to our business, and could take any number of forms, including, for example, an acquisition, merger, sale or distribution of certain assets, refinancing, or other recapitalization or material strategic transaction. There can be no assurance that our joint ventures, strategic alliances, or additional strategic business transactions will be beneficial to us, whether due to the above-described risks, unfavorable global economic conditions, increases in costs, foreign currency fluctuations, political risks, government interventions, retained liabilities, indemnification obligations, or other factors. Evaluating potential transactions and integrating completed ones may divert the attention of our management from ordinary operating matters. In addition, to the extent we consummate an agreement for the sale and disposition of an asset or asset group we may experience operational difficulties segregating them from our retained assets and operations, which could impact the execution or timing of such dispositions and could result in disruptions to our operations and/or claims for damages, among other things.

If we engage in a strategic transaction, we may require additional financing that could result in an increase in the number of our outstanding shares of stock or the aggregate amount and/or cost of our debt, which may result in an adverse impact to our credit ratings or adversely impact our business, financial condition, or results of operations. The number of shares of our stock or the aggregate principal amount of our debt that we may issue in connection with such a transaction could be significant.

Available Capital and Credit-Related Risks

Our business and growth prospects may be negatively impacted by limits on our ability to fund capital expenditures.

We require substantial capital to invest in growth opportunities and to maintain and prolong the life and capacity of our existing facilities. Our ability to generate cash flows is affected by many factors, including market and pricing conditions. Insufficient cash generation or capital project overruns may negatively impact our ability to fund as planned our sustaining and return-seeking capital projects, and such postponement in funding capital expenditures or inadequate funding to complete projects could result in operational issues. For 2025, we project capital expenditures of $700, of which $625 is for sustaining capital projects and $75 is for return-seeking capital projects. If our technology research and development projects prove feasible with an acceptable expected rate of return, our capital expenditures for return-seeking projects would increase significantly over the next several years. To the extent our access to competitive financial, credit, capital, and/or banking markets becomes impaired, our operations, financial results, and cash flows could be adversely impacted. We may also need to address commercial, political, and social issues in relation to capital expenditures in certain of the jurisdictions in which we operate. If our interest in our joint ventures is diluted or we lose key concessions, our growth could be constrained. Any of the foregoing could have a material adverse effect on our business, results of operations, financial condition, and prospects.

Deterioration in our credit profile or increases in interest rates could increase our costs of borrowing money and limit our access to the capital markets and commercial credit.

The major credit rating agencies evaluate our creditworthiness and issue specified credit ratings. These ratings are based on a number of factors, including our financial strength and financial policies as well as our strategies, operations, and execution of announced actions. These credit ratings are limited in scope and do not address all material risks related to an investment in us, but rather reflect only the view of each rating agency at the time its rating is issued. Nonetheless, the credit ratings we receive impact our borrowing costs as well as our access to sources of capital on terms advantageous to our business. Failure to obtain or maintain sufficiently high credit ratings could adversely affect our interest rates in financings, our liquidity, or our competitive position, and could also restrict our access to capital markets. In addition, our credit ratings could be lowered or withdrawn entirely by a rating agency if, in its judgment, the circumstances warrant. If a rating agency were to downgrade our rating, our borrowing costs could increase, our funding sources could decrease, and we would need to rely on our cash flows from operations. As a result of these factors, a downgrade of our credit ratings could have a materially adverse impact on our future operations, cash flows, and financial position.

Our indebtedness impacts our current and future operations, which could adversely affect our ability to respond to changes in our business and manage our operations. Failure to comply with agreements related to our outstanding indebtedness, including events beyond our control, could result in an event of default that could materially and adversely affect our business, financial condition, results of operations, and/or cash flows.

Alcoa and Alcoa Nederland Holding B.V. (ANHBV), a wholly-owned subsidiary of Alcoa, are party to a revolving credit agreement with a syndicate of lenders and issuers named therein (as subsequently amended, the Amended Revolving Credit Facility). Alcoa and ANHBV are also party to a revolving credit agreement available to be drawn in Japanese yen (as subsequently amended, the Amended Japanese Yen Revolving Credit Facility). The terms of the Amended Revolving Credit Facility, Amended Japanese Yen Revolving Credit Facility, and the indentures governing our outstanding notes contain covenants that could impose significant operating and financial restrictions on us upon non-compliance, including our ability to, among other things:

- Make investments, loans, advances, and acquisitions;
- Amend certain material documents;
- Dispose of assets;
- Incur or guarantee additional debt and issue certain disqualified equity interests and preferred stock;
- Make certain restricted payments, including limiting the amount of dividends on equity securities and payments to redeem, repurchase or retire equity securities or other indebtedness;
- Engage in transactions with affiliates;
- Materially alter the business we conduct;
- Enter into certain restrictive agreements;
- Create liens on assets to secure lenders and issuers;
- Consolidate, merge, sell or otherwise dispose of all or substantially all of Alcoa's, ANHBV's or a subsidiary guarantor's assets; and,
- Take any actions that would reduce our ownership of AWAC entities below an agreed level.

The Amended Revolving Credit Facility required us to comply with financial covenants which includes maintaining an interest expense coverage ratio of not less than 3.00 to 1.00 for the 2024 fiscal year, and a debt to capitalization ratio not to exceed .60 to 1.00. As of January 1, 2025, the minimum interest coverage ratio requirement reverted to 4.00 to 1.00. The results of the calculation of these

ratios, when considering the Company's existing debt obligations, affects and could restrict the amount of additional borrowing capacity under the Company's Amended Revolving Credit Facility or other credit facilities, and ANHBV's ability to make restricted payments, to make investments, and to incur indebtedness.

In addition, obligations under the Amended Revolving Credit Facility are secured by, subject to certain exceptions, a first priority security interest in substantially all assets of the Company, the Borrower, the material domestic wholly-owned subsidiaries of the Company, and the material foreign wholly-owned subsidiaries of the Company located in Australia, Brazil, Canada, Luxembourg, the Netherlands, Norway, and Switzerland including equity interests of certain subsidiaries that directly hold equity interests in AWAC entities.

The Amended Japanese Yen Revolving Credit Facility includes covenants that are substantially the same as those included in the Amended Revolving Credit Facility. In addition, obligations under the Amended Japanese Revolving Credit Facility are secured by, subject to certain exceptions, a first priority security interest in substantially all assets of the Company, the Borrower, the material domestic wholly-owned subsidiaries of the Company, and the material foreign wholly-owned subsidiaries of the Company located in Australia, Brazil, Canada, Luxembourg, the Netherlands, Norway, and Switzerland including equity interests of certain subsidiaries that directly hold equity interests in AWAC entities.

Our ability to comply with these agreements may be affected by events beyond our control, including prevailing economic, financial, and industry conditions. These covenants could have an adverse effect on our business by limiting our ability to take advantage of financing, merger and acquisition, or other opportunities. The breach of any of these covenants or restrictions could result in a default under the Amended Revolving Credit Facility, the Amended Japanese Yen Revolving Credit Facility, or the indentures governing our notes and other outstanding indebtedness, including such indebtedness for which the Company is a guarantor.

See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Liquidity and Capital Resources – Financing Activities and Part II Item 8 of this Form 10-K in Note M to the Consolidated Financial Statements for more information on the restrictive covenants in the Company's revolving credit facilities.

If an event of default were to occur under any of the agreements relating to our outstanding indebtedness, including the Amended Revolving Credit Facility, the Amended Japanese Yen Revolving Credit Facility, and the indenture governing our notes, we may not be able to incur additional indebtedness under the Amended Revolving Credit Facility or the Amended Japanese Yen Revolving Credit Facility and the holders of the defaulted debt could cause all amounts outstanding with respect to that debt to be due and payable immediately. We cannot assure that our assets or cash flow would be sufficient to fully repay borrowings under our outstanding debt instruments if accelerated upon an event of default, which could have a material adverse effect on our ability to continue to operate as a going concern. Further, if we are unable to repay, refinance, or restructure our secured indebtedness, the holders of such indebtedness could proceed against the collateral securing that indebtedness. In addition, any event of default or declaration of acceleration under one debt instrument also could result in an event of default under one or more of our other debt instruments.

We cannot guarantee that we will continue to return capital to our stockholders through the payment of cash dividends and/or the repurchase of our common stock. The reduction or discontinuation of the payment of cash dividends to our stockholders or the repurchase of our shares of common stock could adversely affect the market price or liquidity of our shares.

In October 2021, the Company's Board of Directors initiated a quarterly cash dividend program, at $0.10 per share and authorized a $500 common stock repurchase program, which was fully used with the completion of $150 in repurchases during the third quarter of 2022. In July 2022, the Board of Directors approved an additional common stock repurchase program under which the Company may purchase shares of its outstanding common stock up to an aggregate transactional value of $500, depending on the Company's continuing analysis of market, financial, and other factors (the July 2022 authorization). This common stock repurchase authorization does not have a predetermined expiration date. As of December 31, 2024, $500 remained available for repurchase pursuant to this authorization. The Company is under no obligation to pay any cash dividends to stockholders or to repurchase our outstanding shares of common stock at any particular price or at all, and the payment of dividends and/or repurchases of stock may be limited, suspended, or discontinued at any time in our discretion and without notice. The Company set each of the current dividend and July 2022 authorizations at a level it believes is sustainable throughout the commodity cycle, based on our current financial position and reasonable expectations of cash flow. In addition, as described elsewhere in this "Risk Factors" section, the Company's Amended Revolving Credit Facility and Amended Japanese Yen Revolving Credit Facility could inhibit the Company's ability to make certain restricted payments, including the amount of dividends and payments to redeem, repurchase, or retire equity securities or other indebtedness, if the Company does not maintain certain financial ratios.

The Company intends to pay dividends on a quarterly basis. Dividends on Alcoa Corporation common stock and preferred stock are subject to authorization by the Company's Board of Directors. The payment, amount, and timing of dividends, if any, depends upon matters deemed relevant by the Company's Board of Directors, such as Alcoa Corporation's financial position, results of operations, cash flows, capital requirements, business condition, future prospects, any limitations imposed by law, credit agreements or senior securities, and other factors deemed relevant and appropriate.

Declines in asset values or increases in liabilities, including liabilities associated with benefit plans or taxes, can reduce stockholders' equity. A deficit in stockholders' equity could limit our ability under Delaware law to pay dividends and repurchase shares in the future.

The reduction, suspension, or elimination of our cash dividend or our common stock repurchase program could adversely affect the market price of our stock and/or significantly increase its trading price volatility. The payment of any future dividends and the existence of a common stock repurchase program could cause our stock price to be higher than it would otherwise be and could potentially reduce the market liquidity for our stock. Additionally, any future payment of dividends or repurchases of our common stock could negatively impact our financial position and our ability to fund ordinary and existing operations, capital expenditures, the payment of taxes, and growth or other opportunities.

Cybersecurity Risks

Cyber attacks, security breaches, system failures, software or application vulnerabilities, or other cyber incidents may threaten the integrity of our information technology infrastructure and other sensitive business information, disrupt our operations and business processes, expose us to potential liability, and result in reputational harm and other negative consequences that could have a material adverse effect on our business, financial condition, and results of operations.

We depend on information and communications technology, networks, software, and related systems to operate our business, including production controls and operating systems at our facilities and systems for recording and processing transactions, interfacing with customers, financial reporting, and protecting the personal data of our employees and other confidential information. Our global operations require increased reliance on technology, which expose us to risks of theft of proprietary information, including trade secrets and other intellectual property that could have a material adverse effect on our business, financial condition, and results of operations. The protection of such information, as well as sensitive customer information, personal data of our employees, and other confidential information, is critical to us. We face global cybersecurity threats, which may range from uncoordinated individual attempts to sophisticated and targeted measures, known as advanced persistent threats, directed at the Company. In addition, a number of our employees work remotely, which has generally increased cybersecurity vulnerabilities and risk to our information technologies systems.

Cyber attacks and other cyber incidents are becoming more frequent and sophisticated, are constantly evolving, including through the use of artificial intelligence, and are being made by groups and individuals with significant resources that employ a wide range of expertise and motives. Such attacks are also increasing in complexity, which may make cyber attacks more difficult to detect, contain, and mitigate. Cyber attacks and security breaches may include, but are not limited to, unauthorized attempts to access information or digital infrastructure, efforts to direct payments to fictitious parties, viruses, ransomware, malicious codes, hacking, social engineering (such as phishing and SMSishing), denial of service, human error, and other electronic security breaches, any of which could have a material adverse effect on our business, financial condition, and results of operations. Certain techniques used in cyber attacks may not be immediately detectable, we may be unable to anticipate or detect these techniques, such as use of a zero-day exploit or unknown malware, immediately identify the scope and impact of an incident, contain the incident within our systems, or implement preventative or remediation measures, which may have a material adverse effect on our business, financial condition, and results of operations. In addition, we utilize third-party vendors for certain software applications, storage systems, and cloud computing services. Cyber attacks, security breaches, or other incidents on the information technology systems of our service providers or business partners could materially impact us. We have in the past experienced attempts and incidents by external parties to penetrate our and our service providers or business partners networks and systems. Such attempts and incidents to date have not had a material adverse effect on our business, financial condition, or results of operations.

We continue to assess potential cyber threats and invest in our technology infrastructure to address these threats, including by monitoring networks and systems, training employees on cyber threats, and enhancing security policies of the Company and its third-party providers. While the Company continually works to strengthen our systems and security measures, safeguard information, and mitigate potential risks, there is no assurance that such actions will be sufficient to prevent or timely detect cyber attacks or security breaches. Some intrusions could manipulate or improperly use our systems or networks, disclose, or compromise confidential or protected information, destroy, or corrupt data, or otherwise disrupt our operations, and because of any of these things could have a material adverse effect on our business, financial condition, and results of operations.

In addition, some cybersecurity incidents could negatively impact our reputation and competitive position, and could result in litigation with third parties, regulatory action, loss of business, theft of assets, and significant remediation costs, and because of any of these things, have a material adverse effect on our financial condition and results of operations. Such security breaches could also result in a violation of applicable U.S. and international privacy and other laws, and subject us to litigation and governmental investigations and proceedings, any of which could result in our exposure to material civil or criminal liability. For example, the European Union's General Data Privacy Regulation (GDPR) subjects companies to a range of compliance obligations regarding the handling of personal data. In the event our operations are found to be in violation of the GDPR's requirements, we may be subject to significant civil penalties, business disruption, and reputational harm, any of which could have a material adverse effect on our business, financial condition, or results of operations. Some cyber attacks or breaches could require significant management attention and resources and result in the diminution of the value of our investment in research and development, which could have a material adverse effect on our business, financial condition, or results of operations.

Though we have disaster recovery and business continuity plans in place, if our information technology systems, or those of our third-party providers, are damaged, breached, interrupted, or cease to function properly for any reason, and, if the disaster recovery and business continuity plans do not effectively resolve the incident on a timely basis, we may suffer interruptions in our ability to manage or conduct business and we may be exposed to reputational, competitive, and business harm as well as litigation and regulatory action, which may materially and adversely impact our business, financial condition, or results of operations.

Labor- and Pension-Related Risks

Union or workforce disputes or arrangements and other employee relations issues, as well as labor market conditions, could adversely affect our business, financial condition, or results of operations.

A significant portion of our employees are represented by labor unions or worker groups in a number of countries under various collective bargaining agreements or similar arrangements with varying durations and expiration dates.

We may not be able to satisfactorily renegotiate our agreements when they expire. In addition, existing arrangements may not prevent strikes, work stoppages, work slowdowns, union organizing campaigns, or lockouts at our facilities in the future. We may also be subject to general country strikes or work stoppages unrelated to our business or collective bargaining agreements. A labor dispute or work stoppage of employees could have a material adverse effect on production at and shipping from one or more of our facilities, and depending on the length of work stoppage, on our business, financial condition, or results of operations. Additionally, in the current competitive labor market, if we lose critical or a significant number of workers to attrition, it may be difficult or costly to find and recruit replacement employees, which could have a material adverse effect on our business, financial condition, and results of operations.

A decline in the liability discount rate, lower-than-expected investment return on pension assets, and other factors could affect our business, financial condition, results of operations, or amount of pension funding contributions in future periods.

Our results of operations may be negatively affected by the amount of expense we record for our pension and other postretirement benefit plans, reductions in the fair value of plan assets, and other factors. We calculate income or expense for our plans using actuarial valuations in accordance with accounting principles generally accepted in the United States of America (GAAP).

These valuations reflect assumptions about financial market and other economic conditions, which may change based on changes in key economic indicators. The most significant year-end assumptions used by the Company to estimate pension or other postretirement benefit income or expense for the following year are the discount rate applied to plan liabilities and the expected long-term rate of return on plan assets. In addition, the Company is required to make an annual measurement of plan assets and liabilities, which may result in a significant charge to stockholders' equity. See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Critical Accounting Policies and Estimates—Pension and Other Postretirement Benefits and Part II Item 8 of this Form 10-K in Note O to the Consolidated Financial Statements. Although GAAP expense and pension funding contributions are impacted by different regulations and requirements, the key economic factors that affect GAAP expense would also likely affect the amount of cash or securities we would contribute to the pension plans.

Potential pension contributions include both mandatory amounts required under federal law and discretionary contributions to improve the plans' funded status. While the Company took several actions in recent years to improve the funded status of its pension plans and adjust its asset allocation to reduce variance risk, declines in the discount rate or lower-than-expected investment returns on plan assets could have a material negative effect on our cash flows. Adverse capital market conditions could result in reductions in the fair value of plan assets and increase our liabilities related to such plans, adversely affecting our liquidity and results of operations.

Item 1B. Unresolved Staff Comments.

None.

Item 1C. Cybersecurity.

Risk Management and Strategy

The Company's processes for assessing, identifying, and managing material risks from cybersecurity threats are integrated into our overall Enterprise Risk Management (ERM) process. As part of the ERM, the Company focuses on developing multi-layered, collaborative processes to identify, monitor, and manage risks from cybersecurity threats. Risks are grouped into categories that management can then assess, monitor, and prioritize based on the likelihood of an occurrence, level of impact, and mitigating factors.

Our various cybersecurity risk management processes apply to various functions, including but not limited to, third-party suppliers and vulnerability management. We employ processes and technologies to bring visibility to, and protect against, cybersecurity risk, to include real time monitoring of network traffic and email. The Company also has a comprehensive body of policies and standards for assessing, identifying, and managing material risks from cybersecurity threats, including an incident response plan, business continuity plan, crisis management plan, as well as disaster recovery mechanisms, which are tested and updated. Additionally, the Company employs staff that are specifically dedicated to raising cybersecurity awareness and training within the organization.

The Company engages third-party assessors , consultants, and auditors to assist in assessing, identifying, and managing risk from cybersecurity threats. Third parties assist the Company by (i) providing regular penetration testing and vulnerability assessments; (ii) assessing and maintaining our formal incident response policies, including the use of tabletop testing; and (iii) providing multiple sources of threat intelligence information that are fed directly into our technical security platforms and our awareness campaigns, including ongoing network monitoring. The Company also has a comprehensive third-party information security audit program in place.

Alcoa has implemented processes designed to identify and mitigate cybersecurity threats associated with our use of third-party service providers. Such providers are subject to a security risk assessment prior to engagement to determine if they meet defined levels of security capabilities. Our master services agreements with third-party service providers generally carry a number of security requirements, including audit rights for the Company. After engagement, third-party service providers are subject to audits in which contract owners within Information Technology Automation Solutions (ITAS) validate that any certifications a vendor had upon engagement are maintained throughout the life of the agreement.

We have in the past experienced attempts and incidents by external parties to penetrate our, our service providers', and our business partners' networks and systems. Such attempts and incidents to date have not had a material adverse effect on our business, financial condition, or results of operations. See Part I Item 1A of this Form 10-K for more information on risks.

Governance

The Alcoa Board of Directors (Board), in coordination with the Audit Committee , is responsible for the oversight of our cybersecurity risk management program, and specifically, reviews and oversees the Company's risk management and strategy relating to cybersecurity, including cybersecurity developments and threats and the Company's process for assessing, managing, and mitigating material cybersecurity risks and threats. The Audit Committee and the Board receive regular updates regarding the state of the Company's cybersecurity program, cybersecurity developments, and emerging threats. The Chief Information Security Officer (CISO) and the Chief Information Officer (CIO) regularly update the Audit Committee and the Board regarding the Company's strategy to mitigate cybersecurity risks, which includes regular vulnerability assessments and employee training on cybersecurity matters. Alcoa's CISO is responsible for maintaining identified material cybersecurity risks within the Company's ERM platform. On a quarterly basis, the CISO reviews and updates risks, as well as the control procedures in place. These risks are regularly reported to the Audit Committee and Board.

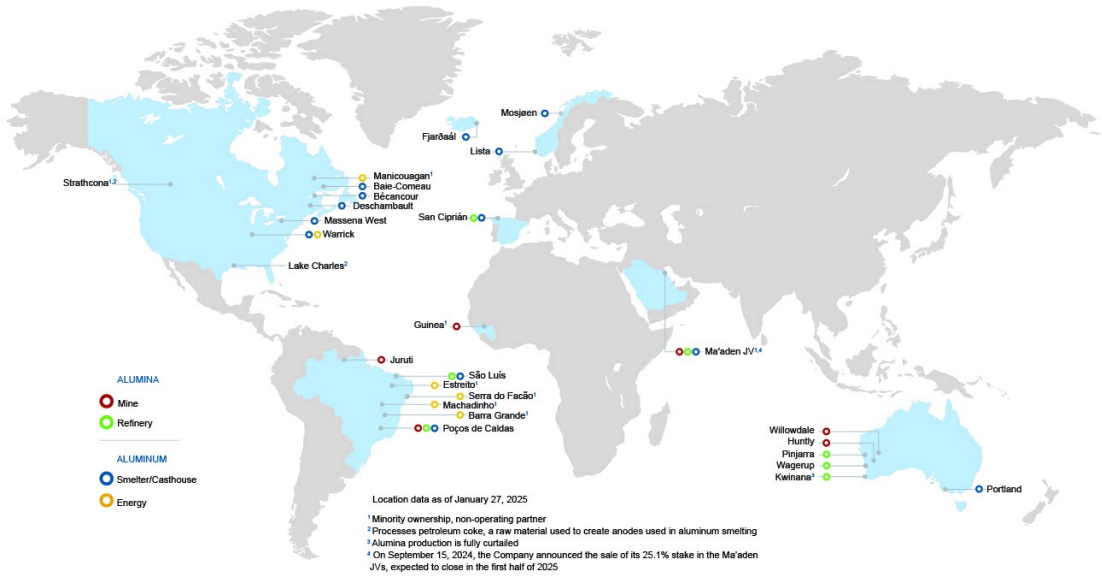
Alcoa's CISO has thirty years of experience in information technology, including over fifteen years in cybersecurity, and prior to joining Alcoa, was the CISO of the U.S. business of a large global insurance and asset company and was responsible for the security of data, systems, and processes supporting customer assets. Alcoa's CISO maintains professional certifications in information security, participates in intelligence sharing organizations, and has extensive cybersecurity risk management experience in manufacturing organizations and reports to the CIO. Alcoa's CIO has almost thirty years of information technology experience, including a diverse knowledge in manufacturing and process control solutions, corporate applications, infrastructure, and service delivery operations. The CISO closely collaborates with the CIO and Chief Financial Officer (CFO) in managing material risks from cybersecurity threats. Alcoa also maintains an information security steering committee (ISSC), which oversees current and emerging cybersecurity risks and investments in the cybersecurity risk protections for the Company. The steering committee is comprised of a cross-functional team of leaders from across Alcoa's business groups, including the CISO (the ISSC Chair) and CIO.

The Company has established comprehensive incident response plans that set forth the processes through which cybersecurity incidents are managed, including how management is informed of cybersecurity incidents. As part of these plans, incidents are evaluated, classified, and elevated to an executive team which includes the CISO and executives on the Crisis Response Team. Once elevated, these executives are ultimately responsible for the management, mitigation, and remediation of incidents.

Item 2. Properties.

Alcoa Corporation's principal executive office, located at 201 Isabella Street, Pittsburgh, Pennsylvania 15212-5858, is leased. Alcoa also leases several office facilities and sites, both domestically and internationally. In addition, Alcoa owns or has an ownership interest in its production sites, both domestically and internationally. Alcoa owns active mines and operations classified under the Alumina and Aluminum segments of its business. These include facilities and assets around the world used for Alcoa's bauxite mining and alumina refining, aluminum smelting and casting production, and energy generation. Capacity and utilization of these facilities varies by segment and the level of demand for each product. See Part I Item 1 of this Form 10-K for additional information, including the ownership, capacity, and utilization of these facilities, used in the Alumina and Aluminum segments. A discussion of our bauxite mining properties is below.

The following map shows the locations of our operations as of December 31, 2024:



Alcoa Locations and Properties.

Although Alcoa's facilities vary in terms of age and condition, management believes that its facilities are suitable and generally adequate to support the current and projected operations of the business. See Part II Item 8 of this Form 10-K in Notes B and K to the Consolidated Financial Statements for more information on properties, plants, and equipment.

Bauxite Mining Properties

Alcoa has access to large bauxite deposit areas with mining rights that extend, in the cases of Darling Range and Juruti, more than 15 years from the date of this Form 10-K. The Company obtains bauxite from its own resources located in the countries listed in the table below, as well as pursuant to both long-term and short-term contracts and mining leases. Tons of bauxite are reported on a zero-moisture basis in millions of dry metric tons (mdmt) unless otherwise stated.

As of December 31, 2024, the Company's individually material mining properties, as determined in accordance with subpart 1300 of Regulation S-K, are our bauxite mining properties in the Darling Range of Western Australia (Darling Range) and Juruti, Brazil (Juruti).

As used in this Form 10-K, the terms "mineral resource," "measured mineral resource," "indicated mineral resource," "inferred mineral resource," "mineral reserve," "proven mineral reserve" and "probable mineral reserve" are defined and used in accordance with subpart 1300 of Regulation S-K. Under subpart 1300 of Regulation S-K, mineral resources may not be classified as "mineral reserves" unless the determination has been made by a qualified person (as defined under subpart 1300 of Regulation S-K) that the mineral resources can be the basis of an economically viable project. Part or all of the mineral deposits (including any mineral resources) in these categories may never be converted into mineral reserves. Further, except for the portion of mineral resources classified as mineral reserves, mineral resources do not have demonstrated economic value. Estimates of inferred mineral resources have too high of a degree of uncertainty as to their existence and may not be converted to a mineral reserve. Therefore, it should not be assumed that all or any part of an inferred mineral resource exists, that it can be the basis of an economically viable project, or that it will ever be upgraded to a higher category. Likewise, it should not be assumed that all or any part of measured or indicated mineral resources will ever be converted to mineral reserves. Management relies on estimates of our recoverable mineral reserves, which estimation is complex due to geological characteristics of the properties and the number of assumptions made and variable factors, some of which are beyond our control.

The following table shows the AWAC and/or Alcoa share (proportion) of annual production tonnage at each of our bauxite mining properties and in the aggregate for each of the last three fiscal years. AWAC became wholly-owned by Alcoa upon its completion of the Alumina Limited acquisition on August 1, 2024.

Summary of Attributable Annual Bauxite Production (mdmt) for the years ended December 31, 2024, 2023, and 2022, respectively:

Country	Property (Region)	2024	2023	2022
Australia	Darling Range (Western Australia, WA)	27.7	30.9	31.4
Brazil	Juruti (Pará State)	5.6	5.0	4.9
Brazil	Trombetas (Pará State)[(1)]	—	—	0.5
Brazil	Poços de Caldas (Minas Gerais)	0.4	0.4	0.4
Guinea	Boké (Sangaredi)	3.4	3.6	3.6
Saudi Arabia	Al Ba'itha (Al Qassim)	1.2	1.1	1.3
		38.3	41.0	42.1

(1) Amounts shown for the year ended December 31, 2022 represent production prior to the Company's sale of its interest in the MRN mine in April 2022.

Related mining operations were not material to the Company's business or financial condition after consideration of both quantitative and qualitative factors assessed in the context of the Company's overall business and financial condition.

The following tables summarize certain information regarding our bauxite mining properties. The information that follows relating to Darling Range and Juruti is derived, for the most part, from the technical report summaries relating to such properties prepared in compliance with Item 601(b)(96) and subpart 1300 of Regulation S-K. Portions of the following information are based on assumptions, qualifications, and procedures that are not fully described herein. Reference should be made to the full text of the Technical Report Summary for Darling Range, Western Australia, dated February 20, 2025, with an effective date of December 31, 2024, filed as Exhibit 96.1 to this Form 10-K (the Darling Range TRS), and the Technical Report Summary for Juruti, Brazil, dated February 24, 2022, with an effective date of December 31, 2021, incorporated by reference as Exhibit 96.2 to this Form 10-K (the Juruti TRS), which are incorporated by reference herein.

Bauxite Interests and Operators:

Property (Region)	Access/Transportation	Operator	Owners' Mining Rights[1]	Expiration Date of Mining Rights	Titles, Rights, Leases or Options	Area (hectares)
Darling Range[2] (WA)	Accessed by road. Ore transported via long-distance conveyor and rail to refineries.	AofA	100%	2045	Mining lease from the WA Government. ML1SA.	702,261
Juruti[3] (Pará State)	Accessed by road from Juruti town, by boat along the Amazon River, or by air from Juruti Airport. Ore transported from the mine to Juruti port by company-operated rail.	AWAB	100%	2100[4]	Mining licenses from the Government of Brazil and Pará. Mining rights do not have a legal expiration date. Various permits have been administratively renewed or are in the process of being renewed.	200,255
Poços de Caldas (Minas Gerais)	Accessed by road. Ore transported from the mine to the refinery by road.	Alcoa Alumínio	100%	2031[4]	Mining licenses from the Government of Brazil and Minas Gerais. Company claims and third-party leases. Operation licenses were renewed and unified and now expires in 2032.	11,008
Boké (Sangaredi)	Accessed by road from Sangaredi and public airports. Ore transported by company-operated rail to Kamsar port.	CBG	22.95%	2038	Mining lease from Government of Guinea. The lease is renewable in 25-year increments. CBG's rights are specified within the Basic Agreement and Amendment 1 to the Basic Agreement with the Government of Guinea.	293,900
Al Ba'itha (Al Qassim)	Accessed by road. Ore is transported to the refinery by rail and truck.	MBAC	25.1%	2037	Mining lease granted to Ma'aden by Kingdom of Saudi Arabia Ministry of Petroleum and Mineral Resources, with a duration of 30 years. Exclusive rights to utilize bauxite and annexed minerals.	14,776

(1) Owners' Mining Rights reflects Alcoa's ownership interest(s) in the properties and related share (proportion) of the mineral resources and reserves and annual production.

(2) For more information, see Individual Property Disclosure—Darling Range below.

(3) For more information, see Individual Property Disclosure—Juruti below.

(4) Brazilian mineral legislation does not limit the duration of mining concessions; rather, the concession remains in force until the deposit is exhausted. These concessions may be extended later or expire earlier than estimated, based on the rate at which these deposits are exhausted and on obtaining any additional governmental approval, as necessary.

Bauxite Mine Types and Facilities:

Property (Region)	Development Stage	Type of Mine and Mineralization	Processing Plant	Other Facilities
Darling Range[1] (WA)	Production/ Operating	Open-cut mines. Bauxite is lateritic formed through weathering of Archean granites and gneisses	N/A Ore crushing only.	Administrative buildings and workshops, crushers, long-distance conveyors. Power supplied from natural gas.
Juruti[2] (Pará State)	Production/ Operating	Open-cut mines. Bauxite is lateritic formed through weathering of Cretaceous Alter do Chao Formation sedimentary sequence.	Fixed plant for ore crushing and washing.	Mine: Administrative buildings and workshops, water supply pumps and pipeline from Juruti Grande, ore stockpiles, railroad, tailings thickening and settling ponds. Port: Administrative buildings, port control, ore stockpiles, rail siding, and ship loader. Power supplied by thermoelectric units at the mine and port.
Poços de Caldas (Minas Gerais)	Production/ Operating	Open-cut mines. Bauxite derived from the weathering of nepheline syenite and phonolite.	N/A Run of mine (ROM) trucked to refinery stockpiles.	Mining offices and services are located at the refinery. Power supplied by commercial grid.
Boké (Sangaredi)	Production/ Operating	Open-cut mines: The bauxite deposits within the CBG lease are of two general types. TYPE 1: In-situ laterization of Ordovician and Devonian plateau sediments locally intruded by dolerite dikes and sills. TYPE 2: Sangaredi type deposits are derived from clastic deposition of material eroded from the TYPE 1 laterite deposits and possibly some of the protoliths from the TYPE 1 plateaus deposits.	N/A Ore crushed and dried at Kamsar port facilities.	Mine: Administrative buildings, workshops, and water/power supply are in Sangaredi. Port: Administrative buildings, port control, ore stockpiles, ore drying facilities, rail siding, and ship loader. Power supplied by fuel oil generators at the mine and port.
Al Ba'itha (Al Qassim)	Production/ Operating	Open-cut mine. Bauxite occurs as a paleolaterite profile developed at an angular unconformity between underlying late Triassic to early Cretaceous sediments (parent rock sequence Biyadh Formation) and the overlying late Cretaceous Wasia Formation (overburden sequence).	Fixed plant for ore crushing and train loading	The mine includes fixed plants for crushing and train loading; workshops and ancillary services; power plant; and water supply. There is a company village with supporting facilities

(1) For more information, see Individual Property Disclosure—Darling Range Mines below.

(2) For more information, see Individual Property Disclosure—Juruti below.

Bauxite Mineral Resources and Mineral Reserves

In accordance with subpart 1300 of Regulation S-K, management engaged SLR International Corporation as the qualified persons to prepare technical report summaries for the disclosure of mineral resources and reserves at Darling Range and Juruti. The tables shown below of resources and reserves by mining property were prepared using the results of the procedures performed by the qualified persons, which have no affiliation with or interest in Alcoa or our mining properties.

Summary of Attributable Bauxite Mineral Resources Exclusive of Mineral Reserves at December 31, 2024:

	Measured			Indicated			Measured + Indicated			Inferred		
Property (Region)	Tonnage (mdmt)[1]	Alumina (%)	Silica (%)	Tonnage (mdmt)[1]	Alumina (%)	Silica (%)	Tonnage (mdmt)[1]	Alumina (%)	Silica (%)	Tonnage (mdmt)[1]	Alumina (%)	Silica (%)
Darling Range (WA)[2]	139.6	30.4	1.8	48.7	30.3	1.4	188.4	30.4	1.7	101.4	32.4	1.2
Juruti (Pará State)[3]	5.6	44.5	5.3	58.4	45.3	4.4	64.0	45.3	4.5	514.3	45.6	4.6
Poços de Caldas (Minas Gerais)[4]	2.1	38.0	4.8	7.5	36.5	5.2	9.6	36.8	5.1	3.0	35.4	5.3
Boké (Sangaredi)[5]	—	—	—	1,357.2	46.6	2.3	1,357.2	46.6	2.3	173.5	45.8	2.4
Al Ba'itha (Al Qassim)[6]	—	—	—	—	—	—	—	—	—	0.7	48.3	11.7

(1) This table shows only the Alcoa share (proportion) of mineral resources. The reference point for the mineral resource is the in situ predicted dry tonnage and grade of material to be delivered to the refinery stockpile following the application of mining design parameters. Metallurgical recovery has not been directly considered in the estimation of the mineral resource as the Darling Range operations do not include a conventional processing plant, only crushing. The metallurgical recovery of the refineries (Kwinana, Pinjarra, and Wagerup) are beyond the boundaries of the mining operations. Certain totals may not sum due to rounding.

(2) Alumina for the Darling Range is stated as Available Alumina (as $A.Al_2O_3$) and Silica is stated as Reactive Silica (as $R.SiO_2$). Darling Range mineral resources are estimated using an alumina life of mine price of $500 per ton and a caustic soda life of mine price of $300 per ton. Mineral resources for the polygonal models are estimated at a ≥ 27.5% $A.Al_2O_3$ and ≤3.5% $R.SiO_2$ cut-off grade and at a minimum mining thickness of 1.5 meters (m).

(3) Alumina for Juruti is stated as Available Alumina (as $A.Al_2O_3$) and Silica is stated as Reactive Silica (as $R.SiO_2$). Juruti mineral resources are estimated at a pit discard cut-off value based on a benefit calculation that determines whether a block is economically viable and has a minimum thickness of 1 m. Further, mineral resources are estimated using a long-term bauxite price of approximately $35 (wet-base) per ton, representing a 30% increase over the mineral reserve bauxite price.

(4) Alumina for Poços de Caldas is stated as Available Alumina (as A.Al_2O_3) and Silica is stated as Reactive Silica (as R.SiO_2). Poços de Caldas mineral resources are estimated at a pit discard cut-off value based on a benefit calculation that determines whether a block is economically viable.

(5) Alumina for Boké is stated as Total Alumina (as T.Al_2O_3) and Silica is stated as Total Silica (as T.SiO_2). Boké resources are estimated at a ≥ 41% T.Al_2O_3 and ≤10% T.SiO_2 cut-off grade. Tonnage reported on a 3% moisture basis.

(6) Alumina for Al Ba'itha is stated as Total Available Alumina (as TAA) and Silica is stated as Total Silica (as T.SiO_2). Al Ba'itha mineral resources are estimated at a ≥ 40% TAA cut-off grade.

The following table shows only the Alcoa share (proportion) of mineral reserves. These estimates are periodically updated to reflect past bauxite production, updated mine plans, new exploration information, and other geologic or mining data. Given the Company's extensive bauxite resources, the abundant supply of bauxite globally, and the length of the Company's rights to bauxite, it is not cost-effective to establish bauxite reserves that reflect the total size of the bauxite resources available to the Company. Certain totals may not sum due to rounding.

Summary of Attributable Bauxite Mineral Reserves at December 31, 2024:

	Proven			Probable			Total		
Property (Region)	**Tonnage** (mdmt)[1]	**Alumina** (%)	**Silica** (%)	**Tonnage** (mdmt)[1]	**Alumina** (%)	**Silica** (%)	**Tonnage** (mdmt)[1]	**Alumina** (%)	**Silica** (%)
Darling Range[2]	26.1	29.2	1.6	397.6	30.8	1.6	423.7	30.7	1.6
Juruti (Pará State)[3]	43.5	47.6	3.6	33.0	46.3	3.5	76.5	47.0	3.5
Poços de Caldas (Minas Gerais)[4]	0.9	40.8	3.6	1.4	39.8	3.9	2.3	40.2	3.8
Boké (Sangaredi)[5]	74.3	47.0	1.9	3.7	48.7	2.5	78.1	47.1	1.9
Al Ba'itha (Al Qassim)[6]	14.0	50.2	8.0	31.8	45.5	11.1	45.7	46.9	10.1

(1) This table shows only the Alcoa share (proportion) of mineral reserves. The reference point for the mineral reserve is the refinery processing plant gate, with crushing, washing (as applicable), and transportation being the only process employed. Metallurgical recovery factor for extractable alumina of 93% has been applied during optimization at Darling Range. Certain totals may not sum due to rounding.

(2) Alumina for the Darling Range is stated as Available Alumina (as A.Al_2O_3) and Silica is stated as Reactive Silica (as R.SiO_2). Darling Range mineral reserves are estimated at variable cut-off grades, dependent on grade, operating costs and ore quality for blending to meet refinery target grades. Mineral reserves are estimated using a base alumina price of $400 per ton and a delivered price for caustic of $500 per ton.

(3) Alumina for Juruti is stated as Available Alumina (as A.Al_2O_3) and Silica is stated as Reactive Silica (as R.SiO_2). Juruti mineral reserves are estimated at a pit discard cut-off value based on a benefit calculation that determines whether a block is economically viable. Further, mineral reserves are estimated using a one-year weighted average bauxite price of approximately $27 per ton, based on contractual agreements with an Alumina segment refinery.

(4) Alumina for Poços de Caldas is stated as Available Alumina (as A.Al_2O_3) and Silica is stated as Reactive Silica (as R.SiO_2). Poços de Caldas mineral reserves are estimated at a pit discard cut-off value based on a benefit calculation that determines whether a block is economically viable.

(5) Alumina for Boké is stated as Total Alumina (as T.Al_2O_3) and Silica is stated as Total Silica (as T.SiO_2). Boké reserves are estimated at a ≥ 45% T.Al_2O_3 and ≤10% T.SiO_2 cut-off grade. Tonnage reported on a 3% moisture basis.

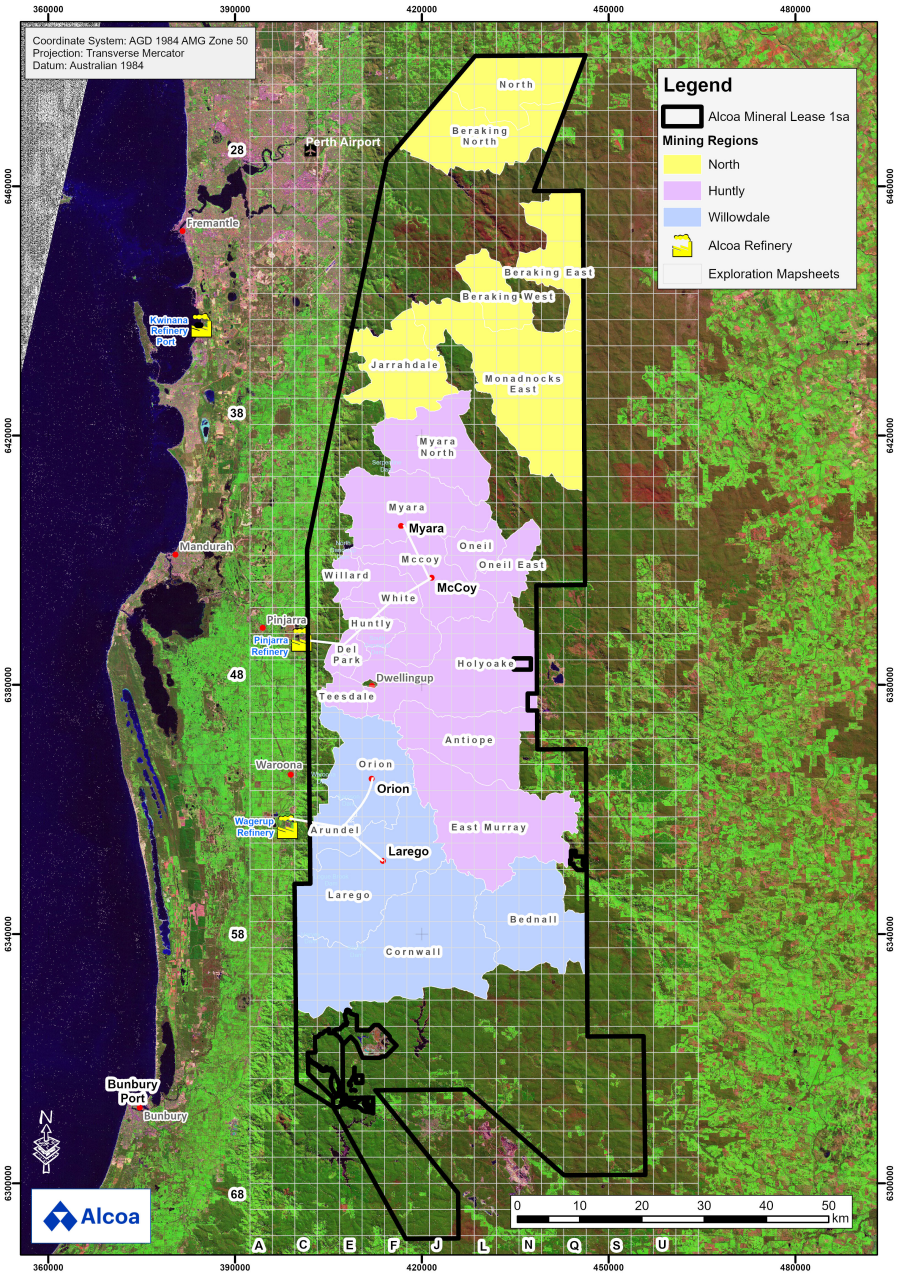
(6) Alumina for Al Ba'itha is stated as Total Available Alumina (as TAA) and Silica is stated as Total Silica (as T.SiO_2). Al Ba'itha mineral reserves are estimated at a ≥ 40% TAA cut-off grade and a minimum mining thickness of 1.0 m.

Individual Property Disclosure—Darling Range

Property Location and Description

The Darling Range bauxite deposits comprise the mining centers of (i) Huntly, located approximately 80 kilometers (km) to the southeast of Perth and 30 km northeast of Pinjarra, Western Australia, Australia, and (ii) Willowdale, located approximately 100 km south-southeast of Perth and 20 km southeast of Waroona, Western Australia, Australia. The Huntly and Willowdale mining centers/regions are separate open pit, surface mines and are both located within Mining Lease ML1SA. Darling Range is owned and operated by Alcoa through AofA.

All spatial data used for mineral resource and reserve estimation are reported using a local grid based on Australian Map Grid 1984 system (Zone 50) and using the Australian Geodetic Datum 1984 coordinate set. The approximate coordinates of the mining areas are 410,000 m East and 6,390,000 m North (Huntly) and 410,000 m East and 6,365,000 m North (Willowdale).



Darling Range Location, Lease Area, Mining Centers, and Mining Regions

Refer to the Darling Range TRS in Sections 2.0 through 5.0 for more information on the Darling Range mining centers – their history, location, accessibility, and other relevant details.

Infrastructure

The figure above illustrates the relative location of each of the individual mining areas within the Huntly and Willowdale centers. These areas include, but are not limited to, Myara, Larego, Orion, and Arundel.

Mining infrastructure in the Darling Range is generally concentrated in the Myara area in the northwest of the Huntly mining center, and at the Larego area (20 km southeast of the Wagerup refinery) in the center of the Willowdale mining center. Both infrastructure areas include:

- Ore crushing and handling facilities;
- Ore stockpile stacker/reclaimer;
- Maintenance facilities;
- Sampling stations;
- Site offices including a production tracking room;
- Haul road networks;
- Overland conveyors, as illustrated on the above map;
- Water supplies consisting of abstraction from licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff, and maintenance workshops; and,
- Power supply lines direct from certain of the Company's refineries.

Personnel are sourced from the area around Perth, Western Australia, which benefits from a skilled workforce due to the relatively large number of operating mines in the region.

Huntly is accessible from the South Western Highway via Del Park Road, which connects the town of North Dandalup in the north with Dwellingup in the south. From Del Park Road, a 3 km road following the route of the bauxite conveyor to the Pinjarra refinery provides access to the Huntly site administration offices. Willowdale is similarly accessible, 19 km from the South Western Highway via Willowdale Road, a road to the south of Waroona. There are several airstrips in the region, although the closest major airport is in Perth, approximately 70 km north of North Dandalup. The nearest commercial port is at the Kwinana refinery, approximately 40 km south of Perth.

While an extensive haul road network and overland conveyors transport crushed bauxite from the main mining hub to the Wagerup and Pinjarra refineries, bauxite was also transferred to the Kwinana refinery via the Kwinana freight railway system, using the Kwinana–Mundijong line prior to the full curtailment of the refinery in the second quarter of 2024.

Alcoa's Darling Range mining operations do not produce mine waste in the same manner as conventional mining operations and waste dumps are not constructed.

Alcoa's Darling Range facilities are in a well-maintained condition. Net book value of these facilities as of December 31, 2024 of $569 is included in Properties, plants, and equipment, net on the Consolidated Balance Sheet.

Refer to the Darling Range TRS in Sections 14.0 and 15.0 for more information on the surface infrastructure and facilities of the Darling Range.

Land Tenure and Permitting

Bauxite occurrences were first recorded in the Darling Range in 1902, with studies and exploration subsequently conducted by the Geological Survey of Western Australia until the 1950s. Commercial exploration took place from 1957 by Western Mining Corporation Ltd (later Western Australia NL, or WANL), across a large portion of southwest Western Australia within a Special Mineral Lease (ML1SA) granted in 1961. Commercial mining first took place within the Darling Range in 1963 at the former Jarrahdale mining center with WANL having joined with Alcoa. The Huntly and Willowdale mines commenced commercial production in 1972 and 1984, respectively. Huntly supplies bauxite to the Pinjarra refinery (approximately 17 Mtpa), while Willowdale supplies the Wagerup refinery (approximately 10 Mtpa). The Kwinana refinery was also supplied by Huntly until the completion of the full curtailment of the refinery in the second quarter of 2024.

The ML1SA lease allows for exploration and mining of bauxite within the tenement boundaries. ML1SA was granted in 1961, by the State Government of Western Australia under the Alumina Refinery Agreement Act, 1961 (the Act 1961), for four 21-year periods, and the current lease expires on September 24, 2045. The State Government concession agreement includes the provision for conditional renewal beyond 2045. Alcoa pays rent for each square mile of ML1SA in accordance with the Act 1961, providing exclusive rights to explore for and mine bauxite on all Crown Land within the ML1SA. The current lease covers an area of 702,261 hectares (ha).

There are certain annual requirements to maintain the existing permits and approvals associated with ML1SA, including:

- Submission of annual mine plans for mining associated with the Wagerup refinery;
- Maintain public Completion Criteria documentation for its bauxite mining operations;
- Annual submission and approval of Mining and Management Programs (MMPs) that include five-year mining schedules;
- Annual reporting of bauxite processed and any non-compliances to maintain environmental operational licenses; and,
- Maintain compliance with environmental protection orders.

The ML1SA area includes sub-lease arrangements made between Alcoa and the Worsley Alumina joint venture participants (the Worsley Participants). The agreements, made in August 2001 and September 2016, provide bauxite mining concessions to the Worsley Participants. No mineral resources or mineral reserves attributable to the Darling Range mining areas have been declared within these sub-lease areas.

Constraints on mining activities within the ML1SA concession are in place, among others, which prevent mining within: 200 m of the top water level margin of any water reservoirs; Serpentine Pipehead Dam Catchment; National Parks; Aboriginal Heritage Sites; Old Growth Forest; formal Conservation Areas; and 50 m of granite outcrop (greater than 1 ha), and Mining Avoidance Zones (MAZ) around the Western Australian forest towns of Dwellingup and Jarrahdale. Mineral resources and mineral reserves have not been defined in these restricted areas.

Additionally, the 2023-2027 MMP requires additional constraints including: a reduction in mining activities inside higher risk areas within drinking water catchments; no mining within 1 km of the top water level after June 30, 2024; no new pit clearing in areas with an average pit slope greater than 16 percent within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level); an acceleration of forest rehabilitation and a reduction in open mining areas; and a maximum annual clearing footprint of 800 ha. In October 2024, the 2023-2027 MMP approval was rolled over to cover the time period of 2024-2028 with the same conditions, noting some temporal conditions of the 2023-2027 MMP had expired and Alcoa had met certain other conditions prior to October 2024. The mineral resources and mineral reserves have been adjusted to reflect the conditions and will continue to change as new commitments are made or if future approvals require additional constraints.

Mining on a day-only basis is conducted in “noise zones” where noise from the mining operations will potentially exceed allowable levels. The operation actively seeks to maintain lower noise levels than those mandated, thus mining in these areas is undertaken by contract miners on day shifts only.

The Company has all environmental permits and operating licenses required for current mining activities. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa’s Environmental Management System and reported within the Annual Environmental Review report.

Refer to the Darling Range TRS in Section 3.0 for more information on Land Permitting and Tenure for the Darling Range.

Geology and Exploration

The Darling Range comprises a low incised plateau formed by uplift along the north-south trending Darling Fault, a major structural lineament that extends for over 250 km, from Bindoon in the north to Collie in the south. Bauxite deposits have been identified throughout the Darling Range and generally occur as erratically distributed alumina-rich lenses. Lateralization and subsequent periodic activity of the Darling Fault has resulted in the current landform of scarps and deeply incised valleys on the western edge of the Darling Range.

Systematic exploration for bauxite within the region commenced in the 1960s and is currently conducted on a continuous basis to maintain sufficient mineral resources and mineral reserves to meet refinery supply. Current mine plans include further exploration throughout all areas where Alcoa has mining permits to sustain future production.

Refer to the Darling Range TRS in Sections 6.0 through 11.0 for more information on the geology, mineralization, and exploration history of the Darling Range, including Quality Assurance / Quality Control (QA/QC) procedures and data used in the current mineral resource estimate.

Mining and Processing

The Huntly and Willowdale mines employ conventional open pit surface mining practices and equipment. Following definition of mineral reserve blocks, vegetation is cleared after which Alcoa operations commence stripping topsoil and secondary overburden removal using small excavators, scrapers, and trucks. Soil is stockpiled at the site, away from the proposed pit, for rehabilitation purposes. After completion of mining, overburden is progressively backfilled into adjacent exhausted pits, topsoiled, and rehabilitated by re-establishment of native vegetation, creating a stable post-mining landform that replicates the pre-existing environment.

The process plant for the Darling Range operations consists of two separate crushing facilities at the Huntly and Willowdale mines, respectively. Both facilities crush the ROM ore and convey the crushed ore to two separate refineries located at Pinjarra and Wagerup. The Pinjarra refinery is located adjacent to the east of the town of Pinjarra and is approximately 25 km southwest of the Huntly mining areas. The Wagerup refinery, supplied by Willowdale, is located immediately adjacent to the east of the South Western Highway, approximately 8 km south of Waroona and 20 km west of the Willowdale mining area. The Kwinana refinery was also supplied by Huntly until the completion of the full curtailment of the refinery in the second quarter of 2024. The Kwinana refinery is approximately 50 km northwest of Huntly in the city of Kwinana, approximately 40 km south of Perth.

The process plant is a dry crushing operation and therefore water is not required as a consumable for the plant. Alcoa's Darling Range mining operations do not produce mine waste in the same manner as conventional mining operations and waste dumps are not constructed.

Refer to the Darling Range TRS in Sections 12.0 and 13.0 for a detailed description of the mineral reserves and mining methods used in the Darling Range.

Environmental and Social

Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly and Willowdale. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within a Triennial Environmental Review report.

Alcoa works proactively with key regulatory agencies to address operational incidents and implement operational improvements to reduce releases to the environment.

In December 2023, the Western Australian government granted a section 6 exemption under the Environmental Protection Act 1986 that allows Alcoa to continue its mining operations while the Western Australian Environmental Protection Authority (WA EPA) assesses the environmental impact of parts of the MMP, following a third party's referral of the Company's future and existing mine plans in existing mine regions to the WA EPA in the first quarter of 2023. Compliance against the section 6 exemption is monitored on a weekly basis by an independent compliance monitor and reported monthly to the Department of Water and Environmental Regulation. In connection with the section 6 exemption, AofA committed to provide a bank guarantee which demonstrates Alcoa's confidence that its operations will not impair drinking water supplies. In September 2024 and October 2024, AofA delivered bank guarantees totaling $62 (A$100). The requirement to provide financial assurance will expire upon the completion of the WA EPA's assessment of the Company's mine plans.

Alcoa is modernizing its environmental approvals framework for the Huntly bauxite mine and referred future mining plans to access Myara North and Holyoake to the WA EPA for assessment in 2020.

Refer to the Darling Range TRS in Section 17.0 for more information on the environmental, social, compliance, and permitting aspects of the Darling Range.

Mineral Resources and Mineral Reserves

In 2024, the economic cut-off for long term mine planning blocks at Darling Range was determined using an optimization that considers a base alumina price with deductions for costs associated with mining and processing the ore from each resource pit.

For information on Darling Range mineral resources and mineral reserves, refer to the tables above. For comparative purposes:

- measured and indicated mineral resources were 188.4 mdmt and 198.4 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 5 percent;
- inferred mineral resources were 101.4 mdmt and 106.9 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 5 percent;
- probable reserves were 397.6 mdmt and 296.0 mdmt as of December 31, 2024 and 2023, respectively, representing an increase of 34 percent; and
- proven reserves were 26.1 mdmt and 48.0 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 46 percent.

The decrease in measured and indicated mineral resources from December 31, 2023 to December 31, 2024 is reflected in the increase in reserves and is primarily due to changes in mine scheduling, partially offset by deferred mining of the RPZ and ongoing exploration activities. The decrease in inferred mineral resources from December 31, 2023 to December 31, 2024 is reflected in the increase in reserves and is primarily due to ongoing exploration activities. The mineral reserves increase from December 31, 2023 to December 31, 2024 is primarily attributable to pit optimization considering base alumina and caustic soda prices, changes in mine scheduling, ongoing exploration activities, and the conversion from mineral resources to mineral reserves, partially offset by deferred mining of the RPZ, constraints required under the 2023-2027 MMP, and mining depletion in 2024.

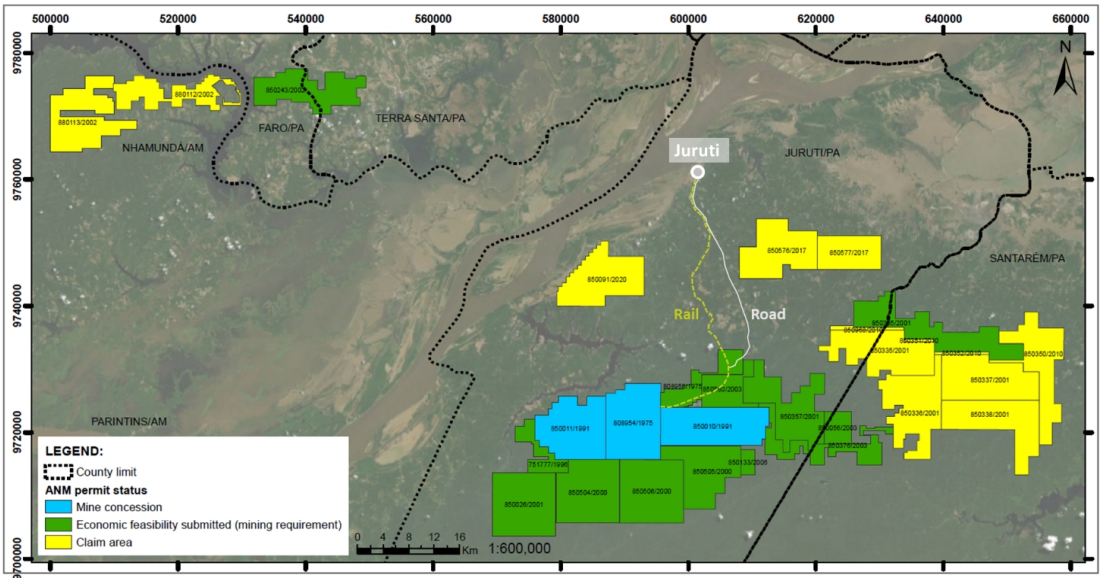
Additionally, refer to the Darling Range TRS Section 11.0 and 12.0 for more information on the mineral resources and mineral reserves of the Darling Range mines.

Individual Property Disclosure—Juruti

Property Location and Description

The Juruti bauxite mine is located in the west of Para State in northern Brazil. The mine is approximately 55 km south from the town of Juruti on the southern shore of the Amazon River. The mine is owned and operated by Alcoa through AWAB. The Juruti bauxite mine represents an established mining operation which commenced commercial production of bauxite in 2009.

All spatial data used for the mineral resource and mineral reserve estimation are reported using a local grid based on SIRGAS 2000 (21S). The approximate coordinates of the mining area for the Capiranga Central, Mauari, São Francisco, Mutum and Santarém plateaus are 618,879 m East and 9,721,768 m North, and for the Nhamundá plateau are 521,657 m East and 9,773,299 m North.



Juruti Location and Bauxite Mine Permit Areas

Refer to the Juruti TRS in Sections 2.0 through 5.0 for more information on the Juruti mine – history, location, accessibility, and other relevant details.

Infrastructure

Infrastructure required for bauxite mining operations is well-established and available, the majority of which is located within the area of the Juruti bauxite mine. The required infrastructure includes the following:

- Rail siding and loading equipment;
- Bauxite beneficiation plant for ore crushing and washing;
- Mine waste facilities including tailings thickening lagoons and tailings disposal ponds;
- ROM and product stockpiles and materials handling conveyors;
- Ancillary buildings (offices, warehouses, laboratory, workshops);
- Fuel station;
- Water supply intake raft, pumps, and approximate 9 km pipeline from the Juruti Grande stream;
- Power generation via thermoelectric units at the mine and port;
- Surface water management including drainage channels and pumps;
- Off-site rail corridor between the mine and port; and,
- Port facilities including rail siding, material handling equipment, ship loader.

The Juruti mining area is connected to Juruti town and port facilities by a road that joins to the PA-257 road near the town, and a dedicated railway between the mining area and port. There are very few major roads across the region and the only major road in this area is the PA-257.

The nearest major city to Juruti is Santarem, approximately 160 km to the east and is only accessible by boat or by air from Juruti Airport (JRT) to Santarem-Maestro Wilson Fonseca Airport (STM). National roads connect Santarem to wider Para State including the port city of Belem on Brazil's northern coast, approximately 1,400 km by road via the 230 and PA-151 roads.

Juruti began production in 2009 and the facilities are in a well-maintained condition. Net book value of these facilities as of December 31, 2024 of $392 is included in Properties, plants, and equipment, net on the Consolidated Balance Sheet.

Refer to the Juruti TRS in Sections 14.0 and 15.0 for more information on the surface infrastructure and facilities of the Juruti mine.

Land Tenure and Permitting

All exploration and mining activities are managed by the National Mining Agency, Agencia Nacional de Mineracao (ANM), under the Mining Code (1967). Permits are granted by the ANM and fall into two categories:

- Exploration Permits: granted to support ongoing exploration activities. On submittal of an approved Exploration Report, the holder is then granted one year to present a Mining Plan as a precursor to obtaining a Mining Concession. Exploration Permits require:
    - o Initial application fee and submission by a registered professional geologist or mining engineer;
    - o Annual fee payment to the ANM;
    - o Declaration of exploration expenditures on an annual basis; and,
    - o Survey visit fee payment to the ANM.

- Mining Concession: following a successful Mining Plan submission, enabling exploitation once Environmental Licenses are granted. Concession holders are required to:
    - o Commence mining activities within 6 months of being granted;
    - o Submit annual reports on all mining / processing activities (Relatorio Annual de Lavra, or RAL) to the ANM;
    - o Make compensation payments to landowners in line with the agreements made for mining easement; and,
    - o Make Brazilian Mineral Royalty payments (Compensacao Financeira pela Exploracao de Recursos Minerais, or CFEM).

At Juruti there are three continuous mining concessions for an aggregated 29,410 ha, where current mineral reserves are determined. Brazilian mineral legislation does not limit the duration of mining concessions and instead the concession remains in force until the deposit is exhausted. These concessions may be extended later or expire earlier than estimated, based on the rate at which the deposits are exhausted and on obtaining any additional governmental approval, as necessary, such as operational licenses and environmental approvals.

In addition to the mining rights, there are thirteen requests for mining concessions, thirteen exploration permits, and two requests for exploration permits. The aggregated area for these permits is 170,845 ha.

The mining operations at Juruti take place on third-party land and, in accordance with the Mining Concession requirements, Alcoa currently has agreements in place with respective landowners. Agreements form a “mining easement,” which grants Alcoa access to the mining areas in exchange for compensation payments. As a result, there are no other titles, claims, leases, or options applicable to the exploration or mining permit areas which may limit Alcoa’s rights. Similarly, there are no liens or encumbrances.

The Company has all environmental permits and operating licenses required for current mining activities; there are no liens or encumbrances.

Refer to the Juruti TRS in Sections 3.0 and 17.0 for more information on Land Permitting and Tenure for the Juruti mine.

Geology and Exploration

The bauxite deposit of the Juruti bauxite mine consist of several lateritic bauxite plateaus which exist over a large lateral extent (several km) in comparison to the total thickness of the deposit (typically up to 20 m below surface).

Systematic exploration for bauxite within the region has persisted since Alcoa’s ownership and is currently conducted on a continuous basis to establish optimal mine plans to achieve a uniform quality of bauxite production. Current mine plans include further exploration throughout all areas where Alcoa has mining permits to sustain future production.

Refer to the Juruti TRS in Sections 6.0 through 11.0 for more information on the geology, mineralization, and exploration history of the Juruti mine, including QA/QC procedures and data used in the current mineral resource estimate.

Mining and Processing

Juruti is an active mining operation using surface strip mining methods over a total of eight plateaus whereby land clearance, topsoil removal, and overburden stripping is followed by bauxite deposit excavation and stockpiling. Waste is subsequently backfilled, and overburden and topsoil are re-instated for surface rehabilitation.

Juruti produces both a washed and unwashed bauxite product; however, all tonnage is presented on a zero-moisture basis. Bauxite processing takes place at a dedicated plant facility located at the Juruti mine site which has been operating since 2009 and comprises a simple comminution (crushing, screening) and washing circuit designed to remove fine particles from the ore.

Fine materials removed from ore are deposited in a thickening pond for settling and water reclamation, after which solid tailings are discarded into separate tailings ponds. There is currently one thickening pond and seven disposal ponds.

Refer to the Juruti TRS in Sections 12.0 and 13.0 for a detailed description of the mineral reserves and mining methods used in the Juruti mine.

Environmental and Social

Alcoa submits annual environmental reports in compliance with the Juruti operating licenses and approvals. Alcoa has shown that the Company works proactively with key regulatory agencies to address any operational non-compliances and implement operational improvements to reduce releases to the environment. No significant compliance issues were identified in the 2022/2023 and 2023/2024 annual environmental reports. Due to drought conditions, the mine applied for and received approval to move the water abstraction point in the Rio Juruti Grande water body in 2024. This new approval allows the abstraction of surface water at three points, to be used alternately. In 2024 the historically low water levels in the Amazon River required dredging to alleviate the impact on shipping operations. Closing the harbor affected community use, resulting in an increase in community complaints. Alcoa consulted the affected communities and have agreed upon compensation arrangements.

Refer to the Juruti TRS in Section 17.0 for more information on the environmental, social, compliance, and permitting aspects of the Juruti mine.

Mineral Resources and Mineral Reserves

For information on Juruti mineral resources and mineral reserves, refer to the tables above. For comparative purposes:

- measured and indicated mineral resources were 64.0 mdmt and 64.2 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of less than 1 percent;
- inferred mineral resources were 514.3 mdmt and 563.6 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 9 percent;
- proven reserves were 43.5 mdmt and 46.2 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 6 percent; and
- probable reserves were 33.0 mdmt and 34.7 mdmt as of December 31, 2024 and 2023, respectively, representing a decrease of 5 percent.

The decrease in mineral resources is attributable to changes in the application of mineral rights to the block models. The decrease in mineral reserves from December 31, 2023 reflects mining depletion during 2024. Refer to the Juruti TRS for more information on the mineral resources and mineral reserves of the Juruti mine.

Internal Controls

Alcoa has a long history of mining bauxite, with the majority of bauxite production having been used to supply Alcoa refineries.

Internal controls used by the Company are informed by internal reviews, representation on Technical Committees of Joint Venture operations, and by reviews, audits, and studies performed by third-party mining consultants. The controls include: surveying of drillhole collar locations, drill sample logging, collection and security, database verification and security, quality assurance/quality control (QA/QC) programs, internal and third-party qualified person statistical analysis, internal and third-party qualified person model validation, and reconciliation. Modelling and analysis of the Company's resources is completed internally and reviewed by a qualified person, with the exception of Al Ba'itha where modelling and analysis is completed by a third-party consultant.

As the ore bodies are shallow and generally horizontal, two-dimensional seam modelling has been the standard practice; however, many operations are implementing more conventional 3D block modelling using geostatistical interpolation methods. Mineral resource estimation is validated internally through visual comparison of drillholes and model blocks as well as through the use of swath plots and statistical distributions. Mineral resource estimation is reviewed and adopted by a qualified person. Mineral reserve estimation is completed internally and reviewed by a qualified person, with the exception of Boké and Al Ba'itha where reserve estimation is completed by a third-party consultant.

Labelled samples from the drill site are securely transported for logging or temporary storage by the drilling contractor or Alcoa personnel. Additional transport to internal or external laboratories is controlled and completed, as necessary, by Alcoa personnel or by courier.

Drillhole databases are all site specific; most sites use industry standard drillhole database software, applications, and processes with security and backup protocols in place. Prior to modelling, secondary validation and cleansing of the modelling datasets is performed. Wherever possible, data collection is digital to allow direct loading into the database.

The Company has well-established QA/QC programs that are site specific. Although some programs are limited to laboratory protocols only covering analysis of duplicate pulps and standards, others involve, to varying degrees, the range of activities from twin hole drilling and collection of field duplicates, submission of blind duplicates and standards and submission of duplicate samples to umpire laboratories. Regardless of the level of QA/QC, all sites have well established and documented sampling and analysis regimes. QA/QC practices and available data are reviewed by a qualified person.

As discussed above, management relies on estimates for our mineral reserves and these estimates could change due to a number of factors, including future changes in: permitting requirements, geological conditions, ongoing mine planning, macroeconomic and industry conditions, and regulatory disclosure requirements. See Part I Item 1A of this Form 10-K for more information on risks.

Item 3. Legal Proceedings.
(dollars in millions)

In the ordinary course of its business, Alcoa is involved in a number of lawsuits and claims, both actual and potential. Proceedings that were previously disclosed may no longer be reported because, as a result of rulings in the case, settlements, changes in our business, or other developments, in our judgment, they are no longer material to Alcoa's business, financial position or results of operations. See Part II Item 8 of this Form 10-K in Note S to the Consolidated Financial Statements for additional information regarding proceedings.

In addition to the matters discussed below, various other lawsuits, claims, and proceedings have been or may be instituted or asserted against Alcoa Corporation, including those pertaining to environmental, safety and health, commercial, tax, product liability, intellectual property infringement, governance, employment practices, employee and retiree benefit matters, and other actions and claims arising out of the normal course of business. While the amounts claimed in these other matters may be substantial, the ultimate liability is not readily determinable because of the considerable uncertainties that exist. Accordingly, it is possible that the Company's liquidity or results of operations in a particular period could be materially affected by one or more of these other matters. However, based on facts currently available, management believes that the disposition of these other matters that are pending or asserted will not have a material adverse effect, individually or in the aggregate, on the financial position of the Company.

St. Croix Proceedings - Abednego and Abraham cases. In January 2010, ParentCo was served with a multi-plaintiff action complaint involving several thousand individual persons claiming to be residents of St. Croix alleging personal injury or property damage from Hurricane Georges or winds blowing material from the St. Croix Alumina, L.L.C. (SCA) facility on the island of St. Croix (U.S. Virgin Islands). This complaint, Abednego, et al. v. Alcoa, et al., which added the then current owners of the facility to a February 1999 action, was filed in the Superior Court of the Virgin Islands, St. Croix Division.

In 2012, ParentCo was served with a separate multi-plaintiff action alleging claims essentially identical to those set forth in the Abednego v. Alcoa complaint.

In 2015, the Superior Court dismissed all plaintiffs' complaints without prejudice, permitting the plaintiffs to re-file the complaints individually. In 2017, the court issued an order that consolidated all timely complaints into the Red Dust Claims docket (Master Case No.: SX-15-CV-620). Following this order, a total of approximately 430 complaints were filed and accepted by the court, which included claims of approximately 1,360 individuals. In November 2018, the Red Dust Claims docket was transferred to the Complex Litigation Division within the Superior Court of the Virgin Islands. At such time, the Company was unable to reasonably predict an outcome or to estimate a range of reasonably possible loss, and thereafter the Red Dust Claims docket became inactive for several years. In March 2022, the Superior Court of the Virgin Islands issued an amended case management order dividing the complaints filed in the Red Dust docket into groups of 50 complaints, designated Groups A though I. The parties selected 10 complaints from Group A to proceed to trial as the Group A lead cases. In May 2024, the Court issued an amended case management order with regard to the Group A lead cases scheduling trials to begin in November 2024. The Court further ordered the parties to participate in mediation on or before August 31, 2024. Alcoa participated in the court-ordered mediation in August 2024 and reached a settlement agreement to resolve the matter in its entirety, which resulted in no further impact to Alcoa's results of operations. The settlement was finalized in January 2025 upon receiving signed release agreements or final dismissals from every plaintiff. This matter is now closed.

Environmental Matters

SEC regulations require disclosure of certain environmental matters when a governmental authority is a party to the proceedings and such proceedings involve potential monetary sanctions that the Company reasonably believes will exceed a specified threshold. Pursuant to these regulations, the Company uses a threshold of $1 for purposes of determining whether disclosure of any such proceedings is required.

Alcoa is involved in proceedings under CERCLA and analogous state or other statutory or jurisdictional provisions regarding the usage, disposal, storage, or treatment of hazardous substances at a number of sites. The Company has committed to participate, or is engaged in negotiations with authorities relative to its alleged liability for participation, in clean-up efforts at several such sites. The most significant of these matters are discussed in Part II Item 8 of this Form 10-K in Note S to the Consolidated Financial Statements under the caption Contingencies.

Intalco (Washington) Notice of Violation—In May 2022, the Company received a Notice of Violation (NOV) from the U.S. Environmental Protection Agency (the EPA). The NOV alleges violations under the Clean Air Act at the Company's Intalco smelter from when the smelter was operational. The EPA referred the matter to the U.S. Department of Justice, Environment and Natural Resources Division (the DOJ) in May 2022. The DOJ and the Company agreed to a stipulated settlement, which was filed with the United States District Court for the Western District of Washington at Seattle on July 18, 2024, requiring the Company to pay a civil fine of $5. On October 15, 2024, the Court approved the stipulated settlement of $5, and payment has been remitted by the Company. This matter is now closed.

Asbestos Litigation

Some of our subsidiaries as premises owners are defendants in active lawsuits filed in various jurisdictions on behalf of persons seeking damages for alleged personal injury as a result of occupational exposure to asbestos at various facilities. Our subsidiaries and acquired companies all have had numerous insurance policies over the years that provide coverage for asbestos based claims. Many of these policies provide layers of coverage for varying periods of time and for varying locations. We have significant insurance coverage and believe that our reserves are adequate for known asbestos exposure related liabilities. The costs of defense and settlement have not been and are not expected to be material to the results of operations, cash flows, and financial position of Alcoa Corporation.

Item 4. Mine Safety Disclosures.

Not applicable.

PART II

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.
(dollars in millions, except share and per-share amounts)

Shares of the Company's common stock are listed on the New York Stock Exchange, its principal market, and trade in U.S. dollars under the symbol "AA." Alcoa Corporation CHESS Depositary Interests (CDIs), each representing one share of the Company's common stock, are listed on the Australian Stock Exchange and trade in Australian dollars under the symbol "AAI."

On October 14, 2021, Alcoa Corporation announced the initiation of a quarterly cash dividend program and the Board of Directors declared the first quarterly cash dividend of $0.10 per share of the Company's common stock, which was paid during the fourth quarter of 2021. Alcoa Corporation paid quarterly cash dividends of $0.10 per share in 2022, 2023, and 2024. Dividends on Alcoa Corporation common stock and Series A preferred stock are subject to authorization by the Company's Board of Directors. The Company intends to pay cash dividends on a quarterly basis; however, the payment, amount, and timing of dividends, if any, depends upon matters deemed relevant by the Company's Board of Directors, such as Alcoa Corporation's financial position, results of operations, cash flows, capital requirements, business condition, future prospects, any limitations imposed by law, credit agreements or senior securities, and other factors deemed relevant and appropriate. See Part II Item 7 of this Form 10-K in Management's Discussion and Analysis of Financial Condition and Results of Operations under caption Liquidity and Capital Resources – Financing Activities for more information.

As of February 14, 2025, there were approximately 7,200 holders of record of shares of the Company's common stock and approximately 39,800 holders of record of the Company's CDIs. Because many of Alcoa Corporation's shares and CDIs are held by brokers and other institutions on behalf of stockholders, the Company is unable to estimate the total number of stockholders represented by these holders.

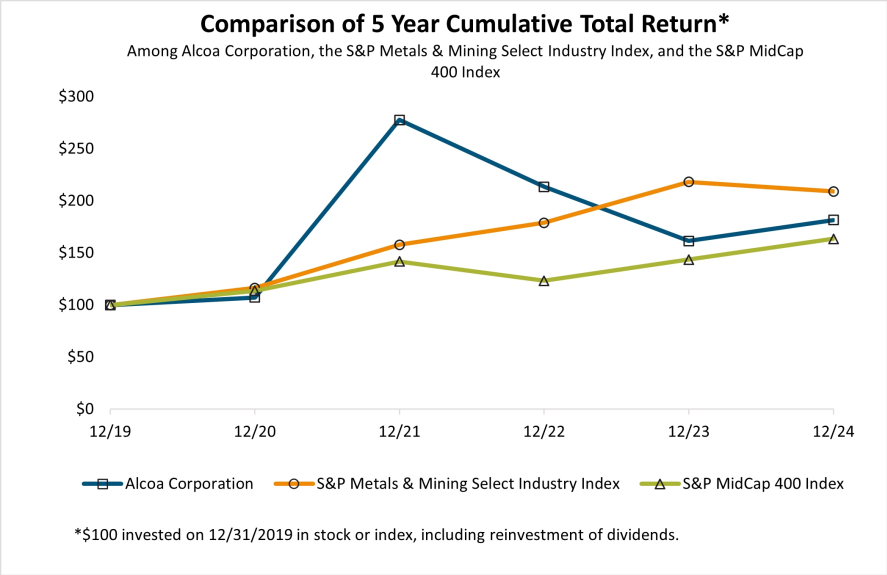
Unregistered Sales of Equity Securities

Information required by Item 701 of Regulation S-K with respect to the Company's issuance of Alcoa common stock (including common stock underlying CDIs) and Alcoa Series A convertible preferred stock is included in the Company's Current Report on Form 8-K, filed with the SEC on August 1, 2024.

Stock Performance Graph

The following graph compares Alcoa Corporation's cumulative total stockholder return (i.e., stock price change plus reinvestment of dividends) with the cumulative total stockholder returns of (1) the Standard and Poor's (S&P) Metals & Mining Select Industry Index, and (2) the S&P MidCap 400® Index. This comparison was based on an initial investment of $100, including the reinvestment of any dividends, on December 31, 2019 through December 31, 2024.

The stock performance information included in this graph is based on historical results and is not necessarily indicative of future stock price performance.



December 31,	2019	2020	2021	2022	2023	2024
Alcoa Corporation	$ 100	$ 107	$ 278	$ 213	$ 161	$ 182
S&P Metals & Mining Select Industry Index	100	116	158	179	218	209
S&P MidCap 400 Index	100	114	142	123	144	164

Issuer Purchases of Equity Securities

Fourth Quarter 2024	Total Number of Shares Purchased	Weighted Average Price Paid Per Share	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet be Purchased Under the Program[(1)]
October 1 to October 31	—	$ —	—	$ 500
November 1 to November 30	—	—	—	500
December 1 to December 31	—	—	—	500
Total	—	—	—	

(1) On July 20, 2022, Alcoa Corporation announced that its Board of Directors approved a common stock repurchase program under which the Company may purchase shares of its outstanding common stock up to an aggregate transactional value of $500, depending on the Company's continuing analysis of market, financial, and other factors (the July 2022 authorization).

As of the date of this report, the Company is currently authorized to repurchase up to a total of $500, in the aggregate, of its outstanding shares of common stock under the July 2022 authorization. Repurchases under this program may be made using a variety of methods, which may include open market purchases, privately negotiated transactions, or pursuant to a Rule 10b5-1 plan. This program may be suspended or discontinued at any time and does not have a predetermined expiration date. Alcoa Corporation intends to retire repurchased shares of common stock.

Item 6. [RESERVED]

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

(dollars in millions, except per-share amounts, average realized prices, and average cost amounts; metric tons in thousands (kmt); dry metric tons in millions (mdmt))

Forward-Looking Statements

This report contains statements that relate to future events and expectations and as such constitute forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include those containing such words as "aims," "ambition," "anticipates," "believes," "could," "develop," "endeavors," "estimates," "expects," "forecasts," "goal," "intends," "may," "outlook," "potential," "plans," "projects," "reach," "seeks," "sees," "should," "strive," "targets," "will," "working," "would," or other words of similar meaning. All statements by Alcoa Corporation that reflect expectations, assumptions or projections about the future, other than statements of historical fact, are forward-looking statements, including, without limitation, statements regarding forecasts concerning global demand growth for bauxite, alumina, and aluminum, and supply/demand balances; statements, projections or forecasts of future or targeted financial results, or operating performance (including our ability to execute on strategies related to environmental, social and governance matters); statements about strategies, outlook, and business and financial prospects; and statements about capital allocation and return of capital. These statements reflect beliefs and assumptions that are based on Alcoa Corporation's perception of historical trends, current conditions, and expected future developments, as well as other factors that management believes are appropriate in the circumstances.

Forward-looking statements are not guarantees of future performance and are subject to known and unknown risks, uncertainties, and changes in circumstances that are difficult to predict. Although Alcoa Corporation believes that the expectations reflected in any forward-looking statements are based on reasonable assumptions, it can give no assurance that these expectations will be attained and it is possible that actual results may differ materially from those indicated by these forward-looking statements due to a variety of risks and uncertainties. Such risks and uncertainties include, but are not limited to: (a) the impact of global economic conditions on the aluminum industry and aluminum end-use markets; (b) volatility and declines in aluminum and alumina demand and pricing, including global, regional, and product-specific prices, or significant changes in production costs which are linked to LME or other commodities; (c) the disruption of market-driven balancing of global aluminum supply and demand by non-market forces; (d) competitive and complex conditions in global markets; (e) our ability to obtain, maintain, or renew permits or approvals necessary for our mining operations; (f) rising energy costs and interruptions or uncertainty in energy supplies; (g) unfavorable changes in the cost, quality, or availability of raw materials or other key inputs, or by disruptions in the supply chain; (h) economic, political, and social conditions, including the impact of trade policies, tariffs, and adverse industry publicity; (i) legal proceedings, investigations, or changes in foreign and/or U.S. federal, state, or local laws, regulations, or policies; (j) changes in tax laws or exposure to additional tax liabilities; (k) climate change, climate change legislation or regulations, and efforts to reduce emissions and build operational resilience to extreme weather conditions; (l) disruptions in the global economy caused by ongoing regional conflicts; (m) fluctuations in foreign currency exchange rates and interest rates, inflation and other economic factors in the countries in which we operate; (n) global competition within and beyond the aluminum industry; (o) our ability to achieve our strategies or expectations relating to environmental, social, and governance considerations; (p) claims, costs, and liabilities related to health, safety and environmental laws, regulations, and other requirements in the jurisdictions in which we operate; (q) liabilities resulting from impoundment structures, which could impact the environment or cause exposure to hazardous substances or other damage; (r) dilution of the ownership position of the Company's stockholders, price volatility, and other impacts on the price of Alcoa common stock by the secondary listing of the Alcoa common stock on the Australian Securities Exchange; (s) our ability to obtain or maintain adequate insurance coverage; (t) our ability to execute on our strategy to reduce complexity and optimize our asset portfolio and to realize the anticipated benefits from announced plans, programs, initiatives relating to our portfolio, capital investments, and developing technologies; (u) our ability to integrate and achieve intended results from joint ventures, other strategic alliances, and strategic business transactions; (v) our ability to fund capital expenditures; (w) deterioration in our credit profile or increases in interest rates; (x) impacts on our current and future operations due to our indebtedness; (y) our ability to continue to return capital to our stockholders through the payment of cash dividends and/or the repurchase of our common stock; (z) cyber attacks, security breaches, system failures, software or application vulnerabilities, or other cyber incidents; (aa) labor market conditions, union disputes and other employee relations issues; (bb) a decline in the liability discount rate or lower-than-expected investment returns on pension assets; and (cc) the other risk factors discussed in Part 1 Item 1A of this Form 10-K and other reports filed by Alcoa Corporation with the SEC, including those described in this report.

We caution readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date they are made. Alcoa Corporation disclaims any obligation to update publicly any forward-looking statements, whether in response to new information, future events or otherwise, except as required by applicable law. Market projections are subject to the risks described above and other risks in the market.

Overview

Our Business

Alcoa Corporation (Alcoa or the Company) is a vertically integrated aluminum company comprised of bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation. Aluminum is a commodity that is traded on the London Metal Exchange (LME) and priced daily. Additionally, alumina is subject to market pricing through the Alumina Price Index (API), which is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price, Platts Metals Daily Alumina PAX Price, and FastMarkets Metal Bulletin Non-Ferrous Metals Alumina Index. As a result, the price of both aluminum and alumina is subject to significant volatility and, therefore, influences the operating results of Alcoa Corporation.

Through direct and indirect ownership, Alcoa Corporation has 26 operating locations in nine countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

Business Update

During 2024, Alcoa experienced strength in alumina and aluminum pricing and made significant progress on its key operational, commercial, financial, and capital allocation objectives, delivering on strategic actions and operational improvements.

Average alumina and aluminum prices increased by 37% and 7%, respectively, with the alumina price reaching an all-time high in the fourth quarter of 2024 driven primarily by supply disruptions. The increase in alumina price outweighed the increase in aluminum price. The alumina and aluminum markets ended 2024 in a volume deficit or balanced, respectively. The cost for energy and raw materials, including carbon products, caustic soda, and other key inputs decreased.

Nine of the Company's eleven smelters increased annual production, while the Mosjøen (Norway) smelter, the Warrick (Indiana) smelter, and the Company's smelters in Canada set annual production records. The Company's mine operations successfully operated under new mine conditions in Western Australia, which included daily observation of its mining and rehabilitation practices by certain regulators.

Commercially, the Company expanded a number of important customer and supplier relationships and invested in growth capital expenditures to enhance value add products to meet its customer demand.

The Company delivered changes to improve the financial performance of its operating portfolio. The Alumar (Brazil) smelter steadily improved stability and increased operating capacity to approximately 84 percent at December 31, 2024.

The Company announced the curtailment of the Kwinana (Australia) refinery in January 2024 and completed the full curtailment in the second quarter of 2024.

Alcoa completed the acquisition of Alumina Limited on August 1, 2024. The acquisition enhances Alcoa's position as a leading pure play, upstream aluminum company globally, while simplifying the Company's corporate structure and governance, resulting in greater financial flexibility and strategic optionality.

In September 2024, Alcoa announced the sale of its 25.1% interest in the Saudi Arabia joint venture to Ma'aden. This decision aligns with the Company's ongoing efforts to streamline its operations and is expected to provide Alcoa with enhanced financial flexibility.

In October 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS Equity Holdings, SL (IGNIS EQT), to support the continued operation of the San Ciprián complex. On January 21, 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed a memorandum of understanding that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations.

In November 2024, the Company began de-levering and repaid $385 drawn under the Alumina Limited Revolving Credit Facility, which was assumed in connection with acquisition.

Alumina Limited Acquisition

On August 1, 2024, Alcoa completed the acquisition of all of the ordinary shares of Alumina Limited (Alumina Shares) through a wholly-owned subsidiary, AAC Investments Australia 2 Pty Ltd. At acquisition, Alumina Limited held a 40% ownership interest in the AWAC joint venture.

Under the Scheme Implementation Deed (the Agreement) entered into in March 2024, as amended in May 2024, holders of Alumina Shares received 0.02854 Alcoa CHESS Depositary Interests (CDIs) for each Alumina Share (the Agreed Ratio), except that i) holders of Alumina Shares represented by American Depositary Shares, each of which represented 4 Alumina Shares, received 0.02854 shares of Alcoa common stock and ii) a certain shareholder received, for certain of their Alumina Shares, 0.02854 shares of Alcoa non-voting convertible preferred stock. The Alcoa CDIs are quoted on the Australian Stock Exchange.

At closing, Alumina Shares outstanding of 2,760,056,014 and 141,625,403 were exchanged for 78,772,422 and 4,041,989 shares of Alcoa common stock and Alcoa preferred stock, respectively. Based on Alcoa's closing share price as of July 31, 2024, the Agreed Ratio implied a value of A$1.45 per Alumina Share and aggregate purchase consideration of approximately $2,700 for Alumina Limited.

For Alcoa stockholders, the transaction enhances Alcoa's vertical integration along the value chain across bauxite mining, alumina refining, and aluminum smelting, increases Alcoa's economic interest in its bauxite and alumina assets, simplifies governance, and reaffirms Alcoa's commitment to Western Australia. In addition to the implied premium over prior share prices, Alumina Limited shareholders' ownership is diversified to a large-scale, global upstream aluminum portfolio.

The transaction consisted in substance of the acquisition of Alumina Limited's noncontrolling interest in AWAC ($1,472), the assumption of Alumina Limited's indebtedness ($385), the recognition of deferred tax assets ($216) primarily related to Alumina Limited's prior net operating losses and the tax allocation of the fixed asset valuation to individual assets, and the acquisition of cash ($9) and other current liabilities ($1). The transaction was accounted for as an equity transaction where net assets acquired ($1,311) and transaction costs ($32) were reflected as an increase to Additional capital. Net income attributable to noncontrolling interest was recognized through July 31, 2024. In November 2024, Alcoa repaid the full amount ($385) of Alumina Limited's indebtedness and cancelled the agreement.

Saudi Arabia Joint Venture

On September 15, 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture, comprised of the Ma'aden Bauxite and Alumina Company and the Ma'aden Aluminium Company, to Ma'aden in exchange for issuance by Ma'aden of approximately 86 million shares and $150 in cash. The implied value of the shares was $950 as of September 12, 2024, based on the volume-weighted average share price of Ma'aden for the previous 30 calendar days. The shares of Ma'aden will be subject to transfer and sale restrictions, including a restriction requiring Alcoa to hold its Ma'aden shares for a minimum of three years, with one-third of the shares becoming transferable after each of the third, fourth, and fifth anniversaries of closing of the transaction (the holding period). During the holding period, Alcoa would be permitted to hedge and borrow against its Ma'aden shares. Under certain circumstances, such minimum holding period would be reduced. The transaction is subject to regulatory approvals, approval by Ma'aden's shareholders, and other customary closing conditions and is expected to close in the first half of 2025. The carrying value of Alcoa's investment was $544 as of December 31, 2024.

Australia Mine Plan Approvals

During 2024, the Company continued to advance mine approvals for the next major Australian mine regions (Myara North and Holyoake), which were referred for accredited assessment by the WA EPA under the Accredited Assessment. Alcoa began the process in 2020, is focused on receiving approval by the first quarter of 2026, and anticipates mining in new regions will commence no earlier than 2027. Until then, the Company expects bauxite quality will remain similar to recent grades.

During the third quarter of 2024, the WA EPA set an indicative timeline for the next key step in the approval process, the public comment period, for early 2025.

The Company continues work to seek annual endorsement from the Western Australian State Government for its rolling five-year mine plan. Separately, in 2023, a third party referred the Company's current five-year mine plan to the WA EPA for assessment (Third-Party Referral). This Third-Party Referral remains under assessment, and the public comment period is expected to be in early 2025 in accordance with the WA EPA streamlined process.

The Company is committed to working collaboratively with the WA EPA and other stakeholders to achieve the indicative timelines set by the WA EPA.

Additionally, the Company is evaluating conditions recommended by the WA EPA in similar accredited assessment processes to address the majority of relevant published conditions in the Company's Environmental Review Document, which Alcoa will submit as part of the Accredited Assessment prior to the upcoming public comment period.

Portfolio Actions

Portfolio Review

In October 2024, the Company completed its five-year strategic portfolio review to improve cost positioning, or curtail, close, or divest 1.5 million and 4 million metric tons of smelting and refining capacity, respectively. The Company reached approximately 93 percent of its target for smelting capacity with the decision to restart capacity at the Warrick smelter completed in the first quarter 2024, and exceeded its target for refining capacity with the decision to curtail the Kwinana refinery in January 2024. The Company continues to evaluate assets for opportunities for improvement to remain profitable throughout business cycles.

Kwinana Refinery

In June 2024, Alcoa completed the full curtailment of the Kwinana refinery, as planned, which was announced in January 2024. The Company's decision to fully curtail the refinery was made based on a variety of factors, including the refinery's age, scale, operating costs, and current bauxite grades, in addition to market conditions.

Prior to the curtailment, the refinery had been operating at approximately 80 percent of its annual nameplate capacity of 2.2 million metric tons since January 2023, when the Company reduced production in response to a domestic natural gas shortage in Western Australia due to production challenges experienced by key gas suppliers.

As of March 2024, the refinery had approximately 780 employees and this number was reduced to approximately 250 through the fourth quarter of 2024 to manage certain processes that are expected to continue until about the fourth quarter of 2025. At that time, the employee number will be further reduced to approximately 50.

San Ciprián Operations

On October 16, 2024, Alcoa announced that it is progressing toward entering into a strategic partnership with IGNIS EQT, the majority shareholder in the IGNIS Group of Companies, a vertically integrated energy company based in Spain, to support the continued operation of the San Ciprián complex.

The proposed agreement is conditional upon delivery of key areas of cooperation with San Ciprián's stakeholders, including the Spanish national government, the Xunta regional government, and San Ciprián employees and workers' representatives. Key areas include:

- Materially higher carbon dioxide compensation support;
- Permitting of power generation projects, especially those with existing agreements with San Ciprián;
- Support and approval for the bauxite residue area capital project; and,
- Flexibility within the February 2023 updated viability agreement, including access to restricted cash for operating needs and deferral or substitution of capital improvement commitments.

On January 21, 2025, the Company, the Spanish national and Xunta regional governments, and IGNIS EQT signed a memorandum of understanding that outlines a process for the parties to work cooperatively toward the common objective of improving the long-term outlook for the San Ciprián operations and focuses on the key areas of cooperation (see above).

Under the proposed agreement, Alcoa would contribute approximately $78 (€75), and IGNIS EQT would make an initial investment of approximately $26 (€25) to fund the operations. Alcoa would continue as the managing operator of the San Ciprián complex, with IGNIS EQT holding 25 percent ownership. Additionally, up to approximately $104 (€100) would be funded by Alcoa as needed for operations with a priority position in future cash returns. Further funding would require agreement by both partners and would be shared 75 percent by Alcoa and 25 percent by IGNIS EQT.

Alcoa has operated the San Ciprián complex for a number of years in a challenging economic environment, primarily due to the high cost of energy. In the first quarter of 2024, Alcoa launched a sale process while also working to identify solutions for the long-term viability of the operations.

Despite sharing information with 60 potential investors, no viable bid was made for 100 percent of the San Ciprián complex. The potential partnership with IGNIS EQT emerged as an alternative for San Ciprián in which Alcoa can leverage its expertise in managing global aluminum operations, combined with IGNIS EQT's strong knowledge of energy markets, to create value via market access and energy management services.

The refinery and smelter incurred substantial losses in 2024 and in prior years. As of December 31, 2024, the Spanish entities that own these operations had approximately $25 of available funding with cash on hand (excluding restricted cash to be made available for capital improvements at the site and smelter restart costs). Although aluminum and alumina prices improved during 2024, the San Ciprián complex remains unviable based on current and forward market assumptions for delivered energy in Spain and sales prices. Based on economic conditions as of December 31, 2024, the San Ciprián operations are expected to incur losses in 2025 and barring finalizing a partnership agreement with IGNIS EQT, Alcoa anticipates that available funding will be exhausted near the end of the first quarter of 2025.

Warrick Operations

During the first quarter of 2024, the Company completed the restart of one potline (54 kmt) at the Warrick smelter in Indiana that began in October 2023, and incurred restart expenses of $3.

Other Matters

In February 2025, the U.S. government established a 25% tariff on a wide range of goods imported from Canada into the United States to take effect on March 4, 2025. Energy resources from Canada, which appears to include aluminum as it is listed as a critical mineral, will be subject to a lower 10% tariff. In addition, in February 2025, the U.S. government expanded tariffs existing under Section 232 of the Trade Expansion Act of 1962 (Section 232) by raising the aluminum tariffs from 10% to 25%, ending all country exemptions, phasing out specific product exclusions, and terminating all existing general approved exclusions. It is unclear if aluminum imported from Canada after March 12, 2025 will be subject to both the 10% tariffs on energy resources and the 25% Section 232 tariffs. Due to the uncertainty related to the application of the tariffs, Alcoa is unable to reasonably estimate the impact to the Company's results of operations until clarification is provided by the U.S. government.

In March 2024, the Company completed an offering of $750 aggregate principal amount of 7.125 percent senior notes due in 2031. This was the Company's first notes issuance under its Green Finance Framework, which prioritizes climate change mitigation expenditures related to circular or low carbon products, pollution prevention technologies, renewable energy, and water management. The Company is utilizing the net proceeds to finance and/or refinance, in whole or in part, new and/or existing qualifying projects on a two-year look back that meet certain eligibility criteria within its Green Finance Framework. The net proceeds also support the Company's cash position and ongoing cash needs, including with respect to its previously announced portfolio actions. The Company does not expect to allocate part of the net proceeds to significant capital investments in breakthrough technologies as those are not expected to occur within the applicable time period.

During the first quarter of 2024, the Company initiated and fully deployed a productivity and competitiveness program across its global operations and functions. The program is part of the Company's objective to improve overall competitiveness and profitability and includes a target to save approximately 5 percent of operating costs, exclusive of raw materials, energy and transportation costs, which are already under active management and cost control programs. Total savings are expected to approximate $100 on a run rate basis and to be achieved by the first quarter of 2025.

The Company paid a quarterly cash dividend of $0.10 per share of the Company's common stock (including common stock underlying CDIs) and Series A convertible preferred stock during 2024, totaling $90.

See the below sections for additional details on the above-described actions.

Basis of Presentation

The Consolidated Financial Statements of Alcoa Corporation are prepared in conformity with accounting principles generally accepted in the United States of America (GAAP). In accordance with GAAP, certain situations require management to make estimates based on judgments and assumptions, which may affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements. They also may affect the reported amounts of revenues and expenses during the reporting periods. Management uses historical experience and all available information to make these estimates. Management regularly evaluates the judgments and assumptions used in its estimates, and results could differ from those estimates upon future events and their effects or new information.

Results of Operations

The discussion that follows includes a comparison of our results of operations and liquidity and capital resources for the fiscal years ended December 31, 2024 and 2023. For a comparison of changes for the fiscal years ended December 31, 2023 and 2022, refer to Management's Discussion and Analysis of Financial Condition and Results of Operation in Part II Item 7 of Alcoa Corporation's Annual Report on Form 10-K for the year ended December 31, 2023 (filed February 21, 2024).

	For the year ended December 31,	
Statement of Operations	**2024**	**2023**
Sales	$ 11,895	$ 10,551
Cost of goods sold (exclusive of expenses below)	10,044	9,813
Selling, general administrative, and other expenses	275	226
Research and development expenses	57	39
Provision for depreciation, depletion, and amortization	642	632
Restructuring and other charges, net	341	184
Interest expense	156	107
Other expenses, net	91	134
Total costs and expenses	11,606	11,135
Income (loss) before income taxes	289	(584)
Provision for income taxes	265	189
Net income (loss)	24	(773)
Less: Net loss attributable to noncontrolling interest	(36)	(122)
Net income (loss) attributable to Alcoa Corporation	$ 60	$ (651)

Selected Financial Metrics	**2024**	**2023**
Diluted income (loss) per share attributable to Alcoa Corporation common shareholders	$ 0.26	$ (3.65)
Third-party shipments of alumina (kmt)	9,005	8,698
Third-party shipments of aluminum (kmt)	2,590	2,491
Average realized price per metric ton of alumina	$ 472	$ 358
Average realized price per metric ton of aluminum	$ 2,841	$ 2,828
Average Alumina Price Index (API)[(1)]	$ 471	$ 343
Average London Metal Exchange (LME) 15-day lag[(2)]	$ 2,409	$ 2,249

(1) API (Alumina Price Index) is a pricing mechanism that is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price, Platts Metals Daily Alumina PAX Price, and FastMarkets Metal Bulletin Non-Ferrous Metals Alumina Index.

(2) LME (London Metal Exchange) is a globally recognized exchange for commodity trading, including aluminum. The LME pricing component represents the underlying base metal component, based on quoted prices for aluminum on the exchange.

Annual Comparison

Overview

Net income (loss) attributable to Alcoa Corporation increased $711 primarily as a result of:

- Higher average realized price of alumina and aluminum
- Lower equity losses
- Favorable energy and raw material costs
- Absence of Net income attributable to noncontrolling interest following Alumina Limited acquisition
- Favorable mark-to-market results on derivative instruments

Partially offset by:

- Higher restructuring charges
- Unfavorable currency impacts
- Higher taxes on higher earnings, partially offset by the absence of a net charge for valuation allowances on certain deferred tax assets in 2023
- Decrease in value add product sales

Sales

Sales increased $1,344 primarily as a result of:

- Higher average realized price of alumina and aluminum
- Higher shipments of aluminum and alumina
- Increased offtake from an aluminum joint venture supply agreement

Partially offset by:

- Lower volumes and price from bauxite offtake and supply agreements
- Decrease in value add product sales

Cost of goods sold

Cost of goods sold as a percentage of sales decreased 9% primarily as a result of:

- Higher average realized price of alumina and aluminum
- Lower energy costs across both segments
- Favorable currency impacts
- Lower production costs in the Aluminum segment
- Favorable raw material costs

Partially offset by:

- Higher production costs in the Alumina segment

Selling, general administrative, and other expenses

Selling, general administrative, and other expenses increased $49 primarily as a result of:

- Higher labor and variable compensation costs and increased fees for professional services, primarily in support of portfolio transformation

Provision for depreciation, depletion, and amortization

The Provision for depreciation, depletion, and amortization increased $10 primarily as a result of:

- Higher depreciation in Brazil and Australia for mine reclamation and bauxite residue storage asset retirement obligations

Partially offset by:

- Lower amortization of mine development costs
- Lower depreciation due to the absence of write offs of assets for projects no longer being pursued

Interest expense

Interest expense increased $49 primarily as a result of:

- Interest incurred on the $750 7.125% Senior Notes issued in March 2024
- Interest incurred on the Alumina Limited Facility that was assumed on August 1, 2024, until Alcoa repaid outstanding amounts under the Alumina Limited Facility on November 29, 2024

Other expenses, net

Other expenses, net was $91 in 2024, compared with $134 in 2023. The favorable change of $43 was primarily a result of:

- Decrease in equity losses from the Ma'aden aluminum joint venture primarily due to higher sales volume, higher aluminum prices and the absence of a charge for a utility settlement, partially offset by higher alumina prices
- Favorable mark-to-market results on derivative instruments primarily due to higher power prices in the current year
- Decrease in equity losses from the Ma'aden bauxite and alumina joint venture primarily due to higher alumina prices and lower production costs
- Lower ELYSIS capital contributions, reducing loss recognition

Partially offset by:

- Unfavorable currency revaluation impacts primarily due to the U.S. dollar strengthening against the Brazilian real in the current year, partially offset by the absence of gains recognized in the prior year due to the U.S. dollar weakening against the Brazilian real

Restructuring and other charges, net

In 2024, Restructuring and other charges, net of $341 primarily related to:

- $287 for the curtailment of the Kwinana refinery
- $40 to record additional asset retirement obligations and environmental remediation at previously closed sites
- $22 for take-or-pay energy contract costs at a previously closed site
- $12 for contract termination costs at the closed Intalco smelter

Partially offset by:

- $20 due to lower costs for environmental remediation and asset retirement obligations at the Intalco smelter and a previously closed site

In 2023, Restructuring and other charges, net of $184 primarily related to:

- $101 for the permanent closure of the previously curtailed Intalco aluminum smelter
- $53 related to the updated viability agreement for the San Ciprián aluminum smelter
- $21 for the settlement of certain pension benefits
- $15 to record net additional environmental remediation and asset retirement obligations at previously closed sites
- $11 for employee termination and severance costs, primarily related to Kwinana refinery productivity program

Partially offset by:

- $19 for the sale of unused carbon credits at a previously closed site

Provision for income taxes

The Provision for income taxes in 2024 was $265 on income before taxes of $289 or 91.7%. In comparison, the 2023 Provision for income taxes was $189 on a loss before taxes of $(584) or (32.4)%.

The increase in tax expense of $76 is primarily attributable to higher income in the jurisdictions where taxes are paid. Additionally, tax expense in 2023 included a charge of $152 to record a full valuation allowance against the deferred tax assets of Alcoa World Alumina Brasil Ltda. (AWAB), partially offset by the full reversal of the valuation allowance of $58 recorded against the deferred tax assets of the Company's subsidiaries in Iceland.

In December 2023, Alcoa recorded a valuation allowance of $154 against the net deferred tax assets of AWAB, of which $106 related to the balance as of December 31, 2022. The 2023 full valuation allowance was a result of AWAB's three-year cumulative loss position for the period ended December 31, 2023. The majority of AWAB's net deferred tax assets relate to prior net operating losses; the loss carryforwards are not subject to an expiration period. If AWAB continues to demonstrate sustained profitability management may conclude that AWAB's deferred tax assets may be realized, resulting in a future reversal of the valuation allowance, generating a non-cash benefit in the period recorded. AWAB's net deferred tax assets, excluding the valuation allowance, were $116 as of December 31, 2024.

The Company's subsidiaries in Iceland had a full valuation allowance recorded against deferred tax assets, which was established in 2015 and 2017, as the Company believed it was more likely than not that these tax benefits would not be realized. During 2023, after considering all positive and negative evidence, including the expectation that the jurisdiction will remain in a three-year cumulative income position, the Company determined that it is more likely than not that the net deferred tax assets will be realized. Based on this conclusion, the Company reversed the valuation allowance totaling $58 during 2023, generating a non-cash benefit from income taxes.

Noncontrolling interest

Net loss attributable to noncontrolling interest was $(36) in 2024 compared with $(122) in 2023. These amounts are entirely related to Alumina Limited's 40% ownership interest in several affiliated operating entities prior to Alcoa's acquisition of Alumina Limited on August 1, 2024.

Net loss attributable to noncontrolling interest in 2024 was driven by restructuring costs partially offset by favorable average realized price of alumina. Net loss attributable to noncontrolling interest in 2023 reflects unfavorable production and raw material costs, unfavorable average realized price of alumina and equity losses from the Ma'aden bauxite and alumina joint venture.

Segment Information

Alcoa Corporation is a producer of bauxite, alumina, and aluminum products. The Company has two operating and reportable segments: (i) Alumina and (ii) Aluminum. The primary measure of performance is Adjusted EBITDA (Earnings before interest, taxes, depreciation, and amortization) for each segment.

The Company calculates Segment Adjusted EBITDA as Total sales (third-party and intersegment) minus the following items: Cost of goods sold; Selling, general administrative, and other expenses; and Research and development expenses. Alcoa Corporation's Segment Adjusted EBITDA may not be comparable to similarly titled measures of other companies. The Chief Operating Decision Maker regularly reviews Segment Adjusted EBITDA to assess performance and allocate resources.

Segment Adjusted EBITDA totaled $2,065 in 2024 and $734 in 2023. The following information provides production, shipments, sales, Segment Adjusted EBITDA, and Adjusted operating costs data for each reportable segment, as well as certain realized price and average cost data, for each of the two years in the period ended December 31, 2024.

Alumina

	2024	2023
Bauxite production (mdmt)	38.3	41.0
Third-party bauxite shipments (mdmt)	6.4	7.6
Alumina production (kmt)	10,034	10,908
Third-party alumina shipments (kmt)	9,005	8,698
Intersegment alumina shipments (kmt)	4,194	4,125
Produced alumina shipments (kmt)	10,050	11,072
Third-party bauxite sales	$ 381	$ 484
Third-party alumina sales	4,281	3,129
Total segment third-party sales	$ 4,662	$ 3,613
Intersegment alumina sales	2,263	1,648
Total sales	$ 6,925	$ 5,261
Adjusted operating costs	3,110	3,487
Other segment items	2,407	1,501
Segment Adjusted EBITDA	$ 1,408	$ 273
Average realized third-party price per metric ton of alumina	$ 472	$ 358
Adjusted operating cost per metric ton of produced alumina shipped	$ 309	$ 315

In the above table, total alumina shipments include metric tons that were not produced by the Alumina segment. Such alumina was purchased to satisfy certain customer commitments. The Alumina segment bears the risk of loss of the purchased alumina until control of the product has been transferred to this segment's customers.

Adjusted operating costs include all production related costs for alumina produced and shipped: raw materials consumed; conversion costs, such as labor, materials, and utilities; and plant administrative expenses. Other segment items include costs associated with trading activity, the purchase of bauxite from offtake or other supply agreements, and commercial shipping services; other direct and non-production related charges; Selling, general administrative, and other expenses; and Research and development expenses.

Overview. This segment represents the Company's global bauxite mining operations and worldwide refining system, which processes bauxite into alumina.

A portion of this segment's bauxite production represents the offtake from an equity method investment in Guinea, as well as Alcoa's share of bauxite production related to an equity investment in Saudi Arabia. Bauxite mined is primarily used internally within the Alumina segment; a portion of the bauxite is sold to external customers. Bauxite sales to third-parties are conducted on a contract basis.

The alumina produced by this segment is sold primarily to internal and external aluminum smelter customers; a portion of the alumina is sold to external customers who process it into industrial chemical products. Approximately two-thirds of the production of alumina is sold under supply contracts to third parties worldwide, while the remainder is used internally by the Aluminum segment. Alumina produced by this segment and used internally is transferred to the Aluminum segment at prevailing market prices. A portion of this segment's third-party sales are completed through alumina traders.

Generally, this segment's sales are transacted in U.S. dollars while costs and expenses are transacted in the local currency of the respective operations, which are the Australian dollar, the Brazilian real, and the euro. Most of the operations that comprise the Alumina segment are part of AWAC, which is now wholly-owned by Alcoa (see Noncontrolling Interest above).

This segment also includes Alcoa's 25.1% ownership interest in the mining and refining joint venture company in Saudi Arabia. In the third quarter of 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture to Ma'aden in exchange for issuance by Ma'aden of approximately 86 million shares and $150 in cash.

Business Update. The average API of $471 per metric ton trended favorably compared to 2023 reflecting a 37% year over year increase. The majority of third-party alumina sales are linked to the API and the favorable price trend has resulted in strong results for the segment.

During 2024, the Alumina segment experienced favorable raw material costs compared to 2023, partially offset by higher production costs primarily due to operating the Australian refineries with lower grade bauxite.

Alumina production decreased 8% in 2024 compared to 2023 primarily due to the full curtailment of the Kwinana refinery in the second quarter of 2024 and reduced production at the Australia refineries due to lower grade bauxite, partially offset by increased production at the Alumar refinery due to the absence of unplanned equipment maintenance and increased operating levels at the San Ciprián refinery in 2024.

Kwinana Refinery

In June 2024, Alcoa completed the full curtailment of the Kwinana refinery, as planned, which was announced in January 2024. As of March 2024, the refinery had approximately 780 employees and this number was reduced to approximately 250 through the fourth quarter of 2024 to manage certain processes that are expected to continue until about the fourth quarter of 2025. At that time, the employee number will be further reduced to approximately 50. In addition to the employees separating as a result of the curtailment, approximately 290 employees have terminated through the productivity program announced in the third quarter of 2023 or redeployed to other Alcoa operations.

In 2024, Alcoa recorded restructuring charges, net of $287 related to the curtailment of the refinery including $220 for water management costs, $41 for employee related costs, $12 for take-or-pay contracts, $9 for asset retirement obligations, and $5 for asset impairments. Related cash outlays of approximately $300 (which includes existing employee related liabilities and asset retirement obligations) are expected through 2025, with $146 spent in 2024.

Capacity. At December 31, 2024, the Alumina segment had a base refining capacity of 13,843 kmt with 3,204 kmt of curtailed capacity. In the second quarter of 2024, curtailed capacity increased 1,752 kmt due to the full curtailment of the Kwinana refinery (see above).

Annual Comparison

Production

Alumina production decreased 8% primarily as a result of:

- Full curtailment of the Kwinana refinery in June 2024
- Reduced production at the Australia refineries due to lower bauxite grade

Partially offset by:

- Increased production at the Alumar refinery due to decreased equipment maintenance
- Increased production at the San Ciprián refinery as the refinery was operating at 50 percent capacity in 2024 and 30 to 50 percent capacity in 2023

Third-party sales

Third-party sales increased $1,049 primarily as a result of:

- Higher average realized price of $114/ton principally driven by a higher average API
- Higher shipments of alumina primarily due to increased sales of externally sourced alumina to satisfy certain customer commitments and increased trading activity
- Favorable currency impacts

Partially offset by:

- Lower volumes and price from bauxite offtake and supply agreements primarily caused by the shift to intrasegment sales due to higher production at the San Ciprián refinery

Intersegment sales

Intersegment sales increased $615 primarily as a result of:

- Higher average API on sales to the Aluminum segment
- Higher alumina shipments primarily due to the Alumar smelter and Warrick smelter restarts

Segment Adjusted EBITDA

Segment Adjusted EBITDA increased $1,135 primarily as a result of:

- Higher average realized price
- Favorable raw material costs primarily on lower prices for caustic soda
- Favorable currency impacts
- Lower energy costs primarily due to favorable natural gas prices

Partially offset by:

- Higher production costs primarily related to operating certain of the Australia refineries with lower grade bauxite
- Write down of certain inventories to their net realizable value

Forward Look.

The Alumina segment is expected to produce between 9.5 to 9.7 million metric tons of alumina in 2025, a decrease from 2024 due to the curtailment of the Kwinana refinery. In 2025, alumina shipments are expected to be between 13.1 and 13.3 million metric tons, consistent with 2024. The difference between production and shipments reflects trading volumes and externally sourced alumina to fulfill customer contracts due to the curtailment of the Kwinana refinery.

Further, in 2025, the Alumina segment expects higher raw material and energy costs to be partially offset by increased sales from bauxite offtake and supply agreements.

Aluminum

	2024	2023
Aluminum production (kmt)	2,215	2,114
Total aluminum shipments (kmt)	2,590	2,491
Produced aluminum shipments (kmt)	2,277	2,166
Third-party aluminum sales	$ 7,359	$ 7,045
Other[(1)]	(129)	(120)
Total segment third-party sales	$ 7,230	$ 6,925
Intersegment sales	16	15
Total sales	$ 7,246	$ 6,940
Adjusted operating costs	5,488	5,281
Other segment items	1,101	1,198
Segment Adjusted EBITDA	$ 657	$ 461
Average realized third-party price per metric ton of aluminum	$ 2,841	$ 2,828
Adjusted operating cost per metric ton of produced aluminum shipped	$ 2,410	$ 2,438

(1) Other includes third-party sales of energy, as well as realized gains and losses related to embedded derivative instruments designated as cash flow hedges of forward sales of aluminum.

In the above table, total aluminum third-party shipments include metric tons that were not produced by the Aluminum segment. Such aluminum was purchased by this segment to satisfy certain customer commitments. The Aluminum segment bears the risk of loss of the purchased aluminum until control of the product has been transferred to this segment's customer. Additionally, Total shipments include offtake from a joint venture supply agreement.

The average realized third-party price per metric ton of aluminum includes three elements: a) the underlying base metal component, based on quoted prices from the LME; b) the regional premium, which represents the incremental price over the base LME component that is associated with the physical delivery of metal to a particular region (e.g., the Midwest premium for metal sold in the United States); and c) the product premium, which represents the incremental price for receiving physical metal in a particular shape (e.g., billet, slab, rod, etc.) or alloy.

Adjusted operating costs include all production related costs for aluminum produced and shipped: raw materials consumed; conversion costs, such as labor, materials, and utilities; and plant administrative expenses. Other segment items include costs associated with trading activity and energy assets; other direct and non-production related charges; Selling, general administrative, and other expenses; and Research and development expenses.

Overview. This segment consists of the Company's (i) worldwide smelting and casthouse system, which processes alumina into primary aluminum, and the (ii) portfolio of energy assets in Brazil, Canada, and the United States.

Aluminum's combined smelting and casting operations produce primary aluminum products, virtually all of which are sold to external customers and traders. The smelting operations produce molten primary aluminum, which is then formed by the casting operations into either common alloy ingot (e.g., t-bar, sow, standard ingot) or into value add ingot products (e.g., foundry, billet, rod, and slab). A variety of external customers purchase the primary aluminum products for use in fabrication operations, which produce products primarily for the transportation, building and construction, packaging, wire, and other industrial markets. Results from the sale of aluminum powder and scrap are also included in this segment, as well as the impacts of embedded aluminum derivatives related to energy supply contracts.

The energy assets supply power to external customers in Brazil and, to a lesser extent, in the United States, as well as internal customers in the Aluminum (Canadian smelters and Warrick (Indiana) smelter) and Alumina segments (Brazilian refineries).

Generally, this segment's aluminum sales are transacted in U.S. dollars while costs and expenses of this segment are transacted in the local currency of the respective operations, which are the U.S. dollar, the euro, the Norwegian krone, the Icelandic króna, the Canadian dollar, the Brazilian real, and the Australian dollar.

This segment also includes Alcoa Corporation's 25.1% ownership interest in the smelting joint venture company in Saudi Arabia. In the third quarter of 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of 25.1% in the Saudi Arabia joint venture to Ma'aden in exchange for issuance by Ma'aden of approximately 86 million shares and $150 in cash.

Business Update. Aluminum prices increased 7 percent year over year with LME prices on a 15-day lag averaging $2,409 per metric ton in 2024.

During 2024, the Aluminum segment experienced favorable raw material costs for carbon materials that was more than offset by higher average alumina input costs.

During 2024, the Company maintained the controlled pace for the restart of the Alumar smelter and continued actions to improve the smelter's overall performance. The restart resumed in the second quarter after the smelter experienced operational instability in the first quarter of 2024. The site was operating at approximately 84 percent of the site's total annual capacity of 268 kmt (Alcoa share) as of December 31, 2024.

In the fourth quarter of 2024, the Company completed the restart of 16 kmt of previously curtailed capacity at the Portland smelter in Australia that began in the fourth quarter of 2023. The site was operating at approximately 83 percent of the site's total annual capacity of 197 kmt (Alcoa share) as of December 31, 2024.

In October 2024, the U.S. Treasury Department issued final regulations on the Section 45X of the Advanced Manufacturing Tax Credit, enacted as part of the Inflation Reduction Act (IRA Section 45X), which further clarified that some direct and indirect material costs can qualify for the credit. In the fourth quarter of 2024, the Company recorded the full year 2023 and 2024 benefit of $30 for the Massena West and Warrick smelters in Cost of goods sold related to this clarification.

In March 2024, Alcoa completed the restart of approximately 54 kmt of capacity at the Warrick smelter in Indiana that began in October 2023. Alcoa incurred restart expenses of $3 during the first quarter of 2024.

San Ciprián Smelter

In March 2024, Alcoa completed the restart of approximately 6 percent of total pots at the San Ciprián smelter as required by the February 2023 updated viability agreement. The Company incurred restart expenses of $5 in 2024. In connection with the December 2021 agreement and the February 2023 updated viability agreement, the Company has restricted cash of $86 remaining at December 31, 2024, of which $10 was released in February 2025 for 2024 expenditures, and the remaining $76 is available for capital improvements at the site and smelter restart costs.

Capacity. At December 31, 2024, the Aluminum segment had 374 kmt of idle smelting capacity on a base capacity of 2,645 kmt, a decrease from 2023 of 91 kmt in idle capacity primarily due to the Alumar, Warrick, San Ciprián, and Portland smelter restarts (see above).

Annual Comparison

Production

Production increased 5% primarily as a result of:

- Warrick smelter and Alumar smelter restarts

Third-party sales

Third-party sales increased $305 primarily as a result of:

- Higher shipments primarily due to the Alumar smelter and Warrick smelter restarts
- Increased offtake from a joint venture supply agreement
- Higher average realized price of $13/ton driven by a higher average LME (on a 15-day lag) partially offset by lower regional premiums and the absence of gains from the Alumar smelter restart hedge program which ended in December 2023
- Higher pricing at the Brazil hydro-electric facilities

Partially offset by:

- Lower trading activities
- Decrease in value add product sales due to lower product premiums in Europe and North America
- Unfavorable currency impacts

Segment Adjusted EBITDA

Segment Adjusted EBITDA increased $196 primarily as a result of:

- Higher average realized price
- Lower energy costs, primarily in Brazil
- Higher pricing at the Brazil hydro-electric facilities
- Lower production costs primarily due to efficiencies at higher production rates

Partially offset by:

- Unfavorable raw material costs primarily on higher average alumina input costs, partially offset by lower market prices for carbon materials
- Decrease in value add product sales

Forward Look. Alcoa expects aluminum production to range between 2.3 and 2.5 million metric tons and aluminum shipments to range between 2.6 and 2.8 million metric tons in 2025. The increase in production and shipments in 2025 is due to smelter restarts.

Additionally, the Company engages in trading activity when favorable market conditions allow. Availability of trading opportunities in 2025 may impact the Company's shipment projection.

Further, in 2025, the Aluminum segment expects lower raw material costs will offset the absence of Ma'aden metal offtake, as expected with the announced sale of the Saudi Arabia joint venture, and certain lower product premiums. The segment also expects higher production costs with the absence of the IRA Section 45X benefit for 2023 recorded in 2024.

Reconciliations of Certain Segment Information

Reconciliation of Total Segment Third-Party Sales to Consolidated Sales

	2024	2023
Alumina	$ 4,662	$ 3,613
Aluminum	7,230	6,925
Total segment third-party sales	$ 11,892	$ 10,538
Other	3	13
Consolidated sales	$ 11,895	$ 10,551

Reconciliation of Total Segment Adjusted EBITDA to Consolidated Net Income (Loss) Attributable to Alcoa Corporation

	2024	2023
Total Segment Adjusted EBITDA	$ 2,065	$ 734
Unallocated amounts:		
Transformation[1]	(62)	(80)
Intersegment eliminations	(231)	7
Corporate expenses[2]	(160)	(133)
Provision for depreciation, depletion, and amortization	(642)	(632)
Restructuring and other charges, net	(341)	(184)
Interest expense	(156)	(107)
Other expenses, net	(91)	(134)
Other[3]	(93)	(55)
Consolidated income (loss) before income taxes	289	(584)
Provision for income taxes	(265)	(189)
Net loss attributable to noncontrolling interest	36	122
Consolidated net income (loss) attributable to Alcoa Corporation	$ 60	$ (651)

(1) Transformation includes, among other items, the Adjusted EBITDA of previously closed operations.

(2) Corporate expenses are composed of general administrative and other expenses of operating the corporate headquarters and other global administrative facilities, as well as research and development expenses of the corporate technical center.

(3) Other includes certain items that are not included in the Adjusted EBITDA of the reportable segments.

Environmental Matters

See Part II Item 8 of this Form 10-K in Note S to the Consolidated Financial Statements under caption Contingencies—Environmental Matters.

Liquidity and Capital Resources

Alcoa Corporation's primary future cash flows are centered on operating activities, particularly working capital, as well as capital expenditures and capital returns. Alcoa's ability to fund its cash needs depends on the Company's ongoing ability to generate and raise cash in the future.

In 2024, the Company generated higher profitability due to higher prices for alumina and aluminum and lower raw material and energy costs, partially offset by higher restructuring charges. The strong financial results allowed the Company to maintain a strong balance sheet, including a strong cash position. Additionally, the Company successfully completed the following actions:

- Issued $750 of 7.125% Senior Notes due 2031 under the Company's new Green Finance Framework;
- Funded $580 in capital expenditures to sustain and grow our operations;
- Voluntarily repaid the $385 drawn under the Alumina Limited Revolving Credit Facility and cancelled the outstanding lender tranche commitments, effectively terminating the facility; and,
- Returned capital to stockholders of $90. In each quarter of 2024, the Board of Directors declared and paid a quarterly cash dividend of $0.10 per share of the Company's stock (including newly issued shares for the acquisition of Alumina Limited).

Management believes that the Company's cash on hand, projected cash flows, and liquidity options, combined with its strategic actions, will be adequate to fund its short-term (at least 12 months) and long-term operating and investing needs. Further, the Company has flexibility related to its use of cash; the Company has no significant debt maturities until 2027 and no significant cash contribution requirements related to its pension plan obligations (see Material Cash Requirements below for more information).

Although management believes that Alcoa's projected cash flows and other liquidity options will provide adequate resources to fund operating and investing needs, the Company's access to, and the availability of, financing on acceptable terms in the future will be affected by many factors, including: (i) Alcoa Corporation's credit rating; (ii) the liquidity of the overall capital markets; (iii) the current state of the economy and commodity markets, and (iv) short- and long-term debt ratings. There can be no assurances that the Company will continue to have access to capital markets on terms acceptable to Alcoa Corporation.

Changes in market conditions caused by U.S., global, or macroeconomic events, such as ongoing regional conflicts, high inflation, and changing U.S. or global monetary policies could have adverse effects on Alcoa's ability to obtain additional financing and cost of borrowing. Inability to generate sufficient earnings could impact the Company's ability to meet the financial covenants in our outstanding debt and revolving credit facility agreements and limit our ability to access these sources of liquidity or refinance or renegotiate our outstanding debt or credit agreements on terms acceptable to the Company. Additionally, the impact on market conditions from such events could adversely affect the liquidity of Alcoa's customers, suppliers, and joint venture partners and equity method investments, which could negatively impact the collectability of outstanding receivables and our cash flows.

At December 31, 2024, the Company's cash and cash equivalents were $1,138, of which $948 was held outside the United States. Alcoa Corporation has a number of commitments and obligations related to the Company's operations in various foreign jurisdictions, resulting in the need for cash outside the United States. Alcoa Corporation continuously evaluates its local and global cash needs for future business operations, which may influence future repatriation decisions. See Part II Item 8 of this Form 10-K in Note Q to the Consolidated Financial Statements for additional information related to undistributed net earnings.

Cash from Operations

Cash provided from operations was $622 in 2024 compared with $91 in 2023. Notable changes to the sources and (uses) of cash include:

- $954 favorable change in net income, excluding the impacts from restructuring charges, primarily due to higher alumina and aluminum pricing and lower raw material and energy costs;
- $168 less income taxes paid on prior year earnings, as well as on lower current year earnings in the jurisdictions where taxes are paid; and,
- ($525) in certain working capital accounts, primarily an increase in receivables in 2024 due to higher sales, a decrease in inventories in 2023 primarily on raw material prices, partially offset by an increase in accounts payable in 2024 due to higher alumina trading payables.

In the third quarter of 2020, AofA paid approximately $74 (A$107) to the ATO related to the tax dispute described in Note S to the Consolidated Financial Statements in Part II Item 8 of this Form 10-K. Upon payment, AofA recorded a noncurrent prepaid tax asset, as the Company continues to believe it is more likely than not that AofA's tax position will be sustained and therefore is not recognizing any tax expense in relation to this matter. In accordance with Australian tax laws, the initial interest assessment and additional interest are deductible against AofA's taxable income. AofA applied this deduction beginning in the third quarter of 2020, reducing cash tax payments. Interest compounded in future years is also deductible against AofA's income in future periods. If AofA is ultimately successful, the interest deduction would become taxable as income in the year the dispute is resolved. In addition, should the ATO decide in the interim to reduce any interest already assessed, the reduction would be taxable as income at that point in time. During 2024, AofA continued to record its tax provision and tax liability without effect of the ATO assessment, since it expects to prevail. The tax payable related to deductions of interest on the assessment will remain on AofA's balance sheet as a noncurrent liability, increased by the tax effect of subsequent periods' interest deductions, until dispute resolution. At December 31, 2024 and December 31, 2023, the noncurrent liability resulting from the cumulative interest deductions was approximately $206 (A$332) and $199 (A$293), respectively.

The Company utilizes a Receivables Purchase Agreement facility to sell up to $150 of certain receivables through a special purpose entity (SPE) to a financial institution on a revolving basis. Alcoa Corporation guarantees the performance obligations of the Company subsidiaries, and unsold customer receivables are pledged as collateral to the financial institution to secure the sold receivables. At December 31, 2024 and December 31, 2023, the SPE held unsold customer receivables of $247 and $104, respectively, pledged as collateral against the sold receivables.

The Company continues to service the customer receivables that were transferred to the financial institution. As Alcoa collects customer payments, the SPE transfers additional receivables to the financial institution rather than remitting cash. In 2024, the Company sold gross customer receivables of $1,186, and reinvested collections of $1,170 from previously sold receivables, resulting in net cash proceeds from the financial institution of $16. In 2023, the Company sold gross customer receivables of $591, and reinvested collections of $477 from previously sold receivables, resulting in net cash proceeds from the financial institution of $114.

Cash collections from previously sold receivables yet to be reinvested of $50 and $99 were included in Accounts payable, trade on the accompanying Consolidated Balance Sheet as of December 31, 2024 and 2023, respectively. Cash received from sold receivables under the agreement are presented within operating activities in the Statement of Consolidated Cash Flows. See Part II Item 8 of this Form 10-K in Note I to the Consolidated Financial Statements for additional information related to this facility.

Financing Activities

Cash provided from financing activities was $201 in 2024 compared with $57 in 2023.

The source of cash in 2024 was primarily $737 of net proceeds from the bond issuance (see below), partially offset by $385 for the repayment of the Alumina Limited debt (see below), and $90 of dividends paid on stock.

The source of cash in 2023 was primarily $158 of net contributions from Alumina Limited (see Noncontrolling interest above) and $55 primarily related to the net issuance of short-term borrowings (see below), partially offset by $72 of dividends paid, $52 in financial contributions primarily related to the sale of the Warrick Rolling Mill, and $34 for payments related to tax withholding on stock-based compensation awards.

Credit Facilities.

Revolving Credit Facility

The Company and Alcoa Nederland Holding B.V. (ANHBV), a wholly-owned subsidiary of Alcoa Corporation and the borrower, have a $1,250 revolving credit and letter of credit facility in place for working capital and/or other general corporate purposes (the Revolving Credit Facility). The Revolving Credit Facility, established in September 2016, most recently amended and restated in June 2022 and amended in January 2024, is scheduled to mature in June 2027. Subject to the terms and conditions under the Revolving Credit Facility, the Company or ANHBV may borrow funds or issue letters of credit. Further, the Revolving Credit Facility contains financial covenants and customary affirmative and negative covenants (applicable to Alcoa Corporation and certain subsidiaries described as restricted), that, subject to certain exceptions, include limitations on (among other things): indebtedness, liens, investments, sales of assets, restricted payments, entering into restrictive agreements, a covenant prohibiting reductions in the ownership of AWAC entities, and certain other specified restricted subsidiaries of Alcoa Corporation, below an agreed level. The Revolving Credit Facility also contains customary events of default, including failure to make payments under the Revolving Credit Facility, cross-default and cross-judgment default, and certain bankruptcy and insolvency events.

On January 17, 2024, Alcoa Corporation, ANHBV, and certain subsidiaries of the Company entered into Amendment No. 1 (Amendment No. 1) to the Revolving Credit Facility (Amended Revolving Credit Facility). The Amended Revolving Credit Facility provides additional flexibility to the Company and the Borrower by temporarily (i) reducing the minimum interest coverage ratio required thereunder from 4.00 to 1.00 to 3.00 to 1.00 and (ii) providing for a maximum addback for cash restructuring charges in Consolidated EBITDA (as defined in the Revolving Credit Facility) of $450, in each case for the 2024 fiscal year. As of January 1, 2025, the minimum interest coverage ratio requirement reverted to 4.00 to 1.00 and the maximum addback for cash restructuring charges in Consolidated EBITDA reverted to 15% of Consolidated EBITDA. The requirement that the Company maintain a debt to capitalization ratio not to exceed .60 to 1.00 was not changed by Amendment No. 1.

In connection with Amendment No. 1, the Company also agreed to provide collateral for its obligations under the Amended Revolving Credit Facility, which requires it to execute all security documents to re-secure collateral under the Amended Revolving Credit Facility by, subject to certain exceptions, a first priority security interest in substantially all assets of the Company, the Borrower, the material domestic wholly-owned subsidiaries of the Company, and the material foreign wholly-owned subsidiaries of the Company located in Australia, Brazil, Canada, Luxembourg, the Netherlands, Norway, and Switzerland including equity interests of certain subsidiaries that directly hold equity interests in AWAC entities.

After January 1, 2025, the Company may obtain a release of the collateral if the Company or the Borrower (as applicable) (i) has at least two of the following three designated ratings: (x) Baa3 from Moody’s Investor Service (Moody’s), (y) BBB- from Standard and Poor’s (S&P) Global Ratings and (z) BBB- from Fitch Ratings and (ii) does not have any designated rating lower than: (x) Ba1 from Moody’s, (y) BB+ from S&P Global Ratings and (z) BB+ from Fitch Ratings.

The Amended Revolving Credit Facility contains customary affirmative covenants, negative covenants, and events of default substantially comparable to the Revolving Credit Facility (other than those that are described above and other minor changes). The representations, warranties and covenants contained in the Amended Revolving Credit Facility were made only for purposes of Amendment No. 1 and as of specific dates and were solely for the benefit of the parties to the Amended Revolving Credit Facility.

As of December 31, 2024, the Company was in compliance with all financial covenants. The Company may access the entire amount of commitments under the Revolving Credit Facility. There were no borrowings outstanding at December 31, 2024 and 2023, and no amounts were borrowed during 2024 and 2023 under the Revolving Credit Facility.

Japanese Yen Revolving Credit Facility

In April 2023, the Company entered into a one-year unsecured revolving credit facility for $250 (available to be drawn in Japanese yen) (the Japanese Yen Revolving Credit Facility). Subject to the terms and conditions under the facility, the Company or ANHBV may borrow funds. The facility included covenants that are substantially the same as those included in the Revolving Credit Facility.

On January 17, 2024, Alcoa Corporation and ANHBV, entered into Amendment No. 1 to the Japanese Yen Revolving Credit Facility (Amended Japanese Yen Revolving Credit Facility) which contains changes that are substantially the same as those included in the Amended Revolving Credit Facility (as described above). Also in connection with this amendment, the Company agreed to provide collateral for its obligations with the same conditions as the Amended Revolving Credit Facility. On April 26, 2024, the Company entered into an amendment extending the maturity of the Japanese Revolving Credit Facility to April 2025.

As of December 31, 2024, the Company was in compliance with all financial covenants. The Company may access the entire amount of commitments under the facility. There were no borrowings outstanding at December 31, 2024 and 2023. During 2024, $201 (29,686 JPY) was borrowed and $196 (29,686 JPY) was repaid. During 2023, $10 (1,495 JPY) was borrowed and repaid.

Alumina Limited Revolving Credit Facility

In connection with the acquisition of Alumina Limited (see Note C), the Company assumed $385 of indebtedness as of August 1, 2024, representing the amount drawn on Alumina Limited's revolving credit facility.

At acquisition, the Alumina Limited revolving credit facility had tranches maturing in October 2025 ($100), January 2026 ($150), July 2026 ($150), and June 2027 ($100). In August 2024, Alcoa cancelled the undrawn portions of the revolving credit facility maturing in July 2026 ($15) and June 2027 ($100). In November 2024, pursuant to the terms of the Alumina Limited revolving credit facility, Alcoa voluntarily repaid all accrued and unpaid amounts outstanding under the revolving credit facility, totaling $385 and, as of the same date, cancelled the outstanding lender tranche commitments ($385). As a result of the repayment and cancellation of undrawn amounts, the Alumina Limited revolving credit facility agreement was effectively terminated. No early termination penalties or prepayment premiums were incurred by Alcoa in connection with the termination of the Alumina Limited revolving credit facility.

The Company may draw on the remaining facilities periodically to ensure working capital needs are met. See Part II Item 8 of this Form 10-K in Note M to the Consolidated Financial Statements for additional information related to these facilities.

Guarantees of Third Parties. As of December 31, 2024 and 2023, the Company had no outstanding potential future payments for guarantees issued on behalf of a third party.

Bank Guarantees and Letters of Credit. Alcoa Corporation and its subsidiaries have outstanding bank guarantees and letters of credit related to, among others, energy contracts, environmental obligations, legal and tax matters, leasing obligations, workers compensation, and customs duties. The total amount committed under these instruments, which automatically renew or expire at various dates between 2025 and 2026, was $316 (includes $87 issued under a standby letter of credit agreement —see below) at December 31, 2024. Additionally, ParentCo has outstanding bank guarantees and letters of credit related to the Company of $12 at December 31, 2024. In the event ParentCo would be required to perform under any of these instruments, ParentCo would be indemnified by Alcoa Corporation in accordance with the Separation and Distribution Agreement. Likewise, the Company has outstanding bank guarantees and letters of credit related to ParentCo of $6 at December 31, 2024. In the event Alcoa Corporation would be required to perform under any of these instruments, the Company would be indemnified by ParentCo in accordance with the Separation and Distribution Agreement.

In December 2023, AofA committed to provide a bank guarantee in connection with the approval of the Company's five-year mine plans that were referred to the Western Australia Environmental Protection Agency (WA EPA), which demonstrates Alcoa's confidence that its operations will not impair drinking water supplies. On September 30, 2024 and October 1, 2024, AofA delivered bank guarantees totaling $62 (A$100). After March 27, 2025, Alcoa may, with the Western Australian government's consent, replace the bank guarantee with a parent company guarantee or a surety bond. The requirement to provide financial assurance will expire upon the completion of the WA EPA's assessment of the Company's five-year mine plans.

In August 2017, Alcoa Corporation entered into a standby letter of credit agreement with three financial institutions, which was most recently amended in May 2024 and expires on May 1, 2026. The agreement provides for a $200 facility used by the Company for matters in the ordinary course of business. Alcoa Corporation's obligations under this facility are secured in the same manner as obligations under the Company's revolving credit facility. Additionally, this facility contains similar representations and warranties and affirmative, negative, and financial covenants as the Company's Revolving Credit Facility. See Part II Item 8 of this Form 10-K in Note M to the Consolidated Financial Statements for additional information related to the Company's debt. As of December 31, 2024, letters of credit aggregating $87 were issued under this facility.

Surety Bonds. Alcoa Corporation has outstanding surety bonds primarily related to tax matters, contract performance, workers compensation, environmental-related matters, and customs duties. The total amount committed under these bonds, which automatically renew or expire at various dates between 2025 and 2029, was $245 at December 31, 2024. Additionally, ParentCo has outstanding surety bonds related to the Company of $7 at December 31, 2024. In the event ParentCo would be required to perform under any of these instruments, ParentCo would be indemnified by Alcoa Corporation in accordance with the Separation and Distribution Agreement. Likewise, the Company has outstanding surety bonds related to ParentCo of $7 at December 31, 2024. In the event Alcoa Corporation would be required to perform under any of these instruments, the Company would be indemnified by ParentCo in accordance with the Separation and Distribution Agreement.

Debt. As of December 31, 2024, Alcoa Corporation had four outstanding series of Notes maturing at varying times. A summary of the Notes and other long-term debt is shown below. See Part II Item 8 of this Form 10-K in Note M to the Consolidated Financial Statements for additional information related to the Company's debt.

December 31,	2024	2023
5.500% Notes, due 2027	$ 750	$ 750
6.125% Notes, due 2028	500	500
4.125% Notes, due 2029	500	500
7.125% Notes, due 2031	750	—
Other	76	82
Unamortized discounts and deferred financing costs	(31)	(21)
Total	2,545	1,811
Less: amount due within one year	75	79
Long-term debt, less amount due within one year	$ 2,470	$ 1,732

The Company entered into inventory repurchase agreements whereby the Company sold aluminum to a third party and agreed to subsequently repurchase substantially similar inventory. The Company did not record sales upon each shipment of inventory and the net cash received of $50 and $56 related to these agreements was recorded in Short-term borrowings within Other current liabilities on the Consolidated Balance Sheet as of December 31, 2024 and December 31, 2023, respectively.

In 2024, the Company recorded borrowings of $88 and repurchased $94 of inventory related to these agreements. In 2023, the Company recorded borrowings of $117 and repurchased $61 of inventory related to these agreements. The cash received and subsequently paid under the inventory repurchase agreements is included in Cash provided from financing activities on the Statement of Consolidated Cash Flows.

Ratings. Alcoa Corporation's cost of borrowing and ability to access the capital markets are affected not only by market conditions but also by the short- and long-term debt ratings assigned to Alcoa Corporation's debt by the major credit rating agencies.

On March 6, 2024, Moody's Investor Service downgraded the rating of ANHBV's long-term debt from Baa3 to Ba1 and revised the outlook from negative to stable.

On March 4, 2024, Fitch Ratings downgraded the rating for Alcoa Corporation and ANHBV's long-term debt from BBB- to BB+ and revised the outlook from negative to stable.

On March 4, 2024, Standard and Poor's Global Ratings downgraded the rating of Alcoa Corporation's long-term debt from BB+ to BB and revised the outlook from positive to stable.

Ratings are not a recommendation to buy or hold any of Alcoa's securities and they may be revised or revoked at any time at the sole discretion of the rating organization.

Dividend. In 2024, the Board of Directors declared and paid quarterly cash dividends of $0.10 per share of the Company's common stock (including common stock underlying CDIs) and Series A convertible preferred stock, totaling $89 and $1, respectively, for the year.

The details of any future cash dividend declaration, including the amount of such dividend and the timing and establishment of the record and payment dates, will be determined by the Board of Directors. The decision of whether to pay future cash dividends and the amount of any such dividends will be based on the Company's financial position, results of operations, cash flows, capital requirements, business conditions, the requirements of applicable law, and any other factors the Board of Directors may deem relevant.

On February 20, 2025, the Board of Directors declared a quarterly cash dividend of $0.10 per share of the Company's common stock (including common stock underlying CDIs) and Series A convertible preferred stock, to be paid on March 20, 2025 to stockholders of record as of the close of business on March 4, 2025.

Common Stock Repurchase Program. In October 2021, Alcoa Corporation's Board of Directors approved a common stock repurchase program for the Company to purchase shares of its outstanding common stock up to an aggregate transactional value of $500, depending on cash availability, market conditions, and other factors.

On July 20, 2022, Alcoa Corporation announced that its Board of Directors approved an additional common stock repurchase program under which the Company may purchase shares of its outstanding common stock up to an aggregate transactional value of $500, depending on the Company's continuing analysis of market, financial, and other factors (the July 2022 authorization). Prior to this authorization, $150 remained available for common stock repurchases at the end of the second quarter of 2022 from the prior authorization in October 2021 of $500 which was fully exhausted in 2022 with the Company's repurchase activity (see below).

No shares were repurchased in 2024 or 2023.

In 2022, the Company repurchased 8,565,200 shares of its common stock for $500; the shares were immediately retired.

As of the date of this report, the Company is currently authorized to repurchase up to a total of $500, in the aggregate, of its outstanding shares of common stock under the July 2022 authorization. Repurchases under this program may be made using a variety of methods, which may include open market purchases, privately negotiated transactions, or pursuant to a Rule 10b5-1 plan. This program may be suspended or discontinued at any time and does not have a predetermined expiration date. Alcoa Corporation intends to retire repurchased shares of common stock.

Investing Activities

Cash used for investing activities was $608 in 2024 compared with $585 in 2023.

In 2024, the use of cash was primarily attributable to $580 related to capital expenditures and $37 of cash contributions to the ELYSIS™ partnership.

In 2023, the use of cash was primarily attributable to $531 related to capital expenditures and $70 of cash contributions to the ELYSIS partnership.

In 2025, Alcoa expects capital expenditures of approximately $700 related to sustaining capital projects and return-seeking capital projects. The timing and amount of capital expenditures may fluctuate as a result of the Company's normal operations.

Material Cash Requirements

As discussed above, the Company relies primarily on operating cash flows to fund its cash commitments and management believes its cash on hand, projected cash flows, and liquidity options combined with its strategic actions, will be adequate to fund its short-term (at least 12 months) and long-term operating and investing needs.

The Company has committed cash outflows related to pension and postretirement benefit obligations, asset retirement obligations, environmental remediation, and operating lease agreements. See Part II Item 8 of this Form 10-K in Notes O, R, S, and T, respectively, to the Consolidated Financial Statements for additional information. As of December 31, 2024, a summary of Alcoa Corporation's outstanding material cash requirements are as follows:

	Total	2025	2026-2027	2028-2029	Thereafter
Operating activities:					
Energy-related purchase obligations	$ 12,438	$ 1,335	$ 2,410	$ 2,030	$ 6,663
Raw material purchase obligations	4,440	2,055	767	514	1,104
Other purchase obligations	1,603	1,091	192	114	206
Interest related to debt	675	150	292	153	80
Financing activities:					
Long-term debt and Short-term borrowings	2,626	125	751	1,000	750
Totals	$ 21,782	$ 4,756	$ 4,412	$ 3,811	$ 8,803

Purchase obligations—Energy-related purchase obligations consist primarily of electricity and natural gas contracts with expiration dates ranging from less than 1 year to 23 years. Raw material obligations consist mostly of bauxite (relates to Alcoa's bauxite mine interests in Guinea and Brazil), caustic soda, lime, alumina, aluminum fluoride, calcined petroleum coke, anodes, and cathode blocks with expiration dates ranging from less than 1 year to 10 years. Other purchase obligations consist principally of freight for bauxite and alumina with expiration dates ranging from less than 1 to 12 years. Many of these purchase obligations contain variable pricing components, and, as a result, actual cash payments may differ from the estimates provided in the preceding table. In accordance with the terms of several of these supply contracts, obligations may be reduced as a result of an interruption to operations, such as a plant curtailment or a force majeure event.

Interest related to total debt—Interest is based on interest rates in effect as of December 31, 2024 and is calculated on debt with maturities that extend to 2031.

Long-term debt and Short-term borrowings—Total debt amounts in the preceding table represent the principal amounts of all outstanding long-term debt and Short-term borrowings, which have maturities that extend to 2031.

Critical Accounting Policies and Estimates

The preparation of the Company's Consolidated Financial Statements in accordance with GAAP requires management to make certain estimates based on judgments and assumptions regarding uncertainties that affect the amounts reported in the Consolidated Financial Statements and disclosed in the Notes to the Consolidated Financial Statements. Areas that require such estimates include the review of properties, plants, and equipment and goodwill for impairment, and accounting for each of the following: asset retirement and environmental obligations; litigation matters; pension plans and other postretirement benefits obligations; derivatives and hedging activities; and income taxes.

Management uses historical experience and all available information to make these estimates; actual results may differ from those used to prepare the Company's Consolidated Financial Statements at any given time. Despite these inherent limitations, management believes that the amounts recorded in the financial statements related to these items are based on its best estimates and judgments using all relevant information available at the time.

A summary of the Company's significant accounting policies is included in Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements.

Properties, Plants, and Equipment. Properties, plants, and equipment are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets (asset group) may not be recoverable, including in the period when assets have met the criteria to be classified as held for sale. The model used to determine recoverability of an asset or asset group would leverage the model that management uses for planning and strategic review of the entire business, including related inputs and assumptions. Management's impairment assessment process is described in Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements. See Part II Item 8 of this Form 10-K in Note K to the Consolidated Financial Statements for more information regarding properties, plants, and equipment.

Goodwill. Goodwill is reviewed for impairment annually (in the fourth quarter) or more frequently if indicators of impairment exist or if a decision is made to sell or exit a business. A significant amount of judgment is involved in determining if an indicator of impairment has occurred. Such indicators may include, among others, deterioration in general economic conditions, negative developments in equity and credit markets, adverse changes in the markets in which an entity operates, increases in input costs that have a negative effect on earnings and cash flows, or a trend of negative or declining cash flows over multiple periods. The fair value that could be realized in an actual transaction may differ from that used to evaluate goodwill for impairment.

Under the qualitative impairment test, management considers a number of factors in its assessment, such as: general economic conditions, equity and credit markets, industry and market conditions, and earnings and cash flow trends.

Under the quantitative impairment test, management uses a discounted cash flow (DCF) model to estimate the current fair value of its reporting units. A number of significant assumptions and estimates are involved in the application of the DCF model to forecast operating cash flows, including markets and market share, sales volumes and prices, production costs, production capability, tax rates, capital spending, discount rate, and working capital changes. The model used for the goodwill impairment test leverages the model, including related inputs and assumptions, that management uses for planning and strategic review of the entire business.

Management will test goodwill on a qualitative or quantitative basis. See Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements for more information regarding management's impairment assessment process.

Management performed a quantitative assessment for the Alumina reporting unit in the fourth quarter of 2024. As a result of the assessment, the estimated fair value of the Alumina reporting unit was substantially in excess of its carrying value, resulting in no impairment.

The impact on the estimated fair value of an increase in the discount rate of 1% would not result in a change in the conclusions reached for the impairment assessment performed in 2024, the estimated fair value would remain in excess of carrying value.

Further, in all years presented, there have been no triggering events that necessitated an impairment test for the Alumina reporting unit, except for the 2023 segment change which resulted in no impairment. See Part II Item 8 of this Form 10-K in Note L to the Consolidated Financial Statements for more information regarding goodwill.

Asset Retirement and Environmental Obligations. Estimates are used to record environmental remediation and asset retirement obligation (ARO) reserves based on the best available information at the time of recognition. Several assumptions are used to estimate the costs required to demolish, environmentally remediate, reclaim, or restore the site, including:

- Engineering designs for construction or closure;
- Materials and services costs;
- Volume of regulated materials to be removed (asbestos, PCB fluids, spent potlining);
- Disposition of demolition materials;
- Extent of contamination based on available data;
- Scope of remediation to mitigate human health or environmental risks and/or to meet regulatory requirements;
- Timing to complete construction or closure; and,
- Commercial availability and pricing for off-site treatment or disposal applications.

As the site is demolished, remediated, reclaimed, or restored, the assumptions and estimates used to record the reserve may change to account for:

- Actual site conditions that require more or less remediation or reclamation;
- Legislation that becomes more or less stringent;
- Regulative authorities requiring updates to final design prior to completion;
- Alternative disposal methods for demolition waste;
- Technological changes which allow remediation to be more efficient;
- Market factors; and,
- Variances in work that is atypical from prior work experience.

Changes to the estimates may result in material changes to the reserve that may require an increase to or a reversal of a previously recorded reserve. See Part II Item 8 of this Form 10-K in Note R and Note S to the Consolidated Financial Statements for more information regarding current reserves.

Litigation Matters. For asserted claims and assessments, liabilities are recorded when an unfavorable outcome of a matter is deemed to be probable and the loss is reasonably estimable. Management determines the likelihood of an unfavorable outcome based on many factors such as, among others, the nature of the matter, available defenses and case strategy, progress of the matter, views and opinions of legal counsel and other advisors, applicability and success of appeals processes, and the outcome of similar historical matters. Once an unfavorable outcome is deemed probable, management weighs the probability of estimated losses, and the most reasonable loss estimate is recorded. If an unfavorable outcome of a matter is deemed to be reasonably possible, then the matter is disclosed, and no liability is recorded. With respect to unasserted claims or assessments, management must first determine that the probability that an assertion will be made is likely, then, a determination as to the likelihood of an unfavorable outcome and the ability to reasonably estimate the potential loss is made. Legal matters are reviewed on a continuous basis to determine if there has been a change in management's judgment regarding the likelihood of an unfavorable outcome or the estimate of a potential loss. See Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements for more information regarding management's litigation matters policy.

Pension and Other Postretirement Benefits. Liabilities and expenses for pension and other postretirement benefits are determined using actuarial methodologies and incorporate significant assumptions, including the interest rate used to discount the future estimated liability, the expected long-term rate of return on plan assets, and several assumptions relating to the employee workforce (salary increases, health care cost trend rates, retirement age, and mortality).

The yield curve model used to develop the discount rate is based on high-quality corporate bonds, parallels the plans' projected cash flows and has a weighted average duration of 10 years. If a deep market of high-quality corporate bonds does not exist in a country, then the yield on government bonds plus a corporate bond yield spread is used. The impact of a change in the weighted average discount rate of ¼ of 1% would be approximately $60 on combined pension and other postretirement liabilities and immaterial to pretax earnings in the following year.

The expected long-term rate of return on plan assets is generally applied to a five-year market-related value of plan assets (a four-year average or the fair value at the plan measurement date is used for certain non-U.S. plans). The process used by management to develop this assumption is one that relies on forward-looking investment returns by asset class. Management incorporates expected future investment returns on current and planned asset allocations using information from various external investment managers and consultants, as well as management's own judgment. A change in the assumption for the weighted average expected long-term rate of return on plan assets of ¼ of 1% would impact pretax earnings by approximately $5 for 2025.

Mortality rate assumptions are based on mortality tables and future improvement scales published by third parties, such as the Society of Actuaries, and consider other available information including historical data as well as studies and publications from reputable sources.

See Part II Item 8 of this Form 10-K in Note O to the Consolidated Financial Statements for more information regarding pension and other postretirement benefits including accounting impacts of current year actions.

Derivatives and Hedging. To calculate the fair value of certain derivatives, management uses DCF and other simulation models that consider the following inputs and assumptions: quoted market prices (e.g., aluminum prices on the 10-year London Metal Exchange (LME) forward curve and energy prices), information concerning time premiums and volatilities for certain option type embedded derivatives and regional premiums for aluminum contracts, aluminum and energy prices beyond those quoted in the market, and the estimated credit spread between Alcoa and the counterparty. The quoted market prices used in the valuation models are dependent on market fundamentals, the relationship between supply and demand at any point in time, seasonal conditions, inventories, and interest rates. For periods beyond the term of quoted market prices, management estimates the price of aluminum by extrapolating the 10-year LME forward curve and estimates the Midwest premium based on recent transactions.

Changes in estimates can have a material impact on the derivative valuations. See Part II Item 8 of this Form 10-K in Note P to the Consolidated Financial Statements for more information regarding derivatives and hedging and related activity during the period.

Income Taxes. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not (greater than 50%) that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management applies judgment in assessing all available positive and negative evidence and considers all potential sources of taxable income, including income available in carryback periods, future reversals of taxable temporary differences, projections of taxable income, and income from tax planning strategies. Positive evidence includes factors such as a history of profitable operations, projections of future profitability within the carryforward period, including from tax planning strategies, and Alcoa Corporation's experience with similar operations. Existing favorable contracts and the ability to sell products into established markets are additional positive evidence. Negative evidence includes items such as cumulative losses, projections of future losses, or carryforward periods that are not long enough to allow for the utilization of a deferred tax asset based on existing projections of income. In certain jurisdictions, deferred tax assets related to cumulative losses may exist without a valuation allowance where in management's judgment the weight of the positive evidence more than offsets the negative evidence of the cumulative losses. Upon changes in facts and circumstances, management may conclude that deferred tax assets for which no valuation allowance is currently recorded may not be realized, resulting in a future charge to establish a valuation allowance. Financial information utilized in this analysis leverages the same financial information, including related inputs and assumptions, that management uses for planning and strategic review of the entire business.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more likely than not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitations has expired, or the appropriate taxing authority has completed their examination even though the statute of limitations remains open.

Changes in estimates can have a material impact on the deferred taxes and uncertain tax positions. See Part II Item 8 of this Form 10-K in Note Q to the Consolidated Financial Statements for more information regarding income taxes and deferred tax assets and related activity during the period.

Related Party Transactions

Alcoa Corporation buys products from and sells products to various related companies, consisting of entities in which Alcoa Corporation retains a 50% or less equity interest, at negotiated prices between the two parties. These transactions were not material to the financial position or results of operations of Alcoa Corporation for all periods presented.

Recently Adopted Accounting Guidance

See Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements under caption Recently Adopted Accounting Guidance.

Recently Issued Accounting Guidance

See Part II Item 8 of this Form 10-K in Note B to the Consolidated Financial Statements under caption Recently Issued Accounting Guidance.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

See Part II Item 8 of this Form 10-K in Note P to the Consolidated Financial Statements under caption Derivatives.

Item 8. Financial Statements and Supplementary Data.

Management's Reports to Alcoa Corporation Stockholders

Management's Report on Financial Statements and Practices

The accompanying Consolidated Financial Statements of Alcoa Corporation and its subsidiaries (the Company) were prepared by management, which is responsible for their integrity and objectivity, in accordance with accounting principles generally accepted in the United States of America (GAAP) and include amounts that are based on management's best judgments and estimates. The other financial information included in the Company's Annual Report on Form 10-K for the year ended December 31, 2024 is consistent with that in the Consolidated Financial Statements.

Management recognizes its responsibility for conducting the Company's affairs according to the highest standards of personal and corporate conduct. This responsibility is characterized and reflected in key policy statements issued from time to time regarding, among other things, conduct of its business activities within the laws of the host countries in which the Company operates and potentially conflicting outside business interests of its employees. The Company maintains a systematic program to assess compliance with these policies.

Management's Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate internal control over financial reporting, as defined in Rules 13a-15(f) and 15d-15(f) of the U.S. Securities Exchange Act of 1934 (as amended), for the Company. The Company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP. The Company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with GAAP, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company, and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the Company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Management conducted an assessment to evaluate the effectiveness of the Company's internal control over financial reporting as of December 31, 2024 using the criteria in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this assessment, management concluded that the Company maintained effective internal control over financial reporting as of December 31, 2024.

PricewaterhouseCoopers LLP, the independent registered public accounting firm that audited the Company's financial statements included in this Annual Report on Form 10-K for the year ended December 31, 2024, has audited the Company's internal control over financial reporting as of December 31, 2024 and has issued an attestation report, which is included herein.

/s/ William F. Oplinger
William F. Oplinger
President and Chief Executive Officer

/s/ Molly S. Beerman
Molly S. Beerman
Executive Vice President and Chief Financial Officer

February 20, 2025

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Alcoa Corporation

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Alcoa Corporation and its subsidiaries (the "Company") as of December 31, 2024 and 2023, and the related consolidated statements of operations, comprehensive income, changes in equity and cash flows for each of the three years in the period ended December 31, 2024, including the related notes (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2024, based on criteria established in *Internal Control—Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2024 and 2023, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2024 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2024, based on criteria established in *Internal Control—Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management's Report on Internal Control over Financial Reporting. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Asset Retirement Obligations – Mine Reclamation and Closure of Bauxite Residue Areas

As described in Notes B and R to the consolidated financial statements, the Company recognizes asset retirement obligations (AROs) related to legal obligations associated with the standard operation of bauxite mines, alumina refineries, and aluminum smelters. For the bauxite mines and alumina refineries, the AROs consist primarily of costs associated with mine reclamation and closure of bauxite residue areas, respectively. The fair values of the AROs are recorded on a discounted basis at the time the obligation is incurred and accreted over time for the change in present value; related accretion is recorded as a component of cost of goods sold. Additionally, the Company capitalizes asset retirement costs by increasing the carrying amount of the related long-lived assets and depreciating the assets over their remaining useful life. As disclosed by management, estimates are used to record AROs based on the best available information at the time of recognition. Several assumptions are used to estimate the cost required for reclamation and restoration of the site including: engineering designs for construction or closure, materials and services costs, regulatory requirements, and timing to complete construction or closure. As of December 31, 2024, the Company had $895 million in AROs, of which $321 million related to mine reclamation and $396 million related to the closure of bauxite residue areas. During 2024, the Company incurred liabilities related to mine reclamation and closure of bauxite residue areas, consisting of $87 million for new mining areas opened during the year and higher estimated mine reclamation costs, $24 million related to changes in closure estimates at the previously closed Suralco refinery, and $9 million related to water treatment due to the curtailment of the Kwinana refinery.

The principal considerations for our determination that performing procedures relating to the AROs for mine reclamation and closure of bauxite residue areas is a critical audit matter are (i) the significant judgment by management in developing the fair value estimate of the AROs; (ii) a high degree of auditor judgement, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to the engineering designs for construction or closure, materials and services costs, regulatory requirements, and timing to complete construction or closure; (collectively "management's assumptions"); and (iii) the audit effort involved the use of professionals with specialized skill and knowledge.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's accounting for AROs, including controls over management's methodology, assumptions, and valuation of the AROs for mine reclamation and closure of bauxite residue areas. These procedures also included, among others, (i) testing management's process for developing the fair value estimate of the AROs for mine reclamation and closure of bauxite residue areas; (ii) evaluating the appropriateness of the methodologies used by management, (iii) testing the completeness and accuracy of underlying data used in the methodologies, and (iv) evaluating the reasonableness of management's assumptions described above. Evaluating management's assumptions involved (i) evaluating the cost of rehabilitation and restoration of a site, including comparing the cost assumptions used, on a sample basis, to comparable data from external parties and internal source data; (ii) evaluating the consistency of management's assumptions across mine and bauxite residue areas, as applicable; (iii) the identification of circumstances which may require a modification to a previous estimate; (iv) physically observing the progress of the mine reclamation; (vi) evaluating management's application of and compliance with regulatory requirements; and (vii) evaluating whether the assumptions were consistent with evidence obtained in other areas of the audit. Professionals with specialized skill and knowledge were used to assist in (i) evaluating the appropriateness of the methodology used by management for closure of bauxite residue areas; (ii) evaluating the reasonableness of the application of and compliance with regulatory requirements for closure of bauxite residue areas; and (iii) evaluating the reasonableness of management's estimate of AROs for closure of bauxite residue areas by developing an independent estimate of the costs included in AROs for a sample of bauxite residue areas, using independently determined assumptions, and comparing the independent estimate of the costs to management's estimate.

/s/ PricewaterhouseCoopers LLP

Pittsburgh, Pennsylvania

February 20, 2025

We have served as the Company's auditor since 2015.

Alcoa Corporation and Subsidiaries
Statement of Consolidated Operations
(in millions, except per-share amounts)

For the year ended December 31,	2024	2023	2022
Sales (E)	$ 11,895	$ 10,551	$ 12,451
Cost of goods sold (exclusive of expenses below)	10,044	9,813	10,212
Selling, general administrative, and other expenses	275	226	204
Research and development expenses	57	39	32
Provision for depreciation, depletion, and amortization	642	632	617
Restructuring and other charges, net (D)	341	184	696
Interest expense (U)	156	107	106
Other expenses (income), net (U)	91	134	(118)
Total costs and expenses	11,606	11,135	11,749
Income (loss) before income taxes	289	(584)	702
Provision for income taxes (Q)	265	189	664
Net income (loss)	24	(773)	38
Less: Net (loss) income attributable to noncontrolling interest	(36)	(122)	161
Net income (loss) attributable to Alcoa Corporation	60	(651)	(123)
Earnings per share attributable to Alcoa Corporation common shareholders (F):			
Basic	$ 0.26	$ (3.65)	$ (0.68)
Diluted	$ 0.26	$ (3.65)	$ (0.68)

The accompanying notes are an integral part of the consolidated financial statements.

Alcoa Corporation and Subsidiaries
Statement of Consolidated Comprehensive Income
(in millions)

For the year ended December 31,	Alcoa Corporation 2024	Alcoa Corporation 2023	Alcoa Corporation 2022	Noncontrolling interest 2024	Noncontrolling interest 2023	Noncontrolling interest 2022	Total 2024	Total 2023	Total 2022
Net income (loss)	$ 60	$ (651)	$ (123)	$ (36)	$ (122)	$ 161	$ 24	$ (773)	$ 38
Other comprehensive (loss) income, net of tax (G):									
Change in unrecognized net actuarial gain/loss and prior service cost/benefit related to pension and other postretirement benefits	—	(62)	944	4	(10)	8	4	(72)	952
Foreign currency translation adjustments	(513)	(92)	(71)	(105)	(57)	(103)	(618)	(149)	(174)
Net change in unrecognized gains/losses on cash flow hedges	147	(136)	180	—	(1)	2	147	(137)	182
Total Other comprehensive (loss) income, net of tax	(366)	(106)	1,053	(101)	46	(93)	(467)	(60)	960
Comprehensive (loss) income	$ (306)	$ (757)	$ 930	$ (137)	$ (76)	$ 68	$ (443)	$ (833)	$ 998

The accompanying notes are an integral part of the consolidated financial statements.

Alcoa Corporation and Subsidiaries
Consolidated Balance Sheet
(in millions)

December 31,	2024	2023
Assets		
Current assets:		
Cash and cash equivalents (P)	$ 1,138	$ 944
Receivables from customers (I)	1,096	656
Other receivables	143	152
Inventories (J)	1,998	2,158
Fair value of derivative instruments (P)	25	29
Prepaid expenses and other current assets	514	466
Total current assets	4,914	4,405
Properties, plants, and equipment, net (K)	6,389	6,785
Investments (H)	980	979
Deferred income taxes (Q)	284	333
Fair value of derivative instruments (P)	—	3
Other noncurrent assets (U)	1,497	1,650
Total Assets	$ 14,064	$ 14,155
Liabilities		
Current liabilities:		
Accounts payable, trade	$ 1,805	$ 1,714
Accrued compensation and retirement costs	362	357
Taxes, including income taxes	102	88
Fair value of derivative instruments (P)	263	214
Other current liabilities	788	578
Long-term debt due within one year (M & P)	75	79

Total current liabilities	3,395	3,030
Long-term debt, less amount due within one year (M & P)	2,470	1,732
Accrued pension benefits (O)	256	278
Accrued other postretirement benefits (O)	412	443
Asset retirement obligations (R)	691	772
Environmental remediation (S)	182	202
Fair value of derivative instruments (P)	836	1,092
Noncurrent income taxes (Q)	9	193
Other noncurrent liabilities and deferred credits (U)	656	568
Total liabilities	8,907	8,310
Contingencies and commitments (S)		
Equity		
Alcoa Corporation shareholders' equity:		
Preferred stock (N)	—	—
Common stock (N)	3	2
Additional capital	11,587	9,187
Accumulated deficit	(1,323)	(1,293)
Accumulated other comprehensive loss (G)	(5,110)	(3,645)
Total Alcoa Corporation shareholders' equity	5,157	4,251
Noncontrolling interest (A)	—	1,594
Total equity	5,157	5,845
Total Liabilities and Equity	$ 14,064	$ 14,155

The accompanying notes are an integral part of the consolidated financial statements.

Alcoa Corporation and Subsidiaries
Statement of Consolidated Cash Flows
(in millions)

For the year ended December 31,	2024	2023	2022
Cash from Operations			
Net income (loss)	$ 24	$ (773)	$ 38
Adjustments to reconcile net income (loss) to cash from operations:			
Depreciation, depletion, and amortization	642	632	617
Deferred income taxes (Q)	23	(22)	219
Equity (income) loss, net of dividends (H)	(2)	201	4
Restructuring and other charges, net (D)	341	184	696
Net loss from investing activities—asset sales (U)	37	18	10
Net periodic pension benefit cost (O)	10	6	54
Stock-based compensation (N)	36	35	40
(Gain) loss on mark-to-market derivative financial contracts	(8)	26	(44)
Other	34	78	53
Changes in assets and liabilities, excluding effects of divestitures and foreign currency translation adjustments:			
(Increase) decrease in receivables	(493)	104	(59)
Decrease (increase) in inventories (J)	51	243	(547)
(Increase) decrease in prepaid expenses and other current assets	(68)	39	44
Increase (decrease) in accounts payable, trade	190	(74)	189
Decrease in accrued expenses	(108)	(133)	(173)
Increase (decrease) in taxes, including income taxes	95	(146)	(152)
Pension contributions (O)	(16)	(24)	(17)
Increase in noncurrent assets	(4)	(210)	(87)
Decrease in noncurrent liabilities	(162)	(93)	(63)

Cash provided from operations	622	91	822
Financing Activities			
Additions to debt (M)	1,032	127	4
Payments on debt (M)	(679)	(72)	(1)
Proceeds from the exercise of employee stock options (N)	—	1	22
Repurchase of common stock (N)	—	—	(500)
Dividends paid on Alcoa preferred stock (N)	(1)	—	—
Dividends paid on Alcoa common stock (N)	(89)	(72)	(72)
Payments related to tax withholding on stock-based compensation awards	(15)	(34)	(19)
Financial contributions for the divestiture of businesses (C)	(35)	(52)	(33)
Contributions from noncontrolling interest (A)	65	188	214
Distributions to noncontrolling interest (A)	(49)	(30)	(379)
Acquisition of noncontrolling interest (C)	(23)	—	—
Other	(5)	1	(4)
Cash provided from (used for) financing activities	201	57	(768)
Investing Activities			
Capital expenditures	(580)	(531)	(480)
Proceeds from the sale of assets and businesses (C)	3	4	5
Additions to investments (H)	(37)	(70)	(32)
Sale of investments (H)	—	—	10
Other	6	12	2
Cash used for investing activities	(608)	(585)	(495)
Effect of exchange rate changes on cash and cash equivalents and restricted cash	(28)	10	(9)
Net change in cash and cash equivalents and restricted cash	187	(427)	(450)

Cash and cash equivalents and restricted cash at beginning of year	1,047	1,474	1,924
Cash and cash equivalents and restricted cash at end of year	1,234	1,047	1,474
	$	$	$

The accompanying notes are an integral part of the consolidated financial statements.

Alcoa Corporation and Subsidiaries
Statement of Changes in Consolidated Equity
(in millions)

	Alcoa Corporation shareholders						
	Preferred stock	Common stock	Additional capital	Accumulated deficit	Accumulated other comprehensive (loss) income	Noncontrolling interest	Total equity
Balance at December 31, 2021	$ —	$ 2	$ 9,577	$ (315)	$ (4,592)	$ 1,612	$ 6,284
Net (loss) income	—	—	—	(123)	—	161	38
Other comprehensive income (loss) (G)	—	—	—	—	1,053	(93)	960
Stock-based compensation (N)	—	—	40	—	—	—	40
Net effect of tax withholding for compensation plans and exercise of stock options (N)	—	—	3	—	—	—	3
Repurchase of common stock (N)	—	—	(440)	(60)	—	—	(500)
Dividends paid on Alcoa common stock ($0.10 per share) (N)	—	—	—	(72)	—	—	(72)
Contributions	—	—	—	—	—	214	214
Distributions	—	—	—	—	—	(379)	(379)
Other	—	—	3	—	—	(2)	1
Balance at December 31, 2022	—	2	9,183	(570)	(3,539)	1,513	6,589
Net loss	—	—	—	(651)	—	(122)	(773)
Other comprehensive (loss) income (G)	—	—	—	—	(106)	46	(60)
Stock-based compensation (N)	—	—	35	—	—	—	35
Net effect of tax withholding for compensation plans and exercise of stock options (N)	—	—	(33)	—	—	—	(33)
Dividends paid on Alcoa common stock ($0.10 per share) (N)	—	—	—	(72)	—	—	(72)
Contributions	—	—	—	—	—	188	188
Distributions	—	—	—	—	—	(30)	(30)

Other	—	—	2	—	—	(1)	1
Balance at December 31, 2023	—	2	9,187	(1,293)	(3,645)	1,594	5,845
Net income (loss)	—	—	—	60	—	(36)	24
Other comprehensive loss (G)	—	—	—	—	(366)	(101)	(467)
Stock-based compensation (N)	—	—	36	—	—	—	36
Net effect of tax withholding for compensation plans and exercise of stock options (N)	—	—	(15)	—	—	—	(15)
Dividends paid on Alcoa preferred stock ($0.10 per share) (N)	—	—	—	(1)	—	—	(1)
Dividends paid on Alcoa common stock ($0.10 per share) (N)	—	—	—	(89)	—	—	(89)
Contributions	—	—	—	—	—	65	65
Distributions	—	—	—	—	—	(49)	(49)
Acquisition of noncontrolling interest (C)	—	1	2,377	—	(1,099)	(1,472)	(193)
Other	—	—	2	—	—	(1)	1
Balance at December 31, 2024	$ —	3	11,587	(1,323)	(5,110)	—	5,157

The accompanying notes are an integral part of the consolidated financial statements.

A. Basis of Presentation

Alcoa Corporation (Alcoa or the Company) is a vertically integrated aluminum company comprised of bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation. Through direct and indirect ownership, the Company has

26
operating locations in

nine
countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States.

Alcoa Corporation became an independent, publicly traded company on November 1, 2016, following its separation (the Separation Transaction) from its former parent company, Alcoa Inc. References herein to “ParentCo” refer to Alcoa Inc. and its consolidated subsidiaries through October 31, 2016, at which time it was renamed Arconic Inc. and since has been subsequently renamed Howmet Aerospace Inc.

Basis of Presentation. The Consolidated Financial Statements of Alcoa Corporation are prepared in conformity with accounting principles generally accepted in the United States of America (GAAP). In accordance with GAAP, certain situations require management to make estimates based on judgments and assumptions, which may affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements. They also may affect the reported amounts of revenues and expenses during the reporting periods. Management uses historical experience and all available information to make these estimates. Management regularly evaluates the judgments and assumptions used in its estimates, and results could differ from those estimates upon future events and their effects or new information.

Principles of Consolidation. The Consolidated Financial Statements of the Company include the accounts of Alcoa Corporation and companies in which Alcoa Corporation has a controlling interest. Intercompany transactions have been eliminated. The equity method of accounting is used for investments in affiliates and other joint ventures over which the Company has significant influence but does not have effective control. Investments in affiliates in which Alcoa Corporation cannot exercise significant influence are accounted at cost less any impairment, a measurement alternative in accordance with GAAP.

Prior to Alcoa’s acquisition of Alumina Limited on August 1, 2024 (see Note C), Alcoa consolidated its

60
% ownership in the entities comprising the Alcoa World Alumina & Chemicals (AWAC) joint venture and Alumina Limited’s interest in the equity of such entities was reflected as Noncontrolling interest on the accompanying Consolidated Balance Sheet.

Management evaluates whether an Alcoa Corporation entity or interest is a variable interest entity and whether the Company is the primary beneficiary. Consolidation is required if both of these criteria are met. Alcoa Corporation does not have any variable interest entities requiring consolidation.

Related Party Transactions. Alcoa Corporation buys products from and sells products to various related companies, consisting of entities in which the Company retains a

50
% or less equity interest, at negotiated prices between the two parties. These transactions were not material to the financial position or results of operations of Alcoa Corporation for all periods presented.

B. Summary of Significant Accounting Policies

Cash Equivalents. Cash equivalents are highly liquid investments purchased with an original maturity of three months or less.

Restricted Cash. Restricted cash is included with Cash and cash equivalents when reconciling the Cash and cash equivalents and restricted cash at beginning of year and Cash and cash equivalents and restricted cash at end of year on the accompanying Statement of Consolidated Cash Flows. Current restricted cash amounts are reported in Prepaid expenses and other current assets on the accompanying Consolidated Balance Sheet. Noncurrent restricted cash amounts are reported in Other noncurrent assets on the accompanying Consolidated Balance Sheet (see Note U for a reconciliation of Cash and cash equivalents and restricted cash).

Inventory Valuation. Inventories are carried at the lower of cost or net realizable value, with the cost of inventories principally determined under the average cost method.

Properties, Plants, and Equipment. Properties, plants, and equipment are recorded at cost. Interest related to the construction of qualifying assets is capitalized as part of the construction costs. Depreciation is recorded principally on the straight-line method over the estimated useful lives of the assets. Depreciation is recorded on temporarily idled facilities until such time management approves a permanent closure. The following table details the weighted average useful lives of structures and machinery and equipment by type of operation (numbers in years):

	Structures	Machinery and equipment
Alumina	24	25
Aluminum smelting and casting	37	22
Energy generation	33	24

Repairs and maintenance are charged to expense as incurred while costs for significant improvements that add productive capacity or that extend the useful life are capitalized. Gains or losses from the sale of assets are generally recorded in Other expenses (income), net.

Properties, plants, and equipment are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of such assets (asset group) may not be recoverable. Recoverability of assets is determined by comparing the estimated undiscounted net cash flows of the operations related to the assets (asset group) to their carrying amount. An impairment loss would be recognized when the carrying amount of the assets (asset group) exceeds the fair value. The amount of the impairment loss to be recorded is calculated as the excess of the carrying value of the assets (asset group) over their fair value, with fair value determined using the best information available, which generally is a discounted cash flow (DCF) model. The determination of what constitutes an asset group, the associated estimated undiscounted net cash flows, and the estimated useful lives of assets also require significant judgments.

Leases. The Company determines whether an arrangement is a lease at the inception of the arrangement based on the terms and conditions in the contract. A contract contains a lease if there is an identified asset which the Company has the right to control. Lease right-of-use (ROU) assets are included in Properties, plants, and equipment, net with the corresponding operating lease liabilities included within Other current liabilities and Other noncurrent liabilities and deferred credits on the accompanying Consolidated Balance Sheet.

Operating lease ROU assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. The Company uses its incremental borrowing rate at the commencement date in determining the present value of lease payments unless a rate is implicit in the lease. Lease terms include options to extend the lease when it is reasonably certain that those options will be exercised. Leases with an initial term of 12 months or less, including anticipated renewals, are not recorded on the Consolidated Balance Sheet.

The Company made a policy election not to record any non-lease components of a lease agreement in the lease liability. Variable lease payments are not presented as part of the ROU asset or liability recorded at the inception of a contract. Lease expense for operating lease payments is recognized on a straight-line basis over the lease term.

Equity Investments. Alcoa invests in a number of privately-held companies, primarily through joint ventures and consortia, which are accounted for using the equity method. The equity method is applied in situations where the Company has the ability to exercise significant influence, but not control, over the investee. Management reviews equity investments for impairment whenever certain indicators are present suggesting that the carrying value of an investment is not recoverable.

Deferred Mining Costs. Alcoa incurs deferred mining costs during the development stage of a mine life cycle. Such costs include the construction of access and haul roads, detailed drilling and geological analysis to further define the grade and quality of the known bauxite, and overburden removal costs. These costs relate to sections of the related mines where the Company is currently extracting bauxite or preparing for production in the near term. These sections are outlined and planned incrementally and generally are mined over periods ranging from one to five years , depending on specific mine plans. The amount of geological drilling and testing necessary to determine the economic viability of the bauxite deposit being mined is such that the reserves are considered to be proven. Deferred mining costs are amortized on a units-of-production basis and included in Other noncurrent assets on the accompanying Consolidated Balance Sheet.

Goodwill and Other Intangible Assets. Goodwill is not amortized but is reviewed for impairment annually (in the fourth quarter) or more frequently if indicators of impairment exist or if a decision is made to sell or exit a business.

Goodwill is allocated among and evaluated for impairment at the reporting unit level, which is defined as an operating segment or one level below an operating segment. Beginning in January 2023, the Company changed its operating segments by combining the Bauxite and Alumina segments, and reported its financial results in the following two segments: (i) Alumina and (ii) Aluminum (see Note E).

The Company has

three
reporting units, of which

two
are included in the Aluminum segment (smelting/casting and energy generation). The remaining reporting unit is the Alumina segment. Of these three reporting units, only Alumina contains goodwill (see Note L).

Goodwill is tested for impairment by assessing qualitative factors to determine whether it is more likely than not (greater than 50%) that the fair value of the reporting unit is less than its carrying amount or performing a quantitative assessment using a DCF model. If the qualitative assessment indicates a possible impairment, then a quantitative assessment is performed to determine the fair value of the reporting unit using a DCF model. Otherwise, no further analysis is required.

Under the quantitative assessment, the estimated fair value of the reporting unit is compared to its carrying value, including goodwill. In the event the estimated fair value of a reporting unit is less than the carrying value, an impairment loss equal to the excess of the reporting unit's carrying value over its fair value not to exceed the total amount of goodwill applicable to that reporting unit would be recognized.

Alcoa's policy for its annual review of goodwill is to perform the quantitative assessment for its reporting unit containing goodwill at least once during every three-year period.

Intangible assets with finite useful lives are amortized generally on a straight-line basis over the periods benefited. The following table details the weighted average useful lives of software and other intangible assets by type of operation (numbers in years):

	Software	Other intangible assets
Alumina		
	4	25
Aluminum smelting and casting		
	3	40
Energy generation		
	3	29

Asset Retirement Obligations. Alcoa recognizes asset retirement obligations (AROs) related to legal obligations associated with the standard operation of bauxite mines, alumina refineries, and aluminum smelters. These AROs consist primarily of costs associated with mine reclamation, closure of bauxite residue areas, spent pot lining and regulated waste materials disposal, and landfill closure. Additionally, costs are recorded as AROs upon management's decision to permanently close and demolish certain structures and for any significant lease restoration obligations. The fair values of these AROs are recorded on a discounted basis at the time the obligation is incurred and accreted over time for the change in present value; related accretion is recorded as a component of Cost of goods sold. Additionally, the Company capitalizes asset retirement costs by increasing the carrying amount of the related long-lived assets and depreciating these assets over their remaining useful life.

The fair values for AROs are determined using significant assumptions, including engineering designs for construction or closure, materials and services costs, regulatory requirements, volume of regulated material to be removed, disposition of demolition materials, and timing to complete construction or closure.

Subsequent adjustments to estimates of previously established AROs for current operations are capitalized by increasing the carrying amount of the related long-lived assets and depreciating these assets over their remaining useful life. Adjustments to estimates of AROs for closed locations are charged to Restructuring and other charges, net on the accompanying Statement of Consolidated Operations (see Note R).

Certain conditional asset retirement obligations related to alumina refineries, aluminum smelters, and energy generation facilities have not been recorded in the Consolidated Financial Statements due to uncertainties surrounding the ultimate settlement date. The fair value of these asset retirement obligations will be recorded when a reasonable estimate of the ultimate settlement date can be made.

Environmental Matters. Environmental related expenditures for current operations are expensed as a component of Cost of goods sold or capitalized, as appropriate. Expenditures relating to existing conditions caused by past operations, generally for closed locations which will not contribute to future revenues, are charged to Restructuring and other charges, net. Liabilities are recorded when remediation costs are probable and can be reasonably estimated. In instances where the Company has ongoing monitoring and maintenance responsibilities, it is Alcoa's policy to maintain a reserve equal to five years of expected costs. The liability is continuously reviewed and adjusted to reflect current remediation progress, rate and pricing changes, actual volumes of material requiring management, changes to the original assumptions regarding how the site was to be remediated, and other factors that may be relevant, including changes in technology or regulations. The estimates may also include costs related to other potentially responsible parties to the extent that Alcoa has reason to believe such parties will not fully pay their proportionate share.

Litigation Matters. For asserted claims and assessments, liabilities are recorded when an unfavorable outcome of a matter is deemed to be probable and the loss is reasonably estimable. With respect to unasserted claims or assessments, liabilities are recorded when the probability that an assertion will be made is likely, an unfavorable outcome of the matter is deemed to be probable, and the loss is reasonably estimable. Legal matters are reviewed on a continuous basis to determine if there has been a change in management's judgment regarding the likelihood of an unfavorable outcome or the estimate of a potential loss. Legal costs, which are primarily for general litigation, environmental compliance, tax disputes, and general corporate matters, are expensed as incurred.

Revenue Recognition. The Company recognizes revenue when it satisfies a performance obligation(s) in accordance with the provisions of a customer order or contract. This is achieved when control of the product has been transferred to the customer, which is generally determined when title, ownership, and risk of loss pass to the customer, all of which occurs upon shipment or delivery of the product. The shipping terms vary across all businesses and depend on the product, the country of origin, and the type of transportation. Accordingly, the sale of Alcoa's products to its customers represent single performance obligations for which revenue is recognized at a point in time, except for the Company's Energy product division in which the customer simultaneously receives and consumes electricity (see Note E). Revenue is based on the consideration the Company expects to receive in exchange for its products. Returns and other adjustments have not been material. Based on the foregoing, no significant judgment is required to determine when control of a product has been transferred to a customer.

The Company considers shipping and handling activities as costs to fulfill the promise to transfer the related products. As a result, customer payments of shipping and handling costs are recorded as a component of revenue. Taxes collected (e.g., sales, use, value added, excise) from its customers related to the sale of its products are remitted to governmental authorities and excluded from Sales.

Cost of Goods Sold. The Company includes the following in Cost of goods sold: operating costs of its

two

segments, excluding depreciation, depletion, and amortization, but including all production related costs: raw materials consumed; purchases of metal for consumption; conversion costs, such as labor, materials, and utilities; equity earnings of certain investments integral to the Company's supply chain; and plant administrative expenses. Also included in Cost of goods sold are: costs related to the Transformation function, which focuses on the management of expenses and obligations of previously closed operations; purchases of bauxite from offtake or other supply agreements, alumina to satisfy customer commitments, and metal for trade; and other costs not included in the operating costs of the segments.

Selling, General Administrative, and Other Expenses. The Company includes the costs of corporate-wide functional support in Selling, general administrative, and other expenses. Such costs include: executive; sales; marketing; strategy; operations administration; finance; information technology; legal; human resources; and government affairs and communications.

Stock-Based Compensation. Compensation expense for employee equity grants is recognized using the non-substantive vesting period approach, in which the expense is recognized ratably over the requisite service period based on the grant date fair value. Forfeitures are accounted for as they occur. The fair value of performance stock units containing a market condition is valued using a Monte Carlo valuation model. Determining the fair value at the grant date requires judgment, including estimates for the average risk-free interest rate, and volatility. These assumptions may differ significantly between grant dates because of changes in the actual results of these inputs that occur over time. As of January 1, 2021, the Company no longer grants stock options.

See Note N for more information regarding stock-based compensation.

Pension and Other Postretirement Benefits. Alcoa sponsors several defined benefit pension plans and health care postretirement benefit plans. The Company recognizes on a plan-by-plan basis the net funded status of these pension and postretirement benefit plans as either an asset or a liability on its Consolidated Balance Sheet. The net funded status represents the difference between the fair value of each plan's assets and the benefit obligation of the respective plan. The benefit obligation represents the present value of the estimated future benefits the Company currently expects to pay to plan participants based on past service. Unrecognized gains and losses related to the plans are deferred in Accumulated other comprehensive loss on the Consolidated Balance Sheet until amortized into earnings.

The plan assets and benefit obligations are measured at the end of each year or more frequently, upon the occurrence of certain events such as a significant plan amendment, settlement, or curtailment. For interim plan remeasurements, it is the Company's policy to record the related accounting impacts within the same quarter as the triggering event.

Liabilities and expenses for pension and other postretirement benefits are determined using actuarial methodologies and incorporate significant assumptions, including the interest rate used to discount the future estimated liability, the expected long-term rate of return on plan assets, and several assumptions relating to the employee workforce (salary increases, health care cost trend rates, retirement age, and mortality).

The yield curve model used to develop the discount rate is based on high-quality corporate bonds, parallels the plans' projected cash flows and has a weighted average duration of 10 years. If a deep market of high-quality corporate bonds does not exist in a country, then the yield on government bonds plus a corporate bond yield spread is used.

The expected long-term rate of return on plan assets is generally applied to a five-year market-related value of plan assets (a four-year average or the fair value at the plan measurement date is used for certain non-U.S. plans). The process used by management to develop this assumption is one that relies on forward-looking investment returns by asset class. Management incorporates expected future investment returns on current and planned asset allocations using information from various external investment managers and consultants, as well as management's own judgment.

Mortality rate assumptions are based on mortality tables and future improvement scales published by third parties, such as the Society of Actuaries, and consider other available information including historical data as well as studies and publications from reputable sources.

A change in one or a combination of these assumptions, or the effects of actual results differing from assumptions, could have a material impact on Alcoa's projected benefit obligation. These changes or differences are recorded in Accumulated other comprehensive loss and are amortized into earnings as a component of the net periodic benefit cost (income) over the average future working lifetime or average remaining life expectancy, as appropriate, of the plan's participants.

One-time accounting impacts, such as curtailment and settlement losses (gains), are recognized immediately and are reclassified from Accumulated other comprehensive loss to Restructuring and other charges, net on the accompanying Statement of Consolidated Operations.

See Note O for more information regarding pension and other postretirement benefits including accounting impacts of current year actions.

Derivatives and Hedging. Derivatives are held for purposes other than trading and are part of a formally documented risk management program.

Alcoa accounts for hedges of firm customer commitments for aluminum as fair value hedges. The fair values of the derivatives and changes in the fair values of the underlying hedged items are reported as assets and liabilities in the Consolidated Balance Sheet. Changes in the fair values of these derivatives and underlying hedged items generally offset and are recorded each period in Sales, consistent with the underlying hedged item.

The Company accounts for certain hedges of foreign currency exposures and certain forecasted transactions as cash flow hedges. The fair values of the derivatives are recorded as assets and liabilities in the Consolidated Balance Sheet. The changes in the fair values of these derivatives are recorded in Accumulated other comprehensive loss and are reclassified to Sales, Cost of goods sold, or Other expenses (income), net in the period in which earnings are impacted by the hedged items or in the period that the transaction no longer qualifies as a cash flow hedge. These contracts cover the same periods as known or expected exposures, generally not exceeding five years .

If no hedging relationship is designated, the derivative is marked to market through Other expenses (income), net.

Cash flows from derivatives are recognized in the Statement of Consolidated Cash Flows in a manner consistent with the underlying transactions.

Income Taxes. The provision for income taxes is determined using the asset and liability approach of accounting for income taxes. Under this approach, the provision for income taxes represents income taxes paid or payable (or received or receivable) for the current year plus the change in deferred taxes during the year. Deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid, resulting from differences between the financial and tax bases of Alcoa's assets and liabilities, and are adjusted for changes in tax rates and tax laws when enacted.

Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not (greater than 50%) that a tax benefit will not be realized. In evaluating the need for a valuation allowance, management applies judgment in assessing all available positive and negative evidence and considers all potential sources of taxable income. Deferred tax assets for which no valuation allowance is recorded may not be realized upon changes in facts and circumstances, resulting in a future charge to establish a valuation allowance. Existing valuation allowances are re-examined under the same standards of positive and negative evidence. If it is determined that it is more likely than not that a deferred tax asset will be realized, the appropriate amount of the valuation allowance, if any, is released. Deferred tax assets and liabilities are also re-measured to reflect changes in underlying tax rates due to law changes and the granting and lapse of tax holidays.

Tax benefits related to uncertain tax positions taken or expected to be taken on a tax return are recorded when such benefits meet a more likely than not threshold. Otherwise, these tax benefits are recorded when a tax position has been effectively settled, which means that the statute of limitations has expired or the appropriate taxing authority has completed their examination even though the statute of limitations remains open. Interest and penalties related to uncertain tax positions are recognized as part of the provision for income taxes and are accrued in the period that such interest and penalties would be applicable under relevant tax law until such time that the related tax benefits are recognized.

Foreign Currency. The local currency is the functional currency for Alcoa's significant operations outside the United States, except for certain operations in Canada and Iceland, a holding and trading company in the Netherlands, and a holding company in Australia, where the U.S. dollar is used as the functional currency. The determination of the functional currency for Alcoa's operations is made based on the appropriate economic and management indicators. Where local currency is the functional currency, assets and liabilities are translated into U.S. dollars using period end exchange rates and income and expenses are translated using the average exchange rates for the reporting period. Unrealized foreign currency translation gains and losses are deferred in Accumulated other comprehensive loss on the Consolidated Balance Sheet.

Recently Adopted Accounting Guidance. In November 2023, the Financial Accounting Standards Board (FASB) issued Accounting Standard Update (ASU) 2023-07 which requires disclosure of significant segment expenses regularly provided to the chief operating decision maker (CODM), other segment items (not included in significant segment expenses for each reportable segment), the title and position of the CODM, and an explanation of how the CODM uses the reported measure of segment profit or loss to assess segment performance and allocate resources. The Company adopted this guidance for the year ended December 31, 2024 , which resulted in enhanced disclosures regarding reportable segments (see Note E) and did no t have a material impact on the Company's financial position or results of operations.

Recently Issued Accounting Guidance. In November 2024, the FASB issued ASU No. 2024-03 which requires detailed disclosures about the types of expenses (including purchases of inventory, employee compensation, depreciation, amortization, and depletion) included within commonly presented expense captions (including cost of goods sold; selling, general administrative, and other expense; and research and development expenses). The guidance is effective for annual periods beginning after December 15, 2026, and interim periods within fiscal years beginning after December 15, 2027. Early adoption is permitted. The adoption of this guidance will not have a material impact on the Company's financial position or results of operations and will provide enhanced disclosures regarding expenses beginning in the Company's Annual Report on Form 10-K for the year ended December 31, 2027.

In December 2023, the FASB issued ASU No. 2023-09 which includes changes to income tax disclosures, including greater disaggregation of information in the rate reconciliation and disclosure of taxes paid by jurisdiction. The guidance is effective for annual periods beginning after December 15, 2024. Early adoption is permitted. The adoption of this guidance will not have a material impact on the Company's financial position or results of operations and will provide enhanced disclosures regarding income taxes beginning in the Company's Annual Report on Form 10-K for the year ended December 31, 2025.

C. Acquisitions and Divestitures

Alumina Limited Acquisition
On August 1, 2024, Alcoa completed the acquisition of all of the ordinary shares of Alumina Limited (Alumina Shares) through a wholly-owned subsidiary, AAC Investments Australia 2 Pty Ltd. At acquisition, Alumina Limited held a

40
% ownership interest in the AWAC joint venture, consisting of several affiliated operating entities, which own, have an interest in, or operate the bauxite mines and alumina refineries within Alcoa Corporation's Alumina segment (except for the Poços de Caldas mine and refinery and portions of the São Luís refinery, all in Brazil) and a portion (

55
%) of the Portland smelter (Australia) within Alcoa Corporation's Aluminum segment. Upon completion of the Alumina Limited acquisition, Alumina Limited and, as a result, the operations held by the AWAC joint venture, became wholly-owned subsidiaries of Alcoa Corporation. The acquisition enhances Alcoa's position as a leading pure play, upstream aluminum company globally, while simplifying the Company's corporate structure and governance, resulting in greater flexibility and strategic optionality.

Under the Scheme Implementation Deed (the Agreement) entered into in March 2024, as amended in May 2024, holders of Alumina Shares received

0.02854
Alcoa CHESS Depositary Interests (CDIs) for each Alumina Share (the Agreed Ratio), except that i) holders of Alumina Shares represented by American Depositary Shares, each of which represented

4
Alumina Shares, received

0.02854
shares of Alcoa common stock and ii) a certain shareholder received, for certain of their Alumina Shares,

0.02854
shares of Alcoa non-voting convertible preferred stock. The Alcoa CDIs are quoted on the Australian Stock Exchange.

At closing, Alumina Shares outstanding of

2,760,056,014
and

141,625,403
were exchanged for

78,772,422
and

4,041,989
shares of Alcoa common stock and Alcoa preferred stock, respectively. Based on Alcoa's closing share price as of July 31, 2024, the Agreed Ratio implied a value of A$

1.45
per Alumina Share and aggregate purchase consideration of approximately $

2,700
for Alumina Limited.

The transaction consisted in substance of the acquisition of Alumina Limited's noncontrolling interest in AWAC ($

1,472
), the assumption of Alumina Limited's indebtedness ($

385
, see Note M), the recognition of deferred tax assets ($

121
, see Note Q), and the acquisition of cash ($

9
) and other current liabilities ($

1
). The transaction was accounted for as an equity transaction where net assets acquired ($

1,216
) and transaction costs ($

32
) were reflected as an increase to Additional capital. Amounts related to Accumulated other comprehensive loss previously attributable to and included within Noncontrolling interest ($

1,099
) were reclassified to Accumulated other comprehensive loss. In the fourth quarter of 2024, the Company recognized an additional deferred tax asset (and a corresponding increase to Additional capital) of $

95
(see Note Q).

Net loss attributable to noncontrolling interest was recognized through July 31, 2024.

Saudi Arabia Joint Venture

On September 15, 2024, Alcoa entered into a share purchase and subscription agreement with Saudi Arabian Mining Company (Ma'aden), pursuant to which Alcoa agreed to sell its full ownership interest of

25.1

% in the Saudi Arabia joint venture, comprised of the Ma'aden Bauxite and Alumina Company and the Ma'aden Aluminium Company, to Ma'aden in exchange for issuance by Ma'aden of

85,977,547

shares and $

150

in cash. The implied value of the shares was $

950

as of September 12, 2024, based on the volume-weighted average share price of Ma'aden for the previous 30 calendar days. The shares of Ma'aden will be subject to transfer and sale restrictions, including a restriction requiring Alcoa to hold its Ma'aden shares for a minimum of three years , with one-third of the shares becoming transferable after each of the third, fourth, and fifth anniversaries of closing of the transaction (the holding period). During the holding period, Alcoa would be permitted to hedge and borrow against its Ma'aden shares. Under certain circumstances, such minimum holding period would be reduced. The transaction is subject to regulatory approvals, approval by Ma'aden's shareholders, and other customary closing conditions and is expected to close in the first half of 2025. The carrying value of Alcoa's investment was $

544

as of December 31, 2024.

Warrick Rolling Mill

In March 2021, Alcoa completed the sale of its rolling mill located at Warrick Operations (Warrick Rolling Mill), an integrated aluminum manufacturing site near Evansville, Indiana (Warrick Operations), to Kaiser Aluminum Corporation (Kaiser) and recorded estimated liabilities for site separation commitments.

In 2024, 2023, and 2022 the Company recorded charges of $

32

, $

17

, and $

8

, respectively, in Other expenses (income), net on the accompanying Statement of Consolidated Operations related to these commitments. During 2024, 2023, and 2022, the Company spent $

35,

$

52

, and $

37

, respectively, against the reserve.

The remaining balance of $

8

at December 31, 2024 is expected to be spent in early 2025. The cash spent against the reserve is included in Cash provided from (used for) financing activities on the Statement of Consolidated Cash Flows.

D. Restructuring and Other Charges, Net

Restructuring and other charges, net were comprised of the following:

	2024	2023	2022
Other costs	$ 264	$ 36	$ (7)
Severance and employee termination costs	44	11	1
Asset retirement obligations (R)	44	41	34
Environmental remediation (S)	5	27	21
Asset impairments	5	50	58
Settlements and/or curtailments related to retirement benefits (O)	(1)	21	632
Reversals of previously recorded charges	(20)	(2)	(122)
Loss on divestitures	—	—	79
Restructuring and other charges, net	$ 341	$ 184	$ 696

Severance and employee termination costs were recorded based on approved detailed action plans submitted by the operating sites that specified positions to be eliminated, benefits to be paid under existing severance plans, union contracts or statutory requirements, and the expected timetable for completion of the plans.

2024 Actions. In 2024, Alcoa Corporation recorded Restructuring and other charges, net, of $ 341 which were primarily comprised of the following components:

- Charges related to portfolio actions:
  - o $ 287 for the curtailment of the Kwinana (Australia) refinery (see below);
- Other charges:
  - o $ 40 to record additional asset retirement obligations (see Note R) and environmental remediation (see Note S) at previously closed sites;
  - o $ 22 for take-or-pay contract costs at a previously closed site; and,
  - o $ 12 for contract termination costs at the closed Intalco (Washington) smelter;
- Reversals:
  - o $ 20 due to lower costs for environmental remediation (see Note S) and asset retirement obligations (see Note R) at the Intalco smelter and a previously closed site.

In June 2024, Alcoa completed the full curtailment of the Kwinana refinery, as planned, which was announced in January 2024. As of March 2024, the refinery had approximately 780 employees and this number was reduced to approximately

250
through the fourth quarter of 2024 to manage certain processes that are expected to continue until about the fourth quarter of 2025. At that time, the employee number will be further reduced to approximately

50
. In addition to the employees separating as a result of the curtailment, approximately

290
employees have terminated through the productivity program announced in the third quarter of 2023 or redeployed to other Alcoa operations. The Company recorded net charges of $

287
in Restructuring and other charges, net on the Statement of Consolidated Operations comprised of other costs of $

232
for water management costs ($

220
) and take-or-pay contracts ($

12
), severance and employee termination costs of $

41
, asset retirement obligations of $

9
(see Note R), and asset impairments of $

5
. Payments related to other costs and severance and employee termination costs were $

136
in 2024 (which included existing employee related liabilities). Additional cash outlays of approximately $

140
are expected through 2025.

2023 Actions. In 2023, Alcoa Corporation recorded Restructuring and other charges, net, of $

184
which were primarily comprised of the following components:

- Non-cash settlement charges related to pension benefits (see Note O):
  - o $

    21
    related to the purchase of group annuity contracts to transfer approximately $

    235
    of pension obligations and assets associated with defined benefit pension plans for approximately

    530
    Canadian retirees and beneficiaries;
- Charges related to portfolio actions:
  - o $

    101
    for the permanent closure of the previously curtailed Intalco smelter (see below);
  - o $

    53
    for the updated viability agreement for the San Ciprián (Spain) smelter; and,
  - o $

    11
    for employee termination and severance costs, primarily related to the Kwinana refinery productivity program (see below);

- Other net charges:
  - $ 17 to record additional environmental remediation and asset retirement obligations at previously closed sites (see Note R and Note S);
  - $ 19 benefit for the sale of unused carbon credits at a previously closed site;
  - $ 1 to record additional asset retirement obligations at Warrick Operations (Indiana) (see Note R); and,
  - $ 1 for additional take-or-pay contract costs at a previously closed site and the Intalco smelter;
- Reversals:
  - $ 2 due to lower costs for demolition obligations at previously closed sites (see Note R).

In December 2023, Alcoa began the closure of a line at its Warrick Operations site that had not operated since 2016 to allow for future capital investments to improve casting capabilities. The Company recorded a charge of $ 1 in Restructuring and other charges, net on the Statement of Consolidated Operations to establish reserves related to demolition obligations. Additionally, Alcoa recorded $ 1 in Cost of goods sold on the Statement of Consolidated Operations to write-off the remaining net book value of related inventory.

In September 2023, the Company initiated productivity programs across its operations in Australia to mitigate the financial impacts of lower grade bauxite and to optimize operating levels. In connection with this program, the Company recorded Restructuring and other charges, net of $ 6 for employee termination and severance costs for approximately 90 employees at the Kwinana refinery. This program was completed in September 2024.

In March 2023, Alcoa Corporation announced the closure of the Intalco aluminum smelter, which had been fully curtailed since 2020. The Company recorded charges of $ 117 related to the closure, including a charge of $ 16 in Cost of goods sold on the Statement of Consolidated Operations to write-down remaining inventories to net realizable value and a charge of $ 101 in Restructuring and other charges, net on the Statement of Consolidated Operations. The restructuring charges were comprised of asset impairments of $ 50, environmental remediation and demolition obligations of $ 50, and severance and employee termination costs of $ 1 for the separation of approximately 12 employees.

In February 2023, the Company reached an updated viability agreement with the workers' representatives of the San Ciprián smelter to commence the restart process in phases beginning in January 2024. The smelter was curtailed in January 2022 as a result of an agreement reached with the workers' representatives in December 2021. Under the terms of the updated viability agreement, the Company is responsible for certain employee obligations during 2023 through 2025 and made commitments for capital improvements of $ 78. The Company recorded charges of $ 53 in Restructuring and other charges, net on the Statement of Consolidated Operations to establish the related reserve for employee obligations in 2023. Cash outlays related to these obligations were $ 7 in 2023, $ 34

in 2024 and the remainder is expected in 2025. At December 31 2024, the Company has restricted cash of $

86

to be made available for remaining capital improvement commitments and smelter restart costs, under the terms of the December 2021 and February 2023 viability agreements. Restricted cash is included in Prepaid expenses and other current assets and Other noncurrent assets on the Consolidated Balance Sheet (see Note U). Cash payments in 2023 also included $

31

related to certain employee obligations under the December 2021 agreement; cash payments related to these obligations were complete as of December 31, 2023.

2022 Actions. In 2022 Alcoa Corporation recorded Restructuring and other charges, net, of $

696

which were primarily comprised of the following components:

- Non-cash settlement charges related to pension benefits (see Note O):
  - o $

    635

    related to the purchase of group annuity contracts to transfer approximately $

    1,000

    of pension obligations and assets associated with defined benefit pension plans for approximately

    4,400

    United States retirees and beneficiaries, as well as lump sum settlements;
- Charges related to portfolio actions:
  - o $

    79

    for the agreement reached with the workers of the divested Avilés and La Coruña facilities to settle various legal disputes related to the 2019 divestiture (see Note S);
  - o $

    58

    for an asset impairment related to the sale of the Company's interest in MRN (see Note H); and,
  - o $

    29

    related to the closure of the previously curtailed magnesium smelter facility in Addy (Washington) (see below);
- Other charges and credits:
  - o $

    26

    to record additional environmental remediation and asset retirement obligations at previously closed sites (see Note R and Note S); and,
  - o $

    7

    net credit for revaluation of adjustments to take-or-pay contract reserves at a previously closed site and the Intalco smelter;
- Reversals:
  - o $

    83

    for the release of a valuation allowance on Brazil value added taxes (VAT) (see Note U); and,
  - o $

    34

    due to lower costs for demolition obligations and environmental remediation at previously closed sites (see Note S).

In July 2022, Alcoa made the decision to permanently close the previously curtailed magnesium smelter in Addy. The facility had been fully curtailed since 2001. The Company recorded a charge of $

29

to establish reserves for environmental remediation and demolition obligations in Restructuring and other charges, net on the Statement of Consolidated Operations in the third quarter of 2022.

Alcoa Corporation does not include Restructuring and other charges, net in the results of its reportable segments. The impact of allocating such charges to segment results would have been as follows:

	2024	2023	2022
Alumina	$ 287	$ 8	$ (27)
Aluminum	—	169	82
Segment total	287	177	55
Corporate	54	7	641
Total Restructuring and other charges, net	$ 341	$ 184	$ 696

Activity and reserve balances for restructuring charges were as follows:

	Severance and employee termination costs	Other costs	Total
Balances at December 31, 2021	$ 3	$ 90	$ 93
Restructuring charges, net	1	73	74
Cash payments	(2)	(37)	(39)
Reversals and other	(1)	(10)	(11)
Balances at December 31, 2022	1	116	117
Restructuring charges, net	11	55	66
Cash payments	(6)	(118)	(124)
Reversals and other	—	4	4
Balances at December 31, 2023	6	57	63
Restructuring charges, net	44	264	308
Cash payments	(38)	(145)	(183)
Reversals and other	1	(8)	(7)

Balances at December 31, 2024			
	$ 13	$ 168	$ 181

The activity and reserve balances include only Restructuring and other charges, net that impact the reserves for Severance and employee termination costs and Other costs. Restructuring and other charges, net that affected other accounts such as Investments (see Note H), Accrued pension benefits and Accrued other postretirement benefits (see Note O), Asset retirement obligations (see Note R), Environmental remediation (see Note S), and Other noncurrent assets (see Note U) are excluded from the above activity and balances. Reversals and other include reversals of previously recorded liabilities and foreign currency translation impacts.

The current portion of the reserve balance is reflected in Other current liabilities on the Consolidated Balance Sheet and the noncurrent portion of the reserve balance is reflected in Other noncurrent liabilities and deferred credits on the Consolidated Balance Sheet. The noncurrent portion of the reserve was $

8
and $

15
at December 31, 2024 and 2023, respectively.

E. Segment and Related Information

Segment Information

Alcoa Corporation is a producer of bauxite, alumina, and aluminum products. The Company has

two

operating and reportable segments: (i) Alumina and (ii) Aluminum. The primary measure of performance reported to Alcoa Corporation's President and Chief Executive Officer (identified as the Company's CODM) is Adjusted EBITDA (Earnings before interest, taxes, depreciation, and amortization) for each segment.

The Company calculates Segment Adjusted EBITDA as Total sales (third-party and intersegment) minus the following items: Cost of goods sold; Selling, general administrative, and other expenses; and Research and development expenses. Alcoa Corporation’s Segment Adjusted EBITDA may not be comparable to similarly titled measures of other companies. The CODM regularly reviews Segment Adjusted EBITDA to assess performance and allocate resources (including employees, property, and financial or capital resources) in the planning and strategic review process.

Segment assets include, among others, customer receivables (third-party and intersegment), inventories, properties, plants, and equipment, and equity investments. The accounting policies of the segments are the same as those described in the Summary of Significant Accounting Policies (see Note B). Transactions between segments are established based on negotiation between the parties. Differences between segment totals and Alcoa Corporation's consolidated totals for line items not reconciled are in Corporate.

The following are detailed descriptions of Alcoa Corporation's reportable segments:

Alumina. This segment represents the Company's worldwide refining system, including the mining of bauxite, which is then refined into alumina.

A portion of this segment's bauxite production represents the offtake from equity method investments in Brazil (prior to the MRN sale in April 2022) and Guinea, as well as Alcoa's share of bauxite production related to an equity investment in Saudi Arabia. Bauxite mined is primarily used internally within the Alumina segment; a portion of the bauxite is sold to external customers. Bauxite sales to third-parties are conducted on a contract basis.

The alumina produced by this segment is sold primarily to internal and external aluminum smelter customers; a portion of the alumina is sold to external customers who process it into industrial chemical products. Approximately two-thirds of Alumina's production is sold under supply contracts to third parties worldwide, while the remainder is used internally by the Aluminum segment. Alumina produced by this segment and used internally is transferred to the Aluminum segment at prevailing market prices. A portion of this segment's third-party sales are completed through alumina traders.

Generally, this segment's sales are transacted in U.S. dollars while costs and expenses are transacted in the local currency of the respective operations, which are the Australian dollar, the Brazilian real, and the euro. Most of the operations that comprise the Alumina segment are part of AWAC, which is now wholly-owned by Alcoa (see Principles of Consolidation in Note A).

This segment also includes Alcoa's

25.1
% ownership interest in a mining and refining joint venture company in Saudi Arabia (see Note H).

Aluminum. This segment consists of the Company's (i) worldwide smelting and casthouse system, which processes alumina into primary aluminum, and (ii) portfolio of energy assets in Brazil, Canada, and the United States.

Aluminum's combined smelting and casting operations produce primary aluminum products, nearly all of which are sold to external customers and traders. The smelting operations produce molten primary aluminum, which is then formed by the casting operations into either common alloy ingot (e.g., t-bar, sow, standard ingot) or into value-add ingot products (e.g., foundry, billet, rod, and slab). A variety of external customers purchase the primary aluminum products for use in fabrication operations, which produce products primarily for the transportation, building and construction, packaging, wire, and other industrial markets. Results from the sale of aluminum powder and scrap are also included in this segment, as well as the impacts of embedded aluminum derivatives (see Note P) related to energy supply contracts.

The energy assets supply power to external customers in Brazil and the United States, as well as internal customers in the Aluminum segment (Canadian smelters and Warrick (Indiana) smelter) and, to a lesser extent, the Alumina segment (Brazilian refineries).

Generally, this segment's aluminum sales are transacted in U.S. dollars while costs and expenses of this segment are transacted in the local currency of the respective operations, which are the U.S. dollar, the euro, the Norwegian krone, the Icelandic króna, the Canadian dollar, the Brazilian real, and the Australian dollar.

This segment also includes Alcoa Corporation's

25.1
% ownership interest in a smelting joint venture company in Saudi Arabia (see Note H).

The operating results, capital expenditures, and assets of Alcoa Corporation's reportable segments were as follows:

	Alumina	Aluminum	Total
2024			
Sales:			
Third-party sales	$ 4,662	$ 7,230	$ 11,892
Intersegment sales	2,263	16	2,279
Total sales	$ 6,925	$ 7,246	$ 14,171
Adjusted operating costs[1]	3,110	5,488	8,598
Other segment items[2]	2,407	1,101	3,508
Segment Adjusted EBITDA	$ 1,408	$ 657	$ 2,065
Supplemental information:			
Depreciation, depletion, and amortization	$ 348	$ 272	$ 620
Equity income (loss)	22	(5)	17
Capital expenditures	367	197	564
2023			
Sales:			
Third-party sales	$ 3,613	$ 6,925	$ 10,538
Intersegment sales	1,648	15	1,663
Total sales	$ 5,261	$ 6,940	$ 12,201
Adjusted operating costs[1]	3,487	5,281	8,768
Other segment items[2]	1,501	1,198	2,699
Segment Adjusted EBITDA	$ 273	$ 461	$ 734
Supplemental information:			
Depreciation, depletion, and amortization	$ 333	$ 277	$ 610
Equity loss	(48)	(106)	(154)
Capital expenditures	323	198	521
2022			
Sales:			

Third-party sales			
	$ 3,724	$ 8,735	$ 12,459
Intersegment sales			
	1,708	27	1,735
Total sales			
	$ 5,432	$ 8,762	$ 14,194
Adjusted operating costs[1]			
	3,745	5,603	9,348
Other segment items[2]			
	899	1,667	2,566
Segment Adjusted EBITDA			
	$ 788	$ 1,492	$ 2,280
Supplemental information:			
Depreciation, depletion, and amortization			
	$ 312	$ 283	$ 595
Equity (loss) income	(39)	48	9
Capital expenditures			
	320	153	473
2024			
Assets:			
Equity investments			
	$ 420	$ 546	$ 966
Total assets			
	6,138	6,129	12,267
2023			
Assets:			
Equity investments			
	$ 395	$ 569	$ 964
Total assets			
	6,153	5,854	12,007

(1) Adjusted operating costs include all production related costs for alumina or aluminum produced and shipped: raw materials consumed; conversion costs, such as labor, materials, and utilities; and plant administrative expenses.

(2) Other segment items include costs associated with trading activity, the Alumina segment's purchase of bauxite from offtake or other supply agreements, the Alumina segment's commercial shipping services, and the Aluminum segment's energy assets; other direct and non-production related charges; Selling, general administrative, and other expenses; and Research and development expenses.

The following tables reconcile certain segment information to consolidated totals:

	2024	2023	2022
Sales:			
Total segment sales	$ 14,171	$ 12,201	$ 14,194
Elimination of intersegment sales	(2,279)	(1,663)	(1,735)
Other	3	13	(8)
Consolidated sales	$ 11,895	$ 10,551	$ 12,451

	2024	2023	2022
Net income (loss) attributable to Alcoa Corporation:			
Total Segment Adjusted EBITDA	$ 2,065	$ 734	$ 2,280
Unallocated amounts:			
Transformation[1]	(62)	(80)	(66)
Intersegment eliminations	(231)	7	138
Corporate expenses[2]	(160)	(133)	(128)
Provision for depreciation, depletion, and amortization	(642)	(632)	(617)
Restructuring and other charges, net (D)	(341)	(184)	(696)
Interest expense (U)	(156)	(107)	(106)
Other (expenses) income, net (U)	(91)	(134)	118
Other[3]	(93)	(55)	(221)
Consolidated income (loss) before income taxes	289	(584)	702
Provision for income taxes (Q)	(265)	(189)	(664)
Net loss (income) attributable to noncontrolling interest	36	122	(161)
Consolidated net income (loss) attributable to Alcoa Corporation	$ 60	$ (651)	$ (123)

(1) Transformation includes, among other items, the Adjusted EBITDA of previously closed operations.

(2) Corporate expenses are composed of general administrative and other expenses of operating the corporate headquarters and other global administrative facilities, as well as research and development expenses of the corporate technical center.

(3) Other includes certain items that are not included in the Adjusted EBITDA of the reportable segments.

December 31,	2024	2023
Assets:		

Total segment assets	12,267	12,007
Elimination of intersegment receivables	$ (364)	$ (159)
Unallocated amounts:		
Cash and cash equivalents	1,138	944
Corporate fixed assets, net	366	392
Corporate goodwill	139	142
Deferred income taxes	284	333
Pension assets	128	125
Other	106	371
Consolidated assets	14,064	14,155
	$	$

Product Information

Alcoa Corporation has four product divisions as follows:

Bauxite—Bauxite is a reddish clay rock that is mined from the surface of the earth's terrain. This ore is the basic raw material used to produce alumina and is the primary source of aluminum.

Alumina—Alumina is an oxide that is extracted from bauxite and is the basic raw material used to produce primary aluminum. This product can also be consumed for non-metallurgical purposes, such as industrial chemical products.

Primary aluminum—Primary aluminum is metal in the form of a common alloy ingot or a value-add ingot (e.g., foundry, billet, rod, and slab). These products are sold primarily to customers that produce products for the transportation, building and construction, packaging, wire, and other industrial markets, and traders.

Energy—Energy is the generation of electricity, which is sold in the wholesale market to traders, large industrial consumers, distribution companies, and other generation companies.

The following table represents the general commercial profile of the Company's Bauxite, Alumina, and Primary aluminum product divisions (see text below table for Energy):

Product division	Pricing components	Shipping terms[3]	Payment terms[4]
Bauxite	Negotiated	FOB/CIF	LC Sight
Alumina:			
Smelter grade	API[1]/spot/fixed	FOB/CIF	LC Sight/CAD/Net 30 days
Non-metallurgical	Negotiated	FOB/CIF	Net 30 days
Primary aluminum:			
Common alloy ingot	LME + Regional premium[2]	DAP/CIF/DDP	Net 30 to 45 days
Value add ingot	LME + Regional premium + Product premium[2]	DAP/CIF/DDP	Net 30 to 45 days

(1) API (Alumina Price Index) is a pricing mechanism that is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price, Platts Metals Daily Alumina PAX Price, and FastMarkets Metal Bulletin Non-Ferrous Metals Alumina Index.

(2) LME (London Metal Exchange) is a globally recognized exchange for commodity trading, including aluminum. The LME pricing component represents the underlying base metal component, based on quoted prices for aluminum on the exchange. The regional premium represents the incremental price over the base LME component that is associated with the physical delivery of metal to a particular region (e.g., the Midwest premium for metal sold in the United States). The product premium represents the incremental price for receiving physical metal in a particular shape or alloy.

(3) CIF (cost, insurance, and freight) means that the Company pays for these items until the product reaches the buyer's designated destination point related to transportation by vessel. DAP (delivered at place) means the same as CIF related to all methods of transportation. FOB (free on board) means that the Company pays for costs, insurance, and freight until the product reaches the seller's designated shipping point. DDP (delivered duty paid) means that the Company pays for all costs and risks, including export and import clearance, transport costs, and customs formalities, until the product reaches the buyer's designated destination point.

(4) The net number of days means that the customer is required to remit payment to the Company for the invoice amount within the designated number of days. LC Sight is a letter of credit that is payable immediately (usually within five to ten business days) after a seller meets the requirements of the letter of credit (i.e. shipping documents that evidence the seller performed its obligations as agreed to with a buyer). CAD (cash against documents) is a payment arrangement in which a seller instructs a bank to provide shipping and title documents to the buyer at the time the buyer pays in full the accompanying bill of exchange.

For the Company's Energy product division, sales of electricity are based on current market prices. Electricity is provided to customers on demand through a national or regional power grid; the customer simultaneously receives and consumes the electricity. Payment terms are generally within 10 days related to the previous 30 days of electricity consumption.

The following table details Alcoa Corporation's Sales by product division:

	2024	2023	2022
Sales:			
Aluminum	$ 7,359	$ 7,045	$ 8,887
Alumina	4,246	3,103	3,478
Bauxite	376	466	168
Energy	147	118	201
Other[1]	(233)	(181)	(283)
	$ 11,895	$ 10,551	$ 12,451

(1) Other includes realized gains and losses related to embedded derivative instruments designated as cash flow hedges of forward sales of aluminum (see Note P).

Geographic Area Information

Geographic information for Third-party sales was as follows (based upon the country where the point of sale originated):

	2024	2023	2022
Sales:			
United States[1]	$ 5,365	$ 4,993	$ 5,462
Australia	3,128	2,240	2,742
Netherlands[2]	2,193	2,261	3,031
Brazil	878	735	527
Spain	293	289	618
Other	38	33	71
	$ 11,895	$ 10,551	$ 12,451

(1) Sales of a portion of the alumina from refineries in Australia and Brazil, most of the aluminum from smelters in Canada, and aluminum off-take related to an interest in the Saudi Arabia joint venture (see Note H), occurred in the United States.

(2) Sales of aluminum from smelters in Iceland and Norway occurred in the Netherlands.

Geographic information for long-lived assets was as follows (based upon the physical location of the assets):

December 31,	2024	2023
Long-lived assets:		
Australia	$ 1,947	$ 2,046
Brazil	1,354	1,550
Canada	903	896
Iceland	901	950
United States	749	780
Norway	288	310
Spain	244	250
Other	3	3
	$ 6,389	$ 6,785

F. Earnings Per Share

Following the issuance of preferred stock on August 1, 2024 (see Note N), basic earnings per share (EPS) is calculated using the two-class method. Under the two-class method, earnings are allocated to Alcoa common stock and preferred stock based on the pro-rata share of each class outstanding. Diluted EPS assumes the issuance of common stock for all potentially dilutive share equivalents outstanding. Diluted EPS is calculated under both the two-class and if-converted methods, and the more dilutive amount is reported.

In 2024, dividends paid on preferred stock were $

1
and undistributed earnings of $

3
were allocated to preferred stock under the two-class method.

The share information used to compute basic and diluted EPS attributable to Alcoa Corporation common shareholders was as follows (shares in millions):

	2024	2023	2022
Average shares outstanding—basic	212	178	181
Effect of dilutive securities:			
Stock options	—	—	—
Stock units	2	—	—
Average shares outstanding—diluted	214	178	181

In 2023, basic average shares outstanding and diluted average shares outstanding were the same because the effect of potential shares of common stock was anti-dilutive. Had Alcoa generated net income in 2023,

three
million common share equivalents related to

three
million outstanding stock units and stock options combined would have been included in diluted average shares outstanding for the period.

In 2022, basic average shares outstanding and diluted average shares outstanding were the same because the effect of potential shares of common stock was anti-dilutive. Had Alcoa generated net income in 2022,

three
million common share equivalents related to

five
million outstanding stock units and stock options combined would have been included in diluted average shares outstanding for the period.

G. Accumulated Other Comprehensive Loss

The following table details the activity of the three components that comprise Accumulated other comprehensive loss for both Alcoa Corporation's shareholders and Noncontrolling interest:

	Alcoa Corporation			Noncontrolling interest		
	2024	2023	2022	2024	2023	2022
Pension and other postretirement benefits (O)						
Balance at beginning of period	$ (62)	$ (882)	$ (15)	$ (5)	$ (13)	
Other comprehensive (loss) income:						
Unrecognized net actuarial gain/loss and prior service cost/benefit	(17)	(112)	263	5	(13)	7
Tax (expense) benefit[2]	(4)	17	(42)	(2)	2	—
Total Other comprehensive (loss) income before reclassifications, net of tax	(21)	(95)	221	3	(11)	7
Amortization of net actuarial gain/loss and prior service cost/benefit[1]	21	39	723	1	1	1
Tax expense[2]	—	(6)	—	—	—	—
Total amount reclassified from Accumulated other comprehensive loss, net of tax[7]	21	33	723	1	1	1
Total Other comprehensive (loss) income	—	(62)	944	4	(10)	8
Acquisition of noncontrolling interest (C)	(11)	—	—	11	—	—
Balance at end of period	$ (11)	$ —	$ 62	$ —	$ (15)	$ (5)
Foreign currency translation						
Balance at beginning of period	$ (2,593)	$ (2,685)	$ (2,614)	$ (983)	$ (1,040)	$ (937)
Other comprehensive (loss) income	(513)	92	(71)	(105)	57	(103)
Acquisition of noncontrolling interest (C)	(1,088)	—	—	1,088	—	—
Balance at end of period	$ (4,194)	$ (2,593)	$ (2,685)	$ —	$ (983)	$ (1,040)
Cash flow hedges (P)						
Balance at beginning of period	$ (1,052)	$ (916)	$ (1,096)	$ —	$ 1	$ (1)
Other comprehensive (loss) income:						
Net change from periodic revaluations	(93)	(295)	(119)	—	—	2
Tax benefit[2]	7	70	43	—	—	—
Total Other comprehensive (loss) income before reclassifications, net of tax	(86)	(225)	(76)	—	—	2
Net amount reclassified to earnings:						

Aluminum contracts[3]	290	181	316	—	—	—
Financial contracts[4]	—	(20)	—	—	—	—
Interest rate contracts[5]	(1)	(5)	5	—	(1)	—
Foreign exchange contracts[6]	(1)	(26)	(5)	—	—	—
Sub-total	288	130	316	—	(1)	—
Tax expense[2]	(55)	(41)	(60)	—	—	—
Total amount reclassified from Accumulated other comprehensive loss, net of tax[7]	233	89	256	—	(1)	—
Total Other comprehensive income (loss)	147	(136)	180	—	(1)	2
Balance at end of period	$ (905)	$ (1,052)	$ (916)	$ —	$ —	$ 1
Total Accumulated other comprehensive loss	$ (5,110)	$ (3,645)	$ (3,539)	$ —	$ 998	$ (1,044)

(1) These amounts were included in the computation of net periodic benefit cost for pension and other postretirement benefits. The amounts related to settlements and/or curtailments of certain pension and other postretirement benefits for Alcoa Corporation include ($ 1), $ 21, and $ 633 for the years ended December 31, 2024, 2023, and 2022, respectively (see Note O). The amounts related to settlements and/or curtailments of certain pension and other postretirement benefits for Noncontrolling interest were immaterial for the years ended December 31, 2024, 2023, and 2022.

(2) These amounts were reported in Provision for income taxes on the accompanying Statement of Consolidated Operations.

(3) These amounts were reported in Sales on the accompanying Statement of Consolidated Operations.

(4) These amounts were reported in Cost of goods sold on the accompanying Statement of Consolidated Operations.

(5) These amounts were included in Other expenses (income), net on the accompanying Statement of Consolidated Operations.

(6) In 2024, $ 1 was reported in Cost of goods sold and ($ 2) was reported in Sales on the accompanying Statement of Consolidated Operations. In 2023, $ 5 was reported in Cost of goods sold and ($ 31) was reported in Sales on the accompanying Statement of Consolidated Operations. In 2022, $ 5 was reported in Cost of goods sold and ($ 10) was reported in Sales on the accompanying Statement of Consolidated Operations.

(7) A positive amount indicates a corresponding charge to earnings and a negative amount indicates a corresponding benefit to earnings.

H. Investments

December 31,	2024	2023
Equity investments	$ 970	$ 969
Other investments	10	10
	$ 980	$ 979

Equity Investments. The following table summarizes information of Alcoa Corporation's equity investments as of December 31, 2024 and 2023 . In 2024, 2023, and 2022, Alcoa Corporation received $

37
, $

51
, and $

127
, respectively, in dividends from these equity investments. Each of the investees either owns the facility listed or has an ownership interest in an entity that owns the facility listed:

Investee	Country	Nature of investment	Income Statement Location of Equity Earnings	Ownership interest
Ma'aden Aluminium Company	Saudi Arabia	Aluminum smelter and casthouse	Other expenses (income), net	25.1 %
Ma'aden Bauxite and Alumina Company	Saudi Arabia	Bauxite mine and alumina refinery	Other expenses (income), net	25.1 %
Halco Mining, Inc.	Guinea	Bauxite mine	Cost of goods sold	45 %
Energética Barra Grande S.A.	Brazil	Hydroelectric generation facility	Cost of goods sold	42.18 %
Pechiney Reynolds Quebec, Inc.	Canada	Aluminum smelter	Cost of goods sold	50 %
Serra do Facão Energia S/A	Brazil	Hydroelectric generation facility	Cost of goods sold	34.97 %
Manicouagan Power Limited Partnership	Canada	Hydroelectric generation facility	Cost of goods sold	40 %
Elysis™ Limited Partnership	Canada	Aluminum smelting technology	Other expenses (income), net	48.235 %

Saudi Arabia Joint Venture—Alcoa Corporation and Ma'aden have a 30 -year (from December 2009) joint venture shareholders agreement (automatic extension for an additional 20 years, unless the parties agree otherwise or unless earlier terminated) setting forth the terms for the development, construction, ownership, and operation of an integrated aluminum complex in Saudi Arabia. The joint venture complex includes a bauxite mine from the Al Ba'itha bauxite deposit in the northern part of Saudi Arabia, an alumina refinery, and a primary aluminum smelter.

The joint venture is owned

74.9
% by Ma'aden and

25.1
% by Alcoa Corporation and is currently comprised of two entities: the bauxite mine and alumina refinery (Ma'aden Bauxite and Alumina Company; MBAC) and the smelter (Ma'aden Aluminium Company; MAC).

On September 15, 2024, Alcoa entered into a share purchase and subscription agreement with Ma'aden, pursuant to which Alcoa agreed to sell its full ownership interest of

25.1
% in MBAC and MAC to Ma'aden in exchange for issuance by Ma'aden of

85,977,547
shares and $

150
in cash (see Note C).

The results for the Saudi Arabia joint venture for the year ended December 31, 2022 include a charge related to a dispute with an industrial utility for periods in 2021 and 2022. Alcoa's share of this charge was $

21
which is included in Other expenses (income), net on the Statement of Consolidated Operations for the year ended December 31, 2022. The results for the Saudi Arabia joint venture for the year ended December 31, 2023 include an adjustment to the estimate for the settlement of this dispute. Alcoa's share of this adjustment is $

41
which is included in Other expenses (income), net on the Statement of Consolidated Operations for the year ended December 31, 2023. As of December 31, 2024 and 2023, the carrying value of Alcoa's investment in this joint venture was $

544
and $

533
, respectively.

ELYSIS Limited Partnership—In June 2018, Alcoa Corporation, Rio Tinto Alcan Inc. (Rio Tinto), and Investissement Québec, a company wholly-owned by the Government of Québec, Canada, launched the ELYSIS Limited Partnership (ELYSIS). The purpose of ELYSIS is to advance larger scale development and commercialization of its patent-protected technology that eliminates direct greenhouse gas emissions from the traditional aluminum smelting process and, instead, emits oxygen. Alcoa and Rio Tinto, as general partners, each own a

48.235

% stake in ELYSIS, and Investissement Québec, as a limited partner, owns a

3.53
% stake.

Through December 31, 2024, the Company has contributed $

152
(C$

202
) toward its investment commitment in ELYSIS. The Company's basis in the investment has been reduced to

zero
for its share of losses incurred to date. In addition to cash contributions, Alcoa is contributing approximately $

3
annually to cover overhead expenses incurred by Alcoa and charged to the joint venture. As a result, the Company has $

67
in unrecognized losses as of December 31, 2024 that will be recognized upon additional contributions into the partnership.

The following table summarizes the profit and loss data for the respective periods ended December 31, as it relates to Alcoa Corporation's equity investments. Information shown for the Saudi Arabia Joint Venture for all periods presented includes the combined balances for MAC and MBAC. The investments are grouped based on the nature of the investment. The Mining investments are part of the Alumina segment, while the Energy and Other investments are primarily part of the Aluminum segment.

	Saudi Arabia Joint Venture	Mining	Energy	Other
2024				
Sales	$ 3,328	$ 573	$ 240	$ 463
Cost of goods sold	2,681	432	107	419
Net income (loss)	134	26	112	(68)
Equity in net income (loss) of affiliated companies, before reconciling adjustments	34	12	44	(32)
Other	(21)	—	(6)	9
Alcoa Corporation's equity in net income (loss) of affiliated companies	13	12	38	(23)
2023				
Sales	$ 2,726	$ 670	$ 236	$ 464
Cost of goods sold	2,550	446	118	425
Net (loss) income	(457)	50	100	(97)
Equity in net (loss) income of affiliated companies, before reconciling adjustments	(115)	23	39	(46)
Other	(43)	—	1	(9)
Alcoa Corporation's equity in net (loss) income of affiliated companies	(158)	23	40	(55)
2022				
Sales	$ 3,317	$ 763	$ 252	$ 488
Cost of goods sold	2,696	488	120	445
Net income (loss)	42	110	109	(75)
Equity in net income (loss) of affiliated companies, before reconciling adjustments	11	39	41	(36)
Other	(7)	(2)	(3)	15
Alcoa Corporation's equity in net income (loss) of affiliated companies	4	37	38	(21)

The following table summarizes the balance sheet data for the respective periods ended December 31, as it relates to Alcoa Corporation's equity investments.

	Saudi Arabia Joint Venture	Mining	Energy	Other
2024				
Current assets	$ 1,456	$ 4	$ 99	$ 177
Noncurrent assets	7,035	454	240	777
Current liabilities	1,227	4	16	85
Noncurrent liabilities	4,534	35	35	120
2023				
Current assets	$ 1,433	$ 8	$ 103	$ 181
Noncurrent assets	6,958	419	310	764
Current liabilities	1,444	5	16	89
Noncurrent liabilities	4,272	24	34	117

On February 15, 2022, the Company signed an agreement to sell its share of its investment in MRN in Brazil for $

10

to South32 Minerals S.A. Related to this transaction, the Company recorded an asset impairment of $

58

in the first quarter of 2022 in Restructuring and other charges, net on the Statement of Consolidated Operations. On April 30, 2022, Alcoa completed the sale of its investment in MRN. An additional $

30

in cash could be paid to the Company in the future if certain post-closing conditions related to future MRN mine development are satisfied.

I. Receivables

In November 2024, a wholly-owned special purpose entity (SPE) of the Company amended an agreement with a financial institution to increase the amount of certain customer receivables that can be transferred without recourse on a revolving basis from $

130
to $

150
and to extend the maturity to November 14, 2025. The agreement was initially entered into in 2023. Company subsidiaries sell customer receivables to the SPE, which then transfers the receivables to the financial institution. The Company does not maintain effective control over the transferred receivables, and therefore accounts for the transfers as sales of receivables.

Alcoa Corporation guarantees the performance obligations of the Company subsidiaries, and unsold customer receivables are pledged as collateral to the financial institution to secure the sold receivables. The SPE held unsold customer receivables of $

247
and $

104
pledged as collateral against the sold receivables as of December 31, 2024 and 2023, respectively.

The Company continues to service the customer receivables that were transferred to the financial institution. As Alcoa collects customer payments, the SPE transfers additional receivables to the financial institution rather than remitting cash.

In 2024, the Company sold gross customer receivables of $

1,186
, and reinvested collections of $

1,170
from previously sold receivables, resulting in net cash proceeds from the financial institution of $

16
.

In 2023, the Company sold gross customer receivables of $

591
, and reinvested collections of $

477
from previously sold receivables, resulting in net cash proceeds from the financial institution of $

114
.

Cash collections from previously sold receivables yet to be reinvested of $

50
and $

99
were included in Accounts payable, trade on the accompanying Consolidated Balance Sheet as of December 31, 2024 and 2023, respectively. Cash received from sold receivables under the agreement are presented within operating activities in the Statement of Consolidated Cash Flows.

J. Inventories

December 31,	2024	2023
Finished goods	$ 406	$ 355
Work-in-process	251	287
Bauxite and alumina	551	586
Purchased raw materials	546	700
Operating supplies	244	230
	$ 1,998	$ 2,158

K. Properties, Plants, and Equipment, Net

December 31,	2024	2023

Land and land rights, including mines		
	233	257
Structures (by type of operation):		
Bauxite mining and alumina refining		
	3,736	4,085
Aluminum smelting and casting		
	3,214	3,274
Energy generation		
	334	380
Other		
	344	357
	7,628	8,096
Machinery and equipment (by type of operation):		
Bauxite mining and alumina refining		
	4,218	4,352
Aluminum smelting and casting		
	5,551	5,781
Energy generation		
	855	869
Other		
	453	457
	11,077	11,459
	18,938	19,812
Less: accumulated depreciation, depletion, and amortization		
	13,161	13,596
	5,777	6,216
Construction work-in-progress		
	612	569
	6,389	6,785

L. Goodwill and Other Intangible Assets

Goodwill, which is included in Other noncurrent assets on the accompanying Consolidated Balance Sheet, was as follows:

December 31,	2024	2023
Alumina	$ 3	$ 4
Aluminum	—	—
Corporate[1]	139	142
	$ 142	$ 146

(1) The carrying value of Corporate's goodwill is net of accumulated impairment losses of $ 742 as of both December 31, 2024 and 2023. As of December 31, 2024, the $ 139 of goodwill reflected in Corporate is allocated to Alcoa Corporation's Alumina reportable segment for purposes of impairment testing (see Note B). This goodwill is reflected in Corporate for segment reporting purposes because it is not included in management's assessment of performance by the reportable segment. Changes in the carrying amount of goodwill were attributable to foreign currency translation as of December 31, 2024 and 2023.

Management performed a quantitative assessment for the Alumina reporting unit in the fourth quarter 2024. The estimated fair value of the Alumina reporting unit was substantially in excess of its carrying value, resulting in no impairment.

Other intangible assets, which are included in Other noncurrent assets on the accompanying Consolidated Balance Sheet, were as follows:

December 31,	2024 Gross carrying amount	2024 Accumulated amortization	2024 Net carrying amount	2023 Gross carrying amount	2023 Accumulated amortization	2023 Net carrying amount
Computer software	$ 203	$ (190)	$ 13	$ 207	$ (194)	$ 13
Patents and licenses	25	(11)	14	25	(10)	15
Other intangibles	20	(11)	9	21	(12)	9
Total other intangible assets	$ 248	$ (212)	$ 36	$ 253	$ (216)	$ 37

Computer software consists primarily of software costs associated with the enterprise business solution within Alcoa to drive common systems among all businesses.

Amortization expense related to the intangible assets in the table above for the years ended December 31, 2024, 2023, and 2022 was $ 5, $ 5, and $ 7, respectively, and is expected to be approximately $

annually from 2025 to 2029.

M. Debt

Short-term Borrowings.

December 31,	2024	2023
Short-term borrowings		
	$ 50	$ 56

Short-term borrowings are reported in Other current liabilities on the accompanying Consolidated Balance Sheet.

Inventory Repurchase Agreements

The Company entered into inventory repurchase agreements whereby the Company sold aluminum to a third party and agreed to subsequently repurchase substantially similar inventory. The Company did not record sales upon each shipment of inventory and the net cash received of $

50
and $

56
related to these agreements was recorded in Short-term borrowings within Other current liabilities on the Consolidated Balance Sheet as of December 31, 2024 and December 31, 2023, respectively. The associated inventory sold was reflected in Prepaid expenses and other current assets on the Consolidated Balance Sheet as of December 31, 2024 and December 31, 2023, respectively.

For the year ended December 31, 2024, the Company recorded borrowings of $

88
and repurchased $

94
of inventory related to these agreements. For the year ended December 31, 2023, the Company recorded borrowings of $

117
and repurchased $

61
of inventory related to these agreements.

The cash received and subsequently paid under the inventory repurchase agreements is included in Cash provided from financing activities on the Statement of Consolidated Cash Flows for the year-ended December 31, 2024.

Long-term Debt.

December 31,	2024	2023
5.500% Notes, due 2027	$ 750	$ 750
6.125% Notes, due 2028	500	500
4.125% Notes, due 2029	500	500
7.125% Notes, due 2031	750	—
Other	76	82
Unamortized discounts and deferred financing costs	(31)	(21)
Total	2,545	1,811
Less: amount due within one year	75	79
Long-term debt, less amount due within one year	$ 2,470	$ 1,732

The principal amount of long-term debt maturing in each of the next five years is: $

75
in 2025, $

1
in 2026, $

750
in 2027, $

500
in 2028, and $

500
in 2029. At December 31, 2024, Other includes $

74
related to a term loan that matures in May 2025 .

144A Debt.

2031 Notes. In March 2024, Alcoa Nederland Holding B.V. (ANHBV), a wholly-owned subsidiary of Alcoa Corporation, completed a Rule 144A (U.S. Securities Act of 1933, as amended) debt issuance for $

750
aggregate principal amount of

7.125

% Senior Notes due 2031 (the 2031 Notes), which carry a green bond designation, with the following terms:

- Net proceeds were approximately $

737

, reflecting a discount to the initial purchasers as well as issuance costs. The discount, as well as costs to complete the financing, were deferred and are being amortized to interest expense over the term;
- Interest is paid semi-annually in March and September, which commenced September 15, 2024 ;
- Indenture contains customary affirmative and negative covenants, see below;
- Option to redeem on at least 10 days, but not more than 60 days, prior notice to the holders under multiple scenarios, including, in whole or in part, at any time, or from time to time on and after March 15, 2027, at the redemption price up to

103.563

% of the principal amount, plus any accrued and unpaid interest; and,
- Subject to repurchase upon the occurrence of a change in control repurchase event (as defined in the indenture) at a repurchase price in cash equal to

101

% of the aggregate principal amount of the notes repurchased, plus any accrued and unpaid interest.

The Company is utilizing the net proceeds to finance and/or refinance, in whole or in part, new and/or existing qualifying projects on a two-year look back and three-year look forward that meet certain eligibility criteria within its Green Finance Framework. The net proceeds also support the Company's cash position and ongoing cash needs, including with respect to its previously announced portfolio actions.

2029 Notes. In March 2021, ANHBV, a wholly-owned subsidiary of Alcoa Corporation, completed a Rule 144A debt issuance for $

500

aggregate principal amount of

4.125

% Senior Notes due 2029 (the 2029 Notes) with the following terms:

- Net proceeds were approximately $

493

, reflecting a discount to the initial purchasers as well as issuance costs. The discount, as well as costs to complete the financing, were deferred and are being amortized to interest expense over the term;
- Interest is paid semi-annually in March and September, which commenced September 30, 2021 ;
- Indenture contains customary affirmative and negative covenants, see below;
- Option to redeem on at least 10 days, but not more than 60 days, prior notice to the holders under multiple scenarios, including, in whole or in part, at any time, or from time to time after March 31, 2024, at a redemption price up to

102.063

% of the principal amount, plus any accrued and unpaid interest; and,
- Subject to repurchase upon the occurrence of a change in control repurchase event (as defined in the indenture) at a repurchase price in cash equal to

101

% of the aggregate principal amount of the notes repurchased, plus any accrued and unpaid interest.

The Company used the net proceeds of the 2029 Notes, together with cash on hand, to contribute $

500

to its U.S. defined benefit pension plans applicable to salaried and hourly employees on April 1, 2021 (see Note O), to redeem in full $

750

aggregate principal amount of the Company's outstanding

6.75

% Senior Notes due 2024 on April 7, 2021, and to pay transaction-related fees and expenses.

2027 Notes. In July 2020, ANHBV completed a Rule 144A debt issuance for $

750

aggregate principal amount of

5.500

% Senior Notes due 2027 (the 2027 Notes) with the following terms:

- Net proceeds were approximately $

736

, reflecting a discount to the initial purchasers as well as issuance costs. The discount, as well as costs to complete the financing, were deferred and are being amortized to interest expense over the term;
- Interest is paid semi-annually in June and December, which commenced on December 15, 2020 ;
- Indenture contains customary affirmative and negative covenants, see below;
- Option to redeem on at least 15 days, but not more than 60 days, prior notice to the holders under multiple scenarios, including, in whole or in part, at any time, or from time to time after June 15, 2023, at a redemption price up to

102.750

% of the principal amount, plus any accrued and unpaid interest; and,
- Subject to repurchase upon the occurrence of a change in control repurchase event (as defined in the indenture) at a repurchase price in cash equal to

101

% of the aggregate principal amount of the notes repurchased, plus any accrued and unpaid interest.

The Company used the net proceeds of the 2027 Notes for general corporate purposes, including adding cash to its balance sheet.

2028 Notes. In May 2018, ANHBV completed a Rule 144A debt issuance for $

500

aggregate principal amount of

6.125

% Senior Notes due 2028 (the 2028 Notes) with the following terms:

- Net proceeds were approximately $

492

, reflecting a discount to the initial purchasers as well as issuance costs. The discount, as well as costs to complete the financing, were deferred and are being amortized to interest expense over the term;
- Interest is paid semi-annually in November and May, which commenced November 15, 2018 ;
- Indenture contains customary affirmative and negative covenants, see below;
- Option to redeem on at least 30 days, but not more than 60 days, prior notice to the holders under multiple scenarios, including, in whole or in part, at any time, or from time to time after May 2023, at a redemption price up to

103.063

% of the principal amount, plus any accrued and unpaid interest; and,
- Subject to repurchase upon the occurrence of a change in control repurchase event (as defined in the indenture) at a repurchase price in cash equal to

101

% of the aggregate principal amount of the notes repurchased, plus any accrued and unpaid interest.

The Company used the net proceeds of the 2028 Notes, together with cash on hand, to make discretionary contributions to certain U.S. defined benefit pension plans.

The indentures governing the 2027 Notes, the 2028 Notes, the 2029 Notes, and the 2031 Notes contain customary affirmative and negative covenants, such as limitations on liens, limitations on sale and leaseback transactions, and a prohibition on a reduction in the ownership of AWAC entities below an agreed level. The negative covenants in the indentures are less extensive than those in the Revolving Credit Facility (see below). For example, the indentures do not include a limitation on restricted payments, such as repurchases of common stock and dividends to stockholders.

The 2027 Notes, the 2028 Notes, the 2029 Notes, and the 2031 Notes are senior unsecured obligations of ANHBV and do not entitle the holders to any registration rights pursuant to a registration rights agreement. ANHBV does not intend to file a registration statement with respect to resales of or an exchange offer for the notes. The notes are guaranteed on a senior unsecured basis by Alcoa Corporation and its subsidiaries that are guarantors under the Revolving Credit Facility (the "subsidiary guarantors" and, together with Alcoa Corporation, the "guarantors"). Each of the subsidiary guarantors will be released from their guarantees upon the occurrence of certain events, including the release of such guarantor from its obligations as a guarantor under the Revolving Credit Facility.

The 2027 Notes, the 2028 Notes, the 2029 Notes, and the 2031 Notes rank equally in right of payment with each other and with all of ANHBV'S existing and future senior unsecured indebtedness; rank senior in right of payment to any future subordinated obligations of ANHBV; and are effectively subordinated to ANHBV's existing and future secured indebtedness, including under the Revolving Credit Facility, to the extent of the value of property and assets securing such

indebtedness. The guarantees of the notes rank equally in right of payment with each other and with all the guarantors' existing and future senior unsecured indebtedness; rank senior in right of payment to any future subordinated obligations of the guarantors; and are effectively subordinated to the guarantors' existing and future secured indebtedness, including under the Revolving Credit Facility, to the extent of the value of property and assets securing such indebtedness.

Credit Facilities.

Revolving Credit Facility

The Company and ANHBV, a wholly-owned subsidiary of Alcoa Corporation and the borrower, have a $

1,250

revolving credit and letter of credit facility in place for working capital and/or other general corporate purposes (the Revolving Credit Facility). The Revolving Credit Facility, established in September 2016, most recently amended and restated in June 2022 and amended in January 2024, is scheduled to mature in June 2027. Subject to the terms and conditions under the Revolving Credit Facility, the Company or ANHBV may borrow funds or issue letters of credit. Further, the Revolving Credit Facility contains financial covenants and customary affirmative and negative covenants (applicable to Alcoa Corporation and certain subsidiaries described as restricted), that, subject to certain exceptions, include limitations on (among other things): indebtedness, liens, investments, sales of assets, restricted payments, entering into restrictive agreements, a covenant prohibiting reductions in the ownership of AWAC entities, and certain other specified restricted subsidiaries of Alcoa Corporation, below an agreed level. The Revolving Credit Facility also contains customary events of default, including failure to make payments under the Revolving Credit Facility, cross-default and cross-judgment default, and certain bankruptcy and insolvency events.

On January 17, 2024, Alcoa Corporation, ANHBV, and certain subsidiaries of the Company entered into Amendment No. 1 (Amendment No. 1) to the Revolving Credit Facility (Amended Revolving Credit Facility). The Amended Revolving Credit Facility provides additional flexibility to the Company and the Borrower by temporarily (i) reducing the minimum interest coverage ratio required thereunder from

4.00

to 1.00 to

3.00

to 1.00 and (ii) providing for a maximum addback for cash restructuring charges in Consolidated EBITDA (as defined in the Revolving Credit Facility) of $

450

, in each case for the 2024 fiscal year. As of January 1, 2025, the minimum interest coverage ratio requirement reverted to

4.00

to 1.00 and the maximum addback for cash restructuring charges in Consolidated EBITDA reverted to

15

% of Consolidated EBITDA. The requirement that the Company maintain a debt to capitalization ratio not to exceed

.60

to 1.00 was not changed by Amendment No. 1.

In connection with Amendment No. 1, the Company also agreed to provide collateral for its obligations under the Amended Revolving Credit Facility, which requires it to execute all security documents to re-secure collateral under the Amended Revolving Credit Facility by, subject to certain exceptions, a first priority security interest in substantially all assets of the Company, the Borrower, the material domestic wholly-owned subsidiaries of the Company, and the material foreign wholly-owned subsidiaries of the Company located in Australia, Brazil, Canada, Luxembourg, the Netherlands, Norway, and Switzerland including equity interests of certain subsidiaries that directly hold equity interests in AWAC entities.

After January 1, 2025, the Company may obtain a release of the collateral if the Company or the Borrower (as applicable) (i) has at least two of the following three designated ratings: (x) Baa3 from Moody's Investor Service (Moody's), (y) BBB- from Standard and Poor's (S&P) Global Ratings and (z) BBB- from Fitch Ratings and (ii) does not have any designated rating lower than: (x) Ba1 from Moody's, (y) BB+ from S&P Global Ratings and (z) BB+ from Fitch Ratings.

The Amended Revolving Credit Facility contains customary affirmative covenants, negative covenants, and events of default substantially comparable to the Revolving Credit Facility (other than those that are described above and other minor changes). The representations, warranties and covenants contained in the Amended Revolving Credit Facility were made only for purposes of Amendment No. 1 and as of specific dates and were solely for the benefit of the parties to the Amended Revolving Credit Facility.

As of December 31, 2024, the Company was in compliance with all financial covenants. The Company may access the entire amount of commitments under the Revolving Credit Facility. There were

no

borrowings outstanding at December 31, 2024 and 2023, and

no

amounts were borrowed during 2024 and 2023 under the Revolving Credit Facility.

Japanese Yen Revolving Credit Facility

In April 2023, the Company entered into a one-year unsecured revolving credit facility for $

250

(available to be drawn in Japanese yen) (the Japanese Yen Revolving Credit Facility). Subject to the terms and conditions under the facility, the Company or ANHBV may borrow funds. The facility included covenants that are substantially the same as those included in the Revolving Credit Facility.

On January 17, 2024, Alcoa Corporation and ANHBV, entered into Amendment No. 1 to the Japanese Yen Revolving Credit Facility (Amended Japanese Yen Revolving Credit Facility) which contains changes that are substantially the same as those included in the Amended Revolving Credit Facility (as described above). Also in connection with this amendment, the Company agreed to provide collateral for its obligations with the same conditions as the Amended Revolving Credit Facility. On April 26, 2024, the Company entered into an amendment extending the maturity of the Japanese Revolving Credit Facility to April 2025.

As of December 31, 2024, the Company was in compliance with all financial covenants. The Company may access the entire amount of commitments under the facility. There were

no

borrowings outstanding at December 31, 2024 and 2023. During 2024, $

201
(

29,686
JPY) was borrowed and $

196
(

29,686
JPY) was repaid. During 2023, $

10

(

1,495

JPY) was borrowed and repaid.

Alumina Limited Revolving Credit Facility

In connection with the acquisition of Alumina Limited (see Note C), the Company assumed $

385
of indebtedness as of August 1, 2024, representing the amount drawn on Alumina Limited's revolving credit facility.

At acquisition, the Alumina Limited revolving credit facility had tranches maturing in October 2025 ($

100
), January 2026 ($

150
), July 2026 ($

150
), and June 2027 ($

100
). In August 2024, Alcoa cancelled the undrawn portions of the revolving credit facility maturing in July 2026 ($

15
) and June 2027 ($

100
). In November 2024, pursuant to the terms of the Alumina Limited revolving credit facility, Alcoa voluntarily repaid all accrued and unpaid amounts outstanding under the revolving credit facility, totaling $

385
and, as of the same date, cancelled the outstanding lender tranche commitments ($

385
). As a result of the repayment and cancellation of undrawn amounts, the Alumina Limited revolving credit facility agreement was effectively terminated. No early termination penalties or prepayment premiums were incurred by Alcoa in connection with the termination of the Alumina Limited revolving credit facility.

N. Preferred and Common Stock

Preferred Stock. Alcoa Corporation is authorized to issue

100,000,000
shares of preferred stock at a par value of $

0.01
per share. In connection with the acquisition of Alumina Limited (see Note C), on July 31, 2024, the Company's Board of Directors created and authorized

10,000,000
shares of non-voting preferred stock designated as "Series A convertible preferred stock" with a par value of $

0.01
per share. At the transaction closing, Alumina Shares outstanding were exchanged for

4,041,989
shares of Alcoa Series A convertible preferred stock. As of December 31, 2024, the Company had

4,041,989

issued and outstanding shares of Series A convertible preferred stock. At December 31, 2023, the Company had

no
issued preferred stock.

Common Stock. Alcoa Corporation is authorized to issue

750,000,000
shares of common stock at a par value of $

0.01
per share. In connection with the acquisition of Alumina Limited (see Note C), Alumina Shares outstanding were exchanged for

78,772,422
shares of Alcoa common stock. As of December 31, 2024 and 2023, Alcoa Corporation had

258,360,908

and

178,472,464

, respectively, issued and outstanding shares of common stock.

Under its employee stock-based compensation plan, the Company issued shares of

1,116,022
in 2024,

1,503,373
in 2023, and

1,434,543
in 2022. The Company issues new shares to satisfy the exercise of stock options and the conversion of stock units. As of December 31, 2024,

19,409,409
shares of common stock were available for issuance.

Common Stock Repurchase Program

In October 2021, Alcoa Corporation’s Board of Directors approved a common stock repurchase program for the Company to purchase shares of its outstanding common stock up to an aggregate transactional value of $

500
, depending on cash availability, market conditions, and other factors.

In July 2022, Alcoa Corporation's Board of Directors approved an additional common stock repurchase program under which the Company may purchase shares of its outstanding common stock up to an aggregate transactional value of $

500
, depending on the Company’s continuing analysis of market, financial, and other factors (the July 2022 authorization). Prior to this authorization, $

150
remained available for common stock repurchases at the end of the second quarter of 2022 from the prior authorization in October 2021 of $

500
which was fully exhausted in 2022 with the Company’s repurchase activity (see below).

No

shares were repurchased in 2024 or 2023.

In 2022, the Company repurchased

8,565,200
shares of its common stock for $

500
; the shares were immediately retired.

As of the date of this report, the Company is currently authorized to repurchase up to a total of $

500
, in the aggregate, of its outstanding shares of common stock under the July 2022 authorization. Repurchases under this program may be made using a variety of methods, which may include open market purchases, privately negotiated transactions, or pursuant to a Rule 10b5-1 plan. This program may be suspended or discontinued at any time and does not have a predetermined expiration date. Alcoa Corporation intends to retire repurchased shares of common stock.

Dividend

Dividends on common and preferred stock are subject to authorization by Alcoa Corporation’s Board of Directors.

Quarterly dividends paid on common stock were $

0.10

per share in 2024, 2023, and 2022, totaling $

89
, $

72
, and $

72
, respectively. After the acquisition of Alumina Limited (see Note C), quarterly dividends of $

0.10
per share were paid on Series A convertible preferred stock, totaling $

1
in 2024.

The details of any future cash dividend declaration, including the amount of such dividend and the timing and establishment of the record and payment dates, will be determined by the Board of Directors. The decision of whether to pay future cash dividends and the amount of any such dividends will be based on the Company's financial position, results of operations, cash flows, capital requirements, business conditions, the requirements of applicable law, and any other factors the Board of Directors may deem relevant.

Stock-based Compensation

Restricted stock units are generally granted in January and/or February of each calendar year to eligible employees. The Company's Board of Directors also receive certain stock units; however, these amounts are not material. Time-based restricted stock units (RSUs) either cliff vest on the third anniversary of the award grant date or vest incrementally over a three-year period (one third each year) on each anniversary of the award grant date. The Company also grants performance restricted stock units (PRSUs), which are subject to performance conditions and earned after the end of the three-year measurement period. As of January 1, 2021, the Company no longer grants stock options.

The final number of PRSUs earned is dependent on Alcoa Corporation's achievement of certain targets over a three-year measurement period for grants. For PRSUs granted in 2022, the award will be earned after the end of the measurement period of January 1, 2022 through December 31, 2024 based on performance against three measures: (1) the Company's total shareholder return measured against the ranked total shareholder return of the S&P Metals and Mining Select Industry Index components; (2) a pre-established average return-on-equity target; and (3) a reduction in carbon intensity in both refining (through reduced carbon dioxide emissions) and smelting (through increased production from renewable energy) operations. For PRSUs granted in 2023, the award will be earned after the end of the measurement period of January 1, 2023 through December 31, 2025 based on performance against three measures: (1) the Company's total shareholder return measured against the ranked total shareholder return of the S&P Metals and Mining Select Industry Index components; (2) a pre-established average return-on-equity target; and (3) a reduction in carbon intensity in both refining (through reduced carbon dioxide emissions) and smelting (through increased production from renewable energy) operations. For PRSUs granted in 2024, the award will be earned after the end of the measurement period of January 1, 2024 through December 31, 2026 based on performance against three measures: (1) the Company's total shareholder return measured against the ranked total shareholder return of the S&P Metals and Mining Select Industry Index components; (2) a pre-established average return-on-equity target; and (3) a reduction in carbon intensity in both refining (through reduced carbon dioxide emissions) and smelting (through increased production from renewable energy) operations.

In 2024, 2023, and 2022, Alcoa Corporation recognized stock-based compensation expense of $

36

, $

35

, and $

40

, respectively, of which approximately

100

% was related to stock units in each period. There was

no

stock-based compensation expense capitalized in 2024, 2023, and 2022.

Stock-based compensation expense is based on the grant date fair value of the applicable equity grant. For both RSUs and PRSUs, the fair value was equivalent to the closing market price per share of Alcoa Corporation's common stock on the date of grant in the respective periods. For stock units with a market condition, the fair value was estimated on the date of grant using a Monte Carlo simulation model, which generated a result of $

40.27

, $

71.12

, and $

126.86

per unit in 2024, 2023, and 2022, respectively. The Monte Carlo simulation model uses certain assumptions to estimate the fair value of a market-based stock unit, including volatility and a risk-free interest rate, to estimate the probability of satisfying market conditions. Volatility (

59.40

%,

64.88

%, and

65.25

% in 2024, 2023, and 2022, respectively) was estimated using the historical volatility of the Company calculated from daily stock price returns. The risk-free interest rate (

4.35

%,

4.26

%, and

1.71

% in 2024, 2023, and 2022, respectively) was based on the U.S. Treasury yield curve at the time of the grant based on the remaining performance period.

The activity for stock units and stock options during 2024 was as follows:

	Stock units		Stock options	
	Number of units	Weighted average FMV per unit	Number of options	Weighted average exercise price
Outstanding, January 1, 2024	2,995,445	$ 35.54	148,608	$ 26.73
Granted	1,598,055	31.43	—	—
Exercised	—	—	(15,162)	18.56
Converted	(1,573,718)	23.23	—	—
Expired or forfeited	(79,161)	39.64	—	—
Performance share adjustment	(28,400)	149.49	—	—
Outstanding, December 31, 2024	2,912,221	$ 38.71	133,446	$ 27.66

The number of Converted units includes

472,858
shares withheld to meet the Company’s statutory tax withholding requirements related to the income earned by the employees as a result of vesting in the units.

As of December 31, 2024, the

133,446
outstanding stock options were fully vested and exercisable, had a weighted average remaining contractual life of 3.07 years, a total intrinsic value of $

2
and a weighted average exercise price of $

27.66
. Cash received from stock option exercises was immaterial in 2024 and 2023 and was $

22
in 2022. The total intrinsic value of stock options exercised was immaterial during 2024 and 2023 and was $

22
in 2022. The total fair value of stock units converted during 2024, 2023, and 2022 was $

37
, $

35
and $

32
, respectively.

At December 31, 2024, there was $

33
of combined unrecognized compensation expense (pretax) related to non-vested grants of stock units. This expense is expected to be recognized over a weighted average period of 1.53 years.

O. Pension and Other Postretirement Benefits

Defined Benefit Plans

Alcoa sponsors several defined benefit pension plans covering certain employees in the U.S. and foreign locations. Pension benefits generally depend on length of service, job grade, and remuneration. Substantially all benefits are paid through pension trusts that are sufficiently funded to ensure that all plans can pay benefits to retirees as they become due. Most salaried and non-bargaining hourly U.S. employees hired after March 1, 2006 and most bargaining hourly U.S. employees hired after January 1, 2020 participate in a defined contribution plan instead of a defined benefit plan.

The Company also maintains health care postretirement benefit plans covering certain eligible U.S. retired employees and certain retirees from foreign locations. Generally, the medical plans are unfunded and pay a percentage of medical expenses, reduced by deductibles and other coverage. The Company retains the right, subject to existing agreements, to change or eliminate these benefits. All salaried and certain non-bargaining hourly U.S. employees hired after January 1, 2002 and certain bargaining hourly U.S. employees hired after July 1, 2010 are not eligible for postretirement health care benefits.

As of January 1, 2024, the pension benefit plans and the other postretirement benefit plans covered an aggregate of approximately

16,000
and approximately

19,000
participants, respectively.

2024 Actions. In 2024, the following actions impacted certain pension plans:

Action #1 – In the first quarter of 2024, Alcoa announced the full curtailment of the Kwinana refinery. As a result, curtailment accounting was triggered within Alcoa's Australian pension plan. The Company recorded a $

1
decrease to Other noncurrent assets and recognized a curtailment loss of $

1
($

0
after-tax) in Restructuring and other charges, net on the accompanying Statement of Consolidated Operations.

Action #2 – In the second quarter of 2024, settlement accounting and a related plan remeasurement was triggered within Alcoa's Australian pension plan as a result of participants electing lump sum settlements. Alcoa recorded a $

19
increase to Other noncurrent assets and recognized a non-cash settlement gain of $

1
($

0
after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

Action #3 – In the fourth quarter of 2024, settlement accounting was triggered within Alcoa's Australian pension plan as a result of participants electing lump sum settlements. Alcoa recognized a non-cash settlement gain of $

1
($

1
after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

The following table presents certain information and the financial impacts of these actions on the accompanying Consolidated Financial Statements:

Action #	Number of affected plan participants	Weighted average discount rate as of prior plan remeasurement date	Plan remeasurement date	Weighted average discount rate as of plan remeasurement date	(Decrease) increase to other noncurrent assets[1]	Curtailment loss[2]	Settlement gain[3]
1	~ 110	N/A	N/A	N/A	$ (1)	$ 1	$ —
2	~ 10	4.81 %	June 30, 2024	5.23 %	19	—	(1)
3	~ 140	N/A	December 31, 2024	N/A	—	—	(1)
					$ 18	$ 1	$ (2)

(1) Actions 1-2 caused interim plan remeasurements, including an update to the discount rates used to determine the benefit obligations of the affected plans. These amounts include impacts due to interim plan remeasurements.

(2) This amount represents the net actuarial loss arising from the curtailment and was recognized immediately in Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

(3) These amounts represent the net actuarial gain and were reclassified from Accumulated other comprehensive loss to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

2023 Actions. In 2023, the following actions impacted certain pension and other postretirement benefit plans:

Action #1 – In the second quarter of 2023, plan amendment accounting and related plan remeasurements were triggered within the Surinamese pension and other postretirement plans as a result of participants electing to prospectively convert their Surinamese dollar pension and Company-provided retiree medical to a United States dollar pension with no Company-provided retiree medical. As a result, Alcoa recorded a $

15
increase to Accrued pension benefits and a $

9
decrease to Accrued other postretirement benefits.

Action #2 – In the second quarter of 2023, settlement accounting and related plan remeasurements were triggered within certain Canadian pension plans as a result of the Company's purchase of group annuity contracts to transfer the obligation to pay the remaining retirement benefits of approximately

530
retirees and beneficiaries from its Canadian defined benefit pension plans. The transfer of approximately $

235
in both plan obligations and plan assets was completed in April 2023. As a result, Alcoa recorded a $

22
increase to Accrued pension benefits and a $

5
decrease to Other noncurrent assets and recognized a non-cash settlement loss of $

21
($

16
after-tax) in Restructuring and other charges, net on the accompanying Statement of Consolidated Operations.

Action #3 – In the third quarter of 2023, settlement accounting and a related plan remeasurement was triggered within Alcoa's Australian pension plan as a result of participants electing lump sum payments. As a result, Alcoa recorded a $

2
decrease to Other noncurrent assets.

The following table presents certain information and the financial impacts of these actions on the accompanying Consolidated Financial Statements:

Action #	Number of affected plan participants	Weighted average discount rate as of prior plan remeasurement date	Plan remeasurement date	Weighted average discount rate as of plan remeasurement date	Increase to accrued pension benefits liability	Decrease to other noncurrent assets	Decrease to accrued other postretirement benefits liability	Settlement loss[1]
1	~ 370	5.58 %	March 31, 2023	5.20 %	$ 15	$ —	$ (9)	$ —

2	~ 530	5.20 %	April 30, 2023	4.80 %	22	(5)	—	21
3	~ 50	5.08 %	September 30, 2023	5.03 %	—	(2)	—	—
					$ 37	$ (7)	$ (9)	$ 21

(1) This amount represents the net actuarial loss and was reclassified from Accumulated other comprehensive loss to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

2022 Actions. In 2022, the following actions impacted certain pension and other postretirement benefit plans:

Action #1 – In the third quarter of 2022, settlement accounting and related plan remeasurements were triggered within Alcoa's U.S. pension plans as a result of the Company's purchase of group annuity contracts to transfer the obligation to pay the remaining retirement benefits of approximately

4,400
retirees and beneficiaries from its U.S. defined benefit pension plans. The transfer of approximately $

1,000
in both plan obligations and plan assets was completed in August 2022. As a result, Alcoa recorded a $

5
increase to Accrued pension benefits and a $

27
increase to Other noncurrent assets and recognized a non-cash settlement loss of $

617
(pre- and after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

Action #2 – In the third quarter of 2022, settlement accounting and related plan remeasurements were triggered within Alcoa's U.S. pension plans as a result of participants electing lump sum payments. Alcoa recognized a non-cash settlement loss of $

11
(pre- and after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

Action #3 – In the third quarter of 2022, settlement accounting and a related plan remeasurement was triggered within Alcoa's U.S. salaried pension plan as a result of participants electing lump sum payments. Alcoa recorded a $

23
increase to Accrued pension benefits and a $

12
decrease to Other noncurrent assets and recognized a non-cash settlement loss of $

1
(pre- and after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

Action #4 – In the third quarter of 2022, settlement accounting and a related plan remeasurement was triggered within Alcoa's Australian pension plan as a result of participants electing lump sum payments. Alcoa recorded a $

21
increase to Other noncurrent assets and recognized a non-cash settlement gain of $

3
(pre- and after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

Action #5 – In the fourth quarter of 2022, settlement accounting was triggered within Alcoa's U.S. pension plans as a result of participants electing lump sum payments. Alcoa recorded a $

3
increase to Accrued pension benefits and recognized a non-cash settlement loss of $

6
(pre- and after-tax) in Restructuring and other charges, net on the Statement of Consolidated Operations.

The following table presents certain information and the financial impacts of these actions on the accompanying Consolidated Financial Statements:

Action #	Number of affected plan participants	Weighted average discount rate as of prior plan remeasurement date	Plan remeasurement date	Weighted average discount rate as of plan remeasurement date	Increase to accrued pension benefits liability[1]	Increase (decrease) to other noncurrent assets[1]	Settlement loss (gain)[2]
1	~ 4,400	2.90 %	July 31, 2022	4.63 %	$ 5	$ 27	$ 617
2	~ 45	2.90 %	July 31, 2022	4.63 %	—	—	11
3	~ 5	4.57 %	September 30, 2022	5.71 %	23	(12)	1
4	~ 25	2.46 %	September 30, 2022	4.99 %	—	21	(3)
5	~ 20	N/A	December 31, 2022	N/A	3	—	6

	$ 31	$ 36	$ 632

(1) Actions 1-4 caused interim plan remeasurements, including an update to the discount rates used to determine the benefit obligations of the affected plans. These amounts include impacts due to interim plan remeasurements.

(2) These amounts represent the net actuarial loss (gain) and were reclassified from Accumulated other comprehensive loss to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

Obligations and Funded Status

December 31,	Pension benefits 2024	Pension benefits 2023	Other postretirement benefits 2024	Other postretirement benefits 2023
Change in benefit obligation				
Benefit obligation at beginning of year	$ 2,393	$ 2,518	$ 494	$ 536
Service cost	9	11	3	3
Interest cost	113	119	24	26
Amendments	—	2	—	—
Actuarial (gains) losses	(78)	117	(8)	(7)
Settlements	(81)	(280)	—	—
Benefits paid, net of participants' contributions	(122)	(133)	(51)	(52)
Suriname resident election transfer	—	12	—	(12)
Foreign currency translation impact	(89)	27	—	—
Benefit obligation at end of year	$ 2,145	$ 2,393	$ 462	$ 494
Change in plan assets				
Fair value of plan assets at beginning of year	$ 2,219	$ 2,434	$ —	$ —
Actual return on plan assets	49	141	—	—
Employer contributions	17	24	—	—
Participant contributions	3	3	—	—
Benefits paid	(115)	(125)	—	—
Administrative expenses	(7)	(9)	—	—
Settlements	(81)	(280)	—	—
Annuity purchase premium refund	—	7	—	—
Foreign currency translation impact	(85)	24	—	—

Fair value of plan assets at end of year	$ 2,000	$ 2,219	$ —	$ —
Funded status	$ (145)	$ (174)	$ (462)	$ (494)
Less: Amounts attributed to joint venture partners	(7)	(11)	—	—
Net funded status	$ (138)	$ (163)	$ (462)	$ (494)
Amounts recognized in the Consolidated Balance Sheet consist of:				
Noncurrent assets	$ 128	$ 125	$ —	$ —
Current liabilities	(10)	(10)	(50)	(51)
Noncurrent liabilities	(256)	(278)	(412)	(443)
Net amount recognized	$ (138)	$ (163)	$ (462)	$ (494)
Amounts recognized in Accumulated Other Comprehensive Loss consist of:				
Net actuarial loss	$ 1,076	$ 1,098	$ 75	$ 88
Prior service cost (benefit)	4	4	(83)	(97)
Total, before tax effect	1,080	1,102	(8)	(9)
Less: Amounts attributed to joint venture partners	29	33	—	—
Net amount recognized, before tax effect	$ 1,051	$ 1,069	$ (8)	$ (9)
Other Changes in Plan Assets and Benefit Obligations Recognized in Other Comprehensive (Loss) Income consist of:				
Net actuarial loss (gain)	$ 9	$ 131	$ (8)	$ (2)
Amortization of accumulated net actuarial loss	(31)	(49)	(5)	(5)
Prior service cost	—	2	—	—
Amortization of prior service benefit	—	—	14	14
Total, before tax effect	(22)	84	1	7
Less: Amounts attributed to joint venture partners	(4)	6	—	—
Net amount recognized, before tax effect	$ (18)	$ 78	$ 1	$ 7

At December 31, 2024, the benefit obligation, fair value of plan assets, and funded status for U.S. pension plans were $ 1,056 , $ 988 , and ($ 68), respectively. At December 31, 2023, the benefit obligation, fair value of plan assets, and funded status for U.S. pension plans were $ 1,119 , $ 1,054 , and ($ 65), respectively.

Pension Plan Benefit Obligations

	Pension benefits	
	2024	2023
The aggregate projected benefit obligation and accumulated benefit obligation for all defined benefit pension plans was as follows:		
Projected benefit obligation	$ 2,145	$ 2,393
Accumulated benefit obligation	2,078	2,285
The aggregate projected benefit obligation and fair value of plan assets for pension plans with projected benefit obligations in excess of plan assets was as follows:		
Projected benefit obligation	1,627	1,636
Fair value of plan assets	1,351	1,336
The aggregate accumulated benefit obligation and fair value of plan assets for pension plans with accumulated benefit obligations in excess of plan assets was as follows:		
Accumulated benefit obligation	1,432	1,425
Fair value of plan assets	1,197	1,169

Components of Net Periodic Benefit Cost

	Pension benefits[1]			Other postretirement benefits		
	2024	2023	2022	2024	2023	2022
Service cost	$ 9	$ 10	$ 13	$ 3	$ 3	$ 4
Interest cost[2]	108	114	104	24	26	15
Expected return on plan assets[2]	(139)	(146)	(151)	—	—	—
Amortization of accumulated net actuarial loss[2]	32	28	88	5	5	18
Amortization of prior service benefit[2]	—	—	—	(14)	(14)	(14)
Settlements[3]	(2)	21	632	—	—	—
Curtailments[4]	1	—	—	—	—	—
Net periodic benefit cost[5]	$ 9	$ 27	$ 686	$ 18	$ 20	$ 23

(1) In 2024, 2023, and 2022 , net periodic benefit cost for U.S pension plans was $

7

, $

6
, and $

698
, respectively.

(2) These amounts were reported in Other expenses (income), net on the accompanying Statement of Consolidated Operations.

(3) These amounts were reported in Restructuring and other charges, net on the accompanying Statement of Consolidated Operations (see Note D). In 2024, 2023 and 2022, settlements were due to plan actions (see Actions above).

(4) These amounts were reported in Restructuring and other charges, net on the accompanying Statement of Consolidated Operations (see Note D). In 2024, curtailments were due to plan actions (see Actions above).

(5) Amounts attributed to joint venture partners are not included.

Assumptions. Liabilities and expenses for pension and other postretirement benefits are determined using actuarial methodologies and incorporate significant assumptions, including the interest rate used to discount the future estimated liability, the expected long-term rate of return on plan assets, and several assumptions relating to the employee workforce (salary increases, health care cost trend rates, retirement age, and mortality).

Weighted average assumptions used to determine benefit obligations for pension and other postretirement benefit plans were as follows:

December 31,	**2024**	**2023**
Discount rate—pension plans	5.30 %	5.03 %
Discount rate—other postretirement benefit plans	5.53	5.19
Rate of compensation increase—pension plans	3.20	3.77

The yield curve model used to develop the discount rate is based on high-quality corporate bonds, parallels the plans' projected cash flows and has a weighted average duration of 10 years . If a deep market of high-quality corporate bonds does not exist in a country, then the yield on government bonds plus a corporate bond yield spread is used.

Weighted average assumptions used to determine net periodic benefit cost for pension and other postretirement benefit plans were as follows:

	2024	2023	2022
Discount rate—pension plans	5.02 %	5.34 %	2.66 %
Discount rate—other postretirement benefit plans	5.17	5.45	2.46
Expected long-term rate of return on plan assets—pension plans	6.13	6.21	4.94
Rate of compensation increase—pension plans	3.77	3.21	3.11

For 2024, 2023, and 2022, the expected long-term rate of return used by management was based on the prevailing and planned strategic asset allocations, as well as estimates of future returns by asset class. For 2025, management anticipates that

5.78
% will be the weighted average expected long-term rate of return.

Assumed health care cost trend rates for U.S. other postretirement benefit plans were as follows (non-U.S. plans are not material):

	2024	2023	2022
Health care cost trend rate assumed for next year	7.0 %	6.5 %	7.0 %
Rate to which the cost trend rate gradually declines	5.0 %	5.0 %	5.0 %
Year that the rate reaches the rate at which it is assumed to remain	2034	2032	2028

The assumed health care cost trend rate is used to measure the expected cost of gross eligible charges covered by the Company's other postretirement benefit plans. For 2025, a

7.0
% trend rate will be used, reflecting management's best estimate of the change in future health care costs covered by the plans.

Plan Assets. Alcoa's pension plan weighted average target and actual asset allocations at December 31, 2024 and 2023, by asset class, were as follows:

	Target asset allocation		Plan assets at December 31,	
Asset class	**2024**	**2023**	**2024**	**2023**
Equities	20 %	20 %	21 %	17 %
Fixed income	65	65	69	70
Other investments	15	15	10	13
Total	100 %	100 %	100 %	100 %

The principal objectives underlying the investment of the pension plan assets are to ensure that the Company can properly fund benefit obligations as they become due under a broad range of potential economic and financial scenarios, maximize the long-term investment return with an acceptable level of risk based on such obligations, and broadly diversify investments across and within various asset classes to protect asset values against adverse movements. Investment risk is controlled by rebalancing to target allocations on a periodic basis and ongoing monitoring of investment manager performance.

The portfolio includes an allocation to investments in long-duration corporate credit and government debt, public and private market equities, intermediate duration corporate credit and government debt, global-listed infrastructure, high-yield bonds and bank loans, real estate, and securitized credit.

Investment practices comply with the requirements of applicable laws and regulations in the respective jurisdictions, including the Employee Retirement Income Security Act of 1974 (ERISA) in the United States.

The following section describes the valuation methodologies used by the trustees to measure the fair value of pension plan assets. For plan assets measured at net asset value, this refers to the net asset value of the investment on a per share basis (or its equivalent) as a practical expedient. Otherwise, an indication of the level in the fair value hierarchy in which each type of asset is generally classified is provided (see Note P for the definition of fair value and a description of the fair value hierarchy).

Equities—These securities consist of: (i) direct investments in the stock of publicly traded U.S. and non-U.S. companies and are valued based on the closing price reported in an active market on which the individual securities are traded (generally classified in Level 1); (ii) the plans' share of commingled funds that are invested in the stock of publicly traded companies and are valued at net asset value; and (iii) direct investments in long/short equity hedge funds and private equity (limited partnerships and venture capital partnerships) and are valued at net asset value.

Fixed income—These securities consist of: (i) U.S. government debt and are generally valued using quoted prices (included in Level 1); (ii) cash and cash equivalents invested in publicly-traded funds and are valued based on the closing price reported in an active market on which the individual securities are traded (generally classified in Level 1); (iii) publicly traded U.S. and non-U.S. fixed interest obligations (principally corporate bonds and debentures) and are valued through consultation and evaluation with brokers in the institutional market using quoted prices and other observable market data (included in Level 2); and (iv) cash and cash equivalents invested in institutional funds and are valued at net asset value.

Other investments—These investments include, among others: (i) real estate investment trusts valued based on the closing price reported in an active market on which the investments are traded (included in Level 1); (ii) the plans' share of commingled funds that are invested in real estate partnerships and are valued at net asset value; (iii) direct investments in private real estate (includes limited partnerships) and are valued at net asset value; (iv) absolute return strategy funds and are valued at net asset value; and (v) indirect investments of discretionary and systematic macro hedge funds and are valued at net asset value.

The fair value methods described above may not be indicative of net realizable value or reflective of future fair values. Additionally, while Alcoa believes the valuation methods used by the plans' trustees are appropriate and consistent with other market participants, the use of different methodologies or assumptions to determine the fair value of certain financial instruments could result in a different fair value measurement at the reporting date.

The following table presents the fair value of pension plan assets classified under either the appropriate level of the fair value hierarchy or net asset value:

December 31, 2024	Level 1	Level 2	Level 3	Net Asset Value	Total
Equities:					
Equity securities	$ 77	$ —	$ —	$ 227	$ 304
Private equity	—	—	—	109	109
	$ 77	$ —	$ —	$ 336	$ 413
Fixed income:					
Intermediate and long-duration government/credit	$ 374	$ 470	$ —	$ 471	$ 1,315
Cash and cash equivalent funds	42	—	—	14	56
	$ 416	$ 470	$ —	$ 485	$ 1,371
Other investments:					
Real estate	$ 17	$ —	$ —	$ 163	$ 180
Discretionary and systematic macro hedge funds	—	—	—	11	11
Other	—	—	—	18	18
	$ 17	$ —	$ —	$ 192	$ 209
Total[1]	$ 510	$ 470	$ —	$ 1,013	$ 1,993

December 31, 2023	Level 1	Level 2	Level 3	Net Asset Value	Total
Equities:					
Equity securities	$ 108	$ —	$ —	$ 134	$ 242
Private equity	—	—	—	127	127

	$ 108	$ —	$ —	$ 261	$ 369
Fixed income:					
Intermediate and long-duration government/credit	$ 403	$ 517	$ —	$ 496	$ 1,416
Cash and cash equivalent funds	14	—	—	114	128
	$ 417	$ 517	$ —	$ 610	$ 1,544
Other investments:					
Real estate	$ 21	$ —	$ —	$ 253	$ 274
Other	—	—	—	19	19
	$ 21	$ —	$ —	$ 272	$ 293
Total[2]	$ 546	$ 517	$ —	$ 1,143	$ 2,206

(1) As of December 31, 2024, the total fair value of pension plan assets excludes a net receivable of $ 7 , which primarily represents securities not yet settled plus interest and dividends earned on various investments.

(2) As of December 31, 2023, the total fair value of pension plan assets excludes a net receivable of $ 13 , which primarily represents securities not yet settled plus interest and dividends earned on various investments.

Funding and Cash Flows. It is Alcoa's policy to fund amounts for defined benefit pension plans sufficient to meet the minimum requirements set forth in applicable country benefits laws and tax laws, including ERISA for U.S. plans. From time to time, the Company contributes additional amounts as deemed appropriate.

In 2024, 2023, and 2022, cash contributions to Alcoa's defined benefit pension plans were $

16
, $

24
, and $

17
.

Alcoa's minimum required contribution to defined benefit pension plans in 2025 is estimated to be $

60
, of which approximately $

40
is for U.S. plans. Under ERISA regulations, a plan sponsor that establishes a pre-funding balance by making discretionary contributions to a U.S. defined benefit pension plan may elect to apply all or a portion of this balance toward its minimum required contribution obligations to the related plan in future years. In 2025, management intends to make such election related to the Company's U.S. plans.

Benefit payments expected to be paid to pension and other postretirement benefit plan participants are as follows:

Year ending December 31,	Pension benefits	Other postretirement benefits
2025	$ 170	$ 50
2026	165	50
2027	165	45
2028	165	45
2029	160	45
2030 through 2034	780	205
	$ 1,605	$ 440

Defined Contribution Plans

The Company sponsors savings and investment plans in several countries. In the United States, employees may contribute a portion of their compensation to the plans, and Alcoa matches a specified percentage of these contributions in equivalent form of the investments elected by the employee. Also, the Company makes contributions to a retirement savings account based on a percentage of eligible compensation for certain U.S. employees that are not able to participate in Alcoa's defined benefit pension plans. The Company's expenses related to all defined contribution plans were $

86
in 2024, $

80
in 2023, and $

71
in 2022.

Member-funded Pension Plans

The Company contributes to member-funded pension plans for the employees of Aluminerie de Bécancour Inc. and Aluminerie de Deschambault in Canada. Alcoa makes contributions to the plans based on a percentage of the employees' eligible compensation. The Company's expenses related to the member-funded pension plans were $

16
in 2024, $

16
in 2023, and $

17
in 2022.

Target Benefit Plan

The Company contributes to a target benefit plan for the employees of Baie-Comeau in Canada. Alcoa makes contributions to the plan based on a percentage of the employees' eligible compensation. The Company's expenses related to the target benefit plan were $

8
in 2024, $

8
in 2023, and $

9
in 2022.

P. Derivatives and Other Financial Instruments

Fair Value. The Company follows a fair value hierarchy to measure its assets and liabilities. As of December 31, 2024 and 2023, respectively, the assets and liabilities measured at fair value on a recurring basis were primarily derivative instruments. In addition, the Company measures its pension plan assets at fair value (see Note O). Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value hierarchy distinguishes between (i) market participant assumptions developed based on market data obtained from independent sources (observable inputs) and (ii) an entity's own assumptions about market participant assumptions developed based on the best information available in the circumstances (unobservable inputs). The fair value hierarchy consists of three broad levels, which gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3). The three levels of the fair value hierarchy are described below:

- Level 1—Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;
- Level 2—Inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly, including quoted prices for similar assets or liabilities in active markets; quoted prices for identical or similar assets or liabilities in markets that are not active; inputs other than quoted prices that are observable for the asset or liability (e.g., interest rates); and inputs that are derived principally from or corroborated by observable market data by correlation or other means; and,
- Level 3—Inputs that are both significant to the fair value measurement and unobservable.

Derivatives. Alcoa Corporation is exposed to certain risks relating to its ongoing business operations, including the risks of changing commodity prices, foreign currency exchange rates, and interest rates. Alcoa Corporation's commodity and derivative activities include aluminum, energy, foreign exchange, and interest rate contracts, which are held for purposes other than trading. They are used to mitigate uncertainty and volatility, and to cover underlying exposures. While Alcoa does not generally enter into derivative contracts to mitigate the risk associated with changes in aluminum price, the Company may do so in isolated cases to address discrete commercial or operational conditions. Alcoa is not involved in trading activities for energy, weather derivatives, or other nonexchange commodities.

Alcoa Corporation's commodity and derivative activities are subject to the management, direction, and control of the Strategic Risk Management Committee (SRMC), which consists of at least

three

members, including the chief executive officer, the chief financial officer, and the chief commercial officer. The remaining member(s) are other officers and/or employees of the Company as the chief executive officer may designate from time to time. The SRMC meets on a periodic basis to review derivative positions and strategy and reports to the Audit Committee of Alcoa Corporation's Board of Directors on the scope of its activities.

Alcoa Corporation's aluminum and foreign exchange contracts are classified as Level 1 under the fair value hierarchy. All of the Level 1 contracts are designated as either fair value or cash flow hedging instruments. Alcoa Corporation also has several derivative instruments classified as Level 3 under the fair value hierarchy, which are either designated as cash flow hedges or undesignated. Alcoa included the changes in its equity method investee's Level 2 derivatives in Accumulated other comprehensive loss through June 30, 2024, when the underlying contracts expired.

The following tables present the detail for Level 1 and 3 derivatives (see additional Level 3 information in further tables below):

	2024		2023	
Balance at December 31,	**Assets**	**Liabilities**	**Assets**	**Liabilities**
Level 1 derivative instruments	$ 1	$ 20	$ 16	$ 9
Level 3 derivative instruments	24	1,079	16	1,297
Total	$ 25	$ 1,099	$ 32	$ 1,306
Less: Current	25	263	29	214
Noncurrent	$ —	$ 836	$ 3	$ 1,092

	2024		2023	
Year ended December 31,	**Unrealized loss recognized in Other comprehensive loss**	**Realized gain (loss) reclassified from Other comprehensive loss to earnings**	**Unrealized gain (loss) recognized in Other comprehensive loss**	**Realized gain (loss) reclassified from Other comprehensive loss to earnings**
Level 1 derivative instruments	$ (23)	$ 1	$ 31	$ 86
Level 3 derivative instruments	(70)	(290)	(326)	(221)
Noncontrolling and equity interest (Level 2)	—	1	—	5
Total	$ (93)	$ (288)	$ (295)	$ (130)

The 2024 realized gain of $

1
on Level 1 cash flow hedges was comprised of a $

2
gain recognized in Sales and a $

1
loss recognized in Cost of goods sold. The 2023 realized gain of $

86
on Level 1 cash flow hedges was comprised of a $

91
gain recognized in Sales and a $

5
loss recognized in Cost of goods sold.

The following table presents the outstanding quantities of derivative instruments classified as Level 1:

	Classification	December 31, 2024	December 31, 2023
Aluminum (in kmt)	Commodity buy forwards	145	78
Aluminum (in kmt)	Commodity sell forwards	108	46
Foreign currency (in millions of euro)	Foreign exchange buy forwards	152	48
Foreign currency (in millions of euro)	Foreign exchange sell forwards	13	9
Foreign currency (in millions of Norwegian krone)	Foreign exchange buy forwards	54	138
Foreign currency (in millions of Brazilian real)	Foreign exchange buy forwards	280	467
Foreign currency (in millions of Australian dollars)	Foreign exchange buy forwards	43	—
Foreign currency (in millions of Canadian dollar)	Foreign exchange buy forwards	5	31

Alcoa routinely uses Level 1 aluminum derivative instruments to manage exposures to changes in the fair value of firm commitments for the purchases or sales of aluminum. Additionally, Alcoa used Level 1 aluminum derivative instruments to manage LME exposures related to profitability improvement actions (expired December 2024), and the Alumar (Brazil) restart (expired December 2023). As a result of delays with the Alumar restart during 2023, it became probable that certain of the original forecasted transactions would not occur by the end of the originally specified time period and Alcoa dedesignated certain aluminum sell forwards. The Company reclassified the related unrealized gain of $

11
included in Accumulated other comprehensive loss to Sales during the year ended 2023. In conjunction with the dedesignations, the Company entered into aluminum buy forwards for the same volume and periods which were also not designated. The unrealized and realized gains and losses on the aluminum buy and sell forwards that are not designated offset resulting in no impact to Alcoa's earnings.

Alcoa Corporation uses Level 1 foreign exchange forward contracts to mitigate the risk of foreign exchange exposure related to euro power purchases in Norway (expires December 2027), U.S. dollar aluminum sales in Norway (expires June 2025), U.S. dollar alumina sales in Brazil (expires October 2026), U.S. dollar aluminum sales in Brazil (expired December 2023), U.S. dollar alumina sales in Australia (expires December 2026) and Canadian dollar expenses in Canada (expires March 2025).

Derivative instruments classified as Level 3 in the fair value hierarchy represent those in which management has used at least one significant unobservable input in the valuation model. Alcoa Corporation uses a discounted cash flow model to fair value all Level 3 derivative instruments. Inputs in the valuation models for Level 3 derivative instruments are composed of the following: (i) quoted market prices (e.g., aluminum prices on the 10 -year LME forward curve and energy prices), (ii) significant other observable inputs (e.g., information concerning time premiums and volatilities for certain option type embedded derivatives and regional premiums for aluminum contracts), and (iii) unobservable inputs (e.g., aluminum and energy prices beyond those quoted in the market, and estimated credit spread between Alcoa and the counterparty). For periods beyond the term of quoted market prices for aluminum, Alcoa Corporation estimates the price of aluminum by extrapolating the 10 -year LME forward curve. For periods beyond the term of quoted market prices for the Midwest premium, management estimates the Midwest premium based on recent transactions. Where appropriate, valuations are adjusted for various factors such as liquidity, bid/offer spreads, and credit considerations. Such adjustments are generally based on available market evidence (Level 2). In the absence of such evidence, management's best estimate is used (Level 3). If a significant input that is unobservable in one period becomes observable in a subsequent period, the related asset or liability would be transferred to the appropriate classification (Level 1 or 2) in the period of such change (there were no such transfers in the periods presented). There were no sales or settlements of Level 3 derivative instruments in the periods presented.

Level 3 derivative instruments outstanding as of December 31, 2024 are described in the table below:

Description	Designation	Contract Termination	Unobservable Inputs Impacting Valuation	Sensitivity to Inputs
Power contracts				
Embedded derivative that indexes the price of power to the LME price of aluminum plus the Midwest premium	Cash flow hedge of forward sales of aluminum	March 2026 December 2029 February 2036	LME price, Midwest premium and MWh per year	Increase in LME price and/or the Midwest premium results in a higher cost of power and an increase to the derivative liability
Embedded derivative that indexes the price of power to the LME price of aluminum	Cash flow hedge of forward sales of aluminum	September 2027	LME price and MWh per year	Increase in LME price results in a higher cost of power and an increase to the derivative liability
Embedded derivative that indexes the price of power to the credit spread between the Company and the counterparty	Not designated	October 2028	Estimated credit spread	Wider credit spread results in a higher cost of power and increase in the derivative liability
Financial contracts				
Hedge power prices	Not designated	June 2035	LME price and power price	Lower prices in the power market or higher LME prices result in an increase in the derivative liability

In December 2022, Alcoa entered into a financial contract with a counterparty to hedge power price exposure through March 31, 2023. The Financial contract was designated as a cash flow hedge of future sales of power. Unrealized gains and losses were recognized in Accumulated other comprehensive loss on the accompanying Consolidated Balance Sheet, and realized gains and losses were recognized in Cost of goods sold on the accompanying Statement of Consolidated Operations.

In August 2023 and September 2024, the Company entered into nine-year financial contracts (undesignated) that hedge the anticipated power requirements at one of its smelters effective July 1, 2026 when the current contracts (undesignated) end.

At December 31, 2024, the outstanding Level 3 instruments are associated with

seven
smelters. At December 31, 2024 and 2023, the power contracts with embedded derivatives designated as cash flow hedges hedge forecasted aluminum sales of

1,230
kmt and

1,456
kmt, respectively.

The following table presents quantitative information related to the significant unobservable inputs described above for Level 3 derivative instruments (megawatt hours in MWh):

	December 31, 2024	Unobservable Input	Unobservable Input Range	
Asset Derivatives				
Financial contract (undesignated)	$ 24	Interrelationship of forward energy price, LME forward price and the Consumer Price Index	Electricity (per MWh)	2025: $ 38.47
				2025: $ 70.70
			LME (per mt)	2025: $ 2,536
				2025: $ 2,558
Total Asset Derivatives	$ 24			
Liability Derivatives				
Power contract	$ 148	MWh of energy needed to produce the forecasted mt of aluminum	LME (per mt)	2025: $ 2,536
				2027: $ 2,609
			Electricity	Rate of 4 million MWh per year
Power contracts	927	MWh of energy needed to produce the forecasted mt of aluminum	LME (per mt)	2025: $ 2,536
				2029: $ 2,638
				2036: $ 2,846
			Midwest premium (per pound)	2025: $ 0.2335
				2029: $ 0.2300
				2036: $ 0.2300
			Electricity	Rate of 18 million MWh per year
Power contract	2	MWh of energy needed to produce the forecasted mt of aluminum	LME (per mt)	2025: $ 2,536
				2025: $ 2,555
			Midwest premium (per pound)	2025: $ 0.2335
				2025: $ 0.2645
			Electricity	Rate of 2 million MWh per year

Power contract (undesignated)	2	Estimated spread between the 30-year debt yield of Alcoa and the counterparty	Credit spread	0.96 %: 30-year debt yield spread 6.49 %: Alcoa (estimated) 5.53 %: counterparty
Total Liability Derivatives	$ 1,079			

The fair values of Level 3 derivative instruments recorded in the accompanying Consolidated Balance Sheet were as follows:

Asset Derivatives	**December 31, 2024**	**December 31, 2023**
Derivatives not designated as hedging instruments:		
Current—financial contract	$ 24	$ 16
Total derivatives not designated as hedging instruments	$ 24	$ 16
Total Asset Derivatives	$ 24	$ 16
Liability Derivatives		
Derivatives designated as hedging instruments:		
Current—power contracts	$ 251	$ 210
Noncurrent—power contracts	826	1,087
Total derivatives designated as hedging instruments	$ 1,077	$ 1,297
Derivatives not designated as hedging instruments:		
Current—embedded credit derivative	$ 1	$ —
Noncurrent—embedded credit derivative	1	—
Total derivatives not designated as hedging instruments	$ 2	$ —
Total Liability Derivatives	$ 1,079	$ 1,297

The following table shows the net fair values of the Level 3 derivative instruments at December 31, 2024 and the effect on these amounts of a hypothetical change (increase or decrease of 10%) in the market prices or rates that existed as of December 31, 2024:

	Fair value asset (liability)	**Index change of + / -10%**
Power contracts	$ (1,077)	$ 253
Embedded credit derivative	(2)	1
Financial contracts	24	9

The following tables present a reconciliation of activity for Level 3 derivative instruments:

2024	Assets Financial contracts
January 1, 2024	$ 16
Total gains or losses included in:	
Other income, net (unrealized/realized)	61
Settlements and other	(53)
December 31, 2024	$ 24
Change in unrealized gains or losses included in earnings for derivative instruments held at December 31, 2024:	
Other income, net	$ 61

2024	Liabilities Power contracts	Embedded credit derivative
January 1, 2024	$ 1,297	$ —
Total gains or losses included in:		
Sales (realized)	(290)	—
Other expenses, net (unrealized/realized)	—	3
Other comprehensive income (unrealized)	70	—
Settlements and other	—	(1)
December 31, 2024	$ 1,077	$ 2
Change in unrealized gains or losses included in earnings for derivative instruments held at December 31, 2024:		
Other expenses, net	$ —	$ 3

2023	Assets Power contracts	Financial contracts
January 1, 2023	$ —	$ 52
Total gains or losses included in:		
Sales (realized)	(4)	—
Cost of goods sold (realized)	—	(20)
Other expenses, net (unrealized/realized)	—	(5)
Other comprehensive income (unrealized)	4	—

Settlements and other			(
		—	11
			)
December 31, 2023			
	$	—	$ 16
Change in unrealized gains or losses included in earnings for derivative instruments held at December 31, 2023:			
Other expenses, net			(
	$	—	$ 5
			)

2023	Liabilities Power contracts
January 1, 2023	$ 1,212
Total gains or losses included in:	
Sales (realized)	(245)
Other comprehensive income (unrealized)	330
December 31, 2023	$ 1,297

Derivatives Designated As Hedging Instruments—Cash Flow Hedges

Assuming market rates remain constant with the rates at December 31, 2024, a realized loss of $

251
related to power contracts is expected to be recognized in Sales over the next 12 months.

Material Limitations

The disclosures with respect to commodity prices and foreign currency exchange risk do not consider the underlying commitments or anticipated transactions. If the underlying items were included in the analysis, the gains or losses on the futures contracts may be offset. Actual results will be determined by several factors that are not under Alcoa Corporation's control and could vary significantly from those factors disclosed.

Alcoa Corporation is exposed to credit loss in the event of nonperformance by counterparties on the above instruments, as well as credit or performance risk with respect to its hedged customers' commitments. Alcoa Corporation does not anticipate nonperformance by any of these parties. Contracts are with creditworthy counterparties and are further supported by cash, treasury bills, or irrevocable letters of credit issued by carefully chosen banks. In addition, various master netting arrangements are in place with counterparties to facilitate settlement of gains and losses on these contracts.

Other Financial Instruments. The carrying values and fair values of Alcoa Corporation's other financial instruments were as follows:

	2024		2023	
December 31,	**Carrying value**	**Fair value**	**Carrying value**	**Fair value**
Cash and cash equivalents	$ 1,138	$ 1,138	$ 944	$ 944
Restricted cash	96	96	103	103
Short-term borrowings	50	50	56	56
Long-term debt due within one year	75	75	79	79
Long-term debt, less amount due within one year	2,470	2,499	1,732	1,702

Cash and cash equivalents and Restricted cash. The carrying amounts approximate fair value because of the short maturity of the instruments. The fair value amounts for Cash and cash equivalents and Restricted cash were classified in Level 1 of the fair value hierarchy.

Short-term borrowings and Long-term debt, including amounts due within one year. The fair value of Long-term debt, less amount due within one year was based on quoted market prices for public debt and on interest rates that are currently available to Alcoa Corporation for issuance of debt with similar terms and maturities for non-public debt. The fair value amounts for all Short-term borrowings and Long-term debt were classified in Level 2 of the fair value hierarchy.

Q. Income Taxes

Provision for income taxes. The components of Income (loss) before income taxes were as follows:

	2024	2023	2022
Domestic	$ (351)	$ (277)	$ (652)
Foreign	640	(307)	1,354
Total	$ 289	$ (584)	$ 702

Provision for income taxes consisted of the following:

	2024	2023	2022
Current:			
Federal	$ —	$ —	$ —
Foreign	242	211	445
State and local	—	—	—
	$ 242	$ 211	$ 445
Deferred:			
Federal	—	—	(3)
Foreign	23	(22)	222
State and local	—	—	—
	$ 23	$ (22)	$ 219
Total	$ 265	$ 189	$ 664

Federal includes U.S. income taxes related to foreign income.

A reconciliation of the U.S. federal statutory rate to Alcoa's effective tax rate was as follows:

	2024	2023	2022
U.S. federal statutory rate	21.0 %	21.0 %	21.0 %
Taxes on foreign operations—rate differential	29.8	7.1	9.9
Impacts of the U.S. Tax Cuts and Jobs Act of 2017	27.8	—	—
Changes in valuation allowances	15.5	(50.8)	76.7
Tax rate differential	5.1	—	—
Other foreign tax effects	4.5	(6.8)	1.7

Interest income/expense	2.8	(0.2)	(0.1)
Noncontrolling interest	1.3	0.2	0.8
Internal legal entity reorganizations	0.1	0.2	(9.0)
Uncertain tax positions	(0.2)	(0.1)	0.4
Equity loss	(0.2)	(5.3)	(2.0)
Adjustment of prior year income taxes	(1.5)	0.3	—
Tax credits	(7.7)	1.4	(0.2)
Tax holidays	(9.6)	0.1	(5.2)
Other	3.0	0.5	0.6
Effective tax rate	91.7%	(32.4%)	94.6%

During 2020, the U.S. Treasury Department finalized regulations implementing GILTI ("Global Intangible Low-Tax Income") provisions of the U.S. Tax Cuts and Jobs Act of 2017. Included in these regulations is an annual election for an exclusion from GILTI for income subject to a high rate of foreign tax (the "high tax exception"). Although affiliates may be located in jurisdictions with a high rate of foreign tax, due to differences between local tax rules used to determine the tax liability and the U.S. tax principles used to determine GILTI, affiliates may not meet the high tax exception each year and, as such, may not qualify for this exclusion. The Company plans to make the high tax exception election for the 2024 tax year in jurisdictions where the rules are met. The jurisdictions where the Company does not meet the high tax exception exclusion for the 2024 tax year resulted in a GILTI inclusion for the year ended December 31, 2024. The GILTI inclusion was fully offset by current losses and net operating losses subject to a full valuation allowance.

Certain income earned by Alcoa World Alumina Brasil Ltda. (AWAB) is eligible for a tax holiday, which decreases the tax rate on this income from

34
% to

15.25
%, which will result in future cash tax savings. The holiday related to production at the Alumar refinery was originally expected to end on December 31, 2027. During 2023, it was extended to December 31, 2032. The holiday related to the operation of the Juruti (Brazil) bauxite mine will end on December 31, 2026.

In 2021, it was determined that the deferred taxes associated with income subject to the tax holiday would be fully exhausted within the holiday period and the amounts were therefore maintained on the balance sheet at the holiday tax rate. In 2022, the Company's projection of the reversal of deferred tax assets during the holiday tax period was lowered, and as a result, the remainder was revalued at the statutory rate of

34
%, resulting in a discrete income tax benefit of $

33
, which is included in Tax holidays above. In 2023, the Company determined that it was no longer more likely than not that the deferred tax asset at AWAB would be realized and recorded a full valuation allowance against the deferred tax asset (see below). As a result, the amount reflected in Tax holidays above is zero with respect to AWAB as of December 31, 2023. In 2024, management's position on the realizability of these deferred tax assets remains the same as 2023, and the amount reflected in Tax holidays above is zero with respect to AWAB.

In October 2022, Alcoa completed the liquidation of a wholly-owned subsidiary, Alcoa Saudi Rolling Inversiones S.L. This liquidation resulted in a deductible loss in the Netherlands and a tax benefit of $

94
was recognized in 2022, however, this tax benefit was substantially offset by a valuation allowance.

In December 2022, Alcoa commenced an internal reorganization to reduce its number of legal entities in Norway from

four
to

one
to simplify accounting and treasury functions and reduce external costs. As a result of the simplification, the Company recorded a deferred tax expense of $

30
in 2022.

Deferred income taxes. The components of deferred tax assets and liabilities based on the underlying attributes without regard to jurisdiction were as follows:

	2024		2023	
December 31,	**Deferred tax assets**	**Deferred tax liabilities**	**Deferred tax assets**	**Deferred tax liabilities**
Tax loss carryforwards	$ 2,218	$ —	$ 2,042	$ —
Employee benefits	312	—	312	—
Derivatives and hedging activities	248	5	312	10
Loss provisions	166	—	161	—
Interest	142	5	142	6
Depreciation	83	202	94	318
Lease assets and liabilities	74	73	34	33
Investment basis differences	73	—	78	—
Tax credit carryforwards	23	—	24	—
Deferred income/expense	15	119	16	131

Other	69	1	25	—
	$ 3,423	$ 405	$ 3,240	$ 498
Valuation allowance	(2,734)	—	(2,595)	—
Total	$ 689	$ 405	$ 645	$ 498

The following table details the expiration periods of the deferred tax assets presented above:

December 31, 2024	Expires within 10 years	Expires within 11-20 years	No expiration	Other	Total
Tax loss carryforwards	$ 164	$ 369	$ 1,685	$ —	$ 2,218
Tax credit carryforwards	23	—	—	—	23
Other	—	—	136	1,046	1,182
Valuation allowance	(187)	(330)	(1,760)	(457)	(2,734)
Total	$ —	$ 39	$ 61	$ 589	$ 689

Deferred tax assets with no expiration may still have annual limitations on utilization. Other represents deferred tax assets whose expiration is dependent upon the reversal of the underlying temporary difference.

The total deferred tax asset (net of valuation allowance) is supported by projections of future taxable income exclusive of reversing temporary differences and taxable temporary differences that reverse within the carryforward period. The composition of Alcoa's net deferred tax asset by jurisdiction as of December 31, 2024 was as follows:

	Domestic	Foreign	Total
Deferred tax assets	$ 1,090	$ 2,333	$ 3,423
Valuation allowance	(1,022)	(1,712)	(2,734)
Deferred tax liabilities	(68)	(337)	(405)
Total	$ —	$ 284	$ 284

Alcoa Australia Holdings Pty Ltd (AAH), a wholly-owned indirect subsidiary of Alcoa, made an election prior to July 31, 2024 that resulted in Alcoa's other wholly-owned Australian subsidiaries joining AAH's tax consolidated group (the AAH Tax Consolidated Group). As a result of the acquisition of Alumina Limited, Alumina Limited and all of its Australian subsidiaries, as well as Alcoa of Australia Limited (AofA) and all of its subsidiaries, joined the AAH Tax Consolidated Group on August 1, 2024. Upon acquisition, Alcoa recognized a deferred tax asset (and a corresponding increase to Additional capital) of $

121

primarily related to the portion of Alumina Limited's Australian net operating loss carryforwards that the Company has determined are more likely than not to be realized as a result of the consolidated return election. In the fourth quarter of 2024, the Company recognized an additional deferred tax asset (and a corresponding increase to Additional capital) of $

95

primarily due to the tax allocation of the fixed asset valuation to individual assets. Additionally, the Company recorded a deferred tax asset of $

265

related to capital loss carryforwards, which was fully offset with a valuation allowance due to uncertain recoverability.

The Company has several income tax filers in various foreign countries. Of the $

284

net deferred tax asset included under the Foreign column in the table above, approximately

100

% relates to

five

of Alcoa's income tax filers (the Foreign Filers) as follows: a $

113

net deferred tax asset for Alcoa Canada Company in Canada; a $

83

net deferred tax asset for Alcoa-Lauralco Management Company in Canada; a $

33

net deferred tax asset for Alcoa Wolinbec Company in Canada; a $

19

net deferred tax asset for Alcoa Islandi and a $

27

net deferred tax asset for Fjarðaál, both in Iceland; and a $

9

net deferred tax asset for AofA in Australia.

The future realization of the net deferred tax asset for each of the Foreign Filers was based on projections of the respective future taxable income (defined as the sum of pretax income, other comprehensive income, and permanent tax differences), exclusive of reversing temporary differences and carryforwards. The realization of the net deferred tax assets of the Foreign Filers is not dependent on any future tax planning strategies.

Accordingly, management concluded that the net deferred tax assets of the Foreign Filers referenced above will more likely than not be realized in future periods, resulting in no need for a partial or full valuation allowance as of December 31, 2024.

In December 2023, Alcoa recorded a valuation allowance of $

154

against the net deferred tax assets of AWAB, of which $

106

related to the balance as of December 31, 2022. The 2023 full valuation allowance for AWAB was a result of AWAB's three-year cumulative loss position for the period ended December 31, 2023. The majority of AWAB's net deferred tax assets relate to prior net operating losses; the loss carryforwards are not subject to an expiration period. If AWAB continues to demonstrate sustained profitability, management may conclude that AWAB's deferred tax assets may be realized, resulting in a future reversal of the valuation allowance, generating a non-cash benefit in the period recorded. AWAB's net deferred tax assets, excluding the valuation allowance, were $

116

as of December 31, 2024.

The Company's subsidiaries in Iceland had a full valuation allowance recorded against deferred tax assets, which was established in 2015 and 2017, as the Company believed it was more likely than not that these tax benefits would not be realized. During 2023, after considering all positive and negative evidence, including the expectation that the jurisdiction will remain in a three-year cumulative income position, the Company determined that it is more likely than not that the net deferred tax assets will be realized. Based on this conclusion, the Company reversed the valuation allowance totaling $

58
during 2023, generating a non-cash benefit from income taxes.

In December 2022, Alcoa recorded a valuation allowance of $

217
against the net deferred tax assets of Alcoa Alumínio (Alumínio), of which $

150
related to the balance as of December 31, 2021. The 2022 full valuation allowance for Alumínio was a result of Alumínio's three-year cumulative loss position for the period ended December 31, 2022. Although the Company entered into aluminum contracts to manage exposures associated with the Alumar smelter restart, these contracts were held by another legal entity, and the associated realized gains are not available to Alumínio to offset the restart losses. While management believes Alumínio will return to profitability in the future with the restart of the Alumar smelter, Alumínio's recent history, including operational instability during the restart and the impact of the recent increased alumina input costs, does not provide a reliable basis for concluding that it is more likely than not that Alumínio's net deferred tax assets, which consist primarily of tax loss carryforwards with indefinite life, will be realized. Alumar smelter profitability in future periods could prompt the Company to evaluate the realizability of the deferred tax assets and assess the possibility of a reversal of the valuation allowance, which could generate a non-cash benefit in the period the valuation allowance is reversed.

The following table details the changes in the valuation allowance:

December 31,	2024	2023	2022
Balance at beginning of year	$ (2,595)	$ (2,333)	$ (2,062)
Establishment of new allowances[1]	(266)	(106)	(150)
Net change to existing allowances[2]	(21)	(113)	(151)
Foreign currency translation	148	(43)	30
Balance at end of year	$ (2,734)	$ (2,595)	$ (2,333)

(1) Reflects valuation allowances initially established as a result of a change in management's judgment regarding the realizability of deferred tax assets.

(2) Reflects movements in previously established valuation allowances, which increase or decrease as the related deferred tax assets increase or decrease. Such movements occur as a result of a change in management's judgment regarding previously established valuation allowances, remeasurement due to a tax rate change and changes in the underlying attributes of the deferred tax assets, including expiration of the attribute and reversal of the temporary difference that gave rise to the deferred tax asset.

Undistributed net earnings. Certain earnings of Alcoa's foreign subsidiaries are deemed to be permanently reinvested outside the United States. The cumulative amount of Alcoa's foreign undistributed net earnings deemed to be permanently reinvested was approximately $ 2,857 as of December 31, 2024. Alcoa Corporation has several commitments and obligations related to the Company's operations in various foreign jurisdictions; therefore, management has no plans to distribute such earnings in the foreseeable future. Alcoa Corporation continuously evaluates its local and global cash needs for future business operations and anticipated debt facilities, which may influence future repatriation decisions. If these earnings were distributed in the form of dividends or otherwise, Alcoa could be subject to foreign income or withholding taxes and state income taxes. Due to the uncertainty of the manner in which the undistributed earnings would be brought back to the United States and the tax laws in effect at that time, it is not practicable to estimate the tax liability that might be incurred if such earnings were remitted to the U.S.

Unrecognized tax benefits. Alcoa and its subsidiaries file income tax returns in the U.S. federal jurisdiction and various foreign and U.S. state jurisdictions. With few exceptions, the Company is not subject to income tax examinations by tax authorities for years prior to 2014. The U.S. federal income tax filings of the Company's U.S. consolidated tax group have been examined through the 2018 tax year, and an examination of the 2021 tax year is ongoing. Foreign jurisdiction tax authorities are in the process of examining income tax returns of several of Alcoa's subsidiaries for various tax years. Excluding the Australia tax matter discussed in Note S, the period under foreign examination includes the income tax years from 2014 through 2022. For U.S. state income tax purposes, the Company and its subsidiaries remain subject to income tax examinations for the 2017 tax year and forward.

In the third quarter of 2020, AofA paid approximately $ 74 (A$ 107) to the ATO related to the tax dispute described in Note S. Upon payment, AofA recorded a noncurrent prepaid tax asset, as the Company continues to believe it is more likely than not that AofA's tax position will be sustained and therefore is not recognizing any tax expense in relation to this matter. In accordance with Australian tax laws, the initial interest assessment and additional interest are deductible against AofA's taxable income. AofA applied this deduction beginning in the third quarter of 2020, reducing cash tax payments. Interest compounded in future years is also deductible against AofA's income in future periods. If AofA is ultimately successful, the interest deduction would become taxable as income in the year the dispute is resolved. In addition, should the ATO decide in the interim to reduce any interest already assessed, the reduction would be taxable as income at that point in time. During 2023, AofA continued to record its tax provision and tax liability without effect of the ATO assessment, since it expects to prevail. The tax payable related to deductions of interest on the assessment will remain on AofA's balance sheet as a noncurrent liability, increased by the tax effect of subsequent periods' interest deductions, until dispute resolution. At December 31, 2024 and December 31, 2023, the noncurrent liability resulting from the cumulative interest deductions was approximately $ 206 (A$ 332) and $ 199 (A$ 293), respectively.

The reserve balance for unrecognized tax benefits is included in Noncurrent income taxes on the Consolidated Balance Sheet. A reconciliation of the beginning and ending amount of unrecognized tax benefits (excluding interest and penalties) was as follows:

December 31,	2024	2023	2022
Balance at beginning of year	$ 5	$ 5	$ 4

Additions for tax positions of prior years	—	—	2
Reductions for tax positions of prior years	(1)	—	—
Expiration of the statute of limitations	—	—	(1)
Balance at end of year	$ 4	$ 5	$ 5

For all periods presented, a portion of the balance at end of year pertains to state tax liabilities, which are presented before any offset for federal tax benefits. The effect of unrecognized tax benefits, if recorded, that would impact the annual effective tax rate for 2024, 2023, and 2022 would be

2
%,

1
%, and

1
%, respectively, of Income (loss) before income taxes. Alcoa does not anticipate that changes in its unrecognized tax benefits will have a material impact on the Statement of Consolidated Operations during 2025.

It is the Company's policy to recognize interest and penalties related to income taxes as a component of the Provision for income taxes on the accompanying Statement of Consolidated Operations. In 2024, 2023, and 2022 Alcoa recognized $

0
, $

1
, and $

1
, in interest and penalties, respectively. Due to the expiration of the statute of limitations, settlements with tax authorities, and refunded overpayments, the Company also recognized interest income of $

1
, $

1
, and $

1
in 2024, 2023, and 2022, respectively. As of December 31, 2024 and 2023, the amount accrued for the payment of interest and penalties was $

3
and $

4
, respectively.

Other Matters. On August 16, 2022, the U.S. enacted the Inflation Reduction Act of 2022 (IRA), which includes a

15
% minimum tax on book income of certain large corporations, a

1
% excise tax on net stock repurchases after December 31, 2022, and several tax incentives to promote clean energy. As a result of the provisions of the IRA, the Company will incur an excise tax of

1
% for certain common stock repurchases made subsequent to December 31, 2022, which will be reflected in the cost of purchasing the underlying shares. The minimum corporate tax did not have an impact on the Company for 2024, 2023, or 2022 and will not have an impact on the Company for 2025.

The IRA contains a number of tax credits and other incentives for investments in renewable energy production, carbon capture, and other climate-related actions, as well as the production of critical minerals. In December 2023, the U.S. Treasury issued guidance on Section 45X of the Advanced Manufacturing Tax Credit. The Notice of Proposed Rulemaking (the Proposed Regulations) clarified that commercial grade aluminum is included in the definition of aluminum eligible for the credit, which was designed to incentivize domestic production of critical materials important for the transition to clean energy. On October 24, 2024, the U.S. Treasury finalized the Proposed Regulations under Section 45X with important modifications including the ability to include the cost of certain direct and indirect materials in the cost base of the credit. The Proposed Regulation on the definition of aluminum was not finalized; however, management believes that commercial grade aluminum continues to qualify for the Section 45X credit. In the Preamble to the Final Regulations, the U.S. Treasury indicated it will finalize the definition at a later date.

In 2024 and 2023, the Company recorded benefits of $

71
and $

36
in Cost of goods sold, respectively, related to its Massena West smelter (New York) and its Warrick smelter (Indiana). As of December 31, 2024, benefits of $

36
were included in Other receivables and $

71
were included in Other noncurrent assets on the Consolidated Balance Sheet. As of December 31, 2023, benefits of $

36
were included in Other receivables on the Consolidated Balance Sheet.

R. Asset Retirement Obligations

The following table details the carrying value of recorded AROs by major category, of which $

204
and $2

17
was classified as a current liability as of December 31, 2024 and 2023, respectively:

December 31,	2024	2023
Closure of bauxite residue areas	$ 396	$ 437
Mine reclamation	321	328
Spent pot lining disposal	103	124
Demolition	50	76
Landfill closure	25	24
Balance at end of year	$ 895	$ 989

The following table details the changes in the total carrying value of recorded AROs:

December 31,	2024	2023
Balance at beginning of year	$ 989	$ 828
Accretion expense	38	33
Liabilities incurred	160	254
Payments	(196)	(148)
Reversals of previously recorded liabilities	(10)	(8)
Foreign currency translation and other	(86)	30
Balance at end of year	$ 895	$ 989

Liabilities incurred in 2024 include:

- $ 87 for new mining areas opened during the year and higher estimated mine reclamation costs;
- $ 24 for changes in closure estimates at the previously closed Suralco (Suriname) refinery;
- $ 22 related to spent pot lining transportation, treatment, and disposal;
- $ 11 related to changes in closure estimates for mine reclamation, landfill closure, and demolition at previously closed sites;
- $ 9 related to water treatment due to the curtailment of the Kwinana refinery; and,
- $ 6 related to the changes in estimates for residue area closure, landfill closure, and mine reclamation at various operating sites.

The liabilities incurred were recorded with corresponding capitalized asset retirement costs, except for $ 6 related to non-operating bauxite residue areas and spent pot lining transportation and disposal, which was recorded to Cost of goods sold; and a net charge of $ 35 related to changes in closure estimates at previously closed sites and the curtailment of the Kwinana refinery which were recorded to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

In 2024, reversals of previously recorded liabilities primarily related to the completion of spent pot lining transportation and disposal at the previously closed Intalco smelter.

Liabilities incurred in 2023 include:

- $ 97 for changes in closure estimates of operating bauxite residue areas;
- $ 87 for new mining areas opened during the year and higher estimated mine reclamation costs;
- $ 36 related to the closure of the previously curtailed Intalco smelter;
- $ 23 related to spent pot lining transportation, treatment, and disposal;
- $ 10 for changes in closure estimates of non-operating bauxite residue areas; and,
- $ 1 related to an accrual for demolition for the closure of a potline at Warrick Operations.

The additional accruals were recorded with corresponding capitalized asset retirement costs except for $ 15 related to non-operating bauxite residue areas at the Alumar refinery, spent pot lining and treatment, and mine reclamation which was recorded to Cost of goods sold; and $ 41 related to the closure of the Intalco smelter, updated estimates for spent pot lining treatment and disposal at a previously closed site, and demolition accruals for the closure of a potline at Warrick Operations, which was recorded to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

In 2023, reversals of previously recorded liabilities primarily related to changes in estimates at various sites and to the completion of a site demolition project, of which $ 2 was recorded to Restructuring and other charges, net (see Note D) on the accompanying Statement of Consolidated Operations.

The estimated timing of cash outflows for recorded AROs at December 31, 2024 was as follows:

2025	$ 204
2026 – 2029	522
Thereafter	169
Total	$ 895

Changes to the estimates may result in material changes to the recorded AROs that may require an increase to or a reversal of previously recorded liabilities, as well as changes in the timing of cash outflows.

S. Contingencies and Commitments

Contingencies

Environmental Matters

Alcoa Corporation participates in environmental assessments and cleanups at several locations. These include currently or previously owned or operated facilities and adjoining properties, and waste sites, including Superfund (Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)) sites.

Alcoa Corporation's environmental remediation reserve balance reflects the most probable costs to remediate identified environmental conditions for which costs can be reasonably estimated. The following table details the changes in the carrying value of recorded environmental remediation reserves:

Balance at December 31, 2021	$ 309
Liabilities incurred	32
Cash payments	(26)
Reversals of previously recorded liabilities	(30)
Foreign currency translation and other	(1)
Balance at December 31, 2022	284
Liabilities incurred	39
Cash payments	(55)
Reversals of previously recorded liabilities	(1)
Foreign currency translation and other	1
Balance at December 31, 2023	268
Liabilities incurred	25
Cash payments	(49)
Reversals of previously recorded liabilities	(12)
Foreign currency translation and other	(12)
Balance at December 31, 2024	$ 220

At December 31, 2024 and 2023, the current portion of the remediation reserve balance was $ 38 and $ 66, respectively.

In 2024, the Company incurred liabilities of $

25
and recorded a reversal of $

12
. The impacts to the Statement of Consolidated Operations were primarily:

- $

20
for an increase in estimated scope and costs associated with ongoing remediation work at several sites and for certain other environmental compliance matters which were recorded in Cost of goods sold;

- $

5
for an increase in estimated costs associated with ongoing remediation work at previously closed sites which were recorded to Restructuring and other charges, net (see Note D); and,

- $

12
reversal for site remediation that is no longer required at a previously closed site which was recorded in Restructuring and other charges, net (see Note D).

In 2023, the Company incurred liabilities of $

39
and recorded a reversal of $

1
. The impacts to the Statement of Consolidated Operations were primarily:

- $

14
for the closure of the previously curtailed Intalco smelter and $

13
for an increase in estimated costs associated with ongoing remediation work at the previously closed Longview (Washington) site which were recorded in Restructuring and other charges, net (see Note D);

- $

12
for an increase in estimated costs associated with ongoing remediation work at various other sites which was recorded in Cost of goods sold; and,

- $

1
reversal due to the determination that certain remaining site remediation was no longer required which was recorded in Restructuring and other charges, net (see Note D).

In 2022, the Company incurred liabilities of $

32

and recorded reversals of $

30

. The impacts to the Statement of Consolidated Operations were primarily:

- $

14

for the closure of the previously curtailed magnesium smelter in Addy and $

6

for estimates for environmental remediation at the Point Henry site which were recorded in Restructuring and other charges, net (see Note D);

- $

4

for a new phase of work at the former East St. Louis site and $

9

for environmental activities at various sites recorded in Cost of goods sold; and,

- $

30

reversals during 2022, primarily related to changes in estimates for site remediation at Massena East of $

18

and Suralco of $

5

and completion of remediation at a previously closed site in Brazil of $

6,

which were recorded in Restructuring and other charges, net (see Note D).

Cash payments include mandated expenditures as well as those not required by any regulatory authority or third party. The estimated timing of cash outflows from the environmental remediation reserve at December 31, 2024 was as follows:

2025	$ 38
2026 – 2029	77
Thereafter	105
Total	$ 220

Reserve balances at December 31, 2024 and 2023, associated with significant sites with active remediation underway or for future remediation were $

154

and $

211

, respectively. In management's judgment, the Company's reserves are sufficient to satisfy the provisions of the respective action plans. Upon changes in facts or circumstances, a change to the reserve may be required. The Company's significant sites include:

Suriname—The reserve associated with the 2017 closure of the Suralco refinery and bauxite mine is for treatment and disposal of refinery waste and soil remediation. The work began in 2017 and is expected to be completed at the end of 2027.

Hurricane Creek, Arkansas—The reserve associated with the 1990 closure of two mining areas and refineries near Hurricane Creek, Arkansas is for ongoing monitoring and maintenance for water quality surrounding the mine areas and residue disposal areas.

Massena, New York—The reserve associated with the 2015 closure of the Massena East smelter by the Company's subsidiary, Reynolds Metals Company, is for subsurface soil remediation to be performed after demolition of the structures. Remediation work commenced in 2021 and will take up to eight years to complete.

Point Comfort, Texas—The reserve associated with the 2019 closure of the Point Comfort alumina refinery is for disposal of industrial wastes contained at the site, subsurface remediation, and post-closure monitoring and maintenance. The final remediation plan is currently being developed, which may result in a change to the existing reserve.

Addy, Washington—The reserve associated with the 2022 closure of the Addy magnesium smelter facility is for site-wide remediation and investigation and post-closure monitoring and maintenance. Remediation work is not expected to begin until 2027 and will take three to five years to complete. The final remediation plan is currently being developed, which may result in a change to the existing reserve.

Ferndale, Washington—The reserve associated with the 2023 closure of the Intalco aluminum smelter in Ferndale, Washington is for below grade site remediation and five years of post-closure maintenance and monitoring. The final remediation plan is under review.

In May 2022, the Company received a Notice of Violation (NOV) from the U.S. Environmental Protection Agency (the EPA). The NOV alleged violations under the Clean Air Act at the Intalco smelter from when the smelter was operational. The EPA referred the matter to the U.S. Department of Justice, Environment and Natural Resources Division (the DOJ) in May 2022. The DOJ and the Company agreed to a stipulated settlement, which was filed with the United States District Court for the Western District of Washington at Seattle on July 18, 2024, requiring the Company to pay a civil fine of $

5
. On October 15, 2024, the Court approved the stipulated settlement of $

5
, and payment was remitted by the Company.

Other Sites—The Company is in the process of decommissioning various other plants and remediating sites in several countries for potential redevelopment or to return the land to a natural state. In aggregate, there are remediation projects at

31
other sites that are planned or underway. These activities will be completed at various times in the future over the next two to four years, after which ongoing monitoring and other activities may be required. At December 31, 2024 and 2023, the reserve balance associated with these activities was $

66
and $

57
, respectively.

Tax

Brazil (AWAB)— Under Brazilian law, taxpayers who generate non-cumulative federal value added tax credits related to exempt exports may either request a refund in cash (monetization) or offset them against other federal taxes owed. In 2012, AWAB requested monetization of $

136
(R$

273
) from the Brazilian Federal Revenue Office (RFB) and received $

68
(R$

136
) that year. In March 2013, AWAB was notified by the RFB that approximately $

110
(R$

220
) of value added tax credits previously claimed were being disallowed and a penalty of

50
% was assessed. $

41
(R$

82
) of the cash received in 2012 related to the disallowed amount. The value added tax credits were claimed by AWAB for both fixed assets and export sales related to the Juruti bauxite mine and Alumar refinery expansion for tax years 2009 through 2011. The RFB has disallowed credits they allege belong to the consortium in which AWAB owns an interest and should not have been claimed by AWAB. Credits have also been disallowed as a result of challenges to apportionment methods used, questions about the use of the credits, and an alleged lack of documented proof. AWAB presented defense of its claim to the RFB on April 8, 2013.

In February 2022, the RFB notified AWAB that it had inspected the value added tax credits claimed for 2012 and disallowed $

4
(R$

19
). In its decision, the RFB allowed credits of $

14
(R$

65
) that were similar to those previously disallowed for 2009 through 2011. In July 2022, the RFB notified AWAB that it had inspected the value added tax credits claimed for 2013 and disallowed $

13
(R$

66
). In its decision, the RFB allowed credits of $

10
(R$

53
) that were similar to those previously disallowed for 2009 through 2011. In September 2024, the RFB notified AWAB that it had further inspected the value added tax credits claimed for 2013 and issued a first administrative decision allowing additional credits of $

1
(R$

5
) that were similar to those previously disallowed for 2009 through 2011. AWAB received the 2012 allowed credits with interest of $

9
(R$

44
) in March 2022, the 2013 allowed credits with interest of $

6
(R$

31
) in August 2022, and the additional 2013 allowed credits with interest of $

1
(R$

6
) in December 2024. The decisions on the 2012 and 2013 credits provide positive evidence to support management’s opinion that there is no basis for these

credits to be disallowed. AWAB will continue to dispute the credits that were disallowed for 2012 and 2013. If AWAB is successful in this administrative process, the RFB would have no further recourse. If unsuccessful in this process, AWAB has the option to litigate at a judicial level. Separately from AWAB's administrative appeal, in June 2015, a new tax law was enacted repealing the provisions in the tax code that were the basis for the RFB assessing a

50
% penalty in this matter. As such, the estimated range of reasonably possible loss for these matters is $

0
to $

48
(R$

300
). It is management's opinion that the allegations have no basis; however, at this time, the Company is unable to reasonably predict an outcome for this matter.

Australia (AofA)— In December 2019, AofA received a statement of audit position (SOAP) from the Australian Taxation Office (ATO) related to the pricing of certain historic third-party alumina sales. The SOAP proposed adjustments that would result in additional income tax payable by AofA. During 2020, the SOAP was the subject of an independent review process within the ATO. At the conclusion of this process, the ATO determined to continue with the proposed adjustments and issued Notices of Assessment (the Notices) that were received by AofA on July 7, 2020. The Notices asserted claims for income tax payable by AofA of approximately $

132
(A$

214
). The Notices also included claims for compounded interest on the tax amount totaling approximately $

438
(A$

707
).

On September 17, 2020, the ATO issued a position paper with its preliminary view on the imposition of administrative penalties related to the tax assessment issued to AofA. This paper proposed penalties of approximately $

79
(A$

128
).

AofA disagreed with the Notices and with the ATO's proposed position on penalties. During 2020, AofA lodged formal objections to the Notices, provided a submission on the ATO's imposition of interest and submitted a response to the ATO's position paper on penalties. After the ATO completes its review of AofA's response to the penalties position paper, the ATO could issue a penalty assessment.

To date, AofA has not received a response to its submission on the ATO's imposition of interest or its response to the ATO's position paper on penalties.

Through February 1, 2022, AofA did not receive a response from the ATO on AofA's formal objections to the Notices and, on that date, AofA submitted statutory notices to the ATO requiring the ATO to make decisions on AofA's objections within a 60-day period. On April 1, 2022, the ATO issued its decision disallowing the Company's objections related to the income tax assessment, while the position on penalties and interest remains outstanding.

On April 29, 2022, AofA filed proceedings in the Australian Administrative Appeals Tribunal (AAT) against the ATO to contest the Notices. The AAT held the first directions hearing on July 25, 2022 ordering AofA to file its evidence and related materials by November 4, 2022, ATO to file its materials by April 14, 2023 and AofA to file reply materials by May 26, 2023. AofA filed its evidence and related materials on November 4, 2022. The ATO did not file its materials by April 14, 2023. At a directions hearing on May 17, 2023, the ATO was granted an extension to file its materials by August 18, 2023. At a directions hearing on September 26, 2023, the ATO was granted an additional extension to file its materials by November 3, 2023. The ATO filed its materials on November 13, 2023. At a directions hearing on November 22, 2023, AofA was ordered to file any reply materials by March 15, 2024. AofA filed its reply materials on March 15, 2024. The substantive hearing was completed in June 2024, and AofA is awaiting the AAT's decision.

The Company maintains that the sales subject to the ATO's review, which were ultimately sold to Aluminium Bahrain B.S.C., were the result of arm's length transactions by AofA over two decades and were made at arm's length prices consistent with the prices paid by other third-party alumina customers.

In accordance with the ATO's dispute resolution practices, AofA paid

50
% of the assessed income tax amount exclusive of interest and any penalties, or approximately $

74
(A$

107
), during the third quarter 2020, and the ATO is not expected to seek further payment prior to final resolution of the matter. If AofA is ultimately successful, any amounts paid to the ATO as part of the

50
% payment would be refunded. AofA funded the payment with cash on hand and recorded the payment within Other noncurrent assets as a noncurrent prepaid tax asset; at December 31, 2024 the related balance was $

66
(A$

107
).

Interest on the unpaid tax continues to accrue during the dispute, which, along with the initial interest assessment, is deductible against taxable income by AofA. Beginning in the third quarter of 2020, AofA applied this deduction and total reductions in cash tax payments of $

206
(A$

332
) and $

199
(A$

293
) are reflected within Other noncurrent liabilities and deferred credits as a noncurrent accrued tax liability at December 31, 2024 and December 31, 2023, respectively. If AofA is ultimately successful, the interest would be taxable as income in the year the dispute is resolved, and accrued cash taxes would be paid to the ATO ($

206
(A$

332
) accrued as of December 31, 2024).

The Company continues to believe it is more likely than not that AofA's tax position will be sustained and therefore is not recognizing any tax expense in relation to this matter. However, because the ultimate resolution of this matter is uncertain at this time, the Company cannot predict the potential loss or range of loss associated with the outcome, which may materially affect its results of operations and financial condition. References to any assessed U.S. dollar amounts presented in connection with this matter have been converted into U.S. dollars from Australian dollars based on the exchange rate in the respective period.

Other

Spain— In July 2019, the Company completed the divestiture of the Avilés and La Coruña (Spain) aluminum facilities to PARTER Capital Group AG (PARTER) in a sale process endorsed by the Spanish government and supported by the workers' representatives following a collective dismissal process. In connection with the divestiture, Alcoa committed to make financial contributions to the divested entities of up to $

95
; a total of $

78
was paid through December 31, 2021.

In early 2020, PARTER sold a majority stake in the facilities to an unrelated party. Alcoa had no knowledge of the subsequent transaction prior to its announcement and on August 28, 2020, Alcoa filed a lawsuit with the Court of First Instance in Madrid, Spain asserting that the sale was in breach of the sale agreement between Alcoa and PARTER. In June 2023, the Court of First Instance in Madrid issued a declaratory judgment in Alcoa's favor ruling that the transaction between PARTER and the unrelated party was a breach of the sale agreement. There was no financial compensation to the Company as a result of this ruling.

Related to this subsequent sale transaction, certain proceedings and investigations were initiated by or at the request of the employees of the facilities against their current employers, the new owners of the current employers, and Alcoa, alleging that certain agreements from the 2019 collective dismissal process remain in force and that, under such agreements, Alcoa remains liable for certain related employment benefits.

During 2022, Alcoa reached a Global Settlement Agreement (GSA) with the workers of the divested Avilés and La Coruña facilities to settle various legal disputes related to the 2019 divestiture, and Alcoa recorded a charge of $

79
in Restructuring and other charges, net to reflect its estimated liability for the GSA. In July 2023, the Supreme Court of Spain ratified the GSA. Upon completion of the remaining administrative and judicial approvals, the Company made cash payments of $

76
to the former employees of the facilities in 2023 in accordance with the GSA. The remaining payments were made in 2024.

St. Croix Proceedings—Prior to 2012, Alcoa Inc., the Company's former parent company, was served with two multi-plaintiff actions alleging personal injury or property damage from Hurricane Georges or winds blowing material from the Company's former St. Croix alumina facility. These actions were subsequently

consolidated into the Red Dust Claims docket in 2017.

In March 2022, the Superior Court of the Virgin Islands issued an amended case management order dividing complaints filed in the Red Dust docket into groups of 50 complaints, designated Groups A through I. The parties selected 10 complaints from Group A to proceed to trial as the Group A lead cases. In May 2024, the Court issued an amended case management order with regard to the Group A lead cases scheduling trials to begin in November 2024. The Court further ordered the parties to participate in mediation on or before August 31, 2024. After completing its case analysis in the second quarter of 2024, the Company recorded a reserve for its estimate of probable loss and a related receivable for insurance proceeds with no material impact to the results of operations. Alcoa participated in the court-ordered mediation in August 2024 and reached a settlement agreement to resolve the matter in its entirety, which resulted in no further impact to Alcoa's results of operations. The settlement was finalized and funds were released in January 2025 upon receiving signed release agreements or final dismissals from every plaintiff. This matter is now closed.

General

In addition to the matters discussed above, various other lawsuits, claims, and proceedings have been or may be instituted or asserted against Alcoa Corporation, including those pertaining to environmental, safety and health, commercial, tax, product liability, intellectual property infringement, governance, employment, and employee and retiree benefit matters, and other actions and claims arising out of the normal course of business. While the amounts claimed in these other matters may be substantial, the ultimate liability is not readily determinable because of the considerable uncertainties that exist. Accordingly, it is possible that the Company's liquidity or results of operations in a particular period could be materially affected by one or more of these other matters. However, based on facts currently available, management believes that the disposition of these other matters that are pending or asserted will not have a material adverse effect, individually or in the aggregate, on the financial position of the Company.

Commitments

Purchase Obligations. Alcoa Corporation is party to unconditional purchase obligations for energy that expire between 2040 and 2041 . Commitments related to these contracts total $

50
in 2025, $

53
in 2026, $

55
in 2027, $

57
in 2028, $

59
in 2029, and $

740
thereafter. Expenditures under these contracts totaled $

50
in 2024, $

53
in 2023, and $

58
in 2022. Additionally, the Company has entered into other purchase commitments for energy, raw materials, and other goods and services, which total $

4,431
in 2025, $

1,764
in 2026, $

1,497
in 2027, $

1,275
in 2028, $

1,267
in 2029, and $

7,233
thereafter.

AofA has a gas supply agreement to power its

three
alumina refineries in Western Australia which began in July 2020 for a 12-year period. The terms of this agreement required AofA to make a prepayment of $

500
prior to 2017. At December 31, 2024, prepayments of $

35
and $

225
were included in Prepaid expenses and other current assets and Other noncurrent assets (see Note U), respectively, on the accompanying Consolidated Balance Sheet. At December 31, 2023, prepayments of $

37
and $

283
were included in Prepaid expenses and other current assets and Other noncurrent assets (see Note U), respectively, on the accompanying Consolidated Balance Sheet.

Guarantees of Third Parties. As of December 31, 2024 and 2023, the Company had

no

outstanding potential future payments for guarantees issued on behalf of a third party.

Bank Guarantees and Letters of Credit. Alcoa Corporation and its subsidiaries have outstanding bank guarantees and letters of credit related to, among others, energy contracts, environmental obligations, legal and tax matters, leasing obligations, workers compensation, and customs duties. The total amount committed under these instruments, which automatically renew or expire at various dates between 2025 and 2026 , was $

316
(includes $

87
issued under a standby letter of credit agreement —see below) at December 31, 2024. Additionally, ParentCo has outstanding bank guarantees and letters of credit related to the Company of $

12
at December 31, 2024. In the event ParentCo would be required to perform under any of these instruments, ParentCo would be indemnified by Alcoa Corporation in accordance with the Separation and Distribution Agreement. Likewise, the Company has outstanding bank guarantees and letters of credit related to ParentCo of $

6
at December 31, 2024. In the event Alcoa Corporation would be required to perform under any of these instruments, the Company would be indemnified by ParentCo in accordance with the Separation and Distribution Agreement.

In December 2023, AofA committed to provide a bank guarantee in connection with the approval of the Company's five-year mine plans that were referred to the Western Australia Environmental Protection Agency (WA EPA), which demonstrates Alcoa's confidence that its operations will not impair drinking water supplies. On September 30, 2024 and October 1, 2024, AofA delivered bank guarantees totaling $

62
(A$

100
). After March 27, 2025, Alcoa may, with the Western Australian government's consent, replace the bank guarantee with a parent company guarantee or a surety bond. The requirement to provide financial assurance will expire upon the completion of the WA EPA's assessment of the Company's five-year mine plans.

In August 2017, Alcoa Corporation entered into a standby letter of credit agreement with three financial institutions, which was most recently amended in May 2024 and expires on May 1, 2026 . The agreement provides for a $

200
facility used by the Company for matters in the ordinary course of business. Alcoa Corporation's obligations under this facility are secured in the same manner as obligations under the Company's revolving credit facility. Additionally, this facility contains similar representations and warranties and affirmative, negative, and financial covenants as the Company's Revolving Credit Facility (see Note M). As of December 31, 2024, letters of credit aggregating $

87
were issued under this facility.

Surety Bonds. Alcoa Corporation has outstanding surety bonds primarily related to tax matters, contract performance, workers compensation, environmental-related matters, and customs duties. The total amount committed under these bonds, which automatically renew or expire at various dates between 2025 and 2029 , was $

245

at December 31, 2024. Additionally, ParentCo has outstanding surety bonds related to the Company of $

7

at December 31, 2024. In the event ParentCo would be required to perform under any of these instruments, ParentCo would be indemnified by Alcoa Corporation in accordance with the Separation and Distribution Agreement. Likewise, the Company has outstanding surety bonds related to ParentCo of $

7

at December 31, 2024. In the event Alcoa Corporation would be required to perform under any of these instruments, the Company would be indemnified by ParentCo in accordance with the Separation and Distribution Agreement.

T. Leasing

The Company records a right-of-use asset and lease liability for several types of operating leases, including land and buildings, plant equipment, vehicles, maritime vessels, and computer equipment. These amounts are equivalent to the aggregate future lease payments on a discounted basis. The leases have remaining terms of less than one to 58 years . The discount rate applied in determining the present value of lease payments is the Company's incremental borrowing rate at the lease commencement date, unless there is a rate implicit in the lease agreement. The Company does not have material financing leases.

Lease expense and operating cash flows include:

	2024	2023
Costs from operating leases	$ 54	$ 53
Variable lease payments	$ 42	$ 25
Short-term rental expense	$ 7	$ 11

The weighted average lease term and weighted average discount rate were as follows:

December 31,	2024	2023
Weighted average lease term for operating leases (years)	10.7	12.9
Weighted average discount rate for operating leases	6.8 %	6.7 %

The following represents the aggregate right-of-use assets and related lease obligations recognized in the Consolidated Balance Sheet:

December 31,	2024	2023
Properties, plants, and equipment, net	$ 259	$ 135
Other current liabilities	$ 38	$ 31
Other noncurrent liabilities and deferred credits	223	104
Total operating lease liabilities	$ 261	$ 135

New leases of $

163

and $

76

were added during the years ended December 31, 2024 and 2023, respectively.

The future cash flows related to the operating lease obligations as of December 31, 2024 were as follows:

Year Ending December 31,	
2025	$ 55

2026	48
2027	42
2028	37
2029	32
Thereafter	170
Total lease payments (undiscounted)	384
Less: discount to net present value	(123)
Total	$ 261

U. Other Financial Information

Interest Cost Components

	2024	2023	2022
Amount charged to expense	$ 156	$ 107	$ 106
Amount capitalized	8	4	3
	$ 164	$ 111	$ 109

Other Expenses (Income), Net

	2024	2023	2022
Equity loss	$ 24	$ 228	$ 27
Foreign currency losses (gains), net	126	(64)	9
Net loss from asset sales	37	14	10
Net (gain) loss on mark-to-market derivative instruments (P)	(58)	5	(174)
Non-service costs – pension and other postretirement benefits (O)	16	13	60
Other, net	(54)	(62)	(50)
	$ 91	$ 134	$ (118)

In 2024 and 2023, Other, net of $ 54 and $ 62, respectively, was primarily related to interest income on interest bearing accounts.

In 2022, Other, net of $ 50 was primarily related to interest income for the Brazil value added tax credits (see Note S).

Other Noncurrent Assets

December 31,	2024	2023
Prepaid gas transmission contract	$ 278	$ 297
Gas supply prepayment (S)	225	283
Value added tax credits	213	336
Deferred mining costs, net	184	187
Goodwill (L)	142	146

Prepaid pension benefit (O)	128	125
IRA Section 45X credit (Q)	71	—
Noncurrent prepaid tax asset (S)	66	73
Noncurrent restricted cash (see below)	53	71
Intangibles, net (L)	36	37
Other	101	95
	$ 1,497	$ 1,650

Prepaid gas transmission contract—As part of a previous sale transaction of an equity investment, Alcoa maintained access to approximately

30
% of the Dampier to Bunbury Natural Gas Pipeline transmission capacity in Western Australia for gas supply to

three
alumina refineries. At December 31, 2024 and 2023, AofA had an asset of $

278
and $

297
, respectively, representing prepayments made under the agreement for future gas transmission services.

Value added tax credits—The Value added tax (VAT) credits (federal and state) relate to

two
of the Company's subsidiaries in Brazil, AWAB, and Alumínio, concerning the Alumar smelter and refinery and the Juruti mine. The mine, refinery and smelter pay VAT on the purchase of goods and services used in the mining, alumina, and production process. The credits generally can be utilized to offset the VAT charged on domestic sales of bauxite, alumina, and aluminum.

In the fourth quarter of 2018, after an assessment of the future realizability of Brazil state VAT credits recorded, the Company established an allowance on the accumulated state VAT credit balances and stopped recording any future credit benefits. With the restart of the Alumar smelter and its first metal sales in June 2022, the Company had the ability to monetize these credits. In June 2022, the Company reversed the allowance with a credit of $

83
to Restructuring and other charges, net and reversed the subsequent additions to the valuation allowance with a credit to Cost of goods sold of $

46
(same accounts as when incurred).

Other Noncurrent Liabilities and Deferred Credits

December 31,	2024	2023
Operating lease obligations (T)	$ 223	$ 104
Noncurrent accrued tax liability (S)	206	199
Accrued compensation and retirement costs	95	94
Deferred energy credits	36	42
Value added tax credits payable to Arconic Corporation	26	58
Deferred alumina sales revenue	12	20
Noncurrent restructuring reserve (D)	8	15
Other	50	36
	$ 656	$ 568

Deferred energy credits—Deferred energy credits relate to cash received for 2022 and 2021 carbon dioxide emissions related to the San Ciprián smelter and refinery during the years ended December 31, 2024 and 2023, respectively, from a governmental agency in Spain. The terms of the credits require the Company to comply with certain conditions for a period of three years. These deferred credits will be recognized as a reduction to Cost of goods sold once it is determined to be probable the Company will satisfy all conditions. Should the Company not meet all conditions during the three-year period, the credits will be repaid to the governmental agency.

Cash and Cash Equivalents and Restricted Cash

December 31,	2024	2023
Cash and cash equivalents	$ 1,138	$ 944
Current restricted cash	43	32
Noncurrent restricted cash	53	71
	$ 1,234	$ 1,047

Restricted cash primarily relates to commitments made for the December 2021 and February 2023 viability agreements for the San Ciprián restart (see Note D).

The Company incurred $

9

of capital investment expenditures and $

5

of smelter restart expenditures against the commitments during 2024, of which $

5

was released from restricted cash. At December 31, 2024, the Company had restricted cash of $

86

, of which $

10

was released in February 2025 for 2024 expenditures, and the remaining $

76

is available for capital improvements at the site and smelter restart costs.

Cash Flow Information

Cash paid for interest and income taxes was as follows:

	2024	2023	2022
Interest, net of amount capitalized	$ 132	$ 100	$ 100
Income taxes, net of amount refunded	157	319	504

V. Supplier Finance Programs

The Company has various supplier finance programs with third-party financial institutions that are made available to suppliers to facilitate payment term negotiations. Under the terms of these agreements, participating suppliers receive payment in advance of the payment date from third-party financial institutions for qualifying invoices. Alcoa's obligations to its suppliers, including amounts due and payment terms, are not impacted by its suppliers' participation in these programs. The Company does not pledge any assets as security or provide any guarantees beyond payment of outstanding invoices at maturity under these arrangements. The Company does not pay fees to the financial institutions under these arrangements. At December 31, 2024 and December 31, 2023, qualifying supplier invoices outstanding under these programs were $

94
and $

104
, respectively, and have payment terms ranging from 50 to 110 days. These obligations are included in Accounts payable, trade on the accompanying Consolidated Balance Sheet.

The rollforward of Alcoa's outstanding obligations confirmed as valid under its supplier finance program for the years ended December 31, 2024 is as follows:

December 31,	2024
Confirmed obligations outstanding at the beginning of the year	$ 104
Invoices confirmed during the year	446
Confirmed invoices paid during the year	(452)
Foreign currency translation and other	(4)
Confirmed obligations outstanding at the end of the year	$ 94

W. Subsequent Events

On February 20, 2025 , the Board of Directors declared a quarterly cash dividend of $

0.10
per share of the Company's common stock (including common stock underlying CDIs) and Series A convertible preferred stock, to be paid on March 20, 2025 to stockholders of record as of the close of business on March 4, 2025 . Dividends on Alcoa's common and preferred stock are paid in U.S. dollars. Dividends on common stock underlying CDIs paid in a currency other than the U.S. dollar will be determined using foreign currency exchange rates as of March 14, 2025.

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

(a) Evaluation of Disclosure Controls and Procedures

Alcoa Corporation's Chief Executive Officer and Chief Financial Officer have evaluated the Company's disclosure controls and procedures, as defined in Rules 13a-15(e) and 15d-15(e) of the U.S. Securities Exchange Act of 1934, as amended, as of the end of the period covered by this report, and they have concluded that these controls and procedures were effective as of December 31, 2024.

(b) Management's Annual Report on Internal Control over Financial Reporting

Management's Report on Internal Control over Financial Reporting is included in Part II Item 8 of this Form 10-K.

(c) Attestation Report of the Registered Public Accounting Firm

The effectiveness of Alcoa Corporation's internal control over financial reporting as of December 31, 2024 has been audited by PricewaterhouseCoopers LLP (PCAOB ID No. 238), an independent registered public accounting firm, as stated in their report, which is included in Part II Item 8 of this Form 10-K.

(d) Changes in Internal Control over Financial Reporting

There have been no changes in internal control over financial reporting during the fourth quarter of 2024 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B. Other Information.

None of the Company's directors or "officers," as defined in Rule 16a-1(f) of the Exchange Act of 1934, as amended, adopted , modified , or terminated a "Rule 10b5-1 trading arrangement" or a "non-Rule 10b5-1 trading arrangement," as each term is defined in Item 408 of Regulation S-K, during the Company's fiscal quarter ended December 31, 2024.

Item 9C. Disclosure Regarding Foreign Jurisdictions that Prevent Inspections.

Not applicable.

PART III

Item 10. Directors, Executive Officers and Corporate Governance.

The information required by Item 401 of Regulation S-K regarding executive officers is set forth in Part I Item 1 of this Form 10-K under the caption "Information about our Executive Officers." The information required by Item 401 of Regulation S-K regarding directors is contained under the caption "Board and Governance Matters—Board of Directors—Director Nominees" of Alcoa Corporation's Definitive Proxy Statement for the 2025 Annual Meeting of Stockholders (Proxy Statement), which will be filed with the SEC within 120 days of the end of Alcoa Corporation's fiscal year ended December 31, 2024 (Proxy Statement) and is incorporated herein by reference.

The Company's Code of Conduct and Ethics (Code of Conduct), which incorporates a code of ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, is publicly available on the Company's website at www.alcoa.com under the section "Investors—Governance—Governance Documents—Code of Conduct." Alcoa Corporation will post any amendments to, or waivers of, its Code of Conduct that apply to its principal executive officer, principal financial officer, principal accounting officer or controller on its website at https://www.alcoa.com.

With respect to Item 408(b) of Regulation S-K, the Company has adopted an insider trading policy and procedures that govern the purchase, sale, and other dispositions of the Company's securities by directors, officers, and employees, as well as by the Company itself. The Company believes that its insider trading policy and procedures are reasonably designed to promote compliance with insider trading laws, rules and regulations, and applicable listing standards. A copy of the Company's insider trading policy is filed as Exhibit 19.1 to this Form 10-K.

The information required by Items 407(c)(3), if applicable, (d)(4) and (d)(5) of Regulation S-K is included under the captions “Information Relating to the 2026 Annual Meeting” and “Board and Governance Matters—Corporate Governance—Board Structure and Operations—Committees of the Board” of the Proxy Statement and is incorporated herein by reference.

Item 11. Executive Compensation.

The information required by Item 402 and Item 407(e)(4) and (e)(5) of Regulation S-K is contained under the captions “Non-Employee Director Compensation Program,” “Executive Compensation” (other than the information contained under the heading "Pay Versus Performance"), “Board and Governance Matters—Corporate Governance— Board Structure and Operations—Committees of the Board,” “Board and Governance Matters—Corporate Governance—Board Oversight Responsibilities—Risk Oversight” and “Board and Governance Matters—Corporate Governance—Board Structure and Operations—Compensation Committee Interlocks and Insider Participation” of the Proxy Statement. Such information (other than the Compensation Committee Report, which shall not be deemed to be filed) is incorporated herein by reference.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

The information required by Item 201(d) of Regulation S-K is contained under the caption “Beneficial Ownership—Equity Compensation Plan Information” of the Proxy Statement and is incorporated herein by reference.

The information required by Item 403 of Regulation S-K is contained under the caption “Beneficial Ownership” of the Proxy Statement and is incorporated herein by reference.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

The information required by Item 404 of Regulation S-K is contained under the caption “Board and Governance Matters—Corporate Governance—Other Governance Policies and Practices—Related Person Transactions” of the Proxy Statement and is incorporated herein by reference.

The information required by Item 407(a) of Regulation S-K is contained under the caption “Board and Governance Matters—Board of Directors—Process for Identification and Evaluation of Director Candidates—Director Independence” of the Proxy Statement and is incorporated herein by reference.

Item 14. Principal Accountant Fees and Services.

The information required by Item 9(e) of Schedule 14A is contained under the caption “Proposal 2 Ratification of the Appointment of PricewaterhouseCoopers LLP as the Company’s Independent Auditor for 2025” and “Audit Matters—Audit Committee Pre-Approval Policy” and “Audit Matters—Auditor Fees” of the Proxy Statement and is incorporated herein by reference.

PART IV

Item 15. Exhibits and Financial Statement Schedules.

(a) The consolidated financial statements and exhibits listed below are filed as part of this report.

(1) The Company's consolidated financial statements, the notes thereto and the report of the Independent Registered Public Accounting Firm are included in Part II Item 8 of this report.

(2) Financial statement schedules have been omitted because they are not applicable, not required, or the required information is included in the consolidated financial statements or notes thereto.

(3) Exhibits.

Exhibit No.	Description of Exhibit
2.1	Deed of Amendment and Restatement of the Scheme Implementation Deed, dated May 20, 2024, by and among Alcoa Corporation, AAC Investments Australia 2 Pty Ltd, and Alumina Limited (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed May 20, 2024 (File No. 1-37816))
3.1	Amended and Restated Certificate of Incorporation of Alcoa Corporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed November 3, 2016 (File No. 1-37816))
3.2	Certificate of Designation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed August 1, 2024 (File No. 1-37816))
3.3	Amended and Restated Bylaws of Alcoa Corporation, as adopted on July 31, 2024 (incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed August 1, 2024 (File No. 1-37816))
4.1	Indenture, dated May 17, 2018, among Alcoa Nederland Holding B.V., Alcoa Corporation, certain subsidiaries of Alcoa Corporation, and the Bank of New York Mellon Trust Company, N.A., as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed May 17, 2018 (File No. 1-37816))
4.2	Supplemental Indenture, dated as of December 9, 2019, among Alcoa Corporation, Alcoa Treasury S.à r.l, Alcoa Nederland Holding B.V., and The Bank of New York Mellon Trust Company, N.A. under the Indenture dated May 17, 2018 (incorporated by reference to Exhibit 4.5 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019, filed February 21, 2020 (File No. 1-137816))
4.3	Indenture, dated July 13, 2020, among Alcoa Nederland Holding B.V., Alcoa Corporation, certain subsidiaries of Alcoa Corporation, and The Bank of New York Mellon Trust Company, National Association, as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed July 13, 2020 (File No. 1-37816))
4.4	Indenture, dated as of March 24, 2021, among Alcoa Nederland Holding B.V., Alcoa Corporation, certain subsidiaries of Alcoa Corporation, and The Bank of New York Mellon Trust Company, N.A., as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed March 24, 2021 (File No. 1-37816))
4.5	Indenture, dated as of March 21, 2024, among Alcoa Nederland Holding B.V., Alcoa Corporation, the subsidiary guarantors party thereto and The Bank of New York Mellon Trust Company, N.A., as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed March 21, 2024 (File No. 1-37816))
4.6	Description of Securities (filed herewith)
10.1	Separation and Distribution Agreement, dated as of October 31, 2016, by and between Arconic Inc. and Alcoa Corporation (incorporated by reference to Exhibit 2.1 to the Company's Current Report on Form 8-K filed November 4, 2016 (File No. 1-37816))
10.2	Tax Matters Agreement, dated as of October 31, 2016, by and between Arconic Inc. and Alcoa Corporation (incorporated by reference to Exhibit 2.3 to the Company's Current Report on Form 8-K filed November 4, 2016 (File No. 1-37816))

Exhibit No.	Description of Exhibit
10.3	Amendment No. 1, dated as of January 17, 2024, which includes, as Exhibit A thereto, the Revolving Credit Agreement, dated as of September 16, 2016, as amended as of October 26, 2016, as amended and restated as of November 14, 2017, as amended and restated as of November 21, 2018, as amended as of August 16, 2019, as amended as of April 21, 2020, as amended as of June 24, 2020, as amended as of March 4, 2021, as amended and restated as of June 27, 2022 and as amended as of January 17, 2024, among Alcoa Corporation, Alcoa Nederland Holding B.V., the lenders and issuers from time to time party thereto, and JPMorgan Chase Bank N.A., as administrative agent for the lenders and issuers (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed January 18, 2024 (File No. 1-37816))
10.4	Kwinana State Agreement of 1961 (incorporated by reference to Exhibit 10.7 to Amendment No. 2 to the Company's Registration Statement on Form 10 filed September 1, 2016 (File No. 1-37816))
10.5	Pinjarra State Agreement of 1969 (incorporated by reference to Exhibit 10.8 to Amendment No. 2 to the Company's Registration Statement on Form 10 filed September 1, 2016 (File No. 1-37816))
10.6	Wagerup State Agreement of 1978 (incorporated by reference to Exhibit 10.9 to Amendment No. 2 to the Company's Registration Statement on Form 10 filed September 1, 2016 (File No. 1-37816))
10.7	Alumina Refinery Agreement of 1987 (incorporated by reference to Exhibit 10.10 to Amendment No. 2 to the Company's Registration Statement on Form 10 filed September 1, 2016 (File No. 1-37816))
10.8	Alcoa Corporation 2016 Stock Incentive Plan (as Amended and Restated as of May 9, 2018), (incorporated by reference to Exhibit 99.1 to the Company's Current Report on Form 8-K filed May 15, 2018 (File No. 1-37816))*
10.9	Alcoa USA Corp. Deferred Compensation Plan, effective August 1, 2016, as amended November 15, 2021 (incorporated by reference to Exhibit 10.24 to the Company's Annual Report on Form 10-K for the year ended December 31, 2021, filed February 24, 2022 (File No. 1-137816))*
10.10	Alcoa USA Corp. Nonqualified Supplemental Retirement Plan C (incorporated by reference to Exhibit 10.3 to Amendment No. 1 to the Company's Registration Statement on Form 10 filed August 12, 2016 (File No. 1-37816))*
10.11	Amendment 1 to Alcoa USA Corp. Nonqualified Supplemental Retirement Plan C, effective January 1, 2021 (incorporated by reference to Exhibit 10.9 to the Company's Annual Report on Form 10-K for the year ended December 31, 2017, filed February 23, 2018 (File No. 1-37816))*
10.12	Form of Amended and Restated Indemnification Agreement by and between Alcoa Corporation and individual directors or officers, effective August 1, 2017 (incorporated by reference to Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q filed August 3, 2017 (File No. 1-37816))*
10.13	Alcoa Corporation Annual Cash Incentive Compensation Plan (as Amended and Restated), effective February 21, 2018 (incorporated by referenced to Exhibit 10 to the Company's Quarterly Report on Form 10-Q filed May 9, 2018 (File No. 1-37816))*
10.14	Alcoa Corporation Amended and Restated Change in Control Severance Plan, dated July 30, 2019 (incorporated by reference to Exhibit 10.5 to the Company's Quarterly Report on Form 10-Q filed October 31, 2019 (File No. 1-37816))*
10.15	Amendment No. 1, dated as of January 8, 2023 to the Alcoa Corporation Amended and Restated Change in Control Severance Plan, dated July 30, 2019 (incorporated by reference to Exhibit 10.27 to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed February 23, 2023 (File No. 1-137816))*
10.16	Amended and Restated Form of Alcoa Corporation Chief Executive Officer and Chief Financial Officer Executive Severance Agreement, effective as of July 30, 2019 (incorporated by reference to Exhibit 10.6 to the Company's Quarterly Report on Form 10-Q filed October 31, 2019 (File No. 1-37816))*
10.17	Amendment No. 1 to Amended and Restated Executive Severance Agreement, between William F. Oplinger and Alcoa Corporation, effective February 1, 2023 (incorporated by reference to Exhibit 10.29 to the Company's Annual Report on Form 10-K for the year ended December 31, 2022, filed February 23, 2023 (File No. 1-137816))*

Exhibit No.	Description of Exhibit
10.18	Amended and Restated Form of Alcoa Corporation Corporate Officer Executive Severance Agreement, effective as of July 30, 2019 (incorporated by reference to Exhibit 10.7 to the Company's Quarterly Report on Form 10-Q filed October 31, 2019 (File No. 1-37816))*
10.19	Amended and Restated Form of Alcoa Corporation Corporate Officer Executive Severance Agreement (Canada), effective as of April 1, 2020 (incorporated by reference to Exhibit 10.26 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed February 21, 2024 (File No. 1-37816))*
10.20	Amended and Restated Form of Alcoa Corporation Corporate Officer Executive Severance Agreement (Australia), effective as of July 30, 2019 (filed herewith)*
10.21	Letter Agreement, dated July 22, 2023, between Andrew Hastings and Alcoa Corporation (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed May 2, 2024 (File No. 1-37816))*
10.22	Terms and Conditions for Employee Stock Option Awards (incorporated by reference to Exhibit 10.30 to the Company's Registration Statement on Form S-1 filed January 18, 2017 (File No. 333-215606))*
10.23	Terms and Conditions for Employee Stock Option Awards, dated January 24, 2018 (incorporated by reference to Exhibit 10.30 to the Company's Annual Report on Form 10-K for the year ended December 31, 2017, filed February 23, 2018 (File No. 1-37816))*
10.24	Terms and Conditions for Employee Stock Option Awards, effective October 1, 2019 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed October 31, 2019 (File No. 1-37816))*
10.25	Terms and Conditions for Employee Restricted Share Units, effective December 8, 2021 (incorporated by reference to Exhibit 10.37 to the Company's Annual Report on Form 10-K for the year ended December 31, 2021, filed February 24, 2022 (File No. 1-137816))*
10.26	Terms and Conditions for Employee Special Retention Awards, effective December 8, 2021 (incorporated by reference to Exhibit 10.38 to the Company's Annual Report on Form 10-K for the year ended December 31, 2021, filed February 24, 2022 (File No. 1-137816))*
10.27	Terms and Conditions for Employee Restricted Share Units, effective January 24, 2024 (incorporated by reference to Exhibit 10.34 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed February 21, 2024 (File No. 1-37816))*
10.28	Terms and Conditions for Employee Special Retention Awards, effective January 24, 2024 (incorporated by reference to Exhibit 10.35 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed February 21, 2024 (File No. 1-37816))*
10.29	Alcoa Corporation Non-Employee Director Compensation Policy, effective August 1, 2024 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q filed August 2, 2024 (File No. 1-37816))*
10.30	Terms and Conditions for Deferred Fee Restricted Share Units Director Awards, effective December 1, 2016 (incorporated by reference to Exhibit 10.34 to the Company's Registration Statement on Form S-1 filed January 18, 2017 (File No. 333-215606))*
10.31	Terms and Conditions for Deferred Fee Restricted Share Units Director Awards, effective May 4, 2022 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed July 25, 2022 (File No. 1-37816))*
10.32	Terms and Conditions for Deferred Fee Restricted Share Units Director Awards, effective August 1, 2024 (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q filed August 2, 2024 (File No. 1-37816))*
10.33	Terms and Conditions for Restricted Share Units Annual Director Awards, effective December 1, 2016 (incorporated by reference to Exhibit 10.35 to the Company's Registration Statement on Form S-1 filed January 18, 2017 (File No. 333-215606))*
10.34	Terms and Conditions for Restricted Share Units Annual Director Awards, effective May 9, 2017 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report Form 10-Q filed August 3, 2017 (File No. 1-37816))*

Exhibit No.	Description of Exhibit
10.35	Terms and Conditions for Restricted Share Units Annual Director Awards, effective May 4, 2022 (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q filed July 25, 2022 (File No. 1-37816))*
10.36	Terms and Conditions for Restricted Share Units Annual Director Awards, effective August 1, 2024 (incorporated by reference to Exhibit 10.3 to the Company's Quarterly Report on Form 10-Q filed August 2, 2024 (File No. 1-37816))*
10.37	Alcoa Corporation 2016 Deferred Fee Plan for Directors (effective November 1, 2016, as amended and restated on December 5, 2018), effective August 1, 2024 (incorporated by reference to Exhibit 10.4 to the Company's Quarterly Report on Form 10-Q filed August 2, 2024 (File No. 1-37816))*
19.1	Insider Trading Policy (filed herewith)
21.1	List of Subsidiaries (filed herewith)
23.1	Consent of PricewaterhouseCoopers LLP (filed herewith)
23.2	Consent of SLR International Corporation (filed herewith)
31.1	Certification of Principal Executive Officer required by Securities and Exchange Commission Rule 13a-14(a) or 15d-14(a) (filed herewith)
31.2	Certification of Principal Financial Officer required by Securities and Exchange Commission Rule 13a-14(a) or 15d-14(a) (filed herewith)
32.1	Certification of Principal Executive Officer, required by Rule 13a-14(b) or Rule 15d-14(b) and Section 1350 of Chapter 63 of Title 18 of the United States Code (furnished herewith)
32.2	Certification of Principal Financial Officer, required by Rule 13a-14(b) or Rule 15d-14(b) and Section 1350 of Chapter 63 of Title 18 of the United States Code (furnished herewith)
96.1	Technical Report Summary for Darling Range, Western Australia (filed herewith)
96.2	Technical Report Summary for Juruti, Brazil (incorporated by reference to Exhibit 96.2 to the Company's Annual Report on Form 10-K for the year ended December 31, 2021, filed February 24, 2022 (File No. 1-137816))
97	Alcoa Corporation Clawback Policy, effective October 15, 2023 (incorporated by reference to Exhibit 97 to the Company's Annual Report on Form 10-K for the year ended December 31, 2023, filed February 21, 2024 (File No. 1-37816))*
99.1	Amended and Restated Grantor Trust Agreement by and between Alcoa Corporation and Wells Fargo Bank, National Association, effective October 24, 2017 (incorporated by reference to Exhibit 99.1 to the Company's Annual Report on Form 10-K for the year ended December 31, 2017, filed February 23, 2018 (File No. 137816))
101.INS	Inline XBRL Instance Document
101.SCH	Inline XBRL Taxonomy Extension Schema with Embedded Linkbases Document
104	Cover Page Interactive Data File (formatted as Inline XBRL and contained in Exhibit 101)

* Denotes management contracts or compensatory plans or arrangements required to be filed as Exhibits to this Form 10-K.

Certain schedules exhibits, and appendices have been omitted in accordance with to Item 601(a)(5) of Regulation S-K. The Company hereby undertakes to furnish copies of any omitted schedule, exhibit, or appendix to the Commission upon request.

Item 16. Form 10-K Summary.

Not applicable.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ALCOA CORPORATION

By: /s/ Renee R. Henry
Renee R. Henry
Senior Vice President and Controller

February 20, 2025

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated and on February 20, 2025.

/s/ William F. Oplinger
William F. Oplinger
President, Chief Executive Officer and Director
(Principal Executive Officer and Director)

/s/ Molly S. Beerman
Molly S. Beerman
Executive Vice President and Chief Financial Officer
(Principal Financial Officer)

/s/ Renee R. Henry
Renee R. Henry
Senior Vice President and Controller
(Principal Accounting Officer)

/s/ Steven W. Williams
Steven W. Williams
Director, Chairman of the Board of Directors

/s/ John A. Bevan
John A. Bevan
Director

/s/ Mary Anne Citrino
Mary Anne Citrino
Director

/s/ Alistair Field
Alistair Field
Director

/s/ Pasquale Fiore
Pasquale Fiore
Director

/s/ Thomas J. Gorman
Thomas J. Gorman
Director

/s/ James A. Hughes
James A. Hughes
Director

/s/ Roberto O. Marques
Roberto O. Marques
Director

/s/ Carol L. Roberts
Carol L. Roberts
Director

/s/ Jackson P. Roberts
Jackson P. Roberts
Director

/s/ Ernesto Zedillo
Ernesto Zedillo
Director

Exhibit 4.6

DESCRIPTION OF THE REGISTRANT'S CAPITAL STOCK

Following is a brief description of the common stock, par value $0.01 per share (the "Common Stock") and the Series A Convertible Preferred Stock, par value $0.01 per share (the "Series A Convertible Stock") of Alcoa Corporation ("Alcoa" or "the Company"). The Common Stock is the only security of the Company registered under Section 12 of the Securities Exchange Act of 1934, as amended.

The following descriptions of the Common Stock and Series A Convertible Preferred Stock are not, and do not purport to be, complete. The descriptions are subject to, and qualified in their entirety by reference to, the Company's Amended and Restated Certificate of Incorporation (the "Certificate of Incorporation"), the Amended and Restated Bylaws (the "Bylaws") and the Certificate of Designation of Series A Convertible Preferred Stock (the "Certificate of Designation"), as applicable, each of which is incorporated by reference as an exhibit to the Annual Report on Form 10-K of which this exhibit is also a part. Please review the Company's Certificate of Incorporation, Bylaws and the Certificate of Designation and the applicable provisions of the Delaware General Corporation Law (the "DGCL") for additional information.

Authorized Capital Stock

The Company's authorized capital stock consists of 750,000,000 shares of Common Stock and 100,000,000 shares of preferred stock, par value $0.01 per share ("Preferred Stock").

Common Stock

Dividend Rights

The Company's Board of Directors (the "Board") may from time to time declare, and Alcoa may pay, dividends on its outstanding shares in the manner and upon the terms and conditions provided by law and the Certificate of Incorporation.

Voting Rights

Except as otherwise provided by law or pursuant to the rights of holders of Preferred Stock, holders of Common Stock are entitled to one vote per share on all matters, including the election of directors. Except as otherwise provided by law, the Certificate of Incorporation or the Bylaws, if a quorum is present, matters will be decided by the affirmative vote of a majority of shares present in person or represented by proxy and entitled to vote on the matter. Subject to the rights of holders of Preferred Stock, each director is elected by the vote of the majority of the votes cast with respect to that director's election; provided, however, that if the number of persons nominated to serve as directors exceeds the number of directors to be elected, then each director shall be elected by a plurality of the votes cast.

The Common Stock does not have cumulative voting rights.

Liquidation Rights

Upon any voluntary or involuntary liquidation, dissolution or winding up of Alcoa, after payments to holders of Preferred Stock of amounts determined by the Board, plus any accrued dividends, the Company's remaining assets will be divided among holders of the Common Stock.

Preemptive or Other Subscription Rights

Holders of Common Stock do not have any preemptive or other subscription rights to any securities of the Company.

Conversion and Other Rights

No conversion, redemption or sinking fund provisions apply to the Common Stock, and Common Stock is not liable to further call or assessment by the Company or subject to any restriction on alienability, except as required by law.

Preferred Stock

The rights of holders of Common Stock may be materially limited or qualified by the rights of holders of Preferred Stock that has been issued or may be issued in the future.

Under the terms of the Certificate of Incorporation, the Board is authorized to issue up to 100,000,000 shares of Preferred Stock in one or more series without further action by the holders of Common Stock. The Board has the discretion, subject to limitations prescribed by Delaware law and by the Certificate of Incorporation, to determine the rights, preferences, privileges and restrictions, including voting, dividend, dissolution, conversion, exchange, and redemption rights, as well as the terms and amount of any sinking fund provided for the purchase or redemption of shares, of each series of Preferred Stock.

Series A Convertible Preferred Stock

Ranking

The liquidation preference of the Class A Convertible Preferred Stock is equal to $0.0001 per share. The Class A Convertible Preferred Stock ranks senior to the Common Stock in the event of a distribution of assets upon dissolution, liquidation or winding up of the Company to the extent of its liquidation preference. Otherwise, the Class A Convertible Preferred Stock will rank, as to the payment of dividends and distribution of assets upon dissolution, liquidation or winding up of the Company (i) senior to any class or series of capital stock of the Company thereafter created specifically ranking by its terms junior to any shares of Series A Convertible Preferred Stock, (ii) *pari passu* with the Common Stock and any class or series of capital stock of the Company created (x) specifically ranking by its terms on parity with the Class A Convertible Preferred Stock or (y) that does not by its terms rank junior or senior to the Class A Convertible Preferred Stock and (iii) junior to any class or series of capital stock of the Company thereafter created specifically ranking by its terms senior to any shares of the Class A Convertible Preferred Stock.

Cash Dividend/Distribution Rights

Holders of the Class A Convertible Preferred Stock participate in cash dividends or distributions (subject to certain exceptions for distributions in kind) alongside the Common Stock on an as-converted basis.

Voting Rights

Class A Convertible Preferred Stock has no voting rights, except as may be required by applicable law and except that the consent of the holders of a majority of the outstanding Class A Convertible Preferred Stock is required to amend the terms of the Class A Convertible Preferred Stock.

Mergers; Reorganizations

In the event of a merger, reorganization, sale of substantially all assets of the Company or similar event where the Common Stock is exchanged for securities and cash (a "Reorganization Event"), the Class A Convertible Preferred Stock will be automatically converted into the types and amounts of securities and cash that is or was receivable in such Reorganization Event by a holder of the number of shares of Common Stock into which such share of Class A Convertible Preferred Stock was convertible immediately prior to such Reorganization Event in exchange for such shares of Common Stock; however, if after giving effect to such conversion, Bestbuy Overseas Co. Ltd. and its affiliates ("CITIC") would collectively hold more than 4.9% of any class of voting securities of another entity that it is impermissible to hold under the Bank Holding Company Act of 1956 (the "BHCA"), then, at the Company's election, the Company may redeem the portion of Class A Convertible Preferred Stock that would cause CITIC and its affiliates to collectively hold more than 4.9% of any class of voting securities of another entity that is impermissible for CITIC to hold under the BHCA at a cash price per share of Class A Convertible Preferred Stock equal to the product of the Applicable Conversion Rate (as defined below) and the "fair market value" of the Common Stock.

Conversion

In the event of a Convertible Transfer (as defined below) to certain non-affiliates of a holder of Class A Convertible Preferred Stock, each share of such holder's Class A Convertible Preferred Stock will convert into shares of Common Stock at a rate of one share of Class A Convertible Preferred Stock to one share of Common Stock (the "Applicable Conversion Rate") no later than the second business day after the Company receives a valid notice of Convertible Transfer and conversion from the holder.

A "Convertible Transfer" is a transfer by the holder of New Alcoa Preferred Stock: (i) to the Company; (ii) in a widely distributed public offering the Common Stock issuable upon conversion of the Class A Convertible Preferred Stock; (iii) in a transaction or series of related transactions in which no one transferee (or group of associated transferees) acquires 2% or more of any class of the Company's then outstanding voting securities; or (vi) to a transferee that controls more than 50% of every class of the Company's then outstanding voting securities without giving effect to such transfer.

Subject to certain limitations, CITIC will have the right to elect to convert its shares of Class A Convertible Preferred Stock into shares of Common Stock at the Applicable Conversion Rate if an action by the Company (*e.g.* a new stock issuance) has the effect of reducing CITIC's voting percentage in Common Stock.

Anti-Takeover Provisions

Certain Effects of Authorized but Unissued Stock

The Company may issue additional shares of Common Stock or Preferred Stock without stockholder approval, subject to applicable rules of the New York Stock Exchange and Delaware law, for a variety of corporate purposes, including future public or private offerings to raise additional capital, corporate acquisitions, and for employee benefit plans and equity grants, all of which may result in additional dilution to existing holders. The existence of unissued and unreserved Common Stock and Preferred Stock may enable the Company to issue shares that could discourage an attempt to obtain control of the Company by means of a proxy contest, tender offer, merger or otherwise.

Undesignated Preferred Stock

The Company's Certificate of Incorporation authorizes the Board to issue shares of Preferred Stock and set the voting powers, designations, preferences, and other rights related to that Preferred Stock without stockholder approval.

Stockholder Action by Written Consent

Subject to the rights of holders of Preferred Stock, the Certificate of Incorporation and Bylaws provide that stockholders may not act by written consent unless such written consent is unanimous.

Size of Board; Vacancies; Removal

Subject to the rights of holders of Preferred Stock to elect directors, the Bylaws provide that the number of directors on the Board is fixed exclusively by the Board. Generally, vacancies created on the Board resulting from any increase in the authorized number of directors or the death, resignation, retirement, disqualification, removal from office or other cause will be filled by the affirmative vote of a majority of the Board then in office, even if less than a quorum is present, or by a sole remaining director. Any director appointed to fill a vacancy on the Board will be appointed for a term expiring at the next annual meeting of stockholders and will serve until his or her successor has been elected and qualified.

Subject to the rights of holders of Preferred Stock, any director or the entire Board may be removed from office, with or without cause, by the affirmative vote of stockholders holding at least a majority of the then-outstanding "voting stock" (as defined in the Bylaws) voting as a class.

Advance Notice for Stockholder Proposals and Nominations

The Bylaws contain advance notice procedures with respect to stockholder proposals and the nomination of candidates for election as directors (other than nominations made by or at the direction of the Board or pursuant to the proxy access procedures included therein).

Special Meetings of Stockholders

Subject to the rights of holders of Preferred Stock, the Certificate of Incorporation and Bylaws provide that the chairman of the Board, the chief executive officer, the Board pursuant to a resolution adopted by a majority of the entire Board, or the secretary at the request of stockholders owning at least 25% of the outstanding shares for at least one year, may call a special meeting of stockholders.

Section 203 of the DGCL (Business Combinations with Interested Stockholders)

Section 203 of the DGCL prohibits a Delaware corporation from engaging in a business combination with an "interested stockholder" for a period of three years after the date of the transaction in which the person became an interested stockholder. The term "business combination" is broadly defined to include mergers, consolidations, sales and other dispositions of assets having an aggregate market value equal to 10% or more of the consolidated assets of the corporation, and other specified transactions resulting in financial benefits to the interested stockholder. Under Section 203, an "interested stockholder" generally is defined as a person who, together with affiliates and associates, owns (or within the three prior years did own) 15% or more of the corporation's outstanding voting stock.

This prohibition is effective unless:

- the business combination or the transaction that resulted in the interested stockholder becoming an interested stockholder is approved by the corporation's board of directors prior to the time the interested stockholder becomes an interested stockholder;
- upon consummation of the transaction that resulted in the interested stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation, other than stock held by directors who are also officers or by specified employee stock plans; or
- at or after the time the stockholder becomes an interested stockholder, the business combination is approved by a majority of the board of directors and, at an annual or special meeting, by the affirmative vote of at least two-thirds of the outstanding voting stock that is not owned by the interested stockholder.

These restrictions generally prohibit or delay the accomplishment of mergers or other takeover or change-in-control attempts that are not approved by a company's board of directors. A corporation can elect to have Section 203 of the DGCL not apply to it by expressly providing so in its certificate of incorporation or bylaws; the Company has not made such an election.

EXHIBIT 10.20
Corporate Officer Agreement (Form - Australia)

AMENDED AND RESTATED EXECUTIVE SEVERANCE AGREEMENT

By this Amended and Restated Executive Severance Agreement dated and effective as of July 30, 2019 (the "Agreement "), Alcoa Corporation (the " Company "), and [NAME], who has been designated as an officer of the Company by the Company's Board of Directors (the "Board") (" Executive "), intending to be legally bound, and for good and valuable consideration, agree as follows:

I. Termination of Executive's Employment by the Company.

The Company may terminate your employment at any time, with or without Cause, with the results described below. In such case, the Company shall determine the effective date of your termination, which termination shall constitute a "separation from service" for purposes of Section 409A of the Internal Revenue Code of 1986, as amended ("409A") (the " Involuntary Termination Date ").

A. Involuntary Termination With Cause. If the Company terminates your employment due to Cause, you will receive no severance payment under this Agreement or any other severance plan, policy or arrangement of the Company or any of its affiliates. For purposes of this Agreement, " Cause " means: (i) your willful and continued failure to substantially perform your duties that has not been cured within thirty days after a written demand for substantial performance is delivered to you, which demand specifically identifies the manner in which the Company believes that you have not substantially performed your duties, or (ii) your willful engagement in conduct which is demonstrably and materially injurious to the Company, monetarily or otherwise. For purposes of clauses (i) and (ii) of this definition, (x) no act, or failure to act, on your part shall be deemed "willful" unless done, or omitted to be done, by you not in good faith and without reasonable belief that your act, or failure to act, was in the best interest of the Company, and (y) in the event of a dispute concerning the application of this provision, no claim by the Company that Cause exists shall be given effect unless the Company's Board of Directors (the "Board ") determines that there is clear and convincing evidence that Cause exists and the Board finding to that effect is adopted by the affirmative vote of not less than three quarters of the entire membership of the Board (after reasonable notice to you and an opportunity for you, together with your counsel, to be heard by the Board).

B. Involuntary Termination Without Cause . If the Company terminates your employment for reasons other than Cause, and you fulfill your obligations as set forth in this Agreement, you shall be paid the greater of the value of (i) any minimum statutory entitlements plus amounts due to you under the severance benefit plans and policies of the Company or its subsidiaries that are applicable to you based on your business or location or (ii) the amounts set forth in this Section I.B; provided, however, that any amounts paid must first be applied to minimum statutory entitlements. If applicable, minimum statutory entitlements shall be paid at the time required by law. Any other amounts shall be paid as soon as practicable after the Involuntary Termination Date but in no event later than 60 days after the Involuntary Termination Date; *provided*, that if you are, as of the Involuntary Termination Date, a "specified employee" within the meaning of 409A as determined in accordance with the methodology duly adopted by the Company as in effect on the Involuntary Termination Date, then such amounts shall instead be paid on the first business day following the date which is six months after the Involuntary Termination Date (the " Six-Month Delay Date ") (or if sooner, upon your death); and *further provided* that the amount payable under Section I.B(ii) will be paid in the fiscal year following the fiscal year in which the Involuntary Termination Date occurs, if later than as otherwise specified herein. Payment of the amounts set forth in Section I.B are conditioned upon and subject to the requirement that, on or after the Involuntary Termination Date, and at least 10 days prior to the Six-Month Delay Date or, if applicable, at least 10 days prior to the last day of the aforementioned 60 day period, (i) you execute and return to the Company, to the extent permitted by law, the release agreement in the form attached hereto as Exhibit A (the " Release Agreement ") (or any equivalent form in accordance with local law of your location) and (ii) any period within which you may revoke the Release Agreement (or any equivalent form in accordance with local law of your location) pursuant to the terms thereof has expired without you having revoked the Release Agreement:

(i) a lump sum amount equivalent to your annual base salary as of the Involuntary Termination Date; and

(ii) a pro-rated annual bonus for the fiscal year in which the Involuntary Termination Date occurs, which lump sum amount shall be determined based on, for such fiscal year, the level of achievement of the applicable performance goals under the Company's Incentive Plan(s), the bonus-eligible percentage of your annual base pay in effect and the amount of base pay actually paid to you prior to the Involuntary Termination Date; and

(iii) access to reasonable outplacement services suitable to the Executive's position for a period of 12 months or, if earlier, until the first acceptance by the Executive of an offer of employment (to the extent of reimbursement for such outplacement services, such reimbursement shall occur prior to the last day of the 15th month following the Involuntary Termination Date); and

(iv)(A) if, on the Involuntary Termination Date, you are an active participant who is accruing benefits under any tax-qualified, supplemental or excess defined benefit pension plan maintained by the Company or any of its affiliates (a "DB Pension Plan "), pursuant to the DB Pension Plan terms, you will receive additional pension service through the earlier of (i) the one year anniversary of your Involuntary Termination Date, and (ii) the date upon which benefit accruals for active employees cease under the terms of the DB Pension Plan; or

(B) if, on the Involuntary Termination Date, you are not an active participant who is accruing benefits under a DB Pension Plan, but are eligible to receive either Employer Retirement Income Contributions (ERIC) under an Alcoa Savings Plan (a "U.S. DC Plan"), or comparable employer contributions under a non-U.S. defined contribution plan maintained by the Company or any of its affiliates which is designed to provide you with retirement benefits (a "Non-U.S. DC Plan"), a lump sum amount, in cash, equal to the U.S. DC Plan or Non-U.S. DC Plan contribution percent in effect on the Involuntary Termination Date multiplied by the sum of your annual base salary as of your Involuntary Termination Date plus your target annual variable compensation; or

(C) if, on the Involuntary Termination Date, you are not an active participant who is accruing benefits under a DB Pension Plan, but are eligible to participate in the Global Pension Plan, you will receive a lump sum amount, in cash, equal to the Global Pension Plan annual percentage contribution in effect on the Involuntary Termination Date, multiplied by the sum of your annual base salary as of your Involuntary Termination Date plus your target annual variable compensation.

In addition, for a period of one year after the Involuntary Termination Date the Company shall arrange to provide you, and anyone entitled under the terms of the applicable plan to claim through you, health (including medical, behavioral, prescription drug, dental and vision) benefits substantially similar to those provided to active employees as long as you pay the active employee contribution for the coverage. Coverage provided under this Agreement will run concurrently with the coverage to which you are entitled under the Consolidated Omnibus Budget Reconciliation Act of 1985. In order to comply with 409A, the following shall apply to the health care benefits provided pursuant to this paragraph, the costs of which are not fully paid by you (the "Health Benefits "). Any and all reimbursements of eligible expenses made pursuant to the Health Benefits shall be made no later than the end of the calendar year next following the calendar year in which the expenses were incurred. The amount of expenses that are eligible for reimbursement or of in-kind benefits that are provided pursuant to the Health Benefits in any given calendar year shall not affect the expenses that are eligible for reimbursement or benefits to be provided pursuant to the Health Benefits in any other calendar year, except as specifically permitted by Treasury Regulation Section 1.409A-3(i)(1)(iv)(B). Your right to the Health Benefits may not be liquidated or exchanged for any other benefit.

If your employment with the Company terminates pursuant to this Section I, upon and following the Involuntary Termination Date, your other compensation and benefits continue to be governed by the terms of the plans in which you participate; provided however, that payments and benefits under this Section I are in lieu of any other involuntary separation benefits or severance payments which you may be eligible to receive from the Company; and if you receive severance pay and benefits under the Company's Change in Control Severance Plan, no payments will be made, or benefits provided, under this Agreement.

In the event that, as of the Involuntary Termination Date, you are not a "specified employee" (as described above), and the 60 day period following your Involuntary Termination Date specified herein for payment of any of the amounts due to you under this Section I.B. spans two calendar years, any such payment will be made in the second calendar year.

Restrictive Covenants

You acknowledge that to the extent that you are a party to any noncompetition, nonsolicitation or other restrictive covenants or confidentiality agreements with the Company (collectively, "Restrictive Covenants"), the terms of such Restrictive Covenants, shall remain in full force and effect.

Tax Withholding

You shall be solely responsible for all taxes owed with respect to all payments and benefits provided hereunder. You must pay all applicable foreign, federal and state income and employment withholding taxes when due. The Company shall be entitled to withhold from amounts to be paid to you hereunder any federal, state or local withholding or other taxes or charges (or foreign equivalents of such taxes or charges) which it is from time to time required to withhold.

Application of 409A Provisions

If you provide a written, unqualified opinion from your tax advisor to the Company stating that you are a non-resident alien not subject to 409A at the time of your termination of employment, or that 409A otherwise does not apply to you at that time, unless the Company has reason to believe that such opinion is more likely than not incorrect, the Company shall cooperate with you to amend this Agreement in a mutually satisfactory manner to cause any severance payments payable hereunder to be paid as soon as practicable following your termination of employment, and to otherwise remove references to Section 409A from this Agreement; provided that in no event shall such payments be made unless and until you have returned an executed Release Agreement (signed by you on or following your termination date) (or any equivalent form in accordance with local law of your location) and any period within which you may revoke the Release Agreement pursuant to the terms thereof has expired without you having revoked the Release Agreement (or any equivalent form in accordance with local law of your location). The Company shall have no responsibility for any taxes or penalties you may incur on account of any such amendments, whether pursuant to 409A or otherwise.

Governing Law; Jurisdiction

This Agreement shall be governed and interpreted in accordance with the laws of the State of Delaware without reference to its choice of law principles. Any action arising out of or related to this Agreement shall be brought in the state or Federal courts located in Pittsburgh, Pennsylvania, and you and the Company consent to the jurisdiction and venue of such courts.

Amendment; Waiver

No provision of this Agreement may be modified, waived, or discharged unless such waiver, modification or discharge is in writing and signed by the Chief Executive Officer of the Company as authorized by the Board or the Compensation and Benefits Committee of the Board (or successor committee). Any failure by you or the Company to enforce any of the provisions of this Agreement shall not be construed to be a waiver of such provisions or any right to enforce each and every provision in the future. A waiver of any breach of this Agreement shall not be construed as a waiver of any other or subsequent breach.

Successors; Binding Agreement

The Company shall have the right to assign its rights and obligations under this Agreement to any entity that acquires all or substantially all of the assets of the Company and continues the Company's business. The rights and obligations of the Company under this Agreement shall inure to the benefit and shall be binding upon the successors and assigns of the Company.

Severability

In the event that any one or more of the provisions of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality and enforceability of the remainder of this Agreement shall not in way be affected or impaired thereby.

Entire Agreement

You acknowledge that you have not relied upon any representations (whether oral or written) from the Company, other than as set forth in this Agreement. This Agreement sets forth the entire agreement and understanding between you and the Company and merges and supersedes any and all prior discussions, agreements, arrangements and understandings with regard to the subject matter hereof, except as provided in Section I.B, and may not be modified, amended, discharged or supplemented in any respect, except by a subsequent writing signed by you and the Company. In the event that any payments under this Agreement in the aggregate are more than 2.99 times of your base salary and bonus, the payments which you will be eligible to receive under this Agreement will be reduced accordingly. Except for involuntary separation benefits or other similar severance payments, this Agreement does not supersede the terms of any other compensation plans, stock option programs, welfare benefit plans, or other such plans or programs in which you are eligible to participate, or may become eligible to participate.

If you agree to the terms of this Agreement, please sign on the line provided below and return two signed copies to the Secretary. A fully executed copy will be returned to you for your files after it is signed by the Company.

Termination of Officer Status and Agreement

You hereby acknowledge and agree that, in the event you cease to be an "officer" of the Company, as designated and determined in the sole discretion of the Board (or a committee thereof), this Agreement shall immediately terminate and become null and void upon such Board determination date and you shall not have any right to payments or benefits provided hereunder.

IN WITNESS WHEREOF, the Executive and the Company, by its duly authorized representative, have executed this Agreement on the dates stated below, effective as of the date first set forth above.

COMPANY: **ALCOA CORPORATION**

By: _____
Title: _____
Date: _____

EXECUTIVE: **[Name]**

By: _____
Title: _____
Date: _____

EXHIBIT 19.1



INSIDER TRADING POLICY

Policy Highlights

You may not trade in securities while in possession of material information about a company's securities that has not been publicly disclosed.

You may not share material, nonpublic information with family members, friends, or others who do not need to know the information as part of their work for Alcoa.

Directors, officers, and certain other identified Alcoa employees and individuals are "blacked out" from trading in Alcoa Securities prior to the quarterly earnings release.

The consequences of violating the insider trading laws and this Policy can be severe.

BACKGROUND:

This Insider Trading Policy (the "Policy") provides guidelines with respect to transactions in the securities of Alcoa Corporation ("Alcoa"), as well as the handling of confidential information about Alcoa and the entities with which Alcoa does business, including each domestic and foreign subsidiary, partnership, venture or other business association that is effectively controlled by Alcoa, either directly or indirectly (collectively, the "Company"). This Policy is designed to prevent insider "trading" (as defined below under "Definitions") or allegations of insider trading, and to protect the Company's reputation for integrity and ethical conduct. It is your obligation to review, understand and comply with this Policy. Should you have any questions regarding this Policy, please see the "Contacts for Questions" section of this Policy.

PERSONS SUBJECT TO THE POLICY:

This Policy applies to the Company and all "Company Persons" (defined as directors, officers, employees, temporary employees, independent consultants and contractors of the Company, at all levels and with any relationship to the Company). This Policy also applies to (1) anyone who resides with or lives in a Company Person's household, and any family members who do not live in a Company Person's household but whose transactions in "Alcoa Securities" (as defined below under "Definitions") are directed by, or are subject to, the influence or control of a Company Person, such as parents or children (collectively, "Family Members"), and (2) entities influenced or controlled by a Company Person ("Related Entities"). It is each Company Person's obligation to ensure that Family Members and Related Entities are aware of, and understand and comply with, the provisions and obligations of this Policy.

The Company, Company Persons, Family Members and Related Entities must act in a manner that does not misuse "material" (as defined below under "Definitions") financial or other information about the Company that has not been publicly disclosed. Failure to do so could damage the Company's reputation. Additionally, in some countries, including the United States, insider trading violates laws that impose strict penalties, including fines and imprisonment, upon both companies and individuals.

PURPOSE OF THE POLICY:

Maintaining the confidence of stockholders and the public markets is important. The principle underlying this Policy is fairness in dealings with other persons, which requires that Company Persons, Family

Members and Related Entities not take personal advantage of undisclosed information to the detriment of others who do not have such information.

It is important that each Company Person understand the breadth of activities that constitute illegal insider trading and their consequences, which can be severe. Both the U.S. Securities and Exchange Commission ("SEC") and the New York Stock Exchange investigate and are very effective at detecting insider trading. The SEC, together with the U.S. Department of Justice, pursue insider trading violations vigorously, from both a criminal and civil perspective. Cases have been successfully prosecuted against individuals as a result of trading (1) by employees through foreign accounts, (2) by Family Members and friends, and (3) involving only a small number of shares. There are no exceptions for small or "immaterial" transactions.

SEC Rule 10b-5 prohibits trading on the basis of material "nonpublic information" (as defined below under "Definitions"). Under the federal securities laws, individuals who engage in insider trading or tipping can be liable for substantial criminal and civil penalties, imprisonment and/or private party damages. In addition to criminal and civil penalties and damage to reputation, violation of this Policy may result in termination of employment.

THE POLICY:

NO TRADING ON OR TIPPING OF MATERIAL NONPUBLIC INFORMATION

1. Neither the Company nor any Company Person, Family Member or Related Entity may buy, sell or otherwise engage in any transactions, directly or indirectly through third parties, in Alcoa Securities if the Company or such person or entity, as applicable, is in possession of material nonpublic information.

2. No Company Person may, directly or indirectly, disclose material nonpublic information either (a) to persons within the Company whose jobs do not require them to have that information, or (b) to persons outside the Company including, but not limited to, Family Members, Related Entities, friends, business associates, investors, and consulting firms, in each case unless any such disclosure is authorized by the Company and made in a manner to protect such information from unauthorized disclosure.

Company Persons, Family Members and Related Entities may be liable for trading by any person (a "tippee") to whom they have disclosed ("tipped") material nonpublic information. Tippees inherit an insider's duties and may be liable for trading on material nonpublic information tipped to them by an insider. Tipping may also result in the same penalties to the tipper as if he or she did actually trade. Just as tippers may be liable for the insider trading of their tippees, tippees who further pass along the material nonpublic information to other persons who trade may be similarly liable.

3. No Company Person, Family Member or Related Entity may make recommendations or express opinions about trading in Alcoa Securities if such person is in possession of material nonpublic information.

4. No Company Person, Family Member or Related Entity may buy, sell or otherwise engage in any transactions, directly or indirectly through third parties, in securities of any other firm (including, without limitation, a current or prospective Company customer, supplier, joint venture participant, partner, or party to a potential corporate transaction) if they are in possession of any material nonpublic information about that firm that they obtained in the course of their employment, or other services performed on behalf of, the Company, or any other relationship with the Company, including through a Company Person. Examples include information about a major contract or potential merger. Note that even if information is immaterial to the Company, it may nevertheless be material to the other firm.

OTHER PROHIBITED TRANSACTIONS

1. Company Persons, Family Members and Related Entities may not trade, directly or indirectly through other persons or entities, in aluminum futures or options if they are in possession of material nonpublic information about the Company's trading activities in aluminum futures markets.

2. The Company and Company Persons, Family Members and Related Entities may not execute short sales (a sale of securities that are not currently owned by the seller) or take short positions in Alcoa Securities or engage in derivative or speculative transactions in Alcoa Securities, including puts and calls.

3. Company Persons, Family Members and Related Entities are not permitted to purchase or use, directly or indirectly through other persons or entities, financial instruments (including prepaid variable forward contracts, equity swaps, collars, and exchange funds), or otherwise engage in transactions, that hedge or offset, or are designed to hedge or offset, any decrease in the market value of Alcoa Securities, and are prohibited from holding Alcoa Securities in margin accounts and pledging, hypothecating or otherwise using Alcoa Securities as collateral for a loan or other form of indebtedness.

4. Directors and Section 16 Officers (as defined below under "Section 16 Reports") are prohibited from maintaining an automatic rebalance feature in 401(k) savings plans, deferred compensation or deferred fee plans.

BLACKOUT PERIODS

Certain designated persons are prohibited from trading in Alcoa Securities during certain time periods, known as blackout periods. The Company has established four routine quarterly blackout periods (the "Quarterly Blackout Periods"). Each Quarterly Blackout Period begins on the 15th day of the third month of the quarter and generally ends one full business day after the Company's quarterly earnings are released. In some instances, the Company may choose to extend the Quarterly Blackout Period until one full trading day has elapsed following the filing of its Form 10-Q or Form 10-K, as applicable, reporting earnings results.

The Company and the following Company Persons are subject to the Quarterly Blackout Periods:

- Directors, officers and assistant officers of Alcoa.
- Members of Alcoa's Executive Team.
- Regional Vice Presidents of Operations.
- Members of Alcoa's legal department as determined by the General Counsel.
- All individuals reporting directly to the Chief Financial Officer of Alcoa.
- Employees in the Controller's group who are involved in the preparation of financial statements (to be determined by the Controller).
- Employees with knowledge of, or access to, consolidated financial results or performance forecasts.
- Designated Investor Relations professionals.
- Designated Corporate Communications professionals.
- Employees in job band 70 or above
- Anyone who has access to, or is in possession of, material nonpublic information in connection with working for any of the foregoing persons, departments or offices (including executive assistants).
- Other Company Persons designated by a member of Alcoa's Executive Team, with notice to the Corporate Secretary's Office.
- Anyone in possession of material nonpublic information.
- Family Members and Related Entities of any of the above.

Examples of transactions that are prohibited during a blackout period are as follows:

- Open market purchase or sale of Alcoa Securities.
- Purchase or sale of Alcoa Securities through a broker.
- Exercise of stock options where all or a portion of the acquired stock is sold during the blackout period.
- Switching existing balances into or out of the Alcoa stock fund in a 401(k) savings plan, deferred compensation or deferred fee plan or other benefit plans.
- New cash investments in any dividend reinvestment plan offered by the Company.
- Gifts of Alcoa Securities.

Examples of transactions that are permitted during a blackout period are as follows:

- Exercise of stock options where no Alcoa Securities are sold in the market.
- Tax withholding transactions where no Alcoa Securities are sold in the market.
- Regular and matching contributions to the Alcoa stock fund in a benefit plan and certain transactions pursuant to deferred compensation or deferred fee plans as provided herein.
- Regular reinvestment in the dividend reinvestment plan, if any.
- Transactions that comply with pre-arranged written plans pursuant to SEC Rule 10b5-1, subject to the conditions described below.

In addition to the regular Quarterly Blackout Periods, the Company may, from time to time, impose special blackout periods upon notice to those Company Persons who are affected.

Note: Company Persons not otherwise subject to the Quarterly Blackout Periods are encouraged to refrain from trading Alcoa Securities during the Quarterly Blackout Periods to avoid the appearance of improper trading.

The Quarterly Blackout Periods apply, whether or not a reminder notice of the blackout is sent. You are responsible for compliance with this Policy.

PRE-CLEARANCE OF ALCOA SECURITIES TRANSACTIONS

In addition to complying with the prohibition on trading during Quarterly Blackout Periods, the following Company Persons must first obtain written pre-clearance before engaging in any transaction in Alcoa Securities, including for transactions occurring outside a Quarterly Blackout Period:

- Directors, officers and assistant officers of Alcoa.
- Members of Alcoa's Executive Team.
- Designated Investor Relations and Corporate Communications professionals.
- Designated Finance- External Reporting professionals.
- Regional Vice Presidents of Operations
- Employees in job band 70 or above.
- Family Members and Related Entities of the foregoing persons.

Transactions requiring pre-clearance include all transactions noted above as being prohibited or permitted during a blackout period, including gifts of Alcoa Securities and any stock option exercise.

In addition, other employees are encouraged to discuss with the General Counsel or the Chief Securities/Governance Counsel as noted below any transaction involving Alcoa Securities to make sure there is no pending material event that could create an appearance of improper trading.

Who authorizes the pre-clearance?

- General Counsel;
- Chief Securities/Governance Counsel; or
- Other attorneys as may be designated from time to time by the General Counsel.

A request for pre-clearance to trade in Alcoa Securities should be submitted in writing to the General Counsel or the Chief Securities/Governance Counsel (or other designated attorneys) at least one business day in advance of the proposed transaction. When a request for pre-clearance is made, the requestor should confirm in the request that he or she (1) has reviewed this Policy and (2) is not aware of any material nonpublic information about the Company. The General Counsel, the Chief Securities/Governance Counsel, and his or her designees will review the circumstances of the proposed trade, taking into consideration any pending material events or other material information regarding the Company that has not yet been publicly disclosed, including with respect to any anticipated or currently-operative Company repurchase programs for Alcoa Securities. The General Counsel, the Chief Securities/Governance Counsel, and his or her designees are under no obligation to approve any trade. If a request for pre-clearance does not receive a response, the request will be deemed to have been denied. If a proposed transaction receives pre-clearance, the pre-cleared trade must be effected within two business days of receipt of pre-clearance, unless an exception is granted or the person becomes aware of material nonpublic information before the trade is executed, in which case the preclearance is void and the trade must not be completed. If transactions are not effected within the time limit, pre-clearance must be requested and approved in writing again. If a person seeks pre-clearance and permission to engage in the transaction is denied, then he or she must refrain from initiating any transaction in Alcoa Securities, and should not inform any other person of the restriction.

INDIVIDUAL RESPONSIBILITY

Company Persons, Family Members and Related Entities subject to this Policy have ethical and legal obligations to maintain the confidentiality of information about the Company and not to trade in Alcoa Securities (or the securities of another firm) while in possession of material nonpublic information. In all cases, the ultimate responsibility for adhering to this Policy and avoiding improper trading rests with such person, and any action on the part of the Company, the General Counsel, the Chief Securities/Governance Counsel, or any other employee or director pursuant to this Policy (or otherwise) does not in any way constitute legal advice or insulate an individual from liability under applicable securities laws. If you violate this Policy, the Company may take disciplinary action, including dismissal for cause. You may also be subject to severe legal penalties under applicable securities laws.

Transactions that may be necessary or justifiable for independent reasons (such as the need to raise money for an emergency expenditure) or small transactions are not exempted from this Policy. The securities laws do not recognize any mitigating circumstances. If your transactions become the subject of scrutiny, they will be viewed after-the-fact with the benefit of hindsight; that is, regulators will have the benefit of knowing how the stock price was affected once the material nonpublic information became public. As a result, before engaging in any transaction, you should carefully consider how your transaction may be viewed in hindsight. Even the appearance of an improper transaction must be avoided to preserve the Company's reputation for integrity and ethical conduct.

In the event you receive any inquiry or request for information (particularly financial results and/or projections, including to affirm or deny information about the Company) from any person or entity outside the Company, such as a stock analyst, and it is not part of your regular corporate duties to respond to such inquiry or request, the inquiry should be referred to Investor Relations, which will determine whether such inquiry should also be forwarded to the Corporate Secretary's Office.

This Policy applies even after termination of employment or service with the Company. If a Company Person is in possession of material nonpublic information when his or her employment or service terminates, that person, Family Members and Related Entities may not trade in Alcoa Securities (or another company's or entities' securities, as described in this Policy) until such information has become public or is no longer material. In certain circumstances, Company Persons may be required to continue to seek pre-clearance from the Company before trading in Alcoa Securities for a period of time following their termination of employment or service with the Company.

ADDITIONAL GUIDANCE:

STANDING AND LIMIT ORDERS

Due to the general lack of control over the timing of the transaction and the potential for execution at a time when you are in possession of material nonpublic information, standing and limit orders (except standing and limit orders under approved 10b5-1 plans, as described below) create heightened risks for insider trading violations and should be used only for a brief period of time and otherwise in compliance with this Policy.

TRANSACTIONS COVERED

Trading includes purchases and sales of Alcoa Securities. Trading also includes certain transactions under Company plans, as follows:

- *Stock Option Exercises.* This Policy's trading restrictions generally do not apply to the exercise of an employee stock option (i.e., merely the conversion of the option into shares). The trading restrictions do apply, however, to any market sale of the underlying stock or any sale of shares as part of a broker-assisted cashless exercise of an option, or any other market sale for the purpose of generating the cash needed to cover the costs of exercising the option.
- *Restricted Stock and Restricted Stock Unit Awards.* This Policy does not apply to the vesting and settlement of restricted stock and restricted stock units, or the withholding or sale of stock back to the Company to satisfy tax withholding obligations upon the vesting of any restricted stock or restricted stock units. The Policy does apply, however, to any market sale of stock after vesting.
- *401(k) Plan.* This Policy's trading restrictions do not apply to purchases of Alcoa stock in the 401(k) plan resulting from a periodic contribution of money to the plan pursuant to a Company Person's payroll deduction election. The trading restrictions do apply, however, to elections to participate in the Alcoa stock fund of the 401(k) plan and certain elections a Company Person may make under the 401(k) plan to (a) increase or decrease the percentage of a Company Person's periodic contributions that will be allocated to the Alcoa stock fund; (b) make an intra-plan transfer of an existing account balance into or out of Alcoa stock fund; (c) borrow money against a 401(k) plan account if the loan will result in a liquidation of some or all of a Company Person's Alcoa stock fund balance; and (d) pre-pay a plan loan if the pre-payment will result in allocation of loan proceeds to the Alcoa stock fund.
- *Deferred Compensation and Deferred Fee Plans.* This Policy's trading restrictions generally do not apply to acquisitions of Alcoa Securities (or their equivalent) in your deferred compensation or deferred fee account resulting from periodic deferrals of compensation pursuant to the deferral methods allowed under the applicable deferred compensation or deferred fee plan and your advance, irrevocable deferral election. The trading restrictions do apply, however, to an election to participate in the Alcoa stock fund of a deferred compensation or deferred fee plan and an election to (a) increase or decrease the percentage of periodic contributions that will be allocated to, or terminate investing in, the Alcoa stock fund of the deferred compensation or deferred fee plan; and (b) make an intra-plan transfer of an existing account balance into or out of the Alcoa stock fund.

Dividend Reinvestment Plan. This Policy's trading restrictions do not apply to purchases of Alcoa Securities under any dividend reinvestment plan offered by the Company, if such purchases result from a Company Person's reinvestment of dividends paid on Alcoa Securities. The trading restrictions do apply, however, to voluntary purchases of Alcoa Securities resulting from additional contributions a Company Person chooses to make to any such dividend reinvestment plan and to an election to participate in the plan or to increase the level of participation in the plan. This Policy also applies to a Company Person's sale of any Alcoa Securities purchased pursuant to any such plan.

TRANSACTIONS BY FAMILY MEMBERS AND RELATED ENTITIES

As stated above, the Policy applies with equal force to Family Members and Related Entities. All Company Persons are responsible for ensuring that Family Members and Related Entities do not engage in the activities restricted or prohibited under this Policy. As such, Company Persons should ensure that all Family Members and Related Entities are aware of the need to confer with such Company Person before the Family Member or Related Entity trades in Alcoa Securities. Company Persons should treat all such transactions for the purposes of this Policy and applicable securities laws as if the transactions were for your own account.

Note that this Policy does not, however, apply to transactions in Alcoa Securities where the purchase or sale decision is made by a third party that is not controlled by, influenced by, or related to the Company Person, Family Member or Related Entity (such as a third party managed mutual fund account).

SECTION 16 REPORTS

Certain Company Persons are required to file reports with the SEC (including Forms 3, 4, and 5) that publicly disclose such Company Person's trading and other transactions relating to Alcoa Securities ("Section 16 Reports").

Who is obligated to file Section 16 Reports?

- Alcoa directors.
- Alcoa officers designated as "executive officers" for SEC reporting purposes by the Board of Directors (referred to as "Section 16 Officers").
- Certain stockholders.

Section 16 Reports are publicly available upon filing. The Corporate Secretary's Office will assist Alcoa directors and Section 16 Officers in preparing and filing the required Section 16 Reports; however, such reporting persons retain responsibility for the Section 16 Reports. To ensure compliance with all reporting requirements, a director or Section 16 Officer must, on the date of any trade, provide the Corporate Secretary's Office with all information relating to the trade that is necessary to properly prepare a Form 4 or other Section 16 Report. A director or Section 16 Officer must also execute a Form 4 or other Section 16 Report (either individually or through a duly-authorized power of attorney) within a sufficient amount of time to allow the Corporate Secretary's Office to electronically file the Form 4 with the SEC via EDGAR before the end of the second business day following the trade.

FORM 144 REPORTS

Certain Company Persons (i.e., all Alcoa directors and certain Alcoa officers designated by the Board of Directors) are required to file a Form 144 with the SEC before making an open market sale of Alcoa Securities. A Form 144 notifies the SEC of the Company Person's intent to sell Alcoa Securities and is publicly available upon filing. This form is generally prepared and filed by the Company Person's broker and is separate from, and in addition, to the Section 16 Reports filed on the Company Person's behalf by the Corporate Secretary's Office.

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RULE 10b5-1 PLANS AND OTHER TRADING PLANS FOR COMPANY PERSONS

SEC Rule 10b5-1 provides an affirmative defense from insider trading liability under SEC Rule 10b-5. To be eligible to rely on this defense, a Company Person must enter into a “10b5-1 plan” for trading in Alcoa Securities that meets the requirements of Rule 10b5-1 and Alcoa’s Rule 10b5-1 Trading Plan Guidelines (attached as Appendix A to this Policy). Alcoa Securities may be purchased or sold pursuant to a 10b5-1 plan without regard to certain insider trading restrictions. To comply with this Policy and Alcoa’s Rule 10b5-1 Trading Plan Guidelines, a Company Person’s 10b5-1 plan must be pre-approved by the General Counsel and the Chief Securities/Governance Counsel.

Any Company Person who wishes to enter into a 10b5-1 plan or other trading plan must submit the trading plan in writing to the General Counsel and the Chief Securities/Governance Counsel for written pre-approval at least five business days prior to the entry into the plan. Subsequent modifications or terminations to any 10b5-1 plan or trading plan must also be pre-approved by the General Counsel and the Chief Securities/Governance Counsel. Whether or not pre-approval will be granted will depend on all the facts and circumstances at the time.

DEFINITIONS:

Alcoa Securities include common stock, options to purchase common stock, stock appreciation rights, restricted stock and restricted stock units, preferred stock, warrants, derivative securities such as put and call options, convertible debentures and debt securities (debentures, bonds and notes) and any other securities the Company may issue from time to time.

trading, trade or traded includes purchases and sales of Alcoa Securities, as well as writing options or transferring to or from the Alcoa stock fund under the savings plan, deferred compensation or deferred fee plans or other benefit plans.

material. In general, information is considered “material” if there is a reasonable likelihood that an investor would consider such information important in a decision to buy, sell or hold securities. Any information that could be expected to affect the price of the securities, whether positive or negative, may be considered material. There is no bright-line standard for assessing materiality.

- It is not possible to define all categories of material information, as the ultimate determination of materiality by enforcement authorities will be based on an assessment of all relevant facts and circumstances. Information that is material at one point in time may cease to be material at another point in time, and vice versa.

- While it may be difficult under this standard to determine whether particular information is material, there are various categories of information that are particularly sensitive and, as a general rule, should always be considered material.

- Examples of material information include: financial results; financial guidance; changes to previously announced earnings guidance; significant changes in management; proposed major mergers, acquisitions, restructurings or divestitures; changes in dividends or dividend policy; the establishment, amendment, or termination of a Company repurchase program for Alcoa Securities; significant financial liquidity problems; financing transactions not in the ordinary course of business; an extraordinary item for accounting purposes; important business developments, such as major raw material shortages or discoveries, and significant disruptions in operations or loss; material breach or unauthorized access to property or assets, including relating to a cybersecurity incident or attack; or a major pending or threatened litigation or government investigation. The information may be positive or negative.

- The public, the media, and the courts may use hindsight in judging what information is material.

nonpublic information means information that has not yet been disclosed broadly to the marketplace (for example, included in a press release or a filing with the SEC) and for which the investing public has not had time to absorb and evaluate the information. Release of information to the media does not immediately free insiders to trade. If the information has been widely disseminated, it is recommended to wait at least one full business day after publication.

CONTACTS FOR QUESTIONS:

If you have any questions about this Policy, please contact the General Counsel or the Chief Securities/ Governance Counsel.

Appendix A

Alcoa Corporation

Rule 10b5-1 Trading Plan Guidelines

These guidelines are designed to facilitate the review of pre-arranged trading plans under Rule 10b5-1 ("Rule 10b5-1") of the Securities Exchange Act of 1934 (as amended, the "Exchange Act") submitted to the General Counsel and the Chief Securities/Governance Counsel of Alcoa Corporation (the "Company") for review and pre-approval pursuant to the Company's Insider Trading Policy (the "Policy"). Capitalized terms used in these guidelines without definition are as defined in the Policy. The General Counsel has been authorized by the Board of Directors of the Company to amend these guidelines at any time for the purpose of conforming these guidelines with applicable law, in accordance with legal advice, or the rules and regulations of the Securities and Exchange Commission.

Pre-Arranged Plan Provisions—Each pre-arranged trading plan will be reviewed and pre-approved by the General Counsel and the Chief Securities/Governance Counsel. The General Counsel and the Chief Securities/Governance Counsel will determine whether the proposed pre-arranged trading plan contains the following mandatory terms, unless the General Counsel and the Chief Securities/Governance Counsel recognize there is an exception in a particular case.

- The plan must affirm an intent to comply with Rule 10b5-1.

- If the person entering into (or modifying) the plan is an "officer" (as defined in Rule 16a-1(f) of the Exchange Act, an "Officer") of the Company or a member of the Board of Directors of the Company (a "Director"), the plan must include a certification by such person that, on the date of adoption (or modification) of the plan, such person is not in possession of material nonpublic information about the Company or its securities.

- If the person entering into (or modifying) the plan is an Officer or a Director, the plan must include a certification by the person that, on the date of adoption (or modification) of the plan, the person is adopting (or modifying) the plan in good faith and not as part of a plan or scheme to evade the prohibitions of Section 10(b) and Rule 10b-5 under the Exchange Act.

- The plan must specify the nature of the transactions (e.g., purchase or sale).

- The plan must not permit the exercise of any subsequent influence over how, when or whether to effect purchases or sales; provided, in addition, that any other person who, pursuant to the plan, did exercise such influence must not have been aware of material nonpublic information when doing so.

- The plan must specify the terms of all transactions (identify the amounts, prices, and dates of proposed transactions).

- If the person entering into (or modifying) the plan is an Officer or a Director, the plan must provide for a cooling-off period of at least the later of (1) 90 days after the adoption (or modification) of the plan and (2) two business days following the disclosure of the Company's financial results in a Form 10-Q or Form 10-K for the completed fiscal quarter in which the plan was adopted (or modified) (but not to exceed 120 days following plan adoption (or modification)), before execution of the first transaction (or next transaction, in the case of a modification) under the plan.

- If the person entering into (or modifying) the plan is not an Officer or Director, the plan must provide for a cooling-off period of at least 30 days after adoption (or modification) of the plan before execution of the first transaction (or next transaction, in the case of a modification) under the plan.

- The plan must specify a termination date that is at least six months following the effective date of the plan.

- If the person entering into (or modifying) the plan is an Officer or Director, the plan must include reporting compliance provisions, instructing parties effecting transactions to provide timely notification of such transactions to the General Counsel and the Chief Securities/Governance Counsel for purposes of assuring compliance with applicable reporting requirements, such as those arising under Rule 144 of the Securities Act of 1933 and Section 16 under the Exchange Act.

Additional Requirements/Considerations—The following requirements and considerations apply in connection with any pre-arranged trading plan, unless the General Counsel recognizes there is an exception in a particular case.

- A plan must be entered into (or modified) in good faith and not as part of a plan or scheme to evade the prohibitions of Section 10(b) and Rule 10b-5 under the Exchange Act.

- Once a plan has been entered into (or modified), the person entering into the plan must act in good faith with respect to such plan throughout the duration of the plan.

- Any modification or change to the amount, price or timing of the purchase or sale of securities underlying a plan will generally be considered a termination of such plan and the adoption of a new plan.

- The plan may not be entered into, modified, or terminated during a blackout period.

- The plan must be entered into, modified or terminated while the person entering into, modifying, or terminating the plan is not aware of any material nonpublic information regarding the Company and its securities.

- The plan may not be modified or terminated without the prior approval of the General Counsel and the Chief Securities/Governance Counsel, which approval may require a waiting period, as appropriate.

- The person entering into (or modifying) the plan may generally only have one pre-arranged trading plan in effect and active at any time. However, a person may maintain two separate plans at the same time so long as trading pursuant to the later-commencing plan is not authorized to begin until after all trades under an earlier-commencing plan are completed or have expired without execution (if an individual otherwise terminates the earlier-commencing plan, the later-commencing plan would be subject to a new cooling-off period, as described above).

- If the plan is designed to effect the open-market purchase or sale of the total amount of securities subject to such plan as a single transaction (a “single-trade plan”), the person entering into (or modifying) the plan must not have entered into (or modified) another single-trade plan in the prior 12-month period that also qualified for the affirmative defense under Rule 10b5-1.

- In the case of Officers and Directors, the adoption, modification, or termination of a plan, the material terms of a plan (other than price), and transactions pursuant to a plan will be publicly disclosed in accordance with the applicable laws, rules, and regulations of the Securities and Exchange Commission.

- In connection with the entry into (or modification of) a plan, an Officer or Director should consider, in consultation with the General Counsel, Section 16(b) of the Exchange Act. Most transactions under Rule 10b5-1 trading plans are likely to involve open-market sales or purchases that could be matched with opposite-way transactions within less than six months to produce profits recoverable by the Company under Section 16(b). An Officer or Director establishing a plan should determine whether there are any potentially matchable transactions in the past, or in the future, that could cause profits from plan transactions to be recovered by the Company under Section 16(b).

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Exhibit 21.1

SUBSIDIARIES OF THE REGISTRANT

Name	State or Country of Organization
AAC Investments Australia PTY Ltd	Australia
AAC Investments Australia 1 PTY Ltd	Australia
AAC Investments Australia 2 PTY Ltd	Australia
Alcoa Alumínio S.A.	Brazil
Alcoa Australian Holdings Pty Ltd	Australia
Alcoa Holland B.V.	Netherlands
Alcoa Nederland Holding B.V.	Netherlands
Alcoa of Australia Limited	Australia
Alcoa USA Corp.	Delaware
Alcoa USA Holding Company	Delaware
Alcoa-Lauralco Management Company	Canada
Alumina Pty Ltd	Australia
Aluminerie Lauralco B.V.	Netherlands
Reynolds Metals Company, LLC	Delaware

The names of particular subsidiaries have been omitted because, considered in the aggregate as a single subsidiary, they would not constitute, as of the end of the year covered by this report, a “significant subsidiary” as defined in Regulation S-X under the Securities Exchange Act of 1934, as amended.

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (Nos. 333-214420, 333-214423, 333-218038, and 333-228258) of Alcoa Corporation of our report dated February 20, 2025 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP

Pittsburgh, Pennsylvania
February 20, 2025

Exhibit 23.2

20 February 2025

CONSENT OF QUALIFIED PERSON

Re: Form 10-K of Alcoa Corporation (the "Company")

SLR Consulting Limited ("SLR"), in connection with the Company's Annual Report on Form 10-K for the year ended December 31, 2024 (the "Form 10-K"), consents to:

- the public filing by the Company and use of the technical report summary titled "Technical Report Summary on the Darling Range, Western Australia," with an effective date of December 31, 2024 and dated February 20, 2025, and the technical report summary titled "Technical Report Summary for Juruti, Brazil," with an effective date of December 31, 2021 and dated February 24, 2022 (together, the "Technical Report Summaries"), that were prepared in accordance with Subpart 1300 of Regulation S-K promulgated by the U.S. Securities and Exchange Commission, as exhibits to and referenced in the Form 10-K;
- the incorporation by reference of the Technical Report Summaries into the Company's Registration Statements on Form S-8 (Nos. 333-214420, 333-214423, 333-218038, and 333-228258) (collectively, the "Registration Statements");
- the use of and references to our name, including our status as an expert or "qualified person" (as defined in Subpart 1300 of Regulation S-K promulgated by the U.S. Securities and Exchange Commission), in connection with the Form 10-K, the Registration Statements, and the Technical Report Summaries; and
- any extracts from or a summary of the Technical Report Summaries in the Form 10-K and incorporated by reference in the Registration Statements and the use of any information derived, summarized, quoted, or referenced from the Technical Report Summaries, or portions thereof, that was prepared by us, that we supervised the preparation of, and/or that was reviewed and approved by us, that is included or incorporated by reference in the Form 10-K and the Registration Statements.

SLR is responsible for authoring, and this consent pertains to, the Technical Report Summaries. SLR certifies that it has read the Form 10-K and that it fairly and accurately represents the information in the Technical Report Summaries for which it is responsible.

SLR Consulting Limited

Per:



John R. Walker FGS, FIMMM, QMR
Technical Director – Mining Advisory Europe

Exhibit 31.1

CERTIFICATIONS

I, William F. Oplinger, certify that:

1. I have reviewed this annual report on Form 10-K of Alcoa Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 20, 2025

/s/ William F. Oplinger

Name: William F. Oplinger

Title: President and Chief Executive Officer

Exhibit 31.2

CERTIFICATIONS

I, Molly S. Beerman, certify that:

1. I have reviewed this annual report on Form 10-K of Alcoa Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

    (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

    (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

    (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

    (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

    (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

    (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 20, 2025

/s/ Molly S. Beerman

Name: Molly S. Beerman

Title: Executive Vice President and Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Alcoa Corporation (the "Company") on Form 10-K for the period ended December 31, 2024 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, in the capacity and on the date indicated below, hereby certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to his knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 20, 2025

/s/ William F. Oplinger
William F. Oplinger
President and Chief Executive Officer

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished solely pursuant to 18 U.S.C. Section 1350 and is not being filed as part of this report.

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Alcoa Corporation (the "Company") on Form 10-K for the period ended December 31, 2024 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, in the capacity and on the date indicated below, hereby certifies pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to her knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: February 20, 2025

/s/ Molly S. Beerman
Molly S. Beerman
Executive Vice President and Chief Financial Officer

A signed original of this written statement required by Section 906, or other document authenticating, acknowledging, or otherwise adopting the signature that appears in typed form within the electronic version of this written statement required by Section 906, has been provided to the Company and will be retained by the Company and furnished to the Securities and Exchange Commission or its staff upon request.

The foregoing certification is being furnished solely pursuant to 18 U.S.C. Section 1350 and is not being filed as part of this report.

Exhibit 96.1

S-K 1300 Report

Technical Report Summary on the Darling Range, Western Australia

Alcoa Corporation

201 Isabella Street

Pittsburgh, Pennsylvania

15212-5858

Prepared by:

SLR International Corporation

22118 20th Ave SE, Suite G202, Bothell, WA 98021 USA

SLR Project No.: 123.020514.00001

Effective Date: 31 December 2024

Signature Date: 20 February 2025

Revision: 02

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1.0 Executive Summary

1.1 Summary

SLR International Corporation (SLR or the QP) was appointed by Alcoa Corporation (Alcoa) to prepare an independent Technical Report Summary (TRS) on the Darling Range bauxite mines, located in Western Australia. The purpose of this report is to support the Mineral Resource and Mineral Reserve estimates for the mines as of December 31, 2024. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300), and Item 601(b)(96) of Regulation S-K, Technical Report Summary.

1.1.1 Conclusions

1.1.1.1 Geology and Mineral Resources

• SLR is independently declaring the 31 December 2024 Mineral Resources for the defined bauxites located within Alcoa's Darling Range deposits. The Mineral Resource models were prepared by Alcoa using their in-house estimation procedures and reviewed extensively by SLR.

• As of December 31, 2024, exclusive of Mineral Reserves, as summarized in Table 11-13 at an appropriate level of precision reflecting confidence, the Measured Mineral Resources are estimated to be 139.6 Mt at a grade of 30.4% available alumina (AL) and 1.77% reactive silica (SI). Similarly, the Indicated Mineral Resources are estimated to be 48.7 Mt at 30.3% AL and 1.42% SI, and the Inferred Mineral Resources are estimated to be 101.4 Mt at 32.4% AL and 1.20% SI.

• Drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.

• The Quality Assurance / Quality Control (QA/QC) of sample preparation and assaying is adequate, and the assay results are suitable for use in Mineral Resource estimation

• Analytical procedures used for the Alcoa Mineral Resource comprises part of conventional industry practice. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied to more operations. At Alcoa the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4. It is the opinion of the QP from the studies on FTIR repeatability discussed above that the overall precision and accuracy of the FTIR assaying is acceptable.

• The database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.

• The continuous improvements in the geological modelling, estimation techniques, and block model migration to the 3D approach are appropriate and constantly improve the confidence level and precision of the Mineral Resources.

• The dry bulk density data is less well controlled than other analytes, although different attempts were taken since 1980. However, based on the different

reconciliation approaches and on the fact that the polygonal and GSM model have lower confidence level, the density values are acceptable for the Resource estimation.

• The condition of Reasonable Prospects for Economic Extraction is met by constraining the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices providing feedback that the modelling is appropriate for the purpose.

1.1.1.2 Mining and Mineral Reserves

• As of December 31, 2024, Proven Mineral Reserves are estimated to total 26.1 Mt at 29.2% AL and 1.61% SI and Probable Mineral Reserves are estimated to total 397.6 Mt at 30.8% AL and 1.56% SI.

• The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate, applying Modifying Factors only to those Resources classified as Measured Mineral Resources and Indicated Mineral Resources.

• The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. The review of the Capex Front End Loading (FEL) 2 Study report for the Myara North Crusher move has provided further support. Consequently, the QP considers that support by a Feasibility Study (FS) is demonstrated by the history of profitable operation and the level of technical support for the Modifying Factors. The QP has reviewed the operating and planning procedures and parameters for the operations.

• The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.

• The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate. The Darling Range operations have however undergone some changes as related to the permitting requirements which are discussed in this report; namely the approvals process, river corridor constraints, restoration obligations, and any required adjustments to accommodate the Q2 2024 curtailment of the Kwinana refinery.

1.1.1.3 Mineral Processing

• The operating data between 2010 and 2024 indicates that the product from the Darling Range operations consisted of an average AL grade of 33%, with SI below the target for refinery feed.

• The QP is of the opinion that the Darling Range operation demonstrated that ore can be effectively crushed and supplied to a refinery for further upgrading to produce alumina. The historical operational data confirmed that the ore consistently met refinery specifications without any deleterious elements.

  o Based on this, and additional information provided by Alcoa regarding the mine plan, it is reasonable to assume that the ore from Darling Range will meet the refinery specifications for the next nine years.

1.1.1.4 Infrastructure

- The Darling Range mining operations have established and operational infrastructure, with mining hubs that host administrative offices, as well as crushing facilities and maintenance facilities.
    - Hubs are relocated periodically as production moves away from the hub and transportation costs increase. These relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.
- An extensive haul road network, rail, and overland conveyors transport crushed bauxite from the Hub to the refineries.
    - Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt.
    - Alumina produced by the Pinjarra and Wagerup refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.
    - As intended the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.
- The Huntly and Willowdale mines are located near the towns of Pinjarra and Waroona respectively. These are easily accessible via the national South Western Highway, a sealed single carriageway road, spanning almost 400 km from the southern side of Perth to the southwest corner of Western Australia.
- Sealed access roads to the main hubs have been established, connecting Huntly and Willowdale to the road network.
- Major haul roads have been established to each mining area, while secondary haul roads cross-cut each individual mining plateau. Roads are unsealed and require continuous maintenance.
- The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS), but also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG).
    - The refinery supplies power to the Huntly Mine by a 33,000 volt power supply line and two 13,800 volt lines.
- The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine; steam being generated by gas fired boilers.
    - The refinery supplies power to the Willowdale Mine by a single 22,000 volt power supply.
- Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes.
    - The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.
    - The annual volume of freshwater abstracted under the Department of Water and Environmental Regulation (DWER) surface water licences and Water Corporation supply agreements decreased from Boronia Dam in comparison to 2022, and remained reasonably consistent to 2022 from Banksiadale and Samson Dams.

- o In 2023, water abstraction comprised approximately:
  - • 4.2% of the annual entitlement from Boronia Dam (i.e. 2,931.1 kL), in comparison to 53% in 2022.
  - • 22% from Banksiadale Dam (i.e. 108,412 kL), in comparison to 22% in 2022.
  - • 82% from Samson Dam (i.e. 368,017), in comparison to 70% in 2022.
- o An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation, significantly reduced from 2022 (651,840.7 kL).

• On site facilities include offices, ablutions, crib-rooms, and workshops, however there are no Alcoa accommodation facilities, as the Huntly and Willowdale mining areas are close to established population centers.

• No tailings are generated within the boundaries of the mining operations and waste dumps are not constructed. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.

• Overburden is segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

1.1.1.5 Environment

• Alcoa has established processes to facilitate conformance with environmental requirements, identifying sensitive areas ahead of time enables them to be managed ahead of disturbance.

• Mining in some areas became more constrained in 2023 as a result of internal and external factors. This has continued into 2024 and has resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation.

• The 2023-2027 MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. It excludes an environmental assessment of mine development activities associated with Myara North or Holyoake mining regions currently under consideration by the EPA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

• Alcoa has made progress in drafting and implementing a number of new management plans and processes required to meet current compliance requirements.

• Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

• Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.

• Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10) and the MMP. Compliance with the section 6 exemption order is also required from 14 December 2023. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:

  o Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.

  o In addition, outcomes of and compliance with the management and monitoring programs are reported within the 2023 Annual Environmental Review against the current MMP to JTSI, and in monthly reports demonstrating compliance with the Exemption Order.

• Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its abstraction and operational licenses.

• A groundwater monitoring program commenced in the second half of 2022 across the Darling Range operations to support approvals and operational monitoring, this is ongoing.

• Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

• Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks and maintain Alcoa's Social License to Operate.

• Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale).

• The current 2023-2027 MMP aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.

1.1.2 Recommendations

1.1.2.1 Geology and Mineral Resources

It is apparent to the QP that the long history of exploration, development and mining of Alcoa's Darling Range bauxite tenements have established sound knowledge and understanding of the geology and mineral endowment. The QP has not identified any fatal flaws in the current practices of mapping (based on the ArcGIS system), drill sampling (based on progressive continuous improvement), assaying (based on calibrated and

validated FTIR, with reasonable quality control), estimation (3D Block Model - 3DBM), database management (using acQuire), the application of mining criteria that assure RPEE, and the application of constraints establishing forestry, heritage and noise limits to the Mineral Resource definition. The following recommendations are offered as suggestions for further improvement, aligned with Alcoa's comprehensive approach to research and development (seen for example in the evolution of their drilling, sampling and assaying technologies). These recommendations are prioritized in terms of their perceived value to the overall operation, but are not expected to add cost:

- Continuing to replace the gridded seam model (GSM) and polygonal areas to the 3D block modelling methodology, using a script-based semi-automated approach, which enables more robust rapid model building. The validation of interpolation parameters using risk-based (conditional simulation) techniques to quantify confidence should be considered.
- To improve the reporting of recoverable resources, a re-blocked block model to a minimum practical mining scale or single mining unit (SMU) should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.
- Investigate whether the 5% bias in the tonnage between the As Mined and sampling tower weightometers is persistent in the 3D block models.
- Further redrilling or where viable re-assaying of pulps.
- Continue implementing the reconciliation system to understand and adjust differences in density and reactive silica, as well as to track the monthly performance of geological models with the refinery.
- To include volume surveys using drones and truck gantry scanning, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, and infra-red moisture determination, meaning that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.
- The QP considers that twinned hole studies are of limited value and should only be implemented once the sample splitting and preparation demonstrates good repeatability, using field duplicates (or the equivalent sample to extinction (STE) samples). They may be of value to investigate specific issues under closely supervised conditions.
- While the STE procedure could be retained for specific studies, in the QP's opinion, the reintroduction of field duplicates using appropriate riffle splitters under supervision should be considered.
- The QP is of the opinion that the grade characteristics of the bauxite profile could be reproduced in the model, which enables optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.

1.1.2.2 Mining and Mineral Reserves

- Currently a historical dilution and mining recovery factor is applied to the final Reserves to reconcile the tonnes and grade. The QP recommends applying dilution and ore loss at the re-blocked model level before performing the optimization and reporting these values independently.

• A reconciliation system should be implemented to allow the comparison of mined tonnes to the predicted tonnes of the geological model. This system would assist in defining dilution and losses related to modifying factors. Alcoa has been actively developing this reconciliation system during 2024 with an intention to implementation for 2025.

• As recommended from 2023, a mine planning schedule (LTMP) has been developed providing a strategic schedule over nine years which incorporates a tactical schedule over the first 3 years. However, currently Reserves would provide an additional 3 years of mine scheduling which would benefit cashflow modelling. Completing a strategic mine schedule for the total Reserve would allow impacts from sequencing of later Capital costs to be modelled appropriately. The view of the QP is that the unscheduled Reserve ore tonnes should be added to the LTMP.

• The QP recommends that a defined Process Acceptance Criteria is provided with specifications on upper and lower limits for all key process constraints.

• The QP recommends detailed haulage analysis is provided focusing on haulage profiles and cycle times, this process will provide more accurate forecasting of operating costs. It is noted during the 2024 visit that Alcoa are currently developing workflows for simulation software.

• Capital costs for the Myara North and Holyoake mine moves were in the process of being developed to FEL 3 classification. These costs should be reviewed during the next update.

1.1.2.3 Mineral Processing

The historical operational data for the Darling Range demonstrates that ore consistently met refinery specifications.

• Ideally, independent verification of sample analysis is conducted, by a certified laboratory, on a structured program, to ensure the QA/QC aspects of the internal analysis. Within this process a proportion of samples from each batch could be sent to the independent laboratory for analysis and the results can be compared with the internal analysis.

• The QP is appreciative that the mine is operational, meaning a trade-off versus logistics / practicality would need to be carried out.

1.1.2.4 Infrastructure

The Darling Range mining operations have well established infrastructure, with mining hubs that are periodically moved to reduce transportation distances between mining operations and the hubs. The QP makes no recommendations regarding infrastructure.

1.1.2.5 Environment

Alcoa has established systems to facilitate adherence to environmental commitments and has made progress with modernizing environmental approvals and permits for Huntly, Willowdale and the future mining areas at Holyoake and Myara North. The QP recommends that the following action is taken:

• Continued close engagement with EPA, DCCEEW and the Bauxite Strategic Executive Committee (BSEC) (previously the Mining and Management Program Liaison Group (MMPLG)) to best enable a prompt resolution to approval and permitting process to minimize impacts to the Reserve estimate into the future.

• Continued compliance with all approval and permit requirements. Compliance with the conditions associated with the *Alcoa Transitional Approvals Framework* exemption is critical as the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point.

• Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design and to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations. Preliminary results and how those results have informed changes to pit design should be reported in the next TRS.

• Close-out the Auditor-compliant contaminated sites process related to the identification of low levels of PFAS and AFFF on site.

1.2 Economic Analysis

1.2.1 Economic Criteria

A technical-economic model was prepared on an after-tax discounted cash flow (DCF) basis, the results of which are presented in this subsection.

Annual estimates of mine production with associated cash flows are provided for years 2025 to 2033 inclusive, based on Proven and Probable Reserves only.

Key criteria used in the analysis are discussed elsewhere throughout this TRS. General assumptions used are summarized in Table 1-1. All values are presented in United States Dollars ($) unless otherwise stated.

able 1-1: LOM Technical-Economic Assumptions

Description	Value
Start Date	January 1, 2025
Mine Life based on Mineral Reserves	9 years
Average LOM Price Assumption	$23.19
Total Operating Costs	$4,045.2 million
Capital over nine years	$1,174.6 million
Income tax	$226.0 million
Discount Rate	9.5%
Discounting Basis	End of Period
Corporate Income Tax Rate	30%
Model Basis	Nominal

1.2.2 Cash Flow Analysis

The economic analysis presented herein complies with S-K 1300 requirements and is based on a reserve-based discounted cashflow analysis using only Proven and Probable Mineral Reserves for the 9-year mine planning window.

Using the defined 9-year detailed mine plan period, at a 9.5% discount rate and average bauxite price of $23.19/t, the operation generates an after-tax NPV of $54.7 million.



This figure reflects substantial sustaining capital requirements (major mine moves, conveyor replacements, haul roads, and other sustaining operations) during the period. This valuation is presented on a 100% attributable basis using nominal cash flows which allow for annual price inflation of 3% and cost escalation primarily ranging between 2 and 3%.

able 1-2: LOM Indicative Economic Results

Description	Units	Total LOM
LOM	Years	9
LOM Bauxite Production (wet)	Mt	298.5
Average LOM Price	$/t	23.19
Gross Revenue	$ million	**6,920.5**
Labor	$ million	1,233.1
Services	$ million	345.4
Other Indirect	$ million	899.2
PAE – Corporate Chargebacks	$ million	239.5
Energy	$ million	28.4
Fuel	$ million	230.2
Supplies	$ million	275.6
Maintenance	$ million	569.6
On-site Mine Operating Costs	$ million	**3,821.0**
Off-site Mine Operating Costs	$ million	**224.2**
Corporate Income Tax	$ million	333.7
Net Income after Taxes	$ million	**778.7**
Depreciation Tax Savings	$ million	1,763.0
Sustaining Capital (2025 to 2033 inclusive)	$ million	1,174.6
Closure Costs	$ million	Included in ARO under operating costs
Free Cash Flow	$ million	**342.3**
NPV @ 9.5%	$ million	**54.7**

1.2.3 Sensitivity Analysis

Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities. The operation is nominally most sensitive to market prices (revenues) followed by operating costs.

1.3 Technical Summary

1.3.1 Property Description

The Mineral Resource and Reserve estimates declared in this Report were derived for bauxite deposits located within the Darling Range in the southwest of Western Australia. The mining center of Huntly is located approximately 80 km to the southeast of Perth, and approximately 30 km northeast of the township of Pinjarra. Willowdale is located 100 km south-southeast of Perth, and approximately 20 km southeast of the township of Waroona.



The Pinjarra refinery is located adjacent to the east of the town of Pinjarra and is approximately 25 km southwest of the Huntly mining areas. The Wagerup refinery, supplied by Willowdale, is located immediately adjacent to the east of the South Western Highway, approximately 8 km south of Waroona and 20 km west of the Willowdale mining area. The Kwinana refinery, previously supplied by Huntly, was curtailed in 2024, and lies approximately 50 km northwest of Huntly in the city of Kwinana, a suburb approximately 40 km south of Perth.

1.3.2 Land Tenure

The bauxite deposits are all located within ML1SA. The Agreement permits the exploration and mining of bauxite within the tenement boundaries. ML1SA was granted on 24 September 1961, for four 21-year periods, and the current lease expires on 24 September 2045, with provision for renewal extending beyond 2045. The current lease covers an area of 7,022.61 km², and extends from just north of Perth, to Collie in the south. The legislation under which Alcoa operates is overseen by the Mining and Management Program Liaison Group, which comprises representatives from several State Government departments. The current concession of ML1SA covers an area of 7,022.61 km², extending from the north of Perth on the eastern side to the town of Collie in the south.

Alcoa has the exclusive right to explore for and mine bauxite on all Crown Land within the ML1SA, however a number of environmental and statutory constraints exist within the area, and Alcoa is not permitted to access bauxite from the areas covered under these constraints. For example, the 2023-2027 MMP requires:

- A reduction in mining activities inside higher risk areas within drinking water catchments.
- Alcoa cannot undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- An increase in rehabilitation and reduction in open areas.
- A maximum annual clearing footprint of 800 ha.

Mineral Resources have not been defined in the constrained areas.

In August 2001, Alcoa entered a sub-lease arrangement with a consortium referred to as the Worsley Participants. This arrangement permits the Worsley Participants to mine and process bauxites within the sub-lease area. Alcoa has not declared Mineral Resources within the sub-lease area.

1.3.3 Ownership

The mining rights and assets involved with bauxite mining and alumina refining in Australia are 100% owned by Alcoa of Australia Limited (AofA), an affiliate of Alcoa owned by Alcoa World Alumina and Chemicals (AWAC). Prior to Alcoa's acquisition of Alumina Limited, Alcoa Corporation and Alumina Limited owned 60% and 40%, respectively, of AWAC, an unincorporated global joint venture consisting of a number of affiliated entities that own, operate, or have an interest in bauxite mines and alumina refineries, as well as an aluminum smelter, in seven countries. In August 2024 Alcoa completed the acquisition of Alumina Limited, putting the AWAC joint venture under full control and ownership of Alcoa. As a result, Alcoa owns 100% of AofA and, indirectly, 100% of the mining rights and assets involved with bauxite mining and alumina refining in Australia.



1.3.4 History

Bauxite occurrences were first recorded in the Darling Range in 1902. Bauxite was detected as a result of analyzing laterite from Wongan Hills, and subsequently through examination of lateritic road gravels from several localities in the Darling Range. The Geological Survey of Western Australia (Geological Survey) produced studies and publications, driving the bauxite exploration, though most attention was focused on localities in the Darling Range close either to Perth or to railway lines servicing towns such as Toodyay and York. By 1938 bauxite deposits were known to be common throughout the Darling Range over an area of 560 km long by 40 km to 80 km wide. The Geological Survey maintained interest in Darling Range laterite as an economic source of aluminum until the 1950s. However, by the late 1950s exploration had been taken over by mining companies. The earliest non-government exploration for bauxite was carried out in 1918 by the Electrolytic Zinc Co. of Australia Pty Ltd, deeming the deposits to be generally low grade and not of commercial value, though like earlier explorers, did not focus upon the underlying friable units.

No further private exploration took place until 1957 when Western Mining Corporation Ltd (WMC) began to explore for bauxite in the Darling Range. Following a regional reconnaissance, a joint venture company, Western Aluminum NL (WANL), formed by WMC with North Broken Hill Ltd and Broken Hill South Ltd, explored temporary reserves over a large portion of the southwest. These areas were part of a Special Mineral Lease (ML1SA) granted to WANL in 1961.

By 1961, WANL had delineated 37 Mt of bauxite at an average grade of 33% AL. Also in 1961, WANL joined with the Aluminum Company of America Ltd (Alcoa US), allowing additional systematic exploration of lease ML1SA. Commercial mining was finally started in 1963 at Jarrahdale and continued until 1998, supplying bauxite to the Kwinana refinery.

In 1977 WANL became Alcoa. As of December 2024, the Huntly and Willowdale mining operations remain active. Huntly supplies bauxite to the Pinjarra refinery (approximately 17 million tonnes per annum, Mtpa) while Willowdale supplies the Wagerup refinery (approximately 10 Mtpa).

1.3.5 Geological Setting, Mineralization, and Deposit

The Mineral Resource estimates declared in this Technical Report Summary were derived for bauxite deposits located within the Darling Range in the southwest of Western Australia. The Darling Range comprises a low incised plateau formed by uplift along the north-south trending Darling Fault, which is a major structural lineament that separates the Pinjarra Orogen to the west, from the Yilgarn Craton to the east. The range extends for over 250 km, from Bindoon in the north to Collie in the south.

Bauxite deposits have been identified throughout the Darling Range and generally occur as erratically distributed alumina-rich lenses within the eroded laterites that mantle the granites to the east of the scarp line. The bauxites are thought to have formed from the lateritization of the peneplained surface of the Western Gneiss Terrane rocks. Lateritization is thought to have commenced during the Cretaceous and continued through to the Eocene, with the subsequent periodic activity of the Darling Fault resulting in the current landform of scarps and deeply incised valleys on the western edge of the Darling Range.

Most of the bauxites display a typical profile comprising the following sequence, from the top down:

- Overburden: A mix of soils, clays, rock fragments and humus that is typically 0.5 m deep, but deeper pockets are common.
- Hardcap: An indurated iron-rich layer that is usually 1 m to 2 m thick. It is generally high in available alumina (AL) and low in reactive silica (SI).

- Friable Zone: A partially leached horizon that usually contains a mix of caprock fragments, clasts, nodules, pisolites, and clays. It is usually a few meters thick but can exceed several meters in places. It is generally high in AL and low in SI.
- Basal Clay: A kaolinitic clay horizon that represents the transition zone between the Friable Zone and the underlying saprolitic material. It is generally high in SI and low in AL.

The Hardcap and Friable Zone are targeted as the ore horizon. Selective mining practices are applied to minimize the inclusion of Overburden, because of its elevated organic carbon levels, and Basal Clay because of its elevated SI concentrations. Within the Hardcap and Friable Zone, the dominant minerals, in order of abundance, are gibbsite, quartz, goethite, kaolinite, and hematite, with lesser amounts of anatase and muscovite.

1.3.6 Exploration

Systematic exploration for bauxite within the region commenced in the 1960s and is conducted on a continuous basis to maintain sufficient Resources and Reserves to meet refinery supply. Alcoa systematically drills the laterite areas on a regular grid spacing of 60 × 60 m, followed by successive infill programs in selected areas that reduce the spacing to 30 × 30 m, and finally to 15 × 15 m. The 2024 Mineral Resource estimates were derived from data acquired from a total of 420,789 holes, drilled between 1981 and 2024, with approximately 83% of the holes drilled after 2009.

The planned drill hole collar locations are pegged by Alcoa surveying staff using real time kinematic differential global positioning system (RTK DGPS). Prior to mid-2015, theodolite/ total stations and DGPS were used to position the 60 m spaced holes, and the 30 m and 15 m grids were positioned by taping and optical square sighting between the 60 m pegs. If the drill rig cannot be setup within 2 m of the peg, the offset distance is measured and marked on the driller's log. Alcoa has recently introduced the practice of resurveying all drill hole locations after drilling. However, the planned coordinates are used for subsequent modelling activities.

All holes are assumed to be vertical. However, the drill rigs have limited levelling capability, and most holes are orthogonal to the local surface gradient, resulting in deviations of several degrees from vertical.

A digital elevation model representing the natural surface was prepared from a combination of collar survey data, LiDAR data, and satellite imagery.

The drilling is conducted using a fleet of tractor-mounted vacuum rigs, which have been modified to operate in forested areas with minimal clearing or ground preparation. In 2015, Alcoa added aircore drilling rigs to the fleet. These rigs are also tractor-mounted and are fitted with a similar sample collection system to that used on the vacuum rigs. The rigs are fitted with hollow-bladed bits that have a nominal cutting diameter of 45 mm and an internal retrieval tube diameter of 22–25 mm.

All samples are collected on 0.5 m intervals, with the material extracted via the hollow drill stem into a collector flask attached to the cyclone underflow. Each sample, which weighs approximately 1.5 kg, is repeatedly passed through a riffle splitter to yield a retained split weighing approximately 200 g. This material is placed into barcode-labelled sample packets for dispatch to the test laboratory. The remaining material is discarded.

For each hole, the drillers prepare a log sheet that contains survey, drilling, geological logging, and sample submission information.

1.3.7 Mineral Resource Estimates

The long production history of Alcoa's ML1SA operations has resulted in the development of an integrated approach for data collection, bauxite delineation, and production planning, aimed at providing feedstock that meets the technical specification requirements of the local refineries. In the past few years, Alcoa recognized that some of its procedures required optimization and updating to be more consistent with best practice approaches within the industry. They commenced a process of investigation and revision of many of these procedures but recognized that this must be implemented in a staged manner to ensure that the Mineral Resources and Mineral Reserves delineation procedures remain consistent with, and do not result in significant disruption to, current mining practices. In 2019, they began introduction 3D block modelling techniques to replace the polygon and gridded seam modelling resource estimation procedures. Approximately 61% of the tonnages that contribute to the current Mineral Resource (exclusives Mineral Reserves) have been prepared using the new 3D block modelling procedures.

The majority of the estimates that make up the current Mineral Resource inventory were prepared using techniques that Alcoa has developed since the commencement of mining in 1963. Over the period, Alcoa developed an integrated approach to data collection, resource definition, and mining that has proven effective in meeting the refineries' feedstock requirements.

The development of the resource estimation procedures largely predates the wider industry move to block modelling and geostatistical estimation techniques that occurred in the 1990s. Although there have been numerous changes and refinements to Alcoa's procedures, these systems are essentially a semi-automated implementation of the traditional 2D polygonal estimation techniques.

A legacy of the development history of the resource estimation system is that different procedures were used to delineate Mineral Resources using the 30 m and 60 m spaced data, termed the ResTag procedures, compared to those defined using the 15 m spaced data, termed the Gridded Seam Model (GSM) procedures.

The estimates defined using the 15 m spaced data are limited to the material that is planned to be mined. The parameters used by Alcoa meant that the resultant estimates were essentially nearest neighbor polygonal estimates.

In essence, all techniques largely rely upon the definition of a resource floor based on AL and SI cut-off grade criteria applied to both individual and accumulated sample grades (for the traditional approaches) or individual and accumulated model grades (for the 3DBM approach). Minimum thickness criteria are also considered. For the models defined using the 15 m spaced data, practical mining constraints are also included in floor definition, including stripping ratios, and the floor heights in surrounding holes. The sample grades in each drill hole or column of model cells are composited over the interval between the base of overburden and the resource floor.

The lateral constraints are initially defined using AL and SI grade thresholds, and then modified to include minimum area, minimum composite numbers, and maximum internal waste criteria. Additional constraints are applied for the resources defined using 15 m spaced data. These include maintaining equipment transit corridors and including minimum buffer distances around environmental exclusion zones and bedrock outcrop.

The resource outlines are divided into resource blocks that delineate sub-regions containing material with similar grade characteristics, and contain tonnages that can be used for long-term, medium-term, and short-term scheduling activities (80 kt to 100 kt for 60 m spacing, down to 20 kt to 40 kt for 15 m spacing). For the 30 m and 60 m areas, the resource blocks are assigned the length-weighted average grades of the enclosed composites.

The model contains estimates for a range of constituents that are of prime importance for Bayer processing including AL, SI, oxalate, sulphate, boehmite, and iron. Validation included visual and statistical checks between the input data and resource block estimates, comparisons of the estimates derived from different data spacings, and comparisons of the estimates with production data.

The annual reconciliation data for the past 10 years indicate the presence of grade and tonnage biases which, although some show long-term trends, appear to be relatively consistent and predictable on a year-to-year basis. The As Mined tonnage estimates are consistently biased high by approximately 5%. The As Mined AL is biased low but has shown a gradual improvement from 5% to 1%, relative over the past decade. Reactive silica is the most variable element, showing lower differences for Huntly in previous years but reaching 20% in 2024, and displaying a higher variability pattern for Willowdale, usually above 10%.

The Mineral Resource classifications have been applied to the resource estimates based on consideration of the confidence in the geological interpretation, the quality and quantity of the input data, the confidence in the estimation technique, and the likely economic viability of the material.

There are limited quality assurance data to enable a thorough assessment of the reliability of the estimation datasets, and nowadays the minority of the Mineral Resource estimates (inclusive Mineral Reserves) have been prepared using traditional 2D estimation techniques which have known limitations when used to prepare local estimates. However, the long production history and significant amount of reconciliation data indicate that past estimates prepared using these techniques have been relatively reliable and predictable.

Based on the above considerations, the main controlling factors for Mineral Resource classification are deemed to be sample spacing, geological modelling and block model criteria, and data quality.

1.3.8 Mineral Reserve Estimates

A Mineral Reserve has been estimated for Alcoa's Darling Range bauxite mining operations in accordance SEC S–K 1300 which are consistent with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the JORC 2012 Code).

The QP inspected the Alcoa Huntly and Willowdale operations and site Mine Planning Department between October 8th and 9th 2024 and visited Alcoa's Mine Planning offices in Booragoon on October 10th and 11th 2024, interviewing relevant personnel on these dates and on other occasions. The QP has prior knowledge of the asset being involved in the previous Mineral Reserve Statement in the preceding years (2021, 2022, and 2023).

The Mineral Reserve is classified with reference to the classification of the underlying Mineral Resource and with reference to confidence in the informing Modifying Factors. The QP considers the Proven and Probable classification to be appropriate to the deposit and associated mining operations.

The reference point for the Mineral Reserve is prior to the processing plant at the refinery.

The Proven Mineral Reserve is a subset of Measured Resources only. The Proven Mineral Reserve is included in the Long Term Mine Plan (LTMP) and is approved for mining.

The Probable Mineral Reserve is estimated from that part of the Mineral Resource that has been classified as Indicated or from Measured resources that are not yet approved for mining.

Variable cut-off grades are applied in estimation of the Mineral Reserve, and these are related to operating cost and the nature of the Mineral Resource in relation to blending



requirements. The Mineral Reserve estimate is expressed in relation to available aluminum oxide (AL) and reactive silica (SI), this being the critical contaminant in relation to the Refinery.

1.3.9 Mining Methods

The Huntly and Willowdale mines employ conventional open pit mining practices and equipment. The fleet is mixed between contract and owner-operator, depending on the nature of the task at hand. Owner operator equipment is used for mining the bulk of the Mineral Reserve, operating in areas away from those subject to environmental restrictions. Contract mining operates smaller equipment, day shift only, in environmentally (noise) sensitive areas and at the perimeter of the mining area.

Following definition of Mineral Reserve blocks, vegetation is cleared ahead of mining by the Western Australian State Forest Products Commission (FPC), saleable timber being harvested for use. On receipt of clearance to proceed from the FPC, Alcoa operations commence stripping topsoil and secondary overburden removal (SOBR) using small excavators, scrapers, and trucks. Soil is stockpiled at the site, away from the proposed pit, for rehabilitation purposes.

Mining progresses on 4 m benches, utilizing a contour-mining sequence, cutting benches across the topography, working from top to bottom, maintaining the flattest floor obtainable to a maximum overall gradient of 1:10. This is most pronounced in steep areas. Most of the mineralization lies beneath a gently undulating topography and contour mining is minimal.

After completion of mining, overburden is progressively backfilled into adjacent exhausted pits, topsoiled and rehabilitated by re-establishment of native vegetation, creating a stable post-mining landform that replicates the pre-existing environment.

1.3.10 Processing and Recovery Methods

The QP notes in accordance with the mine planning reviewed, total ($T.SiO_2$) and SI contents, on an annual average basis, remains on the target for refineries for the next nine years. This means, there are no evidence of any deleterious element's presence in the Darling Range ore within the next nine years of production.

The process plant for the Darling Range operations consists of two separate crushing facilities at the Huntly and Willowdale mines. Both facilities crush the Run-of-Mine (ROM) and currently convey the crushed ore to two separate refineries located at Pinjarra and Wagerup.

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

The process plant is a dry crushing operation and therefore water is only required for dust suppression and is included as part of mine water consumption. Water is not required as a consumable for the plant.

1.3.11 Infrastructure

The infrastructure for the mining operations is established and operational. During 2021, the infrastructure hub for Willowdale was relocated 16 km southwards from Orion (after having been based there for 21 years) to the Larego Hub which is located about 20 km north-east of the town of Harvey. The hub hosts new administrative offices, as well as crushing facilities and maintenance facilities. The Orion Hub site has been decommissioned.

Extensive haul road networks, rail, and overland conveyors transport crushed bauxite from the Hubs to the refineries (namely Kwinana, Wagerup and Pinjarra). Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt, apart from the



Kwinana refinery which receives bauxite via railway. The Alumina produced by the refineries is then currently shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

As intended, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment announced in January 2024. The updated mine plans have been revised accordingly. The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS). The refinery also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG). The refinery supplies power to the Huntly Mine by three different power supply lines (a single 33 kV and two 13.8 kV). Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

The WA mines are licensed by the Department of Water and Environmental Regulation (DWER) to draw surface water from five locations to meet their water supply requirements. The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. Huntly mine also holds a license to draw water from Pig Swamp and Marrinup, however these resources are retained as a backup water supply and have not been utilized in recent years. Huntly mine is also permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation. A pumpback facility from South Dandalup Dam to Banksiadale Dam is used to raise levels in Banksiadale Dam during periods of low rainfall runoff. Willowdale Mine draws water from Samson Dam.

There are no Alcoa accommodation facilities within the Darling Range. As described above, the Huntly and Willowdale mining areas are within proximity to established population centers including Pinjarra approximately 30 km to the southwest of Huntly and Waroona approximately 20 km northwest of Willowdale. Onsite facilities include offices, ablutions, crib-rooms and workshops, all of which were observed to be in excellent condition.

No tailings are generated within the boundaries of the mining operations. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS. Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and waste dumps are not constructed.

1.3.12 Market Studies

Alcoa Corporation is a vertically integrated aluminum company comprising bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation.

Through direct and indirect ownership, during 2024 Alcoa Corporation had 27 locations in nine countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

There are three commodities in the vertically integrated system: bauxite, alumina, and aluminum, with each having their own market and related price and impacted by their own market fundamentals. Bauxite, which contains various aluminum hydroxide minerals, is the principal raw material used to produce alumina. Bauxite is refined using the Bayer process to produce alumina, a compound of aluminum and oxygen, which in turn is the raw material used by smelters to produce aluminum metal.

Alcoa obtains bauxite from its own resources and processes over 80% of its combined bauxite production into alumina.

China is the largest third-party seaborne bauxite market and accounts for more than 90% of all bauxite traded. Bauxite is sourced primarily from Australia, Guinea, and Indonesia on the third-party market. In the long run, China is expected to continue to be the largest consumer of third-party bauxite with Guinea expected to be the majority supplier. Further, third-party traded bauxite is expected to be in surplus over the next decade, with most new mining projects announced recently being located in Guinea.

Bauxite characteristics and variations in quality heavily impact the selection of refining technology and refinery operating cost. Bauxite with high impurities could limit the customer volume an existing refinery could use, resulting in a discount applied to the value-in-use price basis.

Besides quality and geography, market fundamentals, including macroeconomic trends – the prices of raw materials, like caustic soda and energy, the prices of Alumina and Aluminum, and the cost of freight – will also play a role in bauxite prices.

In 2016, Darling Range entered into a 5-year third-party sales contract with a major alumina producer in China. Following the expiration of the third-party sales contract at the end of 2021, all bauxite production from Huntly and Willowdale was consumed internally by the Darling Range.

Alcoa determines economic cut-off grade by deducting operational costs (mining, refining etc) from a base alumina price of USD 400 per tonne. This approach is described in more detail in Section 12.7.

As per previous disclosures, the bauxite price utilized in the mine cashflow is represented by an intercompany price, indicative of mine sales to the refinery, inflated by 3% YoY. The weighted average of this price is $23.19/t over the detailed mine plan period of nine years.

1.3.13 Environmental Studies, Permitting and Plans, Negotiations, or Agreements with Local Individuals or Groups

Alcoa has established practices and processes for enabling conformance to environmental requirements. Sensitive areas are identified and managed ahead of disturbance. Environmental factors are considered prior to infill drilling; hence, mining blocks carrying environmental risks do not feature in the Mineral Reserves (for example, areas around granite outcrops and water courses have a buffer applied and are essentially no-go areas from a mining perspective). Mining in some areas became more constrained in 2023 as a result of internal and external factors, which continued into 2024.

The Final 2023-2027 MMP was developed by Alcoa and approved by the Minister for State Development in December 2023. The MMP describes the way in which Alcoa mines within Mining Lease ML1SA at Huntly and Willowdale. For example, Alcoa undertakes surveys to inform the mine plan development, facilitate characterization of ore quality and volumes, assess geotechnical conditions, identify constraints and protect or manage important environmental, cultural heritage and social values.

As was reported in the previous TRS:

- Reduce mining activities inside higher risk areas within drinking water catchments.
- Alcoa will not undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- Increase rehabilitation and reduce open areas where possible, with priority in higher risk areas.
- Maximum annual clearing footprint of 800 ha.

- Revise the Rehabilitation Completion Criteria by 31 December 2024, in consultation with DBCA.

Alcoa is modernizing its environmental approvals framework for the Huntly Bauxite Mine by referring future mining plans beyond the scope of the 2023-2027 MMP for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The future mining plans that have currently been referred to both state and federal departments propose to transition the Huntly Mine into the proposed Myara North and Holyoake mine regions within Alcoa's Mining Lease ML1SA.

The resulting Environmental Impact Assessments (EIAs) under State and Federal legislation will inform stakeholders on long-term mine plans and environmental management requirements and facilitate the setting of approval conditions.

Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal Western Australian Environmental Protection Authority (EPA) EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.

Importantly, based on reports provided under Clause 10 of the 2023 Exemption Order for January to June of 2024, Alcoa has been able to comply with increased regulatory requirements while the EPA formally assesses the 2022-2026 and 2023-2027 MMPs.

As reported in the TRS for 2022, numerous baseline studies have been completed to support approvals for future extensions to the mining footprint to the Myara North and Holyoake regions. Baseline studies are guided by the requirements of the EPA and guidelines under the EPBC Act and are well understood.

Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP Act and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

There is no requirement for the monitoring of any tailings or mine waste dumps associated within the mining operations as:

- No tailings are generated within the boundaries of the mining operations.
- Alcoa's Darling Range mining operations do not produce mine waste - waste dumps are not constructed. Overburden from Darling Range ore blocks is carefully segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10). Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:

- Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.



- The increase in spills reported in the previous TRS has been reversed in 2023.

Alcoa has established systems and processes for maintaining its social license to operate and was admitted to the International Council on Mining and Metals (ICMM) in 2019, aligning to its social performance requirements. Related to the requirements of the BSEC, Alcoa's actions include an annual 5-year consultation process aligned with the 5 Year Mine Plan. The consultation process involves engaging with affected landowners. Alcoa's consultation extends to shires, as well as state and local government.

Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

Alcoa strives to align its social performance and community engagement to global leading practice and was admitted to ICMM in 2019. In addition, Alcoa's Western Australian operations are certified under the Aluminum Stewardship Initiative, valid until 16 January 2026.

Alcoa has formally consulted and engaged survey work from the relevant Traditional Owners across its operational footprint. Following a joint review of the Draft Cultural Heritage Management Plan late in 2024, Alcoa and Gnaala Karla Boodja have agreed that further work is required to finalise the document. In view of Gnaala Karla Boodja Aboriginal Corporation's capacity constraints, it is likely that finalization of the Cultural Heritage Management Plan will require a minimum of a further six months. A formal request for an extension of time to facilitate this has been submitted to the relevant Government regulator.

Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks, and maintain Alcoa's Social License to Operate.

Alcoa's Closure Planning and Execution staff for Darling Range are located across multiple teams. The closure staff within the Global Planning Team are primarily responsible for developing the Long-Term Mine Closure Plans (LTMCPs) and life of asset planning of Alcoa's WA Mining Operations (Huntly and Willowdale). Short to Medium terms closure planning and execution is developed across organizational divisions and includes multidisciplinary inputs such as from Operations, Mid- and Short-term Planning, Finance, Centre for Excellence, Environment and Asset Management (both Fixed and Mobile Plant). The agreed closure requirements for Darling Range centers around the return of Jarrah Forest across the site.

The Alcoa procurement system defines "local" as the localities of Dwellingup, Harvey, Pinjarra, Waroona, Coolup, North Dandalup, Jarrahdale and Yarloop. Within Alcoa's guidelines of safe, ethical, and competitive business practices, they state they will:

- Invite capable local businesses to bid on locally supplied or manufactured goods or services.
- Give preference to local business in a competitive situation.
- Work with local business interest groups to identify and utilize local suppliers.
- Where possible, structure bids to enable local supplier participation.

Alcoa also endeavors to add value to Traditional Owners and the local economy through the use of businesses owned by Traditional Owners, businesses that employ and work with Traditional Owners and locally owned businesses.

1.3.14 Capital and Operating Cost Estimates

Alcoa forecasts its capital and operating costs estimates based on annual budgets and historical capital and operating costs over the long life of the current operation.

1.3.14.1 Capital Costs

The operation is well-established, and the LOM plan outlines capital expenditures aligned with scheduled production rates throughout the mine's life. This includes future capital expenditures for major mine relocations to meet anticipated refinery production while sustaining ongoing operations.

Projected mine capital expenditure over the next nine years of mine life is estimated to total $1,175 million, although this will include capital outlay required to extend the mine life much beyond the nine-year period covered by the valuation. Of this total, it is understood that $182 million is associated with completing the mine move to the Myara North site. Capital for the Holyoake move is estimated to be $471 million.

A breakdown of the major expenditure areas and total expenditure over the Mine Plan is shown in Table 1-3.

able 1-3: Nine Year LOM Sustaining Capital Costs by Area

Project	Cost $ Million	Percentage of Total
Mine Moves	787	67.0%
Conveyor Belt Replacements	53	4.5%
Haul Road Improvements	136	11.6%
Other Sustaining capital	199	16.9%
Total	**1,175**	**100%**

Other capital costs are for replacement of conveyors, haul road improvements and other sustaining capital needed to continue the operations.

Alcoa’s sustaining capital estimates for Darling Range are derived from annual budgets and historical actuals over the long life of the current operation. According to the American Association of Cost Engineers (AACE) International, these estimates would generally be classified as Class 1 or Class 2 with an expected accuracy range of -3% to -10% to +3% to +15%.

1.3.14.2 Operating Costs

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees. Contractors are also used for certain activities on site.

Operating costs for the current LOM of nine years are based on the 2024 long-term plan.

No items have been identified that would significantly impact operating costs either positively or negatively over the life of mine. Minor year-to-year variations should be expected based upon maintenance outages and production schedules. It should be noted that the current mine plans and operational cost projections reviewed by the QP now accommodate the Kwinana refinery curtailment (which was completed in June 2024).

Forecast costs for 2025 and average mine operating costs for the nine-year LOM are shown below in Table 1-4.

able 1-4: LOM On-site Mine Operating Costs by Category*

Cost Centre	2025 ($/wmt)	Average LOM ($/wmt)	Percentage of Operating Cost
Direct Labor	$3.70	$4.13	32%
Services	$1.83	$1.16	9%
Other	$1.48	$3.01	24%
Corporate Chargebacks for support services	$1.08	$0.80	6%
Energy	$0.23	$0.10	1%
Fuel	$0.67	$0.77	6%
Operating Supplies and Spare Parts	$0.79	$0.92	7%
Maintenance (fixed plant and mobile fleet)	$1.17	$1.91	15%
Mine Operating Cash Cost ($/wmt)	**$10.95**	**$12.80**	**100%**
Off-site Costs			
G & A, selling and other expenses	$0.85	$0.57	
R & D Corporate Chargebacks	$0.13	$0.06	
Other COGS	$0.15	$0.12	
Total Cash Operating Costs	**$12.08**	**$13.55**	

**Due to rounding, numbers presented may not add up precisely to the totals provided.*

Services costs include contractor costs for certain mining activities such as in noise sensitive areas and for haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.



2.0 Introduction

SLR International Corporation (SLR) was appointed by Alcoa Corporation (Alcoa) to prepare an independent Technical Report Summary (TRS) on the Darling Range bauxite mines, located in Western Australia. The purpose of this report is to support the Mineral Resource and Mineral Reserve estimates for the mines as of December 31, 2024. This TRS conforms to the United States Securities and Exchange Commission's (SEC) Modernized Property Disclosure Requirements for Mining Registrants as described in Subpart 1300 of Regulation S-K, Disclosure by Registrants Engaged in Mining Operations (S-K 1300), and Item 601(b)(96) of Regulation S-K. This Technical Report Summary updates the TRS titled "Technical Report Summary for Darling Range, Western Australia," with an effective date of December 31, 2023, that was prepared in accordance with S-K 1300 and Item 601(b)(96) by SLR for Alcoa.

Alcoa is one of the world's largest aluminum producers and is a publicly traded company on the New York Stock Exchange (NYSE). The company owns and operates integrated bauxite mining, alumina refining and aluminum smelting operations at numerous assets globally across nine countries. Alcoa is also a Joint Venture partner for several other integrated operations in Brazil, Canada, Guinea, and Saudi Arabia. Regarding the latter, in September 2024 Alcoa announced an agreement to sell its 25.1% stake in the Ma'aden Joint Venture to Ma'aden.

The Darling Range, located south of Perth in Western Australia, comprises two active bauxite mining areas – the Huntly and Willowdale mines – owned and operated by Alcoa Corporation (Alcoa). The Huntly and Willowdale operations collectively represent one of the world's largest bauxite mines which currently supplies Alcoa's alumina refineries Pinjarra and Wagerup. On the basis that both mining areas supply ore to the same local refineries which are also operated by Alcoa, and that both mining areas are located within the same mining lease boundary, SLR considers the mines a single property for the purposes of this report.

Alcoa has a long history of mining in the Darling Range with Huntly and Willowdale commencing commercial production in 1972 and 1984 respectively. These mining areas were preceded by the Jarrahdale bauxite mine which was operational between 1963 and 1998. The Huntly mine currently supplies bauxite to the Pinjarra refinery, while the Willowdale mine supplies the Wagerup refinery. The mines collectively supply approximately 27 Mtpa of bauxite, with approximately 17 Mtpa from Huntly and 10 Mtpa from Willowdale. For the purposes of this report, available alumina ($A.Al_2O_3$) is abbreviated to AL, and reactive silica ($R.SiO_2$) is abbreviated to SI.

2.1 Site Visits

SLR Qualified Persons (QPs) for Geology/Resources and Mining/Reserves visited the sites between 07 October to 11 October, 2024. The SLR Geologist and SLR Mining Engineer were accompanied by various Alcoa personnel to undertake site visits, inspections of various aspects of the Huntly and Willowdale mining areas. Further discussions on reconciliation, geological modeling, long term mine planning, and permitting were undertaken at the Booragoon office. Table 2-1 below provides a summary of the site visit. Alcoa provided permission to document the site visit with video, photos, and audio which were shared with the other SLR team members. Further, an SLR Environmental practitioner attended some of the corporate meetings regarding Surveys/Approvals/Reconciliation/Regional Environmental to inquire about pertinent items such as the site constraints and other aspects of rehabilitation (as part of the broader Modifying Factor review).

able 2-1: Site Visit Summary

Date	Day	Tasks / Areas of Investigation	Comments
07-Oct	Mon	Modelling update	-
08-Oct	Tues	Willowdale Mine tour	Inspect pre-mining process and mining operation
		Capital Plan/Environmental Operations/WDL MTP	Capital Plan, Environmental, and MTP discussions at Pinjarra Hub
09-Oct	Wed	Mine tour for Huntly Mine Myara	Inspection of rehabilitation planning & process, and rehab operations
		Economics, Financial modelling/GIS for Environmental reporting and constraint management	Finance and GIS discussions at Pinjarra Hub
10-Oct	Thurs	Long and Medium Term Mine Plans	LTMP for Huntly and Willowdale, MTP for Huntly
		Surveys/Approvals/Reconciliation/Regional Environmental discussions	Heritage process/MMP and Part IV Approvals/Reconciliation
11-Oct	Fri	Reporting approach/Review feedback, plus Contingency and Follow Up	Meet with Global Planning Team

2.2 Sources of Information

During the preparation of this Technical Report Summary, discussions were held with personnel from Alcoa Corporation and the Huntly and Willowdale Mines, as below:

able 2-2: List of Alcoa staff who had input into discussions with SLR QPs

Name	Position	Department	Area of responsibility
Alex Hatch	Principal Geologist	Global Planning	Geology - Review Coordinator
Wayne Baird	Pre-mining co-ordinator	Willowdale	Operational Planning
Bowen Zhang	Mine Planning Engineer	WA Mining	Medium Term Planning - Willowdale
William Ong	Rehabilitation Planning Engineer	Huntly Mine	Operational planning
Peter Ladyman	Rehabilitation Superintendent	Huntly Mine	Operations
Deborah May	WA Mining Controller	WA Mining	Finance
Luke Gossage	Environment Manager	WA Mining	Environmental Operations
Rishi Kumar	Senior Mining Engineer	Mining CoE	Mining Improvement Projects - Reconciliation
Francois Vorster	Project Director	Major Projects	Myara North/Holyoake/O'neil
Matt George	Regional Spatial Manager	Global Planning	GIS
Neylor Aguiar	Principal Mining Engineer	Global Planning	Long Term Mine Planning - Darling Range

John Un	Senior Mine Planning Engineer	Global Planning	Long Term Mine Planning - Darling Range (Ex MTP Huntly)
Lucas Tuckwell	Senior Resource Geologist	Global Planning	Geology - Resource/Reserve Modelling
Kane Moyle	Director of Regulatory Approvals	Regulatory Approvals	Regulatory Approvals - MMP and transition
Ashley Bird	Regulatory Approvals Manager	Regulatory Approvals	Regulatory Approvals - Part 4/5/EPBC
Angela Murphy	Cultural Heritage Lead	Sustainability	Indigenous engagement/Cultural Heritage
Jennifer Longstaff	Director Environment Australia	Environmental CoE	Regional Environmental
Karthik Sampath	Global Planning Director	Global Planning	Planning
Alex Greaves	Global Mine Planning Manager	Global Planning	Mine Planning

The documentation reviewed, and other sources of information, are listed at the end of this report in Section 24.0.

2.3 List of Abbreviations

Units of measurement used in this report conform to the metric system. All currency in this report is United States dollars (US$), unless otherwise noted.

Abbreviation	Description
$	United States Dollars
°C	degree Celsius
°F	degree Fahrenheit
2D	2-dimensional
3D	3-dimensional
3DBM	3D Block Model
a	Annum
A	Ampere
A.Al_2O_3 or AL	available alumina
AACE	American Association of Cost Engineers
AFFF	Aqueous Film Forming Foams
AGD	Australian Geodetic Datum
Alcoa	Alcoa Corporation
Alcoa US	Aluminum Company of America Ltd
AMG	Australian Map Grid
AMPD	Absolute Mean Percentage Difference
AMSL	above mean sea level
AMWU	Australian Metal Workers Union

AofA	Alcoa of Australia Ltd
API	Alumina Price Index
ARO	Asset Retirement Obligations
AWAC	Alcoa World Alumina and Chemicals
AWU	Australian Workers Union
B&P	Bias and Precision
bbl	barrels
BD	Bomb digest
BD-GC	bomb digest gas chromatography
BD-ICP	bomb digest inductively coupled plasma
BD-NDIR	bomb digest non-dispersive infrared
Bella	Bella Analytical Systems
BSEC	Bauxite Strategic Executive Committee Bauxite
Btu	British thermal units
BV	Bureau Veritas
C$	Canadian dollars
cal	calorie
CalVal	calibration and validation for FTIR
cfm	cubic feet per minute
CIM	CIM (2014)
cm	centimeter
cm²	square centimeter
CV	Coefficient of Variation
d	Day
DBCA	Department of Biodiversity, Conservation and Attractions
DCF	Discounted Cash Flow
DEM	Digital Terrain Model
DG	Discrete Gaussian
DGPS	(Differential) Global Positioning System
dia	Diameter
DIBD	dry in situ bulk density (t/m3)
DJTSI	Department of Jobs, Tourism, Science and Innovation
DMIRS	Department of Mines Industry Regulation and Safety
dmt	dry metric tonne
DWER	Department of Water and Environment Regulation
dwt	dead-weight ton
EMS	Environmental Management System
ETU	Electrical Trades Union

EWR	Ecological water requirements
FEL	Front End Loading
FMS	Fleet Management System
FPC	Forest Products Commission
FS	Feasibility Study
ft	foot
ft/s	foot per second
ft²	square foot
ft³	cubic foot
FTIR	fourier transform infrared spectrometry
g	gram
G	giga (billion)
g/L	gram per liter
g/t	gram per tonne
Gal	Imperial gallon
GC	gas chromatography
Geological Survey	Geological Survey of Western Australia
GIS	Geographical Information System
Gpm	Imperial gallons per minute
gr/ft³	grain per cubic foot
gr/m³	grain per cubic meter
GSM	gridded seam model
ha	hectare
HARD	Half Absolute Relative Difference
hp	horsepower
hr	hour
HRSG	Heat Recovery Steam Generator
Hz	Hertz
ICP-OES	inductively coupled plasma optical emission spectrometry
IDW	inverse distance weighting
ID2	inverse distance squared
in.	inch
in²	square inch
IRM	internal reference material
IRR	Internal Rate of Return
ISO	International Standardization Organization
J	Joule
JORC	JORC Code (2012)

k	kilo (thousand)
kcal	kilocalorie
kg	kilogram
km	kilometer
km/h	kilometer per hour
km²	square kilometer
kPa	kilopascal
kV	kilovolt
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt-hour
KWI	Kwinana Mining Laboratory
L	liter
L/s	liters per second
lb	pound
LiDAR	Light Detecting and Ranging
LIMS	laboratory information management system
LME	London Metal Exchange
LOM	Life of Mine
LTMCPs	Long-Term Mine Closure Plans
LTMP	Long Term Mine Plan
m	micron
m	meter
M	mega (million); molar
m²	square meter
m³	cubic meter
m³/h	cubic meters per hour
Ma	Million years ago
MALSI	microwave available alumina (AL) and reactive silica (SI)
MASL	meters above sea level
MD	microwave digest
MD-ICP	microwave digest inductively coupled plasma optical emission spectrometry
mg	microgram
mi	mile
min	minute
mL	milliliters
ML	Mineral Lease
mm	millimeter

MMPLG	Mining and Management Program Liaison Group
MMPs	Mining and Management Programs
mph	miles per hour
MS	Ministerial Statement or Magnetic Susceptibility
MTP	Medium Term Plan
Mtpa	Million tonnes per annum
MVA	megavolt-amperes
MW	megawatt
MWh	megawatt-hour
NATA	Australian National Association of Testing Authorities
NI 43-101	National Instrument 43-101 (2014)
NN	Nearest Neighbor
NPC	Net Present Cost
NPV	Net Present Value
NTU	Nephelometric Turbidity Units
NYSE	New York Stock Exchange
OK	ordinary kriging
oz	Troy ounce (31.1035g)
oz/st, opt	ounce per short ton
PFAS	per- and polyfluoroalkyl substances
ppb	part per billion
ppm	part per million
psia	pound per square inch absolute
psig	pound per square inch gauge
QA	Quality Assurance
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
QP(s)	Qualified Person(s)
R.SiO_2 or SI	reactive silica
RC	Reverse Circulation
REF	reference method
ResTag	mineral resource estimation system
RL	relative elevation
ROM	Run of Mine
RPEE	Reasonable Prospects for Economic Extraction
RTK	real time kinematic
s	second
SEC	Securities and Exchange Commission

S-K 1300	Subpart 1300 of Regulation S-K
SLR	SLR International Corporation
SMU	Single Mining Unit
Snowden	Snowden Mining Consultants
SOBR	stripping topsoil and secondary overburden removal
SPU	sample presentation unit
SRK	SRK Consulting (Australasia) Pty Ltd
st	short ton
STE	sample to extinction
stpa	short ton per year
stpd	short ton per day
SWIS	South West Interconnected System
t	metric tonne
T.Al_2O_3	Total Alumina
T.SiO_2	Total silica
TICTOC	Total Inorganic Carbon and Extractable Organic Carbon
tpa	metric tonne per year
tpd	metric tonne per day
TRS	Technical Report Summary
US$	United States dollar
Usg	United States gallon
Usgpm	United States gallon per minute
V	volt
W	watt
WA	Western Australia
WANL	Western Aluminum NL
WMC	Western Mining Corporation Ltd
wmt	wet metric tonne
wt%	weight percent
XRD	x-ray diffraction
XRF	x-ray fluorescence
Xstract	Xstract Resources
yd^3	cubic yard
yr	Year

3.0 Property Description

3.1 Location

The Darling Range is located in the southwest of Western Australia and comprises an extensive uplifted plateau of bauxite deposits which is host to several mining operations including the Huntly and Willowdale mining areas, approximately 80 km and 100 km southeast of Perth, respectively. The nearest towns to the mining centers are North Dandalup (approximately 15 km west of Huntly) and Waroona (approximately 20 km northwest of Willowdale). Both towns are within the Peel Region of southwest Western Australia and are on the route of the South Western Highway, a major national road connecting Perth with the south coast.

All spatial data used for Mineral Resource estimation are reported using a local grid based on Australian Map Grid 1984 (AMG84) system (Zone 50) and using Australian Geodetic Datum 1984 (AGD84) coordinate set. The approximate coordinates of the mining areas are 410000 m East and 6390000 m North (Huntly) and 410000 m East and 6365000 m North (Willowdale). The Huntly and Willowdale mining areas are separated by approximately 35 km (Figure 3-1).

The Pinjarra refinery is located adjacent to the east of the town of Pinjarra and is approximately 25 km southwest of the Huntly mining areas. The Wagerup refinery, supplied by Willowdale, is located immediately adjacent to the east of the South Western Highway, approximately 8 km south of Waroona and 20 km west of the Willowdale mining area. The Kwinana refinery, previously supplied by Huntly, was curtailed in 2024, and lies approximately 50 km northwest of Huntly in the city of Kwinana, a suburb approximately 40 km south of Perth.

3.2 Land Tenure

The Huntly and Willowdale bauxite mines are covered by a single mineral concession referred to as Mineral Lease (ML) 1SA. The concession was originally granted on September 25, 1961, by the State Government of Western Australia under the Alumina Refinery Agreement Act, 1961, permitting the exploration and extraction of bauxite. ML1SA was granted for a period of four, 21-year periods, the fourth period of which is due to expire on September 24, 2045. The State Government concession agreement includes the potential for conditional renewal beyond 2045. This will require negotiation between Alcoa and the State Government prior to this date to agree on an extension of the agreement and is therefore not guaranteed.

Conditions which must be fulfilled by Alcoa to retain ML1SA include annual reporting requirements under several State Agreement Acts, Ministerial Statements, and Environmental Protection Acts. These are described in Section 3.6 below.

The current concession of ML1SA covers an area of 7,022.61 km², extending from the north of Perth on the eastern side to the town of Collie in the south (Table 3-1). Alcoa has the exclusive right to explore for and mine bauxite on all Crown Land within the ML1SA; however, a number of environmental and statutory constraints exist within the area, and Alcoa is not permitted to access bauxite from the areas covered under these constraints. For example, the 2023-2027 MMP requires:

- A reduction in mining activities inside higher risk areas within drinking water catchments.
- Alcoa cannot undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).

- An increase in rehabilitation and reduction in open areas.
- A maximum annual clearing footprint of 800 ha.

The ML1SA area includes sub-lease arrangements made between Alcoa and the Worsley Alumina joint venture participants which include South32, Japan Alumina Associates (Australia) Pty Ltd and Sojitz Alumina Pty Ltd (Worsley Participants). The agreements, made in August 2001 and September 2016, provide bauxite mining concessions to the Worsley Participants. No Mineral Resources or Mineral Reserves attributable to the Darling Range mining areas have been declared within these sub-lease areas.

able 3-1: ML1SA License Details

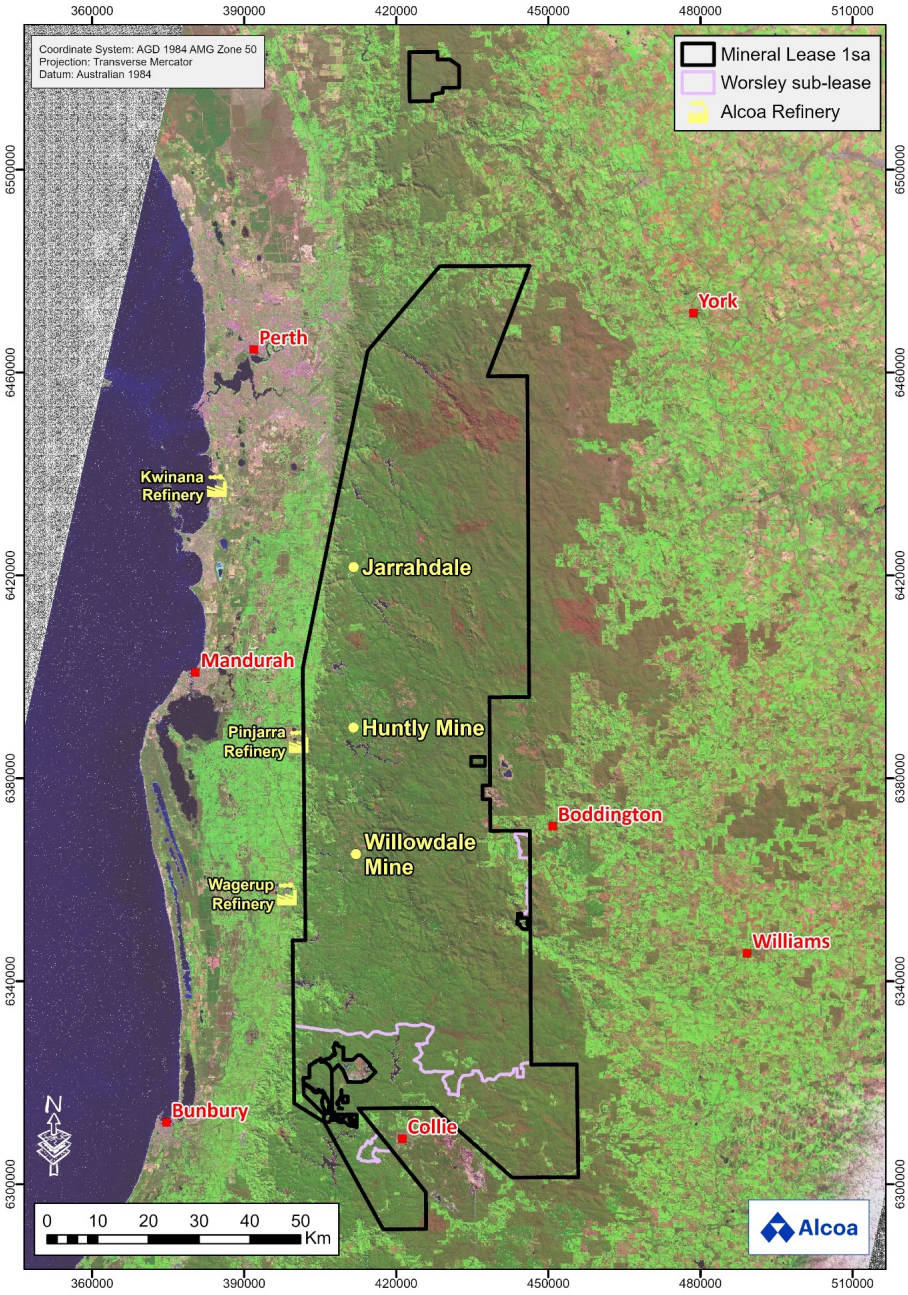
Concession Name	Title Holder	Expiry Date	Area (km²)
ML1SA	Alcoa of Australia	24/09/2045	7,022.61

Alcoa pays rental for each square mile of ML1SA in accordance with the Alumina Refinery Agreement Act 1961 (WA). In 2024, this amounted to A$13,560.

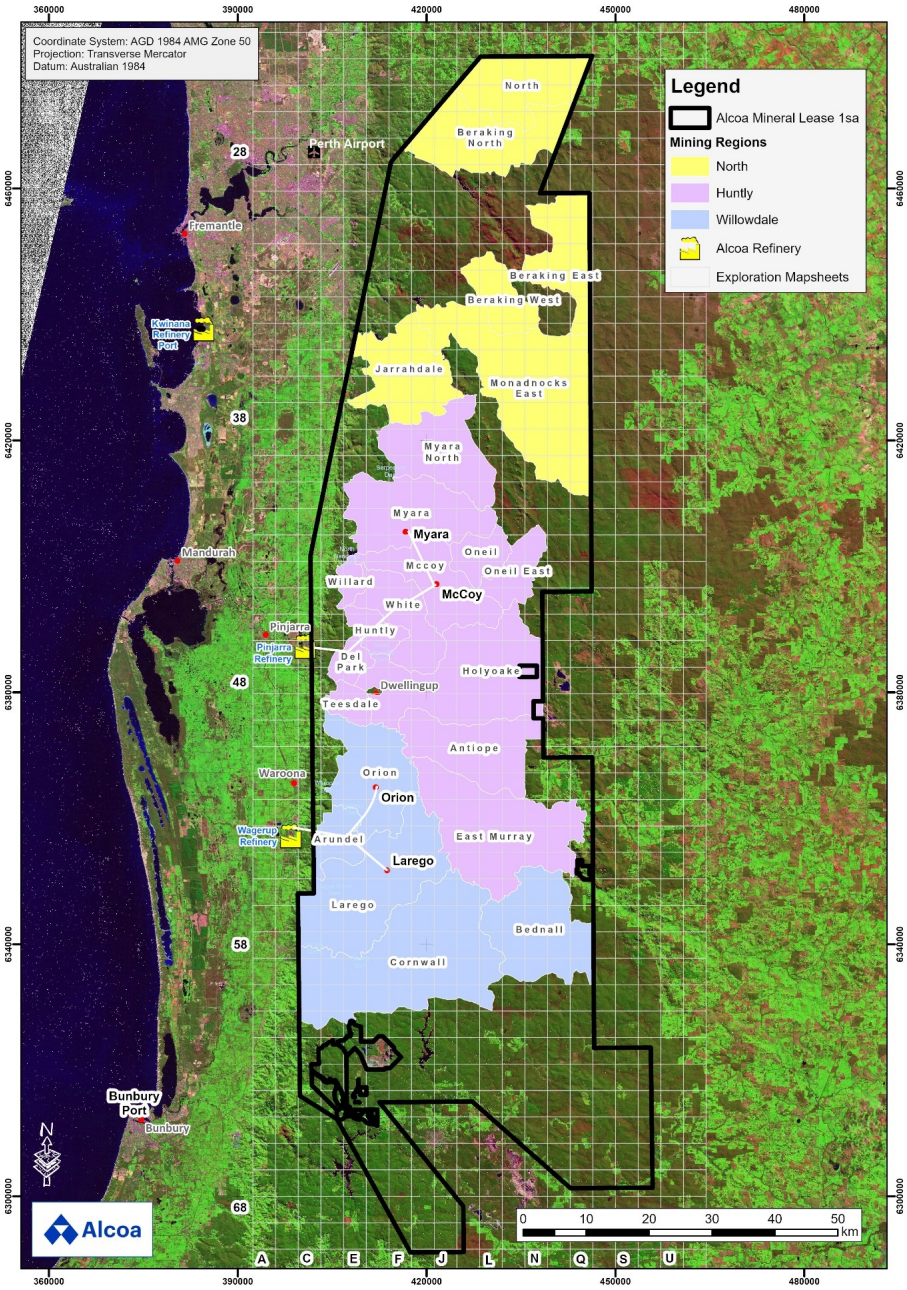
The boundary of the ML1SA concession area, including the limit of the Worsley Participants' area, is illustrated in Figure 3-1. The contained Mining Regions are shown in Figure 3-4, while the extents of the mined areas and Mineral Resources and Mineral Reserves are shown in Figure 3-3.

The mining rights and assets involved with bauxite mining and alumina refining in Australia are 100% owned by Alcoa of Australia Limited (AofA), an affiliate of Alcoa owned by Alcoa World Alumina and Chemicals (AWAC). Prior to Alcoa's acquisition of Alumina Limited, Alcoa Corporation and Alumina Limited owned 60% and 40%, respectively, of AWAC, an unincorporated global joint venture consisting of a number of affiliated entities that own, operate, or have an interest in bauxite mines and alumina refineries, as well as an aluminum smelter, in seven countries. In August 2024 Alcoa completed the acquisition of Alumina Limited, putting the AWAC joint venture under full control and ownership of Alcoa. As a result, Alcoa owns 100% of AofA and, indirectly, 100% of the mining rights and assets involved with bauxite mining and alumina refining in Australia.

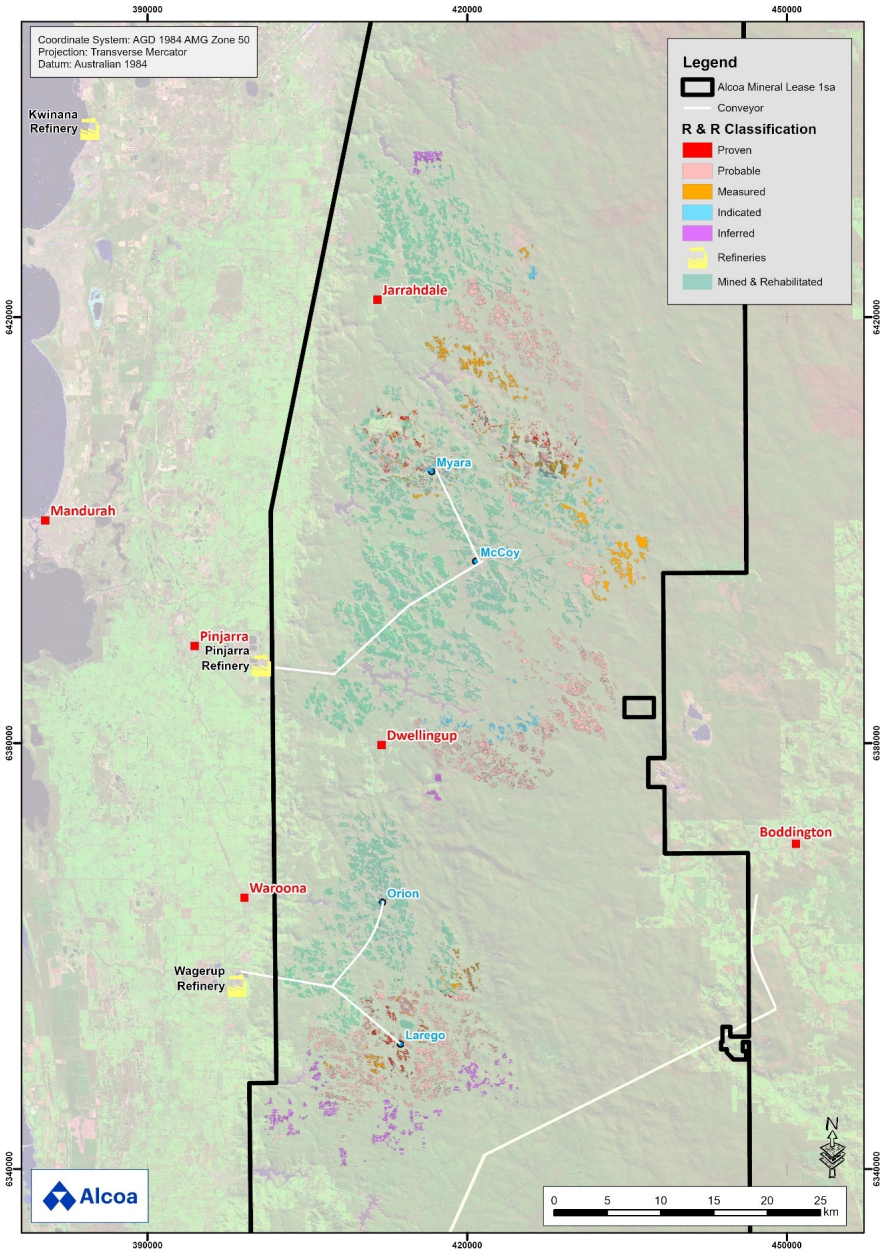
igure 3-1: ML1SA Lease Extents (Alcoa, 2024)



igure 3-2: Map of Mining Reporting Centers, Mining Regions, and Production Sheets (Alcoa, 2024)



igure 3-3: Map of Current Mineral Resource and Mineral Reserve Extents (Alcoa, 2024)



3.3 Naming Conventions

Alcoa has developed a terminology to refer to various parts of the Mineral Lease. There are three major Mining Reporting Centers in ML1SA: North (previously Jarrahdale), Huntly in the central area, and Willowdale in the south. The boundaries are nominal and may change to match the planned ore destination. The southernmost region of the North mining center was reallocated to Huntly in 2017 and named Myara North.

Mining Regions are subdivisions of the Reporting Centers that cover several years of mining activities, focused on a specific crusher location. The boundaries are named after forestry blocks. A total of 11 Mining Regions are represented in the current resource estimate: one in North, seven in Huntly, and three in Willowdale.

Mining Pits are named based on their sequence along haul roads. These names are used by the mining fleet when referring to local short-term production. The map reference system outlined below is used for drilling, estimation, and long-term planning.

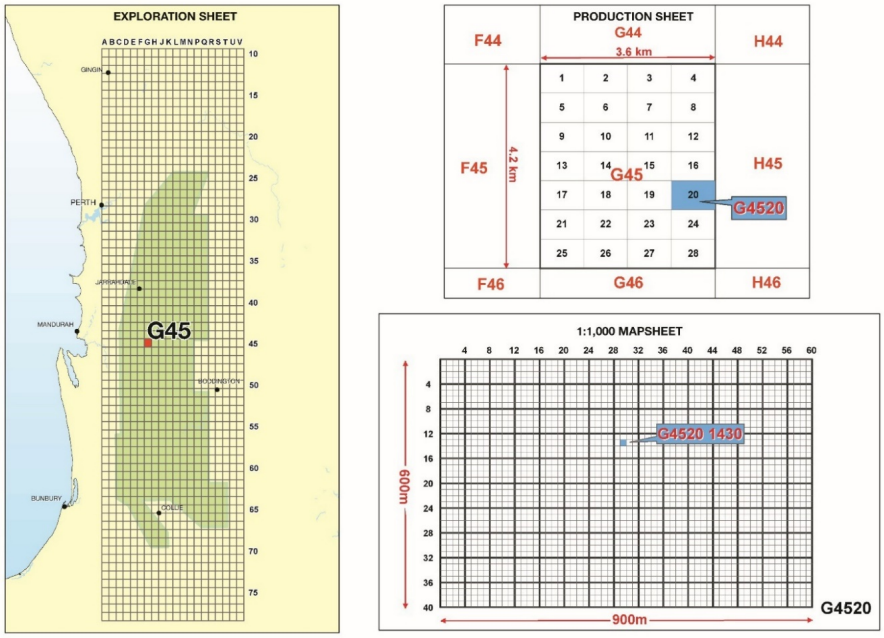
The Mineral Lease is divided into a grid of Exploration Sheets being rectangles 4.2 km (north) by 3.6 km (east). Each 15.12 km² Exploration Sheet is assigned a name and coded using letters A to V (west to east), and numbers 10 to 80 (north to south), e.g., G45.

Each Exploration Sheet is divided into 28 Production Sheets 900 m (east) by 600 m (north), an area of 0.54 km². The Production Sheets are assigned a number (1 to 28), sequentially 4 across (towards the east) and 7 down (towards the south), e.g., G4520.

Each Production Sheet is divided using a 15 m by 15 m grid resulting in 2,400 grid cells (40 north by 60 east). Each of these is regarded as a point and assigned a numeric code 1 to 40 towards the south and 1 to 60 towards the east. These are appended to the Production Sheet name to provide a grid point label, e.g., G4520 1430 and used on 1:1000 Map Sheets to define drill hole locations.

The Exploration Sheet, Production Sheet, and Map Sheet conventions are shown in Figure 3-4:

igure 3-4: Exploration Sheet, Production Sheet, and Map Sheet Conventions (SRK, 2021)



3.4 Encumbrances

Baseline constraints on mining activities within the ML1SA concession are in place which prevent bauxite mining in these areas including (but not limited to):

- Within 200 m of the top water level margin of any water reservoir
- Within Serpentine Pipehead Dam Catchment
- National Parks
- Aboriginal Heritage Sites
- Old Growth Forest
- Formal Conservation Areas
- Within a 50 m buffer of Granite Outcrop (greater than 1 ha)
- The agreed Mining Avoidance Zones (MAZ) around the towns of Dwellingup and Jarrahdale.

Mineral Resources and Mineral Reserves have not been defined in these restricted areas. Operating rights are obtained by Alcoa through annual submission and approval of the Mining and Management Programs (MMPs) which include mining schedules and the authorizations provided by the Bauxite Strategic Executive Committee Bauxite (BSEC; previously the Mining and Management Program Liaison Group (MMPLG)).

Mining on a day-only basis is conducted in “noise zones” where noise from the mining operations will potentially exceed allowable levels. The operation actively seeks to maintain

lower noise levels than those mandated, thus mining in these areas is undertaken by contract miners on day shifts only.

3.5 Royalties

Alcoa is the holder of ML1SA. For bauxite that is mined and processed in Alcoa's Western Australian alumina refineries, Alcoa pays royalties on the alumina produced in accordance with the Alumina Refinery Agreement Act 1961 (WA).

3.6 Required Permits and Status

Alcoa operates under several State Agreement Acts as well as Ministerial Statements and environmental operating licenses issued under the Environmental Protection Act 1986 (WA) (EP) including:

- Alumina Refinery Agreement Act 1961 (WA);
- Alumina Refinery (Pinjarra) Agreement Act 1969 (WA);
- Alumina Refinery (Wagerup) Agreement Act and Acts Amendment Act 1978 (WA), which provided for the creation of the MMPLG (now BSEC);
- Alumina Refinery Agreements (Alcoa) Amendment Act 1987 (WA);
- Ministerial Statement 728 (as amended by Ministerial Statements 897, 1069 and 1157) (MS728);
- Ministerial Statement 646;
- Environmental Protection (Alcoa – Huntly and Willowdale Mine Sites) Exemption Order 2004 (Exemption Order);
- Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023
- Approved 2023-2027 Mining Management Plan (2023-27 MMP);
- Roll-over approval in October 2024 of the 2023-27 MMP (and conditions) now covers the time period of 2024-2028. While the conditions of both approvals are identical; the approval noted some temporal conditions of the 2023-2027 approval had expired, and that Alcoa had met some conditions prior to the roll-over approval;
- Environmental licenses L6210/1991/10 and L6465/1989/10 granted under Part V of the Environmental Protection Act 1986 (WA).

The MMPLG was first established in 1978 and is chaired by the Department of Jobs, Tourism, Science and Innovation (JTSI). It is now referred to as BSEC. Along with JTSI it is comprised of the following State Government agencies:

- Department of Biodiversity, Conservation and Attractions (DBCA)
- Department of Energy Mines, Industry Regulation and Safety (DEMIRS)
- Department of Planning, Lands and Heritage (DPLH)
- Department of Water and Environmental Regulation (DWER)
- Water Corporation (WC).

The MMPLG is recognized by the Minster for Environment in Ministerial Statements (95, 390, 564, 728, 897 and 1069) regarding expansion of Alcoa operations. The management and oversight of all Darling Range operations by the BSEC/MMPLG involves:

- Provide oversight to mining, infrastructure, processing and related operations within ML1SA;
- Advise on the environmental and social adherence of the 5-year MMPs developed by Alcoa on a recurring annual basis;
- Provide six-monthly authorizations for ground clearance for mining in accordance with the submitted and approved MMPs; and
- Provide oversight to ongoing rehabilitation of mined areas.

The permitting and approval processes, as provided by Alcoa, are summarized below:

- Clause 9 (1) of the 1961 State Agreement provides Alcoa the sole rights to explore and mine the bauxite deposits within ML1SA.
- Clause 5 of the Wagerup State Agreement specifies that Alcoa must consult with the DBCA in relation to the requirement to submit annual mine plans for mining associated with the Wagerup refinery.
- Under Clause 6 (1) of the Wagerup State Agreement, Alcoa has submitted several environmental review documents to the State Government for subsequent approvals of the Wagerup refinery construction and expansions. Within these environmental assessment documents, significant information on Alcoa's bauxite mining operations associated with the Wagerup refinery was included, resulting in several conditions in relation to Alcoa's bauxite mining operations associated with the Wagerup refinery being incorporated in the Ministerial Statements of which the current one is Ministerial Statement 728 (as amended). Procedure 3 of MS728 outlines Alcoa's requirements to have a publicly available Completion Criteria document for its bauxite mining operations, developed in consultation with the MMPLG/BSEC. Procedure 4 of MS728 outlines the MMPLG's/BSEC's authority to review and approve Alcoa's mining operations through the five-year Mine Plan process. To the extent the conditions on bauxite mining operations in Ministerial Statement 728 and the predecessor Ministerial Statements did not cover bauxite mining unrelated to the Wagerup refinery, Alcoa agreed to extend the conditions to the rest of its bauxite mining.
- Through the Wagerup State Agreement, MS728, and agreement between the State Government and Alcoa, the MMPLG/BSEC is responsible for reviewing and providing a recommendation to the Minister for State Development to approve Alcoa's five-year Mine Plans in concurrence with the Minister for the Environment and the Minister for Water.
- Alcoa's mining operations within ML1SA are also conducted in accordance with the Environmental Protection (Alcoa – Huntly and Willowdale Mine Sites) Exemption Order 2004 (Exemption Order) made by the Minister for the Environment. The Exemption Order is consistent with the Wagerup State Agreement that established the MMPLG/BSEC and MMP processes and it also reflects the procedures of MS728 that sets out the MMPLG's/BSEC's responsibility to review annual rolling 5-year mine plans for Alcoa's operations.
- The Exemption Order is in place while the EPA assessed the 2022-2026 and 2023-2027 MMP which were third party-referred to the EPA in February 2023.

Alcoa reports that all licenses and permissions for the current mining operations are valid, monthly and annual compliance reports submitted for review by SLR support this. On 28 February 2023, the Western Australian Forest Alliance Inc (WAFA) made two third-party referrals to the EPA under s. 38 of the EP Act. The referrals referenced Alcoa's Mining and Management Programs (MMPs) and its bauxite mining operations on the Darling Range in



the southwest of WA for the years 2022 to 2026 and 2023 to 2027. Following receipt of the referrals, the EPA sought further advice from Alcoa including detail on the scope of its planned/completed activities between 2022 to 2026 and 2023 to 2027. On 7 August 2023, EPA conducted a 7-day public comment on whether or not it should assess the proposals and, if so, what level of assessment is considered appropriate.

Section 38B of the EP Act provides that a proposal cannot be referred to the EPA more than once. In considering these referrals, the EPA undertook detailed investigations and enquiries to identify whether the proposals have been previously referred to the EPA.

Importantly, on 14 December 2023, the State Government announced the *Alcoa Transitional Approvals Framework* which enabled Alcoa to continue mining as defined in the 2023-2027 MMP (this approval was rolled over to 2024-28 in October 2024, with all conditions consistent with the 2023-27 approval) while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process, however, the State Government granted Alcoa an exemption under section 6 of the EP Act to continue operating subject to a series of conditions. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. The Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions in October 2024.

On 18 December 2023, the EPA published its public advice in relation to the third-party referrals. The EPA concluded that five mine areas at Huntly (Myara North, Holyoake, White Road and portions of McCoy and Myara), and two at Willowdale (Mt William/Arundel/part Larego and Willowdale North/part Orion) have been previously referred. The remaining mine areas, the subject of the referrals, were found to be validly referred and that the likely environmental effects are significant warranting formal assessment at the level of public environmental review (10 weeks), the EPA's assessment numbers for the 2022-2026 MMP and 2023-2027 MMP are 2384 and 2385, respectively.

The EPA prepared a single Environmental Scoping Document (ESD) for both assessments across the first half of 2024, in consultation with Alcoa. The final ESD was published on 29 August 2024. The ESD outlines the basis on which the EPA will assess the MMPs for 2022-2026, and 2023-2027. The ESD acknowledges the short term duration of the Proposals, whereby authorisation to clear and implement the Proposals is sought for a time period not exceeding the years 2026 and 2027 (respectively).

In addition, as reported for 2022 and 2023, Alcoa is seeking formal environmental impact assessment and approval from the State and Federal Government to transition mining from the current Huntly mine area to Myara North and Holyoake, and to increase production at the Pinjarra refinery by 5%. The proposed transition in mining area and production increase has been determined by the EPA to be a significant amendment to an approved proposal. The proposed changes to Ministerial Statement 646 (MS 646) for the Pinjarra Refinery Efficiency Upgrade (PREU), approved in 2004 will be considered by the EPA in accordance with section 40AA of the EP Act; the PREU assessment is EPA's assessment number 2253.

The EPA acknowledges the unique relationships between assessments 2253, 2384 and 2385. 2384 and 2385 cover a shorter period of time and therefore focus on the avoidance of impacts in the execution of the MMPs up to 2027, whereas assessment 2253 is able to consider longer term mitigations across a wider area. Alcoa reports that all Environmental Review Documents for the three assessments are well progressed, and it is targeting publication in the first half of 2025.



3.7 Other Significant Factors and Risks

SLR is not aware of any environmental liabilities on the property. Alcoa has all the required permits to conduct the proposed work on the property. SLR is not aware of any other significant factors and risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

4.0 Accessibility, Climate, Local Resources, Infrastructure and Physiography

4.1 Accessibility

As described in previous sections, the Darling Range Huntly and Willowdale operations are located approximately 150 km south of Perth. The Darling Range is readily accessible via road from Perth and surrounding areas. The mines are near the towns of Pinjarra and Waroona. Both towns are easily accessible via the national South Western Highway, a sealed single carriageway road, which starts on the southern side of Perth and continues for almost 400 km to the southwest corner of Western Australia.

Huntly is accessible from the South Western Highway via Del Park Road, a sealed single carriageway road which connects the town of North Dandalup in the north with Dwellingup in the south. From Del Park Road, a 3km sealed road following the route of the bauxite conveyor to the Pinjarra refinery provides access to the Huntly site administration offices.

Willowdale is similarly accessible 19 km from the South Western Highway via Willowdale Road, a sealed single carriageway road to the south of Waroona.

There are several airstrips in the region, although the closest major airport is in Perth, approximately 70 km north of North Dandalup. The nearest commercial port is at the curtailed Kwinana refinery, approximately 40 km south of Perth (as illustrated on Figure 15-1).

An extensive haul road network and overland conveyors transport crushed bauxite from the main mining hub to the Wagerup and Pinjarra refineries. Rail transport of bauxite to the curtailed Kwinana refinery (via the Kwinana freight railway system, using the Kwinana–Mundijong line) is also possible.

4.2 Climate

The southwest region of Western Australia exhibits a temperate climate, with very hot and dry summers (December to February) and mild winters (June to August). Rainfall is generally low and variable, ranging from an average rainfall of 25 mm during the three summer months and exceeding 200 mm during the three winter months (Australian Government, Bureau of Meteorology). Local climate conditions generally do not interrupt the mining schedule, which continues throughout the year. Occasionally however, significant rainfall inhibits access and can impact mining activities.

able 4-1: Historical Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°C Mean Max	29.8	29.8	27.1	22.6	18.6	16.1	15.1	15.8	17.4	20.2	23.9	27.5
°C Mean Min	14.3	14.6	13.1	10.4	7.8	6.5	5.6	5.5	6.5	8.1	10.5	12.7
mm Mean Rainfall	16.4	21.4	26.7	65.5	155.0	231.0	234.0	192.0	129.0	78.1	45.2	20.2

Notes:

1. Temperature and rainfall data sourced from the Australian Government Bureau of Meteorology, collected from the weather station at Dwellingup http://www.bom.gov.au/climate/averages/tables/cw_009538.shtml

2. Data includes that collected from 1935 to November 2024 (as available on 27 November 2024).

4.3 Local Resources

The Darling Range is located in an easily accessible region of southwest Western Australia with the Huntly and Willowdale mining areas both within 15 km of well-established towns which act as residential and commercial centers. Several other towns and smaller settlements are positioned along the South Western Highway which acts as a major connection for the Darling Range to the city of Perth where a far greater range of general services is available.

4.4 Infrastructure

The following section refers to several named mining areas within the Huntly and Willowdale mining centers, including Myara, Larego, Orion, and Arundel, each of which is illustrated in

Figure 3-2 above.

Mining infrastructure in the Darling Range is generally concentrated in the Myara site in the northwest of the Huntly mining center, and at the Larego site in the center of the Willowdale mining area (20 km southeast of Wagerup). Both operations include various ancillary facilities that are not listed exhaustively here, however both infrastructure areas include:

- Ore crushing and handling facilities;
- Ore stockpile stacker/reclaimer;
- Maintenance facilities;
- Sampling stations;
- Site offices including a production tracking room;
- Haul road networks;
- Overland conveyors, as illustrated on Figure 15-1; and
- Water supplies consisting of abstraction from licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff, and maintenance workshops. Water sources are illustrated on Figure 15-1.
    - The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. The mine also holds a license to draw water from Pig Swamp and Marrinup, although these are reported as being rarely utilized, and it is permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation.
    - Willowdale Mine draws water from Samson Dam, approximately 10 km southeast of Waroona.

Personnel are sourced from the area around Perth, Western Australia, which benefits from a skilled workforce due to the relatively large number of operating mines in the region. Personnel typically have private accommodation in the nearby city of Mandurah (60 km from the mine) and towns (Waroona, Hamel, Yarloop, Harvey, and Wagerup).

Huntly Mine has three power supplies fed from the Pinjarra refinery. A single 33 kilovolt (KV) supply and two 13.8 kV supplies. The Pinjarra refinery is a net importer of power from the South West Interconnected System (SWIS), with internal generation capacity of 100 Megawatt (MW) from 4 steam driven turbine alternators. The steam is produced by gas fired boilers and a non-Alcoa gas turbine Heat Recovery Steam Generator (HRSG).

Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

4.5 Physiography

The western edge of the Darling Range is characterized by scarps and incised valleys, landforms which are attributed to tectonic activity along the Darling Fault, the dominant structural feature in the region which acts as the western boundary of the deposits. This feature is observable in regional topographical survey information and satellite imagery to roughly follow the coastline of southwest Western Australia and is approximately demarcated by the extent of Jarrah Forest, a recognized bioregion.

The topography of the ML1SA concession generally comprises wide valleys and undulating hills separated by minor surface water drainage channels and streams. Vegetation across the ML1SA is dominated by several areas of State Forest including Dwellingup, Lane Poole, and Youraling. These include distinct areas of old growth forest within which mining is prohibited.

The typical elevation ranges from 300 m to 400 m in the mining areas, however the highest points of the region (outside of the mining areas) are approximately 550 m.

Topography data was acquired from:

- Drill hole collar survey data;
- Light Detecting and Ranging (LiDAR) surveys; and
- Landgate satellite data.

5.0 History

5.1 Prior Ownership

Prior to 1961, there were no records of ownership of the Darling Range mines. A Special Mineral Lease (ML1SA) was granted to Western Aluminum NL (WANL) in 1961. In the same year WANL joined Aluminum Company of America Ltd (Alcoa US). In 1977 WANL became Alcoa.

5.2 Exploration and Development History

The following text is sourced and modified from Hickman, *et al.*, 1992.

Bauxite occurrences were first recorded in the Darling Range in 1902. Bauxite was detected as a result of analyzing laterite from Wongan Hills, and subsequently through examination of lateritic road gravels from several localities in the Darling Range. The Geological Survey of Western Australia (Geological Survey) produced studies and publications, driving the bauxite exploration, though most attention was focused on localities in the Darling Range close either to Perth or to railway lines servicing towns such as Toodyay and York. The Geological Survey mapped the extent of laterite in the Darling Range (close to Perth) to determine whether it contained commercial deposits of iron or aluminum ore.

The earliest non-government exploration for bauxite was carried out in 1918 by the Electrolytic Zinc Co. of Australia Pty Ltd, deeming the deposits to be generally low grade and not of commercial value, though like earlier explorers, did not focus upon the underlying friable units.

Of 46 early samples of laterite analyzed in 1919, 26 contained 35% or more available alumina. It was then assumed that bauxite in the Darling Range was confined to the duricrust part of the profile, and not considered in the underlying friable units. By 1938 bauxite deposits were known to be common throughout the Darling Range over an area of 560 km long by 40 km to 80 km wide.

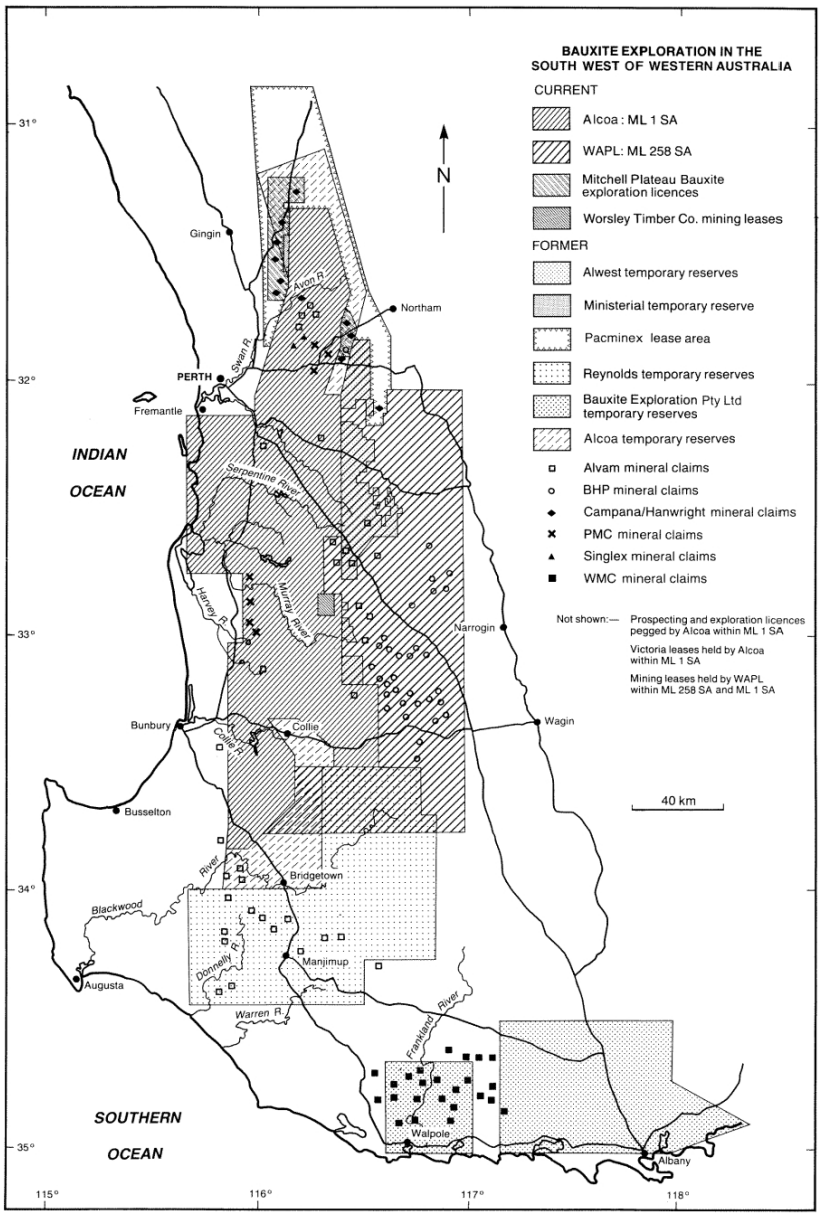
The Geological Survey maintained an interest in Darling Range laterite as an economic source of aluminum until the 1950s. However, by the late 1950s exploration had been taken over by mining companies.

No further private exploration took place until 1957 when Western Mining Corporation Ltd (WMC) began to explore for bauxite in the Darling Range. Following a regional reconnaissance, a joint venture company, WANL, formed by WMC with North Broken Hill Ltd and Broken Hill South Ltd, explored temporary reserves over a large portion of the southwest. Profiles were sampled from road cuttings, with samples collected at 400 m intervals along main roads. Selected lateritic ridges and plateaus were sampled at 90 m intervals. These areas were part of a Special Mineral Lease (ML1SA) granted to WANL in 1961.

By 1961, WANL had delineated 37 Mt of bauxite at an average grade of 33% AL. Also in 1961, WANL joined with the Alcoa US, allowing additional systematic exploration of lease ML1SA (Figure 5-1). Holes were drilled initially on 370 m by 185 m centers. Progressive in-fill drilling down to a spacing of 45 m by 45 m blocked out the ore at Jarrahdale and was followed by grade-control drilling. Commercial mining was finally started in 1963 at the former Jarrahdale mining center and continued until 1998, supplying bauxite to the Kwinana refinery.

In 1977 WANL became Alcoa. As of December 2024, the Huntly and Willowdale mining operations remain active. Huntly supplies bauxite to the Pinjarra refinery (approximately 17 million tonnes per annum, Mtpa) while Willowdale supplies the Wagerup refinery (approximately 10 Mtpa).

igure 5-1: Bauxite Exploration in the Southwest of Western Australia 1961 (adapted from Hickman, 1992)



6.0 Geological Setting, Mineralization, and Deposit

6.1 Bauxite Deposits

Bauxite deposits, economic concentrations of aluminum oxide, represent the world's major source of aluminum and consist primarily of the minerals gibbsite, boehmite, and diaspore. These are commonly found alongside iron oxide minerals including goethite and hematite, kaolinite clay minerals, and minor accessory minerals.

Lateritic bauxite deposits such as those in the Darling Range of WA generally formed in tropical (hot and humid) environments through chemical weathering. As a result, lateritic bauxite deposits are known to exist across Central and South America, West Africa, Central Asia, and Australia.

With its large available resources, access to a stable workforce, infrastructure (comprising conveyors, rail, road, and port access), and three captive (mine-to-mill) dedicated alumina refineries, Alcoa's Darling Range Bauxite operations near Perth WA, has been one of the world's leading alumina producing regions for at least 30 years (Hickman *et al*, 1992), or approximately 60 years as of 2024.

6.2 Regional Geology

The bauxite deposits of the Huntly and Willowdale operations are located in the Darling Range region of southwest Western Australia. The predominant topographic feature of the region is the Darling Range Fault, a north-south trending scarp which extends approximately 220 km from Bindoon (70 km north-northeast of Perth) to Collie (160 km south-southeast of Perth).

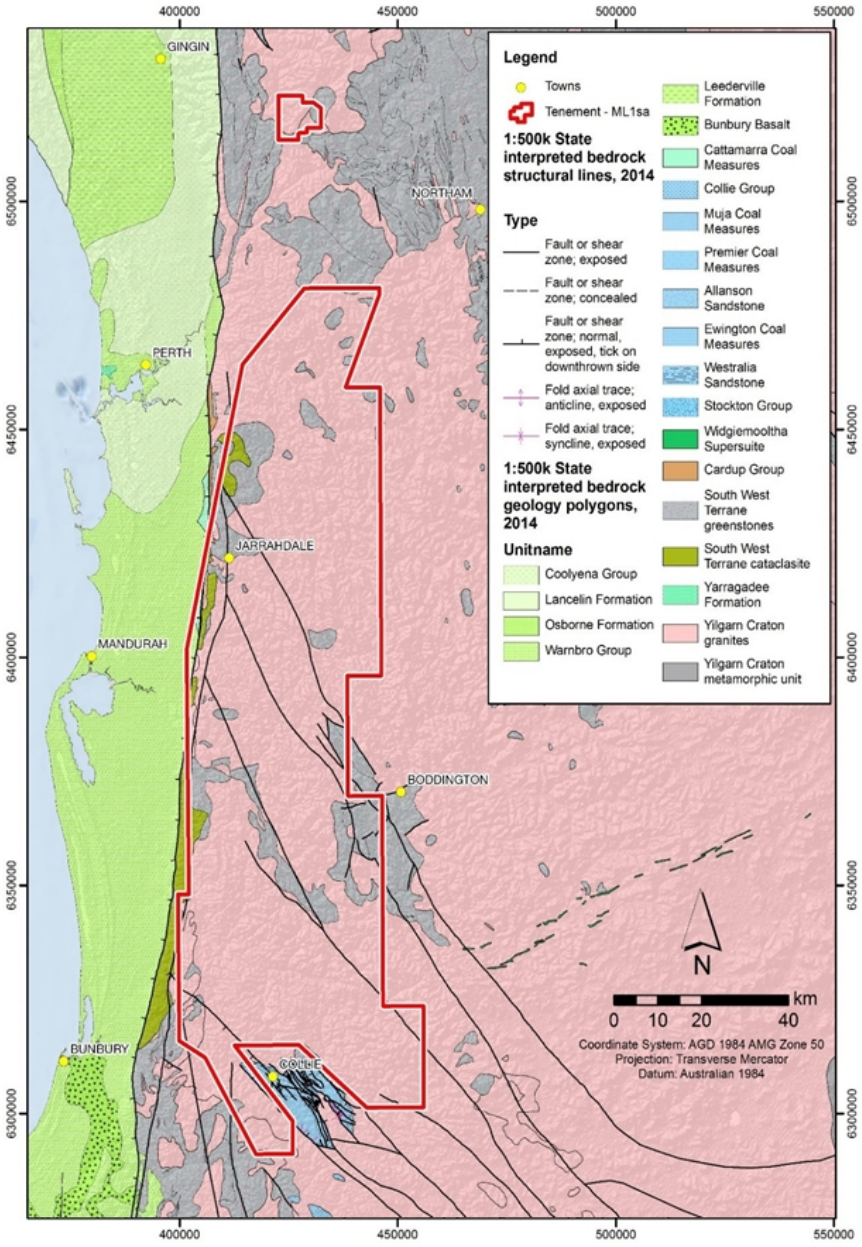
The Darling Range Fault is the structural boundary between two geological terranes: the Pinjarra Orogen to the west, now the sedimentary Swan Coastal Plain, and the Yilgarn Craton to the east, a gneissic granite complex with greenstones. To the east of the Darling Range Fault intense weathering and erosion of exposed Archean basement rocks of the Western Gneiss Terrane, the western portion of the Yilgarn Craton, formed widespread lateritic bauxite deposits by the intense weathering, accumulation and leaching of the aluminosilicate rich material of the bedrock granites (Hickman *et al*, 1992).

Alcoa's current bauxite mining areas of Huntly and Willowdale are on the eastern side of the Darling Range Fault, as low-lying plateaus separated by valleys in which alluvial deposits have accumulated. Figure 6-1 shows the regional geology of the southwest region of Western Australia and Alcoa's ML1SA lease boundary in relation to Perth, while Figure 6-2 shows the distribution of surficial deposits across the region.

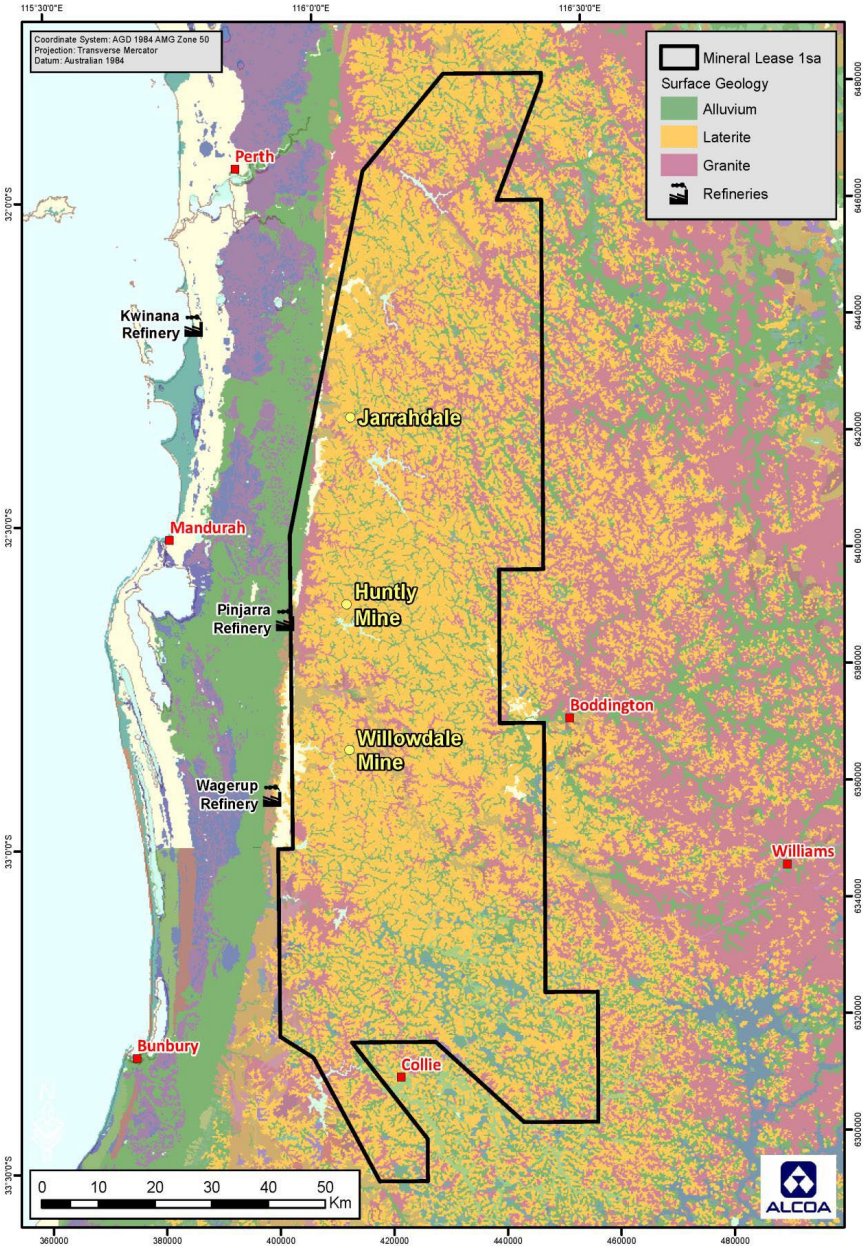
The Jarrahdale, Del Park, Huntly and Willowdale areas that have been mined by Alcoa are on laterite within the Western Gneiss Terrane (Figure 6-2), formed over granites that have been intruded by numerous north trending tholeiitic, quartz dolerite dykes, of early to late Proterozoic age, with thicknesses ranging from 1 m to 200 m.

Lateritic bauxite developed from the Late Cretaceous (65 million years ago, Ma) to the Eocene (40 Ma), with several periods of erosion and intense weathering of the basement granites and dolerites. Subsequent reactivation of the Darling Fault combined with periods of erosion led to the establishment of plateaus and incised valleys, trending to wider valleys and low hills to the east which now characterize the physiography of the region.

igure 6-1: Regional Geology (adapted from SRK, 2021)



igure 6-2: Surface Geology Showing Laterite Over Granite (Alcoa, 2015)

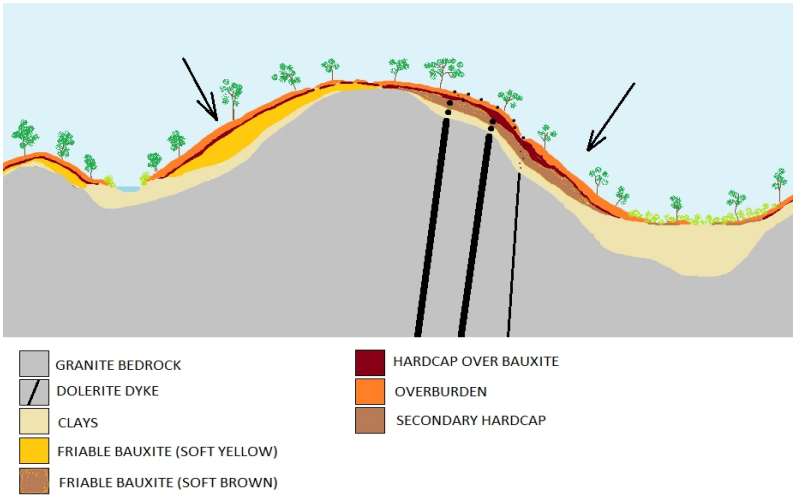


6.3 Local Geology

Laterite remnants are thickest and most extensive over a 150 km long region between the Avon and Harris Rivers, and within about 50 km of the Darling Scarp. The laterite occupies gently sloping (3° to horizontal) upland areas with an average elevation of 280 to 300 meters above sea level (MASL), and high annual rainfall. Steeper slopes may have a thin cover of partly transported laterite with bedrock near the surface. Above 340 m the laterite is penetrated by bedrock which rises above the general topographic level. Below 200 m drainage has removed pre-existing laterite. Blocks of laterite, released by headward erosion of streams, decay to lateritic gravels on the lower slopes of valleys, which pass laterally into alluvial sands and silt in the valley floors (Hickman *et al*, 1992).

Bauxite deposits typically occur as irregularly shaped lenses on the flanks of plateaus. Critical to this is the laterite position on the slopes (Figure 6-3): erosion generally dominates on steeper slopes which prevent accumulation and effective bauxite formation, whereas flat areas lack the necessary sub-surface water flows which drive the removal of clays and the enrichment of soluble silicate minerals.

igure 6-3: Bauxite Deposit Formation Schematic – Relief Exaggerated (Alcoa, 2021)



6.4 Mineralization

Weathering, alteration and leaching of the granite bedrock has developed the bauxite mineralization which principally occurs as 65% microcrystalline gibbsite $Al(OH)_3$ with minor to rare boehmite $AlO(OH)$, and accessory minerals of 18% goethite $FeO(OH)$, 7% hematite Fe_2O_3, 9% quartz SiO_2, 1% kaolinite/halloysite $Al_2Si_2O_5(OH)_4$, and 0.5% anatase/rutile TiO_2.

Other minerals within the bauxite that may influence the alumina refinery performance include:

- Boehmite: generally occurring below 1%, this can cause premature precipitation of dissolved gibbsite resulting in alumina being lost to the red mud residues.
- Organic Carbon: as oxalate, typically less than 0.2%, (2.0 kg/t, measured as $Na_2C_2O_4$) this can result in reduced digestion efficiencies and cause crystal growth issues during precipitation.

• Sulphate: generally occurring at 0.25%, this can consume caustic soda during digestion resulting in lower yields.

6.5 Property Geology

Table 6-1 provides a summary of the typical stratigraphy defined by Alcoa across their Darling Range deposits. The Hardcap and Friable Zones represent the primary horizons of economic interest due to their concentrations of alumina. A generalized mineralogical profile through these horizons is provided in Figure 6-4 and a typical grade profile in Figure 6-5 showing the alumina and iron-rich Hardcap, with increasing silica and decreasing alumina through the Friable Zone.

able 6-1: Alcoa's Darling Range Deposit Typical Stratigraphic Column

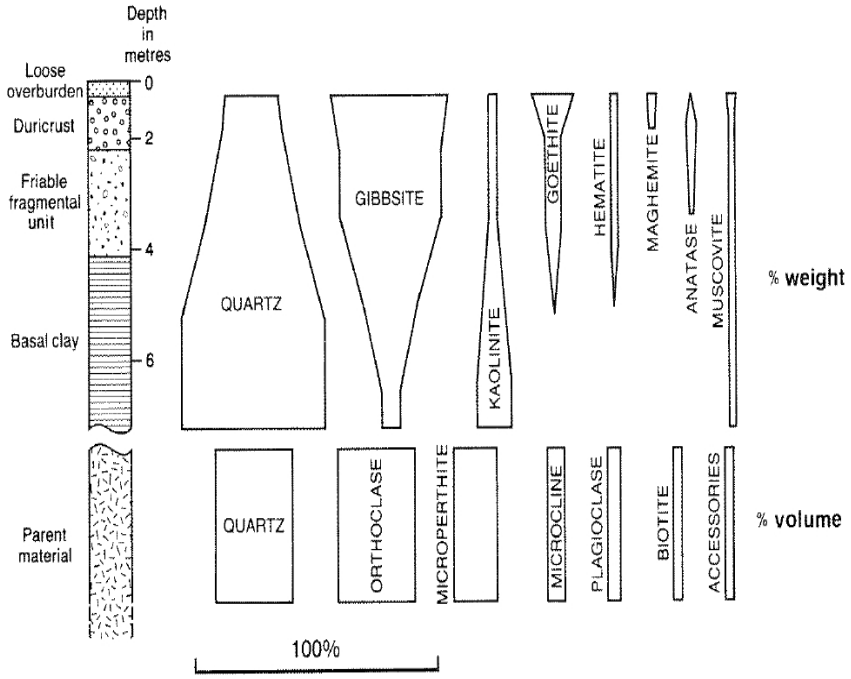
Stratigraphic Horizon	Typical Thickness Range (m)	Description
Overburden	0 to 0.5	Mixed soils and clays, high in organic matter, generally forming a thin layer which can penetrate deeper if the underlying Hardcap surface is variable.
Hardcap (Caprock)	1 to 3	Ferricrete formed by the remobilization of iron into a layer comprising iron and alumina-rich nodules which can exhibit the highest alumina concentrations across the deposit. Highly variable in thickness but generally 1 m to 3 m with a sharp contact against the underlying Friable Zone.
Friable Zone	3 to 5	Leached horizon resulting in the accumulation and enrichment of bauxite minerals. The Friable Zone comprises a mixture of the overlying Hardcap, clasts, Al and Fe rich nodules, and clays. Upper contact with the Hardcap is variable, found as a sharp or transitional boundary in places. AL typically reduces with depth as SI increases, defining the lower boundary with the Basal Clay.
Basal Clay	-	Kaolinitic clay horizon which transitions into a saprolitic zone above unweathered basement. This horizon is typically used as a marker indicating the full bauxite zone has been intersected and where drilling is often stopped.

Alcoa's bauxite deposits across the Darling Range show high variability in both the thickness and relative proportion of each horizon. Table 6-2 provides an extract from the acQuire database for the Mining Centres of Huntly (in the north) and Willowdale (more southerly) showing the most common (modal) Depth To Top and Thickness of the four stratigraphic horizons, based on logged drill holes from 2016 to 2020.

able 6-2: Summary of Typical (Modal) Stratigraphic Horizons Within Each Area

Area	Description (m)	Overburden	Hardcap	Friable Zone	Basal Clay
Huntly	Depth to top	-	0.64	1.51	4.54
	Thickness	0.64	0.87	3.04	-
Willowdale	Depth to top	-	0.58	1.51	4.91
	Thickness	0.58	0.93	3.40	-
North	Depth to top	-	0.64	1.78	4.45
	Thickness	0.64	1.14	2.67	-

igure 6-4: Typical Alcoa Darling Range Mineralogy Profile (Hickman et al, 1992)



igure 6-5: Typical Alcoa Darling Range Grade Profile (Alcoa, 2015)



Typical photos of the bauxite profile in current mining areas observed on 14 October 2021 are provided in Figure 6-6.

igure 6-6: Typical Alcoa Darling Range Mining Sequence and Vertical Profile (SLR, 2021)



Vegetation cleared prior to mining



Top soil and oxalate removed leaving Hardcap



Blastholes on Hardcap after sheeting with low grade



Hardcap (hard brown) Friable (soft yellow), relict fresh remnant Dolerite dyke boulder



Sandy topsoil, Hardcap (hard brown), Friable (soft yellow), Basal Clay (white clay, lower right in the floor).

7.0 Exploration

7.1 Exploration

WANL, which became Alcoa (in 1977), carried out exploration over much of the ML1SA lease area in the 1960s as mentioned in Section 5.2. Samples were assayed for Total Al_2O_3 only and the data, referred to as the Imperial Drilling, is still retained comprising approximately 104,400 holes and approximately 670,000 samples.

The Imperial Drilling has not been used to prepare the current Mineral Resource estimate because the sample collection, preparation, and assaying techniques were not consistent with current practices and can no longer be validated.

7.2 Resource Definition Drilling

Resource definition drilling is initially done on a nominal regular grid spacing of 60 by 60 m. Infill drilling programs are then scheduled as required to reduce the drill spacing to 30 by 30 m, and then 15 by 15 m.

The planned drill hole collars are assigned a hole identifier (Hole ID) using the code of the 15 by 15 m grid point on the 1:1,000 Map Sheets (Section 3.3).

A total of 420,789 holes were used for the resource estimate, and these holes were drilled between 1981 to 2024, with approximately 83% drilled after 2009.

A tabulation of the drill quantities by year and location is presented in Table 7-1, and a graphical summary is shown in Figure 7-1.

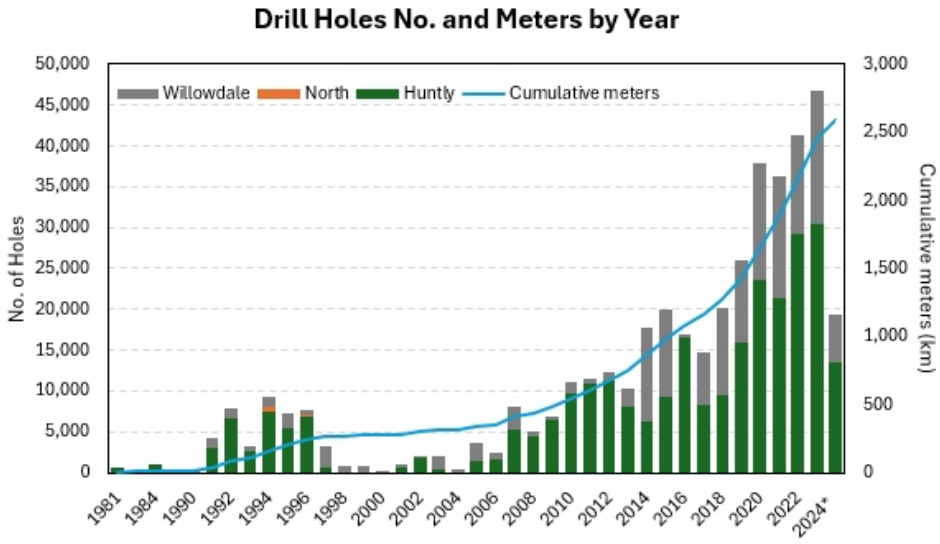
able 7-1: Drill Quantities by Year and Location

Year	Holes				Meters				Assay			
	Huntly	North	Willowdale	Total	Huntly	North	Willowdale	Total	Huntly	North	Willowdale	Total
1981	656	---	---	656	5,574	---	---	5,574	10,415	---	---	10,415
1983	199	---	---	199	1,090	---	---	1,090	1,899	---	---	1,899
1984	995	---	---	995	7,083	---	---	7,083	12,119	---	---	12,119
1985	393	---	---	393	2,815	---	---	2,815	4,971	---	---	4,971
1990	13	---	---	13	58	---	---	58	101	---	---	101
1991	3,123	0	1,017	4,140	17,405	0	7,726	25,130	30,133	0	13,909	44,042
1992	6,669	0	1,153	7,822	37,561	0	8,399	45,960	65,048	0	15,234	80,282
1993	2,672	0	518	3,190	15,339	0	3,331	18,670	26,413	0	6,117	32,530
1994	7,380	632	1,168	9,180	41,092	4,019	6,453	51,563	69,785	7,103	11,224	88,112
1995	5,355	79	1,839	7,273	32,111	477	10,524	43,112	55,222	871	18,989	75,082
1996	6,777	336	634	7,747	37,195	1,522	3,998	42,715	63,627	2,667	7,256	73,550
1997	583	0	2,730	3,313	3,620	0	17,199	20,820	6,406	0	30,917	37,323
1998	12	0	830	842	162	0	5,119	5,281	307	0	9,289	9,596
1999	18	0	842	860	137	0	4,082	4,219	239	0	7,198	7,437
2000	22	0	174	196	187	0	1,022	1,210	344	0	1,852	2,196
2001	633	0	385	1,018	5,844	0	2,693	8,536	10,817	0	4,955	15,772
2002	1,818	0	247	2,065	16,135	0	1,417	17,552	29,624	0	2,515	32,139
2003	418	0	1,516	1,934	2,605	0	9,855	12,459	4,662	0	18,023	22,685
2004	0	0	389	389	0	0	2,000	2,000	0	0	3,603	3,603
2005	1,391	0	2,186	3,577	8,887	0	12,442	21,329	15,930	0	22,418	38,348
2006	1,652	0	736	2,388	11,809	0	4,561	16,370	21,749	0	8,396	30,145
2007	5,229	0	2,840	8,069	35,800	0	19,002	54,802	65,477	0	34,677	100,154

2008	4,371	0	739	5,110	25,955	0	4,524	30,478	45,654	0	8,101	53,755
2009	6,491	0	299	6,790	38,025	0	1,744	39,769	66,797	0	3,159	69,956
2010	9,776	0	1,220	10,996	57,679	0	8,540	66,219	100,163	0	15,718	115,881
2011	10,799	0	691	11,490	58,535	0	4,963	63,497	101,566	0	9,095	110,661
2012	11,270	0	1,127	12,397	62,056	0	8,767	70,824	107,576	0	16,251	123,827
2013	7,971	0	2,375	10,346	48,026	0	19,297	67,322	83,988	0	35,787	119,775
2014	6,297	0	11,429	17,726	33,616	0	80,252	113,869	58,175	0	147,213	205,388
2015	9,243	0	10,789	20,032	51,370	0	66,228	117,598	89,750	0	120,696	210,446
2016	16,512	0	443	16,955	96,102	0	2,373	98,474	168,325	0	4,268	172,593
2017	8,265	0	6,363	14,628	44,296	0	37,777	82,073	76,690	0	67,290	143,980
2018	9,476	0	10,768	20,244	52,689	0	56,673	109,362	92,887	0	99,811	192,698
2019	15,923	0	10,138	26,061	91,912	0	67,348	159,259	162,134	0	121,383	283,517
2020	23,570	0	14,292	37,862	124,981	0	91,537	216,518	217,667	0	165,080	382,747
2021	21,347	0	15,002	36,349	131,600	0	114,280	245,880	231,155	0	207,367	438,522
2022	29,231	0	12,165	41,396	179,487	0	88,487	267,974	318,537	0	160,277	478,814
2023	30,494	0	16,230	46,724	183,141	0	119,708	302,848	318,665	0	220,275	538,940
2024*	13,419	0	6,005	19,424	84,457	0	45,311	129,768	147,413	0	83,504	230,917
Total	280,463	1,047	139,279	420,789	1,646,435	6,018	937,628	2,590,081	2,882,430	10,641	1,701,847	4,594,917

** Drill holes completed until June 30, 2024.*

igure 7-1: Chart of Resource Drill Holes by Year



The Darling Range deposits contain more than three million drillholes distributed across a lease of over 7,000 km², making it unfeasible to show a plan view of the property with the locations of all drill holes and other samples. Figure 3-3, however, shows the lateral extent of Alcoa's mined areas and Mineral Resources and Mineral Reserves within the ML1SA lease.

The Darling Range bauxite project is considered to be in the process of sustaining Mineral Reserve from already defined mineralization, rather than in Exploration mode, looking for new, broader targets. Resource Definition drilling is planned to continue throughout all areas where Alcoa has mining permits as described, to sustain the Mineral Reserves and future production.

7.3 Drilling Methods

The methods currently used for drill sampling in the Darling Range by Alcoa have been consistently used since the 1980s. Drilling is done using dedicated drills mounted on a fleet of tractors which can be driven off tracks into the forest, causing minimal damage or disturbance and obviating the need to clear drilling pads. Planned hole positions are located by the driller using Global Positioning System (GPS). The articulated tractors are highly maneuverable and there is only minor disruption to groundcover vegetation and saplings which may be eased out of the way (Figure 7-2).

igure 7-2: Resource Drilling Tractor Accessing the Forest (SLR, 2021)





Drilling is completed by Alcoa using vacuum drill rigs, by contractor Wallis Drilling using their patented reverse circulation (RC) aircore rigs, and by contractor JSW using a similar RC method. Wallis and JSW holes are both referred to as aircore drilling.

In recent years the drilling period has been extended from 9 to 10 months. More wet ground is now encountered and, where required, vacuum drilling is either deferred until the ground conditions improve, or is re-assigned for aircore drilling.

Drilling is rapid with holes typically completed every 15 minutes from locating the collar position to completing the drilling, cleaning the sampling equipment and readying the samples for dispatch. While 12 rigs are currently used, the procedure is consistent across all rigs and virtually unchanged since the early 1990s at Jarrahdale. Minor modifications to the drilling procedures that have occurred include (in order of importance for their impact on the resource database):

- Drilling initially was done by vacuum rigs but this has been supplemented by the aircore rigs.
- GPS methods have been introduced to locate the drill hole collar positions in 3D space, providing more precision on the hole and sample locations.
- The sample catching, splitting and logging procedures have been progressively upgraded, following review by various independent consultants (Holmes, 2018; Snowden, 2015; SRK, 2017, 2018, 2019b, 2021a; Xstract, 2016). The riffle splitting system has been enhanced through simple changes to provide a better, more robust method.
- The logging system has changed from manual paper plods to a completely digital recording system, albeit with paper backup where needed. Barcodes are now used on samples and matching these to the logs is now semi-automatic.
- The splitting and logging equipment on the drill rig has been progressively improved to make setup and pack-down more efficient and to protect the logging equipment during site moves.
- Rollover bars, guards, shields, lockouts and other safety protections have been added, and safety procedures have been enhanced with industry norms.
- Environmental protections and reporting have been enhanced to best practice in SLR’s opinion.

Samples used for Mineral Resource estimation are only acquired using vacuum drilling or aircore reverse circulation. Both methods generally drill dry holes in that water is not added. Water ingress into vacuum holes destroys the sample circulation and wet holes are abandoned. Alcoa commenced aircore drilling in 2015, with the initial plan being to phase out vacuum drilling. The prime advantage of aircore over vacuum is sample recovery when holes do encounter groundwater.

In vacuum drilling the sample is finely ground and sucked up from the bottom of the hole by a top-mounted vacuum pump. In aircore drilling, compressed air is blown down the annulus between the inner and outer drill string tubes, pushed out through ports on the face of the bit and then blows the sample through the center of the bit and up the drill string.

In both methods, the sample material is extracted from inside the bit, avoiding sample delineation error (contamination), and carried up the center of the drill string into the sampling container, avoiding sample extraction error (sample material left down the hole or lost as dust).

The aircore drilling uses a blade bit with a nominal cutting diameter of 45 mm and an internal retrieval tube diameter of 22 mm (Figure 7-3). Alcoa increased the internal diameter to 25 mm in 2018 to reduce blockages. The particle size of drilled material is sufficiently small (less than 10 mm) to promote good sample splitting in dry conditions.

igure 7-3: Drill Bits, Reverse Circulation Drill String and Particle Size of the Sample Residue (SLR, 2021)



Scale pen diameter 13 mm

7.4 Drill Sampling

7.4.1 Procedure

The sample catching, splitting, and logging procedures are the same for both vacuum and aircore drilling (Figure 7-4).

The drilling and logging are controlled by the driller with minimal supervision by geologists. This has been observed and is deemed reasonable by the QP due to the combination of very simple logging, experienced personnel, employment continuity and continual review by geologists.

Sampling begins at the base of the overburden and continues until the driller considers that the basal clays have been penetrated for at least 1 m or for infill holes at a 15 m spacing to the depth defined on the drill hole plan from surrounding data. The depth of basal clays to be penetrated was increased to 2m in 2019 for 60m spaced holes and in 2021 for 30m spaced holes. Alcoa estimates that, most recently, less than 5% of the limited depth holes terminate in bauxite.

Samples are collected at 0.5 m intervals, measured using a laser gauge mounted on the rig. At the end of each 0.5 m interval, the drilling is paused and the sample passes from the cyclone (for aircore) into the collection flask. For vacuum drilling the collection flask is at the end of the vacuum system.

The sample, nominally 1.5 kg, is poured from the flask into a feed tray, distributed evenly, then on the vacuum rigs the tray is pivoted to feed a small 12-vane riffle splitter (the rotating tray is excellent but not yet fitted to the aircore rigs). Where (usually) required, the splitting is repeated to give a retained split of 150 to 200 g, small enough to be collected into a 120 mL measuring cup with minimal spillage. The riffle split subsample is poured into a barcoded Kraft packet and boxed for dispatch to the assay laboratory. The sample retrieval and splitting systems are cleaned with compressed air after each hole.

During the site inspection, the JSW RC sampling procedures were observed closely. It was found that the principles of correct sampling were understood by all personnel at the rig and the equipment and practices were observed to be satisfactory.

Over the period 2015 to 2021 the drill sampling procedures have been externally reviewed (Snowden, 2015; Holmes, 2018; and others) and various improvements have been made such as using riffle splitters with more vanes, using a pivoting tray to consistently feed the splitter, training in the correct splitting and retention of all the subsample, digital recording of logging, monitoring of accuracy with Standards, and monitoring of precision with duplicates.

SLR opinion on the drilling, sampling, and recovery factors are discussed in Sections 8.5 and 11.17.

igure 7-4: Sample Catching and Riffle Splitting Practices (SLR, 2021)



7.4.2 Recording Sampling Data

The drill hole and sample information are recorded digitally onto a tablet at the rig during drilling (Figure 7-5). The data is automatically loaded into an acQuire database. In previous years the same information was all recorded in a ticket book and manually transferred to the database.

This approach remains as a backup method when needed. Data recorded includes hole number, drill rig number, driller name, offsider name, depth of overburden, depth of Caprock, map reference, material type code, and comments on the reason for ending the hole, e.g. if bedrock or water was encountered.

igure 7-5: Barcode Reader and Digital Recorder Mounted on the Drill Rig (SLR, 2021)



7.4.3 Sample Logging

The geology of the Darling Range bauxite is well understood. The Material Type codes have been simplified to meet the production needs of the operation and the drill crew has been trained in their identification, which is primarily based on color and hardness.

This results in logging of a reasonably consistent regolith profile formed by surface weathering of the few bedrock types (granite or dolerite). A comprehensive geological log is not produced but the Material Type codes can be ratified by the assay results. The Material Type codes are provided in Table 7-2.

able 7-2: Logging Codes for Material Type

Material Type	Description	Comment
HB	Hard brown	Hardcap and Friable Zone
HSB	Hard / soft brown	
SB	Soft brown	
SY	Soft yellow	
CLB	Clayish brown	
CLY	Clayish yellow	Basal Clay Zone
BC	Brown clay	
YC	Yellow clay	
WC	White clay	
DOL	Dolerite	Intrusion
GR	Granite	
WET	Wet	Other
ROD	Broken rod	

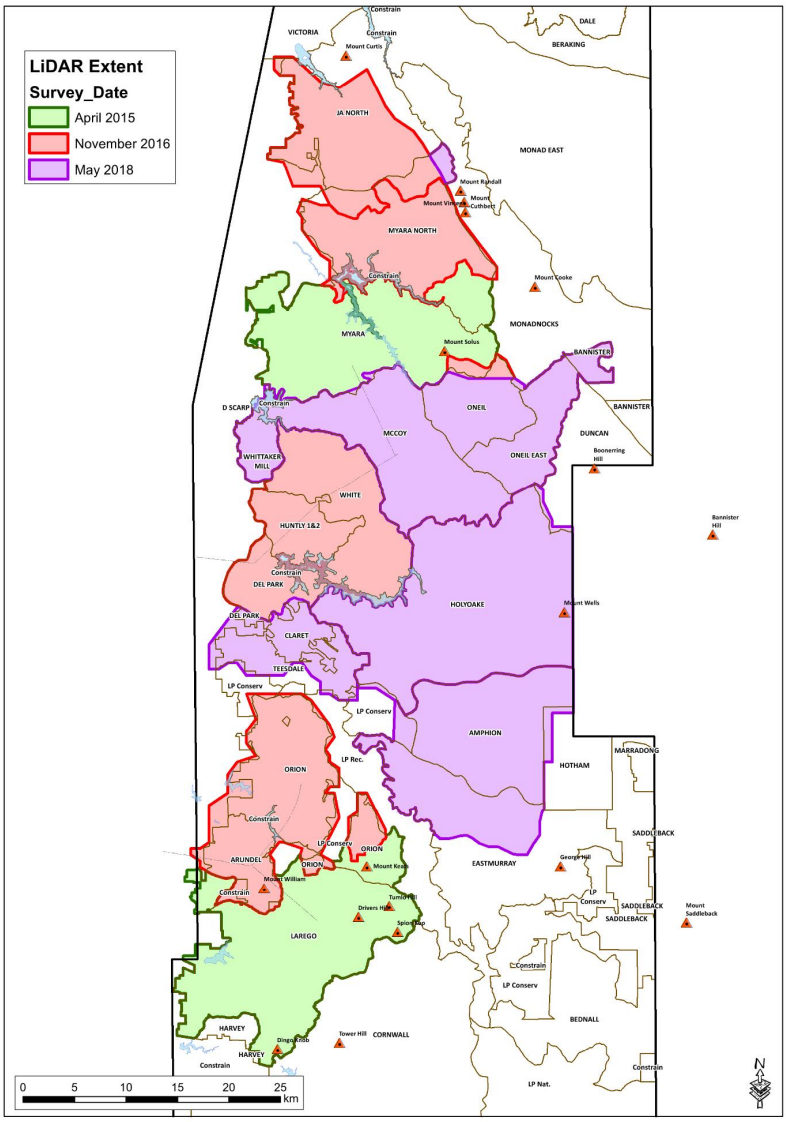
7.5 Topography

Topography data was acquired from:

- Drill hole collar survey data and check surveys performed using Trimble R10 real time kinematic differential global positioning system (RTK DGPS) equipment.
- LiDAR surveys conducted in April 2015, November 2016, and June 2018 (no further surveys have been required). A plan showing the LiDAR coverage for each survey is provided in Figure 7-6.
- Landgate satellite data collected in the late 1990s.

A digital elevation model representing the natural surface was prepared by combining (in order of priority) the collar survey data, the LiDAR data, and the satellite data.

igure 7-6: Topographic Data Coverage of the 2015, 2016 and 2018 LiDAR Surveys (Alcoa, 2022)



7.6 Surveying

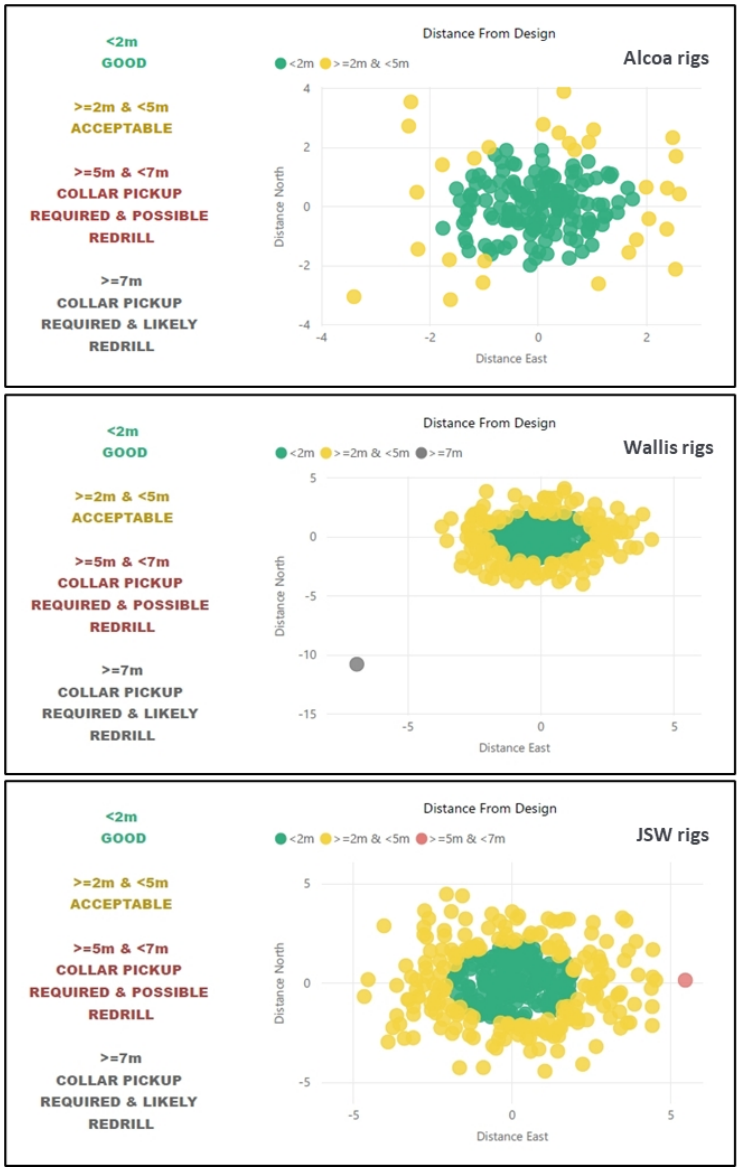
Alcoa has consistently drilled the Darling Range bauxite deposit on a 60 by 60 m grid (with infills to 30 by 30 m and 15 by 15 m) since the 1970s. Initially collar peg positions were surveyed using either a theodolite or Total Station. The 30 m and 15 m pegs were positioned between the 60 m pegs using tape and an optical square. Alcoa commenced using GPS survey control (RTK DGPS) in mid-2015.

Drilling is conducted before any forest clearing activities, which are only carried out for mine development. Positioning the drill rigs is thus imperfect. If the actual coordinates are within 2 m of the planned coordinates, the hole is considered to be correctly located, and the planned coordinates are used in all subsequent processing. Holes that are collared more than 2 m away from the planned location are flagged accordingly in the database, but the planned coordinates are still used in preference to the actual locations. In 2015, Alcoa commenced check surveying of collar positions after drilling. Most of the holes drilled in 2016 and 2017 were check surveyed. Major discrepancies, such as large differences between the actual coordinates and the coordinates defined by the hole identifier, are investigated and corrected in the database.

The planned coordinates at the 15 by 15 m grid points on Map Sheets (see Section 3.3) were used in preference to the actual coordinates. This choice stems from the fact that the original resource delineation systems (Polygonal and GSM, see Section 11.4) were based on the use of regularly gridded data. However, the current 3DBM methodology prioritizes the use of actual coordinates. The use of planned instead of actual coordinates does introduce some uncertainty in the local sample position and consequently the local estimates. However, it is noted that:

- The lateral error is random, small in magnitude compared to the smallest drill grid spacing (15 m) and monitored (Figure 7-7) with deviations from plan greater than 7 m redrilled.
- The error affects few holes (for example, in 2022/23 of the 60,754 holes drilled, 58% were within 2 m, and 99.8% within 5 m).
- The long range of the grade continuity of mineralization as shown by the variograms is several hundred meters.
- The local small-scale variations on the grade of mineralization due to variations in the amount of lateralization are uncontrolled and unpredictable (see discussions of drill hole twinning in Section 8.4.4.3).
- The effect is a controlled ‘random stratified grid’, given that the nominal collar position is always used for estimation and there is no evident bias.

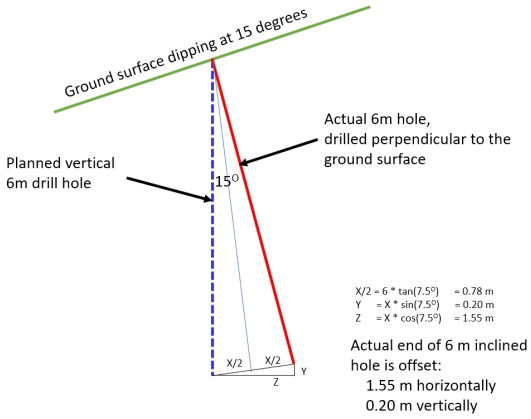
igure 7-7: Error in Actual Collar Location from the Nominal (planned) Position is Monitored for the Three Drill Rig Types (Alcoa, 2021)



Downhole surveys are not performed in drill holes because of their generally shallow depth and narrow diameter, so all holes are assumed to be vertical.

The drill rigs have limited capacity to be levelled and cannot drill angled holes, so in some circumstances the holes may be drilled perpendicular to the natural surface. The rigs are designed to safely operate on gradients of up to 15°, so holes could be drilled up to 15° off the vertical. For a 6 m hole drilled at the planned collar position, the offset may be up to 1.55 m horizontally and 0.2 m vertically (Figure 7-8).

igure 7-8: Possible Lateral and Vertical Sample Location Error on 15° Sloping Ground (SLR, 2021)



The impact of differences between the actual locations of samples in 3D space compared to their nominal location on the mine plan is considered to not materially impact the Mineral Resource because the errors in the spatial controls on mining are likely to be of the same magnitude as the spatial errors in mining (±2 m laterally and ±0.3 m vertically). Mining is locally controlled by DGPS on mining equipment to meet short-term plans and visually for indications of the base of ore (e.g., WC white clay).

7.7 Sampling Conclusions

In the QP's opinion, the drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.

7.8 Hydrogeology Data

Historically, no site-specific hydrogeological data was available on the basis that no hydrogeological considerations are required for the definition of mining plans in Alcoa's Darling Range operations. However, extension of mining activities into the proposed Myara North and Holyoake development envelopes was recently considered to potentially pose a risk to the multiple uses of groundwater in the area including drinking water production, timber harvesting, pine plantation and recreation.

Alcoa has collected groundwater level and groundwater quality data within the Myara North mine region since the 1970s, with available groundwater data typically concentrated within the eastern areas of the mine region. In contrast, only limited water level and water quality data had

been obtained within the Holyoake mine area. As part of the 2020 to 2021 baseline monitoring program, the monitoring network and program was expanded to include:

- 18 new groundwater bores at 16 locations within the Myara North mine region, to supplement 25 existing Alcoa groundwater bores. Two sites included installation of a shallow and deep paired bores, providing data on groundwater for the upper 'perched' unit and the underlying more regional groundwater.
- 17 new groundwater monitoring bores were installed in 2020 within the Holyoake mine region, to supplement 8 existing Alcoa groundwater bores.
- The baseline groundwater monitoring program comprised monthly water level dips and physico-chemical parameter measurements from October 2020, with groundwater samples collected for laboratory analysis of a broader suite of parameters in October 2020 and February 2021.

In consideration of the data obtained from the expanded monitoring network, several hydrogeologic and hydrologic investigations were undertaken by GHD Pty Ltd (GHD) throughout 2021 and into 2022, including:

- Implementation of a baseline surface and groundwater monitoring program including installation of a monitoring network
- Groundwater modelling for Myara North and Holyoake mine regions
- Drinking water risk assessment for Serpentine, Serpentine Pipehead, South Dandalup and Wungong Brook catchments.

The results of these investigations will be assessed as part of the Pinjarra Alumina Refinery Revised Proposal (Assessment No. 2253), which includes the Huntly Bauxite Mine transition to Myara North and Holyoake (See Section 17.1.2).

The work completed by GHD has been incorporated into Alcoa's Catchment Risk Assessment (CRA). The CRA considers potential hazards to PDWSAs and other factors to evaluate mining related catchment risk. This is an iterative process that will allow refining of the model to ensure it is more accurate on the completion of each subsequent iteration. Iteration 1 was produced in 2022; it will be revised in consultation with DWER, DBCA and other relevant regulators. While the CRA is designed to inform mining risk (and lack of risk) the data and predictions can be applied to exploration. Ultimately, the CRA will help Alcoa understand in more detail the hydrological and hydrogeological risk down to a subcatchment level, supporting the development of future mining areas. The CRA is an integral part of the approved 2023-2027 MMP, and the roll-over approval of 2024-2028.

7.9 Geotechnical Data

As the slopes are so shallow, no geotechnical considerations are required for the definition of mining plans in Alcoa's Darling Range operations.

Some limited material characterization is available within the historic reports carried out for the ROM and bauxite crushing facility and seven other mine infrastructure locations. The crusher site is situated south of Willowdale though the geology is considered similar across the sites. Testing includes cone penetration (CPT), basic laboratory classification, some limited consolidated undrained (Cu) triaxials and point load testing (PLT). Some historical data is available for strength testing within the caprock unit including unconfined compressive strength (UCS), young's modulus (E), tensile strength and abrasion. A factual laboratory report is

available from Wirtgen group based off six rock samples (post drilled from cobbles) taken at Huntly with testing including UCS, tensile strength and Cerchar abrasivity. Details for the testing protocols/standards for the Wirtgen tests are not available. As such, it is considered that there is limited information available in terms of material characterization, strength testing, or pit wall design for the mine site.

Recent factual and interpretive results of a geotechnical investigation carried out by Tetra Tech Coffey Pty Ltd (TTC) in July 2023 for the Kisler Stage 1 area are available. Laboratory testing was carried under TTC direction by STATS Australia, a National Association of Testing Authorities (NATA) accredited laboratory located in Canning Vale WA, in accordance with the general requirements of Australian Standard AS1289. A NATA accreditation is to the ISO/IEC 17025 standard, which demonstrates that the laboratory operates competently and generates valid results. TTC states that the geotechnical laboratory assessment was conducted on representative soil and rock samples recovered from test pits and boreholes, with laboratory test certificates available. The investigations were carried out primarily within the footprint of the proposed Kisler facility, located approximately 10 km south-east of the Serpentine Main Dam. The generalized subsurface profile of the site is presented in Table 7-3, with the assumption that the actual interface between materials may be far more gradual or abrupt than those made based on the facts obtained. An additional assumption is made in that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area.

Groundwater was not encountered at any of the test pit locations, to the maximum depth of investigation (i.e. 3.3m BGL). Groundwater was not observable at the borehole locations due to the use of drilling fluid. However, all boreholes have been converted to monitoring bores for future groundwater monitoring purposes.

Based on the results of geotechnical investigation and AS 1170.4 – 2007 Structural Design Actions (Part 4: Earthquake actions in Australia), a sub-soil classification of “Class Ce – Shallow soil” is considered appropriate for the Kisler Stage 1 site at the time of investigation by TTC.

able 7-3: Generalized subsurface profile

Layer/Unit	Typical Depth to Top of Layer (m)	Typical Layer Thickness (m)	Description/Remarks
Sandy Silt / Silty Sand / Sandy Clay / Clayey Sand	0.2 – 3.0	1.2 – To maximum depth of investigation	Low to medium plasticity, yellow-brown to brown, sand, fine grained, sub-angular, with some gravel. Predominantly encountered at most test locations throughout the course of investigation.
Clay	0.00 – 11.0	3.0 – 5.4	Medium to high plasticity, brown, yellow-brown, grey-brown, with some sand and gravel.
Silty Gravel / Clayey Gravel	0.0 – 9.0	3.0 – 5.0	Fine to coarse grained, sub-rounded and sub- angular, grey-brown and brown, clay, low to medium plasticity, with some sand, trace non-plastic fine.
Granite / Dolerite	5.60 – 20.00	To maximum depth of investigation	Medium to coarse grained, pale grey to grey, red- brown, generally very high to extremely high strength. Some boreholes showed very low to medium strength.



Granite was encountered at most borehole locations. Generally high to extremely high strength.

Dolerite was encountered at 1 location. Extremely high strength.

8.0 Sample Preparation, Analyses, and Security

Sample preparation is performed by Bella Analytical Systems (Bella). Although the laboratory is located within Alcoa's curtailed Kwinana Refinery complex and only processes Alcoa material, it is independently owned and operated by Bella. A link exists between the Bella and Alcoa Laboratory Information Management System (LIMS) for the two-way exchange of data. Bella does not have Australian National Association of Testing Authorities (NATA) accreditation.

All assays produced by Bella are monitored and controlled by Alcoa at the Kwinana Mining Laboratory (KWI), which, although it has a QA/QC system based on ISO 9001 protocols, only has one section of the laboratory certified to ISO 9001 for the purpose of certification of shipment assays of alumina.

A robotic processing system is used to prepare each sample for Fourier Transform Infrared Spectrometry (FTIR) and Reference Method (REF) testing. This entails pulverizing each sample in a flow-through ring mill to a nominal grind size of 85% passing 180 µm, and then splitting off sufficient material to fill a barcoded scanning flask (20 mm high with an 80 mm diameter). The material from the ring mill is discharged through a rotary splitter, with approximately 80–100 g of material retained for geochemical testing, and the remainder discarded. A duplicate sample is collected from 1% of the samples via a rotary splitter fitted with twin select chutes. These samples are used for Reference Methods testing.

8.1 Sample Security

Subsamples are collected by the drillers, sealed into Kraft packets with barcodes and submitted for assay. Cardboard boxes holding 50 packets are delivered at the end of each shift, by the drilling crew, to secure sample storage facilities. Unfilled boxes are stored in the drill support vehicle and completed in the next shift.

The filled sample boxes are stacked onto pallets in batches of 40 (i.e., 2,000 samples), wrapped with plastic and dispatched by courier to the Bella assay facility at the curtailed Kwinana Refinery.

8.2 Sample Preparation

Upon receipt by Bella, the sample barcodes are scanned and checked against the submission data in the Bella LIMS. Each sample packet is then split open at the top, placed in a cardboard drying tray and oven-dried at 100°C for 10 hours. The packets are transferred to a customized holder in batches of about 60, with a control between each batch, and automatically fed to a bank of 10 Rocklabs flow-through ring mills (Figure 8-1), each of which have three concentric milling rings. The barcode is read, the sample is pulverized, a subsample is rotary split, captured in a single-use plastic Petri dish with the barcode printed on the lid, then sent to the spectral analyzer for assay. The ring mills are air flushed and vacuumed between samples.

Each sample is pulverized to a nominal grind size of 85% passing 180 µm. The ring mill discharges through a chute and rotary splitter, retaining 80 to 100 g and discarding the rest. One of the ring mills is set up to take two splits and these are used for pulp duplicate assays and to generate the Reference (REF) samples. These are sent to the KWI for wet chemical assay checking of the spectral assay. Pulverized samples are stored in a barcoded dedicated receptacle for assay (Figure 8-2).

The robotic system can run 24 hours a day handling approximately 3,000 samples per day. Only the Mineral Resource estimation samples are processed at Bella with all other stockpile and processing control samples processed using the same methods as the REF samples.

igure 8-1: The Bella Robotic Sample Preparation using Rocklabs Ring Mills (SLR, 2021)

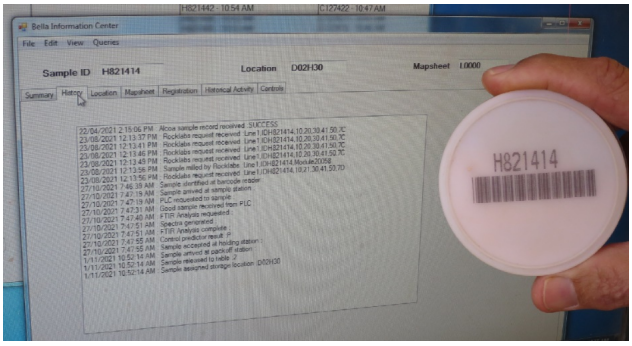


igure 8-2: The Pulverized Sample is Stored in a Barcoded Dedicated Receptacle for Assay (SLR, 2021)



A LIMS system controls the progress of the sample packet through the whole of the sample preparation and assay procedure enabling digital tracking of all stages (Figure 8-3). This ensures *inter alia* that the sample is valid, not previously assayed, and the assay looks like one for a bauxite sample. It also generates pulp duplicates at a frequency of 1 in 100 which are also the REF samples.

igure 8-3: The Pulverized Sample is Tracked Digitally Through the Bella Preparation and Assaying (SLR, 2021)



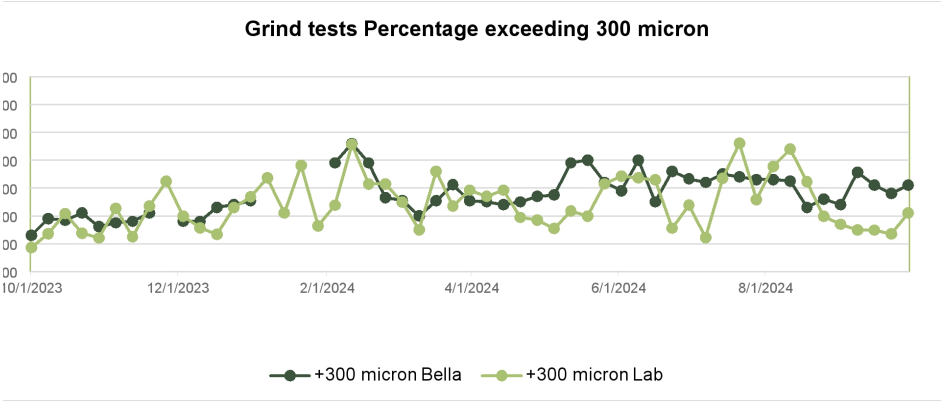
Grind size monitoring is carried out with the advantage of the robotic sample preparation being consistent grind size. A risk with all such systems is the possibility of contamination between samples. This is usually avoided by inserting blank samples of zero grade into the sample processing stream. The difficulty is that the blank samples may themselves contaminate the next sample being assayed.

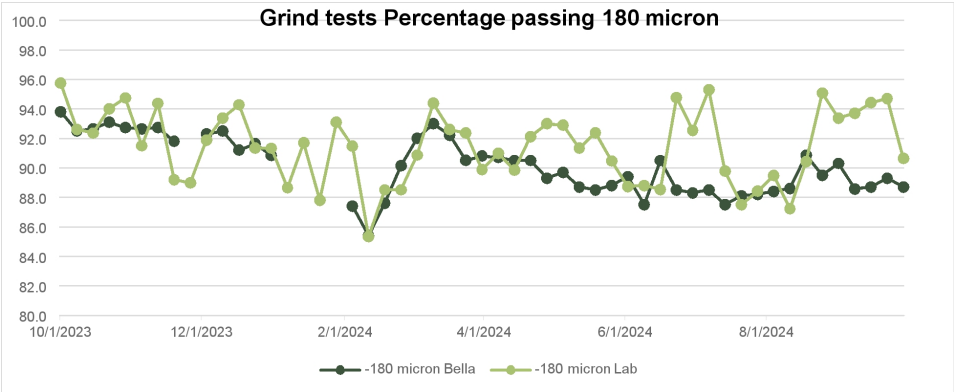
Quality control (QC) procedures were developed and implemented to monitor the Bella robotic sample preparation system (Franklin, 2019) and they include:

- Temperature testing on the ovens. These are recorded between 2 and 5 times a year since 2017 at 8 positions for each of 4 ovens and demonstrate consistent safe drying temperatures below 100°C (average 97.9°C for 352 readings).

• Daily grind size checks. The percentage passing 180 microns and percentage exceeding 300 microns is recorded at Bella on all 10 ring mills at a rate of 1:200 for the resource drill samples, with independent checks by the KWI on a random selection of all samples milled for the week. These demonstrate satisfactory sample preparation, and the consistency of the Bella robotic system, which is critical for effective FTIR assaying (Figure 8-4).

igure 8-4: Sample Preparation Monitoring: Grind Sizes for the Robotic Sample Preparation Unit Tested by Bella and by KWI





8.3 Assaying

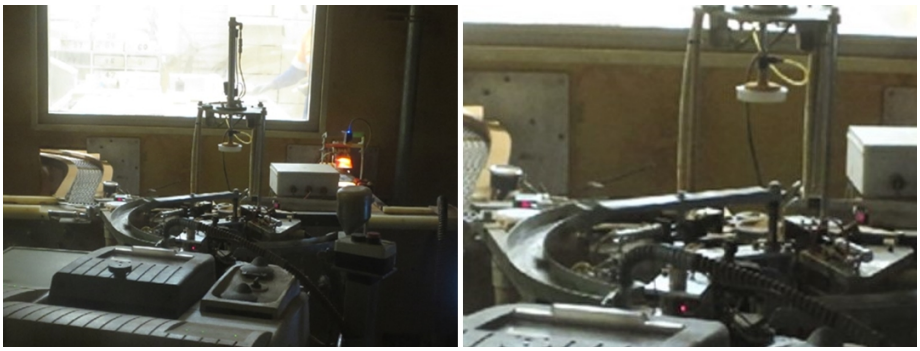
Assaying of the drill samples is based on a spectral method, using a Nicolet 6700 FTIR Spectrometer with a robotic feeder (Figure 8-5). FTIR obtains an infrared absorption spectrum from the sample. The FTIR spectrometer simultaneously collects high-resolution spectral data over a wide spectral range. A mathematical process (Fourier transformation) converts the raw data into the actual spectrum for subsequent determination of the component analytes.

All drill samples are currently assayed using a customized, bespoke FTIR method, with the final corrected results used for Mineral Resource estimation. Calibration and monitoring of the FTIR results are done using the Reference Method assay results.

Bella generates the raw FTIR spectral dataset for each sample, which is transferred to the Alcoa LIMS system for post-processing. Alcoa performs all the Reference Method analyses at KWI.

The FTIR spectra are determined using a robotic scoop arm that collects an approximately 5 g aliquot of the pulp from the Petri dish and presents it to a platinum crucible. The material in the crucible is pressed flat to ensure an even surface for scanning. The crucible is then rotated several times through the spectrometer and 20 scans are conducted on the aliquot. The scans are processed and validated by the Bella system and when accepted, they are then transferred to the Alcoa LIMS system for post-processing and further validation.

igure 8-5: The Robotic FTIR Assaying Equipment (RHS shows the sampling scoop arm and pulp dish with the lid elevated) (SLR, 2021)



8.3.1 FTIR Method Assays and the CalVal Dataset

The FTIR Method for bauxite assay uses infrared absorption spectra to characterize the presented sample for multiple analytes as element, compound, or mineral percentages. The approach has been developed using an extensive calibration and validation (CalVal) dataset, constant monitoring of Reference samples and Standards, and periodic revision of the prediction algorithms.

In 1990, an initial set of approximately 2,300 CalVal samples was collected covering the Darling Range tenement. A subset of approximately 700 samples was used to develop the initial FTIR prediction model. Extra CalVal samples have been added to help predictions in areas of low Reactive Silica (less than 0.5% Si) and high Total Iron (greater than 50% Fe). The CalVal samples are run randomly through the FTIR equipment in triplicate, under differing conditions (time of day, season, operator, order, etc.) to test for external factors. The FTIR results based on the prediction model algorithm are monitored using the REF assays (Franklin, 2019).

Initially some FTIR analytes (Available Alumina, Total Iron, Carbonate, Sulphate, Total Silica, Total Phosphorus and Magnetic Susceptibility) were all determined using a ‘common’ algorithm, whereas Reactive Silica, Oxalate, Extractable Organic Carbon, Total Alumina and Boehmite each used a specific algorithm. Since 2017 specific algorithms have been used for all analytes. The algorithms are periodically updated, typically if there has been a change in equipment or Reference Method. Retaining all FTIR spectra now means additional analytes can be

determined using specific algorithms, with three new analytes being added to Method Set MIC#00005 in 2021 (Potassium, Titanium and Gallium).

8.3.2 Reference Method (REF) Assays

The REF assaying is done by Alcoa in the KWI to validate and calibrate the FTIR assays. This is a suite of assays and tests that are carried out by wet chemical and other means and has included:

- XRF x-ray fluorescence spectroscopy
- ICP-OES inductively coupled plasma optical emission spectrometry
- XRD x-ray diffraction
- MS magnetic susceptibility, a proxy for grindability
- BD-ICP bomb digest in a caustic solution, with an ICP-OES finish
- BD-GC bomb digest in a caustic solution, with a gas chromatography finish
- BD-NDIR bomb digest in a caustic solution, with a non-dispersive infrared finish
- MD-ICP microwave digest in a caustic solution, with ICP-OES finish

There are differences in the nature of these tests. Both XRF and ICP methods are instrument-based methods designed to replicate wet chemical analysis results, either total or partial assays depending on the digestion. Both XRD and MS methods are used to investigate mineralogy contents so they are regarded as proxies for assays. Bomb digest (BD) methods have been developed by the alumina refining industry to determine the expected yield of bauxite ore during processing. They are the basis for ‘metallurgical assays’ that are designed to replicate the physicochemical reactions in the refinery and accordingly may be customized for a particular ore type or process plant. At Alcoa some BD assaying has been replaced with a microwave digest (MD) method.

8.3.2.1 REF Assaying Methods

A summary of the assaying used for the REF samples, which are used to calibrate and validate the FTIR Method, is provided in Table 8-1.

able 8-1: Assaying Methodologies for Resource Estimation Samples

Name	Analyte	Code	Units	Reference Method
Available Alumina	$A.Al_2O_3$	AL	%	MD – ICP (MALSI)
Reactive Silica	$R.SiO_2$	SI	%	MD – ICP (MALSI)
Total Iron	Fe_2O_3	FE	%	XRF and FTIR
Oxalate	NaC_2O_4	OX	kg/t	BD – GC
Carbonate	Na_2CO_3	CO	kg/t	BD – NDIR (TICTOC)
Extractable Organic Carbon	C	EO	kg/t	BD – NDIR (TICTOC)
Total Phosphorous	P_2O_5	PT	%	XRF
Sulphate	Na_2SO_4	SU	kg/t	XRF

Total Silica	SiO_2	ST	%	XRF
Magnetic Susceptibility	MagSus	MS	None	MS (CGS system)
Total Alumina	Al_2O_3	AT	%	XRF
Boehmite	AlO(OH)	BO	%	XRD

The bomb digest (BD) method involves adding a measured amount of carbonate free 52% caustic soda to the sample aliquot (1 g), sealing it in a small 10 mL pressure vessel and then cooking it at 145°C. After cooling, the solution is assayed by titration or other methods to determine the alumina and silica contents. As the digestion of these elements by the hot caustic solution is determined by the physical conditions during digestion (mainly temperature and pressure) the results provide a proxy for the expected performance of ore of that nature in the alumina refinery plant. The resulting assays are termed available alumina (AL) and reactive silica (SI), measured as percentages.

The MD method was introduced in 1996 to supplant the BD methods for assaying of the Mineral Resource drill samples. Atmospheric digestion is done in a microwave oven using a 13% caustic solution. The advantage of this is that it is faster, more repeatable and uses a bigger aliquot (0.5 g). The MD assays are collectively named ‘microwave available alumina and reactive silica’ (MALSI). The BD methods are still used for the refinery monitoring samples including those taken from the sampling towers prior to the feed stockpiles of crushed ore.

Following digestion using either MD, BD, or wet chemical methods, the analytes are assayed (Table 8-1) using the following methods (Figure 8-6):

- For ICP the digestion liquor is read using a PerkinElmer Optima 8300 machine.
- For XRF an aliquot of 0.7 g is combined with a lithium borate flux, fused in platinum crucibles on a dedicated Phoenix 8-bank burner, and batches are assayed on an Axios Max PW4400 machine.
- For gas chromatography (GC) a 1.00 g aliquot is used and assayed on an Agilent 7890B machine.
- For Total Inorganic Carbon and Extractable Organic Carbon (TICTOC) a 1.00 g aliquot is digested and assayed using an Analytical Aurora 1030 Total Organic Carbon Analyzer with carousel.

igure 8-6: Digestion and Assay Equipment used for REF Samples at the KWI Clockwise from top left: BD, MD, TICTOC, ICP, XRF, GC (SLR, 2021)



Details on the assaying method used for the final (Best) assay value for every sample interval are carried in the acQuire database.

For resource estimation, the Reference Method results are used to monitor the performance of the FTIR assaying, and to calibrate (adjust) the FTIR results on a batch-by-batch basis. The Reference Method is also used for all monitoring of the refinery performance including the grades of ore presented to the sampling towers at Pinjarra and Wagerup prior to stockpiling and reclaiming of the ore feed.

A consistent approach to sample collection, preparation and assaying for Mineral Resource estimation has been used since 1980. Refinements to the assaying methods have comprised:

- 1996 Microwave digestion was introduced instead of bomb digestion for the REF samples.
- 1999 The collection of the FTIR spectral data was outsourced to Bella, with direct control of processing and prediction still done by Alcoa.
- 2006 Robotic sample preparation was introduced at Bella.
- 2006 Digital retention of all FTIR spectral data was introduced, enabling additional post-processing of assayed samples for new analytes.
- 2017 The calibration sets were rescanned with FTIR and an updated Method Set (MIC#00005), was developed.
- 2018 Original wet chemical assays were replaced by FTIR for approximately 73,000 samples (drilled in Myara North from 1992 to 2002).
- 2019 Original wet chemical or FTIR assays were replaced by FTIR for approximately 251,000 samples (drilled in Myara North from 1991 to 1997).

The impact of these changes and validation of the results were investigated by Alcoa personnel and independently by SRK (2021a). It was concluded that the assaying precision (i.e. repeatability) and accuracy (lack of bias, as demonstrated by quantile-quantile plots) did not show significant differences between the pre-2018 and post-2018 data sets.

Since completion of the 2023 Mineral Resource inventory, an additional 70,253 vacuum and aircore holes have been drilled and approximately 710,870 routine FTIR analyses performed. These represent holes drilled between September 2023 and June 30, 2024.

8.4 Quality Assurance and Quality Control

Quality assurance (QA) consists of evidence that the assay data has been prepared to a degree of precision and accuracy within generally accepted limits for the sampling and analytical method(s) to support its use in a Mineral Resource estimate. Quality control (QC) consists of procedures used to ensure that an adequate level of quality is maintained in the process of collecting, preparing, and assaying the drilling samples.

8.4.1 QA/QC Protocols

The following QA/QC protocols are implemented and managed by Alcoa's team, and QA/QC samples are not blind to the laboratory, with the exception of Sample To Extinction (STE). Batches of samples are submitted to the Bella laboratory daily. Internal standards created from the stockpile of the Darling Range bauxite are introduced by the Bella Laboratory every 50 samples during the FTIR analysis to check the chain of process. All standard sample insertions and batches maintain consecutive numerical order. Calibration is done at first to generate the reference mean of the standard as well as the acceptable minimum and maximum values totaling three standard deviations.

After the boxes of drill samples are received at Bella, packets of Reference Method samples (REF) are split out by the robotic sample preparation, based on a random selection by Alcoa LIMS, at a frequency of 1 in 100 (1%). These are submitted to the KWI in batches of 19 for REF assaying to calibrate and validate the quality of the FTIR Bella assays. As the FTIR assays are adjusted to match the REF assays (using a 'broken stick' curve adjustment to remove bias and maintain precision) it is expected that there should be minimal bias between REF and FTIR corrected results (FTIR_corr). However, the repeatability between the two methods is an important attribute of the quality of the assay results used for Mineral Resource estimation. Each batch of REF samples includes 1 Blank and 1 Standard. The REF samples are considered to serve the same purpose as pulp repeats in defining the repeatability of the assays. Alcoa also sends checks of REF samples assayed at Bella and KWI to an independent laboratory, Bureau Veritas (BV).

Alcoa introduced in 2018 an alternative procedure to field duplicates, termed Sample To Extinction (STE). This involves taking the normal 0.5 m drill sample (referred to as the Parent) and collecting all the residue from that drilled interval (i.e. the riffle split reject, and previously any material left in the sampling cup). This residue is collected once per shift from each rig under supervision by the geologist. The residue is pulverized and homogenized, then two equal splits (referred to as the Daughters) are assayed.

Following receipt of results from the laboratories, Alcoa geologists review the values, and sample batches identified as anomalous are repeated by the laboratory. Monthly and quarterly QA/QC reports are produced to detect and address potential temporal trends or issues in their results.

The following are the existing written QA/QC procedures available to all staff:

- Franklin (2019) describing the FTIR process.
- Use of the customized in-house Exploration PowerApps digital module to record and document field inspections by the geologist at the drill rigs (documenting visible contamination, Sample ID, Hole ID, splitting, chip size of sample, split volume, depth measurement, collection of Sample To Extinction (STE) samples, collection of further FTIR calibration and validation (CalVal) samples, as well as other prestart, safety, risk and EHS inspections.
- Procedures for generating STE samples.
- Various PowerPoint presentations providing an overview of the laboratory procedures.

QP reviewed QA/QC information compiled in the previous report (SLR, 2023) and analyzed the new QA/QC data compiled by Alcoa between November 2023 and September 2024. The findings of this analysis are presented in the subsequent sub-sections.

8.4.2 Blanks

Blanks are not routinely introduced in FTIR submission batches into the robotic mills at Bella and there is no check on cross-contamination during sample preparation. Given the style of mineralization, the ore grades being assayed, and the volume of material milled compared to the final aliquot assayed, the absence of sample preparation blanks is not considered material. There is also no available blank sample on the market that would not introduce contamination of the mills by very low-grade samples at Bella. KWI laboratory submits blanks with a frequency of 1 to 19 in the REF samples sets compiled and dispatched regularly by Bella, however that information was not available for review.



8.4.3 Standards

Standards evaluate accuracy of the assaying by detecting the differences between a result and an expected value, also known as a bias. Alcoa has used a series of specially prepared Internal Reference Material (IRM) samples derived from Darling Range bauxite, pulverized and homogenized by Gannet Holdings, labelled KH09 to KH20. Between 2021 and 2024, only IRM KH14 and KH20 have been used at the Bella Laboratory and KH10 at the mining laboratory. Monitoring using these IRM samples provides arguably better assurance of assaying accuracy than commercial Certified Reference Material samples. The IRMs have generally been sourced from stockpile material and used in both coarse-crushed and pulp form. The IRMs have not been externally certified. A summary of the IRMs used is provided in Table 8-2.

able 8-2: Standards Used for Drilling and REF Monitoring (IRMs)

Standard	Date	Comment
KH09	May 1999 to present	Boehmite analysis, FTIR, MD-ICP, and XRF analysis Mining reference analysis (IRM)
KH10	May 2012 to present	Mining reference analysis (IRM)
KH11	July 2008 to March 2015	FTIR analysis (IRM)
KH12	July 2008 to April 2014	Grind size control (IRM)
KH13	April 2014 to present	Grind size control (IRM)
KH14	March 2015 to October 2021	FTIR analysis (IRM)
KH15	October 2015 to September 2017	Preparation and analytical control – introduced at the drill rig (IRM)
KH16	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH17	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH18	September 2017 to December 2018	Preparation and analytical control – introduced at the drill rig (IRM)
KH20	October 2021 to present	FTIR analysis (IRM)

Control of the accuracy of FTIR samples is currently monitored at the Bella laboratory using IRM KH20. The IRMs are inserted every 50 FTIR samples. FTIR batches totaling 48,855 samples of KH20 analyzed primarily between November 2023 to September 2024 and using Priority Codes P202 to P212, BV002 to BV004, and INT001 grouped by quarters, were sent to SLR for review. Priority Codes represent batches assayed by the FTIR Method using the same batch correction factors.

The QP reviewed all batches from either KH10 or KH20, adhering to the failure limits set by Alcoa, which are three standard deviations (SD) from the expected value. The QP evaluated the available alumina (AL), reactive silica (SI), and iron (FE) through extended timeline series to identify potential bias trends or systematic outliers.

In general, IRMs exhibited robust accuracy biases, ranging from -0.03% to 3.4% for the elements AL, FE, and SI as summarized in Table 8-3. These results were obtained with a controlled number of failures across all three grade IRM categories: low-grade, intermediate-grade, and high-grade.



able 8-3: Performance of IRM Samples used in the 2023 - 2024 QA/QC Programs.

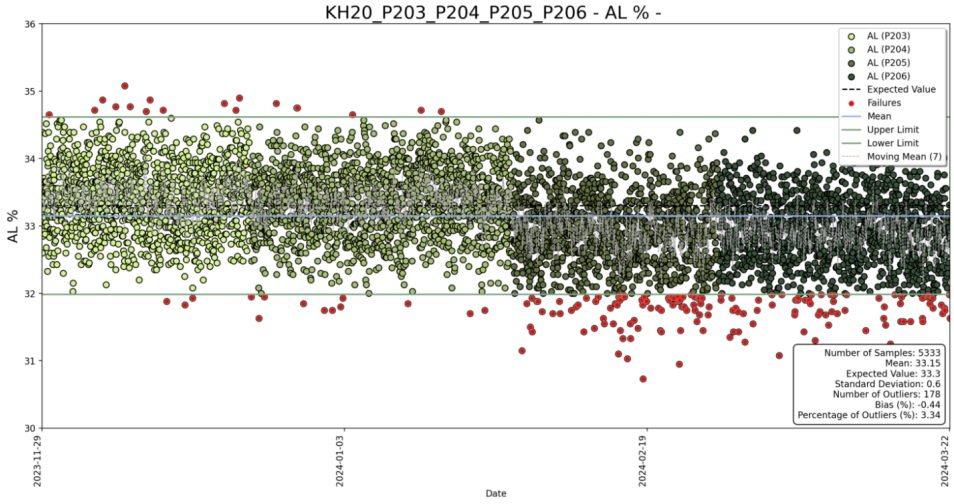
IRM	Element	Unit	Year Quarter	N Samples	Mean	EV	SD	N Outliers	Bias (%)	Outliers (%)	Upper Limit	Lower Limit
KH20_BV002	AL	%	2023Q4	1010	31.52	31.53	1.4	2	-0.02	0.2	35.63	27.43
	FE	%		1010	16.39	16.38	1.23	3	0.04	0.3	20.04	12.72
	SI	%		1010	1.03	1.03	0.11	6	0.02	0.59	1.35	0.71
KH20_BV004	AL	%	2023Q4	339	34.55	34.55	0.91	3	0	0.88	37.28	31.82
	FE	%		339	16.51	16.51	0.8	0	-0.02	0	18.92	14.1
	SI	%		339	0.86	0.86	0.02	0	0.09	0	0.92	0.8
KH20_P202	AL	%	2023Q4	1417	33.44	33.24	0.54	21	0.61	1.48	34.56	31.92
	FE	%		1417	15.87	16.12	0.6	34	-1.54	2.4	17.45	14.79
	SI	%		1417	1	1.03	0.04	170	-3.42	12	1.12	0.94
KH20_P203_P204_ P205_P206	AL	%	2023Q4 - 2024Q1	5333	33.15	33.3	0.6	178	-0.44	3.34	34.62	31.98
	FE	%		5333	15.84	16.01	0.58	125	-1.06	2.34	17.34	14.68
	SI	%		5333	0.99	0.99	0.04	153	-0.1	2.87	1.08	0.9
KH20_INT001	AL	%	2024Q2	460	33.35	33.36	0.89	0	-0.01	0	38.72	27.99
	FE	%		460	16.54	16.54	0.66	0	-0.02	0	19.58	13.5
	SI	%		460	1.06	1.06	0.05	0	-0.45	0	1.27	0.84
KH20_P207_P209_ P210_P208	AL	%	2024Q2	5000	32.99	32.95	0.54	66	0.13	1.32	34.27	31.63
	FE	%		5000	15.85	15.82	0.58	96	0.21	1.92	17.14	14.49
	SI	%		5000	0.98	0.98	0.04	68	-0.03	1.36	1.07	0.89
KH10	AL	%	2024Q3	549	35.09	35.13	0.63	1	-0.13	0.18	36.93	33.34
	FE	%		518	15.55	15.52	0.1	0	0.18	0	15.9	15.13
	SI	%		549	1.01	1.01	0.03	14	0.16	2.55	1.08	0.94
KH20_BV003	AL	%	2024Q3	328	31.94	31.95	1.12	0	-0.03	0	35.32	28.58
	FE	%		328	16.74	16.74	0.92	1	0	0.3	19.49	13.98
	SI	%		328	1.15	1.15	0.1	1	-0.42	0.3	1.46	0.84
KH20_P211_P212	AL	%	2024Q3	2398	32.95	33.03	0.55	39	-0.26	1.63	34.34	31.71
	FE	%		2398	15.84	15.85	0.57	38	-0.04	1.58	17.18	14.52
	SI	%		2398	0.98	0.99	0.04	58	-0.58	2.42	1.08	0.9

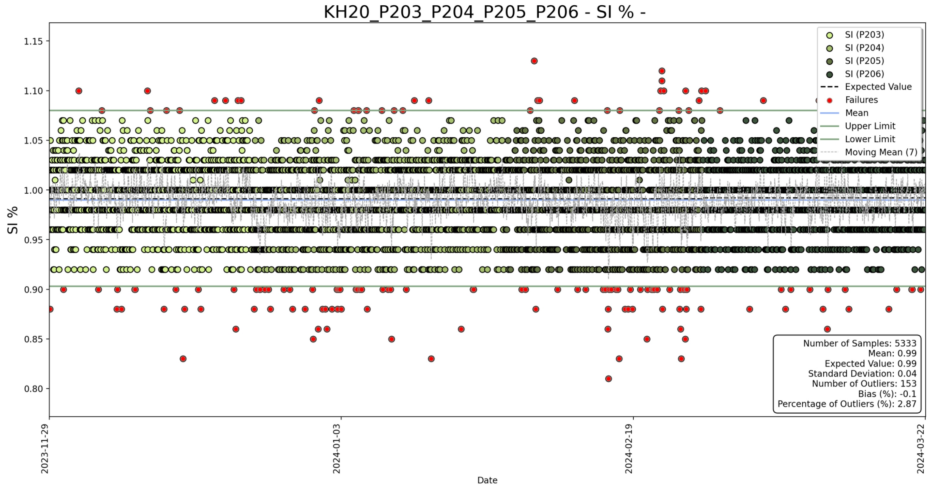
SLR selected three IRMs KH20 series for in-depth analysis, based on the number of samples utilized over the entire timeline from the fourth quarter of 2023 to the third quarter of 2024. This selection includes samples from batches P202 to P212.

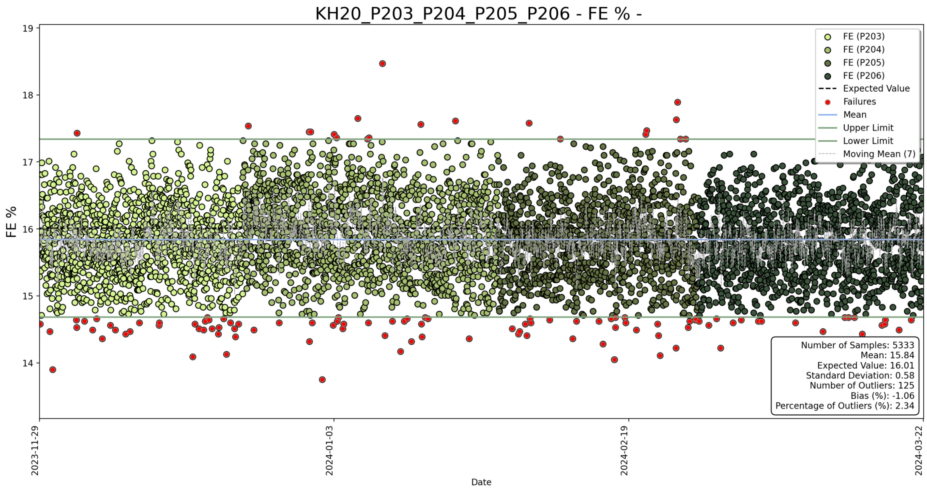
The results from the IRM KH20, analyzed by the laboratory between Q4 2023 and Q1 2024, as shown in Figure 8-7, include batches P203, P204, P205, and P206. These batches exhibit a slight negative bias of -0.4% for available alumina (AL), particularly in batches P205 and P206, with 146 instances falling below the -3SD threshold. Although this bias remains below the ±5% threshold, its negative trend makes it worthwhile to investigate the cause and implement corrections to avoid future issues. Conversely, reactive silica (SI) maintains a bias of -0.1%, with 2.8% of outliers, and iron (FE) shows a bias of -1%, with few failures falling below the lower limit.



igure 8-7: KH20 control chart of AL, SI, and FE

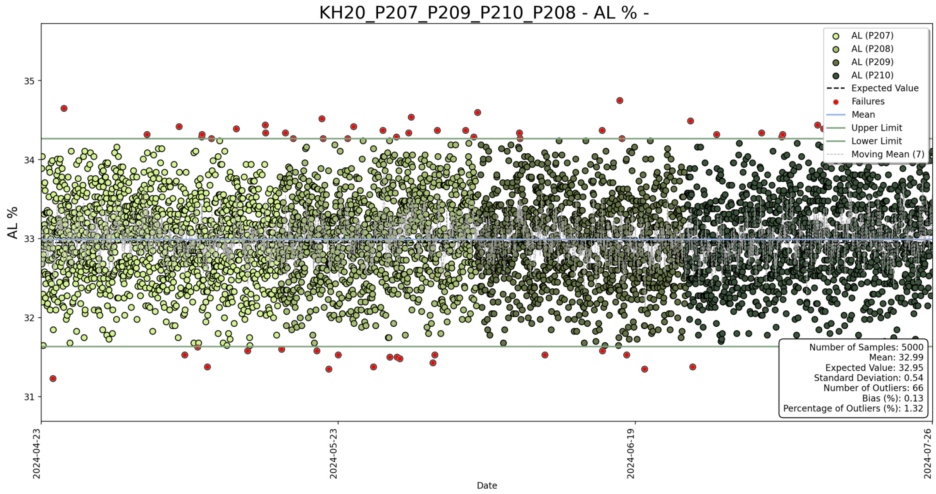


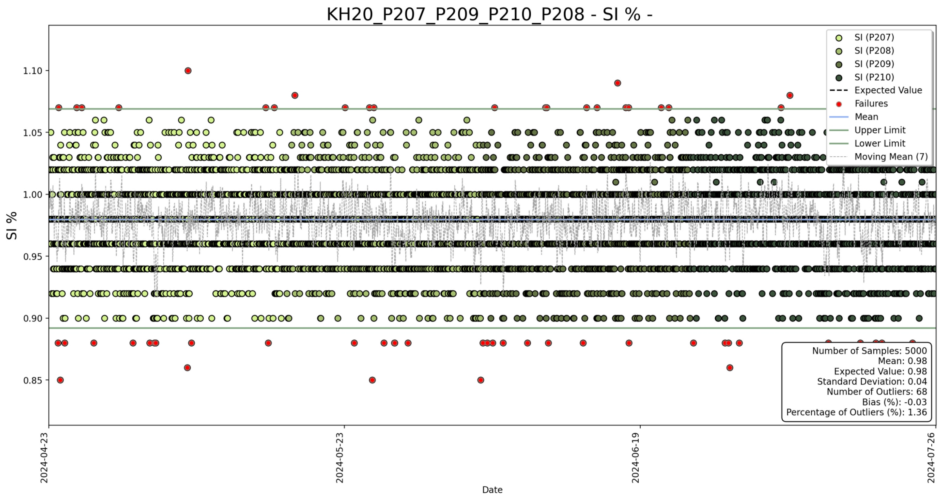


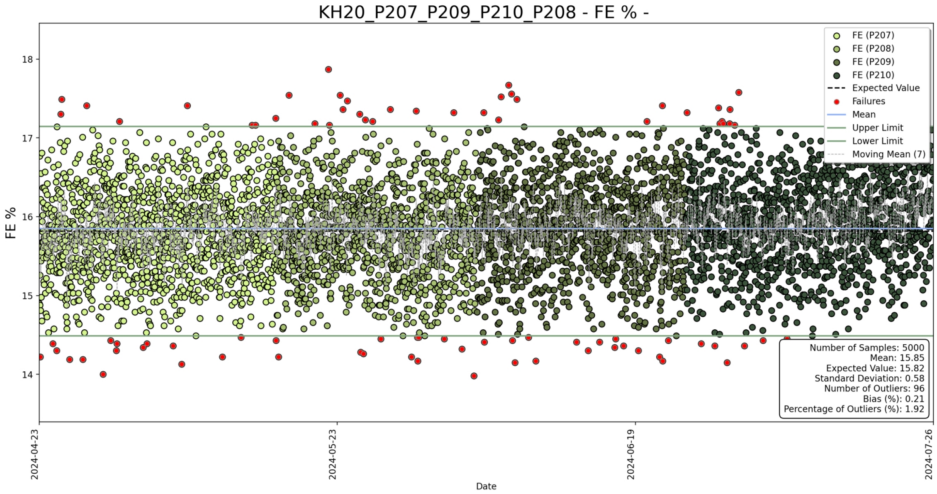


The IRM KH20 including batches P207 to P210, visualized in Figure 8-8, analyzed between Q2 and part of Q4 2024, shows more stable results with a minimal bias of 0.1% for AL, -0.03% for SI, and 0.21% for FE, and a controlled number of failures. This confirms an improved performance compared to batches P203 to P206. Similarly, batches P211 and P212, analyzed during the third quarter of 2024, display most results within threshold limits and low biases ranging from -0.04% to -0.58% for AL, SI, and FE, as observed in Figure 8-9.

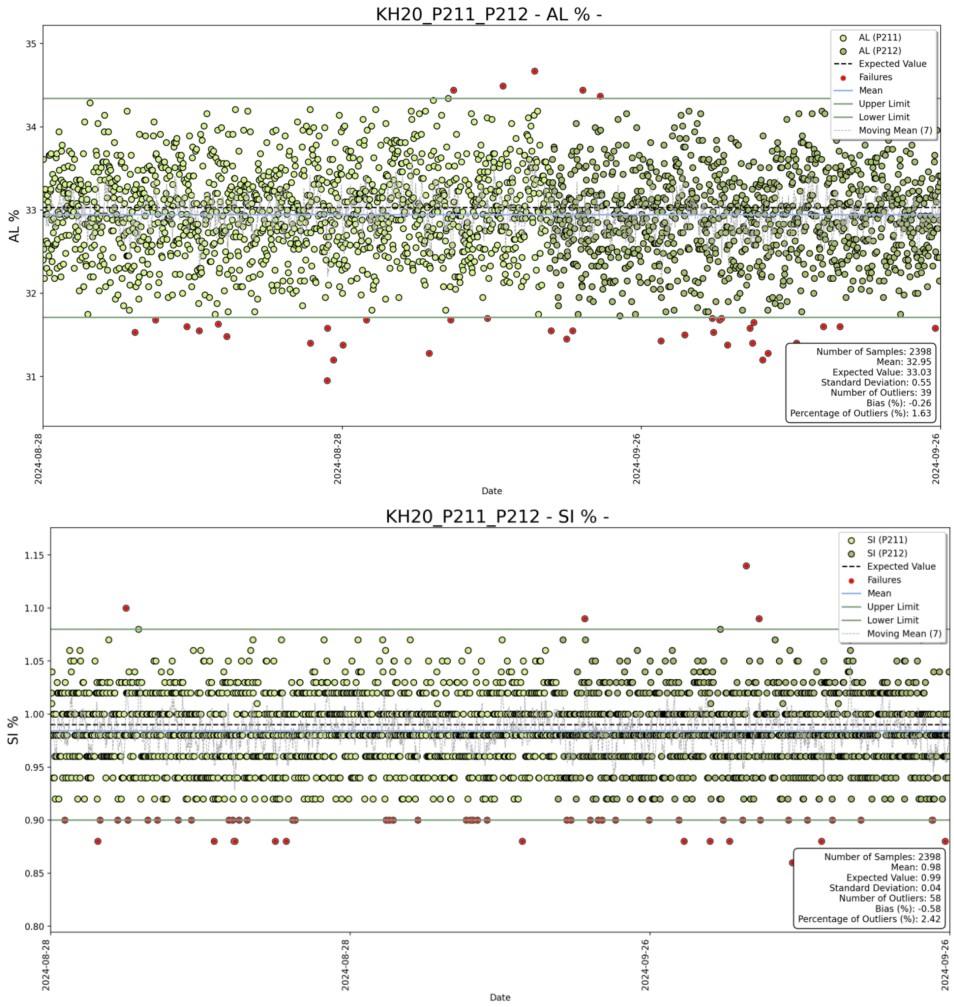
igure 8-8: KH20 control chart of AL, SI, and FE: Q2 2024 and Q3 2024

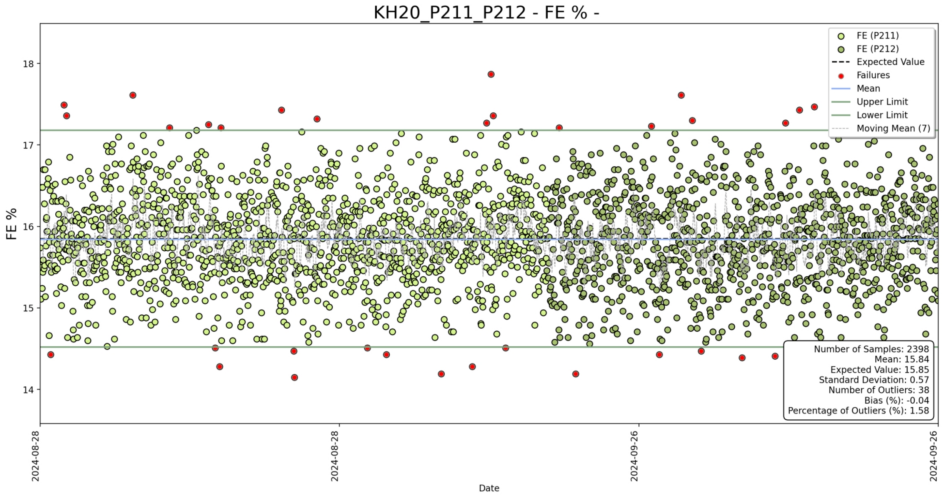



KH20_P207_P209_P210_P208 - SI % -
SI (P207)
SI (P208)
SI (P209)
SI (P210)
Expected Value
Failures
Mean
Upper Limit
Lower Limit
Moving Mean (7)
SI %
1.10
1.05
1.00
0.95
0.90
0.85
Number of Samples: 5000
Mean: 0.98
Expected Value: 0.98
Standard Deviation: 0.04
Number of Outliers: 68
Bias (%): -0.03
Percentage of Outliers (%): 1.36
2024-04-23
2024-05-23
2024-06-19
2024-07-26
Date


KH20_P207_P209_P210_P208 - FE % -
FE (P207)
FE (P208)
FE (P209)
FE (P210)
Expected Value
Failures
Mean
Upper Limit
Lower Limit
Moving Mean (7)
FE %
18
17
16
15
14
Number of Samples: 5000
Mean: 15.85
Expected Value: 15.82
Standard Deviation: 0.58
Number of Outliers: 96
Bias (%): 0.21
Percentage of Outliers (%): 1.92
2024-04-23
2024-05-23
2024-06-19
2024-07-26
Date

igure 8-9: KH20 control chart of AL, SI, and FE: Q3 2024 and Q4 2024





8.4.4 Duplicates

Duplicate samples help monitor preparation, assay precision, and grade variability as a function of sample homogeneity and laboratory error. The field duplicates are used to evaluate the natural variability of the original core sample, as well as detect errors at all levels of preparation and analysis including core splitting, sample size reduction in the preparation laboratory, subsampling of the pulverized sample, and analytical error. Coarse reject and pulp duplicates provide a measure of the sample homogeneity at different stages of the preparation process (crushing and pulverizing).

8.4.4.1 Field Duplicates

In January 2018, Alcoa discontinued the routine collection of field duplicates due to the limited benefits and issues with the sample splitting procedure (SLR, 2022). Consequently, no further data is available for review regarding field duplicates. This process has been replaced by the Sample to Extinction method, detailed in Section 8.4.4.4.

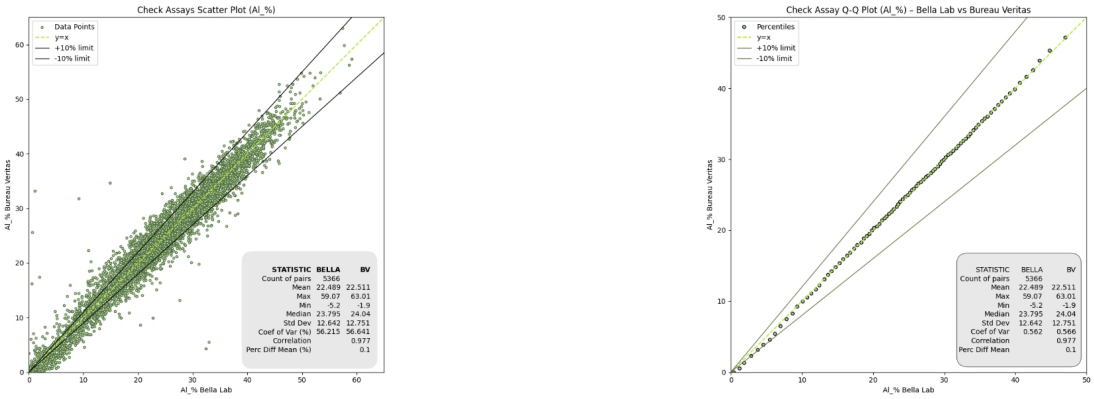
8.4.4.2 Check Assay – Umpire Laboratory Checks

Alcoa sends checks of REF samples assayed at Bella Lab to an independent laboratory, Bureau Veritas Minerals (BV), in Canning Vale, Western Australia for an impartial review. BV holds NATA accreditation No.626 and it is accredited for compliance with ISO/IEC 17025 – Testing. SLR was handed out a spreadsheet to examine, with a total of 5,366 samples that covered the original Bella and REF values as well as the results from the analytes re-assay by FTIR at BV. Results from the REF comparison with BV can be visualized in the form of scatter plots and quantile-quantile plots in Figure 8-10 to Figure 8-12 for AL, SI, and FE.

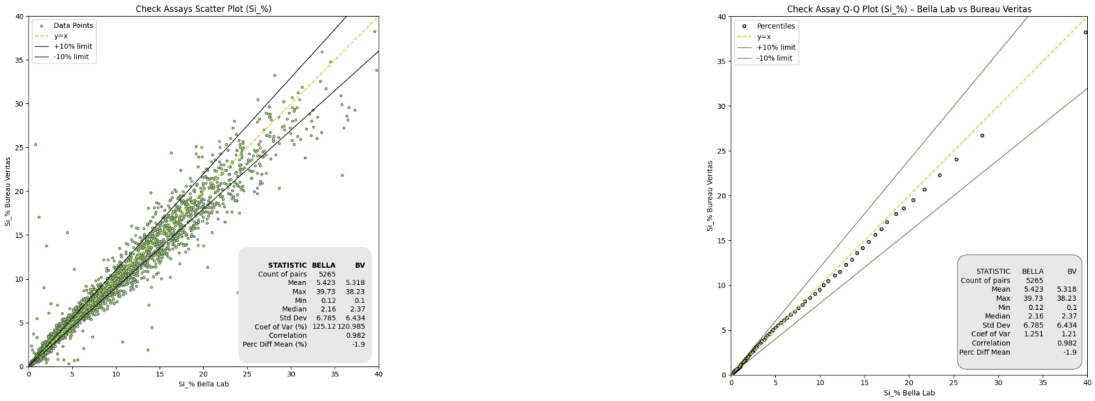
Results for AL show an acceptable difference of 0.1% between means and a very strong correlation of 0.977 for 5,336 pairs. The quantile-quantile plot suggests there does not seem to be any systematic bias in the measurements; since the data points follow the trend line closely and are consistent across the range of values. The analysis of SI showed a difference between

pairs of -1.9%. Bureau Veritas is reporting marginally lower values from 0% to 1%, slightly higher values between 1-6%, and exhibits a low to moderate bias above 6%. However, the correlation of 0.982 is considered good for 5,265 pairs and it may be worth noting that both populations are statistically similar. Similarly, the results of FE demonstrated a good correlation, with a coefficient of 0.985 and a low difference between means of 0.6%.

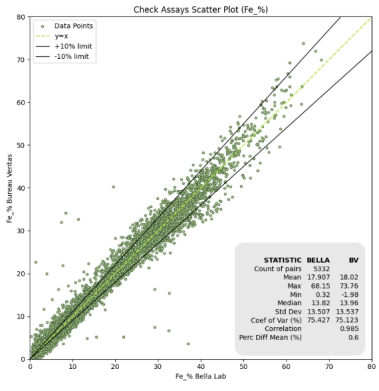
igure 8-10: Scatter Plot, Quantile-Quantile Plot and Statistics of AL Umpire Laboratory Checks – Bella and Bureau Veritas

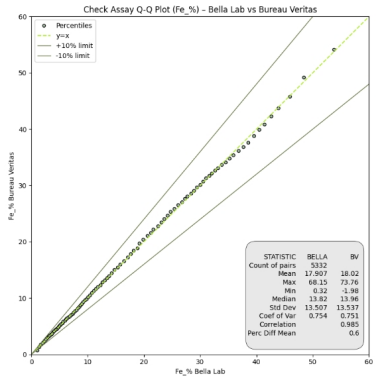


igure 8-11: Scatter Plot, Quantile-Quantile Plot and Statistics of SI Umpire Laboratory Checks – Bella and Bureau Veritas



igure 8-12: Scatter Plot, Quantile-Quantile Plot and Statistics of FE Umpire Laboratory Checks – Bella and Bureau Veritas





8.4.4.3 Twinned Hole Studies

Since the last report (SLR, 2023), the twin hole studies campaign has been suspended because of its limited value and therefore, no additional data is available for an updated analysis.

8.4.4.4 Sample To Extinction (STE) Samples

Following several reviews of the data sets from 2018 to 2021 by independent consultants, biases and poor repeatability were identified. The investigation suggested that the splitting process at the drill rig might have been flawed. It highlighted the sampling principle that pulverizing (reducing particle size) before splitting can significantly reduce errors. Based on these studies and external reviews, modifications were made to the splitting procedure at the rig.

Since 2020, Alcoa has refined the STE sampling procedure to collect one sample per shift from each drill rig and assay three Daughters after pulverizing and splitting. The 2023-2024 STE clean dataset, reviewed by SLR, included results for 380 pairs. SLR utilized this dataset to generate bivariate statistics, scatter plots, and quantile-quantile plots.

Comparisons were carried out for the analytes AL, SI, and FE between:

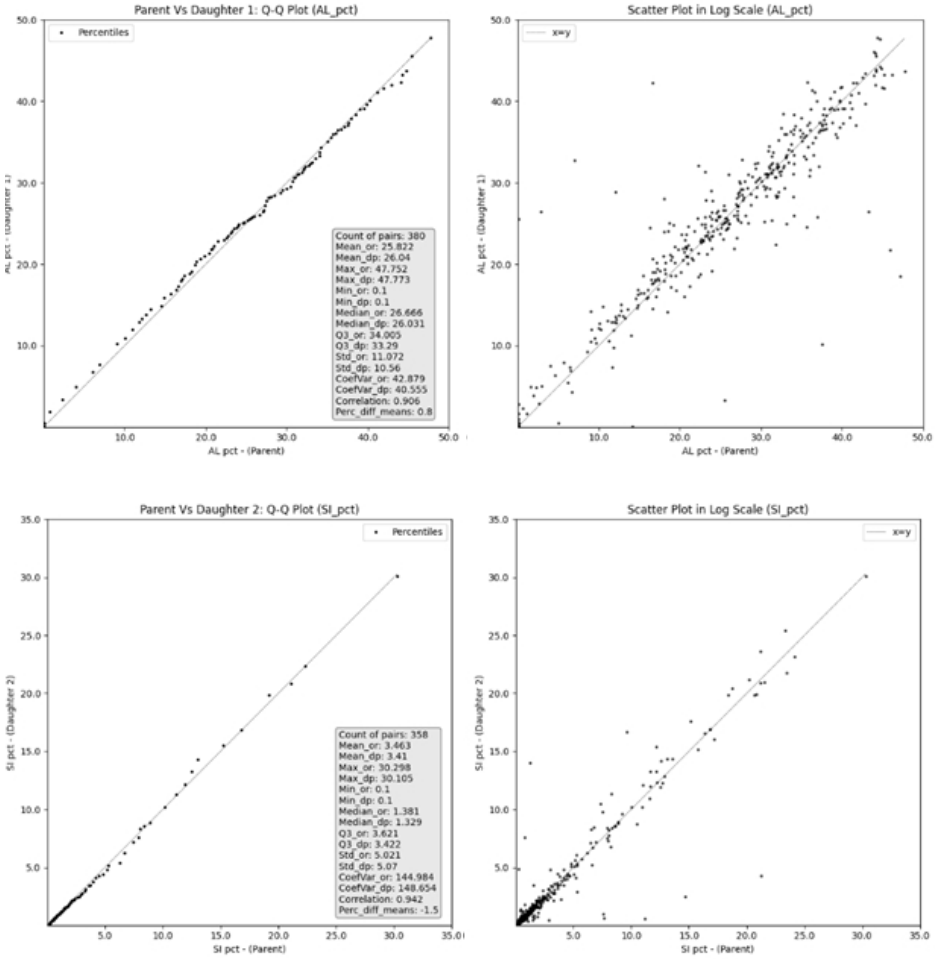
- Daughter 1 vs the Parent
- Daughter 2 vs the Parent
- Daughter 3 vs the Parent
- The average of the Daughters vs the Parent

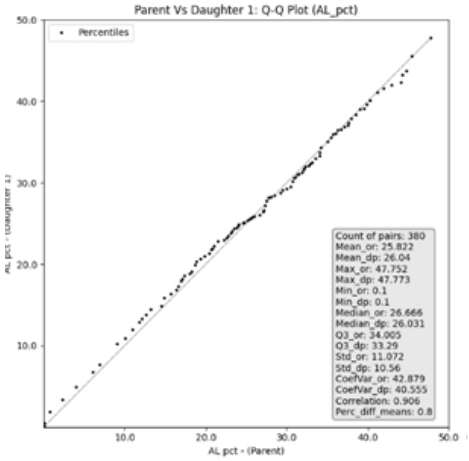
The evaluation of Parent-Daughter samples demonstrated reliable repeatability for the residue pulp repeats, indicating consistent test results across multiple trials. While the correlation between the tests was strong, the precision of the match was not perfect, with correlation coefficients ranging from 0.912 to 0.956. The Daughters (D1, D2, and D3) closely matched the original Parent sample, suggesting that the sample preparation and division methods were executed correctly.

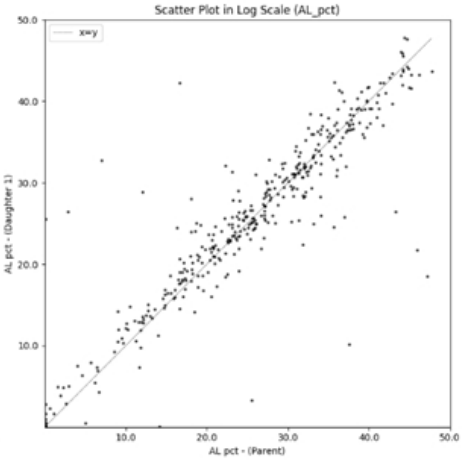
The available alumina (AL) results demonstrate overall good reproducibility, with a correlation coefficient of 0.91 when comparing parent samples to D1, D2, and D3. A slight shift in bias from positive to negative is observed at approximately 25%, even though the minimal difference of 0.8% between the means confirms the reproducibility. Conversely, reactive silica (SI) results exhibit some fluctuation along the 45-degree line, particularly at grades of 5% and above, but maintain a good correlation of 0.94 and a mean difference of -1.5% for D2. In contrast, iron (FE) results show a strong correlation coefficient of 0.96 and excellent reproducibility across all grade ranges. Examples are provided in Figure 8-13 for AL, SI, and FE.

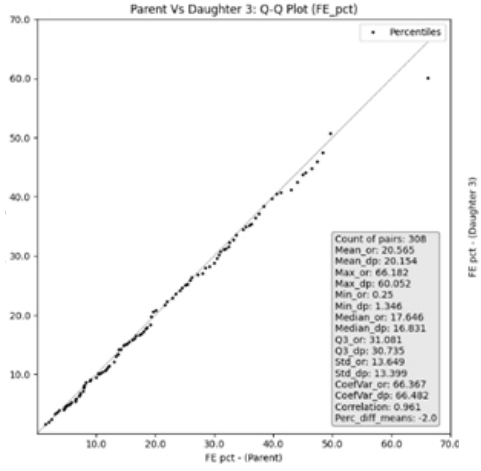
Regarding Average Daughter samples compared to Parent results, the data indicates good repeatability, as anticipated. This suggests that the split taken at the drill rig (parent sample, reduced to 150 g) provides a representative measure of the drill interval grade. This method is as effective as collecting the entire residue followed by pulverizing, homogenization, and splitting, as visualized in Figure 8-14.

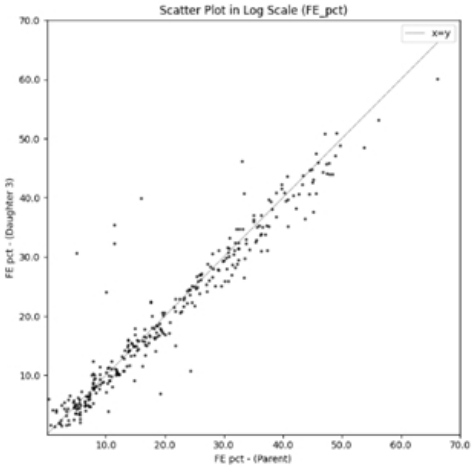
igure 8-13: Quantile-Quantile Plot (On the left) and Scatter Plots (on the right) of Parent and Individual Daughters' Analysis of AL,SI and FE



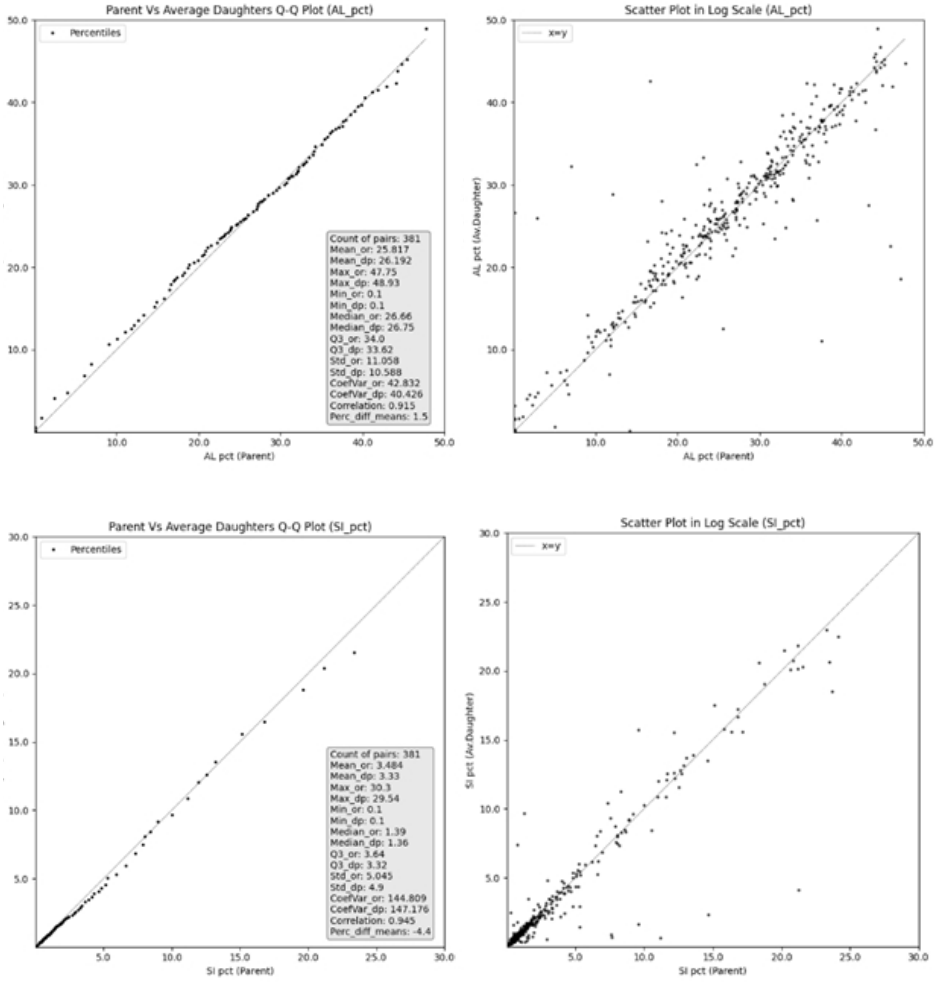

Parent Vs Daughter 1: Q-Q Plot (AL_pct)
Percentiles
Count of pairs: 380
Mean_or: 25.822
Mean_dp: 26.04
Max_or: 47.752
Max_dp: 47.773
Min_or: 0.1
Min_dp: 0.1
Median_or: 26.666
Median_dp: 26.031
Q3_or: 34.005
Q3_dp: 33.29
Std_or: 11.072
Std_dp: 10.56
CoefVar_or: 42.879
CoefVar_dp: 40.555
Correlation: 0.906
Perc_diff_means: 0.8
AL pct - (Parent)

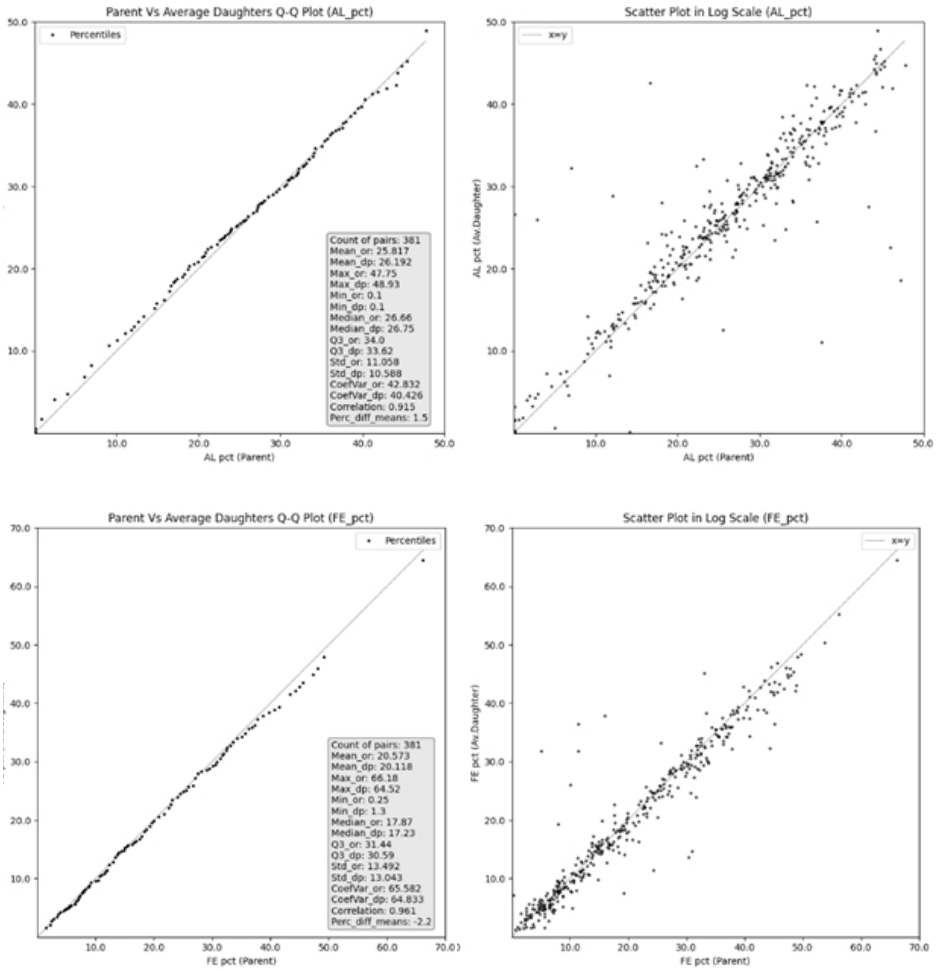

Scatter Plot in Log Scale (AL_pct)
x=y
AL pct - (Daughter 1)
AL pct - (Parent)


Parent Vs Daughter 3: Q-Q Plot (FE_pct)
Percentiles
Count of pairs: 308
Mean_or: 20.565
Mean_dp: 20.154
Max_or: 66.182
Max_dp: 60.052
Min_or: 0.25
Min_dp: 1.346
Median_or: 17.646
Median_dp: 16.831
Q3_or: 31.081
Q3_dp: 30.735
Std_or: 13.649
Std_dp: 13.399
CoefVar_or: 66.367
CoefVar_dp: 66.482
Correlation: 0.961
Perc_diff_means: -2.0
FE pct - (Parent)


Scatter Plot in Log Scale (FE_pct)
x=y
FE pct - (Daughter 3)
FE pct - (Parent)

igure 8-14: Quantile-Quantile Plot (on the left) and Scatter Plots (on the right) of Parent and Average of Daughters' Analysis of AL, SI and FE





8.4.4.5 Holyoake Program

In 2022, SLR undertook a comprehensive re-evaluation of historic assays to monitor the quality of historical data and guide daily production. A total of 33,224 historic and recent assays were provided, which were refined to produce 15,412 perfectly matched pairs. The QP conducted an analysis comparing the original historic FTIR available alumina (AL) and reactive silica (SI) assays with recent Holyoake duplicate assay results. Alcoa implemented the Holyoake check assay in 2021.

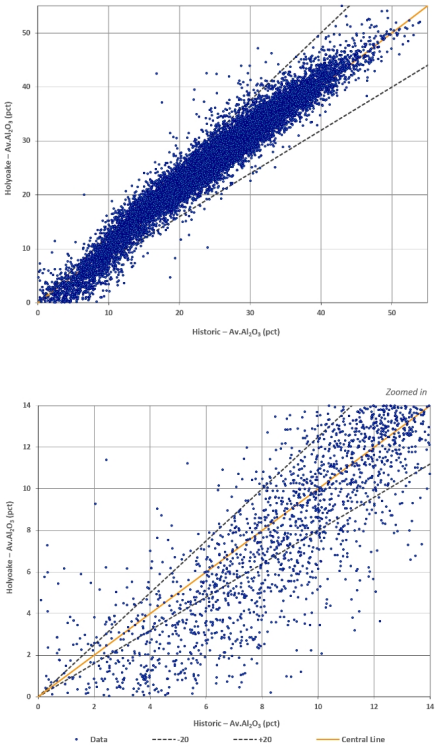
The analysis revealed that recent AL values are significantly higher above the 10% grade, indicating a clear high bias. Conversely, values below 10% showed a low bias, often exceeding an acceptable 20% difference limit. Similarly, SI values exhibited a low bias between grades of

0 and 5%, and a strong high bias for values above 5%. The percent differences between the means were notably high for both analytes, at 5.3% for AL and 13.5% for SI. These trends are illustrated in Figure 8-15, and Figure 8-16.

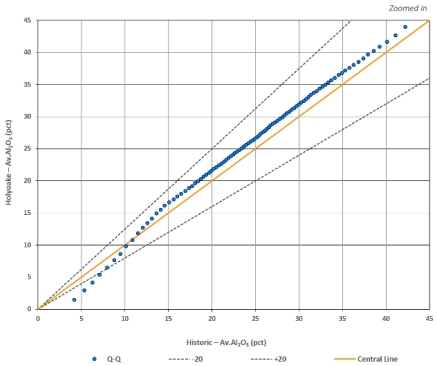
These discrepancies likely result from improvements in analytical methods and procedures since 2005, reflecting a better geochemical understanding of the deposit. SLR recommended addressing these biases by limiting the use of historic data where possible and continuing the re-assay program for assays collected before 2005.

igure 8-15: Scatter Plot, Quantile-Quantile Plot and Statistics of AL Historic and Holyoake Results.

Scatter Plot – AL



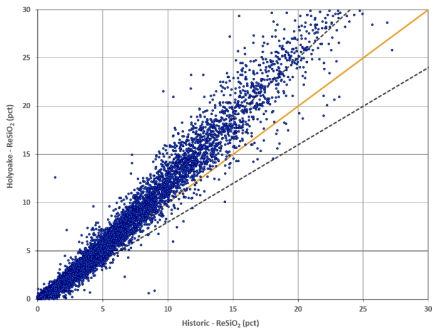
Quantile-Quantile Plot – AL

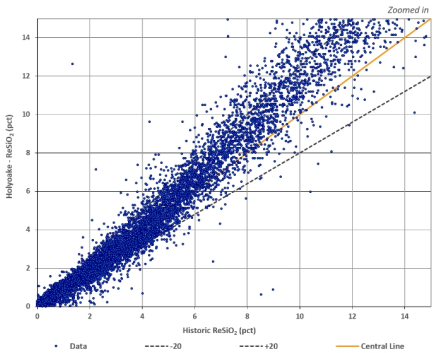


	Original	Duplicate
Number of Samples (N):	15,412	15,412
Mean (%):	23.71	24.96
Maximum Value (%):	59.00	58.60
Minimum Value (%):	-4.09	-2.08
Median (%):	24.46	26.10
Variance:	101.39	120.83
Std. Dev:	10.07	10.99
Co-ef. Variation:	0.42	0.44
Correlation Coefficient	0.975	
%Difference Between Means	-5.3%	

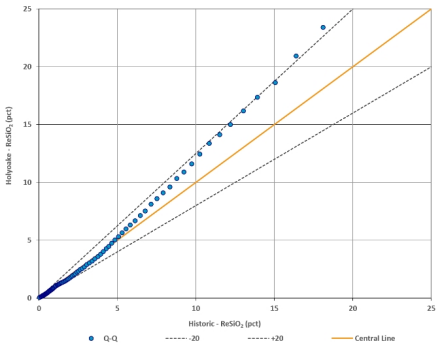
igure 8-16: Scatter Plot, Quantile-Quantile Plot and Statistics of SI Historic and Holyoake Results.

Scatter Plot – SI





Quantile-Quantile Plot – SI



	Original	Duplicate
Number of Samples (N):	15,412	15,412
Mean (%):	3.65	4.14
Maximum Value (%):	34.55	42.96
Minimum Value (%):	-0.92	-0.13
Median (%):	1.64	1.48
Variance:	21.37	34.71
Std. Dev:	4.62	5.89
Co-ef. Variation:	1.27	1.42
Correlation Coefficient	0.987	
% Difference Between Means	-13.5%	

8.4.4.6 Stockpile Feed and Sampling

Refinery feed grade is monitored at Huntly and Willowdale using material collected at the Pinjarra and Wagerup sample plants. At each operation, the sample plants are located at the refinery end of the overland conveyors, just prior to the stockpile stackers.

The stockpile area at the Pinjarra refinery is fed by two conveyor belts (SP-171 and SP-271) that derive their ore from the same crusher (currently at Myara). Prior to the ore being combined from the belts and fed to the stockpile area, it passes through a sampling tower that alternatively takes a primary cut from each belt, dries, crushes, subsamples and combines them into two parallel samples for 12-hour shifts.

A comparison of these paired samples (SLR, 2022) found no material issues and no new data was presented for this review.

8.5 Conclusions

The SLR QP is of the opinion that the data reviewed from November 2023 to September 2024, along with the protocols in place for ensuring accuracy and precision, provide sufficient confidence in the reliability of the data used for resource estimation. Sample and data security protocols adhere to the best industry standards.

In particular:

- The current use of internal standards provides a robust framework for ensuring the precision and accuracy of assay data through continuous adjustments. The QP recommends investigating the cause of the negative bias observed in available alumina results from batches P205 and P206 of the IRM KH20, which occurred between February and March 2024, to prevent future occurrences. Additionally, it is advised to continue monitoring failures and recurrent trending biases that might adversely affect the Mineral Resources estimate.
- The regular external checks performed by Bureau Veritas have ensured the reproducibility of the Bella lab results, with no significant biases observed in this review.
- The STE method effectively represents the drill interval grade, comparable to collecting the entire residue and performing pulverizing, homogenization, and splitting. Despite the efficacy of the STE process, the QP recommends considering the reintroduction of field duplicates using appropriate riffle splitters for additional validation of the sampling process.

It is the opinion of the QP that the sample preparation, security, and analytical procedures used for the Alcoa Mineral Resource meet conventional industry practice and are adequate to allow provision of data included in this Mineral Resource estimate. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied at more operations. At Alcoa, the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4.

It is the opinion of the SLR QP that, from the studies on FTIR repeatability discussed above, the overall precision and accuracy of the FTIR assaying is acceptable and adequate for use in a Mineral Resource estimate.

9.0 Data Verification

9.1 Data Structures

Wherever possible the transfer of geological, sampling and assaying data is now carried out digitally.

The use of rugged field tablets was introduced after an external review (Snowden, 2015). The data recorded at the drill rig is uploaded daily via WiFi for validation prior to importing into the acQuire database. This allows the data to be captured, checked, approved, and then loaded without any further manual keystroke entry.

The sample preparation and assaying data are all recorded at the Bella facility (see Figure 8-3) allowing all aspects of the sample preparation to be tracked and transferred to KWI through direct connection to their Laboratory Information Management System (LIMS). After calibration, validation and checking of the FTIR and REF assays they are transferred digitally to the acQuire database.

Within the database, scripts are run to prioritize the results and to define the BEST value for each analyte (e.g. AL_BEST, SI_BEST, etc.). The downhole accumulations of all grades are calculated, and the base of mineralization is determined. Other values are also calculated such as the Density using a regression equation (see Section 11.9.5).

An events table is used to change the status of each hole at all stages as it progresses through the validation process from designed, to drilled, to dispatched, to lab pending, to validated.

The various downhole geological features (LithCode, Seam, Geol Floor, etc.) are all verified spatially, validated by geologists using the vertical position and assays (e.g. Figure 7-6), and where appropriate metadata (e.g. Status Flag) is added to record the basis of the interpretation.

The required modelling files are exported from the acQuire database by the geostatisticians using queries. The final Mineral Resource models are then imported into the over-arching ArcMap environment for mine planning, and integration with the environmental and other planning protocols.

igure 9-1: Visual Display of Hole Status (logged and assayed) for Hole G39150224 in Serpentine (Alcoa, 2021)



9.2 Data Verification Measures

The QP interrogated the data extracted from the acQuire database for two areas (Serpentine and Millars). For these two areas, the count of records in each table is summarized in Table 9-1.

able 9-1: Count of Records by Database Table for Two Database Extracts

Data Type	Table	Serpentine	Millars
Collars	*tblass*	6,362	8,298
Surveys	*tblsur*	6,362	8,298
Assays	*tblass*	59,622	70,905
REF Assays	*tblassrefs*	611	711
Lithology	*tblgeoLithology*	69,564	82,762
Geology Floor	*tblgeoGeolFloor*	69,561	82,761
Seam	*tblgeoSeam*	69,564	82,762

Extensive checks were run to validate the integrity. These included searching for duplicate records, downhole gaps¸ interval overlaps, missing collar or survey records, etc.

The following observations were made:

- As expected, the Validation Tables ensure that there are no anomalous codes.
- Checks for assay closure (adding all assays to 100%) are done by Alcoa when the assay data is prepared for resource estimation. The availability of total oxide assays (e.g. AT and ST) has progressively increased over time.
- In a few cases (156 for Serpentine, drilled from October 2019 to December 2019, and 114 for Millars) there were blank values for LithCode in the table geoLithology at the top of the hole, followed by a zero-length interval (e.g. From 1.2 m and To 1.2 m) with a valid LithCode. This is due to the practice of not sampling the overburden but instead discarding it, creating in some cases a short interval with no assay or LithCode. This type of database error is usually picked up by a validation check looking for zero length drill segments. In this deposit, because the geological logging is expected to follow a vertical sequence (which is used for some of the interpretation scripts), such zero length intervals are not uncommon to allow for pinching and swelling of some horizons.

Some calculation and range checks were run that highlighted gaps or anomalies in the scripts used to validate that data before resource estimation:

- There are 19 records with ST_BEST values greater than 100% in Serpentine and 2 in Millars. Such values should be investigated, trimmed, and flagged.
- There are a number of records (107 for Serpentine and 165 for Millars) where AL (available alumina) is greater than AT (total alumina). There are also records (1,273 for Serpentine and 2,029 for Millars) where SI (reactive silica) is greater than ST (total silica). These should be further investigated, flagged in the database, and future instances flagged during data loading so that when such results (infrequently) occur there is recognition during the data loading that this is due to FTIR assays outside the normal calibration range, rather than due to sample mix-up or contamination.

• Checks on the regression calculation for density were run on the Serpentine database. There were 1,187 records not flagged as Seam=CAP, that had density values ranging from 2.04 to 2.28. These were either 20% or 40% CAP and had a density value reflecting the length weighted average of the two domains assigned. Of the total 6,399 records with valid seam and iron data, SLR found that 5,566 (87%) were within ±0.1 of the database density value. The remaining 833 records with Seam=CAP and an FE_BEST assay were either 60% or 80% CAP and had a density value reflecting the length weighted average of the two domains assigned.

9.3 QP Opinion

The database extracts that were provided proved very robust to scrutiny, except for a small number of anomalies noted, none of which are considered material in view of the vast number of drill holes, assays, and other records.

The QP is of the opinion that the database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.

10.0 Mineral Processing and Metallurgical Testing

Mineral processing and metallurgical test work samples representing the entirety of the Darling Range operations are not available. However, as an operating mine the resource classification is upgraded to measured well before extraction, with samples and test work conducted as part of these operations to confirm process suitability and compliance defining Reserves. SLR has reviewed the available resource data to confirm that this operating data aligns with the LOM schedule for material to be mined over the next nine years. This material is sourced from four mining regions, representing the various types and styles of mineralization within the Darling Range operations.

It is important to note that there is no upgrading involved in the processing and therefore the processing recovery can be considered above 99% allowing for any losses in production.

The operating data between 2010 to September 2024 for the Willowdale operation and 2010 to September 2024 for the Huntly operations indicates that the product from the Darling Range operations consisted of an average AL grade of 33% and average Total SiO_2 grade of 20%. It is important to note that higher grades of SI are potentially deleterious (in that they would increase the refinery cost) but that it has remained below 1.31% throughout the 14 years of operation with the recent increase associated with the reduction in available bauxite stocks in the current mining regions. SLR understands that according to the long term mine plan on an annual basis the Total SiO_2 content marginally increases towards 23% over the next three years, and then for the remainder returns to averages of 22.5%. The SI, on the same basis, remains at or below 1.8% (for the combined mine output) both in the short term and over the remaining period of the next nine years. This means there is no evidence of any problematic deleterious elements present in the Darling Range ore within the next nine years of production.

A summary of the product grades from the Darling Range operations are shown in Table 10-1, Table 10-2, and Table 10-3.

able 10-1: Product Grades of Darling Range Operation (Willowdale–Wagerup refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2010	8.0	22.3	38.1	21.8	17.5	1.43	32.8	1.13
2011	7.9	20.9	40.6	22.3	17.6	1.47	32.8	1.14
2012	8.0	21.0	38.1	21.1	18.1	1.58	33.0	1.16
2013	7.7	21.2	36.8	18.6	19.5	1.61	32.7	1.21
2014	7.9	21.2	37.2	18.1	19.3	1.62	33.1	1.17
2015	7.5	21.5	37.0	18.0	19.0	1.72	33.2	1.11
2016	7.8	21.6	37.6	16.7	20.6	1.75	33.1	1.14
2017	7.8	21.8	37.9	16.0	21.4	1.83	33.0	1.10
2018	8.0	21.6	38.3	15.9	21.3	1.88	33.0	1.13
2019	7.6	21.3	37.3	16.8	21.3	1.85	32.3	1.15
2020	7.8	21.5	37.4	14.1	23.3	2.10	32.5	1.07
2021	8.3	21.5	37.5	18.0	21.0	1.73	32.4	1.06

2022	7.8	21.1	37.5	17.9	21.3	1.85	32.3	1.02
2023	7.8	20.6	36.8	18.8	21.5	1.80	31.6	1.04
2024*	8.0	19.1	34.0	23.2	21.1	1.81	28.4	2.00

** Data available to 30 September 2024*

able 10-2: Product Grades of Darling Range Operations (Huntly–Pinjarra refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2010	7.4	20.8	38.6	20.8	17.4	1.34	33.1	1.05
2011	7.8	21.0	38.8	20.0	18.0	1.41	33.0	1.04
2012	8.2	21.4	39.4	20.2	17.1	1.37	33.6	1.13
2013	8.1	21.5	39.8	19.5	17.1	1.35	33.9	1.12
2014	8.2	21.5	39.6	18.6	17.7	1.45	33.8	1.16
2015	8.0	21.6	39.3	19.5	17.3	1.41	33.8	1.08
2016	8.2	21.4	39.2	20.3	17.0	1.38	33.8	1.13
2017	8.3	21.3	39.3	19.6	17.5	1.42	33.9	1.11
2018	8.3	21.4	39.1	19.5	17.6	1.42	33.7	1.07
2019	8.1	21.3	38.9	20.1	17.2	1.38	33.5	1.12
2020	8.4	21.4	39.1	18.4	18.6	1.52	33.5	1.20
2021	8.9	21.1	38.8	19.7	18.3	1.48	33.0	1.24
2022	8.5	20.8	37.9	19.3	19.9	1.62	31.9	1.31
2023	9.1	19.7	35.6	20.0	21.9	1.84	29.6	1.64
2024*	9.3	18.9	33.9	22.9	20.5	1.78	28.5	2.19

* Data available to 30 September 2024

able 10-3: Product Grades of Darling Range Operations (Huntly–Kwinana refinery feed)

Year	Moisture (%)	LOI (%)	Total Al_2O_3 (%)	Total SiO_2 (%)	Fe_2O_3 (%)	TiO_2 (%)	AL (%)	SI (%)
2006	7.8	21.7	39.3	18.7	18.0	1.37	33.9	1.10
2007	8.0	21.6	39.2	19.5	17.6	1.33	33.7	1.11
2008	7.9	21.3	39.1	20.1	17.3	1.34	33.8	1.09
2009	7.8	21.3	39.0	20.7	17.3	1.29	33.5	1.02
2010	7.5	21.4	38.6	20.8	17.4	1.26	33.1	1.04
2011	7.6	21.3	38.7	20.1	18.2	1.30	32.8	1.03
2012	8.2	21.5	39.4	20.3	17.0	1.25	33.5	1.13
2013	8.1	21.8	39.8	19.5	17.1	1.26	33.9	1.11
2014	8.2	22.0	39.6	18.8	17.7	1.37	33.7	1.17
2015	8.0	22.0	39.4	19.7	17.2	1.31	33.8	1.08



2016	8.2	21.7	39.1	21.3	16.1	1.32	33.8	1.03
2017	8.3	22.2	38.9	20.6	16.5	1.34	33.8	1.03
2018	8.3	22.1	38.6	20.8	16.7	1.33	33.9	1.05
2019	8.0	21.8	38.9	21.2	16.4	1.32	33.5	1.12
2020	8.4	21.7	39.1	19.8	17.6	1.44	33.5	1.16
2021	8.9	21.0	38.7	20.9	17.6	1.39	33.0	1.20
2022	8.5	20.8	37.6	20.7	18.6	1.50	31.9	1.26
2023	9.1	20.0	35.8	21.2	20.6	1.76	29.6	1.61
2024*	8.0	19.0	34.6	24.5	19.6	1.70	28.1	2.33

** Data available to 30 April 2024*

10.1 QP Opinion

SLR is of the opinion that the Darling Range operation demonstrates that ore can be effectively crushed and supplied to a refinery for further upgrading to produce Alumina. The historical operational data confirms that the ore consistently meets refinery specifications without any deleterious elements. Based on this, and the additional information about the mine plan provided by Alcoa, it is reasonable to assume that the ore from Darling Range can be economically processed for the next nine years.



11.0 Mineral Resource Estimates

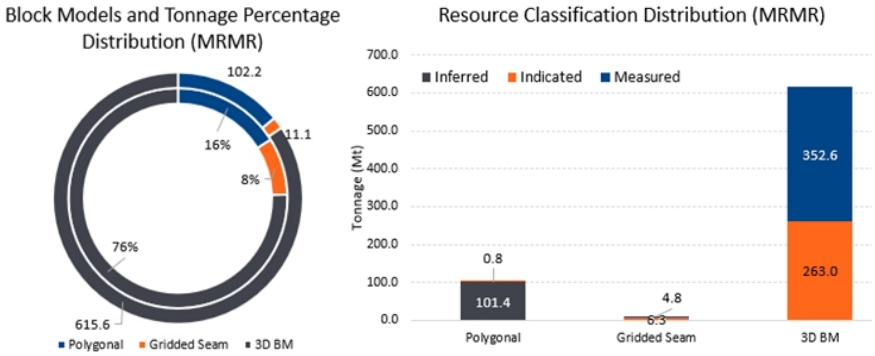
11.1 Summary

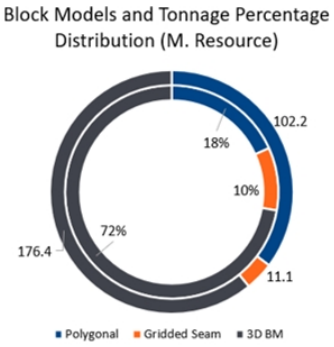
The Darling Range resource comprises over 20,000 resource blocks, with a combined area of approximately 10,250 ha, averaging 30 kt of Mineral Resource per block. The lateritic bauxites occur as surficial coverings of limited thickness, typically between 4 m to 8 m, but with significant lateral extent. Historically, resource estimation was by 2D plan-polygonal methods (Polygonal) referred to by Alcoa informally as the ResTag procedure. More recently, resource estimation by Alcoa has evolved to include gridded seam (GSM) and 3D block (3DBM) models using geostatistical techniques. Mineral Resource estimates based on GSM and 3DBM models (and some Polygonal models) consider practical mining constraints.

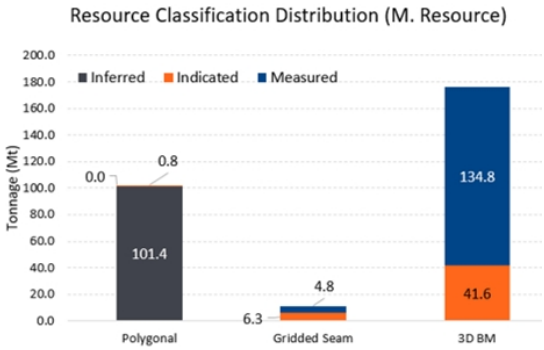
The delineation of Mineral Resources using 3D methods has focused on well drilled areas that fall within the nine-year mine plan. Approximately 82% of the total tonnage, including Mineral Resources and Mineral Reserves (MRMR), of the Darling Range project is already in 3D block models. GSM models were typically constructed in areas with 15 m spaced drilling, which comprises 10 models. Approximately 34% of the Mineral Resources are based on Polygonal (ResTag) estimates which are mostly located in areas of wider-spaced (30 m and 60 m) drilling and are of lower confidence. All new resource updates employ the 3DBM methods irrespective of drill hole spacing.

Figure 11-1 illustrates the tonnages and number of models for each model type that are being discussed in this section.

igure 11-1: Circle Charts Showing the Tonnage in Mt (external circle) and Number of Models (internal Circle) and Bar Charts Showing the Tonnage by Mineral Resource Categories







Charts on the top refer to all the tonnage of the Darling Range project, and on the bottom to the exclusive Mineral Resources

Mineral Resource estimation was carried out by Alcoa and resources are defined for 92 sheets in 70 mining regions. There are 13,467 discrete zones of mineralization that comprise the resource, each split vertically into 4 domains for which 11 elements were estimated. SLR carried out audits on representative models selected in conjunction with Alcoa and comprising:

- Models to be mined in the short to medium term (less than 5 years)
- Models with significant amounts of resource material
- Models representing the three estimation methods used by Alcoa.

The models audited were:

- ResTag estimation method: Teesdale
- GSM estimation method: Larego (F54 and F55)
- 3DBM estimation method: Myara North M25, M22, M23, and Holyoake H12.

The audit process by SLR comprised examination of the procedures used by Alcoa, independent review, discussion with staff, and normal validation checks (e.g., global statistics, swath plots, visual examination, and change of support analysis). M23 and H12 were the focus of the 2023 work, while R25 and R22 were reviewed in detail in the previous years.

The process used by Alcoa involves an integrated approach to data collection, bauxite delineation, and production planning aimed at the provision of feedstock that meets the requirements of the local alumina refineries.

For all 3 estimation methods drill holes were flagged with geological units using multi-pass geochemical scripts that included thickness constraints. The GSM flagging process incorporated some additional mining constraints. Geological interpretations in both 2D and 3D were constructed with the flagged drill hole composite data, which constrain the spatial estimation of bauxite mineralization. Subsequent to block grade estimation, mining constraints are applied to the 3DBM models to restrict Mineral Resources to areas of potentially economic bauxite mineralization.

AL, SI, FE, ST, PT, OX, EO, CO, and SU are estimated for all models, but only AL and SI are reported for the Mineral Resource. GSM uses inverse distance weighting methods to assign grades to the bauxite profile, and 3DBMs rely on ordinary kriging block grade estimates. Validation methods differ slightly for the different model types, but all models are reported by Alcoa to validate well against the input drill hole data.

Mineral Resources have been classified in accordance with the definitions for Mineral Resources in S-K 1300, which are consistent with Australasian JORC Code (2012) and Canadian Institute of Mining Metallurgy and Petroleum (CIM) (2014) definitions in NI 43-101 and are determined primarily on drill hole spacing. Models constructed primarily with pre-2010 drill holes are downgraded as this information is considered to be of lower confidence.

Mineral Resource estimates exclusive of Mineral Reserves Darling Range deposit are shown in Table 11-1, and include a 5% reduction factor in tonnage, based on the results of annual reconciliations (see discussion on density in Section 11.14).

able 11-1: Summary of Darling Range Mineral Resources exclusive of Mineral Reserves – 31 December 2024

Category	Tonnage (Mt)	AL (%)	SI (%)
Measured	139.6	30.4	1.77
Indicated	48.7	30.3	1.42
Measured + Indicated	**188.4**	**30.4**	**1.68**
Inferred	101.4	32.4	1.20

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed, which are consistent with JORC (2012) definitions.

2. Mineral Resources are 100% attributable to Alcoa.

3. Mineral Resources for the polygonal models are estimated at a geological cut-off grade, which generally approximates to nominal cut-off grades of 27.5% available alumina (AL) with less than 3.5% reactive silica (SI). Locally the cut-off grade may vary, depending on operating costs and ore quality for blending.

4. Mineral Resources were estimated using an alumina LOM price of $500/t and a caustic soda LOM price of $300/t.

5. A minimum total mining thickness of 1.5 m was used.

6. In situ dry bulk density is variable and is defined for each block in the Mineral Resource model.

7. A global downwards adjustment of tonnes by 5% is made to account for density differences based on historic mining performance.

8. Mineral Resources are reported exclusive of Mineral Reserves.

9. The reference point for the Mineral Resource is the in situ predicted dry tonnage and grade of material to be delivered to the refinery stockpile following the application of Mineral Resource pit.

10. Metallurgical recovery has not been directly considered in the estimation of Mineral Resources as the Darling Range operations do not include a conventional processing plant, only crushing as described in Section 14.0. The metallurgical recovery of the refineries (Pinjarra and Wagerup) are beyond the boundaries of the mining operations being the subject of the TRS.

11. Numbers may not add due to rounding.

11.2 Comparison with Previous Estimate

A comparison of the current Alcoa Mineral Resource estimate, exclusive of Mineral Reserves, to the previous 2023 Mineral Resource estimate is presented in Table 11-2.

Overall, the Measured and Indicated resources decreased 10.1 Mt (-5%), from 198.4 to 188.4 Mt, while the Inferred resource decreased 5.5 Mt (-5%), from 106.9 to 101.4 Mt.

The decreases are primarily due to the following changes:

- Optimization of the Mineral Resources and Mineral Reserves considering the base alumina and caustic soda prices

- Migration from Mineral Resources to Mineral Reserves due to mine scheduling changes

Partially offset by:

- Deferred mining of the RPZ
- Continuous mineral exploration activities (for Resource expansion).



able 11-2: Comparison with Previous Mineral Resource Estimates

Category	Mine	2024 Mineral Resource			2023 Mineral Resource			Difference (%)		
		Tonnage (Mt)	AL (%)	SI (%)	Tonnage (Mt)	AL (%)	SI (%)	Tonnage	AL	SI
Measured	Huntly	106.1	30.4	1.89	51.5	30.5	1.62	106%	0%	17%
	North	0.0	0.0	0.00	0.0	0.0	0.00	---	---	---
	Willowdale	33.5	30.4	1.39	41.5	30.4	1.39	-19%	0%	0%
	Sub-total	**139.6**	**30.4**	**1.8**	**93.0**	**30.4**	**1.52**	50%	0%	17%
Indicated	Huntly	40.7	30.3	1.46	66.3	31.0	1.50	-39%	-2%	-2%
	North	0.8	32.3	1.38	0.8	32.3	1.38	0%	0%	0%
	Willowdale	7.2	29.9	1.16	38.3	30.4	1.05	-81%	-2%	10%
	Sub-total	**48.7**	**30.3**	**1.42**	**105.4**	**30.8**	**1.34**	-54%	-1%	6%
Measured + Indicated	Huntly	146.9	30.4	1.8	117.7	30.8	1.55	25%	-1%	14%
	North	0.8	32.3	1.38	0.8	32.3	1.38	0%	0%	0%
	Willowdale	40.7	30.3	1.35	79.8	30.4	1.23	-49%	0%	10%
	Sub-total	**188.4**	**30.4**	**1.68**	**198.4**	**30.6**	**1.42**	-5%	-1%	18%
Inferred	Huntly	9.0	35.7	1.25	11.2	34.4	1.35	-19%	4%	-8%
	North	15.1	31.6	1.00	15.1	31.6	1.00	0%	0%	0%
	Willowdale	77.3	32.2	1.24	80.6	32.2	1.24	-4%	0%	0%
	Sub-total	**101.4**	**32.4**	**1.2**	**106.9**	**32.3**	**1.22**	-5%	0%	-1%



11.3 Resource Database

11.3.1 Drill Hole Data

Drill hole collar, survey, and assay data are exported from the acQuire database for resource estimation.

Data exports from acQuire currently utilize Python scripts and the Spyder open-source plugin for validation and initial processing, including:

- Removing holes where drill hole intervals lack AL, SI, and FE assays
- Removing holes from the database if located greater than 7 m horizontally from the planned location
- Identifying and removing duplicate or repeat holes based on a set of criteria
- Resetting AT to AL where AL exceeds AT
- Where SI exceeds ST, resetting SI to ST if ST is greater than 15%, otherwise reset ST to SI
- Calculating Assay Total = AT (AL if AT absent) + ST + FE + PT + (SU/17.74) + 2
- Deleting assays for samples where the Assay Total is below 70% or greater than 100%.

The output is a set of CSV files for collar, survey, assay, and geology. The assay file contains a series of variables, including grades, cumulative grades, and historical domaining fields that are no longer used for the current geological modelling methodology. Table 11-3 shows the variables available in the assay output file.

able 11-3: Variables in the assay table

Variable	Description	Variable	Description
Hole ID	Drill hole identification	**Cumulatives Date**	Date Cumulatives script was run
Project	Mining region	**BO_BEST**	Final bohemite AlO(OH) assay - based on DB priority, generally REF first then FTIR
Sample ID	Sample identification	**AL_BEST**	Final available alumina (AL) assay
From	Beginning of the sample	**EO_BEST**	Final extractable organic carbon (C) assay
To	End of the sample	**FE_BEST**	Final Fe_2O_3 assay
Seam	Profile unit - derived from logging. CAP from logged Cap depth then FRI derived from set of rules that determine the first clay sample beneath it	**MS_BEST**	Final magnetic susceptibility assay
Storage Status	Information of the sample's storage	**OX_BEST**	Final oxalate (NaC_2O_4) assay
Cumulative Density	Downhole cumulative density calculated in DB from top of CAP	**CO_BEST**	Final carbonate assay
Cumul_AL	Downhole cumulative AL calculated in DB from top of CAP	**SU_BEST**	Final sulphate (Na_2SO_4) assay
Cumul_AT	Downhole cumulative AT calculated in DB from top of CAP	**PT_BEST**	Final total phosphorus (P_2O_5) assay
Cumul_BO	Downhole cumulative BO calculated in DB from top of CAP	**SI_BEST**	Final reactive silica (SI) assay
Cumul_CO	Downhole cumulative CO calculated in DB from top of CAP	**ST_BEST**	Final total silica (SiO_2) assay
Cumul_EO	Downhole cumulative EO calculated in DB from top of CAP	**AT_BEST**	Final total alumina (Al_2O_3) assay
Cumul_FE	Downhole cumulative FE calculated in DB from top of CAP	**Density**	Density - calculated and stored as an assay - FE based algorithm for CAP otherwise 2. but are consistent with the values used other than for OVB and CLY

Cumul_MS	Downhole cumulative MS calculated in DB from top of CAP	**DOM1**	Levels of domain coding - Historical fields no longer used
Cumul_OX	Downhole cumulative OX calculated in DB from top of CAP	**DOM2**	
Cumul_PT	Downhole cumulative PT calculated in DB from top of CAP	**DOM3**	
Cumul_SI	Downhole cumulative SI calculated in DB from top of CAP	**DOM4**	
Cumul_ST	Downhole cumulative ST calculated in DB from top of CAP	**DOM5**	
Cumul_SU	Downhole cumulative SU calculated in DB from top of CAP	**DOM6**	
Cumulatives By	Whoever ran the script to calculate Cumulatives		

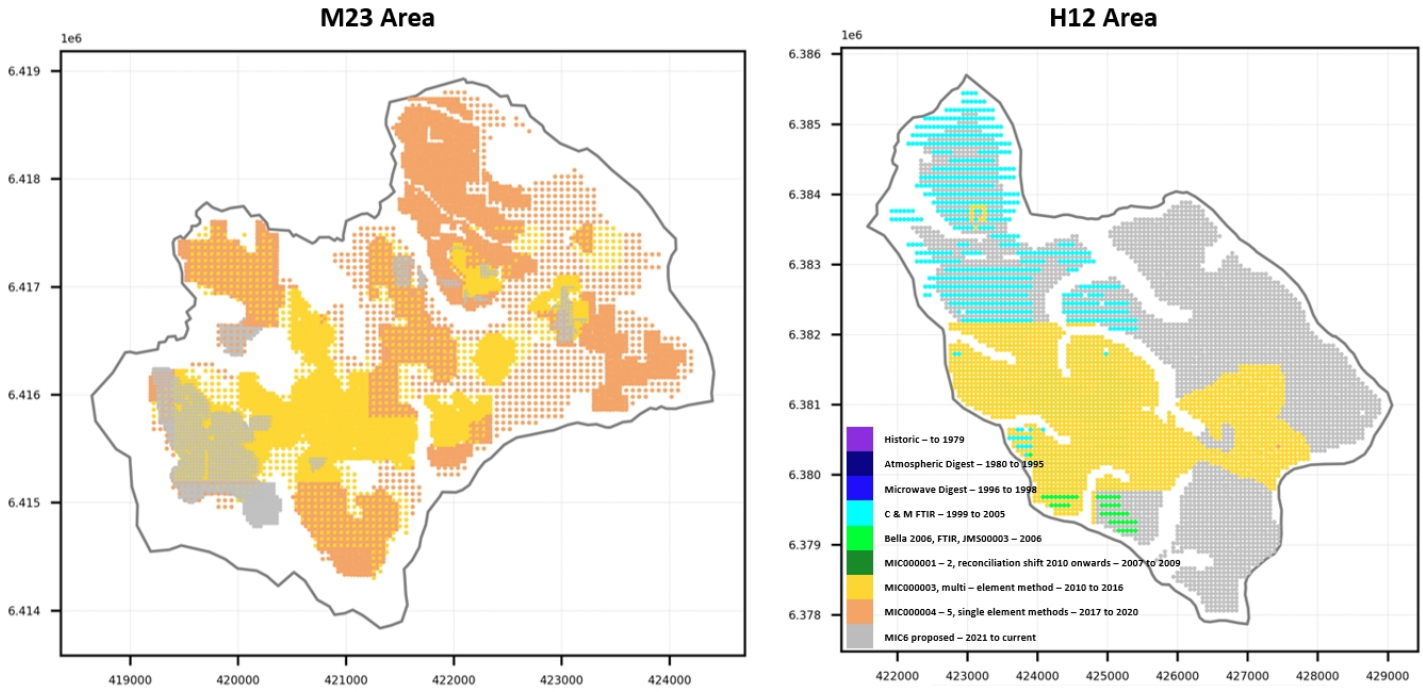
The validation checks have been implemented progressively over time as drill hole data for some project areas includes some samples where AL exceeds AT and SI exceeds ST.

Other than collar elevation adjustments, no further data transformations are applied prior to resource estimation.

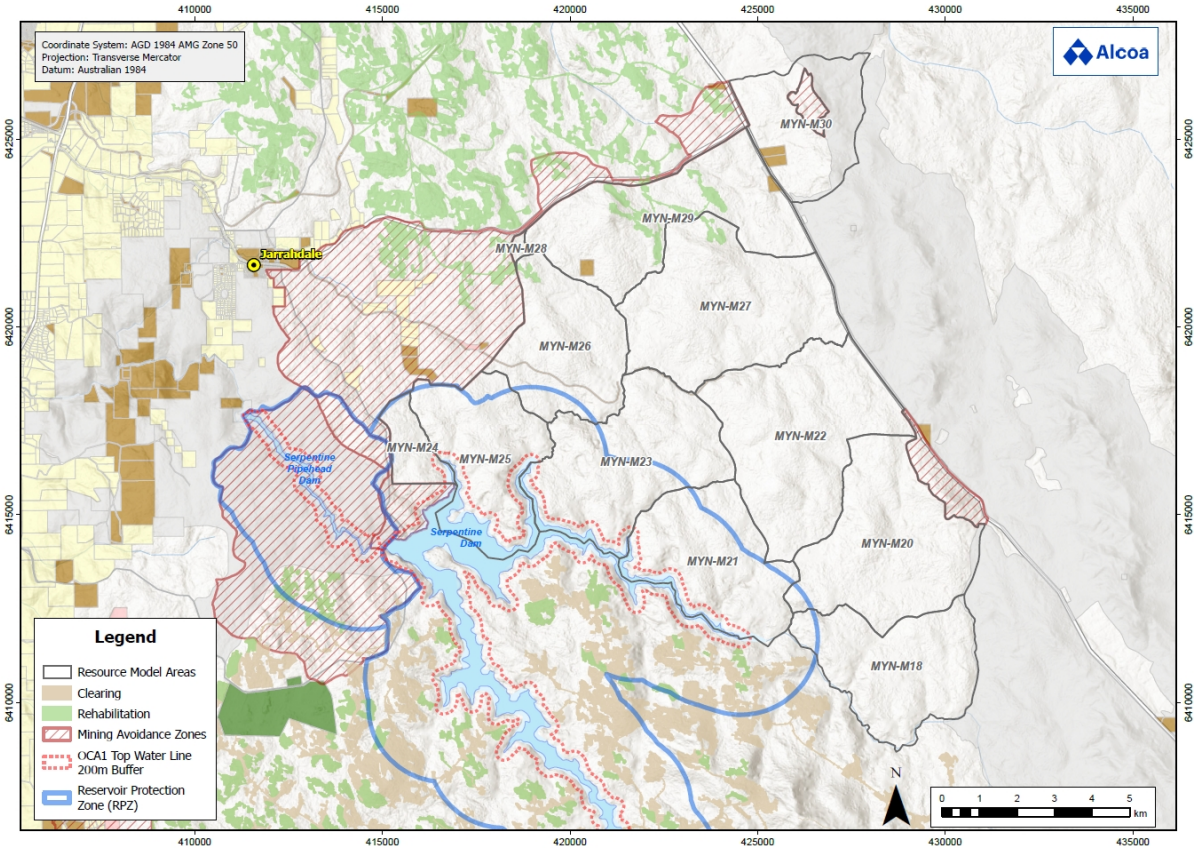
A summary of the drillhole database is outlined in Figure 7-1.

Due to the large lateral extension of the project, SLR randomly selected two areas to be illustrated and detailed in the report, these being MYN-M23 (M23) and HLY-H12 (H12). Figure 11-2 illustrates the drilling in the M23 and H12 areas; Figure 11-3 and Figure 11-4 location of the M23 and H12 areas, respectively.

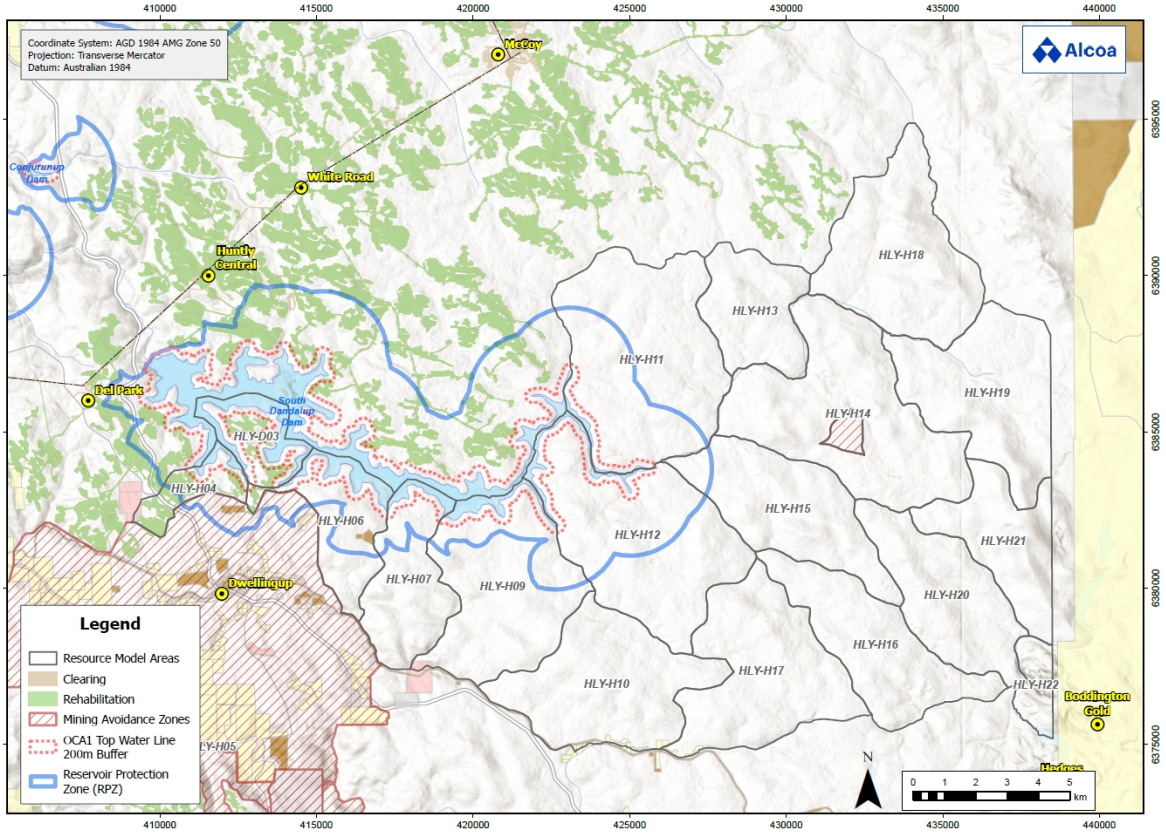
igure 11-2: M23 and H12 area delimitation and drilling. The different colours represent the assay method used for each drilling phase



igure 11-3: Location of the M23 Resource Model Area (MYN-M23)



igure 11-4: Location of the H12 Resource Model Area (HLY-H12)



11.3.2 Topographic Data

Digital elevations models (DEMs) were generated from (in order of priority) drill collar survey data, LiDAR survey data, and Landgate satellite data. A 7.5 m by 7.5 m mesh is used for the DEMs. Drill hole collar elevations were registered to the DEM for resource estimation.

11.4 Geological Interpretation

11.4.1 Polygonal Models

For Polygonal resource estimates, grade-based ‘geological’ codes are assigned to drill hole intervals. These codes are used to define the top and bottom of the ‘bauxite’ horizon in each hole, which is then used to estimate the bauxite volumes and average grades within polygons.

The top of the bauxite usually coincides with the base of the overburden, as defined in the drillers’ logs. The base of the Bauxite Zone (termed the geological floor) is defined within the acQuire database using a multi-pass script that applies the following hierarchical set of rules to the sample grades:

Pass 1:

- Uphole search for two consecutive samples with individual AL values ≥27.0%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see pass 3);
- If all criteria are met, set flag to “pass”, set geological floor depth to lower sample depth; and
- Proceed to pass 2.

Pass 2:

- Uphole search for two consecutive samples with individual AL values ≥25.5%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see Pass 3);
- If all criteria are met, set flag to “pass”, set geological floor depth to lower sample depth; and
- If any criteria fail, geological floor defined in Pass 1 is retained.

Pass 3:

- Uphole search for two consecutive samples with individual AL values ≥27.0%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥27.5%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that sampled depth = hole depth; and
- If all criteria are met, set flag to “pass – open”, set geological floor depth to lower sample depth.

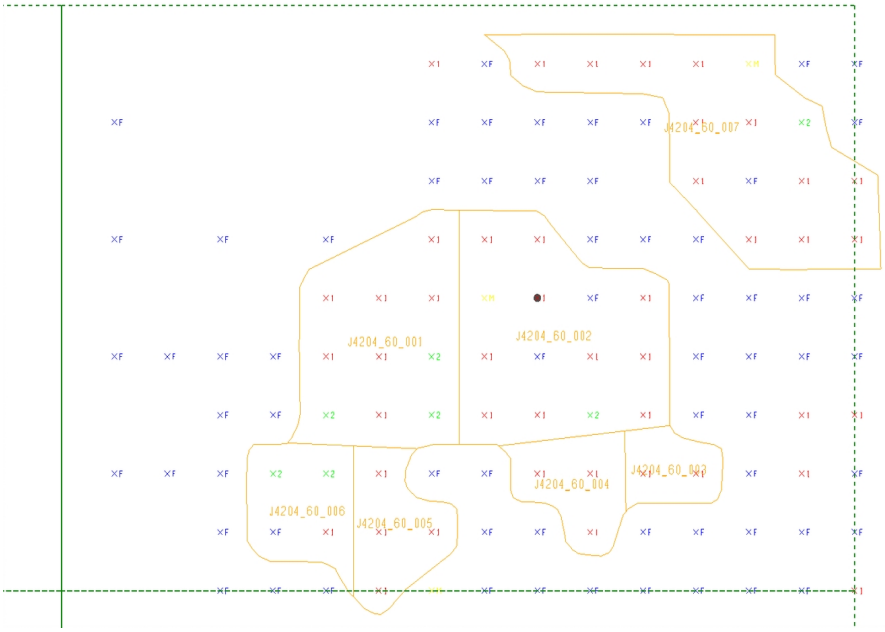
Pass 4:

- Uphole search for two consecutive samples with individual AL values ≥24.5%;
- Record depth of the lower of the two samples;
- Check that the cumulative AL at that depth is ≥25.0%;
- Check that the individual SI at that depth is ≤3.5%;
- Check that the cumulative SI at that depth is ≤3.0%;
- Check that the cumulative OX at that depth is ≤4 kg/t;
- Check that the sampled depth is ≥2.0 m, but less than hole depth (if equal, see pass 3); and
- If all criteria are met, set flag to “marginal”, set geological floor depth to lower sample depth.

The application of these rules assigns a geological floor depth to each hole, along with a Pass, Pass-Open, Marginal, or Fail flag. Holes flagged as Marginal or Fail are inspected by Alcoa staff members, with manual adjustments applied if warranted. For areas infilled to 15 m spaced holes, the geological floor model is replaced by a mining floor model, which is discussed in the following section.

Results of geological floor flagging are used to subjectively define the lateral extents of the Mineral Resource. Outlines are manually interpreted by Alcoa geologists in ArcGIS or MineSight, and are guided by consistency in thickness, depth, and grade, minimum limits on the number of enclosed samples and the enclosed area, and local geomorphology. The polygons delineate separate areas that typically range in size from 10 ha to 100 ha, with most being around 30 ha. An example plan view is shown below in Figure 11-5.

igure 11-5: Plan View of Polygonal Approach (Pass = red, pass open = green, marginal = yellow, fail = blue) (Alcoa, 2022)



11.4.2 Gridded Seam Models

GSM models are located in areas of 15 m spaced infill drilling and include practical mining constraints as part of the 'geological' interpretation used for resource models.

The base of overburden and the base of caprock is identified in each drill hole as 3D points and wireframed as surfaces. The geological bauxite zone floor, which is defined for the wider drill spacings used for Polygonal estimates, is replaced by a mining floor for GSMs. The mining floor is interpreted directly from the drill hole data presented on the 15 m spaced east-west cross sections, digitized in MineSight as strings, then linked to form wireframe surfaces.

The interpretation of the mining floor is a manual process performed by the site geologist, with the objective of achieving acceptable grades and practical mining outlines. The mining floors are defined using a set of guidelines instead of prescribed rules, including:

- Nominal cut-off grades of ≥27.5% AL and ≤3.5% SI are used for mining floor definition;
- If the SI grade in the sample immediately below the floor exceeds 5.0%, the floor is raised 0.5 m;
- A minimum face height (distance from mining floor to the base of overburden) is targeted;
- Face heights exceeding 4 m will require multiple cuts or bench mining;
- The overburden to face height ratio should not exceed 1;

- A maximum floor gradient of 1 in 7 is required between 15 m spaced holes (the gradient can be increased to 1 in 5 for second and third cuts);
- Benching should be invoked where the gradient constraints cannot be maintained; and
- The floor interpretations should be extended laterally into at least one of the surrounding waste holes.

The base of overburden and mining floor surfaces are used to flag the drill hole samples. For each drill hole, the samples located below the base of the overburden and above the mining floor are composited into a single interval, with composite grades length- and density-weighted. Additional drill hole composites are generated for second and third pass mining floors.

The composite data are examined in plan view, and polygons are digitized around the interpreted lateral extents of the mining zones using the following guidelines:

- Nominal cut-off grades of ≥27.5% AL and ≤3.5% SI for lateral boundary definition;
- The boundary is positioned at least 15 m away from holes with SI grades exceeding 5%;
- Buffer zones are placed around environmental constraints, and around bedrock outcrop;
- Internal waste zones should contain at least three drill holes;
- Individual polygons should have an area of at least 1 ha; and
- A width of at least 45 m should be retained for mining equipment movement.

The resulting polygons are divided into typically smaller ‘mining’ blocks that each contain approximately 20 kt to 40 kt of Mineral Resource.

11.4.3 3D Block Models

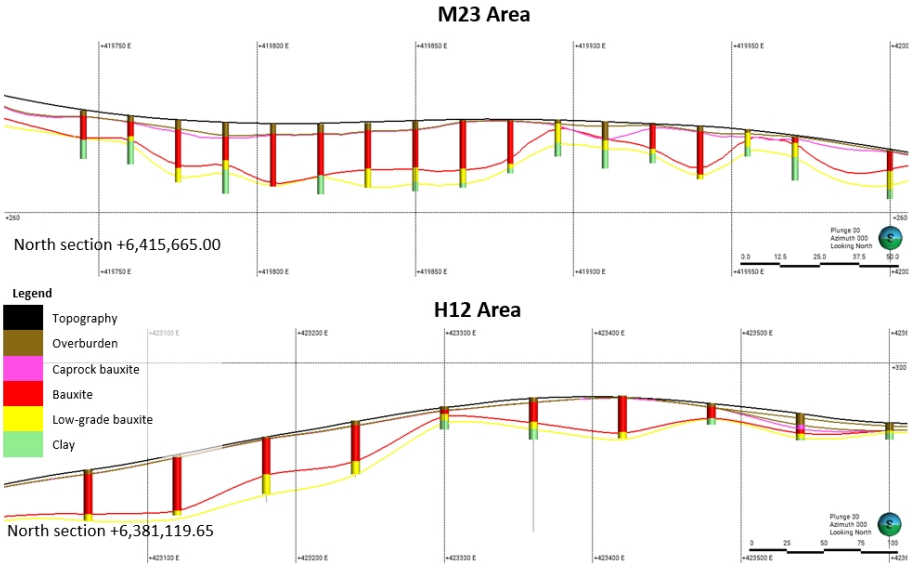
Similar to the Polygon and GSM interpretation approaches, a set of rules written in Python scripts are used to assign initial domain codes to individual samples. These domain codes are then modified in several subsequent passes that take into account the grades and coding of other intervals in the hole.

The initial script is used to assign a domain code to each interval based on various combinations of major analyte threshold grades. A total of six main material type domains (DOMAF) are defined:

- DOMAF = 99: overburden;
- DOMAF = 10: caprock waste;
- DOMAF = 20: caprock bauxite;
- DOMAF = 30: bauxite;
- DOMAF = 40: low-grade bauxite; and
- DOMAF = 50 clay.

Figure 11-6 illustrates an example of those domains in the M23 and H12 areas. Each of these material types (apart from overburden) is divided into up to five grade-based sub-domains. Three subsequent coding passes are conducted that iteratively adjust the codes to combine the sub-domain into the six main domains while ensuring that strict stratigraphic ordering is maintained. A further two passes are coded to assign domain codes that denote whether the material is derived from granite or dolerite.

igure 11-6: Section Showing Domain (DOMAF) and the Main Wireframed Surfaces for the M23 (top) and H12 (bottom) areas– vertical scale 5x

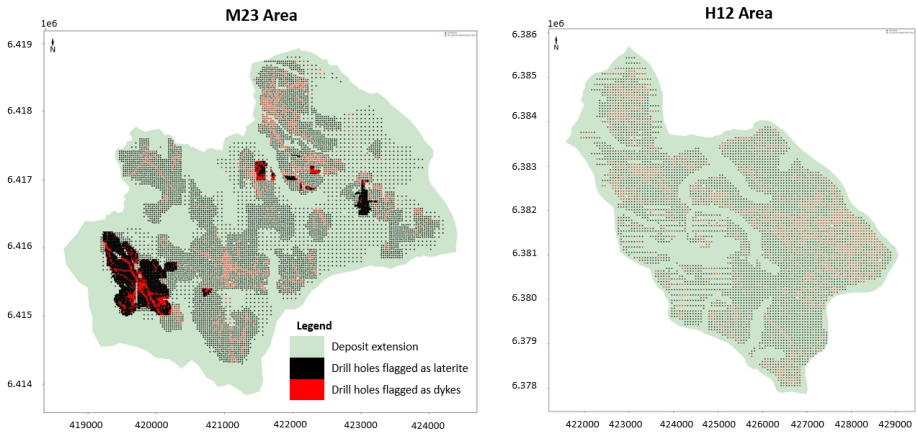


Source: SLR, 2023

The base of each Domain is generated on a 7.5 m by 7.5 m grid using an automated modelling process. To ensure a better fit of the wireframes, the elevation of some collars was adjusted to match the topography surface. Where drill holes do not penetrate the full bauxite profile or the domain contact is not properly defined due to missing assays, a conditional simulation algorithm is used to estimate the domain thickness from adjacent drill holes. The simulation algorithm employs a general variogram and selects the average of 10 simulations for the missing data point. The grid mesh is then wireframed in MineSight to provide 3D surfaces. The base of domain 50 (clay) is set at 10 m below the top of that domain.

Potential dolerite dyke intervals are flagged for samples where FE exceeds 25% and ST is below 10%, and the entire hole is flagged as potential dyke if 3 or more samples are flagged in this manner. The interpretation of dykes is carried out manually using local orientation trends and may be based on one or more holes. They are assumed to be vertical, are extended laterally half-way between drill holes, and can represent up to 15% of material in some areas but unweathered material can generally be screened out in the pit or prior to crushing as oversize boulders. The dykes tend to be well defined only when drill hole spacings are reduced to 15 m by 15 m, as shown in Figure 11-7.

igure 11-7: Plan View of Bauxite Zone and Drill Holes Flagged as Laterite and Dykes



Source: SLR, 2023

The dolerite dykes are delineated and flagged in the block models. A lateral boundary is interpreted to constrain the resource model, and the 3D surfaces are extended where required. The lateral boundary, domain surfaces, and dolerite dyke interpretations are converted to wireframe solids. All the constraints where mining is not allowed (federal reserves, indigenous heritage sites, and rivers and protection buffers associated) are delimitated and removed after the geological modelling step. This way all the mineable reminiscent area is included in the final orebody perimeters.

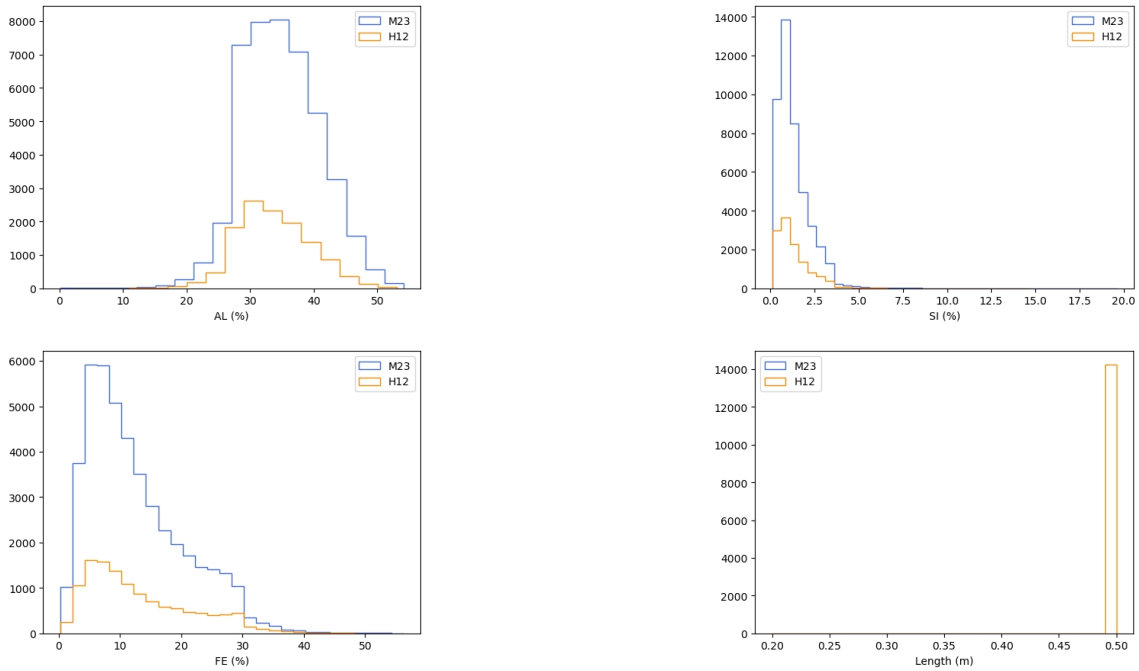
11.5 Resource Assay

The statistical data analysis procedures are carried out in DeepLime and Supervisor. Usually, the statistical analysis is performed using the univariate approach, however, FTIR and ICP scatter plots are also analyzed.

Global statistics by lithology and histograms are created for the statistical population assessment, validation after compositing and for checks against the resulting resource models. For the purposes of this report, a more detailed focus will be given for the caprock bauxite, bauxite and low-grade bauxite layers, as well as the main variables; AL, AT, FE, SI and ST.

Histograms show that AL analytes have distributions that are close to normal, while SI and FE are moderately to strongly positively skewed, as shown in Figure 11-8.

igure 11-8: Histograms for AL, SI, FE and Length in the bauxite domain (M23 and H12 areas)



The descriptive statistics from the histograms of Figure 11-8 for the bauxite layer, as well as for the caprock bauxite and low-grade bauxite are shown in Table 11-4.

able 11-4: Descriptive Statistics for the Main Variables

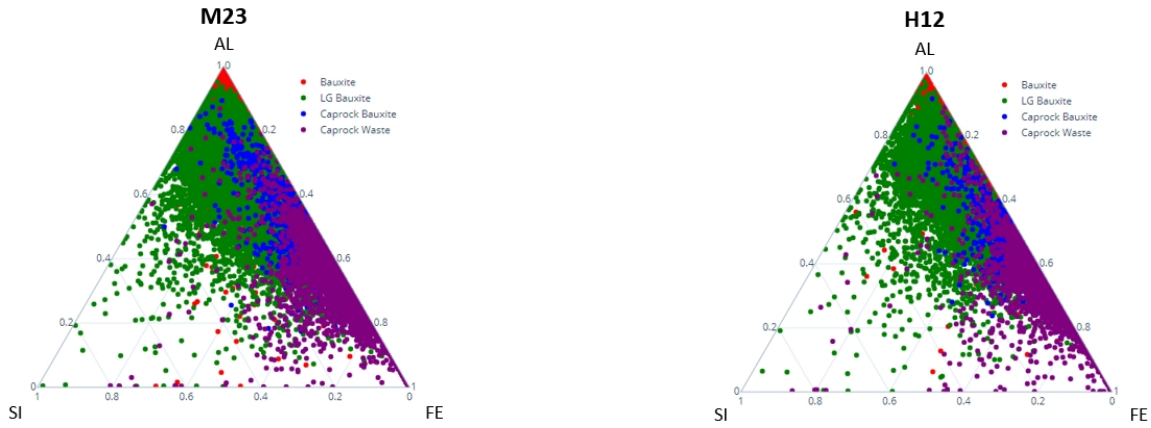
Lithology	Variable	Count	Length	Mean	SD	Variance	Minimum	Q25	Q50	Q75	Maximum
M23 Area											
Caprock Bauxite	AL (%)	5,226	2,613.0	26.83	3.96	15.72	7.75	24.57	26.47	29.25	54.73
	AT (%)	5,226	2,613.0	35.35	4.32	18.65	15.30	32.55	35.34	38.05	61.36
	FE (%)	5,226	2,613.0	33.13	7.85	61.69	0.25	30.46	33.73	37.68	59.65
	SI (%)	5,226	2,613.0	1.66	1.76	3.09	0.10	0.56	1.02	2.06	19.45
	ST (%)	5,226	2,613.0	9.32	8.13	66.04	0.25	3.96	7.07	11.61	64.66
	Length (m)	5,226	2,613.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Bauxite	AL (%)	44,460	22,230.0	34.87	6.13	37.53	0.10	30.39	34.56	39.00	55.00
	AT (%)	44,460	22,230.0	39.78	5.95	35.38	11.65	35.75	40.03	43.89	64.90
	FE (%)	44,460	22,230.0	12.50	7.89	62.24	0.25	6.39	10.49	17.12	57.66
	SI (%)	44,460	22,230.0	1.30	0.96	0.93	0.10	0.64	1.03	1.70	20.10
	ST (%)	44,460	22,230.0	24.57	12.67	160.41	0.25	14.86	22.43	33.82	80.17
	Length (m)	44,460	22,230.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Low-grade Bauxite	AL (%)	21,007	10,503.5	24.59	4.89	23.89	0.10	21.71	24.29	26.69	53.94
	AT (%)	21,007	10,503.5	31.63	5.89	34.64	6.09	27.54	30.90	35.37	62.25
	FE (%)	21,007	10,503.5	12.44	10.73	115.05	0.25	4.60	7.94	17.87	75.58
	SI (%)	21,007	10,503.5	4.11	2.98	8.88	0.10	2.06	3.57	5.26	35.71

	ST (%)	21,007	10,503.5	37.35	16.81	282.48	0.25	24.50	42.05	50.74	82.62
	Length (m)	21,007	10,503.5	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
H12 Area											
Caprock Bauxite	AL (%)	2,734	1,367.0	26.92	4.22	17.82	10.63	24.46	26.54	29.43	41.38
	AT (%)	2,306	1,153.0	34.79	4.12	16.95	19.41	32.20	34.85	37.34	50.27
	FE (%)	2,734	1,367.0	33.78	7.82	61.10	1.52	30.73	34.18	38.20	64.01
	SI (%)	2,734	1,367.0	1.61	1.77	3.14	0.10	0.54	0.94	1.92	16.28
	ST (%)	2,734	1,367.0	9.07	8.40	70.56	0.25	3.77	6.29	10.99	57.78
	Length (m)	2,981	1,490.5	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50
Bauxite	AL (%)	12,287	6,143.2	33.76	5.78	33.43	2.03	29.61	33.19	37.51	55.00
	AT (%)	10,651	5,325.2	38.22	5.54	30.73	15.54	34.53	38.23	42.00	67.96
	FE (%)	12,287	6,143.2	13.19	8.62	74.23	0.25	6.41	10.69	18.58	55.79
	SI (%)	12,287	6,143.2	1.30	0.99	0.97	0.10	0.61	1.02	1.70	14.71
	ST (%)	12,287	6,143.2	25.85	13.04	170.08	0.25	16.08	25.25	35.72	70.09
	Length (m)	14,275	7,137.2	0.50	0.00	0.00	0.20	0.50	0.50	0.50	0.50
Low-grade Bauxite	AL (%)	8,489	4,244.5	24.40	4.95	24.54	0.10	21.50	24.23	26.79	48.61
	AT (%)	7,562	3,781.0	31.77	5.68	32.29	3.28	27.82	31.27	35.44	57.73
	FE (%)	8,489	4,244.5	14.11	11.25	126.51	0.25	5.16	9.72	22.13	64.77
	SI (%)	8,489	4,244.5	4.28	3.42	11.69	0.10	1.92	3.50	5.49	28.69
	ST (%)	8,489	4,244.5	34.83	17.14	293.95	0.25	19.83	38.84	48.83	79.03
	Length (m)	9,600	4,800.0	0.50	0.00	0.00	0.50	0.50	0.50	0.50	0.50

Clear grade trends at depth exist for most analytes and are consistent with the mineralization style. They have been adequately accounted for by the geological interpretation and the use of unfolding methods during block grade estimation.

Figure 11-9 illustrates the compositions of the different layers according to AL, SI and FE proportions.

igure 11-9: Ternary Charts of Lithologies for M23 and H12 Areas



Missing values, that are mostly result of the validation routines, are kept as null in the database, as well as results below the detection limit are changed to values that are half of the detection limit.

11.6 Treatment of High-Grade Assays

High-grade caps for all analytes were applied to individual composites by Alcoa on a domain-by-domain basis following inspection of the data distribution, and no high-grade spatial restrictions were used by Alcoa in the resource estimation process. SLR QP notes that the top-cuts of areas M23 and H12, are in the upper break of the probability plots. Table 11-5 shows the top-cuts used for the M23 and H12 areas.

able 11-5: Top-Cuts Used for the M23 and H12 Areas

Area	Lithology	AL	AT	FE	SI	ST	BO	EO	OX	PT	CO	SU
M23	Caprock Bauxite	48.44	70	80	12.86	56.98	8.89	9.89	15	0.248	11.9	15
	Bauxite	55	70	80	13.39	69.35	9.02	8.84	9.29	0.351	10.17	7.94
	Low-Grade Bauxite	55	70	63.21	24.82	95	6.18	9.97	8.32	1	9.6	15
H12	Caprock Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15
	Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15
	Low-Grade Bauxite	55	70	80	49.063	95.26	15	15	15	1	34	15

11.7 Compositing

Drill holes were sampled at 0.5 m intervals in the bauxite zone below the base of the overburden, with residual intervals sometimes present at domain contacts. The Polygon and GSM estimation approaches used the original drill hole data intervals. Prior to the interpretation of geological surfaces, holes used in the 3DBM resource estimates were composited to 0.5 m, and with residual intervals of maximum 50% the composite length, the total length ranges between 0.25 m and 0.75 m.

Following the interpretation of geological surfaces, drill holes used for Polygonal and GSM resource models were composited to:

- Polygonal – a single interval for samples located below the base of the overburden and above the geological floor.
- GSM – a single interval for samples located below the base of the overburden and above the mining floor. Additional composites were generated in areas where second and third pass mining floors were identified.

All grade compositing for drill holes employs length-weighted linear averages.

11.8 Trend–Analysis - Variography

Only some variogram analysis was carried out for Polygonal and GSM models as variogram parameters were not required to generate the resource models.

For the 3DBMs, variogram analysis is routine. Experimental variograms are calculated in unfolded space, with bauxite domains 20, 30 and 40 unfolded to the 10/20 domain contact and the clay domain (50) unfolded to the 40/50 domain contact.

Variograms are calculated for AL, SI, ST, and FE for the bauxite zone, standardized to a sill of one, and modelled with 3-structure spherical models, as described in Table 11-6 and Table 11-7. A single variogram model that provides the best fit to these four variables was selected.

able 11-6: Variogram parameters for the M23 area (MineSight ZXY rotation)

Parameter	M23				
Domain	Domain 20,30,40				
Domain Name	Caprock Bauxite, Bauxite, and Low-Grade Bauxite				
Element	AL	SI	FE	ST	Combined Variogram
Nugget C0	0.07	0.04	0.03	0.01	**0.04**
First Structure C1	0.64	0.51	0.5	0.64	**0.6**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	35	60	45	45	**45**
Range 2	20	50	40	40	**40**
Range 3	3	3	6	6	**5**
Second Structure C2	0.14	0.15	0.23	0.21	**0.16**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	55	100	120	105	**85**
Range 2	40	80	115	100	**75**
Range 3	4	6	7	7	**6**
Third Structure C3	0.15	0.3	0.24	0.14	**0.2**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	120	250	285	315	**200**
Range 2	95	185	155	190	**150**
Range 3	5	7	10	8	**7**
Rotation Strike (°)(1)	140	140	140	140	**140**
Rotation Plunge (°)(2)	0	0	0	0	**0**
Rotation Dip (°)(3)	0	0	0	0	**0**

able 11-7: Variogram parameters for the H12 area (MineSight ZXY rotation)

Parameter	H12				
Domain	Domain 20,30,40				
Domain Name	Caprock Bauxite, Bauxite, and Low-Grade Bauxite				
Element	AL	SI	FE	ST	Combined Variogram
Nugget C0	0.1	0.09	0.1	0.04	**0.1**
First Structure C1	0.52	0.54	0.59	0.61	**0.56**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	90	95	80	100	**90**
Range 2	70	80	80	90	**80**
Range 3	4	4	4	4	**4**
Second Structure C2	0.34	0.12	0.05	0.15	**0.15**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	200	230	200	250	**220**

Range 2	150	150	150	220	**170**
Range 3	5	5	6	6	**6**
Third Structure C3	0.04	0.25	0.26	0.2	**0.19**
Structure Type	Spherical	Spherical	Spherical	Spherical	**Spherical**
Range 1	500	500	600	800	**550**
Range 2	400	500	400	700	**500**
Range 3	6	6	7	7	**7**
Rotation Strike (°)(1)	120	130	130	120	**125**
Rotation Plunge (°)(2)	0	0	0	0	**0**
Rotation Dip (°)(3)	0	0	0	0	**0**

Variogram models display nugget values of less than 10% and total ranges of several hundred meters, but 80% of the sill is generally reached within 100 m laterally. As expected, horizontal to vertical anisotropy ratios are high (typically exceeding 50:1), but there is minor lateral anisotropy. This good definition of continuity compared to the 15 m drill spacing is considered by SLR to be a benefit of the unfolding approach.

Independent variogram models for each bauxite domain and analyte are not used for grade estimation to enable correlations between analytes to be maintained during the change in support from drill hole samples to blocks, which is important for mine planning considerations.

11.9 Bulk Density

For Mineral Resource estimation purposes, density can be regarded as another analyte, and tests can be evaluated for repeatability (precision) and accuracy (bias). The determination of the metal content of a specified volume of ore is as sensitive for density as it is for grade. For bulk commodities, like bauxite, there is usually much more emphasis on grade since product tonnages are measured by a weightometer.

Alcoa does not routinely collect density data but relies on production records to define averages. This is due to the broad geological consistency of the ore zones and the local chemical and physical nature of the lateritized ore. Porosity and permeability in particular show high lateral and vertical variability, rendering repeatability of density test work meaningless. Even if large numbers of data points were available (for example by developing a density algorithm from the FTIR assaying of every drill sample, and then modelling it), the resulting model would still need to be factored by the actual mining results for local porosity.

For 3DBM resource estimation, each drill hole bauxite composite is assigned a dry *in situ* bulk density (DIBD) value based on the logged material type and the FTIR iron grade using the regression equation defined below in Section 11.9.5.

The available density test work data is summarized as follows.

11.9.1 1980 to 1992

Senini (1993) collated and reviewed all previous bauxite density data, including that by Sadleir done in 1986, and modified Sadleir's algorithm used for computation of density from individual 0.5 m sample assays of Fe_2O_3. Results are summarized in Table 11-8.



able 11-8: Summary of Density Test Data (t/m³) from 1980 to 1992 (Senini, 1993)

Year	Source	Material	Count	Mean	Min	Max	Fe Mean	Regression On Fe_2O_3	
								Slope	Intercept
1980	DOSCO	Hardcap	18	2.200	1.98	2.52	19.35	0.0089	2.032
1986	Sadleir (in Senini)	Hardcap	14	2.364	2.08	2.75	20.88	0.0092	2.172
1992	Senini	Hardcap	67	2.409	1.81	3.10	21.00	0.0103	2.192
1986	Sadleir (in Senini)	Friable	11	1.846	1.64	2.12	8.80	0.0015	1.830
1992	Senini	Friable	27	2.225	1.88	2.79	14.30	0.0045	2.–89
1980 - 1992	reported above	Granitic	67	2.327	1.81	3.10	16.7–		
1980 - 1992	reported above	Doleritic	32	2.444	2.07	2.96	28.96		

While the approach used has merit, there are some obvious challenges:

- There are very few data points, unevenly distributed by material type and mining area
- Methodologies for collecting and testing the samples varied (sand replacement method for Hardcap, driven cylinder for Friable, water displacement are all noted)
- There is some lack of clarity on moisture, but it is assumed that the values are all in situ dry bulk density reported as t/m³.

The differences between hardcap (caprock) and friable (other material) and between granitic or doleritic derivation are however clear.

Senini (1993) concluded that the dry *in situ* bulk density (DIBD) should be estimated using a regression equation which is still used.

11.9.2 2013 to 2018 Drill Samples

Various further test programs have been attempted including collection of all material from drill samples (assuming the drill hole volume is constant) and then taking wet and dry weights and assaying for iron. There were 51 samples from 8 holes at Huntly and 93 samples from 24 holes at Willowdale. Scatter plots produced by SRK 2021a showed significant scatter of all available data for both Hardcap and Friable (other) material.

11.9.3 2016 to 2017 Pit Samples

Alcoa collected 2 kg to 5 kg grab samples from 16 Huntly pits (76 samples) and 10 Willowdale pits (41 samples). Water immersion density testing was done by Bureau Veritas. The average of 2.01 t/m³ is significantly lower than that from the 2015 study of 2.23 t/m³. The drill samples did not account for porosity and voids and were not adequately sealed.

FTIR assays for Fe_2O_3 were compared to sealed and unsealed density estimates and it was found that Senini's regression equation better predicted the unsealed densities. Thus, it appears that the current regression equation based on Fe_2O_3 assays overestimates the in situ dry tonnage.

11.9.4 2018 Downhole Density Estimates

In December 2018 Alcoa contracted downhole geophysical measurements in 54 aircore holes drilled in the Larego area. The data from this study is still being evaluated and is not used for Mineral Resource estimation.



11.9.5 Density Estimation

Ore grades range from 28 to 38% AL for paired belt sample data (see Section 8.4.4.6) whereas test work densities range from 1.5 t/m³ to 3.2 t/m³, but the data is sparse and unreliable.

For resource estimation, each 0.5 m drill hole sample is assigned a dry in situ bulk density (DIBD) value based on the logged material type and the FTIR iron grade, using Senini's 1993 regression equation:

*Hardcap (caprock) = 2.19 + 0.0103*Fe*

Friable (other) = 2.00 (used for all non-Hardcap material)

If the sample is logged as comprising a mix of Hardcap and Friable, the assigned value for that 0.5 m interval represents a volume-weighted average. There is no differentiation between granitic and dolerite derived bauxite, due to the relatively small proportion of the latter (less than 15%).

In resource estimates prior to 2017 a moisture content of 9% was assumed and used to estimate wet tonnes. Since the implementation of 3D block modelling in 2018, densities are assigned after grade estimation, based on the regression equation and Fe grade of Hardcap, and using 2.0 t/m³ for all other material, weighted by the proportion of Hardcap or other material.

11.9.6 Reconciliation of Density

Alcoa uses comparisons between the As Mined tonnages and the sampling tower weightometers to apply adjustment factors to mine design estimates, scheduling and stockpile planning. Such adjustments are not applied directly to the Mineral Resource estimate as they vary locally.

Reconciliation of Huntly and Willowdale mined production (see discussion on density in Section 11.14) indicates that the density estimates are biased, with the long-term average As Mined tonnages being approximately 5% higher than the actual production measured on calibrated weightometers.

11.9.7 Density Conclusions

The density data is limited in coverage and there is significant uncertainty regarding the methodology used for some sampling programs. A simple regression algorithm is used to estimate the DIBD for Hardcap from the FTIR assays of Fe_2O_3. This does not account for voids or porosity, nor does it differentiate between Hardcap derived from granitic or doleritic material. All other material is assigned a density of 2.0 t/m³. A constant moisture content of 9% is assumed for wet tonnages.

The SLR QP is of the opinion that the dry bulk density data is less well controlled than other analytes, however, the long history of mining production and stockpile reconciliation means that the assumed values are adequate for resource estimation.

11.10 Resource Models

11.10.1 Polygonal

For each drill hole contained within a polygon, the samples located below the base of the overburden and above the geological floor are composited into a single interval. The following numbers are assigned to each polygon:



- Thickness = average length of contained composites;
- Grade = length-weighted average grade of contained composites (density weighting is not applied);
- Density = average density of contained composites;
- Volume = Polygon area by Thickness; and
- Tonnage = Volume by Density.

11.10.2 Gridded Seam Modelling

GSM employs 15 m by 15 m cells centered on the nominal drill hole locations. Separate seams are created for the overburden, and for the interpreted Bauxite Zone (BXZ) between the overburden and the mining floor. BXZ is subdivided into separate seams where second and third mining cuts have been interpreted. Interpreted wireframe surfaces are used to assign a seam thickness to each cell, effectively the seam thickness of drill hole at the cell centroid.

Cell grade estimation used inverse distance weighting (IDW) techniques as follows:

- Hard boundaries, with each seam cell only estimated using nearby composite drill hole data within the corresponding seam;
- IDW weighting factor of 1.2 for SI and 2 for all other variables;
- 1 by 1 by 1 cell discretization;
- Isotropic search distance of 180 m, and;
- Minimum of 2 and maximum of 8 composites with a maximum of 2 composites per quadrant

Where drill holes are located at the centroid of cells the resulting cell grade estimates are essentially nearest neighbor estimates. In other words, the GSM outcomes are equivalent to 2D polygon estimates, with the usual constraint of that method, specifically that the block variances are not smaller than the composite variances.

The GSM is constrained to the interpreted lateral extents of the mining zones. For each mining zone the following attributes are determined:

- Seam Thickness = average seam thickness of the contained GSM cells;
- Grade = weighted average grade of contained cells (density weighting is not applied);
- Density = average density of contained cells;
- Volume = mining zone area by Seam Thickness, and;
- Tonnage = Volume by Density.

11.10.3 3D Block Modelling

In 2019, Alcoa commenced preparing Mineral Resource estimates using 3DBM techniques, with the aim to progressively replace all Polygonal and GSM models. To date, Alcoa has prepared a total of 89 3DBM representing around 76% of the Mineral Resource and Mineral Reserves (MRMR) tonnage.

This section describes the current 3DBM procedures, which have evolved over time, with some parts now automated or semi-automated. Changes in the 3DBM procedures have generally been minor and are not considered material to the resulting resource models.

Block models are initially generated using the ML1SA lease area grid, and with an origin that ensures that the majority of the drill holes are located closer to the block corners rather than



the centroids. The parent block size is 15 m by 15 m by 0.5 m and a sub-block size of 3 m by 3 m by 0.25 m (XYZ), respectively.

The block grade estimation includes the interpolation by ordinary kriging (OK) of AL, SI, ST, FE, EO, PT, CO, SU, OX, BO, and AT, using the same unfolding surfaces as used in the variogram analysis. Hard boundaries between the bauxite domains (DOMAF 20, 30 and 40) started to be implemented in 2022, where the previous block models were estimated using soft boundaries between these domains. A 3-pass search strategy is used for the bauxite domains and only one pass for the clay zone (DOMAF 50). A list of the search parameters is presented in Table 11-9. It is important to note that the major and semi-major orientations are in the unfolded horizontal plane, and that a maximum of 3 samples are used from any one drill hole. Thus, a minimum of four holes is required for pass one, two holes for pass two, and one hole for pass 3.

able 11-9: Ordinary Kriging Search Parameters (MineSight ZXY rotation).

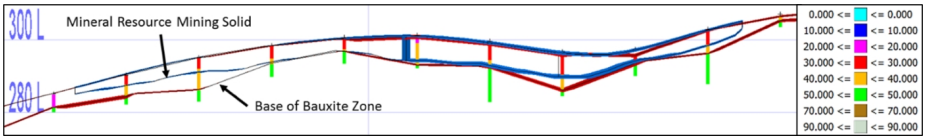
Domain	Pass	Bearing (Z)	Search Distance (m)			Number of Samples		
			Major	Semi-major	Minor	Min	Max	Max Per Hole
20, 30, 40	3	140°	300	300	50	3	27	3
	2		100	100	20	4	27	3
	1		55	55	20	12	27	3
50	1	130°	300	300	50	4	27	3

The DIBD (density) is not estimated into individual parent and sub blocks but is a post-estimation calculation based on the block domain compositions (see 11.8.5).

The OK estimation approach is designed to maintain correlations between analytes and assist in ensuring that estimation totals are consistent with the input drill hole data.

A set of wireframe solids representing the mining outlines are generated using a similar grade accumulation and threshold approach to those used for the GSM model, as shown in the example of Figure 11-10. The sub-block model is then regularized to the parent block size (15 m by 15 m by 0.5 m), with blocks located within the mining solids flagged for reporting Mineral Resources. Block tonnages are factored to reflect the proportion of the block contained below the topographic surface and within the mining solid.

igure 11-10: Example Section showing Bauxite Zone and Mining Solid



Notes:

1. Vertical to horizontal exaggeration is 3:1.

2. Drill holes colored by DOMAF variable.

3. Source: SLR, 2021.

The QP summarized the information of 10 block models, shown in Table 11-10, where there is available data for a comparison between a soft and hard boundary estimation of the bauxite layer. In overall, the AL grades increased by 7% and SI grades decreased by 23%, and the tonnage is higher in most of the cases, reflecting the additional drilling.

able 11-10: Tonnage and Grade Information Between the Original Resource Model and the 3D Block Model

Model	Original Resource Model			3DBM - Resource Model			Difference		
	Tonnage (000 t)	AL (%)	SI (%)	Tonnage (000 t)	AL (%)	SI (%)	Tonnage (000 t)	AL (%)	SI (%)
Holyoake Central	25,211	31.97	1.94	25,919	34.12	1.23	3%	7%	-36%
Windsor	8,935	32.82	2.67	8,798	33.69	2.38	-2%	3%	-11%
Cooke	15,421	30.85	2.22	18,976	31.99	1.95	23%	4%	-12%
Serpentine	16,444	32.00	1.96	20,299	32.75	1.72	23%	2%	-12%
Gleneagle	26,333	31.58	1.67	35,144	34.69	1.14	33%	10%	-32%
Buckley	17,998	33.74	1.68	27,435	35.39	1.27	52%	5%	-24%
Cobiac	23,498	31.15	1.70	30,865	34.81	1.18	31%	12%	-31%
Frollett	12,556	30.07	1.68	18,587	33.59	1.31	48%	12%	-22%
Yarri	10,044	30.90	2.04	30,362	32.51	1.62	202%	5%	-20%
Millars	26,156	30.64	2.21	24,987	32.32	1.88	-4%	5%	-15%
Total	**182,596**	**31.55**	**1.93**	**241,372**	**33.71**	**1.48**	**32%**	**7%**	**-23%**

11.11 Block Model Validation

11.11.1 Polygonal and Gridded Seam Modelling

Alcoa uses a similar general approach to validate both the Polygonal and GSM resource models which includes:

1. Visual validation of cell estimated grades versus seam composited data;
2. Comparison between composite and block model global statistics;
3. Swath plots comparing cell grades against seam composite grades; and
4. Comparison between models when upgraded with new information.

Estimated cell grades were compared visually to the drill hole composite grades to ensure that the cell grade estimates appeared consistent with the drill hole seam composite data.

As GSMs were effectively nearest neighbor estimates, checks by SRK (2021a) on several GSM models indicated excellent global and local correlation between the estimated cell grades and the input seam composite grades.

The QP undertook some independent checks on datasets and GSMs for the F54 and F55 blocks to confirm that the modelling procedures had performed as intended. Results were consistent with those observed by previous consultants and no material issues were noted.

Polygonal resource models were updated by Alcoa when drill hole data is infilled from 60 m and 30 m spacings, and then GSM models were previously produced by Alcoa after 15 m infill drilling (3DBM models are now produced routinely at this stage). Changes in tonnages and average grades (AL, SI, OX) are presented as scatterplots in Figure 11-11 for map sheets at Huntly where such infill drilling has occurred. It is noted that:

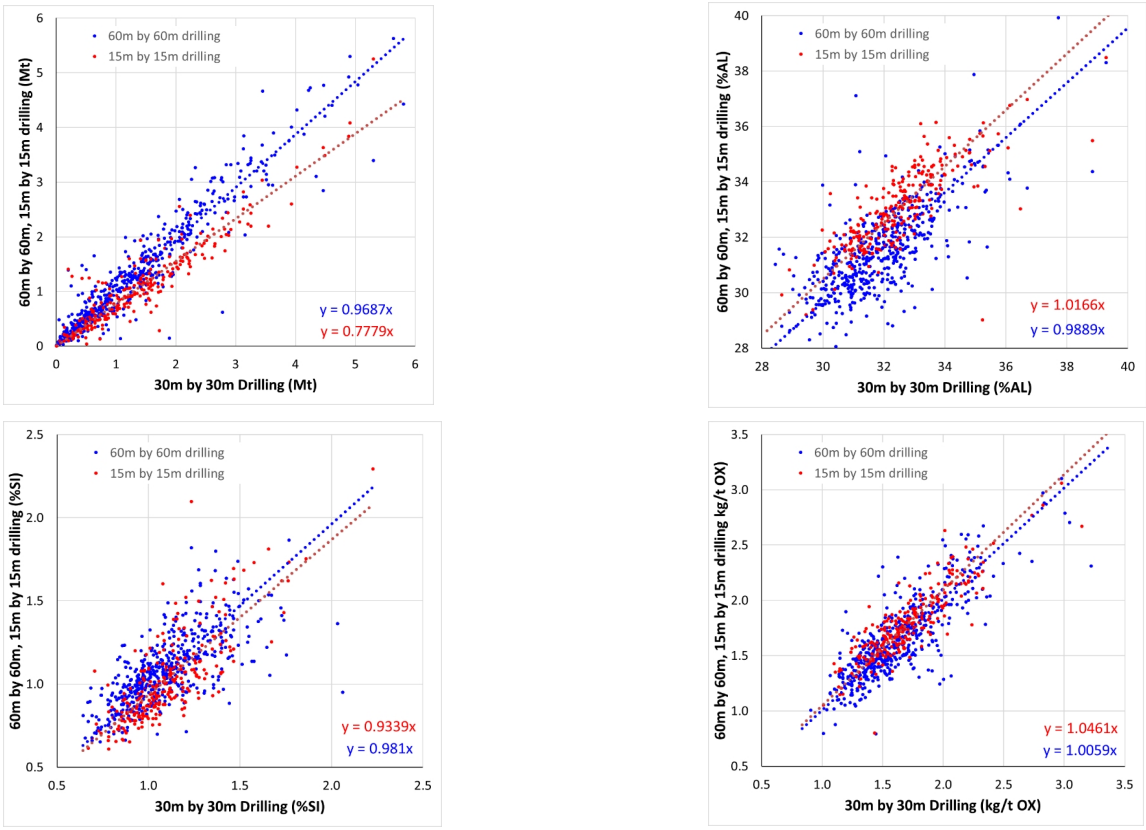
- Material differences in tonnages are evident for individual map sheets, represented by the scatter around the 45° line in the top left-hand plot in Figure 11-11.
- Globally, there is only a 3% change in resource tonnage when infilling from 60 m to 30 m, but a 22% drop in tonnage when the deposit is further infilled to 15 m drill

centers. The latter is mainly due to a change in the geological interpretation from a geological to a mining floor.

- Decreasing the drill spacings from 60 m to 15 m results in an average reduction in SI of 10%, an increase in OX of 5%, but little change to AL. These grade changes are likely due to the preferential loss of deeper DOMAF 40 material that is high in SI and low in OX when mining constraints are considered.
- Similar grade-tonnage relationships related to infill drilling were noted at Willowdale by SLR.

Applying a global correction factor to Polygonal resource model tonnages generated from 30 m and 60 m spaced drill hole datasets is not considered appropriate as local differences are highly variable and not considered to be predictable, as shown by the red dots in the top left-hand plot in Figure 11-11.

igure 11-11: Resource Comparison Scatterplots for Huntly (Tonnage, AL, SI, OX) (SLR, 2021)



Source: SLR, 2021.

11.11.2 3D Block Modelling

Alcoa staff performs the block model validation for the individual areas through the volume checks between the geological interpretation solids and sub-block model, visual validation of block model coding and estimated grades versus composite data, comparison between composite and block model global statistics, and swath plots comparing block grades against composite grades.

SLR evaluated the information provided in the block model summary files provided by Alcoa, and also undertook independent checks on datasets and block models for M23 and H12 areas, obtaining results that were consistent with those provided by Alcoa. The SLR QP ran individual inverse distance squared (ID^2) and nearest neighborhood (NN) estimations to assist in the block model validation.

Visual validations, global statistical comparison, and swath plots were built comparing the main variables estimated by Alcoa and the parallel estimation made by SLR. The results of these comparisons for the M23 and H12 areas are provided in the following subsections.

11.11.2.1 Statistical Validation

Statistics of the blocks estimated by OK were compared against the composited and capped samples, ID2 and NN estimates. Table 11-11 and Table 11-12 present the statistical comparison for the M23 and H12 areas.

In overall, smaller differences are observed for the AL estimation of the bauxite and low-grade bauxite for the M23 area, and more significant differences are observed for the SI estimation of both areas. These differences may be related to either potential differences in the estimation parameters used by the independent estimation made by SLR, and/or small discrepancies in the sample selection used for the estimation due to the parallel workflow used by SLR. The impact of these differences can be minimized once the composites and OK means show a good correlation.

Despite the differences mentioned previously, the SLR QP is of the opinion that the statistical comparisons are reasonable.

able 11-11: Composites, OK, ID², and NN statistics for the M23 area

M23													
Variable	Statistical Parameter	Caprock Bauxite			Bauxite				Low-Grade Bauxite				
		Samples	OK	ID²	NN	Samples	OK	ID²	NN	Samples	OK	ID²	NN
AL	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	26.83	26.54	26.19	26.27	34.87	34.81	31.92	31.58	24.59	24.99	22.80	21.62
	SD	3.95	1.96	4.02	6.81	6.13	3.66	4.93	8.70	4.89	2.46	4.02	8.36
	Variance	15.61	3.85	16.16	46.32	37.53	13.40	24.33	75.62	23.89	6.04	16.15	69.83
	Minimum	7.75	15.96	3.75	0.10	0.10	14.26	6.37	0.10	0.10	9.85	2.21	0.10
	Q25	24.57	25.32	24.14	23.34	30.39	32.36	28.75	26.54	21.71	23.44	20.71	17.71
	Q50	26.47	26.18	26.16	26.71	34.56	34.40	32.00	32.21	24.29	24.72	22.90	22.55
	Q75	29.25	27.49	28.34	30.12	39.00	37.00	35.29	37.56	26.69	26.31	24.95	26.36
	Maximum	48.44	44.72	46.46	51.45	55.00	52.67	51.84	55.00	53.94	44.67	49.55	55.00
SI	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	1.66	1.87	2.77	2.90	1.30	1.46	2.23	2.29	4.10	4.60	5.55	5.99
	SD	1.74	1.15	2.46	3.87	0.95	0.68	1.55	2.84	2.96	1.76	2.60	4.76
	Variance	3.02	1.32	6.05	14.97	0.90	0.46	2.42	8.06	8.76	3.10	6.77	22.64
	Minimum	0.10	0.10	0.12	0.10	0.10	0.12	0.22	0.10	0.10	0.10	0.42	0.10
	Q25	0.56	1.00	1.19	0.74	0.64	0.91	1.20	0.76	2.06	3.45	3.72	2.65
	Q50	1.02	1.67	2.18	1.48	1.03	1.40	1.85	1.37	3.57	4.51	5.09	4.58
	Q75	2.06	2.43	3.57	3.35	1.70	1.98	2.77	2.57	5.26	5.52	7.02	7.82
	Maximum	12.86	8.94	31.19	40.20	13.39	9.13	24.21	38.90	24.82	20.93	32.32	40.18
FE	Number	5,226	19,988	19,988	19,988	44,460	157,444	157,444	157,444	21,007	101,770	101,770	101,770
	Mean	33.13	32.70	31.04	30.33	12.50	12.77	12.72	12.28	12.44	11.49	11.07	10.83
	SD	7.85	5.31	7.13	10.55	7.89	5.30	5.74	9.04	10.72	6.31	6.90	9.88

Variance	61.69	28.24	50.84	111.37	62.24	28.10	32.93	81.81	114.97	39.77	47.55	97.62
Minimum	0.25	3.72	2.53	0.25	0.25	0.95	1.70	0.25	0.25	0.25	0.42	0.25
Q25	30.46	30.88	28.08	25.78	6.39	8.74	8.32	5.44	4.60	6.81	5.97	4.05
Q50	33.73	33.23	32.46	32.58	10.49	12.45	11.53	9.47	7.94	9.96	8.99	6.92
Q75	37.68	35.79	35.48	37.75	17.12	15.86	16.01	16.92	17.87	14.56	14.11	13.93
Maximum	59.65	54.35	54.97	71.06	57.66	42.37	43.65	80.00	63.21	48.80	51.35	63.21



able 11-12: Composites, OK, ID2, and NN statistics for the H12 area

H12													
Variable	Statistical Parameter	Caprock Bauxite				Bauxite				Low-Grade Bauxite			
		Samples	OK	ID^2	NN	Samples	OK	ID^2	NN	Samples	OK	ID^2	NN
AL	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	26.87	26.94	26.67	26.29	33.66	33.57	31.76	30.85	24.40	24.49	23.70	23.36
	SD	4.17	2.35	3.52	6.44	5.76	3.72	4.15	7.85	4.92	2.62	3.22	6.66
	Variance	17.41	5.52	12.40	41.45	33.23	13.81	17.25	61.56	24.23	6.86	10.38	44.40
	Minimum	10.63	16.63	0.22	0.10	2.03	9.80	1.87	0.10	0.10	7.53	0.93	0.10
	Q25	24.45	25.48	24.88	23.34	29.55	30.91	29.10	26.92	21.52	22.96	21.91	20.34
	Q50	26.49	26.60	26.52	26.39	33.11	33.18	31.54	31.01	24.23	24.27	23.51	23.70
	Q75	29.41	28.27	28.68	29.72	37.39	35.81	34.22	35.79	26.77	25.78	25.28	27.08
	Maximum	41.38	38.01	44.45	48.30	55.00	53.74	53.92	55.00	48.61	42.03	43.18	49.51
SI	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	1.59	1.50	2.02	2.48	1.29	1.31	1.82	2.10	4.22	4.29	4.78	5.03
	SD	1.73	1.04	2.13	3.48	0.97	0.65	1.21	2.69	3.36	2.16	2.52	4.20
	Variance	2.99	1.09	4.54	12.13	0.94	0.42	1.46	7.22	11.32	4.67	6.35	17.66
	Minimum	0.10	0.12	0.13	0.10	0.10	0.10	0.12	0.10	0.10	0.10	0.13	0.10
	Q25	0.54	0.73	0.78	0.54	0.61	0.81	1.02	0.69	1.85	2.82	3.02	2.07
	Q50	0.94	1.22	1.33	1.12	0.99	1.22	1.54	1.26	3.45	4.01	4.40	3.87
	Q75	1.89	1.94	2.47	3.00	1.68	1.72	2.27	2.31	5.47	5.28	5.97	6.49
	Maximum	12.08	9.48	30.96	32.19	9.69	8.81	24.69	31.65	23.16	19.91	26.87	34.39
FE	Number	2,981	64,964	64,964	64,964	14,275	297,393	297,393	297,393	9,600	205,206	205,206	205,206
	Mean	33.64	33.30	33.21	32.11	12.94	13.70	13.82	13.91	13.93	13.76	13.29	13.21
	SD	7.90	5.17	6.02	9.13	8.48	5.97	6.21	9.67	11.16	7.51	7.81	10.76
	Variance	62.44	26.69	36.23	83.31	71.96	35.62	38.62	93.54	124.59	56.47	60.92	115.88

Minimum	1.52	3.09	0.66	0.25	0.25	1.16	1.54	0.25	0.25	0.25	0.36	0.25
Q25	30.63	30.66	30.70	28.01	6.32	9.08	9.06	6.31	5.11	7.89	7.28	4.94
Q50	34.06	33.65	33.79	32.88	10.48	12.88	12.64	10.99	9.48	12.48	11.22	8.88
Q75	38.12	36.47	36.95	37.37	18.14	17.59	17.41	19.55	21.67	18.15	17.62	20.83
Maximum	64.43	54.00	59.79	64.43	55.79	46.11	49.60	64.01	58.53	50.54	53.11	58.53

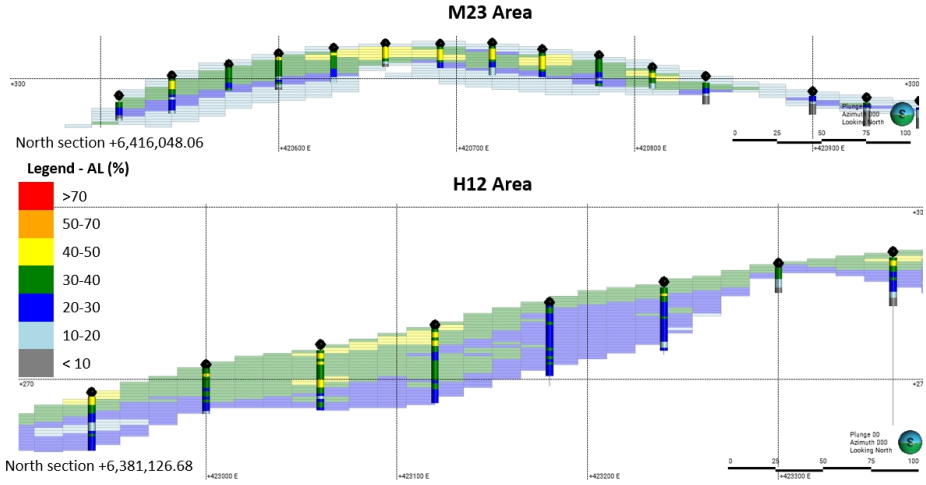


11.11.2.2 Visual Validation

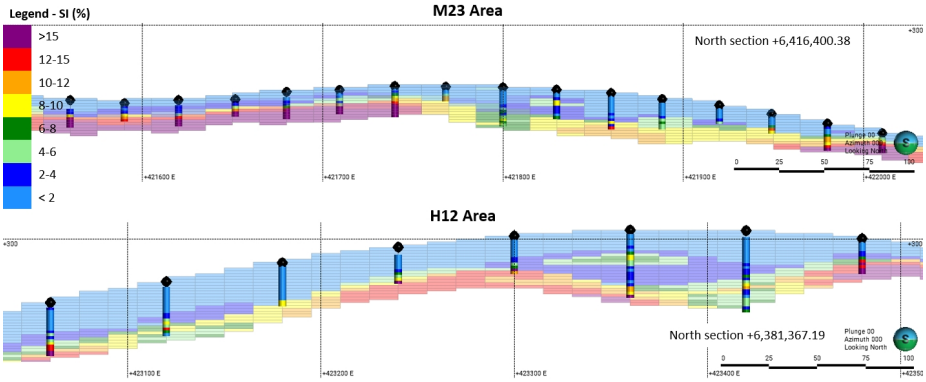
For the visual validation, several cross sections in multiple orientations were created aiming to assess the grade distribution over the blocks and related to the composites. No major discrepancies were identified, being observed in most of the cases a good adherence of the grades estimated in the blocks with the samples around, and also the grade continuity with the topography.

Figure 11-12, Figure 11-13, and Figure 11-14 illustrate the cross sections in the block models comparing the AL, SI, and FE OK estimation and the composites.

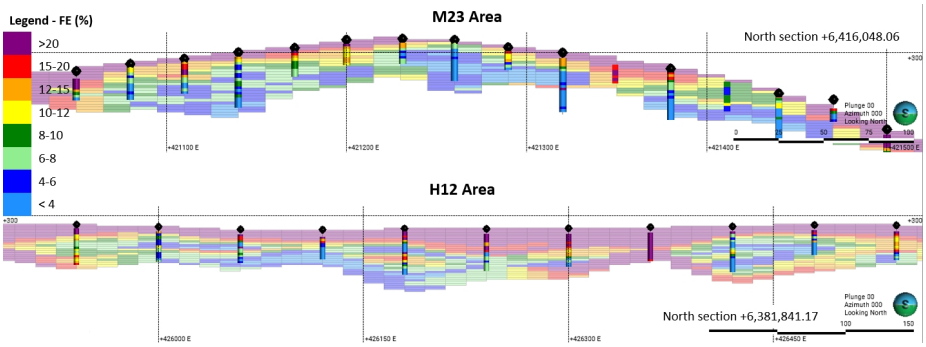
igure 11-12: Visual validation of Blocks and Composites for AL



igure 11-13: Visual validation of Blocks and Composites for SI



igure 11-14: Visual validation of Blocks and Composites for FE



11.11.2.3 Swath Plots

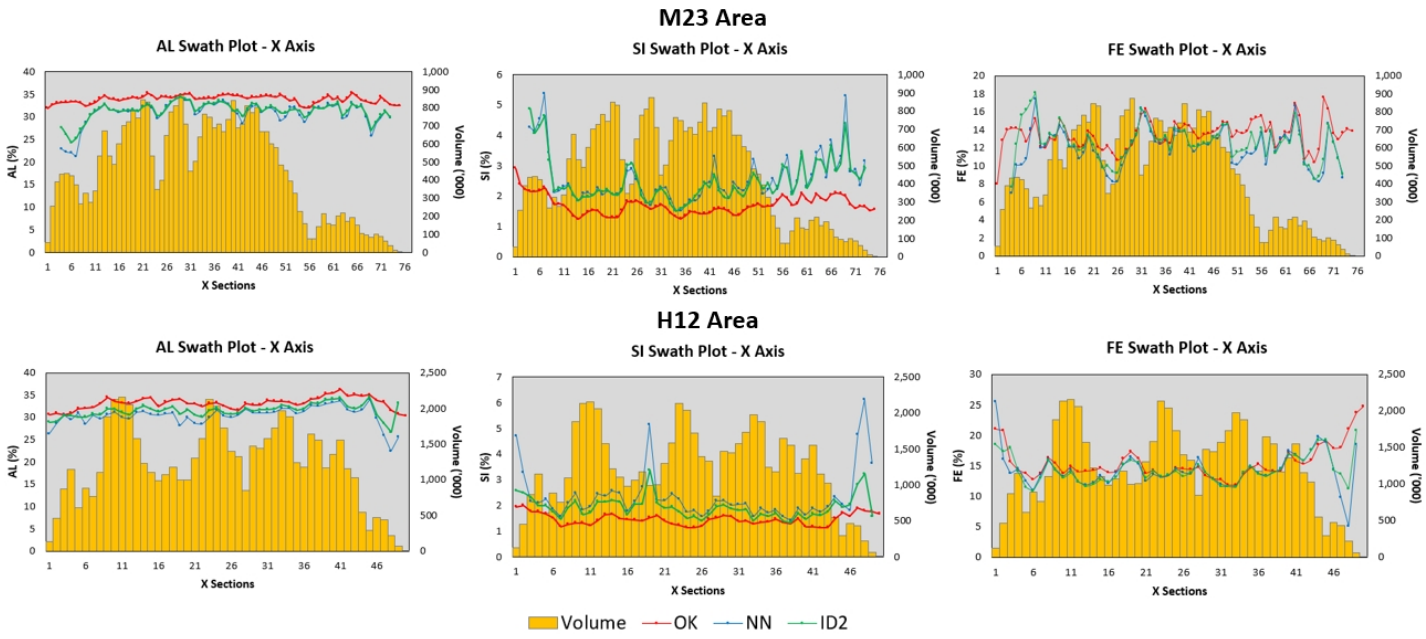
Swath plots were built comparing the OK, ID^2 and NN estimations on the X, Y and Z directions.

AL and SI exhibit opposite behaviors, showing higher values for AL and lower values for SI when compared with ID^2 and NN for the bauxite layer. These differences are around +8% and – 5%, respectively, and are also identified in the statistical validation. Additionally, the ID^2 and NN estimates show a more variable average grade locally, while the OK behavior is more constant, which indicates a potential over smoothing of the estimation for these variables. FE shows a similar local and global trend between the different estimation methods.

As mentioned before, although some variation is expected due to the differences in the estimation workflows, SLR recommends that additional estimation validation procedures be incorporated to the current validation workflow, such as the comparison with ID^2 and NN, and a smoothing degree evaluation.

Figure 11-15 illustrates the AL, SI, and FE swath plots in the X direction for the bauxite domain of both areas. Sections of 5 and 10 meters were used for the M23 and H12 areas respectively.

igure 11-15: Swath Plots in X direction for AL, SI and FE for the M23 and H12 areas – bauxite layer



11.12 Cut-off Grade and Mining Constraints

Darling Range uses a historically accepted economic Mineral Resource cut-off grade of ≥27.5% AL, ≤3.5% SI, and ≤4kg/t OX, that is implicit in the delineation of the bauxite layer in the geological modelling stage. A minimum thickness of 2 m is also used to improve the Mineral Resource definition.

In addition to the geological modelling cut-offs criteria, the constraints described below are applied to the GSM and 3DBM Mineral Resource definition:

- a minimum area of 1 ha.
- a minimum face height of 1.5 m (distance from mining floor to the base of overburden).
- face heights exceeding 4 m are treated as multiple benches.
- an overburden to face height ratio ≤1.
- a maximum floor gradient of 1 in 7 over a minimum of 15 m for the first cut, and 1 in 5 for second and third cuts.
- a minimum access corridor of 45 m for mining equipment.

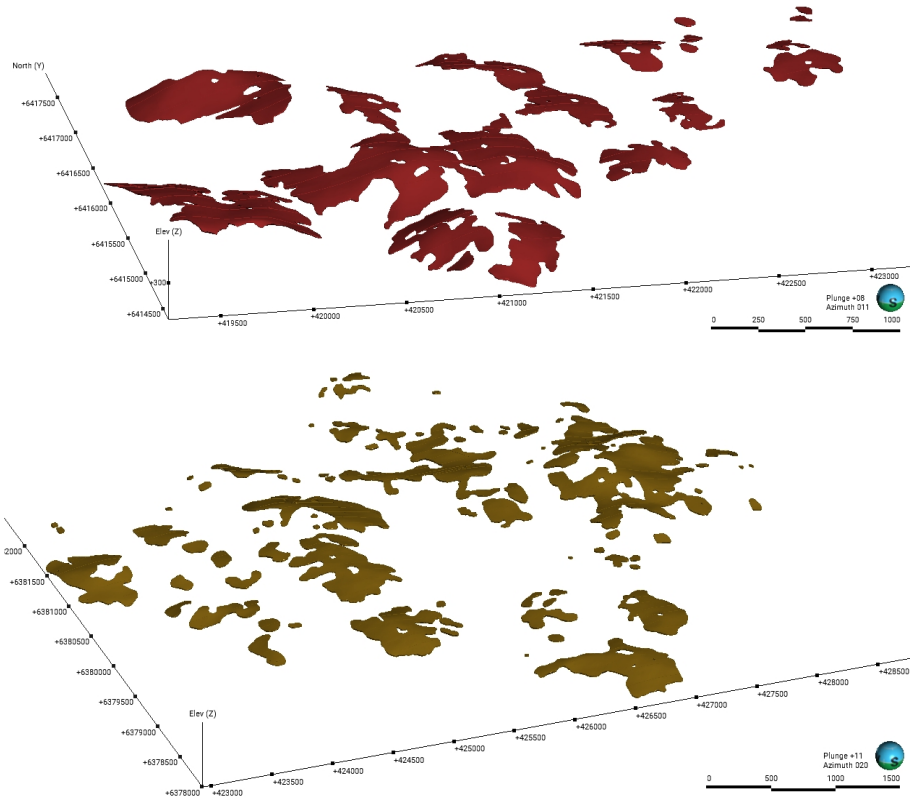
Bauxite resources can include material outside the geological modelling grade cut-offs that may also be considered as mineable, and a cut-off depth basis is used when AL grade is lower to define whether or not a block is economic.

Mineral Resources have been estimated using a LOM price of $500/t for alumina and $300/t for caustic soda, respectively. These prices were determined based on historical market trends. The $500/t alumina price corresponds to the maximum API average price over a six-month period in the past ten years, while the $300/t caustic soda price reflects the minimum caustic price over the same time frame, adjusted for delivery costs to relevant refinery locations.

The time frame used to estimate these commodity prices aligns with the long-term strategic planning window (2025–2033), which considers average pricing trends for mine scheduling. These prices are in accordance with the criteria of reasonable prospects for economic extraction (RPEE). The selected values are reviewed periodically and will be updated if material changes occur.

The optimized Mineral Resource pits are shown in Figure 11-16.

igure 11-16: Mineral Resource Pits for the M23 (top) and H12 (bottom) areas. Vertical exaggeration 3x



Source: SLR, 2023.

The grade cut-off criteria to report the Mineral Resources is a common approach for the bauxite mines, and the QP is of the opinion that to improve the recoverable resources reporting, a re-blocked block model to a minimum practical mining scale or single mining unit should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.

11.13 Reconciliation

Alcoa's staff is working on an integrated reconciliation process for all operating mines, aimed at standardizing reconciliation terminology, metrics, and standards. The workflow began development in 2023 and entered the testing phase for Darling Range in 2024 to calibrate the inputs and outputs.

The following sections describe the current reconciliation methodology and results.

11.13.1 Sampling Tower Data

Refinery feed grade is monitored for the Huntly and Willowdale mining regions using material collected prior the arrival of the stockpile stackers at the Pinjarra and Wagerup sampling towers.

Alcoa mine planning personnel rely upon historical comparisons between the As Mined estimates, which means the tonnage and grade based on the block model using a mined-out perimeter or surface, and the sampling tower data to apply adjustment factors to mine design estimates, to assist with scheduling and stockpile planning activities. The adjustments are not applied to the global reported Mineral Resource estimates as they are considered to be local factors.

Sampling tower performance was discussed in SLR, 2022.

11.13.2 Resource to Sampling Tower Comparison

Alcoa reconciles the resource (mine design) estimates with the sampling tower estimates once mining is completed for each mining zone. It is important to note that the majority of the Mineral Resources are prepared using 30 m or 60 m spaced data, whereas As Mined to sampling tower reconciliation is based on mine planning models constructed from 15 m spaced data that include additional mining constraints.

Figure 11-17 and Figure 11-18 show the annual relative grade differences for both Huntly and Willowdale respectively. These plots indicate:

- For Huntly, the reactive silica trend shifted from higher differences (above 20%) to lower differences (around 5%) between 2014 and 2023. However, in 2024, the difference increased again above 10%.
- Willowdale also shows a high variability pattern for reactive silica, historically usually above 10%, and reaching around 25% in 2024.
- The most variable pattern is for the reactive silica compared with the other elements.
- That most As Mined grades are currently within 5% of the sample grades.

The sources of the reconciliation differences shown in Figure 11-17 and Figure 11-18 are not known, but the following factors could contribute:

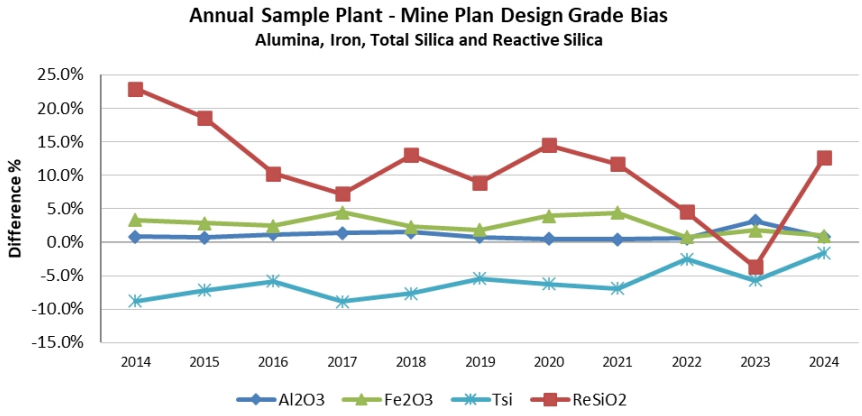
- Resource models were prepared using FTIR assay data, whereas the sampling tower samples are assayed using the same techniques as the REF Method (see Table 8-1 in Section 8.3.2.1) but with BD rather than MD. Alcoa assumes that this is more accurate, but that is difficult to confirm for partial digestion methods such as AL, SI, and OX.
- Changes in the resource modelling procedures from Polygonal, to GSM, to 3DBM. The latter method has only recently been introduced and represents limited material processed in recent years.
- The As Mined grades and tonnages could include some additional dilution and ore loss relative to the planned mine design.
- Differences between the Pinjarra (inspected and validated by SLR, see Section 8.4.4.6) and Wagerup sampling towers.

Incremental reconciliation improvements appear to have started around 2010, which may reflect an improvement in data quality (drilling and assaying procedures) around this time. Consequently, Mineral Resources using data collected prior to approximately 2010 are considered to be of lower confidence and the classification of resource models constructed from this data has been downgraded accordingly.

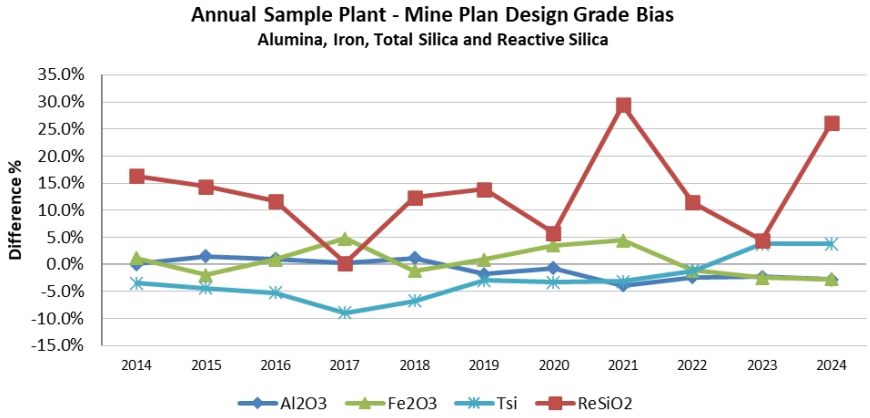


Reconciliation data in recent years falls within acceptable limits on an annual basis to support the classifications used for reporting of Alcoa's Darling Range Mineral Resource.

igure 11-17: Resource versus Sample Plant Reconciliation – Huntly (SLR, 2024)



igure 11-18: Resource versus Sample Plant Reconciliation – Willowdale (SLR, 2024)



11.14 Mineral Resource Estimation Risk

The estimation of Mineral Resources for any commodity, including bauxite, is subject to significant risks, including those described below and elsewhere in the discussion of risks associated with mining and processing of bauxite to produce alumina (see Section 12.9). An investor should carefully consider these risks. If any of the described risks occur, the Darling Range bauxite mining and processing business, financial position and operational results could be materially affected adversely.

The purpose of Technical Report Summaries issued under S-K 1300 and other similarly purposed International Codes (JORC, 2012; NI 43-101, 2014) is to ensure that known risks are disclosed by the QP subject to expectations of Transparency, Materiality and Competency. This Technical Report Summary addresses the technical risks associated with

the Geology, Sampling, Assaying, Data Management in Sections 6.0 to 9.0 and Mineral Resource Estimation in Section 11.0. The QP considers that no material technical risks are identified in those Sections.

The risks described below are not comprehensive and there may be additional risks and uncertainties not presently known, for example due to market or technology changes, that are currently deemed immaterial but may also affect the business. The QP considers that the following risks specifically pertain to the Mineral Resources declared for Alcoa's Darling Rang operations.

11.14.1 Specific Identified Risks

- Continuous improvement of all aspects of Alcoa's resource delineation programs means that changes have been incremental as refinement to previous procedures. Thus, estimates for the majority of the Mineral Resources are essentially variants of those devised in the late 1980s and early 1990s and are not consistent with current conventional practices. This is reflected in the large tonnage of Inferred Resources declared. The demonstrated successful operation of the Alcoa operations over an extended period indicates that it is unlikely that any aspects of the data collection and resource delineation process are significantly flawed, although there are recognized shortcomings.
- Drill sampling is essentially the extraction of small volumes of material taken to be representative of the large tonnages being estimated. There are always local errors of precision and biases that are not recognized. Robust sample preparation and geostatistical estimation are used to identify and overcome these errors, backed up by closed-loop reconciliation with the stockpile tower samplers. These systems may not identify changes in the underlying geology or other data as the area to be delineated expands over time.
- The Mineral Resource estimates may not contain adequate or relevant data if the bauxite is supplied to other refineries, or if processing methods change, or if some new analyte is required.
- The older ResTag and GSM estimation procedures, which represent the bulk of the Inferred Mineral Resources, are relatively inflexible, and may not contain the level of detail necessary to adequately support mining optimization studies. This has been largely addressed by the recent move to 3DBM resource estimation technique, which more easily enable the preparation of models that contain sufficient resolution and detail to support conventional mining optimization studies. These models will allow incremental improvements to address any challenges in meeting target grade specification, resolving reconciliation issues, or tailoring the estimation parameters and procedures to prepare models that better reflect local changes in mineralization characteristics. The 3DBM modelling procedures offer more flexibility in moderating any adverse effects of sampling imprecision compared to the older procedures and in producing grade tonnage curves to meet various impurity constraints (when modelled).
- Further advances in geostatistical estimation may be expected including more use of directional anisotropy (through variograms), and conditional simulation to quantify estimation risk and optimize drill sampling grids.
- A comprehensive program is required to resolve the issue of density estimation. Estimates in the resource models use a simplistic linear regression algorithm for iron rich material based on very few data, and otherwise assumed values. This deficiency is overcome by reconciliation of tonnages of material fed to stockpiles and the subsequent adoption of a downgrading factor (currently 5%) to account for differences to the model estimated density. Technology now available, including



volume surveys using drones and truck gantry scanning, infra-red moisture determination, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, mean that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.

- The grade characteristics of the bauxite profile could be reproduced in the model, enabling optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.
- There is currently significant reliance upon the sample plant results for production scheduling and blending, as well as for assessing the reliability of the Mineral Resource estimates.

The current drill sampling methods have been improved over time, based on independent review, and the requirements for minimum impact on the Darling Range. The assaying methods, including the use of FTIR, have been comprehensively reviewed and validated. The geostatistical estimates of in situ dry tonnages and grades are reasonable and validated by comprehensive reconciliation. The SLR QP considers that these methods are appropriate to produce the declared Mineral Resources and Mineral Reserves.

11.14.2 Generic Mineral Resource Uncertainty

- Estimates of Measured and Indicated Mineral Resources are uncertain. The volume and grade of ore actually defined from these as Mineral Reserves is not predictable until mine planning is done to account for all the identified Modifying Factors. Forecasts based on the current transfer price of bauxite, current interpretations of geological data obtained from drill holes, and other information regarding the Modifying Factors, may not necessarily be indicative of future results. A significantly lower bauxite transfer price as a result of a decrease in aluminum prices, increases in operating costs, reductions in metallurgical recovery, or other changes to the Modifying Factors, could result in material write-downs of the value of the Darling Range mines.
- Should changes be required due to exigent circumstances, it may take some years from exploration until commencement of production, during which time the economic feasibility of production may change.
- Alcoa cannot be certain that any part or parts of a deposit or Mineral Resource estimate will ever be confirmed or converted into Regulation S-K Subpart 1300 compliant Mineral Reserves or that mineralization can in the future be economically or legally extracted.

To ameliorate such risks the Mineral Reserves declaration is limited to material for which extraction is currently planned within the LTMP. The Mineral Resources excluding Mineral Reserves indicate the likely potential beyond that time frame, given all the limitations on future knowledge outlined above.

11.15 Classification

Definitions for resource categories used in this report are those defined by the SEC in S-K 1300. Mineral Resources are classified into Measured, Indicated, and Inferred categories.

The Mineral Resource estimate for Darling Range is produced by aggregating many different models, produced using data of different qualities at different drilling densities, and modelled using different estimation procedures. The Mineral Resource classification has been applied to the various resource models based on consideration of the quality and quantity of the input data, confidence in the geological interpretation, and confidence in the outcomes from



the various estimation methods. The main factors that drive the Mineral Resource classification are the drill hole spacing, the quality of data collected, and the resource modelling technique. These elements will be explored in greater detail in the following paragraphs.

A drill hole spacing study (SRK, 2019a) aimed at quantifying the differences in the reliability of local estimates with different drill spacings was undertaken in 2019 using a similar approach to Alcoa's 3DBM procedures. The study concluded that drill spacings of 30 m by 30 m and 60 m by 60 m were adequate to support the delineation of Measured and Indicated Resources respectively.

Due to the different block model types, the following adjustments in the classification were done aiming to best reflect the uncertainty for each one:

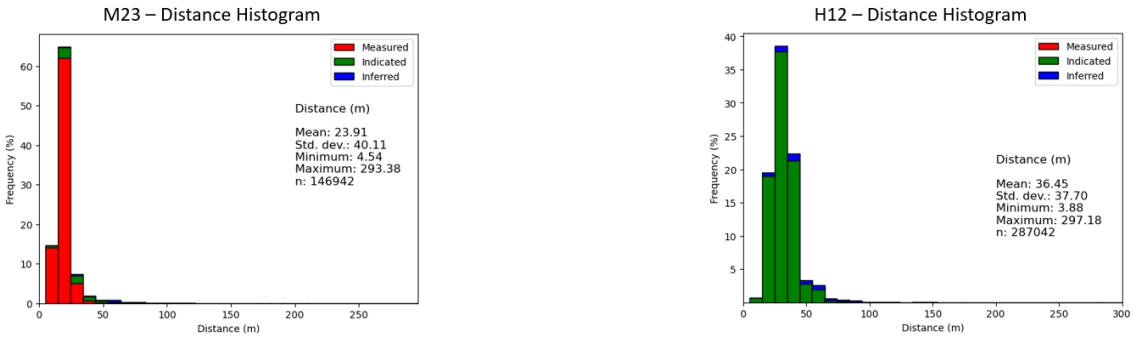
- For the GSM models where the drill hole spacing is 30x30 m, the Measured material was downgraded to Indicated, unless on a tighter 15 by 15 m drilling grid. The additional data density overcomes the potential deficiency of the GSM method. Some of the defined Measured material estimated using a significant amount of older (pre-2010) drill sampling was also downgraded to Indicated, reflecting the lower confidence in that older drilling data, since data quality (due to drilling, sampling, and assaying procedures) has been upgraded since then.
- For the Polygonal models where the drill hole spacing is 60 by 60 m, the resource estimate was classified as Inferred.

The Mineral Resource material has mining constraints applied, as detailed in the Cut-off Grade and Mining Constraints section, effectively ensuring that reasonable prospects for economic extraction are assured.

Resource classification criteria are applied in the horizontal plane and are consistent for the entire laterite vertical profile. Thus, interpretation of the roof and floor of the Bauxite Zone are implicitly assumed to be of similar confidence. In some areas, the geological floor may be erratic for Polygonal models and of lower confidence than the roof, but these areas are typically excluded when mining constraints are applied to the GSM and 3DBM resource models.

Figure 11-19 shows histograms of the resource classification and the distance of the closest sample for the M23 and H12 areas.

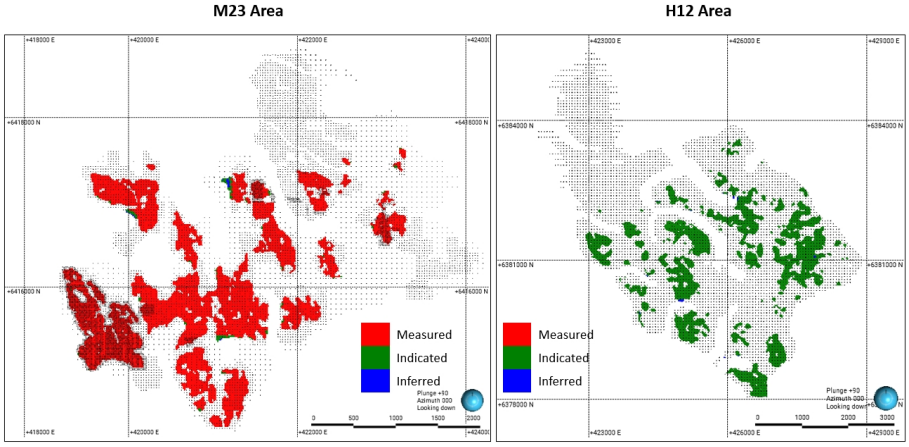
igure 11-19: Minimum distance histograms showing the resource classification by the distance of the closest sample



A visual example of the final Mineral Resource classification within the Mineral Resource pit is shown in Figure 11-20 for the M23 and H12 areas. The great majority of the blocks within the Mineral Resource pit in the M23 area are Measured due to the 15x15 and 30x30 m drill

hole spacing, and for the H12 area the great majority is Indicated, due to the 60x60 m drill hole spacing. The final classification polygons can include small areas where the gaps between drill holes are at the next spacing increment, and they are used to assign resource classification for the full vertical profile of the laterite profile.

igure 11-20: Plan View of M23 and H12 Resource Classification. Block within the Mineral Resource Pit



Source: SLR, 2023.

11.16 Mineral Resource Reporting

Key refinery target grade requirements for AL, SI, and OX along with practical mining considerations have been taken into account when defining resource blocks using GSM and 3DBM modelling methods. Polygonal resource models do not account for mining constraints other than a 1.5 m minimum thickness.

ML1SA contains some sub-regions for which mining permission has not been granted, due to forestry, environmental, social or other constraints, and Mineral Resources have not been defined in these areas by constraining the Mineral Resource model using ArcGIS software.

For Mineral Resource reporting, the block tonnage estimates have all been reduced by 5% on the basis that:

- the reconciliation data at both Huntly and Willowdale indicate that the As Mined tonnage estimates over the past 20 years have been consistently higher than the stockpile received tonnages after the sampling tower by approximately 5%; and
- the stockpile estimates are derived from weightometer readings, and the weightometers are regularly checked and calibrated.

A summary of the Mineral Resource estimates, exclusive of Mineral Reserves, for the three ML1SA mining regions is shown below.

able 11-13: Darling Range Mineral Resources exclusive of Mineral Reserves by Mining Region – 31 December 2024

Category	Mine	Tonnage (Mt)	AL (%)	SI (%)
Measured	Huntly	106.1	30.4	1.89
	North	0.0	0.00	0.00
	Willowdale	33.5	30.4	1.39
	Sub-total	**139.6**	**30.4**	**1.77**
Indicated	Huntly	40.7	30.3	1.46
	North	0.8	32.3	1.38
	Willowdale	7.1	29.9	1.16
	Sub-total	**48.7**	**30.3**	**1.42**
Measured + Indicated	Huntly	146.8	30.4	1.77
	North	0.8	32.3	1.38
	Willowdale	40.7	30.3	1.35
	Sub-total	**188.4**	**30.4**	**1.68**
Inferred	Huntly	9.0	35.7	1.25
	North	15.1	31.6	1.00
	Willowdale	77.3	32.2	1.24
	Sub-total	**101.4**	**32.4**	**1.20**

Notes:

1. The definitions for Mineral Resources in S-K 1300 were followed, which are consistent with JORC (2012) definitions.

2. Mineral Resources are 100% attributable to Alcoa.

3. Mineral Resources for the polygonal models are estimated at a geological cut-off grade, which generally approximates to nominal cut-off grades of 27.5% available alumina (AL) with less than 3.5% reactive silica (SI). Locally the cut-off grade may vary, depending on operating costs and ore quality for blending.

4. Mineral Resources were estimated using an alumina LOM price of $500/t and a caustic soda price LOM of $300/t.

5. A minimum total mining thickness of 1.5 m was used.

6. In situ dry bulk density is variable and is defined for each block in the Mineral Resource model.

7. A global downwards adjustment of tonnes by 5% is made to account for density differences based on historic mining performance.

8. Mineral Resources are reported exclusive of Mineral Reserves.

9. The reference point for the Mineral Resource is the in situ predicted dry tonnage and grade of material to be delivered to the refinery stockpile following the application of Mineral Resource pit.

10. Metallurgical recovery has not been directly considered in the estimation of Mineral Resources as the Darling Range operations do not include a conventional processing plant, only crushing as described in Section 14.0. The metallurgical recovery of the refineries (Pinjarra and Wagerup) are beyond the boundaries of the mining operations being the subject of the TRS.

11. Numbers may not add due to rounding.

11.17 QP Opinion

The SLR QP is of the opinion that Alcoa's Mineral Resource classification scheme is considered appropriate for delineating the expected relative confidence of the Mineral Resource, in accordance with the S-K 1300 definitions as follows:

- All sampling, sampling preparation, assaying and database management practices are compliant with current industry best practice and no fatal flaws were identified for all material classed as Mineral Resource.



- Appropriate industry best practice for geological modelling techniques and variography are used to establish geological and grade continuity from appropriately spaced drill holes.
- Industry standard estimation techniques (3D block modelling or seam block modelling) are used for all Measured and Indicated Mineral Resources, using appropriate drill spacings.

The SLR QP is of the opinion that the modelling work completed to date is deemed suitable for its intended purpose. Upon evaluation of diverse technical and economic factors, it has concluded that the conditions stipulated under the Reasonable Prospects For Economic Extraction are met. This includes the effective constraint of the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices reincorporating feedback into the geological model.

12.0 Mineral Reserve Estimates

12.1 Summary

A Mineral Reserve has been estimated for Alcoa's Darling Range bauxite mining operations in accordance SEC S-K 1300 definitions which are consistent with the guidelines of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The JORC 2012 Code).

The QP inspected Alcoa's Willowdale operations on 08 October 2024 and Huntly on 09 October 2024. Alcoa's Mine Planning department was visited 10 & 11 October 2024 to review the LTMP, Medium Term Plan (MTP) and to interview relevant personnel on these dates. This supports prior review and discussions and on other occasions (2021 to 2023). A full account of the site visit to the mines, offices, and the refineries is provided in Section 2.1.

The Mineral Reserve is classified with reference to the classification of the underlying Mineral Resource and with reference to confidence in the informing Modifying Factors. The QP considers the Proven and Probable classification to be appropriate to the deposit and associated mining operations.

The reference point for the Mineral Reserve is prior to the processing plant at the refinery.

The Proven Mineral Reserve is a subset of Measured Resources only. The Proven Mineral Reserve is included in the Long Term Mine Plan (LTMP) and is approved for mining.

The Probable Mineral Reserve is estimated from that part of the Mineral Resource that has been classified as Indicated or from Measured Resources that are included in the LTMP but not yet approved for mining.

Variable cut-off grades are applied in estimation of the Mineral Reserves, and these are related to operating cost and the nature of the Mineral Resource in relation to blending requirements. The Mineral Reserve estimate is expressed in relation to available aluminum oxide (AL) and reactive silica (SI), this being the critical contaminant in relation to the Refinery.

able 12-1: Summary of Darling Range Mineral Reserves – Effective 31 December 2024

Region	Class	Tonnage (Mt)	AL (%)	SI (%)
Huntly	Proven	12.4	28.3	1.87
	Probable	254.3	30.6	1.77
	Total	**266.7**	**30.5**	**1.77**
Willowdale	Proven	13.7	30.0	1.38
	Probable	143.3	31.2	1.19
	Total	**157.0**	**31.1**	**1.21**
Total	Proven	26.1	29.2	1.61
	Probable	397.6	30.8	1.56
	Total	**423.7**	**30.7**	**1.56**

Notes:

1. The definitions for Mineral Reserves in S-K 1300 were followed, which are consistent with JORC definitions.

2. Mineral Reserves are stated on a 100% ownership basis following Alcoa Corporation's acquisition of Alumina Limited.

3. The target grade for mine planning is generally between 29.0 to 32.6% available aluminum oxide (AL) and around 1.5% reactive silica (SI) and varies locally. Related to the MTP from 2025 to 2028 these targets are lower at 28.5 to 30% Al and higher at 1.8 to 2.25% for SI.



4. Mineral Reserves are estimated at an economic cut-off which considers grade, operating costs and ore quality for blending. The economic cut off has been estimated using a base alumina price of $400/t for Alumina. Various deductions for caustic ($500 /t), other alumina production costs, along with mining related costs and a metallurgical recovery factor for extractable alumina of 93% have been applied during optimization to provide economically minable shells for the purpose of the LTMP.

5. Minimum mining widths are not used due to the surficial nature of the Mineral Resource, rather a minimum mining block size of 15m by 15m by 1m deep is applied.

6. The reference point for the Mineral Reserve is the refinery processing plant gate, with crushing, washing (as applicable), and transportation being the only process employed.

7. Bulk density is variable, dependent on the nature of the Mineral Resource and is separately estimated in the Mineral Resource model.

8. The moisture factor used to convert wet tonnes to dry tonnes is 0.91

9. Numbers may not add due to rounding.

The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate.

The LTMP requires that permitting for operational dependencies is achieved timeously. The LTMP also requires two crusher moves (which are costed for). Longer haul distances 25km (+10km pre 2024) will be utilized over short periods at Huntly and the deliverable tonnage to the refinery will be 18Mtpa until 2032.

The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.

The Modifying Factors are summarized as follows:

- Only Measured and Indicated Mineral Resources are considered.
- Only mineralization defined in mine planning work has been considered. This includes Measured and Indicated material, subject to the application of mining Modifying Factors.
- Indicated Mineral Resources are classified as Probable Mineral Reserves, subject to the Modifying Factors and mine scheduling constraints.
- Measured Mineral Resources are classified as Proven Mineral Reserves or Probable Mineral Reserves, subject to the Modifying Factors and mine scheduling constraints.

12.2 Comparison with Previous Estimate

A comparison of the current Alcoa Mineral Reserve estimate, to the previous 2023 Mineral Reserve estimate, is presented in Table 12-2. Overall, the Proven and Probable Reserves increased by 79.6 Mt (23.1%), from 344.1 Mt to 423.7. The AL grades have decreased by 2.5% and SI has increased by 18% respectively over the same period.

The increase in reserves is primarily due to the following changes:

- 11.2Continuous mineral exploration activities (for Resource expansion)
- Optimization of the Mineral Resources and Mineral Reserves considering the base alumina and caustic soda prices
- Migration from Mineral Resources to Mineral Reserves due to mine scheduling changes

Partially offset by:

- Deferred mining of the RPZ
- Constraints as per the MMP conditions described in Section 17.1.1
- Annual mining depletion (in 2024).



able 12-2: Comparison with Previous Mineral Reserve Estimates

Category	Mine	2024 Mineral Reserve			2023 Mineral Reserve			Difference (%)		
		Tonnage dmt (Mt)	AL (%)	SI (%)	Tonnage dmt (Mt)	AL (%)	SI (%)	Tonnage (Mt)	AL (%)	SI (%)
Proven	Huntly	12.4	28.3	1.87	26.2	27.81	1.87	-52.67	1.76	0.00
	Willowdale	13.7	30.6	1.77	21.8	30.75	1.38	-37.16	-0.49	28.26
	Sub-total	26.1	29.2	1.61	48.0	29.14	1.65	-45.63	0.21	-2.42
Probable	Huntly	254.3	30.6	1.77	210.4	31.66	1.36	20.87	-3.35	30.15
	Willowdale	143.3	31.2	1.19	85.6	32.43	1.04	67.39	-3.79	14.42
	Sub-total	397.6	30.8	1.56	296.0	31.88	1.27	34.34	-3.39	22.83
Proven & Probable	Huntly	266.7	30.5	1.77	236.6	31.23	1.42	12.73	-2.34	24.65
	Willowdale	157	31.1	1.21	107.4	32.09	1.11	46.15	-3.09	9.01
	Sub-total	423.7	30.7	1.56	344.1	31.50	1.32	23.15	-2.54	18.18

12.3 Modifying Factors

A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by application of Modifying Factors that demonstrate that, at the time of reporting, extraction could reasonably be justified.

- Mining – Alcoa's Darling Range mining operations are conventional open pit mines and have been operating for over 60 years. The practicalities of mining and associated sustaining capital and operating costs are well understood and have been incorporated in Alcoa's technical assessments to the satisfaction of the QP. An updated economic benefit basis which uses a base alumina price of $400/t has been used by Alcoa to assess the economics of mining operations. The QP is satisfied that the base alumina price of $400/t, and caustic price of $500/t, are reasonable, and the resulting benefit incorporates all related costs associated with mining, processing of the bauxite ore and the subsequent refining to produce alumina. As described above in Section 12.2, the operations have undergone recent changes that have directly affected the MTP resulting in lower AL and higher SI in the short term (36-month) plan. For a more substantive description of Alcoa's Darling Range mining operations, refer to Section 13.0. The mining schedule is discussed further in Section 12.6.
- Processing – This Mineral Reserve is stated with reference to the refinery processing plant gate, with crushing and conveying being the sole processes employed. Bauxite is refined to alumina in the refinery using the Bayer process, which has been employed at the Darling Range operations for many years. For a more substantive description of Alcoa's Darling Range processing operations, refer to Section 14.0.
- Metallurgy – The mining operations are given an ore specification by the sole customers, the refineries. Blending is undertaken at the pit, before the crusher, to ensure that these specifications are met. The QP is satisfied that the procedures employed by mining technical staff have been developed over a lengthy period and are appropriate for the suppression of metallurgically deleterious material in ore sent to the refineries. For a more substantive description of Alcoa's Darling Range metallurgy, refer to Section 10.0.



• Infrastructure – The QP has observed the Darling Range mine infrastructure to be well established, maintained and to a high standard. The operations are located near a major city, with excellent transportation, facilities, and workforce. Provision is made in Alcoa's Life of Mine (LOM) plans for sustaining capital for infrastructure replacement. For a more substantive description of Alcoa's Darling Range infrastructure, refer to Section 15.0.

• Economic – Costs and pricing have been reviewed and the QP is satisfied that the pit optimization, scheduling, and analysis undertaken by mine technical staff is appropriate to the operation and that the costs are well understood. For a more substantive description of Alcoa's Darling Range economics, refer to Section 19.0.

• Marketing – All bauxite is delivered at cost to Alcoa's Darling Range refineries, the sole customer for the mines. The refineries produce alumina, which is further refined into aluminum metal at Alcoa's aluminum plants or exported. Alumina and aluminum are internationally traded commodities and subject to normal market forces and cycles. For a more substantive description of Darling Range's market aspects, refer to Section 16.0.

• Legal – The QP observes that the Darling Range operations have been in operation for a long time (+60 years) and are licensed in relation to obligations under Western Australian legislation. The primary operational approval for Darling Range is provided under the Mining Management Plan 2023-2027 by the statutory Mining and Management Program Liaison Group (MMPLG; now Bauxite Strategic Executive Committee Bauxite (BSEC)). The 2023-2027 MMP approval was rolled over to cover the time period of 2024-2028 in October 2024.

• The MMPLG/ BSEC consists of representatives from across government and is responsible for reviewing mine plans and associated activities and making recommendations to the Western Australian Minister for State Development.

• Environmental - The QP observes that the Darling Range operations have a long history of progressive rehabilitation of mined-out areas. There are restrictions placed on some mining areas that are related to proximity to water catchments, places of social importance and fauna habitat. The current primary operational approval is by the MMPLG/BSEC. For a more substantive description of Alcoa's Darling Range environmental obligations, refer to Section 17.0.

• Social – The QP observes that the Darling Range operations have long been a major employer and economic contributor to the region and that the operations have numerous well-established community and social initiatives. A skilled workforce resides in the area, as do many service industries. The QP does not consider social risk to be material to the Darling Range operations.

• Governmental – Western Australia and Australia in general are stable, developed democracies with an advanced economy. Governmental relations with the Darling Range operations are currently facilitated by the BSEC (previously the MMPLG), which has representation from the relevant government departments. The QP does not consider governmental risk to be material to the Darling Range operations.



12.4 Basis of Estimate

Historically, Alcoa did not report material in the Measured Mineral Resource category, reporting mineralization in areas of 15 m by 15 m spaced drilling as Mineral Reserves reported to the prior SEC standard. Alcoa has subsequently incorporated S-K 1300 and JORC Modifying Factor considerations into its mine planning processes and this was observed and confirmed on site.

The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate. The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. Consequently, the QP considers that support by a Feasibility Study is demonstrated by the demonstrable history of profitable operation and the level of technical support for the Modifying Factors and Front-End Loading (FEL 2), or pre-project planning study, for the recent major Myara capital crusher move. Additional capital costs for the forward mines moves to McCoy have also been reviewed. The QP has reviewed the operating and planning procedures and parameters for the operations and considers that the work completed is sufficient to allow definition of Mineral Reserves.

Proven Mineral Reserves are derived from scheduled Measured Mineral Resources which are included in the Long Term Mine Plan (LTMP) and approved for mining. Probable Mineral Reserves are derived from scheduled Measured Mineral Resources which are not yet approved for mining, or from scheduled Indicated Mineral Resources. The Mineral Resource estimate reported in this document (Section 11.0) is exclusive of the Mineral Reserve.

Consequently, Modifying Factors that relate to community and environmental considerations are formally assessed. The QP considers that as a result there is low risk to not establishing Proven Reserves relating to the project.

The QP has formed an independent view of the Modifying Factors applied in the estimation of the Mineral Reserve. This view is supported by examination and verification of mine planning data and procedures and historic reconciliation information. The QP has interviewed technical staff responsible for Alcoa’s operations and reviewed the operating, planning and forecast reports for the operations supplied by Alcoa.

The mine planning process excludes mineralization that is not considered recoverable due to various constraints, defining no Mineral Resource or Mineral Reserve within these zones. Such constrained zones include Aboriginal heritage sites and old-growth forest; however, these are proactively and dynamically updated by Alcoa through engagement with stakeholders, such as the community, and in response to government requests.

12.5 Dilution and Ore Loss

Dilution and ore loss are not reported separately to the Mineral Reserve. Internal and edge dilution is modelled at the mine planning stage through the application of 15 m by 15 m mining blocks to the Mineral Resource model. These regularized blocks contain proportional estimates of ore and contaminants and are optimized through the application of a Lerchs-Grossman algorithm developed specifically for the operation. This variation of the conventional Lerchs-Grossman algorithm is applied vertically, given that the shallow nature of the mineralization precludes geotechnical considerations. Blocks that do not satisfy grade and contaminant parameters against revenue are thus excluded from the mine plan.

Mining dilution is controlled by excavation of dilution at the top of the mineralization (a source of oxalate or organic contamination) and the pit floor (SI contamination). The upper contact is a sharp geological contact on an undulating surface. GPS-controlled machinery is used to locate these intersections.

igure 12-1: Undulating Hanging Wall Hardcap Surface; and Footwall (white clay, lower right in the floor) (Left: Pearman, 2015 & Right: SLR, 2021)





Organic material reacts with sodium hydroxide in the refinery to form oxalate, which is considered to be a contaminant. Alcoa has developed a process known as Secondary Overburden Removal (SOBR) whereby the soil and clay on top of the hardcap that covers the mineralization and contains this organic material is removed by either scraper, surface miner or small excavator. This removes as much carbonaceous material overlying the undulating hardcap layer as possible. Further description of SOBR is given in Section 13.1.

A surface miner is employed as required at the Huntly mine to cut highly contaminated overburden to the hardcap contact. Historically, this results in a 2.9% ore loss, which is considered in the Mineral Reserve estimation.

The lower mineralization contact is gradational, and dilution is minimal on contaminants other than SI. This contact is defined through drilling and chemical analysis and excavation is controlled by GPS to modelled surfaces.

The Grade Control process checks the accuracy of excavation and assesses adherence to excavation of the target floor.

12.6 Extraction and Mine Planning

12.6.1 Long Term Mine Plan (LTMP)

Alcoa prepares an LTMP annually. The first five years of this plan is submitted to the statutory BSEC (previously MMPLG) for approval of mining areas. The LTMP includes a mine production schedule that demonstrates scheduling of mineralization classified as Mineral Resources for estimation as Mineral Reserves. This schedule contemplates higher confidence Mineral Resources during the early production periods, with lower confidence mineralization planned in subsequent periods (Figure 12-2 and Figure 12-3).

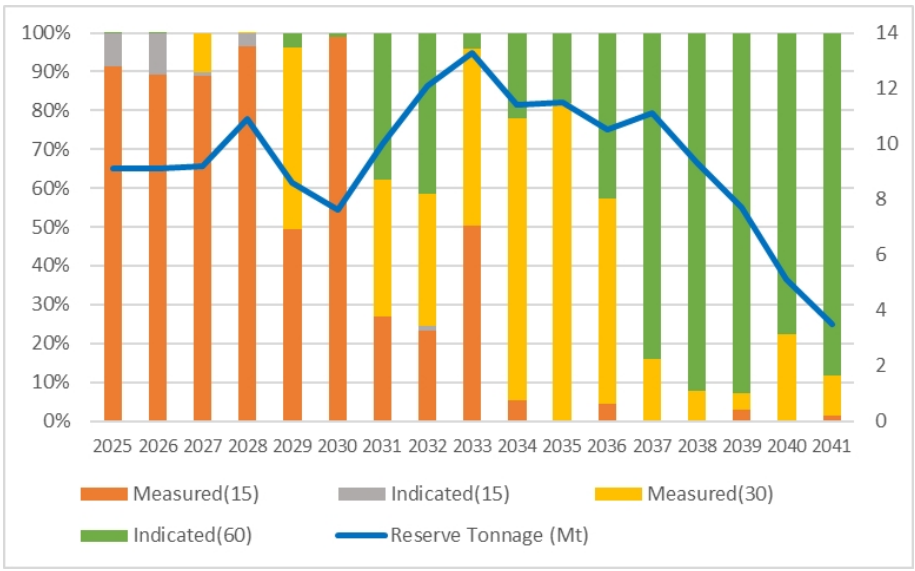
The schedule has several operational parameters in addition to statutory limitations (refer to Section 12.3 above):

- The mineralization lies under haul roads and extraction is delayed until the road is no longer required.
- Mineralization is near a planned crusher location and mining has been delayed until the crusher is installed.
- Contaminants exclude a parcel from blending in the schedule.

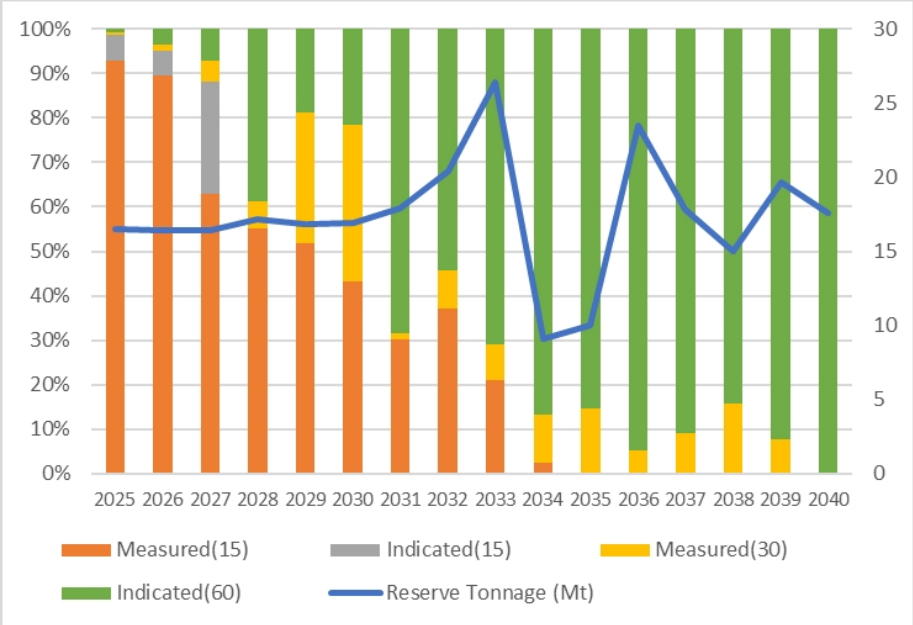
• The mining areas are small and demonstrate low mining efficiency and mining has been delayed.

Confidence in the Mineral Reserves is predicated on confidence in the underlying Mineral Resources in the mining schedule. Continuous Mineral Resource definition drilling maintains an inventory of sufficient confidence to maintain Mineral Reserves.

igure 12-2: Willowdale LTMP Resource Confidence (drill hole spacing in meters shown in brackets) (Alcoa, 2024)



igure 12-3: Huntly LTMP Resource Confidence (drill hole spacing in meters shown in brackets) (Alcoa, 2024)



12.6.2 Mine Planning

Alcoa has been actively refining the mine planning process in such a way that the Mineral Resource and Mineral Reserve Models are updated continuously using various scripts and rationalizing of computer software. This process is mostly complete, the QP observed its progress both on the mine sites and at the Booragoon mine planning office.

The mine planning process commences with receipt by the mine planning department of the regularized and classified electronic Mineral Resource model from the geologists. The regularization process sees the Mineral Resource blocks agglomerated into blocks of 15 m by 15 m by 0.5 m vertically. Grade, bulk density and contaminant parameters are estimated into the model, which is expressed as a percentage model. This model is then manually checked and validated.

Electronic files are centrally stored, and the master versions are copied by relevant personnel for manipulation.

Optimization of the pits is undertaken using a bespoke variant of the Lerchs-Grossman algorithm designed to operate vertically. The algorithm accumulates blocks vertically on 0.5 m increments, commencing at a minimum thickness of 2m, to find the pit floor.

The optimization is driven by Net Present Cost (NPC), rather than the conventional Net Present Value (NPV). The optimization considers a number of cost and consumption inputs which include caustic, lime, electricity, and gas power to be deducted from the base alumina price of USD 400/tonne.

Geotechnical constraints are not relevant, given that the pits are generally around 4 m in depth and placed on gently undulating country (Section 7.9). Contour mining is applied in areas of greater topographic relief, whereby mining progresses across the contour, maintaining as consistent a pit floor as possible.

Optimization parameters are calculated for each block, including costs associated with drilling, blasting and ripping and haulage cost, which is estimated from major haulage roads and minor pit access roads against gradient. Electronic surface models are prepared to constrain the optimization; these are informed by LiDAR radar surveys and model the topography, the base of overburden and the base of mineralization, derived from chemical analysis of resource definition drilling samples. Caprock requires drilling and blasting, and modelled surfaces are contoured for thickness, which is derived from examination of drill logs and high-Fe assays.

Pit shells are visually assessed for practicality and minimum mining widths and any impractical pit shells are removed. Minimum mining widths vary according to topography and material type.

Individual areas are optimized separately, and the resultant pit shells are combined to provide grade and contaminant specifications for Life of Mine (LOM) scheduling. Haul roads are divided into 50 m segments with appropriate cost increments applied to each segment using commercial haul road optimization software. This process electronically tags each block with haulage cost information as a function of distance of the relevant node (haul road) from the nearest crusher. The software then normalizes the data by calculating the equivalent flat haul distance, maintaining a gradient of less than 8% for all nodes.

The model is then depleted for mined material and blocks that have been otherwise committed for development or have been mined out and also for environmental constraints.

Environmental constraints include proximity to streams, designated heritage areas (both Aboriginal and European) and the water catchment offset. GIS software is used to continuously generate electronic shape files that are converted daily to string files for import into the mine design software. These are then used to deplete the model in relation to environmental constraints.

Mineralization that has been identified as being under infrastructure is scheduled for mining only after that infrastructure has been removed in the LOM plan.

Noise zones are those where noise from the mining operations will potentially exceed allowable levels and the operation actively seeks to maintain lower noise levels than those mandated. Mining in these areas is undertaken by contract miners on day shift only and attracts higher costs than conventional owner-operator mining, which is applied to most of the operation.

The regularized model is then coded for the above parameters and checked. All the above processes are logged, checked, and validated both electronically and visually. Electronic scripts are then run in the mine planning software, resulting in the reporting of Mineral Reserves.

The Value in Use (VIU) revenue for mined ore is defined from an in-house optimization and integrated mine planning process. This VIU is calculated by subtracting the costs associated with mining and refining activities from the base alumina price. The costs considered in this calculation include various consumable inputs such as caustic, lime, electricity, and gas power, all of which are deducted from the base alumina price of USD 400 per tonne.

A discount rate of 12.00% is mandated by the Finance Department and applied to the NPV scheduler during the mine planning process.

The QP notes that costs and revenues used in this process demonstrate reasonable variations consistent with market trends over time and that revenue has remained constant over the past year.

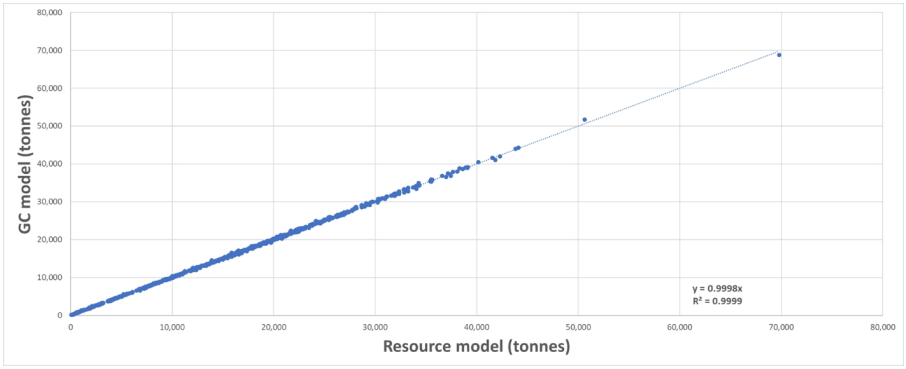
In practice, the Grade Control Model is used to direct mining at the bench scale, because it has more up-to-date drilling data than the Mineral Resource Model. Reconciliation is undertaken between the Mineral Resource, Mineral Reserve and Grade Control Models, with

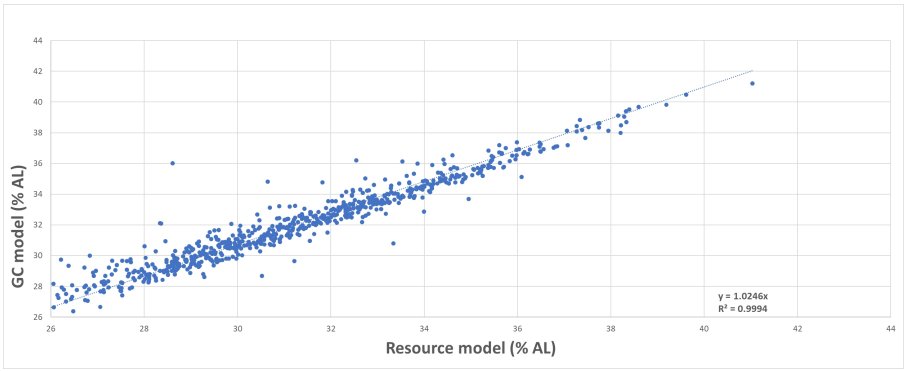


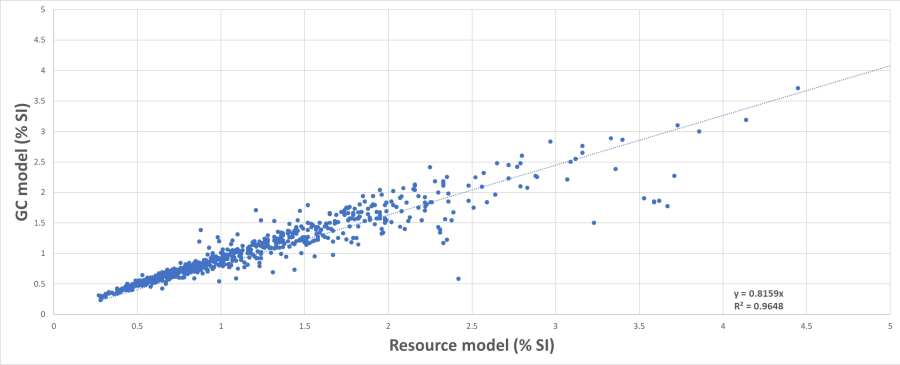
the QP observing the reconciliations between Mineral Resource and Grade Control Models to be within acceptable parameters. Reconciliation of the Mineral Reserve model has not been regularly undertaken in the past and this process was observed to be in development.

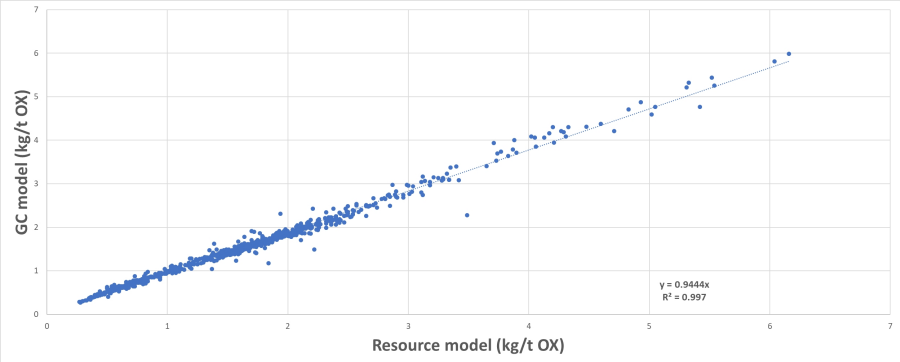
Figure 12-4 shows an example of the reconciliation between Resource and Grade Control models undertaken regularly by Alcoa.

igure 12-4: Example of Reconciliation Between Mineral Resource and Grade Control Models for Tonnage, Al, Si, and OX (Alcoa, 2022)









The resultant pit shells are scheduled using specialist automated mine scheduling software. A text file containing the model and its parameters is exported to the scheduling software, which is programmed with current wait times and the current mining capacity of 26.5 Mtpa (Huntly) & 11 Mtpa (Willowdale). The software calculates and defers, as much as possible, capital haul road development costs for each block and identifies an optimal schedule.

Sustaining capital is calculated and added for haul road maintenance and equipment replacement. Not all machinery is capitalized, some being leased, and this is included in the operating cost. Review of ownership costs against leasing is constant and appropriate factors applied to the model.

The resultant model is coded for grade and contaminants and blocks are flagged with the appropriate mining sequence. Mineral Reserve blocks are contained within the LTMP schedule. The model is then re-exported as a text file to the mine planning software and distributed to the relevant mine planning departments and mine closure engineers for detailed planning.

12.6.3 Abandoned Resources

Some planned mining areas that are included in the schedule are unable to be totally mined for a variety of operational reasons. These reasons usually relate to issues with rock outcrops, hard ground, contamination and access difficulties that are encountered when developing a new mining area. This process drives the continuous development of new mining areas to maintain production capacity.

Alcoa's recorded average abandoned mineralization between 2016 to 2019 (inclusive) is estimated at an average of 4.4% of Huntly (being 1.5% abandoned + 2.9% scalped using surface miner) and 2.0% of Willowdale planned production but can vary materially. These factors are applied to forecast production in the Mineral Reserve estimation process.

12.7 Economic Cut-off Grade

An economic cut-off grade has been used for mine production planning. The process is based on mine optimization to define economic boundaries of minable bauxite in measured or indicated classification from the resource model. The economic cut-off grade is dependent on various operating costs deducted against a base alumina price. The base alumina price has been estimated as a 9 year average (2025 to 2033). Mining cost estimations are also based over 9 years as related to the LTMP. The deductions and basis are shown in Table 12-3. This benefit has been updated for the 2024 LTMP by Alcoa's Mine Planning Department and was reviewed by the QP during the 2024 site visit to the mine planning department. It is the view of the QP that the economic cut-off grade reflects a reasonable market expectation for the sales of bauxite from the Darling Range based on alumina price movements and associated trend over the previous ten years. SLR have reviewed the various detailed inputs and are satisfied that the economic parameters applied to the cut-off grade definition are appropriate. Mining and refinery costs form part of the LTMP (2025-2033), with some key variables summarised in the table below.

able 12-3: Highlighted Cut Off Grade Variables

Plan Input Assumption	Units	Value
Base Alumina Price	USD/t	400
Caustic Price (delivered)	USD/t	500
Recovery	%	93
Exchange Rate	$A/USD	0.7
Moisture Factor	-	0.91

The economic cut-off is determined by subtracting all incurred costs from the base alumina price. Operating costs are primarily influenced by haulage distance and the reliance on contract mining. Contract mining is used in areas where operations are limited to day shifts due to environmental restrictions. Haulage costs increase as the distance between the mined ore and the crusher station increases, which depends on the mine layout.

The current economic cut-off process described presents grades generally above 25.5% for AL and below 3.5% for SI. As previously reported an optimization process is followed that considers the costs associated with mining and processing the ore from each resource pit. Each resource area block model has its cut-off calculated before pit optimization is performed. Commodity pricing is described previously in Section 12.6.2.

12.8 Metallurgical Factors

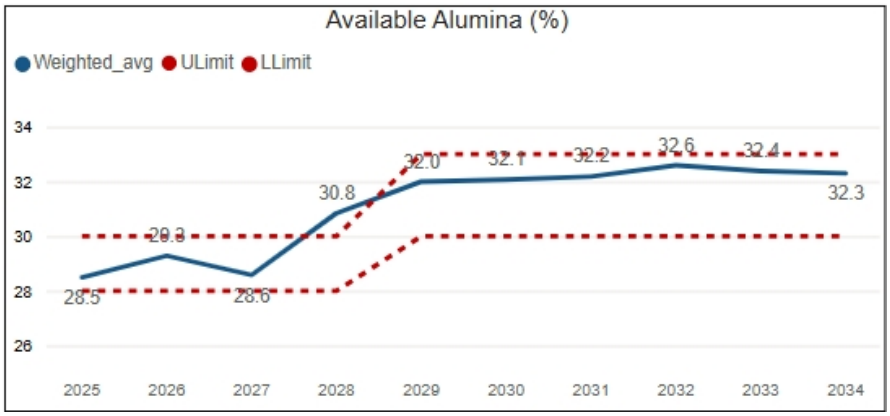
The Huntly and Willowdale Darling Range mining operations currently feed the Wagerup and Pinjarra refineries. The Huntly mine provides feed for the Pinjarra refinery and the Willowdale mine provides feed for the Wagerup refinery. As announced in January 2024, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The LTMP allows for a potential restart of Kwinana within the next ten years. Ore is transported via conveyor belt from the relevant crushers, and the battery limit for the mining process is the refinery gate. All three refineries are established, mature and use the conventional low-temperature Bayer refining processes.



The refineries are designed to accommodate long-term average bauxite and impurity grades from the mines. Internal Alcoa specification contracts are established between the refineries and each of the mining operations and these contracts are updated annually and contemplate a five-year mine plan. These contracts set impurity targets, the key impurities being SI, oxalate, and iron. It is noted that short term (i.e. up to 2027) supply AL grades will be at lower acceptance limits and SI will be at towards upper acceptance limits. Mineral processing testing is discussed in Section 10.0, and processing and recovery in Section 14.0.

The internal LOM (nominally 2045) specification for bauxite is based on a 27.5% AL cut-over acceptance grade, which is supported by the MTP, LTMP and extensive operating history at the refineries. The Figures below show the LTMP for Al schedule for both Huntly (Figure 12-5) and Willowdale (Figure 12-6).

igure 12-5: LTMP: Huntly



igure 12-6: LTMP: Willowdale



Deleterious elements are managed within contracted limits by blending at each mine, with the aim of minimizing variation. The refineries conduct metallurgical test work to ensure that any potential effects of variance caused by new mining areas are understood.

Geometallurgical analysis is conducted on drill hole samples using FTIR analysis as a primary method. A subset of the samples is assayed using conventional analytical procedures, with the results used for FTIR batch calibration and quality assurance purposes. The Mineral Resource model is coded for geometallurgical grades for available alumina and reactive silica. This information is reported in the Mineral Resource estimate as well as the Mineral Reserve estimate.

The Mineral Reserve is based on geometallurgical criteria that have been set by the refineries as suitable for producing alumina to agreed product marketing specifications.

12.9 QP Opinion

The QP considers that, because of the integrated process by which Measured and Indicated Mineral Resources translate to Mineral Reserves for Alcoa's Darling Range operation, there are no foreseeable risks associated with Modifying Factors (mining, processing, metallurgical, infrastructure, economic, marketing, legal, environment, social, or government) that materially affect the Mineral Reserve estimate at 31 December 2024.

The operations are sensitive to the economics related to the actual grade mined, as such lower alumina or higher reactive silica grades or a combination of both remain the main risk to the overall economics. Alcoa has demonstrated through its grade control program an effective control to minimizing the dilution and mining at its forecast grades. Grade control is particularly important along ore-waste boundaries to maintaining expected mined grades, Alcoa demonstrates processes to handle and define boundaries to mitigate these risks.

Haul distance is considered a major cost driver due to the hauling cost making up a significant portion of the mining cost. Hauling directly links to fuel cost and maintenance, the combination of an increased hauling distance as well as an increase in fuel cost and maintenance would result in a significant impact on the operational costs. Haul distances to Reserve blocks typically increase over time until such time there is a plant relocation and so there is an expected increase in hauling distance in the medium term. It is noted because of permitting challenges that there are some significant increases during the MTP schedule in haulage distances. Alcoa has previously managed such risks by defining when the major plant needs to be relocated, however permitting challenges in the short term need to be overcome with some longer than normal average haulage distances.

Alcoa may be unable to obtain or retain necessary permits, which could adversely affect its operations. The Darling Range operation is subject to extensive permitting requirements. The requirements to obtain and/or achieve or maintain full compliance with such permits can be costly and involve extended timelines and possible delays. Alcoa strives to obtain and comply with all required permits but there can be no assurance that all such permits can be obtained and/or always achieve or maintain full compliance with such permits.



13.0 Mining Methods

13.1 General Description of Operations

The Huntly and Willowdale mines employ conventional open pit mining practices and equipment. The fleet is mixed between contract and owner-operator, depending on the nature of the task at hand. Owner operator equipment is used for mining the bulk of the Mineral Reserve, operating in areas away from those subject to environmental restrictions. Contract mining operates smaller equipment, day shift only, in environmentally (noise) sensitive areas and at the perimeter of the mining area.

The Huntly mine currently operates at a nominal mining capacity in order to supply about 17 Mtpa to the Pinjarra refinery. The Willowdale mine further supplies 10 Mtpa to Wagerup refinery.

The Darling Range operations currently have a nominal expected LOM until 2045 (when ML1SA expires), although provision exists for Alcoa to apply for a further mineral lease (Section 3.2). As an annual rolling process, a Long Term Mine Plan (9-10 years) for the estimation of Mineral Reserves (Section 12.6.1) is developed from Measured & Indicated classified Mineral Resources. Appropriate modifying factors are applied to facilitate the conversion of the Resources to Reserves. The Reserves currently extend beyond the mine schedule (LTMP) that forms the basis of the 9-year LOM plan (see also Section 19.0). Mining units of 15 m by 15 m by 0.5 m vertically are in use at the operations (Section 12.6.2).

Dilution and ore loss are not reported separately to the Mineral Reserve (Section 12.5). Internal and edge dilution is modelled at the mine planning stage through the application of 15 m by 15 m mining blocks to the Mineral Resource model. These regularized blocks contain proportional estimates of ore and contaminants and are optimized through the application of an algorithm of a similar nature to Lerchs-Grossman developed specifically for the operation. This variation of the conventional Lerchs-Grossman algorithm is applied vertically, given that the shallow nature of the mineralization precludes geotechnical considerations. Blocks that do not satisfy grade and contaminant parameters against revenue are thus excluded from the mine plan.

Mining recovery from Huntly and Willowdale are estimated to be 95.6% and 98%, respectively.

Figure 3-3 shows the outlines of mined areas, Mineral Resources, and Mineral Reserves, which are collectively taken as representing the final pit outline, as currently understood. This does not account for any required extensions or additional licenses and assumes that all Mineral Resources and Mineral Reserves are ultimately mined.

13.1.1 Clearing

Following definition of Mineral Reserve blocks, vegetation is cleared ahead of mining by an Alcoa managed contractor on behalf of the Western Australian State Forest Products Commission (FPC), saleable timber being harvested for use. Clearing approval is sought ahead of mining allowing time for harvesting of saleable timber before vegetation clearing.

13.1.2 Stripping

After vegetation clearing and harvesting of saleable timber, Alcoa operations commence stripping topsoil and Secondary Overburden Removal (SOBR) using small excavators, scrapers, and trucks. Soil is stockpiled at the site, away from the proposed pit, for rehabilitation purposes. Soil is stockpiled in windrows in such a manner that it maintains its organic viability.

The dieback fungus (*Phytopthora spp*.) is endemic in parts of the mining areas, which are flagged by Alcoa and precautions are taken to contain the fungus, which is lethal to the eucalyptus forest. The QP observed these precautions, which include separation of machinery fleets in areas where dieback is present and washing of machinery before entry into different areas. This represents a minor short-term scheduling challenge, though it is well managed.

13.1.3 SOBR

The SOBR process is specialized and aims to remove as much overburden and organic material from the top of the mineralization as possible. This organic material reacts with NaOH in the refinery to produce oxalates, which are deleterious to the process. After scrapers have removed the topsoil and overburden, small (60t class) excavators equipped with swivel buckets are used to scrape clay containing organic material from the undulating surface of the hardcap that sits on top of the mineralization. This is later used to backfill mined out areas.

igure 13-1: SOBR (SLR, 2022)



The SOBR process is applied to those areas where hardcap has been identified by Resource definition drilling, using the drillers' logs. The hardcap is drilled and blasted before mining with the rest of the bauxite sequence.

In areas without hardcap, wheel tractor-scrapers of 24 m³ capacity remove soil overburden, scraping directly to the top of the mineralization model surface, being controlled by GPS. This material is similarly stockpiled for rehabilitation or used as backfill in exhausted mining areas.

igure 13-2: Topsoil Removal (Background), Blasting of Hardcap and Marking of Ore (foreground) (SLR, 2021)



When required a surface miner is employed in limited areas of hardcap in the vicinity of blasting-sensitive infrastructure such as power lines. The surface mining may also be employed in lieu of SOBR where appropriate, for example, where there are high levels of contaminants in the hardcap. During both the 2023 and 2024 visits it was noted that as there were no operations of sensitivity around infrastructure the surface miner was not required.

13.1.4 Mining

Mining progresses on 4 m benches, utilizing a contour-mining sequence, cutting benches across the topography, working from top to bottom, maintaining the flattest floor obtainable to a maximum gradient of 1:7. Most of the mineralization lies beneath a gently undulating topography and contour mining is minimal.

igure 13-3: Contour Mining (SLR, 2021)



On completion of overburden removal, the exposed surfaces are sheeted with 0.25 m of suitable mineralized material taken from the dozed second cut in adjacent pits. Where hardcap is present, a drill rig is mobilized, and the hardcap drilled and blasted on an appropriate pattern to fragment the hardcap.

Trucks haul the mined ore to fixed crushers, which crush the material to varying sizes (refer to Section 14.0) before conveying down the escarpment to the refinery where it is stockpiled to give surge capacity.

No visual grade control is applied, the ore contacts being gradational. Grade control is achieved by mining to electronic ore surfaces derived from drill assays, control being achieved using GPS equipped equipment, the GPS being regularly calibrated.

Blending takes place at the pit face before which the crushed ore from different pits is assessed using specialist short-term mine planning software and pit production is scheduled to achieve the desired blend.

The QP is of the opinion that considering the style of mineralization, the average depth of the deposit, and the material characteristics of the overburden material whereby it is amenable to ripping / excavation using conventional earth-moving equipment, the open pit mining method adopted at Darling Range is the most appropriate method for the Mineral Reserves.

13.2 Haul Roads and Infrastructure

13.2.1 Haul Roads

Haul roads are the limiting factor to the mining operations. Major haul roads are established to each mining area, honoring the topography at the least possible gradient. Roads are unsealed and formed by conventional bulldozer and grader and sheeted with appropriate material. Once established, haul road maintenance was observed to be continuous and forms part of the operating cost for each mining area. Haul roads are observed by the QP to be treated as sustaining capital in an appropriate manner.

igure 13-4: Truck on Haul Road (SLR, 2021)



igure 13-5: Haul Roads with Berms (SLR, 2021)



Secondary haul roads to individual mining areas are formed in the same manner, with provision for rehabilitation once mining is complete.

The Darling Range climate is subject to wet winter months and trafficability of haul roads during these months is included in mine planning. Redundancy during wet months is planned for, allowing well drained areas to be mined in the wet.

There are some restrictions to the establishment and operation of haul roads, and these are incorporated into the road design and operation:

- Water runoff from the roads is impounded in sumps and these were observed to be well formed and appropriate, being regularly dewatered, emptied of sediment and cleaned. This water is retained within the operational area.
- Dieback control necessitates separation of machinery between that which operates in dieback-prone and dieback-free areas. This presents short-term scheduling challenges that were observed to be well controlled.
- Proximity to a major water catchment restricts the volume of hydrocarbons that may be taken into particular areas around the catchment. This was observed to be adhered to, with particular road rules and scheduled delivery of approved volumes of hydrocarbons along haul roads that are specially formed with impoundments in the event of spillage.

The QP has observed that Alcoa's Darling Range operations have a well-established system for haul road design, construction, maintenance and regulation and that this does not present a major impediment to mining efficiency.

13.2.2 Infrastructure

The main elements of infrastructure at Alcoa's Darling Range mining operations are the location of crushers and conveyors to the refineries. These crushers form hubs for the mining operations, connected by the primary haul roads and are scheduled to be moved every ten years or so, in accordance with the requirements of the mining schedule and the location of ore as the mines progress. This crusher movement is planned well in advance and is treated as sustaining capital expenditure.

The crushers would be regarded as on relatively light duty for a mining operation and are well maintained. Similarly, the conveyors, which operate all year round and are covered, negating any potential effect of weather.

igure 13-6: Covered Conveyor (SLR, 2021)



Both the crushers and conveyors were observed to be in excellent condition and subject to scheduled maintenance, including replacement of conveyor belts.

Alcoa plans additional stockpiling compared to the historical direct feed mine to crusher operation as part of the LTMP 2025. In this change stockpiling and reclaim will be utilized to smooth feed grade to the crushers from the variable grades to be mined. Whilst adding a marginal operating cost for the rehandle it is envisaged this provides a cost benefit in completely mining out pits rather than having to return periodically as grade dictated previously.

Other ancillary equipment includes offices, ablutions, crib-rooms, and workshops, all of which were observed to be in excellent condition.

13.3 Geotechnical and Hydrogeology Considerations

Based on their long operating history, Alcoa's approach to mine stability has largely been based on strong pit performance. Mining at Alcoa's Darling Range operations is very shallow, pits being an average of 4 m deep. Consequently, geotechnical considerations are negligible other than immaterial localized batter failures. Similarly, the mining areas are elevated and well drained and groundwater and surface water hydrology is not material in these areas other than the catchment, impoundment, and decantation of runoff during the wet winter months. No drainage diversion occurs or is necessary because the mineralization sits between the stream beds and the bauxite occurs above the groundwater table. Deeper bauxite may be seasonally affected by the water table and is scheduled to be mined in summer. Backfilling of these places occurs before the rain raises the water table.

Contour mining (Figure 13-7) is practiced in areas of relatively steep topography, maintaining access ramps at less than 1:8 gradient and mining across the contour and downwards, creating a flat working floor. Hydrological considerations in these areas include management of runoff during the wet winter months and trafficability.

Mine overburden is progressively backfilled into adjacent exhausted pits (Figure 13-8), topsoiled, landscaped (Figure 13-9), and rehabilitated by re-establishment of native

vegetation (Figure 13-10), creating a stable post-mining landform that replicates the pre-existing environment. Recommended pit design constraints are shown in Table 13-1.

able 13-1: Alcoa Recommended Pit Design Constraints

Feature	Constraint
Pit total void Crest/Toe offset	0.15m
Maximum floor cut for a digger	4m. Recommended 3.5m
Maximum floor cut for a loader (depending on loader size)	7m. Recommended 6m (depending on loader size)
Dozer Push	Recommended 50m but can be dependent on the pit and extraction
Minimum Cut depth (non terrace)	Huntly 2m, WDL 1.5m
Maximum Cut depth before a berm	8m cut, then a 7.5m berm is required
Offset to Non blasted ground	7.5m

WSP-Golder were engaged by Alcoa to undertake a desktop study and gap analyses in February 2023 as part of broader scope to develop a ground control management plan for their Huntly and Willowdale operations. As part of the study, critical geotechnical hazards were identified with any associated failure mechanisms. These include rock fall, excavator stability whilst loading, dump / stockpile stability and land slips / rotational failure of batters. Surface water and groundwater are closely interlinked and are considered a major trigger for initiating all of these events. A geotechnical training package has been developed in order to provide training to mine operating staff. Ideally, all employees should be able to identify warning signals and are responsible for making the mine a safe place to work. All hazards are site specific related to Huntly and Willowdale operations. Recommendations for controls have been provided and can be applied as part of standard work procedures.

Alcoa mines areas of both flatter and steeper terrain, adopting higher walls and multi batter slopes where gradients are higher. It is recommended material strength characterization and stability analyses are continually investigated in particular for areas with planned high walls. A forward work plan with more detailed recommendations is available.

igure 13-7: Contour Mining (SLR, 2021)



igure 13-8: Soil Being Returned for Backfilling and Landscaping the Pit (Alcoa, 2018)



igure 13-9: Landscaped Mining Area, Prior to Replanting of Forest (SLR, 2021)



igure 13-10: Rehabilitated Pit Through Re-plantation of Native Vegetation (SLR, 2021)



13.4 Mine Equipment

Mining is undertaken by 250 t and 200 t-class excavators top-loading 140 t and 190 t capacity rigid-bodied mining trucks (Figure 13-11). This fleet was observed by the QP at Huntly to be aged. The equipment has undergone relatively light duties for a mining fleet, which prolongs its life. Sustaining capital is being invested in equipment replacement and modernization at Willowdale, progressively working toward Huntly. New equipment includes 250 t-class excavators and 140 t-class trucks.

A full list of equipment at Darling Range is provided in Table 13-2.

igure 13-11: Ore Mining at Darling Range (SLR, 2021)



able 13-2: Darling Range Operations Equipment List

Location	Classification	Type	No. Units
Huntly	Primary	Excavator	6x CAT 336D 2x Komatsu PC3000 3x Komatsu PC2000 4x Hitachi 2600-7
		Haul truck 1	8x CAT 789C (190T) 9x CAT 789D (190T) 4x Komatsu HD 1500

	Ancillary	Bulldozer / Loader	3x CAT D11R 3x Komatsu 475 2x Komatsu 375 1x CAT 992K 2x CAT 993K 2x CAT 980 Loaders
		Grader	2x CAT 16M 1x CAT 24M
		Scrapers	5x CAT 637G
		Low Loaders	1x CAT 785D (220T) 1x CAT 793 (450T) 1x CAT 785C (175T)
		Water truck	3x CAT 785C
		Drills	3x Epiroc D50 (Blast) 5x WB93 (Exploration)
Willowdale	Primary	Excavator	2x Hitachi ZX360 2x CAT 336D 1x Komatsu PC2000 2x Komatsu PC3400
		Haul truck 1	6x Komatsu 730E (190T)
	Ancillary	Bulldozer / Loader	3x CAT D11T 1x Komatsu 475 2x CAT 993K 2x Komatsu WA320
		Grader	1x CAT 16H 1x CAT 18M
		Scrapers	3x CAT 637K 1x CAT 637G
		Low Loaders	1x CAT 793 (450T)
		Water truck	2x CAT 777F 2x Komatsu 730E
		Drills	3x Epiroc D50 (Blast)

13.4.1 Contractors

Alcoa's practice in noise sensitive areas such as the perimeter of the operation near residents is to engage contractors. These areas operate on day shift only and attract higher operating costs than the main production areas. The flexibility required in these areas precludes the use of the primary owner-operator fleet and equipment is dry or wet hired or mining takes place under conventional schedule of rates contracts.

Alcoa also engages contractors for aspects of haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

This practice has led to the establishment of a secondary contracting industry around the Darling Range operations. Contractors are overseen by Alcoa personnel.

13.4.2 Ancillary Equipment

Ancillary equipment at Alcoa's Darling Range operations includes a fleet of bulldozers, graders and loaders that are primarily used for haul road formation, pit development (for the removal of overburden and blasted caprock) and ground preparation for digging, landscaping, clean-up, and road maintenance.

The SOBR process requires small excavators, articulated trucks, scrapers, and specialist skills to grub organic-containing clay from the top of the mineralization.

igure 13-12: Blasthole Drill Working on Hardcap (SLR, 2021)



All ancillary equipment was observed to be in good and well-maintained conditions, the conditions being relatively light duty in comparison to other Western Australian mining operations. The current mining areas are shown in Figure 13-2.

13.5 Personnel

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees. Contractors are also used for certain activities on site.

Three unions are recognized at the operations:

- The Australian Workers Union (AWU), which covers most of the operations workers
- Australian Metal Workers Union (AMWU), which covers the metal trades, being fitters, boilermakers and mechanics
- Electrical Trades Union (ETU), which covers the electricians

Lost time during strikes is generally uncommon. The Enterprise Agreements (EA) have varied timing for expiration. The AMWU Agreement, negotiated in early 2023, will expire in

April 2027. The ETU EA was negotiated at the end of 2021, with a 4 year term and the AWU Agreement was negotiated in the fourth quarter of 2023, with a 2.5 year term.

Alcoa's Darling Range operations were observed to have a stable workforce, drawn from the surrounding areas. The location is highly desirable in the Western Australian mining context and skilled personnel are readily attracted to the operations. Primary haul roads are named after personnel with greater than forty years' service and there are many of these.

Employee turnover is below industry standard, as the drive in, drive out nature of the work attracts many to work at Alcoa.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.

A breakdown is shown in Table 13-3 (current vacancies not accounted for).

able 13-3: Darling Range Personnel

Location	Classification	No Personnel
Huntly 661	Technical	24
	Management	71
	Operations	566
Willowdale 320	Technical	12
	Management	51
	Operations	257
Central 171	Technical	46
	Management	21
	Operations	104
Total		**1152**



14.0 Processing and Recovery Methods

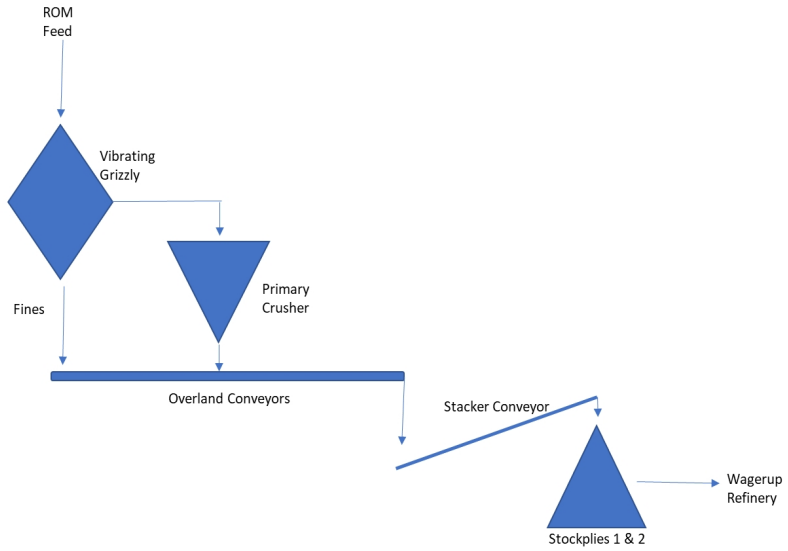
14.1 Process Description

The process plant for the Darling Range operations consists of two separate crushing facilities at the Huntly and Willowdale mines. Both facilities crush the ROM and convey the crushed ore to two separate refineries.

The Willowdale operation consists of a single stage crushing flowsheet and includes a series of conveyors to transport the crushed ore at an annual throughput of 10 Mtpa. The ROM is discharged from trucks on a dump hopper. An apron feeder transfers the ore from the dump hopper to a vibrating grizzly with an aperture of 180 mm. The grizzly oversize is discharged into a single toggle jaw crusher which crushes the ore to a top size of 180 mm. A hydraulic rock breaker is installed at the crusher to break the larger rocks that do not pass through the crusher opening. The crushed product and the grizzly undersize are discharged on to a discharge conveyor and subsequently discharged on to an overland conveyor. The discharge conveyor is fitted with a tramp magnet to remove any metal that is present along with the crushed ore product. The overland conveyor, which is 9.4 km long, transports the crushed ore to an intermediate transfer station. The ore is then transported by a second overland conveyor, 8.8 km long, to the transfer station located at Wagerup. An apron feeder is used to transfer the crushed ore from the Wagerup transfer station on to a stockpile conveyor and subsequently discharge on a stacker conveyor. The stacker conveyor discharges the ore into two separate stockpiles. The crushed ore is then reclaimed from there for processing in the Wagerup refinery. The total capacity of the stockpiles is approximately 0.7 Mt and sufficient for three weeks of feed to the refinery.

A simplified block flow diagram of the Willowdale operation is shown in Figure 14-1.

igure 14-1: Simplified Block Flow Diagram of the Willowdale Operation



The Huntly operation consists of multiple stages of crushing and includes a series of conveyors to transport the crushed ore to the refinery at an annual throughput of 17 Mtpa. The primary crushing is achieved by two similar crushing circuits operating in a parallel

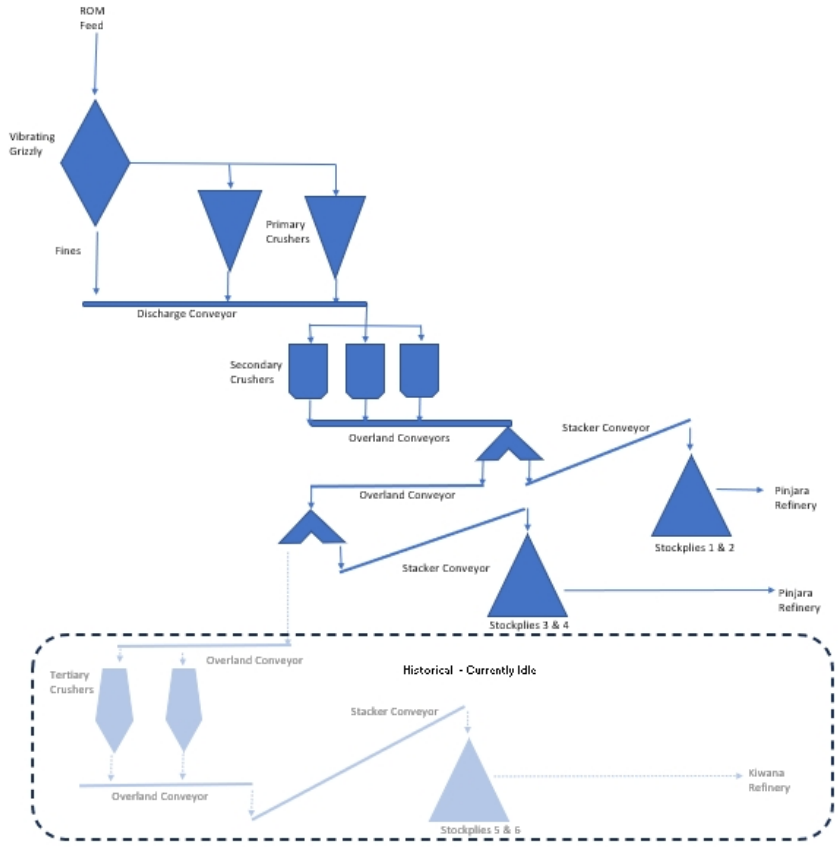
configuration. The ROM is discharged from trucks on dump hoppers. Apron feeders transfer the ore from the dump hopper to vibrating grizzlies with an aperture of 180 mm. The grizzly oversize fractions are fed to jaw crushers which crush the ore to a top size of 200 mm. The crushed product and the grizzly undersize are discharged on to discharge conveyors and transferred to the secondary crushers (sizers). The discharge conveyors are each fitted with a tramp magnet to remove any metal that is present in the crushed ore. Secondary crushing is achieved in sizers with the objective of reducing the ore particle size to a top size of 100 mm. The secondary crusher product is transported by three overland conveyors (operating in series with two intermediate transfer stations in between) to a transfer station and randomly split into two by a splitter bin.

One fraction from the splitter bin is transferred by another overland conveyor and discharged into a stockpile conveyor via an apron feeder. The stockpile conveyor transfers the ore and subsequently discharges onto a stacker conveyor. The stacker conveyor discharges the ore into two separate stockpiles identified as Stockpile 1 and Stockpile 2. The crushed ore is then reclaimed from there for processing in the Pinjarra refinery. The second fraction of the ore is transported by an overland conveyor to an apron feeder, to a transfer conveyor and then to an adjustable splitter chute located at a separate transfer station. One of the splits from the splitter chute previously led to the Kwinana refinery, prior to curtailment in Q2 2024. Currently the whole stream is destined for Pinjarra refinery.

The fraction for the Pinjarra refinery is transported by stockpile conveyor and subsequently discharged on to two sperate stockpiles (identified as Stockpile 3 and Stockpile 4) via a stacker conveyor. The ore is then reclaimed from the stockpiles for processing in Pinjarra refinery along with the ore from Stockpile 1 and Stockpile 2.

The split for Kwinana refinery was transported by a conveyor and processed by a tertiary crushing circuit consisting of two roller crushers operating in parallel configuration. The tertiary crusher product with a top size of 25 mm was transferred by a stockpile conveyor and discharged into two separate stockpiles identified as Stockpile 5 and Stockpile 6 via a stacker conveyor. The crushed ore from Stockpiles 5 and Stockpile 6 was then reclaimed and transferred by a reclaim conveyor to a surge bin for subsequent loading and transport to the refinery by train. This section (System 4) was put into care and maintenance following the curtailment of Kwinana. A simplified block flow diagram of the full Huntly operation, prior to Kwinana curtailment, is shown in Figure 14-2.

igure 14-2: Simplified Block Flow Diagram of the Huntly Operation



** System 4 of the flowsheet above is currently on care and maintenance following curtailment of the Kwinana refinery. The supply to Pinjarra remains as previous.*

14.2 Primary Equipment List

The primary equipment lists of the full Willowdale and Huntly operations are shown in Table 14-1 and Table 14-2.

able 14-1: Primary Equipment List (Willowdale)

Equipment	Quantity	Installed Power (kW)
Apron feeder	1	264
Vibrating grizzly	1	75
Primary Crusher	1	355
Discharge conveyor	1	132
Overland conveyor	1	2500

Overland conveyor	1	1800
Apron feeder	1	75
Stockpile conveyor	1	300
Stacker boom conveyor	1	110

able 14-2: Primary Equipment List (Huntly)

Equipment	Quantity	Installed Power (kW)
Apron feeder	1	260
Vibrating grizzly	1	55
Primary Crusher	1	250
Discharge conveyor	1	140
Secondary crusher	1	1000
Apron feeder	1	260
Vibrating grizzly	1	75
Primary Crusher	1	250
Discharge conveyor	1	140
Secondary crusher	1	1000
Overland conveyor	1	7500
Overland conveyor	1	5000
Overland conveyor	1	6100
Apron feeder	1	75
Overland conveyor	1	1500
Apron feeder	1	55
Apron feeder	1	75
Overland conveyor	1	1350
Apron feeder	1	110
Stockpile conveyor	1	225
Stacker boom conveyor	1	110
Yard conveyor*	1	250
Stockpile conveyor*	1	150
Stacker boom conveyor*	1	110
Conveyor*	1	250
Apron feeder*	1	75
Tertiary crusher*	1	370
Apron feeder*	1	75
Tertiary crusher*	1	370
Stockpile conveyor*	1	300
Stockpile boom conveyor*	1	110
Bucket wheel reclaimer*	1	264

Reclaim bridge conveyor*	1	110
Transfer conveyor*	1	280
Reclaim conveyor*	1	280
Reclaim conveyor*	1	900

** These items are associated with System 4, which is currently on care and maintenance following curtailment of the Kwinana refinery.*

14.3 Consumables and Power

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

The process plant is a dry crushing operation and therefore water is only required for dust suppression and is included as part of mine water consumption. Water is not required as a consumable for the plant.

Other consumables of the process plant include crusher liners, screen panels and spares for feeders and conveyors. These are kept on site and replaced as part of the routine maintenance schedule according to manufacturer's guidelines.

Personnel requirements for the operation and maintenance of the plant as described are included in Table 13-3.

14.4 QP Opinion

The QP is of the opinion that the selected processing method and the flowsheet are suitable for Darling Range operations. It is important to note that the ore head grades meet the refinery specifications for processing in terms of Al_2O_3 grades and SiO_2 grades, this means the ore can be directly shipped to the refineries for further processing without any upgrading in the mineral processing plant. The crushing circuit reduces the particle size suitable for conveying as well as to meet particle size specified by the refineries.

15.0 Infrastructure

The infrastructure for the mining operations is established and operational. In 2021, the infrastructure hub for Willowdale was relocated 16 km southwards from Orion (after having been based there for 21 years) to the Larego Hub which is located about 20 km north-east of the town of Harvey. The hub hosts administrative offices, as well as crushing facilities and maintenance facilities. The Orion Hub site is currently being rehabilitated with planning for infrastructure decommissioning commencing in 2025.

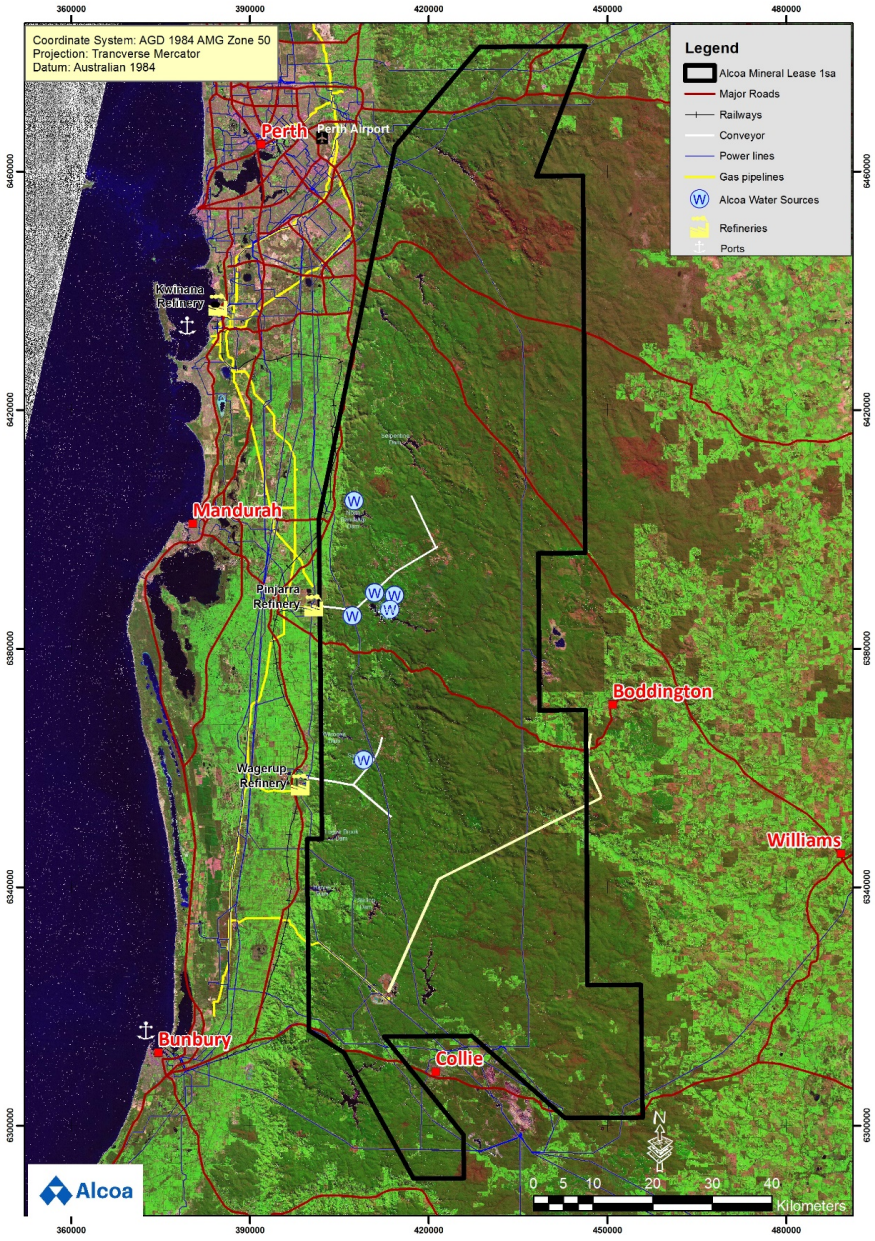
The mining hubs are relocated periodically as production moves away from the hub and thus transportation costs increase. Alcoa plans for the Larego Hub to be in place for approximately 20 years, though this is the fourth relocation since the mines opened in the 1970s/80s (approximately 13 years on average). The mining hub relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.

An extensive haul road network, rail, and overland conveyors are able to transport crushed bauxite from the Hub to the refineries on the coast (namely Kwinana, Wagerup and Pinjarra). As announced in January 2024, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment; with the associated mine plans being revised accordingly.

Bauxite is transferred from each mine to Wagerup and Pinjarra primarily via long distance conveyor belt. Rail transport of bauxite to the curtailed Kwinana refinery is also possible. The Alumina produced by the refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

The infrastructure layout for the Darling Range operations is shown below (Figure 15-1).

igure 15-1: Infrastructure Layout (Alcoa, 2022)



15.1 Access Roads

The Darling Range is readily accessible via road from Perth and surrounding areas. The mines are near the towns of Pinjarra and Waroona. Both towns are easily accessible via the national South Western Highway, a sealed single carriageway road, which starts on the southern side of Perth and continues for almost 400 km to the southwest corner of Western Australia.

The Huntly mining area is accessible from the South Western Highway via Del Park Road, a sealed single carriageway road which connects the town of North Dandalup in the north with Dwellingup in the south. From Del Park Road, a further sealed road which follows the route of the bauxite conveyor to the Pinjarra refinery provides access to the Huntly site.

The Willowdale mining area is similarly accessible from the South Western Highway via Willowdale Road, a sealed single carriageway road to the south of Waroona.

Major haul roads have been established to each mining area. Roads are unsealed and require continuous ongoing maintenance which was observed during the site visit. Secondary haul roads, also unsealed, cross-cut each individual mining plateau.

15.2 Power

The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS). The refinery also has internal generation capacity of 100 MW from 4 steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG). The refinery supplies power to the Huntly Mine by three different power supply lines (a single 33 kV and two 13.8 kV).

Willowdale Mine has a single 22 kV power supply fed from the Wagerup refinery. The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine. The steam is produced by gas fired boilers.

The power consumption of the Huntly operation is approximately 5,500 MWh to 6,500 MWh per month. The Willowdale power consumption is approximately 2,000 MWh per month.

15.3 Water

Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes. The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.

The WA mines are licensed by the Department of Water and Environmental Regulation (DWER) to draw surface water from five locations to meet their water supply requirements. The Huntly mine draws water from Banksiadale Dam and Boronia Waterhole. Huntly mine also holds a license to draw water from Pig Swamp and Marrinup, however these resources are retained as a backup water supply and have not been utilized in recent years. Huntly mine is also permitted to draw water from South Dandalup Dam under an agreement with the Water Corporation. A pumpback facility from South Dandalup Dam to Banksiadale Dam is used to raise levels in Banksiadale Dam during periods of low rainfall runoff. Willowdale Mine draws water from Samson Dam.

Table 15-1 summarizes the license allocation for water usage. In 2023, water abstraction comprised approximately:

- 4.2% of the annual entitlement from Boronia Dam
- 22% from Banksiadale Dam
- 82% from Samson Dam.



An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation.

able 15-1: Water Abstraction License Volumes

Site	Water Source	Surface Water License	Annual Water Entitlement
Huntly	South Dandalup Dam	N/A	N/A
Huntly	Banksiadale Dam	SWL63409	500,000
Huntly	Pig Swamp Waterhole	SWL153635	30,000
Huntly	Boronia Waterholeon Marrinup Brook	SWL83356	70,000
Marrinup Nursery	Lot 908 on Marrinup Brook	SWL68893	45,000
Willowdale	Samson Dam	SWL61024	450,000

15.4 Accommodation Camp

There are no Alcoa accommodation facilities within the Darling Range. As described above, the Huntly and Willowdale mining areas are within proximity to established population centers including Pinjarra approximately 30 km to the southwest of Huntly and Waroona approximately 20 km northwest of Willowdale.

On site facilities includes offices, ablutions, crib-rooms, and workshops, all of which were observed to be in excellent condition.

15.5 Mine Waste Management

15.5.1 Tailings Disposal

No tailings are generated within the boundaries of the mining operations. The management of tailings generated downstream at the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.

15.5.2 Waste Rock Disposal

Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and waste dumps are not constructed.

Topsoil and overburden from Darling Range ore blocks is carefully segregated for later rehabilitation of adjacent, completed mining operations. Overburden is used to backfill these shallow, completed pits and the topsoil spread on top and contoured. Maximum slopes (angle and length) are defined in the Completion Criteria. If topsoil has been harvested and stored for up to three months prior to use as a rehabilitation input it is considered 'direct-return' and seeding may not be undertaken. If it is older than 3 months, it is considered 'fallow' and requires seeding. Nursery-raised seedlings are also used in rehabilitated areas.

To date, some 20,000 ha of mined areas have been backfilled and reforested, which represents around 75% of the area mined since 1966, including areas reserved for long-term infrastructure. Rehabilitation standards are described in Alcoa's 2016 statutory Bauxite Mine Rehabilitation Completion Criteria. These completion criteria have been progressively revised since inception in the 1990s.

16.0 Market Studies

16.1 Overview

Alcoa Corporation is a vertically integrated aluminum company comprising bauxite mining, alumina refining, aluminum production (smelting and casting), and energy generation.

Through direct and indirect ownership, Alcoa Corporation has 27 locations in nine countries around the world, situated primarily in Australia, Brazil, Canada, Iceland, Norway, Spain, and the United States. Governmental policies, laws and regulations, and other economic factors, including inflation and fluctuations in foreign currency exchange rates and interest rates, affect the results of operations in these countries.

There are three commodities in the vertically integrated system: bauxite, alumina, and aluminum, with each having their own market and related price and impacted by their own market fundamentals. Bauxite, which contains various aluminum hydroxide minerals, is the principal raw material used to produce alumina. Bauxite is refined using the Bayer process to produce alumina, a compound of aluminum and oxygen, which in turn is the raw material used by smelters to produce aluminum metal.

Alcoa obtains bauxite from its own resources and processes over 80% of its combined bauxite production into alumina. The remainder is sold to the third-party market.

Aluminum is a commodity that is traded freely on the London Metal Exchange (LME) and priced daily. Pricing for primary aluminum products is typically composed of three components:

i. The published LME aluminum price for commodity grade P1020 aluminum;

ii. The published regional premium applicable to the delivery locale; and

iii. A negotiated product premium that accounts for factors such as shape and alloy.

Further, alumina is subject to market pricing through the Alumina Price Index (API), which is calculated by the Company based on the weighted average of a prior month's daily spot prices published by the following three indices: CRU Metallurgical Grade Alumina Price; Platts Metals Daily Alumina PAX Price; and Metal Bulletin Non-Ferrous Metals Alumina Index. As a result, the price of both aluminum and alumina is subject to significant volatility and, therefore, influences the operating results of Alcoa Corporation.

Unlike alumina and aluminum, bauxite is not a standard commodity traded on an index. Bauxite's grades and characteristics vary significantly by deposit location and the value of bauxite deposits for each downstream refinery could be different, based upon:

- refinery technology;
- the location of each refinery in relation to the ore deposit; and
- the cost of related raw materials to each refinery.

As such, there is no widely accepted index for bauxite. Most bauxite traded on the third-party market is priced using a value-in-use methodology. The key assumption for the value-in-use methodology is that both the (1) offered bauxite and the (2) comparative bauxite being used in the target refinery will generate the same refining cost. As such, using the known price for the comparative bauxite used in the target refinery, the offered bauxite price will then be derived by considering the bauxite characteristics and quality differences between the offered and comparative bauxite.

16.1.1 Market Fundamentals

Bauxite is the principal ore of alumina (Al_2O_3), which is used to produce aluminum. Bauxite mining and alumina refining are the upstream operations of primary aluminum production.

China is the largest third-party seaborne bauxite market and accounts for more than 90% of all bauxite traded. Bauxite is sourced primarily from Guinea and Australia on the third-party market. In the long run, China is expected to continue to be the largest consumer of third-party bauxite with Guinea expected to be the majority supplier. Further, third-party traded bauxite is expected to be tight over the next decade, driven by China demand together with new supplies coming from Guinea.

Bauxite characteristics and variations in quality heavily impact the selection of refining technology and refinery operating cost. A market bauxite with high impurities could limit the customer volume an existing refinery could use, resulting in a discount applied to the value-in-use price basis.

Besides quality and geography, market fundamentals, including macroeconomic trends – the prices of raw materials, like caustic soda and energy, the prices of Alumina and Aluminum, and the cost of freight – will also play a role in bauxite prices.

16.2 Market: Darling Range

16.2.1 Operation

The Darling Range mines are part of an integrated operation of two mines, three refineries and two ports. Subsequent to 2021, production from the Darling Range mines (Huntly and Willowdale) was used exclusively for consumption by the integrated refineries.

Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt, apart from the Kwinana refinery, which receives bauxite via railway. The Alumina produced by the three refineries is then shipped to external and internal smelter customers through two ports, based in Kwinana and Bunbury.

As intended, the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.

16.2.2 Pricing

In 2016, Darling Range entered into a 5-year third-party sales contract with a major alumina producer in China. Following the expiration of the third-party sales contract at the end of 2021, all bauxite production from Huntly and Willowdale was consumed internally by Alcoa refineries.

The pricing mechanism of the third-party sales contract was based on a value-in-use methodology (as described in Section 16.1) that was anchored to the customer’s other bauxite sources at the time of execution, with a market adjustment factor linked to the alumina price.

Alcoa determines economic cut-off grade by deducting operational costs (mining, refining etc) from a base alumina price of USD 400 per tonne. This approach is described in more detail in Section 12.7.

As per previous disclosures, the bauxite price utilized in the mine cashflow is represented by an intercompany price, indicative of mine sales to the refinery, inflated by 3% YoY. The weighted average of this price is $23.19/t over the detailed mine plan period of nine years.



16.3 Contracts

All Darling Range production is shipped via conveyor to one of the Alcoa's Pinjarra and Wagerup refineries.

Material operational contracts that are in place include:

- Harvesting and Clearing contracts: Alcoa has long term contracts with third party suppliers to harvest and clear the forecast prior to development for mining. Pricing is based on fixed rate schedules, payable either per hectare or on equipment hire and labor hire rates.
- Rehabilitation contracts: Alcoa has long-term contractual agreements with third-party suppliers to rehabilitate certain mined areas, ready for closure. Pricing is based on fixed rate schedules, payable either per hectare or on equipment and labor hire rates.
- Fuel contract: Alcoa has a mid-term contractual agreement with a third-party to supply diesel fuel for mining operations. Pricing is based on market pricing for diesel, payable on volume consumed.

These types of contracts are typical of other similar mining operations.

17.0 Environmental Studies, Permitting, and Plans, Negotiations, or Agreements with Local Individuals or Groups

17.1 Environmental Studies

17.1.1 Existing Operations

Alcoa has established practices and processes for enabling conformance to environmental requirements. Sensitive areas are identified and managed ahead of disturbance. Environmental factors are considered prior to infill drilling; hence, mining blocks carrying environmental risks do not feature in the Mineral Reserves (for example, areas around granite outcrops and water courses have a buffer applied and are considered no-go areas from a mining perspective). Mining in some areas became more constrained in 2023 as a result of internal and external factors; these constraints continued through 2024 and are associated with:

- Alcoa's ongoing consultation with key stakeholders including the EPA, ITAG and BSEC (previously MMPLG)
- Approval conditions of the 2023-2027 MMP (these were copied across into the October 2024 roll-over approval now covering 2024-28)
- Conditions associated with the *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023*
- Alcoa's progress on the EP and EPBC Act assessment (beyond the scope of the MMP) to increase refinery production by 5% through the transition of mining from Huntly to the Myara North and Holyoake areas, as described in Section 3.6.

The Final 2023-2027 MMP was developed by Alcoa and approved by the Minister for State Development in December 2023. It excludes an environmental assessment of mine development activities associated with the Myara North and Holyoake mining regions currently under consideration by the EPA and DCCEEW (section 17.1.2). The MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. For example, Alcoa undertakes surveys to inform the mine plan development, characterization of ore quality and volumes, assess geotechnical conditions, identify constraints and protect or manage important environmental, cultural heritage and social values. Surveys include:

- Vegetation mapping to delineate vegetation community types, ensure clearing does not have cumulative impacts on underrepresented species assemblages and identify critical habitat for known threatened species.
- Establishment of forest reference vegetation monitoring plots to enable representative comparison with post-mining rehabilitation. Mean species richness of forest reference sites is utilized to measure the effectiveness of rehabilitation.
- Black cockatoo surveys to locate trees that will be protected from disturbance, to minimize impact on these species. All nest trees and significant trees (as defined under technical guidance from the DCCEEW) are conserved with a buffer wherever they occur in the landscape. Habitat trees are conserved on haul road alignments, where the alignment can be adjusted to avoid these trees.
- Assessment of Phytophthora dieback to inform activities which may cause soil disturbance, to manage dieback soils and prevent contamination of dieback free areas. This data is also utilized in soil movement and rehabilitation planning.

- Baseline hydrology data acquisition to inform detailed design of mine pit and infrastructure.

As reported in the 2023 TRS, the current restrictions on mining while the EPA assesses the 2023-2027 MMP and Alcoa continues to operate under the Exemption Order include but are not limited to:

- Reduce mining activities inside higher risk areas within drinking water catchments.
- Alcoa will not undertake any new pit clearing in any areas with an average pit slope greater than 16% within any Reservoir Protection Zone (RPZ, 2 km from reservoir top water level).
- Increase rehabilitation and reduce open areas where possible, with priority in higher risk areas.
- Maximum annual clearing footprint of 800 ha.
- As required by Ministerial Condition 23, related to the 2023-2027 MMP, the draft rehabilitation criteria agreed between DBCA and Alcoa were submitted to the Minister for State Development on 19 December 2024 (due date was 31 December 2024). Alcoa is awaiting further review by BSEC; JTSI is yet to provide a timeframe for this (as of 20 December 2024)

These changes have resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation, future operating conditions may be different once the EPA assessment is complete for the 2022-2026 and 2023-2027 MMPs, and conditions on the subsequent Ministerial Statement are known. The MMP ESD states the EPA is aiming to complete its Assessment reports for the 2022-2026 MMP (assessment 2384) and 2023-2027 MMP (assessment 2385) in the third quarter of 2025. This timing is dependent on some factors that are within Alcoa's ability to influence, and some factors that are beyond Alcoa's ability to influence. The Ministerial Statement would follow from the EPA Report.

As reported in previous years, the threat of bushfires is the only significant naturally occurring risk identified to the Reserve estimation for existing operations.

Bushfire mitigation and firefighting activities within state forest are managed by the Department of Biodiversity Conservation and Attractions (DBCA). Alcoa maintains fire access tracks as required by the working arrangement with DBCA and complies with requirements of the Bushfires Act including seeking exemptions for certain activities during Total Fire Bans. Asset protection zones are not mandated although Alcoa does maintain them around infrastructure as per internal standards to mitigate risk. Alcoa owned private property is maintained to local government requirements as per the requirements of the Bushfire Act.

Bushfires have occurred in the past, but to date have not had a material impact on production.

Overall SLR is of the opinion that the current plans and well understood processes that are in train with the EPA (specifically EPA assessments 2384 and 2385) are considered adequate to address issues related environmental, social, and permitting risks. However, the timing of the EPA assessments is not wholly within Alcoa's control.

17.1.2 Future Mining Operations

Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by self-referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The future mining plans that have currently been referred to both State and Federal departments

propose to transition the Huntly Mine into the proposed Myara North and Holyoake mine regions within Alcoa's Mining Lease ML1SA.

The Western Australian Environmental Protection Authority (State) has determined that the Pinjarra Alumina Refinery Revised Proposal (Assessment No. 2253), which includes the Huntly Bauxite Mine, will be assessed via a Public Environmental Review (PER).

Alcoa referred two separate Proposed Actions under the EPBC Act (Federal) for the following components:

- Huntly Bauxite Mine Transition – Myara North and Holyoake; and
- Pinjarra Alumina Refinery – development of water storage ponds and associated borrow pits.

The referred actions have been determined as Controlled Actions under the EPBC Act, and as such, require formal assessment.

In 2023, Alcoa proposed changes to the proposal while it was under assessment:

- Changes to the development envelope within which future activities will be contained
- Reduction in proposed disturbance within the overall Mine Development Envelope by 950 ha to total 8,323 ha
- Removal of the supply of 2.5 Mtpa of bauxite for export from the proposal scope.

The EPA has recognized:

- The reduction to the proposed disturbance and net reduction to the development envelope will decrease/avoid impacts to flora and vegetation, terrestrial fauna, inland waters and social surroundings.
- There are no new environmental factors likely to be significantly affected as a result of the amendments, and no additional EPA functions need to be performed to assess the amended proposal.
- The environmental review document to be released for public comment will be based on the proposal as amended.
- The amendment would not, if the proposal were already approved, be a significant amendment. In considering this, the effects of the amendment on its own, the effect of the amendment in the context of the existing referred proposal, cumulative and holistic impacts have been considered.
- The amended proposal will be substantially the same character as the existing referred proposal.

The EPA has enabled the altered proposal to be assessed as part of assessment 2253 already in progress. DCCEEW made a complementary decision and the assessment under the EPBC Act also continues.

The resulting Environmental Impact Assessments (EIAs) under State and Federal legislation will inform stakeholders on long-term mine plans and environmental management requirements and facilitate the setting of approval conditions.

As reported in the TRS for 2022 and 2023, numerous baseline studies have been completed to support approvals for future extensions to the mining footprint to the Myara North and Holyoake regions. Baseline studies are guided by the requirements of the Western Australian Environmental Protection Authority (EPA) and guidelines under the EPBC Act which are well understood. Studies have been undertaken to define the environmental values and constraints associated with:

- Flora and vegetation

- Short-range endemic vertebrates
- Aquatic and subterranean fauna
- Phytophthora dieback
- Terrestrial vertebrate fauna including Black Cockatoos
- Surface water
- Groundwater quality and dewatering drawdown
- Air quality
- Noise
- Landscape and visual impacts
- Historical and aboriginal heritage
- Greenhouse gas emissions.

Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. Alcoa plans to commence construction, to facilitate the transition to Holyoake Central, from approximately 2028 and commence operation from approximately 2030, as reported in the MMP dated 10 November 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

Supporting both the existing and future mining operations, additional environmental studies were further progressed in 2023 to identify regional environmental risks associated with low levels of PFAS in surface water catchments around the current and future Huntly and Willowdale operations. As is the case at most (if not all) mining operations in Western Australia, Per- and Poly-Fluoroalkyl Substances (PFAS) containing aqueous film-forming foams (AFFF) were used at Huntly and Willowdale Mines in vehicle fire suppression systems from approximately 2014 to 2021. Discharge of AFFF has occurred within the Operational Areas due to both testing and maintenance of fire suppression systems (at workshops) and activation (within Operational Areas) in response to vehicle fires or equipment malfunction. Alcoa reported areas around workshops at the Orion, Arundel, McCoy and Myara Operational Areas to the Department of Water and Environmental Regulation (DWER) under the obligations of the Contaminated Sites Act (2003) as possibly contaminated. These areas have subsequently been classified as *possibly contaminated – investigation required*. Stage 1 and 2 investigations have been endorsed by the DWER-appointed Contaminated Sites Auditor, a Stage 3 Detailed Site Investigation has been completed and submitted to the Auditor. Auditor comments are anticipated to be closed out and the report submitted to DWER in the first quarter of 2025. It is not unusual for these processes to take multiple years to complete alongside ongoing operations.

17.2 Waste and Tailings Disposal, Site Monitoring, and Water Management

17.2.1 Waste and Tailings Disposal

No tailings are generated within the boundaries of the mining operations as bauxite processing is undertaken at the refineries. Similarly, Alcoa's Darling Range mining operations do not produce mine waste or "mullock" in the same manner as conventional mining operations and as such waste dumps are not constructed.

Overburden from Darling Range ore blocks is carefully segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

As such, there is no requirement for the monitoring of any tailings or mine waste dumps associated within the mining operations.

17.2.2 Site Monitoring

Alcoa's mine sites are monitored in accordance with conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10, last updated 09/02/21) and Willowdale (L6465/1989/10, last updated 20/02/24). The 2024 update at Willowdale was to enable:

- The construction and operation of a PFAS water treatment plant at Arundel mining area (further discussed later in this section).
- Upgrades to stormwater management at Arundel (new stormwater dams, oil-water separator and pipelined).
- Review of noise emissions from crushing infrastructure associated with move to Larego mining region.

Monitoring and reporting is also required under the approved 2023-2027 Mining and Management Program (2023-2027 MMP) and the *Environmental Protection (Darling Range Bauxite Mining Proposals) Exemption Order 2023*.

Environmental management and monitoring commitments exist for the following environmental aspects which have been assessed as being significant and therefore require operational controls as a minimum. The significant environmental aspects for which monitoring and/or management undertaken are:

- Discharge of environmental hazardous material outside of containment infrastructure; discharge response and dangerous goods storage. All underground storage tanks were previously removed from Alcoa's operations and are prohibited.
- Waste management and minimization.
- The management of mining within the lower rainfall zone to minimize risks of salinization of land and water resources.
- Surface water catchment protection for the nearby Public Drinking Water Source Areas (PDWSAs), including the exclusion of clearing, exploration, mining or other operations:
- within 1 km of the top water level of any water reservoir; or
- within the Serpentine Pipehead Dam Catchment;
- in any area with an average slope greater than 16% within the Reservoir Protection Zone of any water reservoir.

- Air emissions including:
- Smoke pollution associated with wood waste (although wood waste burning has now largely been phased out, with a small amount of burning in 2022 and no burning in 2023 and 2024)
- An ambient dust monitoring program to identify and quantify fugitive dust emissions from operating areas
- Ozone depleting substances
- Hazardous materials management including asbestos, synthetic mineral fiber, and polychlorinated biphenyls.
- Land including:
- Recordkeeping and Geographical Information System (GIS) mapping of the location and timing of all soil removal, landscaping, soil return, ripping and seeding
- Stabilization of cleared land post-mining and prior to rehabilitation
- Rehabilitation area monitoring to ensure the number of established plants meet the completion criteria targets associated with species richness, weed outbreaks and erosion
- Dieback management, mapping and field identification
- Forest and land clearing
- Flora and fauna, specific sensitivity and restrictions related to Black Cockatoos, including the exclusion of clearing, exploration, mining or other operations within 10 metres of any Black Cockatoo nesting trees or Black Cockatoo significant trees. Note this condition does not apply to the activities outlined in[1].
- Aboriginal and Historic (European) heritage
- Environmental value of national parks, nature reserves and native forests
- Visual amenity
- Noise.

Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported in monthly and annual reports to regulators including the BSEC (previously MMPLG) and DWER (at least annually, according to MMPLG requirements and Part V Licence requirements), the Minister for State Development (in accordance with the Exemption Order).

Review of the most recent report to JTSI – the Annual Environmental Review 2021-2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to managed environmental objectives. The following incidents were noted:

[1] These three restrictions do not apply to:

- stabilisation or rehabilitation activities; or
- environmental monitoring activities; or
- use and maintenance of existing infrastructure; or
- modification of existing road infrastructure with the written consent of the State Development Minister; or
- construction of drainage control infrastructure; or
- mining within 1 kilometre of the top water level of any water reservoir in Myara Central and Myara South carried out before 30 June 2024

• As reported in the previous TRS, Alcoa reported a potential heritage incident resulting from the installation of a groundwater monitoring bore within the recorded site boundary of MY08-11 to DPLH on 18 November 2022. This was also reported to Gnaala Karla Booja in parallel. An internal investigation into the incident was undertaken and Gnaala Karla Booja representatives undertook a site visit to the location on 19 January 2023. The results of the investigation and Gnaala Karla Booja consultation were provided to the DPLH on 20 February 2023. Alcoa has been advised that no further investigation will be undertaken by DPLH into this matter.

• There were no heritage incidents in 2023.

• No vegetation clearing incidents were reported in 2023.

• There were four dieback breaches at Huntly in 2021, seven in 2022 and four in 2023; two were the result of operator error and two resulted from surface water flows. Of the two that were related to surface water flows, one resulted from wash water build up against a trafficable hump causing the water to flow into a dieback free area. The other was caused by protective bunding deterioration allowing dieback wash water to flow into a dieback free stockpile. The remaining two events were the result of clean down procedures not being followed prior to entry to dieback free areas, and a dozer mistakenly tracking over the toe and around dieback free stockpiles as they were located close to the mine pit face. Upon further investigation of this final incident, it was found that the dieback free stockpiles had been compromised by wash water flowing from dieback stockpiles placed higher in profile with no drainage protection installed. This event led to 58.4 ha of stockpiles being downgraded. Corrective actions taken included a review of all dieback free stockpiles in GIS and then ground truthing to investigate any other potential dieback concerns. This was completed and further drainage and dieback protection was added to identified stockpiles.

• No dieback breaches occurred at Willowdale during 2022 and 2023. There were two breaches at Willowdale in 2021.

• No drainage events[2] were reported at Huntly in 2023 (two were reported in 2022); conversely two drainage events were reported at Willowdale in 2023 (none in 2022). Both 2023 events were related to the same 35.2 mm rainfall event, both were noted on 04 July and both were related to stormwater management (from separate sumps) at 374 Conveyor. Alcoa reported that neither event resulted in discharged water reaching a stream, neither were within an RPZ and neither resulted in a turbidity event at the nearest turbidity monitoring station.

• Failure of containment infrastructure events continued to show a down-ward trend across 2021 to 2023; Alcoa attributes this to both improved catchment protection and decreased annual rainfall across the period.

• At Huntly, the 2021-2022-2023 events decreased 51-11-8, respectively. For the eight events in 2023 at Huntly:

  o Five were outside the RPZ, three were inside;

  o Six of the events did not appear to reach a stream, the other two were both discharges from Deworboies 2 Rehabilitation Pit on 26 March and 26 April 2023, and comprised two of the three discharges within an RPZ. Alcoa provided information demonstrating that this pit had been contour ripped progressively up to February 2024, with aerial imagery captured on 29 March 2024 indicating ripping has been completed;

[2] A drainage event is defined under the approved 2023 – 2027 Mining and Management Program (MMP) as runoff from the mining disturbance footprint to the surrounding environment except where turbidity is measured below 25 nephelometric turbidity units (NTU).



o No turbidity event(s) were observed at the nearest downstream monitoring station for any of the failures.

• At Willowdale, the 2021-2022-2023 events decreased 20-7-1, respectively.

o The event on 25 April 2023 at a sump on Conveyor 371 was within McKnoe's Brook Catchment and did not result in a turbidity event at the nearest downstream monitoring station. This site has a history of discharge events and failed mitigations. A review was undertaken and sumps were identified for construction/ redesign in the area. Construction was completed, and no drainage events were recorded throughout winter 2024.

• Into 2024, Alcoa reports it has further developed the risk assessment process to evaluate pit compliance to containing 1 in 100 year rainfall events. Its success, or otherwise, should be reviewed in a future TRS.

• The total annual spills (>20L) onto unsealed ground and total volume of such spills decreased from 2022 to 2023, as reported to JTSI in the triennial report (April 2024).

• In March 2023, DWER issued Alcoa a Prevention Notice (reference 202302) in relation to the PFAS pipeline constructed from Orion to the Arundel Pre-Treatment Dams. A related Prevention Notice was issued in May 2023 (reference 202304) specifying that Alcoa must not operate the PFAS pipeline, that PFAS containing wastewater must not be transferred or transported by any means across or within the Samson Brook catchment or Priority 1 Public Drinking Water Source Protection Area and a range of conditions for managing PFAS affected wastewater. Throughout winter 2024, Alcoa engaged Controlled Waste Carriers to transfer PFAS affected wastewater offsite to Cleanaway Henderson for treatment or to the Arundel Pre-Treatment Dams #1 and #2 in anticipation for the commissioning of the PFAS treatment unit (PTU). As noted at the beginning of this Section 17.2.2, Alcoa was granted a licence amendment from DWER in February 2024 approving the construction of the PTU at Arundel. At the time of writing, Alcoa is in the commissioning phase for the Arundel PTU and expects to complete commissioning early in 2025.

• Section 72 (s.72) of the Environmental Protection Act 1986 (EP) outlines the obligation to report discharges of waste to the environment if the discharge of waste has caused or is likely to cause pollution, material environmental harm or serious environmental harm. There were no incidents reported under s.72 in 2023, as was the case in 2022.

Alcoa is proactively working with relevant regulatory agencies to address operational incidents and implement operational improvements to reduce releases to the environment.

In addition, Alcoa provided the monthly reports for January to June 2024 required under Clause 10 of the 2023 Exemption Order, and verbally confirmed during meetings to inform this TRS, that no non-compliances had occurred. While not directly related to 2023 activities, the results are considered of interest given the importance of compliance with the Exemption Order to Alcoa's ongoing ability to operate while the EPA assesses the 2022-2026 and 2023-2027 MMPs.



17.2.3 Water Management

Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its surface water and operational licenses, and also acts with a view of continuous improvement, particularly in relation to water which is a key operational and environmental consideration for the Darling Range. For example:

- Haul road sumps began being designed and constructed as per the WA Mining and Haul Road Drainage Design Manual. Upgrade works on identified priority sumps across both sites began in the summer of 2021/22 and continued in summer 2022/23 and 2023/24.
- Construction of the Arundel pre-treatment dams was completed in 2022 (50ML and 60ML lined dams), providing greater water storage capacity.
- As reported to JTSI in the 2023 Triennial report, Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. This process continues to occur on an ongoing basis to inform mine planning. 447 groundwater monitoring bores were installed across Huntly and Willowdale since the program began to the end of 2023. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design. Biannual bore sampling to monitor groundwater quality and levels began in 2022. This program is ongoing with sampling planned to occur after each wet and dry season in April and September. Alcoa also aims to utilise groundwater level data obtained from the bores with rainfall records to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations.
- As reported in previous years, Alcoa has continued to develop its Catchment Risk Assessment tool to improve understanding of inherent and residual catchment risk associated with mining operations. Development of the tool is occurring in iterations to facilitate continual improvement during development and to improve accuracy. Iteration 2 of the Catchment Risk Assessment Tool was completed in Q4 of 2023 to include improvements and additional functionality recommended by an independent review team. The next iteration (3) will incorporate consultation and collaboration with key stakeholders via the Independent Technical Advisory Group (ITAG) prior to implementation.

Key components of Alcoa's water management and monitoring program include:

- Treatment of stormwater that may contain traces of hydrocarbons via a wastewater treatment system to concentrations that meet DWER license requirements prior to release.
- Turbidity monitoring along tributaries to key catchments to prevent contaminated or turbid runoff into the drinking water supply.
- Wastewater treatment and monitoring to meet DWER license requirements prior to release including treated water quality monitoring prior to release and continuous discharge volumes.
- Surface water drainage management to prevent uncontrolled surface water runoff from operations to the surrounding forest and/or surface water bodies.
- Implementation of the *Interim PFAS Water Management Strategy*. The interim Strategy will remain in place until the Contaminated Sites process outlined in section 17.1.2 is complete.
- Drainage protection management through the implementation of a Drainage Control Management Plan.

- Sewage management though a biological aeration treatment unit (BioMAX).
- Monitoring of cumulative water abstraction volumes at licensed and unlicensed surface water abstraction points in accordance with the *Surface Water License Operating Strategies* for Huntly and Samson Dam.
- Potable water monitoring for identification of possible biological or chemical contamination.
- Ecological water requirements (EWRs) have not been defined for the site, however Alcoa undertakes monitoring of the downstream environments to ensure no unacceptable impact. This is completed via photographic monitoring for Banksiadale Dam, Pig Swamp Waterhole, Boronia Dam and Marrinup Nursery. Note the EPA has not explicitly required Alcoa to develop EWRs as part of the formal impact assessment process for Myara North and Holyoake to date.
- Water use efficiency programs are implemented pertaining to wastewater recycling, efficient watering of haul roads, pumping and reusing water from roadside sumps, and effective mining planning to reduce dust suppression requirements.
- Alcoa, in association with the former Water and Rivers Commission, has researched the hydrology and salinity in the Jarrah forest since the 1970s, as part of the Joint Intermediate Rainfall Zone Research Program (JIRZRP). The JIRZRP has included monitoring of surface water, groundwater and salinity as well as analysis and modelling of the Intermediate Rainfall Zone (IRZ). This work continues to evaluate potential impacts of clearing and rehabilitation on groundwater salinization.
- Alcoa will continue to expand its monitoring program, as necessary, if groundwater quality or quantity has been identified as potentially at risk due to operational or mining activities, or potential exists for mining to impact offsite/private groundwater supply quantity or quality.

Baseline water quality monitoring has been undertaken at Myara North and Holyoake as part of the Part IV approvals process for these mining areas. It is anticipated that groundwater monitoring will be required as part of the operational license for these deposits.

17.3 Project Permitting

The environmental approvals and reviews / reporting form part of the BSEC/MMPLG approvals process outlined in Section 3.6. Compliance with the MMP will be demonstrated through an annual Compliance Assessment Report submitted to the Department of Jobs, Tourism, Science and Innovation.

From 14 December 2023, Alcoa is also required to comply with the requirements of the section 6 exemption. A section 6 exemption under the Environmental Protection Act 1986 (EP) allow continued operations whilst the Environmental Protection Authority undertakes an assessment of the mining activities which were not previously referred. Compliance against the section 6 exemption is monitored on a weekly basis by an independent compliance monitor and reported monthly to the Department of Water and Environmental Regulation.

Operational matters at the Willowdale and Huntly mines are licensed by the Department of Water and Environmental Regulation via instruments L6465/1989/10 and L6210/1991/10, respectively. These licenses condition the processing of ore and reporting is required annually to DWER describing the total volume of bauxite crushed and any non-compliance. The latest available reporting at the time of writing is for the calendar year 2023.

Compliance with the Alcoa ISO14001 accredited EMS was audited in December 2021, with recertification issued in May 2022. This recertification is valid until May 2025.

The only known requirement to post performance or reclamation bonds is a $100M AUD bank guarantee to help fund the Western Australian Government's response in the unlikely event of an impact to Perth's drinking water dams which is not rectified within the relevant time periods, announced as part of the Alcoa Transitional Approvals Framework (ATAF) on 14 December 2023. In September 2024 and October 2024, AofA delivered bank guarantees totalling $69M (A$100M) demonstrating confidence that operations will not impair drinking water supplies. The requirement to provide financial assurance will expire upon the completion of the WA EPA's assessment of the Company's mine plans.

17.4 Social or Community Requirements

Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

Alcoa strives to align its social performance and community engagement to global leading practice and was admitted to ICMM in 2019. In addition, Alcoa's Western Australian operations are certified under the Aluminum Stewardship Initiative, valid until 16 January 2026.

17.4.1 Community Consultation

Related to the requirements of the BSEC/MMPLG, Alcoa's actions include an annual 5-year consultation process aligned with the 5 Year Mine Plan. The consultation process involves engaging with affected landowners.

Alcoa's consultation extends to state and local government and Gnaala Karla Booja Aboriginal Corporation representing the Traditional Owners of the area.

Where appropriate, the mine plan accommodates community requirements, in particular, concerns related to noise, dust, etc., and allows for buffer zones and modified working hours.

Community consultation (both in-bound (e.g. noise complaints) and out-bound (e.g. Alcoa-initiated engagement with stakeholder groups)) is recorded in the Community Consultation System (CCS). CCS allocates and tracks follow-up actions.

Alcoa's move towards formal, publicly scrutinized environmental impact assessment and approval under the State and Federal acts (Section 3.6) for the extraction of future resources will provide greater transparency around Alcoa's future operations that should go some way to addressing the challenges it faces with some parts of the wider community.

Alcoa has formally consulted and engaged survey work from the relevant Traditional Owners across its operational footprint. Following a joint review of the Draft Cultural Heritage Management Plan late in 2024, Alcoa and Gnaala Karla Boodja have agreed that further work is required to finalise the document. In view of Gnaala Karla Boodja Aboriginal Corporation's capacity constraints, it is likely that finalization of the Cultural Heritage Management Plan will require a minimum of a further six months. A formal request for an extension of time to facilitate this has been submitted to the relevant Government regulator.

Alcoa seeks to add value to the communities where it operates and beyond. Through a drive for sustainable development and desire to support reputable non-profit and community-based organizations, community investment supports partnerships and initiatives that look to deliver long-term community benefits.

Each year Alcoa and its global charity, the Alcoa Foundation, invests in a wide variety of programs at the local, state, and national level. In 2023 Alcoa invested $5.2 million in community partnerships across the Australian regions where it operates its business.



In addition to community partnerships, employees are encouraged to participate each year in Alcoa Volunteers (volunteering as teams during work time) and employee giving programs. The Alcoa Community Together In Our Neighborhood (ACTION) program encourages employees to make a positive difference by volunteering in their communities with at least eight work-mates, Alcoa then matches these volunteering efforts with a $3,000 grant for nominated organizations.

17.4.2 Social Performance Management System

Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks, and maintain Alcoa's Social License to Operate.

SP360 includes the following management standards which guide social performance management:

- Social Performance Management Standard
- Human Rights Standard
- Indigenous and Land Connected Peoples Standard
- Cultural Heritage Management Standard.

Each location maintains a Social Performance Plan which details the activities Alcoa undertakes to support their understanding and management of social impacts and risks, including:

- Socio-economic baselines
- Social impact assessment and management plans
- Social risk assessments
- Stakeholder and community engagement planning
- Social commitments and obligation management
- Complaints and grievances handling.

17.5 Mine Closure Requirements

Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale). Closure Strategies, Schedules and Cost Estimates are being developed across organizational divisions and includes multidisciplinary inputs from Operations, Mid- and Short-term Planning, Finance, Centre for Excellence, Environment and Asset Management (both Fixed and Mobile Plant).

As described in Section 15.5.2, overburden is used to backfill adjacent, completed mining operations and the topsoil spread on top and contoured.

Current rehabilitation practices and closure planning have evolved positively since the 1990s.

The agreed closure requirements for Darling Range centers around the return of Jarrah Forest across the site. End land uses are required to comply with the State's Forest Management Plan and include water catchment protection, timber production and biodiversity conservation. Completion Criteria were revised in 2015 by the MMPLG for rehabilitation works commencing in and after 2016. These criteria do not apply to areas which commenced rehabilitation prior to 2015 and represent a 'step forward' in rehabilitation practices at Darling Range.



The 2023-2027 MMP (and roll-over approval of 2024-28), and EIA process being applied to Myara North and Holyoake represent another step forward in rehabilitation planning. Appropriate mine planning and closure implementation mitigates environmental risks to ecological, hydrological, social and physical receptors. In addition, the current Completion Criteria will be revised in consultation with DBCA by 31 December 2024.

The 2023-2027 MMP (and roll-over approval of 2024-28) aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.

Mine closure costs are considered as part of Asset Retirement Obligations (ARO) described in Section 18.0.

17.6 Local Procurement and Hiring

Alcoa's Local Community Supplier Policy defines "local" as the localities of Dwellingup, Harvey, Pinjarra, Waroona, Coolup, North Dandalup, Jarrahdale and Yarloop. Within Alcoa's guidelines of safe, ethical, and competitive business practices, Alcoa's Local Community Supplier Policy states it will:

- Invite capable local business to bid on locally supplied or manufactured goods or services.
- Give preference to local business in a competitive situation.
- Work with local business interest groups to identify and utilize local suppliers.
- Where possible, structure bids to enable local supplier participation.

Whilst the Policy does not specifically address local hiring, most of the mine's workforce are based within the close vicinity.

Alcoa also endeavors to add value to Traditional Owners and the local economy through the use of businesses owned by Traditional Owners, businesses that employ and work with Traditional Owners and locally owned businesses. Alcoa will help Traditional Owner businesses and local businesses to do business with Alcoa and encourage the employment of Traditional Owner and local labor. Alcoa have made a policy commitment to:

- Invite capable local Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses to bid on every locally supplied or manufactured good or service.
- Give preference to Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses in a competitive situation.
- Tender evaluations shall apply a minimum weighting of 10 per cent for Traditional Owner, Aboriginal and Torres Strait Islander and Local businesses.
- Work with Traditional Owner, Aboriginal and Torres Strait Islander and Local business interest groups to identify, utilize and build local supplier capability.
- Offer reduced Payment Terms to support the growth and sustainability of Traditional Owner, Aboriginal and Torres Strait Islander and Local business.

18.0 Capital and Operating Costs

Alcoa forecasts its capital and operating costs estimates based on annual budgets and historical actuals over the long life of the current operation. All values are presented in United States Dollars ($) unless otherwise stated.

18.1 Capital Costs

The operation is well-established, and the LOM plan outlines capital expenditures aligned with scheduled production rates throughout the mine's life. This includes future capital expenditures for major mine relocations to meet anticipated refinery production while sustaining ongoing operations.

Projected mine capital expenditure over the next nine years of mine life is estimated to total $1,175 million, although this will include capital outlay required to extend the mine life much beyond the nine-year period covered by the valuation. Of this total, it is understood that $183 million is associated with completing the mine move to the Myara North site. Capital for the Holyoake move is estimated to be $471 million.

A breakdown of the major expenditure areas and other sustaining capital expenditure over the next nine years of mine life (2025 – 2033) is shown below.

able 18-1: Nine Year LOM Sustaining Capital Costs by Area

Project	Cost $ Million	Percentage of Total
Mine Moves	787	67.0%
Conveyor Belt Replacements	53	4.5%
Haul Road Improvements	136	11.6%
Other Sustaining capital	199	16.9%
Total	**1,175**	**100%**

Other capital costs are for replacement of conveyors, haul road improvements and other sustaining capital needed to continue the operations.

Alcoa’s sustaining capital estimates for Darling Range are derived from annual budgets and historical actuals over the long life of the current operation, as well as detailed feasibility studies where required (such as for the mine moves) that include costs and associated contingencies. These are noted to be less than 10% of the total capital costs. According to the American Association of Cost Engineers (AACE) International, these estimates would generally be classified as Class 1 or Class 2 with an expected accuracy range of -3% to -10% to +3% to +15%. The SLR QP is satisfied that the costs meet these accuracy requirements.

18.2 Operating Costs

The main production mining operations are primarily Owner-operated using Alcoa equipment and employees, with contractors engaged for specific supporting activities.

Operating costs are derived from historical site cost data and, in the QPs opinion, achieve an accuracy range of -10% to +15%, which is appropriate for this level of study.

No material factors have been identified that would significantly impact operating costs over the life of mine. Year-to-year variations are expected due to routine maintenance outages and production schedule fluctuations. Table 18-2 presents both the forecast costs for 2025 and average operating costs over the nine-year LOM. As intended, the Kwinana refinery



ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans and operational cost projections have been revised accordingly.

able 18-2: LOM Mine Operating Costs by Category*

Cost Centre	2025 ($/wmt)	Average LOM ($/wmt)	Percentage of Operating Cost
Direct Labor	$3.70	$4.13	32%
Services	$1.83	$1.16	9%
Other	$1.48	$3.01	24%
Corporate Chargebacks for support services	$1.08	$0.80	6%
Energy	$0.23	$0.10	1%
Fuel	$0.67	$0.77	6%
Operating Supplies and Spare Parts	$0.79	$0.92	7%
Maintenance (fixed plant and mobile fleet)	$1.17	$1.91	15%
Mine Operating Cash Cost ($/wmt)	**$10.95**	**$12.80**	**100%**
Off-site Costs			
G & A, selling and other expenses	$0.85	$0.57	
R & D Corporate Chargebacks	$0.13	$0.06	
Other COGS	$0.15	$0.12	
Total Cash Operating Costs	**$12.08**	**$13.55**	

** Due to rounding, numbers presented may not add up precisely to the totals provided*

Services costs include contractor costs for certain mining activities such as in noise sensitive areas and for haul road construction services, in select areas of pit development, and during landscaping activities for rehabilitation after mining.

As of December 2024, the Huntly and Willowdale operations together employ 981 employees consisting of 36 technical, 122 management and 823 operations employees. Additionally, 171 employees are centrally employed on the combined operations.

Table 18-3 summarizes the current workforce for the operations.

able 18-3: Workforce Summary

Category	Technical	Management	Operations	Total
Huntly	24	71	566	**661**
Willowdale	12	51	257	**320**
Central	46	21	104	**171**
Total	**82**	**143**	**927**	**1152**

As regards mine closure, compensation for vegetation clearing is paid in advance and rehabilitation is an ongoing process that is incorporated into the mining cost (as part of Asset Retirement Obligations (ARO)).

19.0 Economic Analysis

19.1 Economic Criteria

Alcoa prepares a rolling operational LTMP for the purposes of long-term mine and business planning.

The assumptions used in the analysis are current as of 31 December 2024.

A technical-economic model was prepared on an after-tax discounted cash flow (DCF) basis, the results of which are presented in this subsection.

The cashflow is presented on a 100% attributable basis. Alcoa has applied a 9.5% discount rate for DCF analysis. The QP is of the opinion that a 9.5% discount/hurdle rate for after-tax cash flow discounting of such large-scale bauxite mining projects in Western Australia with a demonstrable operating track record is reasonable and appropriate, considering both project-specific factors and sovereign risk profile.

Key criteria used in the analysis are discussed elsewhere throughout this TRS. General assumptions used are summarized in Table 19-1. All values are presented in United States Dollars ($) unless otherwise stated.

able 19-1: Technical-Economic Assumptions

Description	Value
Start Date	January 1, 2025
Mine Life based on Mineral Reserves	9 years
Average LOM Price Assumption	$23.19
Total Operating Costs	$4,045.2 million
Capital over nine years	$1,174.6 million
Income tax	$226.0 million
Discount Rate	9.5%
Discounting Basis	End of Period
Corporate Income Tax Rate	30%
Model Basis	Nominal

Table 19-2 provides a summary of the estimated mine production over the nine-year model life.

able 19-2: LOM Production Summary

Description	Units	Value
Total ROM Ore	Mt	326.0
Waste Mined	Mt	65.6
Total Material Moved	Mt	393.4
Annual Average Ore Mining Rate	Mtpa	33.2

19.2 Cash Flow Analysis

The economic analysis presented herein complies with S-K 1300 requirements and is based on a reserve-based analysis using only Proven and Probable Mineral Reserves for the current 9-year mine planning window.

19.2.1 Economic Analysis

The economic analysis, consistent with previous submissions, considers only the Proven and Probable Mineral Reserves, supporting a nine-year mine life (2025-2033) with production averaging 33.2 Mtpa (wet tonnes). Production volumes are determined by refinery requirements rather than mining constraints, with annual throughput varying from 27.4 Mtpa (2025) to 37.2 Mtpa (2029). The QP confirms that sufficient Proven and Probable Reserves exist to support this production profile.

Using the defined 9-year detailed mine plan period, at a 9.5% discount rate and average bauxite price of $23.19/t, the operation generates an after-tax NPV of $54.7 million. The bauxite price used in the cashflow is defined by an intercompany price inflated by 3% YoY, equivalent to the $23.19/t average over the detailed mine plan period of nine years.

This figure reflects substantial sustaining capital requirements during the period. This valuation is presented on a 100% attributable basis using nominal cash flows which allow for annual price inflation of 3% and cost escalation ranging primarily between 2 and 3%.

The QP notes several factors supporting potential operation beyond 2033, including demonstrated success in annual Resource to Reserve conversion through infill drilling, extensive operational history, scale of existing deposits, and consistent historical Reserve replacement rate.

19.2.2 Analysis Summary

Table 19-3 summarizes the key project economic results and estimated cash flows provided for the period 2025 to 2033. The economic analysis, conducted using the technical inputs and cost estimates presented in this Technical Report Summary, confirms positive cash flows that supports the statement of Mineral Reserves.

able 19-3: LOM Indicative Economic Results

		FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32	FY33
Macro Assumptions										
Region		Australia	Australia	Australia	Australia	Australia	Australia	Australia	Australia	Australia
Days/Year		365	365	365	366	365	365	365	366	365
InterCo Price		$ 20.16	$ 20.57	$ 20.98	$ 21.40	$ 21.83	$ 22.26	$ 22.71	$ 23.16	$ 23.62
3P Price		$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
Local Currency		USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD	USD/AUD
Fx Rate		0	0	0	0	0	0	0	0	0
Minority Interest		0%	0%	0%	0%	0%	0%	0%	0%	0%
Tax Rate		30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%	30.00%
Production										
InterCo Production (Wet Kt)		$ 27,418,672	$ 27,288,000	$ 28,638,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,806,000	$ 37,131,000	$ 36,898,000
3P Production (Wet Kt)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Production (Wet Kt)		$ 27,418,672	$ 27,288,000	$ 28,638,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,806,000	$ 37,131,000	$ 36,898,000
Shipments										
InterCo Shipments (Wet Kt)		$ 27,418,672	$ 27,288,000	$ 28,638,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,806,000	$ 37,131,000	$ 36,898,000
3P Shipments (Wet Kt)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Shipments (Wet Kt)		$ 27,418,672	$ 27,288,000	$ 28,638,177	$ 30,115,920	$ 37,214,000	$ 36,955,000	$ 36,806,000	$ 37,131,000	$ 36,898,000
--Income Statement--										
Sales		558,261,386	572,268,841	618,601,527	670,037,297	852,798,487	872,269,123	894,814,760	929,797,529	951,681,864
Cost of goods sold		304,027,045	374,081,706	384,305,823	438,291,267	585,960,099	577,590,082	415,893,394	385,398,609	391,783,172
Selling, general administrative, and other expenses		23,441,816	18,548,710	18,423,804	18,318,527	18,230,111	18,142,122	18,054,557	17,967,416	18,326,764
Research and development expenses		3,641,403	1,871,011	1,858,412	1,847,793	1,838,874	1,829,998	1,821,166	1,812,376	1,848,623
Provision for depreciation, depletion, and amortization		91,012,747	164,171,030	211,844,402	256,657,326	223,458,270	194,789,163	233,160,016	192,016,082	195,856,403
Restructuring and other charges		-	-	-	-	-	-	-	-	-
Other expenses (income), net		-	-	-	-	-	-	-	-	-
Total costs and expenses		**422,123,011**	**558,672,457**	**616,432,441**	**715,114,913**	**829,487,354**	**792,351,365**	**668,929,133**	**597,194,483**	**607,814,962**
Income (loss) before income taxes		136,138,375	13,596,384	2,169,086	(45,077,616)	23,311,134	79,917,758	225,885,627	332,603,046	343,866,902
Provision for income taxes		40,841,513	4,078,915	650,726	(13,523,285)	6,993,340	23,975,327	67,765,688	99,780,914	103,160,071
Net income (loss)		**95,296,863**	**9,517,469**	**1,518,360**	**(31,554,331)**	**16,317,793**	**55,942,430**	**158,119,939**	**232,822,132**	**240,706,832**
Less: Net income attributable to noncontrolling interest		-	-	-	-	-	-	-	-	-
Net Income (Loss) Attributable to Alcoa Corporation		95,296,863	9,517,469	1,518,360	(31,554,331)	16,317,793	55,942,430	158,119,939	232,822,132	240,706,832
EBITDA		227,151,122	177,767,414	214,013,488	211,579,710	246,769,404	274,706,921	459,045,643	524,619,128	539,723,305
EBIT		136,138,375	13,596,384	2,169,086	(45,077,616)	23,311,134	79,917,758	225,885,627	332,603,046	343,866,902
--Cash Flow Statement--										
CF Income before NCI		95,296,863	9,517,469	1,518,360	(31,554,331)	16,317,793	55,942,430	158,119,939	232,822,132	240,706,832
CF Depreciation, depletion, and amortization		91,012,747	164,171,030	211,844,402	256,657,326	223,458,270	194,789,163	233,160,016	192,016,082	195,856,403
CF Working capital change		10,840,111	11,434,747	1,869,488	(1,120,154)	8,562,629	(1,416,841)	(7,000,105)	(1,731,997)	977,809
CF Equity earnings net of dividends		-	-	-	-	-	-	-	-	-
CF Pension contributions net of accrual		-	-	-	-	-	-	-	-	-
CF Tax payments net of accrual		-	-	-	-	-	-	-	-	-
CF Other (Cash from Operations)		(134,503,759)	(120,445,177)	(128,579,936)	(110,310,104)	(110,751,702)	(111,743,202)	(109,179,128)	(109,737,259)	(111,932,003)
Cash from Operations		**62,645,961**	**64,678,069**	**86,652,314**	**113,672,737**	**137,586,991**	**137,571,550**	**275,100,722**	**313,368,959**	**325,609,040**
CF Distributions to NCIs		-	-	-	-	-	-	-	-	-
CF Contributions from NCIs		-	-	-	-	-	-	-	-	-
CF Change in debt		-	-	-	-	-	-	-	-	-
CF Stock issuances / repurchases		-	-	-	-	-	-	-	-	-
CF Other (Cash from Financing)		-	-	-	-	-	-	-	-	-
Cash from Financing		-	-	-	-	-	-	-	-	-
CF Capital expenditures		(113,285,406)	(195,637,871)	(151,995,789)	(170,406,025)	(200,351,783)	(213,736,478)	(40,842,436)	(44,274,351)	(44,060,657)
CF Acquisitions/divestitures		-	-	-	-	-	-	-	-	-
CF Investments		-	-	-	-	-	-	-	-	-
CF Other (Cash from Investing)		-	-	-	-	-	-	-	-	-
Cash from Investing		(113,285,406)	(195,637,871)	(151,995,789)	(170,406,025)	(200,351,783)	(213,736,478)	(40,842,436)	(44,274,351)	(44,060,657)
Free Cash Flow		**$ (50,619,445)**	**$ (130,959,802)**	**$ (65,343,475)**	**$ (56,733,289)**	**$ (62,764,792)**	**$ (76,164,928)**	**$ 234,258,286**	**$ 269,094,607**	**$ 281,548,383**
Model NPV	**$ 54,714,266**	$ (50,619,445)	$ (119,597,993)	$ (54,497,175)	$ (43,211,128)	$ (43,657,576)	$ (48,382,069)	$ 135,897,118	$ 142,562,781	$ 136,219,752

19.3 Sensitivity Analysis

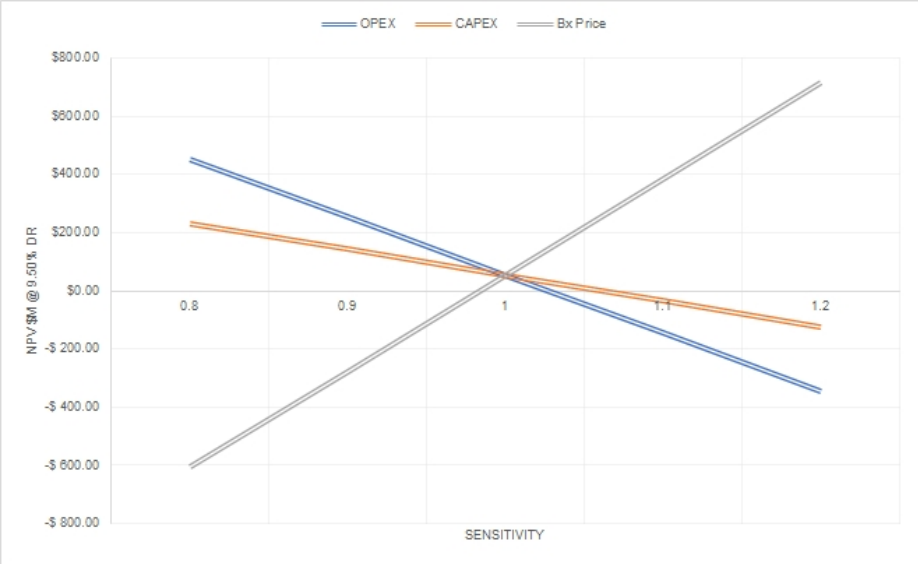
Project risks can be identified in both economic and non-economic terms. Key economic risks were examined by running cash flow sensitivities. The operation is nominally most sensitive to market prices (revenues) followed by operating costs.

igure 19-1: Sensitivity Analysis (NPV)

NPV $M OPEX	80%	90%	100%	110%	120%
7.50%	$523.42	$310.29	$97.15	-$ 115.99	-$ 329.13
8.50%	$486.97	$280.99	$75.01	-$ 130.96	-$ 336.94
9.50%	$453.14	$253.93	**$54.71**	-$ 144.50	-$ 343.71
10.50%	$421.74	$228.91	$36.09	-$ 156.73	-$ 349.55
11.50%	$392.56	$205.78	$19.00	-$ 167.78	-$ 354.56

NPV $M CAPEX	80%	90%	100%	110%	120%
7.50%	$285.29	$191.22	$97.15	$3.08	-$ 90.99
8.50%	$258.17	$166.59	$75.01	-$ 16.57	-$ 108.15
9.50%	$233.13	$143.92	**$54.71**	-$ 34.49	-$ 123.70
10.50%	$209.99	$123.04	$36.09	-$ 50.86	-$ 137.81
11.50%	$188.59	$103.80	$19.00	-$ 65.79	-$ 150.58

NPV $M Bx Price	80%	90%	100%	110%	120%
7.50%	($614.79)	-$ 258.82	$97.15	$453.12	$809.09
8.50%	($611.05)	-$ 268.02	$75.01	$418.05	$761.08
9.50%	($607.00)	-$ 276.14	**$54.71**	$385.57	$716.43
10.50%	($602.70)	-$ 283.30	$36.09	$355.48	$674.88
11.50%	($598.17)	-$ 289.58	$19.00	$327.59	$636.18



20.0 Adjacent Properties

The Darling Range has no material adjacent properties.

21.0 Other Relevant Data and Information

No additional information or explanation is necessary to make this Technical Report Summary understandable and not misleading.

22.0 Interpretation and Conclusions

22.1 Geology and Mineral Resources

• SLR is independently declaring the 31 December 2024 Mineral Resources for the defined bauxites located within Alcoa's Darling Range deposits. The Mineral Resource models were prepared by Alcoa using their in-house estimation procedures and reviewed extensively by SLR.

• As of December 31, 2024, exclusive of Mineral Reserves, as summarized in Table 11-13 at an appropriate level of precision reflecting confidence, the Measured Mineral Resources are estimated to be 139.6 Mt at a grade of 30.4% available alumina (AL) and 1.77% reactive silica (SI). Similarly, the Indicated Mineral Resources are estimated to be 48.7 Mt at 30.3% AL and 1.42% SI, and the Inferred Mineral Resources are estimated to be 101.4 Mt at 32.4% AL and 1.20% SI.

• Drill sampling and sample control procedures at Alcoa's Darling Range Bauxite Operations are adequate and appropriate for use in the estimation of Mineral Resources. The defined volumes and grades of mineralization are not expected to be systematically impacted (biased) by errors in either the collar location or the 3D sample location.

• The Quality Assurance / Quality Control (QA/QC) of sample preparation and assaying is adequate, and the assay results are suitable for use in Mineral Resource estimation

• Analytical procedures used for the Alcoa Mineral Resource comprises part of conventional industry practice. FTIR is not widely used yet in the bauxite industry but is becoming more widely accepted and applied to more operations. At Alcoa the method has been consistently applied successfully for a decade and is routinely validated by industry standard XRF and wet chemical procedures as discussed in Sections 8.3 and 8.4. It is the opinion of the QP from the studies on FTIR repeatability discussed above that the overall precision and accuracy of the FTIR assaying is acceptable.

• The database is adequate, and the data is appropriate for the purpose of Mineral Resource estimation.

• The continuous improvements in the geological modelling, estimation techniques, and block model migration to the 3D approach are appropriate and constantly improve the confidence level and precision of the Mineral Resources.

• The dry bulk density data is less well controlled than other analytes, although different attempts were taken since 1980. However, based on the different reconciliation approaches and on the fact that the polygonal and GSM model have lower confidence level, the density values are acceptable for the Resource estimation.

• The condition of Reasonable Prospects for Economic Extraction is met by constraining the Mineral Resource model using the ArcGIS system, by ensuring that the model defines key parameters for the refinery, and by sound reconciliation practices providing feedback that the modelling is appropriate for the purpose.

22.2 Mining and Mineral Reserves

• As of December 31, 2024, Proven Mineral Reserves are estimated to total 26.1 Mt at 29.2% AL and 1.61% SI and Probable Mineral Reserves are estimated to total 397.6 Mt at 30.8% AL and 1.56% SI.



• The QP has used the December 31, 2024 Mineral Resource estimate as the basis for its Mineral Reserve estimate, applying Modifying Factors only to those Resources classified as Measured Mineral Resources and Indicated Mineral Resources.

• The bauxite operations are operating mining projects with a long history of production for which establishment capital has been repaid and for which sustaining capital and supported operating costs have been observed to be applied in economic analysis. The review of the Capex Front End Loading (FEL) 2 Study report for the Myara North Crusher move has provided further support. Consequently, the QP considers that support by a Feasibility Study (FS) is demonstrated by the history of profitable operation and the level of technical support for the Modifying Factors. The QP has reviewed the operating and planning procedures and parameters for the operations.

• The QP considers that the accuracy and confidence in the Mineral Reserve estimate to be appropriate for the classification applied, which is supported by both the conservative operational processes and the long operational history.

• The QP is not aware of any risk factors associated with, or changes to, any aspects of the Modifying Factors such as mining, metallurgical, infrastructure, permitting, or other relevant factors that could materially affect the current Mineral Reserve estimate. The Darling Range operations have however undergone some changes as related to the permitting requirements which are discussed in this report; namely the approvals process, river corridor constraints, restoration obligations, and any required adjustments to accommodate the Q2 2024 curtailment of the Kwinana refinery.

22.3 Mineral Processing

• The operating data between 2010 and 2024 indicates that the product from the Darling Range operations consisted of an average AL grade of 33%, with SI below the target for refinery feed.

• The QP is of the opinion that the Darling Range operation demonstrated that ore can be effectively crushed and supplied to a refinery for further upgrading to produce alumina. The historical operational data confirmed that the ore consistently met refinery specifications without any deleterious elements.

    o Based on this, and additional information provided by Alcoa regarding the mine plan, it is reasonable to assume that the ore from Darling Range will meet the refinery specifications for the next nine years.

22.4 Infrastructure

• The Darling Range mining operations have established and operational infrastructure, with mining hubs that host administrative offices, as well as crushing facilities and maintenance facilities.

    o Hubs are relocated periodically as production moves away from the hub and transportation costs increase. These relocations are well-understood with planning and associated budgeting occurring well in advance of relocations; production restarted seven days after the most recent shutdown.

• An extensive haul road network, rail, and overland conveyors transport crushed bauxite from the Hub to the refineries.

    o Bauxite is transferred from each mine to the refineries primarily via long distance conveyor belt.

    o Alumina produced by the Pinjarra and Wagerup refineries is then shipped to external and internal smelter customers through the Kwinana and Bunbury ports.

- o As intended the Kwinana refinery ceased production in the second quarter of 2024 following phased curtailment. The updated mine plans have been revised accordingly.

• The Huntly and Willowdale mines are located near the towns of Pinjarra and Waroona respectively. These are easily accessible via the national South Western Highway, a sealed single carriageway road, spanning almost 400 km from the southern side of Perth to the southwest corner of Western Australia.

• Sealed access roads to the main hubs have been established, connecting Huntly and Willowdale to the road network.

• Major haul roads have been established to each mining area, while secondary haul roads cross-cut each individual mining plateau. Roads are unsealed and require continuous maintenance.

• The Darling Range's Pinjarra refinery receives power from the South West Interconnected System (SWIS), but also has internal generation capacity of 100 MW from four steam driven turbine alternators, with steam produced by gas fired boilers and a gas turbine Heat Recovery Steam Generator (HRSG).

- o The refinery supplies power to the Huntly Mine by a 33,000 volt power supply line and two 13,800 volt lines.

• The Wagerup refinery is a net exporter of power to the SWIS, with internal generation capacity of 108 MW from three steam driven turbine alternators and one gas turbine; steam being generated by gas fired boilers.

- o The refinery supplies power to the Willowdale Mine by a single 22,000 volt power supply.

• Water is used on the mines for dust suppression, dieback washdown, vehicle washdown, workshops, conveyor belt wash, construction, and domestic purposes.

- o The water supplies for mining consist of licensed surface water sources supplemented with treated wastewater from vehicle washdowns, stormwater runoff and maintenance workshops.
- o The annual volume of freshwater abstracted under the Department of Water and Environmental Regulation (DWER) surface water licences and Water Corporation supply agreements decreased from Boronia Dam in comparison to 2022, and remained reasonably consistent to 2022 from Banksiadale and Samson Dams.
- o In 2023, water abstraction comprised approximately:
  - 4.2% of the annual entitlement from Boronia Dam (i.e. 2,931.1 kL), in comparison to 53% in 2022.
  - 22% from Banksiadale Dam (i.e. 108,412 kL), in comparison to 22% in 2022.
  - 82% from Samson Dam (i.e. 368,017), in comparison to 70% in 2022.
- o An additional 126,306 kL was also abstracted from South Dandalup Dam under the agreement with Water Corporation, significantly reduced from 2022 (651,840.7 kL).

• On site facilities include offices, ablutions, crib-rooms, and workshops, however there are no Alcoa accommodation facilities, as the Huntly and Willowdale mining areas are close to established population centers.

• No tailings are generated within the boundaries of the mining operations and waste dumps are not constructed. The management of tailings generated downstream at

the refineries is beyond the boundaries of the Darling Range mining operations and are therefore not considered in this TRS.

• Overburden is segregated for later contouring and rehabilitation of adjacent, completed mining operations. Caprock and other non-viable rock is used to backfill these shallow, completed pits and the viable topsoil is spread on top, contoured, and revegetated.

22.5 Environment

• Alcoa has established processes to facilitate conformance with environmental requirements, identifying sensitive areas ahead of time enables them to be managed ahead of disturbance.

• Mining in some areas became more constrained in 2023 as a result of internal and external factors. This has continued into 2024 and has resulted in a presumed temporary decrease in operability and associated decrease in Reserve estimation.

• The 2023-2027 MMP describes Alcoa's proposed mining operations for the Huntly and Willowdale mines within ML1SA from 1 January 2023 to 31 December 2027. It excludes an environmental assessment of mine development activities associated with Myara North or Holyoake mining regions currently under consideration by the EPA and DCCEEW.

• Alcoa has made progress in drafting and implementing a number of new management plans and processes required to meet current compliance requirements.

• Alcoa is modernizing its environmental approvals framework for its Huntly Bauxite Mine and Pinjarra Alumina Refinery, by referring future mining plans for assessment under Part IV of the Western Australian *Environmental Protection Act 1986* (EP) and the Australian *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Construction for Myara North will be commenced pursuant to the requirements of the Ministerial Decision, which will be issued upon completion of the EPA assessment process indicatively forecast for the first quarter of 2026, as opposed to approximately mid-2025 as reported in the TRS for 2023. The timeframe to approval of Myara North and Holyoake under the EP and EPBC Act can be estimated, but not predicted with certainty; further delays are possible.

• Importantly, on 14 December 2023 the State Government announced the *Alcoa Transitional Approvals Framework* which will enable Alcoa to continue mining as defined in the 2023-2027 MMP while the formal EPA EIA is in progress. In most circumstances, activities under assessment must cease during the EPA's process. Note, that the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point. In October 2024 the Premier rolled over the 2023-2027 approval to cover 2024-2028 with the same conditions.

• Alcoa's mine sites are monitored in accordance with the conditions of Government authorizations and its operational licenses at Huntly (L6210/1991/10) and Willowdale (L6465/1989/10) and the MMP. Compliance with the section 6 exemption order is also required from 14 December 2023. Outcomes of and compliance with the management and monitoring programs are tracked within Alcoa's Environmental Management System and reported within the Annual Environmental Review report:

  o Review of the most recent report, JTSI Annual Environmental Review 2023 (dated April 2024), largely reported compliance with environmental commitments and success of operational controls to manage environmental objectives.

- o In addition, outcomes of and compliance with the management and monitoring programs are reported within the 2023 Annual Environmental Review against the current MMP to JTSI, and in monthly reports demonstrating compliance with the Exemption Order.

• Alcoa implements a comprehensive water management and monitoring program in accordance with the requirements of its abstraction and operational licenses.

• A groundwater monitoring program commenced in the second half of 2022 across the Darling Range operations to support approvals and operational monitoring, this is ongoing.

• Alcoa has established systems and processes to support maintenance of its social license to operate and conducts an extensive program of community relations activities to ensure that the public is aware and informed regarding its operations.

• Alcoa's Social Performance Management System (SPMS), SP360, is in place across its global operations. The SPMS supports locations to undertake effective engagement with communities, manage their social risks and maintain Alcoa's Social License to Operate.

• Alcoa's Closure Planning group for Darling Range (located within the Global Planning Team) is responsible for developing the closure planning process as well as the subsequent Long-Term Mine Closure Plans (LTMCPs) of Alcoa's WA Mining Operations (Huntly and Willowdale).

• The current 2023-2027 MMP aims to establish, and return to the State, a self-sustaining Jarrah Forest ecosystem, that meets the agreed forest values that will support similar management practices as that employed in the surrounding Northern Jarrah Forest.



23.0 Recommendations

23.1 Geology and Mineral Resources

It is apparent to the QP that the long history of exploration, development and mining of Alcoa's Darling Range bauxite tenements have established sound knowledge and understanding of the geology and mineral endowment. The QP has not identified any fatal flaws in the current practices of mapping (based on the ArcGIS system), drill sampling (based on progressive continuous improvement), assaying (based on calibrated and validated FTIR, with reasonable quality control), estimation (3D Block Model - 3DBM), database management (using acQuire), the application of mining criteria that assure RPEE, and the application of constraints establishing forestry, heritage and noise limits to the Mineral Resource definition. The following recommendations are offered as suggestions for further improvement, aligned with Alcoa's comprehensive approach to research and development (seen for example in the evolution of their drilling, sampling and assaying technologies). These recommendations are prioritized in terms of their perceived value to the overall operation, but are not expected to add cost:

- Continuing to replace the gridded seam model (GSM) and polygonal areas to the 3D block modelling methodology, using a script-based semi-automated approach, which enables more robust rapid model building. The validation of interpolation parameters using risk-based (conditional simulation) techniques to quantify confidence should be considered.
- To improve the reporting of recoverable resources, a re-blocked block model to a minimum practical mining scale or single mining unit (SMU) should be considered. Economical parameters considering more flexible costs and bauxite prices related to the Mineral Reserves can also be implemented in the Mineral Resources workflow, aiming to optimize the bauxite mineable portion including potential marginal grades.
- Investigate whether the 5% bias in the tonnage between the As Mined and sampling tower weightometers is persistent in the 3D block models.
- Further redrilling or where viable re-assaying of pulps.
- Continue implementing the reconciliation system to understand and adjust differences in density and reactive silica, as well as to track the monthly performance of geological models with the refinery.
- To include volume surveys using drones and truck gantry scanning, wet mass measurement using weightometers on conveyors and LoadRite sensors on mining equipment, and infra-red moisture determination, meaning that better in situ dry density estimation may become possible if the operation requires it for better refinery feedstock control.
- The QP considers that twinned hole studies are of limited value and should only be implemented once the sample splitting and preparation demonstrates good repeatability, using field duplicates (or the equivalent sample to extinction (STE) samples). They may be of value to investigate specific issues under closely supervised conditions.
- While the STE procedure could be retained for specific studies, in the QP's opinion, the reintroduction of field duplicates using appropriate riffle splitters under supervision should be considered.
- The QP is of the opinion that the grade characteristics of the bauxite profile could be reproduced in the model, which enables optimization techniques to be used for the definition of mining floors and boundaries, better support for ore loss and dilution studies, and more accurate reconciliation studies.

23.2 Mining and Mineral Reserves

- Currently a historical dilution and mining recovery factor is applied to the final Reserves to reconcile the tonnes and grade. The QP recommends applying dilution and ore loss at the re-blocked model level before performing the optimization and reporting these values independently.
- A reconciliation system should be implemented to allow the comparison of mined tonnes to the predicted tonnes of the geological model. This system would assist in defining dilution and losses related to modifying factors. Alcoa has been actively developing this reconciliation system during 2024 with an intention to implementation for 2025.
- As recommended from 2023, a mine planning schedule (LTMP) has been developed providing a strategic schedule over nine years which incorporates a tactical schedule over the first 3 years. However, currently Reserves would provide an additional 3 years of mine scheduling which would benefit cashflow modelling. Completing a strategic mine schedule for the total Reserve would allow impacts from sequencing of later Capital costs to be modelled appropriately. The view of the QP is that the unscheduled Reserve ore tonnes should be added to the LTMP.
- The QP recommends that a defined Process Acceptance Criteria is provided with specifications on upper and lower limits for all key process constraints.
- The QP recommends detailed haulage analysis is provided focusing on haulage profiles and cycle times, this process will provide more accurate forecasting of operating costs. It is noted during the 2024 visit that Alcoa are currently developing workflows for simulation software.
- Capital costs for the Myara North and Holyoake mine moves were in the process of being developed to FEL 3 classification. These costs should be reviewed during the next update.

23.3 Mineral Processing

The historical operational data for the Darling Range demonstrates that ore consistently met refinery specifications.

- Ideally, independent verification of sample analysis is conducted, by a certified laboratory, on a structured program, to ensure the QA/QC aspects of the internal analysis. Within this process a proportion of samples from each batch could be sent to the independent laboratory for analysis and the results can be compared with the internal analysis.
- The QP is appreciative that the mine is operational, meaning a trade-off versus logistics / practicality would need to be carried out.

23.4 Infrastructure

The Darling Range mining operations have well established infrastructure, with mining hubs that are periodically moved to reduce transportation distances between mining operations and the hubs. The QP makes no recommendations regarding infrastructure.

23.5 Environment

Alcoa has established systems to facilitate adherence to environmental commitments and has made progress with modernizing environmental approvals and permits for Huntly, Willowdale and the future mining areas at Holyoake and Myara North. The QP recommends that the following action is taken:

- Continued close engagement with EPA, DCCEEW and BSEC (previously MMPLG) to best enable a prompt resolution to approval and permitting process to minimize impacts to the Reserve estimate into the future.
- Continued compliance with all approval and permit requirements. Compliance with the conditions associated with the *Alcoa Transitional Approvals Framework* exemption is critical as the State Government reserves the right to, with reasonable notice, withdraw or amend the exemption at any point.
- Alcoa began installing groundwater monitoring bores in 2022 to facilitate assessment of groundwater levels and water quality in proposed mining areas. The boreholes are installed prior to mining to understand the baseline site conditions and interim groundwater levels and inform pit design and to understand the recharge from precipitation in the long term and to assess the groundwater response before, after and during mining operations. Preliminary results and how those results have informed changes to pit design should be reported in the next TRS.
- Close-out the Auditor-compliant contaminated sites process related to the identification of low levels of PFAS and AFFF on site.

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25.0 Reliance on Information Provided by the Registrant

This report has been prepared by SLR for Alcoa. The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to SLR at the time of preparation of this report,
- Assumptions, conditions, and qualifications as set forth in this report, and
- Data, reports, and other information supplied by Alcoa and other third party sources.

For the purpose of this report (namely Section 1.3.3), SLR has relied on ownership information provided by Alcoa in a legal opinion by Paul Volich, Managing Counsel – Australia, dated 22 January 2025, entitled Technical Report Summary on the Darling Range, Western Australia S-K 1300 Report for Alcoa Corporation – that ML1SA in good standing. SLR has not researched property title or mineral rights for the Darling Range as we consider it reasonable to rely on Alcoa's legal counsel who is responsible for maintaining this information.

SLR has relied on Alcoa for guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from Darling Range in the Executive Summary and Sections 18.0 and 19.0. As Darling Range has been in operation for over ten years, Alcoa has considerable experience in this area.

The Qualified Persons have taken all appropriate steps, in their professional opinion, to ensure that the above information from Alcoa is sound.

Except for the purposes legislated under applicable securities laws, any use of this report by any third party is at that party's sole risk.



26.0 Date and Signature Page

This report titled “Technical Report Summary on the Darling Range, Western Australia, S-K 1300 Report” with an effective date of December 31, 2024 was prepared and signed by:

SLR International Corporation



John R. Walker FGS, FIMMM, QMR
Technical Director, Mining Advisory Europe

Dated in UK

Signature Date: 20 February 2025