Planning Report

Proposed BDRA Raise at Aughinish East, Aughinish West, Island Mac Teige, Glenbane West, and Fawnamore at or adjacent to Aughinish Island, Askeaton, Co. Limerick

PREPARED FOR:
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1.0 INTRODUCTION

1.1 Application for Planning Permission

Aughinish Alumina Ltd.[1] ('AAL') has retained Tom Phillips + Associates[2] ('TPA'; Planning Consultants) to apply to An Bord Pleanala (ABP) for development at an existing alumina facility located in the townlands of Aughinish East, Aughinish West, Island Mac Teige, Glenbane West, and Fawnamore at or adjacent to Aughinish Island, Askeaton, Co. Limerick.

The alumina facility is operated in accordance with the Conditions of the Industrial Emissions Licence (IEL) P0035-07 issued by the Environmental Protection Agency (EPA).

Figure 1.1: Aerial view of the site and its surrounding context (source: www.myplan.ie 2021, Annotated by TPA).

The lands subject to this current application measure c. 222 ha and currently accommodate processes associated with the operation of the adjoining refinery plant located to the north west of the subject site. The overall landholding of the Applicant including the subject site, the refinery plant, and ancillary areas extends to c. 601 ha.

The proposed development relates to works which will facilitate an expansion of capacity within the existing disposal areas accommodating residues arising from the adjoining alumina refinery facility. Proposed works also include an extension to the permitted borrow pit on the subject site providing for an additional 380,000 m^3 of rock fill material which is needed to satisfy the requirements of the construction and operation of the BRDA. Additional works include the use of portions of the site to accommodate rock and soil stockpiles and upgrades to the existing water infrastructure.

The proposed development is described in further detail in Section 3.0 of this report and also within the enclosed Environmental Impact Assessment Report.

[1] Aughinish Island, Askeaton, Co. Limerick.
[2] 80 Harcourt Street, Dublin 2.

1.2 Need for Proposed Development

The existing alumina refinery at Aughinish is the largest of its kind in Europe and is thus of strategic national and continental importance. Aluminium, which is ultimately produced from alumina, is of increasing importance as economies transition towards a low carbon future. The metal's light-weight nature, corrosion resistant qualities, and recyclability are all characteristics which have resulted in its application in renewable technologies such as solar photovoltaic (PV) panels and electric vehicles.

The production of alumina is thus critical to facilitating the production of renewable technologies and thereby ensuring that a low carbon and green economy centred on renewable energy production and electric transport modes can be delivered.

Alumina plants are capital intensive because of the nature and size of equipment employed in the process of refining bauxite. Such major start-up capital investments invariably present significant challenges for development at new greenfield locations. As a result, the efficient operation and expansion of existing facilities is of critical importance in ensuring that alumina supply is maintained to satisfy worldwide demand.

The maximum production level permitted at the refinery plant is and will remain at c.1.95 million tonnes of alumina per annum. This represents 30% of that alumina produced in Europe. In order to protect such production levels, future disposal capacity for bauxite residue is required. This application seeks to ensure that such disposal capacity is appropriately accommodated on site to secure the continued operation of the alumina facility.

1.3 The Applicant

Aughinish Alumina Limited (the Applicant) operates a long-established alumina refinery, located on Aughinish Island on the southern side of the Shannon Estuary near the industrial port of Foynes, Co. Limerick. The landholding extends to c. 601 ha.

The industrial activity undertaken at the site comprises the processing of bauxite in order to extract alumina (aluminium oxide) which is required for the production of aluminium as well as having a number of other industrial uses. The bauxite, which is transported by ship from South America and West Africa, is unloaded at a dedicated Marine Terminal located in the Shannon Estuary, and transferred by enclosed conveyor to the plant, where the bauxite is refined to produce alumina, an operation known as the 'Bayer Process'.

The 'Bayer Process' results in the production of alumina and a bauxite residue, which is deposited in the Bauxite Residue Disposal Area ('BRDA'). The alumina refinery is permitted[3] to produce up to 1.95 million tonnes of alumina per annum, which is exported to smelters where it is used to produce aluminium.

The alumina refinery commenced operations in 1983, and has been the subject of considerable expansion and investment over the intervening years. The plant is now one of the most efficient alumina refineries in the World, and the state-of-the-art facilities provide

[3] Planning Permission Reg. Ref. 05/1836 (ABP Ref. PL13.217976) refers.

a total of c. 482 jobs directly plus 385 maintenance and installation contractor employees, and considerable further employment for local service industries.

Aughinish Alumina Ltd is owned by RUSAL, a leading aluminium producer, with interests throughout the aluminium production process – from bauxite ore mines to alumina extraction plants to aluminium smelters.

1.4 Pre-Application Consultation

A consultation meeting took place with An Bord Pleanála on 19th February 2021 in order to determine whether the proposed development, as summarised in Section 1.1, constitutes strategic infrastructure and falls within the criteria set out in section 37(A)(2) of the Planning and Development Acts, 2000 (as amended).

Further to this consultation meeting, the Board subsequently decided, by letter dated 1st April 2021, that it is of the opinion that the proposed development falls within the scope of paragraphs 37A(2)(a) and (b) of the Acts, that the development would be strategic infrastructure and that any application for permission for the proposed development should therefore be made directly to An Bord Pleanála, as a Strategic Infrastructure Development (SID) under Section 37E of the Acts.

In accordance with this determination, the subject application (including an EIAR) is submitted to An Bord Pleanála under section 37E of the Planning and Development Acts, 2000 (as amended).

1.5 Environmental Impact Assessment Report (EIAR)

The proposed development is covered by the following classes of development in the EIA Directive.

- Schedule 5, Part 2 Class 11(b) of the *Planning and Development Regulations, 2001 (as amended),* an EIAR is a mandatory requirement for *"Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule".* The proposal seeks the disposal of c. 1.57 million tonnes of bauxite residue per annum which would exceed this threshold.

- Schedule 5, Part 2, 2(b) of the *Planning and Development Regulations, 2001 (as amended),* an EIAR is a mandatory requirement for the "*Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares".* The proposal seeks to extend the permitted borrow pit by c. 3.9 hectares which would create an overall borrow put of c. 8.4 hectares and thus exceed the threshold.

As noted in Section 1.4 of this report, consultation was undertaken with An Bord Pleanála in respect of the proposed development and correspondence was subsequently issued by the Board confirming that the development fell within the scope of paragraphs 37A(2) of the Acts and thus constituted Strategic Infrastructure Development. As such, the subject application is a SID application submitted directly to the Board and must therefore be accompanied by an EIAR.

A core objective of the enclosed EIAR is to provide the appropriate information and evaluation of the proposed development, having regard to the specific characteristics of the development, the scale of the development and the potential for significant effects arising from the development.

2.0 SITE LOCATION AND CONTEXT

2.1 Location of the Subject Site

Aughinish Alumina Limited (the Applicant) operates a long-established alumina refinery, located on Aughinish Island on the southern side of the Shannon Estuary near the industrial port of Foynes, Co. Limerick. The AAL facility is located c. 6 km north-west of Askeaton and c. 30 km west of Limerick City Centre.

Figure 2.1: Site Context Map with subject site highlighted in red (source: www.myplan.ie 2021, Annotated by TPA).

The Limerick – Foynes railway line (closed in 2002) runs to the south of the island, as does the N69 National Secondary Route between Limerick and Tarbert. Aughinish Island is accessed via the L1234 Aughinish Road, which is a two-way local road which connects with the N69.

The application site is located at the western and south western portions of the Applicant's overall landholding at Aughinish Island. The application site is bounded by grassland and vegetation to the north, beyond which lies the Shannon Estuary.

The refinery plant is located to the north east of the subject site with AAL Sports Complex, a Limerick City and County Council (LCCC) water treatment plant and main site access road all located to the east of the subject site.

The western boundary of the subject site runs parallel with the Robertstown River, the edge of which is defined by an existing flood tidal defence berm (FTDB) and drainage channel.

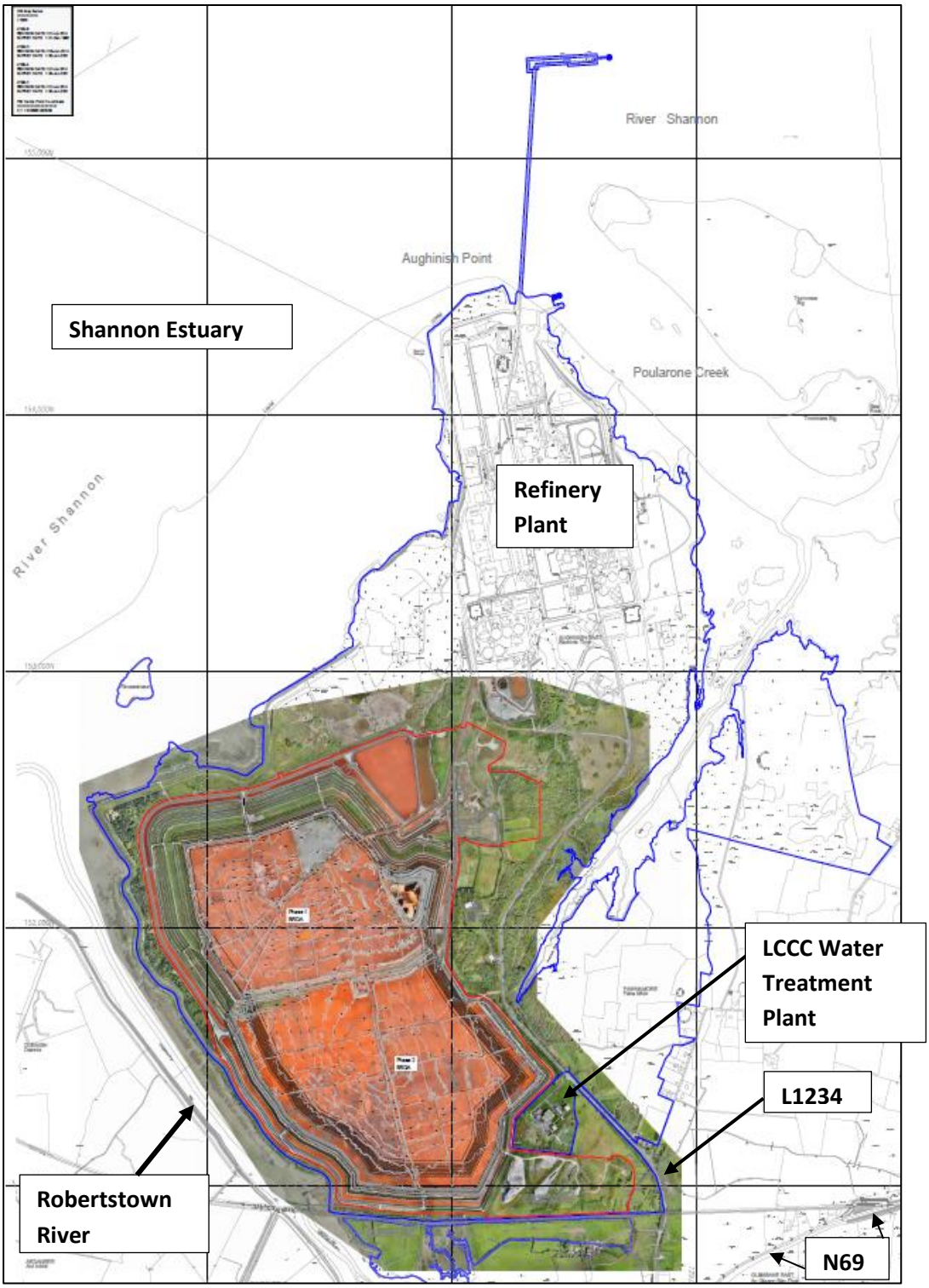


Figure 2.2: Aerial View of Subject Site and Wider AAL Facility (Source: Golder, 2021).

2.2 Processes Undertaken at Alumina Refinery Plant and Existing BRDA

The AAL facility, including the subject site area, operates in accordance with the Conditions of the Industrial Emissions Licence (IEL) P0035-07 issued by the Environmental Protection Agency (EPA).

At the refinery plant, alumina (also known as aluminium oxide) is extracted from bauxite raw material. The facility was principally constructed between 1978 and 1983. Plant production has been continually increased since the commissioning of the plant in 1983 up to its current maximum production of approximately 1.95 million tonnes of alumina per annum.

Bauxite, the raw material processed within the refinery plant, is a naturally dark red coloured earth which gets its colour from its iron content. It is imported by ship to the facility in bulk ore carriers from bauxite mines primarily located in West Africa and Brazil. The bauxite is then unloaded at the dedicated AAL marine terminal on the Shannon Estuary.

2.2.1 'Bayer Process'

Once the bauxite is received on site, the alumina is then extracted via what is known as the 'Bayer Process'. This five-step process is outlined below.

1. **Preparation:** The bauxite ore is crushed, ground and mixed with caustic soda solution and then pumped into digester pressure vessels.

2. **Digestion:** Under high pressure and heat, the alumina (within the bauxite slurry) is dissolved by and combines with the caustic soda to produce sodium aluminate.

3. **Clarification:** The solid residues (bauxite residue and process sand) in the digested bauxite slurry are separated by settling out of the sodium aluminate solution. The residues are then washed, and the bauxite residue is thickened by vacuum filtration and pumped to what is known as the Bauxite Residue Disposal Area (BRDA).

4. **Precipitation:** As the soluble sodium aluminate is cooled, it is agitated and seeded with aluminium hydroxide crystals. These form larger aluminium hydroxide crystals which gradually settle out of solution. Seed crystals and sodium aluminate remaining in solution are recirculated.

5. **Calcination:** The aluminium hydroxide crystals are calcined at over 1100 degrees Celsius to remove the water of crystallisation. A fine white powder, alumina (aluminium oxide), is produced and this product is exported by ship to overseas smelters.

2.2.2 Bauxite Residue Disposal Area (BRDA)

Bauxite residue from the above described process is pumped as a thickened residue to what is known as the Bauxite Residue Disposal Area (BRDA). Figure 2.3 outlines the location of this BRDA within the overall AAL facility. The bauxite residue can be directed into selected areas of the BRDA by valve operated piped discharge points. The bauxite residue is deposited to facilitate drying.

The placement and direction of movement of the bauxite residue is influenced by the level and distribution of the previously deposited material and position of residue berms.

As the bauxite residue dries, its moisture content and volume decreases while its density increases. The maturing of the bauxite residue is achieved by the following principal methods;

- Compaction of the residue by mechanical plant principally a series of amphirols and low ground pressure excavators
- Air drying of the surface of the bauxite residue by evaporation
- Consolidation of the bauxite residue under its own weight

Compaction of the residue by mechanical plant achieves the largest increase in density over a short period of time. Air drying by evaporation is the most important process in drying the bauxite residue and improving undrained shear strength. Self-weight consolidation of the residue achieves long term increases in density and strength.

The process sand, arising from the Bayer process, is transported from the plant by truck and is used to construct ramps and access roads within the BRDA. Other residues of the production process include salt cake, lime grits and process waste, which are deposited in the BRDA. The salt cake is stored within a separate specially engineered cell located within the BRDA (discussed further in Section 2.2.2.5.

Figure 2.3: Aerial View of part of Aughinish Alumina Site – BRDA (source: Golder Associates).

2.2.2.1 Characteristics of the Residue Deposits

As noted in Section 2.2.2 above, the residues deposited in the existing BRDA and those proposed to be deposited in the expanded BRDA include bauxite residue and salt cake.

Bauxite Residue

The farmed bauxite residue is classified as a solid non-hazardous material. There are 5 predominant compounds measured (Moisture, Aluminium Goethite, Hematite, Calcium Cancrinite, Bayer Sodalite) amounting to 75% of the overall content. A detailed description of all compounds identified in the bauxite residue and the classification of each is provided in Chapter 7 of the submitted EIAR.

Mineral raw materials such as bauxite exhibit natural radioactivity slightly above the average level in the earth's crust. In bauxite, both thorium 232 and uranium 238 are present in measurable amounts. Material such as this is termed naturally occurring radioactive material (NORM).

The Radiological Protection Institute of Ireland (RPII) (merged into the EPA in 2014) is the competent Authority in Ireland with regulatory, monitoring and advisory responsibilities in matters pertaining to ionising radiation and radioactive contamination in the environment.

The RPII surveyed the Aughinish site and assessed the facility, raw materials (bauxite) and wastes (bauxite residue, process scales and effluent) for NORM properties. The RPII (2008) concluded that the (low) levels of NORM are in compliance with safe levels set out in S.I. No. 125/2000: Radiological Protection Act, 1991 (Ionising Radiation) Order, 2000 and are below the threshold at which the facility would come within the scope of the above Regulations. As such, the BRDA does not present a radiation hazard to either site operatives, visitors or the surrounding environment. Additional detail in this regard can be found in Chapter 8 of the submitted EIAR.

Salt Cake

The salt cake is classified as hazardous according to the European Waste Catalogue, it is therefore deposited within a specially engineered cell (Salt Cake Disposal Cell, "SCDC") within the BRDA.

The salt cake deposits consist of the organic degradation produced from naturally occurring humates in the bauxite.

2.2.2.2 Development of Existing BRDA

The existing BRDA at the subject site was constructed in three phases and comprises two disposal areas which are currently merging (see Figure 2.3). The combined total size of these areas is 184ha.

- The Phase 1 BRDA is formed from two areas, the original Phase 1 BRDA constructed in the early 1980s, covering an area of 72 ha., and the Phase 1 BRDA extension, constructed in the mid-to-late 1990s, covering an area of 32 ha. The initial design for the Phase 1 BRDA was to provide a disposal area to the year 2009 based on the BRDA constructed to Stage 7 (elevation 18m OD), which equates to a central dome elevation of 27.5m OD or 26m above original ground level.
- The Phase 2 BRDA is a southern extension of the Phase 1 BRDA that was permitted in 2007 (*Limerick County Council Reg. Ref. 05/1836; ABP Ref. PL13.217976*) to Stage 10 with a maximum perimeter elevation of 24m OD and a maximum central elevation of 32m OD. The Phase 2 BRDA merges with the southern extent of the Phase 1 BRDA. The Phase 2 BRDA covers an area of approximately 80 ha. and was commissioned in 2011.
- The permitted BRDA provides a disposal area for Bauxite at the facility until c. 2030. The current level of the BRDA residue varies, from 22m OD to 32m OD in Phase 1 and from 11m OD to 20m OD in Phase 2.

2.2.2.3 BRDA Structure

As noted above in Section 2.2.2.2, the BRDA is comprised of two disposal areas – Phase 1 to the north and Phase 2 to the south. The perimeter structure of the existing/permitted BRDA is shown in Figure 2.4, below. This demonstrates that the structure is characterised by external perimeter walls within which the bauxite residue is stored in a terraced nature known as stage raises.

The BRDA is surrounded by composite lined Perimeter Interceptor Channels (PIC) which are formed by constructing the Inner Perimeter Wall (IPW) and the Outer Perimeter Wall (OPW).

The OPW is constructed of either till or rock fill and is composite lined on the upstream slope to form the PIC. The downstream slope has been overlain with a wire mesh gabion mattress for the northern and western extents of the Phase 1 BRDA. The IPW is constructed of permeable rock fill and provides the starter dam for the BRDA.

The lining system for the BRDA basin is a mixture of natural and geosynthetic materials which have very low hydraulic conductivity. These lining systems provide the short-term containment as the BRDA basin is filled, the depth of deposited bauxite residue is increased, and consolidation occurs.

Once a sufficient depth of bauxite residue has been deposited above the basal lining system, then the bauxite residue itself becomes the controlling containment and long-term containment, owing to the following characteristics:

- Bauxite residue has a low hydraulic conductivity
- Bauxite residue is farmed, and the consolidation benefits are achieved directly.
- No free water is stored on the BRDA.

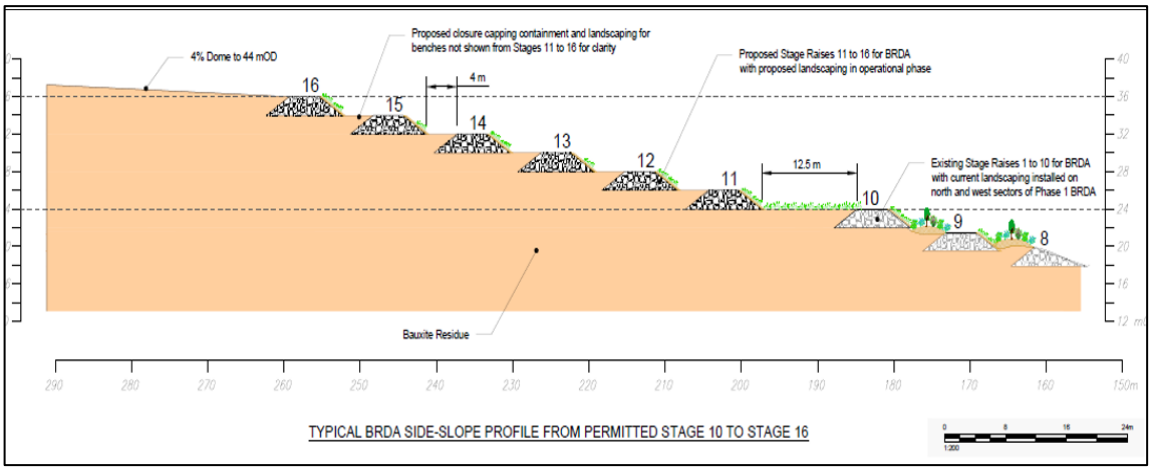


Figure 2.4: Typical BRDA Side-Slope Profile from Permitted Stage 10 to Stage 16

Permitted Drainage Arrangement

The BRDA is surrounded by the Perimeter Interceptor Channel (PIC) which collects water emerging from the BRDA (seepage, bleed water, sprinkler water and surface water runoff) and conveys it via pumps either to the Effluent Clarification System (ECS) located in the plant and/or to the Storm Water Pond (SWP).

The SWP is located in the north-east sector of the BRDA and its function is two-fold:

- To provide surge capacity for excess surface water prior to processing by the ECS; and
- To provide a continuous flow of water that is used for dilution or wash water within some parts of the processing plant.

Excess water from the SWP is pumped to the ECS via pumps. The SWP does not currently have an overflow spillway (during operation) but will be breached during the closure works for the post-closure period. Please refer to Chapter 10 of the submitted EIAR for further detail.

The Liquid Waste Pond (LWP) is located adjacent to the SWP and receives treated water from the ECS and conditions this water (cooling and settlement) prior to discharging or re-use in the refinery.

Distribution of Bauxite Deposits

There are two discharge platforms located centrally in the Phase 1 and Phase 2 BRDA areas. These discharge platforms with valve manifold installation feed a network distribution of fixed piped spigot points called mud points (MPs) for residue deposition within controlled cells in layers sloped away from the discharge point for layered residue deposition. The cells have perimeter berms constructed from rock to a height of 2m.

Currently, there are 17 No. mud points in the BRDA with 9 number located in the Phase 1 BRDA and 8 number located in the Phase 2 BRDA. The distribution network for the discharge platforms and the MPs were installed at the base of the BRDA when the basin was constructed, and the MPs are raised vertically corresponding to the increase in height of the BRDA.

The deposited bauxite residue is farmed to enhance drying of the residue, promote densification and to enhance exposure of the residue to the atmospheric carbon dioxide to reduce the liquid phase alkalinity. The farmed bauxite residue is tested to achieve a pH < 11.5 and is subsequently graded and compacted in preparation for the next deposition layer.

The BRDA surface is managed via a system of sprinklers which cover the entire exposed bauxite residue surface on an approximately a 75m x 75m grid. Sprinkling of the Bauxite Residue surface is considered a Best Available Technique (BAT), as identified by the European Commission. The sprinkler guns rotate and distributes water up to 50m radius such that adjacent points in the grid form overlapping radii (max. 25m) to provide complete coverage.

During extended dry periods, the LWP provides a buffer storage for the sprinkler system. The sprinkler operational patterns and duration are decided daily based on an assessment of the

weather forecasts and programmed by the BRDA Operations Department. In full operation, the sprinkler system can discharge at a rate of 650 to 750 m^3 / hour.

The Perimeter Access Road and internal road and ramps in the BRDA are maintained using road sweepers and dust suppression is achieved using tractor towed water bowsers.

Cell Layout

The current layout of layered deposition cells for the Phase 1 BRDA (Cells 1 to 24) and Phase 2 BRDA (Cells 26 to 46) is shown in Figure 2.5. Residue farming within the cells allows for the reduction of the pH to < 11.5 and for the increase in the density and strength parameters of the deposited bauxite residue layer. Areas for deposition are partitioned by up to 3m high berms of farmed bauxite residue formed using a dozer. Two layers are deposited in each cell annually, after which the cell bunds are then re-formed from farmed bauxite residue using a dozer.

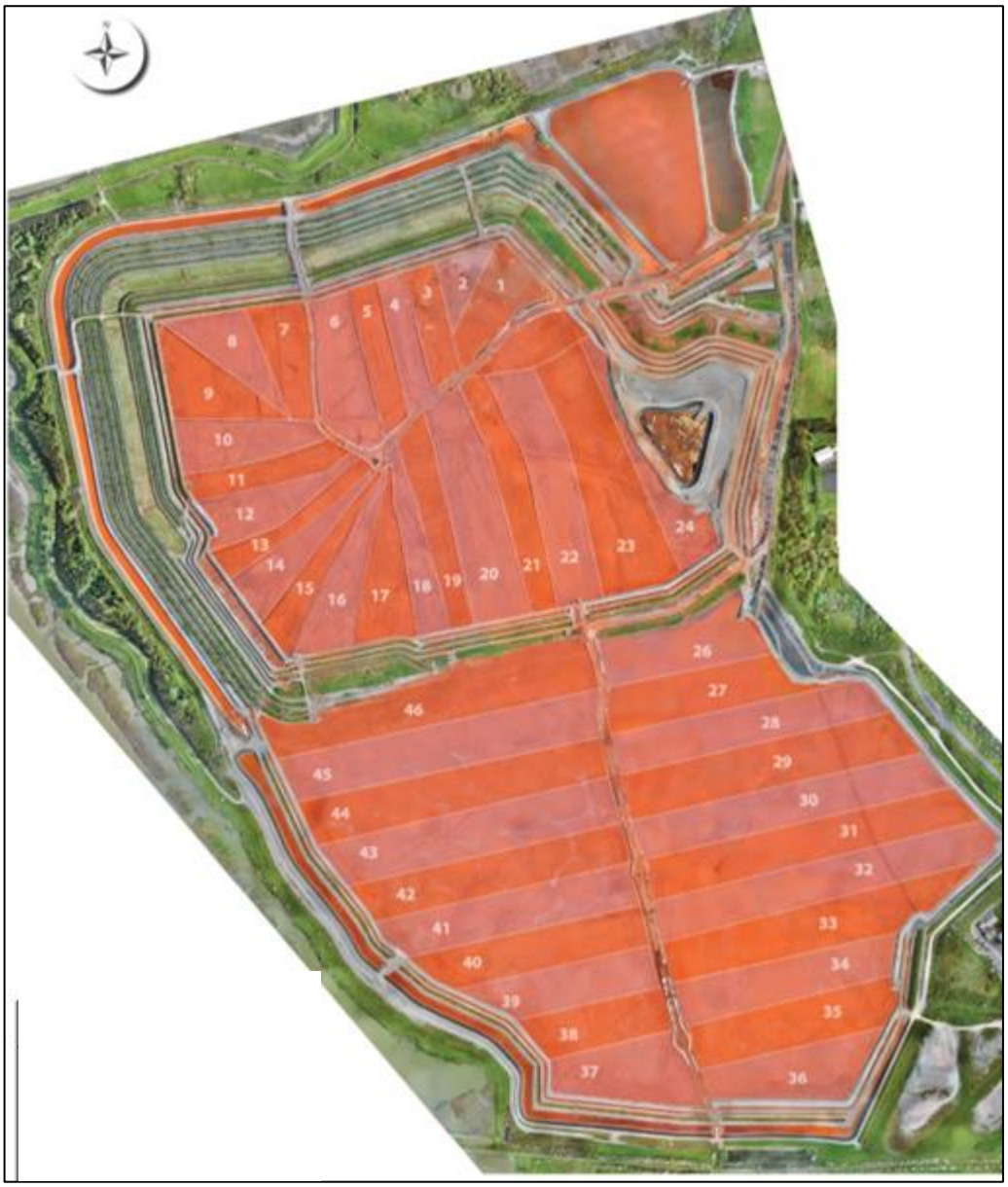


Figure 2.5: BRDA Layered Deposition Cell Layout (Source: Golder, 2021).

BRDA Raise

The approximate rate of rise of the BRDA was 12m in 14 years (0.86m / year from 2005 to 2019) for the Phase 1 BRDA and 14m in 14 years (1.00m / year from 2005 to 2019) for the Phase 1 BRDA Extension. This represents a reduction in the pre-2005 rate of the raising of the Phase 1 BRDA that can be attributed to the additional footprint provided by the Phase 2 BRDA since 2011.

The majority of bauxite residue is being placed within the Phase 2 BRDA in recent years (80% in 2018 and 82.5% in 2019), the rate of rise in the Phase 2 BRDA has been slightly greater than the Phase 1 BRDA with an average depth of 14m placed alongside the centre of the North-South Road during the 10 years of operation (1.75 m / year). An average depth of 10m has been placed at the perimeters (east, west and south) during the 10 years of operation (1.0m / year).

Raising of the Existing BRDA

The BRDA is progressively raised by the upstream method, identified by the European Commission as the 'Best Available Technique'[4]. The upstream method involves constructing a permeable rock fill berm (stage raise) at the perimeter which is founded on the previously deposited and farmed bauxite residue. The stage raises are constructed in 2m vertical lifts (4m crest width, side-slopes of 1.5(H):1(V) and typically offset from inner crest to starting toe by a 4m wide bench), thus forming a supporting face to the overall structure, whilst also allowing drainage.

Unlike other tailings facilities or water retaining dams, the BRDA retains little to no surface water on the surface. The bauxite residue is discharged as a thickened slurry from several near central discharge points and migrates to the perimeter stage raises to form a dome which typically has the apex some 6m to 8m above the perimeter stage raise elevation. The slope produced averages grades between 2 % and 4 %. As noted above in Section 2.2.2.2, the permitted final elevation of the perimeter BRDA wall is 24m OD at the final stage, Stage 10, and the highest elevation of the BRDA for the dome is 32m OD.

A collection drain has been formed in the bench of the uppermost stage raise to collect seepage and runoff and divert the waters towards a piped drainage system (300mm and 450mm OD twin-walled HDPE pipes at max. 100m centres) leading directly to the PIC. This system allows for the progressive restoration of lower benches as the BRDA increases in height by eliminating the trickle down of the alkaline water over vegetation.

Downstream side slope restoration, comprising side-slope drainage and planting berms, was completed during 2013 along the northern and western sectors of the Phase 1 BRDA from Stage 1 to Stage 8. Interim side-slope restoration, comprising drainage between toe drains of stage raises and hydroseeding of the upstream faces of the stage raises, is ongoing, and has been completed along the northern and western sectors of Phase 1 BRDA to Stage 10 and along the western flanks of the Phase 2 BRDA to Stage 3.

[4] Best Available Techniques (BAT) Reference Document for the Management of Waste from Extractive Industries in accordance with Directive 2006/21/EC (European Commission, 2018)

2.2.2.4 Current Status of BRDA

AAL have successfully raised the Phase 1 BRDA to Stage 10 along the east, north-east and north-west sectors and also are currently constructing the south-west and south sectors to Stage 10. The elevation of bauxite residue deposited varies from approx. 32m OD at the centre to approx. 22m OD to 24m OD at the perimeter stage raises.

For the Phase 2 BRDA, AAL have constructed to Stage 4 (12m OD) along the west and south boundaries. Bauxite residue has been placed to approx. 11m OD along the east perimeter wall, which will subsequently form the base of the internal perimeter interceptor channel (PIC) along this extent. The crest of east perimeter wall currently varies in elevation from Stage 6 (16m OD) to Stage 4 (12m OD) from its north-eastern extent to its eastern extent and transitions into the external PIC at the Observation Area located centrally on the east perimeter wall. The elevation of the bauxite residue deposited varies from approx. 20mOD centrally along the internal access road (north-south road), splitting the Phase 2 BRDA into east and west sectors. The elevation of bauxite residue at the east, south and west perimeter stages raises is at approx. 11m OD.

The Phase 1 and Phase 2 BRDAs are being progressively merged, with the Phase 2 BRDA overlapping on the upstream raises on the south face of the Phase 1 BRDA to a current elevation of approx. 15m OD.

The current average rate of production of bauxite residue is c.1.57 million tonnes / year (dependent on grade of ore) and is deposited at a characteristic dry density 1.63 tonnes / m^3, following mud-farming activities. The planned rate of void consumption is 0.9 to 1 million m^3 / year for bauxite residue and approx. 35,000 m^3 / year for rock fill.

2.2.2.5 Salt Cake Disposal Cell

Salt cake is classified as a hazardous waste that is required to be segregated from the other BRDA deposits.

As such, a dedicated Salt Cake Disposal Cell (SCDC) is located to the east of the main Phase 1 BRDA area. This SCDC is an independent, composite lined cell with a triangular shape characterised by north, east and west dam walls. The permitted maximum height of the SCDC is 29m OD at crest level.

The SCDC is accessed from the central access ramp to the Phase 1 BRDA, via a turn-off to the south onto the access ramp leading to a turning point, which is at the crest elevation of the cell. The salt cake is produced in the adjoining refinery plant and hauled to the SCDC in dumpers, where it is tipped into the cell at designated 'Tipping Points'. The west dam wall is the 'Tipping Wall' and has a width of 23.5m. The north and east dam walls measure 8.0m in width and they provide through access around the crest of the cell and to a Decant Tower.

The total storage volume of the SCDC is estimated to be 72,800m^3 at the crest level (29m OD). The current cell capacity is expected to expire during 2023.

AAL has developed, in conjunction with a number of laboratories and technology suppliers, a process modification to avoid the production of saltcake from its facility. The research at AAL identified that the most suitable way of modifying the process was to install a Wet Air

Oxidation (WAO) system within the refinery (located outside of the subject site). WAO was chosen because it was a mature technology with hundreds of installations worldwide which allows the oxidation products to be recovered to the refinery without any gaseous, liquid or solid emissions. The WAO will be fully integrated into the alumina production process, operate continuously and allow recovery of the process stream.

In summary this process involves oxidizing the saltcake with dissolved oxygen at an elevated temperature and will be used as a method of treatment for saltcake. There are no environmental emissions associated with this process and it is fully compliant with all relevant EPA 'Best Available Technique' (BAT) Guidance Notes. A detailed project schedule has been developed with commissioning to be completed by 2023

Further detail regarding the SCDC can be found in Section 6.13 of the Engineering Design Report, prepared by Golder (Appendix A of EIAR).

2.3 Description of the Subject Site

The lands subject to this current application are located to the west and south west of the overall AAL facility. The subject site measures c. 222 ha and comprises three main elements - the BRDA area (including ancillary elements and SCDC) which itself comprises c.184ha, the Borrow Pit area and the Stockpile area (see Figure 2.6). Access to the subject site is provided from the existing access infrastructure associated with the wider facility.

Figure 2.6: Aerial View of the Subject Site (Source: Golder, 2021 – Cropped and Annotated by Tom Phillips + Associates).

2.3.1 BRDA (Including SCDC)

As noted above in Section 2.2, the BRDA comprises the majority of the subject site area. The Phase 1 BRDA area, located at the north of the application site measures c.104ha. The Phase 2 BRDA area, located at the south of the subject site measures c.80ha.

As outlined in earlier sections of this Planning Report, the BRDA areas are principally comprised of perimeter walls and channels enclosing a basin of bauxite residue which is stored in a terraced form structure comprising 10 no. permitted terraces known as stage raises. Deposits within the phase 1 area are at the stage 10 level, whilst deposits within the

Phase 2 area, which has been in operation for a shorter time period is deposited at stage levels 4.

Ancillary infrastructure located within the BRDA area includes a Salt Cake Disposal Cell, located at the east of the phase 1 area and a Storm Water Pond (SWP) and Liquid Waste Pond located to the north east of the phase 1 BRDA area.

2.3.2 Borrow Pit Area

The permitted borrow pit area is located at the north east of the application site and its extraction area is c.4.5ha in size (LCCC Reg. Ref. 17/714; ABP Ref. 301011-18). It will serve the construction and operation of the permitted BRDA by providing processed rock which is required to build up the stage raises before residue is deposited and then contained by the rock-fill.

The permitted borrow pit area has a depth of c.8.5m OD. Rock extraction and the initial blasts at this borrow pit are expected to take place during April 2022. The permitted borrow pit area is expected to provide 375,000 m^3 of rock fill material which is considered to be sufficient to construct the existing BRDA to Stage 10 (220,000 m^3), to implement the closure design (105,000 m^3) and miscellaneous rock fill (50,000 m^3).

Adjacent to the permitted borrow pit area to the east is an area which is currently covered in vegetation. It is proposed that the borrow pit will extend eastwards into this area to facilitate the expansion and raising of the BRDA. Details in this regard are provided in Chapter 3 of the submitted EIAR. The total extraction area of this planned extension to the borrow pit amounts to c.3.9ha.

2.3.3 Stockpile Area

A stockpile area is located at the south east of the application site. This area measures c.12.5ha. The area currently accommodates rock and topsoil which is used to construct and progressively restore the BRDA. In addition, portions of the area are covered in vegetation at present.

3.0 PLANNING HISTORY

The Aughinish Alumina Ltd. facility has an extensive planning history typical of such long-established large-scale industrial facilities. The 'parent' permission for the plant dates from 1974, and in the 38 years since the plant was opened in 1983, a considerable number of planning applications have been made.

A Table setting out the planning history of Aughinish Alumina is included in Appendix 1.

4.0 PLANNING CONTEXT OF THE PROPOSED DEVELOPMENT

4.1 National Planning Framework: Project Ireland 2040

The National Planning Framework (NPF) is a high-level strategic plan shaping the future growth and development of Ireland out to the year 2030. It is a framework to guide public and private investment, to create and promote opportunities for people, and to protect and enhance the environment.

The Shannon Estuary Strategic Integrated Framework Plan (SIFP) is identified as a case study within the NPF and is therefore considered to be fully supported at national planning level. The further development of the AAL facility is strongly supported in the SIFP (section 4.3 below refers).

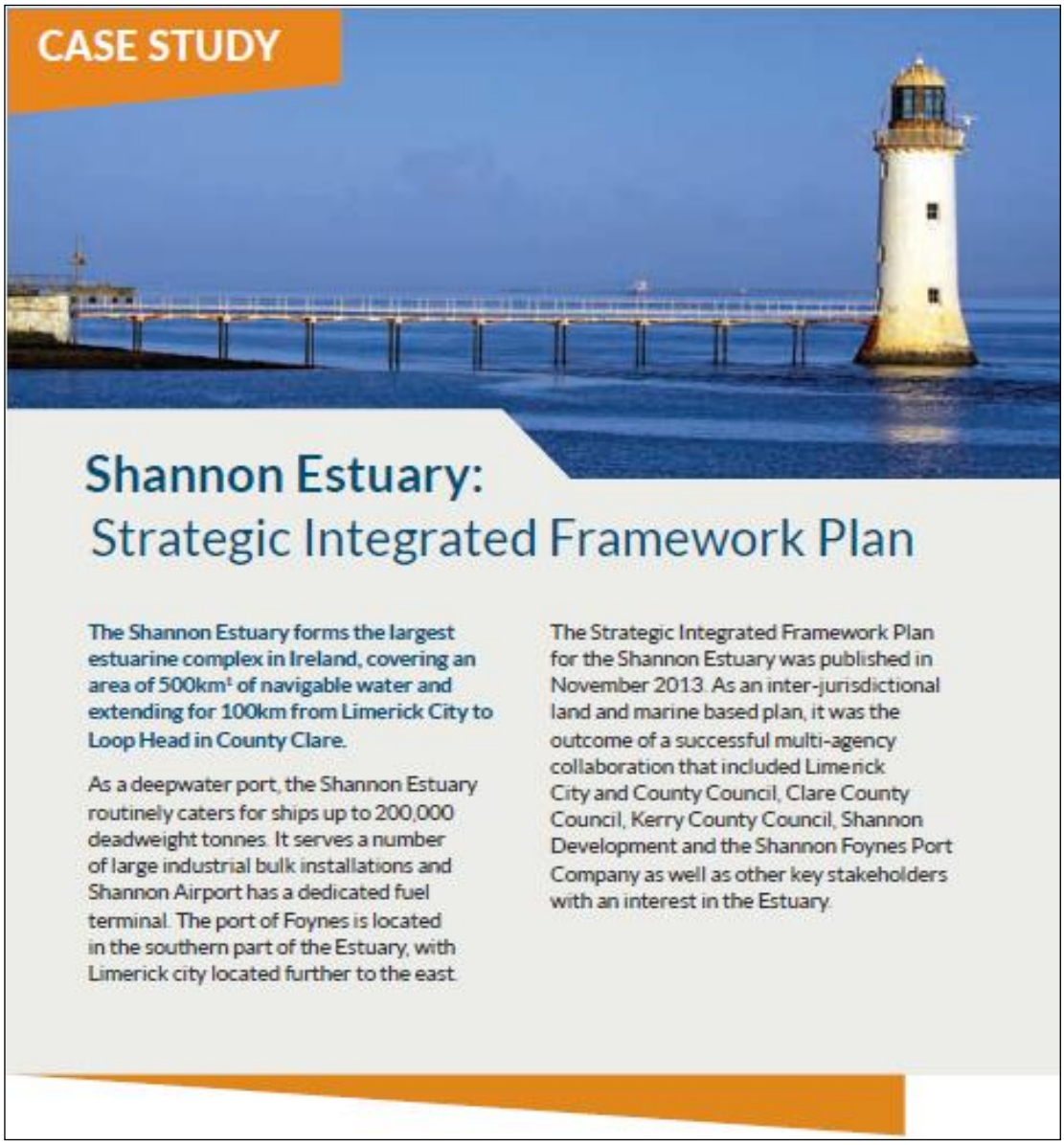


Figure 4.1: Shannon Estuary SIFP identified as a Case Study in the National Planning Framework (Source: National Planning Framework, pg 105).

4.2 Regional Spatial and Economic Strategy for the Southern Region

The Regional Spatial & Economic Strategy (RSES) for the Southern Region provides the framework through which the NPF's vision and the related Government policies and objectives will be delivered for the region. In line with International best practice, the RSES for the Southern Region adopts a territorially differentiated and place-based approach to regional planning and development.

The RSES identifies that across the region there are examples of smaller scale settlements or networks that have a significant role in employment provision in their surrounding communities, often in highly skilled and world leading innovative sectors. An example of this type of network of settlements includes:

> *"North Kerry / **West Limerick / Shannon Estuary** / Clare*
> ***The RSES recognises and supports the economic role and potential of settlements including** Listowel, Abbeyfeale Newcastle West (Key Town), Kilrush as economic drivers in a potential North Kerry/**West Limerick**/Clare **network connected with the Shannon Estuary** (and Shannon Foynes Port. **Their attributes extend to include the Shannon Integrated Framework Plan (SIFP) area and strategic locations identified under the SIFP** as a Shannon Estuary Coastal Network. Reference to the SIFP network is also included as an example of our region's strategic marine and costal assets in Chapter 4."* [Our emphasis.]

Aughinish Alumina (Aughinish Island) is identified as Strategic Development Location F in the Shannon Estuary SIFP and therefore the development of the site is fully supported in the RSES.

Furthermore, we refer to Regional Policy Objective (RPO) 79 and RPO 142 which further supports the overall Shannon Estuary SIFP and the development of the strategic development locations identified in the document, such as AAL.

RPO 79

Shannon Estuary and Other Harbour Plans

a. The RSES recognises the national and international importance of the Shannon Estuary, its potential to attract multinational development and the significant work that has been undertaken to progress its promotion and development. It is an objective to support and promote the delivery of the Strategic Development Locations as set out in the SIFP for the Shannon Estuary subject to the implementation of mitigation measures outlined in the SEA and AA undertaken on SIFP and zoned in the Local Authority Development Plans.

b. It is an objective to promote the SIFP initiative as a good practice model for the Southern Region and to seek the preparation of similar initiatives for Cork Harbour and Waterford Harbour between the relevant stakeholders.

c. It is an objective to support the promotion, marketing and seeking of financial and expertise support for the Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary and specific projects emerging there from.

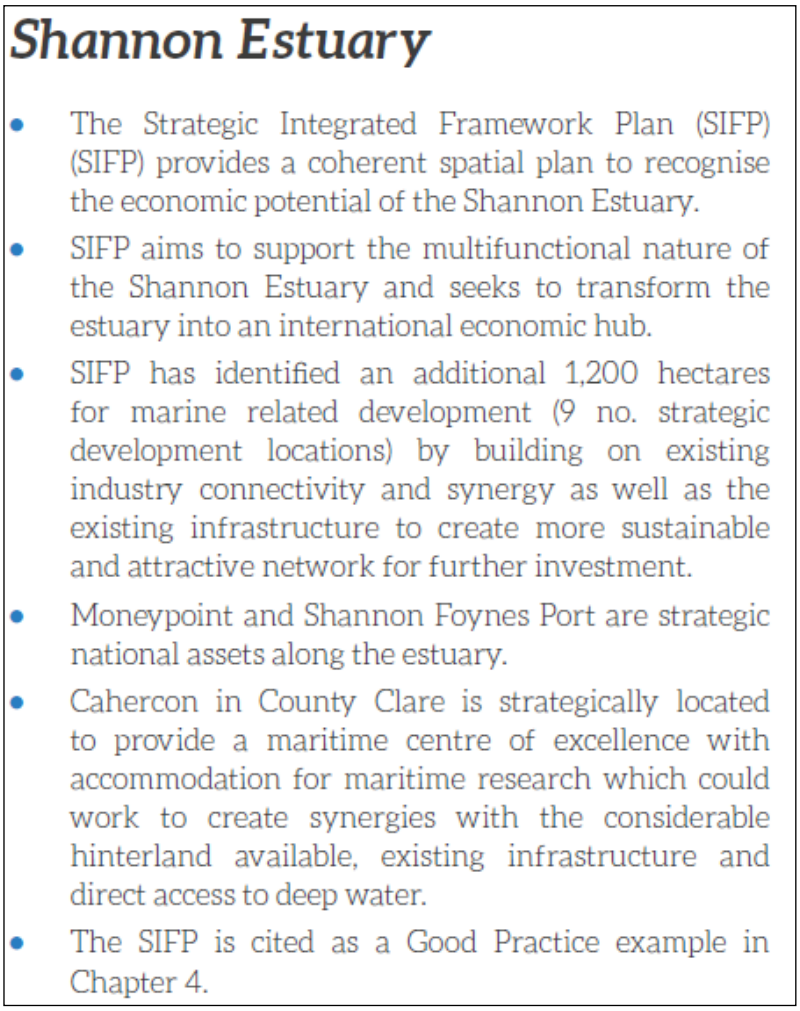
d. Such initiatives shall be subject to the relevant environmental assessment requirements including SEA, EIA SFRA and AA as appropriate.

RPO 142, in relaton to Ports, states that:

> ***"It is an objective to strengthen investment to deliver actions under National Ports Policy** and investment in sustainable infrastructure projects that:*
> *……*

e. Support the sustainable development of the 9 no. strategic development locations adjoining sheltered deep-water in line with the recommendations of the SIFP for the Shannon Estuary *and subject to the implementation of mitigation measures outlined in the SEA and AA undertaken on the SIFP."*

Having particular regard to the Shannon Estuary, the RSES also outlines the below.



Shannon Estuary

- The Strategic Integrated Framework Plan (SIFP) (SIFP) provides a coherent spatial plan to recognise the economic potential of the Shannon Estuary.
- SIFP aims to support the multifunctional nature of the Shannon Estuary and seeks to transform the estuary into an international economic hub.
- SIFP has identified an additional 1,200 hectares for marine related development (9 no. strategic development locations) by building on existing industry connectivity and synergy as well as the existing infrastructure to create more sustainable and attractive network for further investment.
- Moneypoint and Shannon Foynes Port are strategic national assets along the estuary.
- Cahercon in County Clare is strategically located to provide a maritime centre of excellence with accommodation for maritime research which could work to create synergies with the considerable hinterland available, existing infrastructure and direct access to deep water.
- The SIFP is cited as a Good Practice example in Chapter 4.

Figure 4.2: Extract from Regional Spatial and Economic Strategy for the Southern Region

The AAL facility is identified as Strategic Development F in the Shannon Estuary SIFP and therefore the development of the site is fully supported through regional planning policy.

4.3 Strategic Integrated Framework Plan for the Shannon Estuary 2013-2020

The *Strategic Integrated Framework Plan for the Shannon Estuary 2013-2020* ('SIFP') is an inter-jurisdictional land and marine based framework plan to guide the future development and management of the Shannon Estuary.

It was commissioned by Clare County Council, Kerry County Council, Limerick City and County Council, Shannon Development and the Shannon Foynes Port Company and was incorporated into the *Limerick County Development Plan* in 2015.

The SIFP notes in Section 2.1.1 that:

> *"**The lower Shannon Estuary** and its surrounding hinterland **facilitate large scale, national industrial activities, and as such is considered by many as a key economic driver for the national and regional economy.***
>
> ***The presence of** the deepwater port at Foynes, the Moneypoint ESB power station and **the Aughinish Alumina plant demonstrate the critical role played by the Shannon Estuary, in facilitating economic development within the national context**."* [Our emphasis.]

Aughinish Island is designated as a 'Strategic Development Location' (SDL) within the SIFP, and Section 5.4.4.6 of the SIFP describes the Aughinish Island SDL's assets:

> *"The SDL incorporates a **well established, strategic, industrial complex where further growth in the primary industry is anticipated**. This is likely to include the potential extension to the existing deepwater berthing facilities, to take advantage of the potential for larger vessels and upgrading of loading machinery. The hinterlands of the SDL are relatively flat with good access to the N69, and also straddle the existing Limerick-Foynes rail network corridor. The area is connected via a spur line to the Bord Gais Natural Gas Ring Main, and is connected to the 110kV electricity transmission network with a number of substations located on site. The existing industrial development has permission to expand to the south, and is currently pursuing opportunities to increase production and storage capacity. **The alumina facility anticipates remaining as a significant working industrial plant for the foreseeable future, generating considerable contributions and employment to the local and regional economy**."* [Our emphasis.]

The SIFP sets out the following development objectives for the Aughinish Island Strategic Development Location:

> *"**SIFP MRI 1.2.9: Aughinish Alumina***
>
> *To **safeguard the role and function of Aughinish Alumina as a key driver of economic growth in the region**, encouraging its sustainable growth, expansion and diversification to facilitate greater and more competitive trade potential.*
>
> ***SIFP MRI 1.2.10: Aughinish Marine Related Industry***
>
> *To support and facilitate the sustainable development of marine related industry on land within this Strategic Development Location, which harnesses the potential of the deep water, large hinterland and existing infrastructure. Other sustainable land uses may be acceptable where they*

are considered compatible or complementary with the level of flood risk, and where the ability to deliver the primary use (marine related industry) is not compromised. Development will be subject to compliance with the criteria set out in Objective SIFP MRI 1.2." [Our emphasis.]

The proposed development will entail significant investment and enhancement of the AAL facility and will assist the Planning Authority in achieving its Vision for the Shannon Estuary as set out in the SIFP. The proposed development will safeguard the future supply of rockfill for use in construction projects within the confines of the AAL facility and as such support the role and function of AAL as a key driver of economic development in the region.

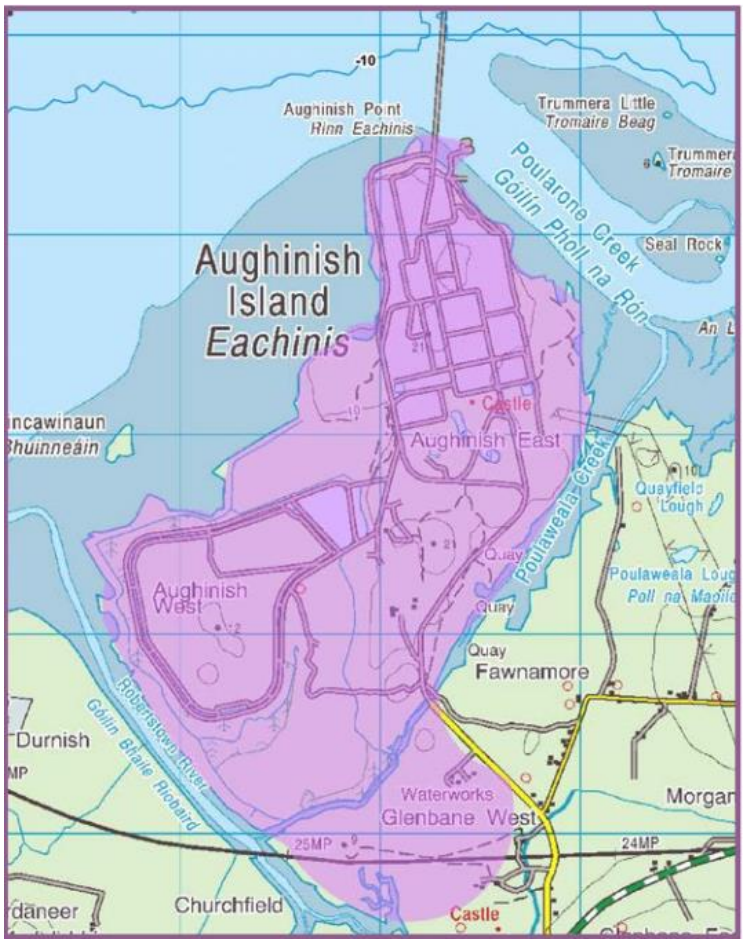


Figure 4.3: Extent of Aughinish Island Strategic Development Location F. (Source: *Strategic Integrated Framework Plan for the Shannon Estuary*.)

4.3 Limerick County Development Plan 2010-2016

The *Limerick County Development Plan 2010-2016* sets out Limerick City and County Council's overall strategy for the proper planning and sustainable development of the County to 2016 and beyond. It seeks to develop and improve, in a sustainable manner, the social, economic, cultural and environmental assets of the County.

The *Limerick County Development Plan 2010-2016* will continue to have effect until the Limerick City and County Development Plan 2022-2028 is adopted. The 2022-2028 Plan is currently at Draft stage and is addressed in Section 4.5 of this Chapter.

The importance of industry to Limerick and the State is acknowledged in Section 5.4.1, which states that:

> ***"Industry and enterprise together as sectors are crucial as drivers of economic growth****. In this context, enterprise means small and medium scale businesses in light industry as well as in internationally traded services such as in software, telecommunications and financial services.* ***These sectors play a leading role in improving Ireland's versatility*** *and technological advancement,* ***giving it a greater competitive edge in international markets****, and* ***thereby creating revenue and employment****. Businesses in other sectors such as in retail and property will rely on the capacity of manufacturing and enterprise to raise incomes and stimulate confidence locally."* [p. 5-7; Our emphasis.]

The AAL plant is zoned as 'Marine Related Industry' in the Development Plan (refer to Figure 4.1). Objective ED 06 notes that the purpose of this zoning objective is as follows:

> *"Land zoned for Marine Related Industry, shall provide for marine related industry and large scale uses that create a synergy with the marine use. Marine related industry shall be taken to include the use of land for industry that, by its nature, requires a location adjacent to estuarine/deep water including a dependency on marine transport, transhipment, bulk cargo or where the industrial process benefit from a location adjacent to the marine area."*

The AAL plant relies upon the Shannon Estuary for the import of raw materials and the export of alumina by ship, and is therefore consistent with this zoning objective. The proposed development will also assist in fulfilling the following Development Plan Objectives.

> ***"Objective ED 04: Safeguard Strategic Development locations along the estuary***
>
> ***It is the objective of the Council to safeguard the Strategic Development Locations at*** *Foynes Port, Foynes Island and* ***Aughinish Island for the sustainable growth and development of marine related industry*** *and industrial development at Askeaton.*
>
> *All proposed developments shall be in accordance with regional and national priorities and the SEA Directive, Birds and Habitats Directive, Water Framework Directive, Shellfish Waters Directive, Floods Directive and EIA Directive.*
>
> *Buffer zones shall be incorporated into proposals for developments where necessary to preserve potentially valuable habitats, for example, areas of estuary, shallow bays and inlets, mudflats, lagoon, salt marsh and woodland*

habitat which occur at or surrounding these Strategic Development Locations. The extent of such buffer distances shall be established in consultation with relevant statutory bodies. Detailed botanical, faunal and ornithological surveys should be undertaken in relation to proposed developments at these Strategic Development Locations to fully consider the potential effects of the development and inform how to best avoid significant ecological effects." [Our emphasis.]

*"**Objective SE O2: Promoting Development***

***The Council will seek to promote the economic and industrial development of the Shannon estuary** in order to capitalise on its location in the Mid West industrial and business region. Sufficient land will be zoned or identified for industrial and business use through the medium of Local Area Plans or zoning within this Plan including zonings in the Strategic Integrated Framework Plan for the Shannon Estuary."* [Our emphasis.]

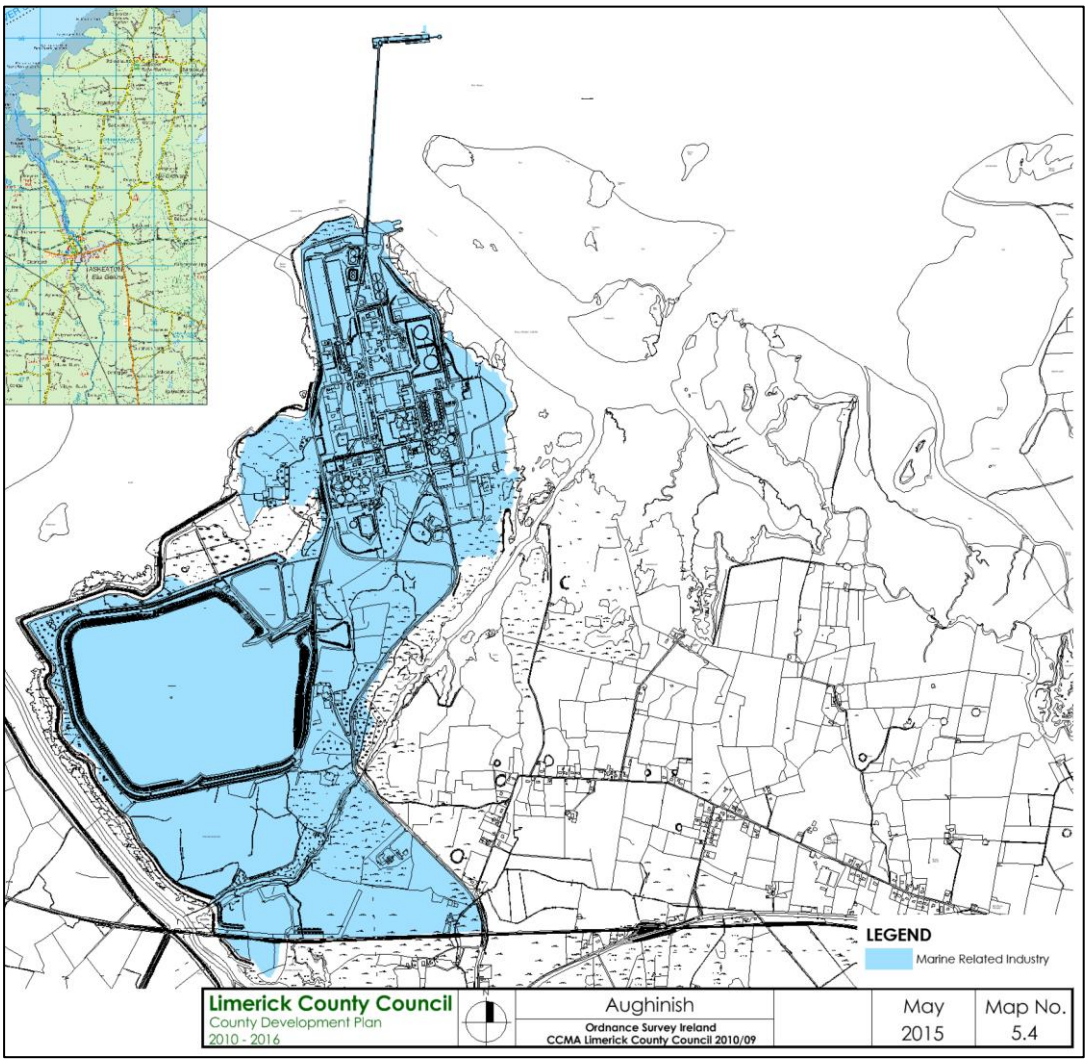


Figure 4.4: Marine Related Industry Zoning of Aughinish Island. (Source: Extract from Map 5.4 of the *Limerick County Development Plan 2010-2016.)*

The Development Plan recognises the aggregates (stone, sand and gravel) and concrete products industry contribute significantly to the economic development of the County. The proposed Borrow Pit will support the existing and future development of the BRDA and ensure that there is a readily available supply of rockfill at the site to support permitted construction projects.

4.4 Draft Limerick City and County Development Plan 2022-2028

Limerick City and County Council published the Draft Development Plan on the 26th June 2021. This Draft Plan sets out an overall strategy for the proper planning and sustainable development of the functional area of both Limerick city and county over a six year period between 2022 and 2028.

Chapter 4 of the Draft Plan is titled 'A Strong Economy' and highlights in Section 4 the importance of Shannon estuary to the economy of Limerick. Objective ECON 043 is of specific relevance to the subject site as it identifies Aughinish Island as a Strategic Development Location which should be safeguarded for the sustainable growth and development of marine related industry and industrial development.

> *"**Safeguard Strategic Development locations along the Estuary It is an objective of the Council to safeguard the Strategic Development Locations** at Foynes Port, Foynes Island **and Aughinish Island for the sustainable growth and development of marine related industry** and industrial development at Askeaton. All proposed developments shall be in accordance with regional and national priorities and the SEA Directive, Birds and Habitats Directive, Water Framework Directive, Shellfish Waters Directive, Floods Directive and EIA Directive. Buffer zones shall be incorporated into proposals for developments where necessary to preserve potentially valuable habitats, for example, areas of estuary, shallow bays and inlets, mudflats, lagoon, salt marsh and woodland habitat, which occur at or surrounding these Strategic Development Locations. The extent of such buffer distances shall be established in consultation with relevant statutory bodies. Detailed botanical, faunal and ornithological surveys should be undertaken in relation to proposed developments at these Strategic Development Locations, to fully consider the potential effects of the development and inform how to best avoid significant ecological effects."*

Further to the above, the boundaries of the Aughinish Island facility are outlined in Figure 4.4 of the Draft Plan.

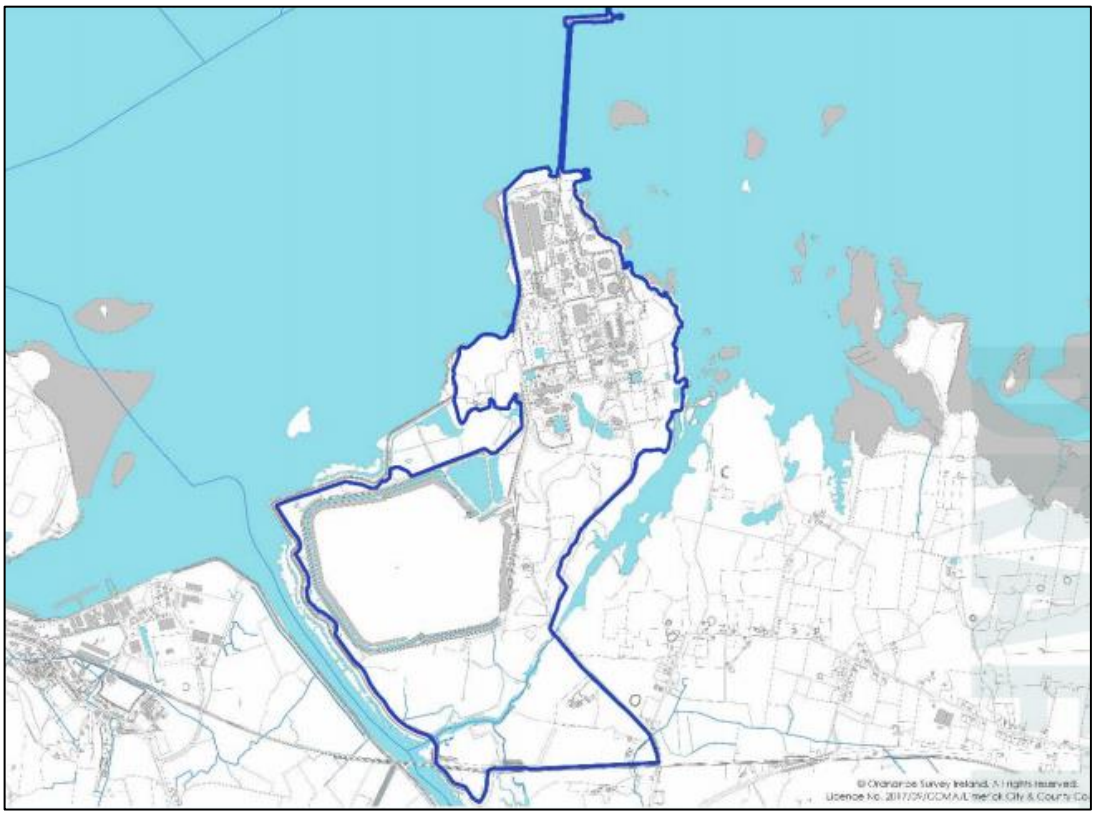


Figure 4.2: "Map of Aughinish" –(Source: Map 4.4, Draft LCCC Development Plan 2022-2028)

5.0 DESCRIPTION OF PROPOSED DEVELOPMENT

5.1 Summary of Proposed Development

The proposed development consists of works to the Bauxite Residue Disposal Area (BRDA) comprising of an expansion to increase its disposal capacity to accommodate additional bauxite residue arising from the continued operation of the permitted alumina refinery plant located on the wider AAL facility. The proposed increase in disposal capacity to the BRDA will result in a proposed increase in height of c.12m above the currently permitted stage 10 level (c. 32m OD) to a final stage 16 level (c. 44m OD). No increase to the existing footprint of the BRDA is proposed.

The proposed method of raising the BRDA will be the upstream method, consistent with the construction methodology for the permitted BRDA and involves the construction of rock fill embankments (Stages), offset internally and founded on the previously deposited and farmed bauxite residue, in 2 m high vertical lifts. The overall BRDA is raised systematically as the stages are filled with bauxite residue, farmed, carbonated and compacted, prior to deposition of the next layer.

Additional works proposed as part of this application include the following:

- A vertical extension to the existing Salt Cake Disposal Cell (SCDC) to accommodate further disposal of salt cake resulting in an increase in height of c.2.25m. The SCDC is located within the BRDA. A description of the SCDC and its function is provided in Chapter 2 of the submitted EIAR.

- An extension of the existing borrow pit, located to the east of the BRDA, is also proposed. This extension proposes to increase the footprint of the borrow pit from c.4.5ha to c.8.4ha. This expansion will provide an additional 380,000m^3 of rock fill material which is needed to satisfy the requirements of the construction and operation of the BRDA.

- The continued use of an existing stockpile area at the south east of the subject site to store topsoil in order to satisfy the additional restoration requirements of the extended BRDA.

- Modifications to the existing water management infrastructure to accommodate the BRDA development to Stage 16 which will also allow for greater Inflow Design Flood (IDF) capacity for the entirety of the BRDA.

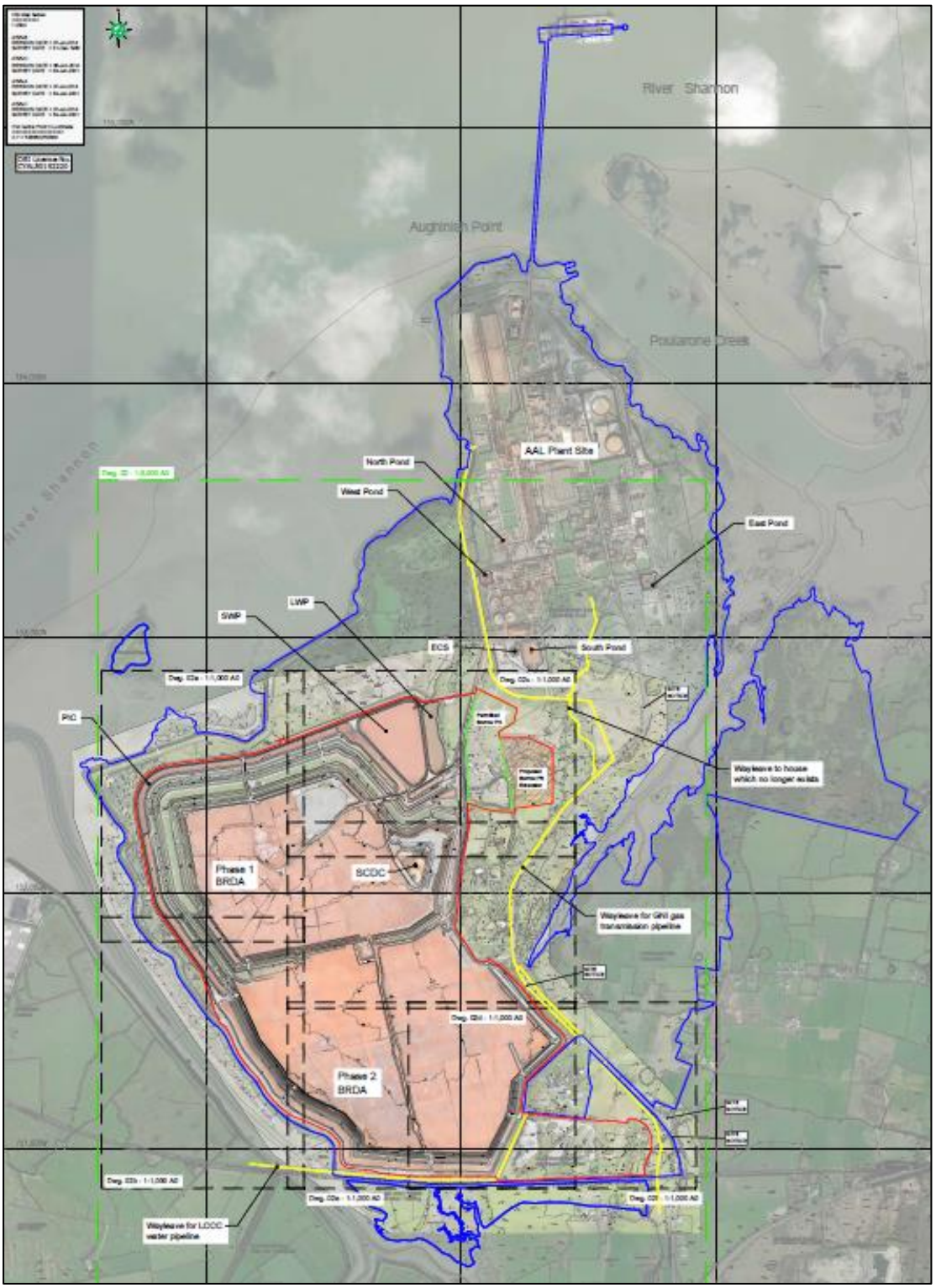


Figure 5.1: Subject Site Boundary Outlined in Red [Wider AAL Landholding Outlined in Blue] (Source: Extract from Golder Associates Dwg. No. 01a).

5.2 Proposed Works to the BRDA

As noted in Chapter 2 of the submitted EIAR, the permitted BRDA has capacity to provide a disposal area for bauxite residue until c.2030, for the current rate of alumina production (1.95 million tonnes per annum) at the adjoining refinery plant. As currently permitted, the BRDA will have a final perimeter elevation of 24m OD and a maximum dome crown elevation of 32m OD.

The subject application proposes that the permitted height of the overall BRDA (Phase 1 and 2 BRDA) be increased to accommodate additional bauxite residue disposal capacity. It is intended that this additional disposal capacity will extend the lifetime of the currently permitted BRDA up to c.2039 – an extension of approximately 9 no. years based on current residue disposal and production rates. The raising of the BRDA does not require any amendments to the existing BRDA footprint.

It is proposed that the existing BRDA can facilitate an increase in height to Stage 16 (currently permitted to Stage 10) which would provide a perimeter elevation of 36mOD and a maximum dome crown elevation of 44m OD. The proposed development will provide for the deposition of circa 0.9 to 1.0 million m^3 / year of bauxite residue and total of circa 8.0 million m^3 over the lifetime of the development (at current residue disposal and production rates).

The proposed method of raising the BRDA from Stage 10 to Stage 16 will be the upstream method, consistent with the construction methodology for the current BRDA and involves the construction of rock fill embankments (Stages), offset internally and founded on the previously deposited and farmed bauxite residue, in 2m high vertical lifts.

The proposed increased in height is 12m which will comprise 6 x 2m high stages raises (Stages 11 to 16), to provide a new perimeter crest elevation of 36m OD and a maximum dome crown elevation of 44m OD. The total area enclosed by the toe of the perimeter Stage 11 raise is 96.37ha. The Stage 10 bench is 12.5m wide bench, and subsequent benches from Stage 11 to Stage 16 are the standard 4m width, to form a new upper gradient of 4.83(H):1(V) and an overall BRDA wall gradient of 6.8(H):1(V).

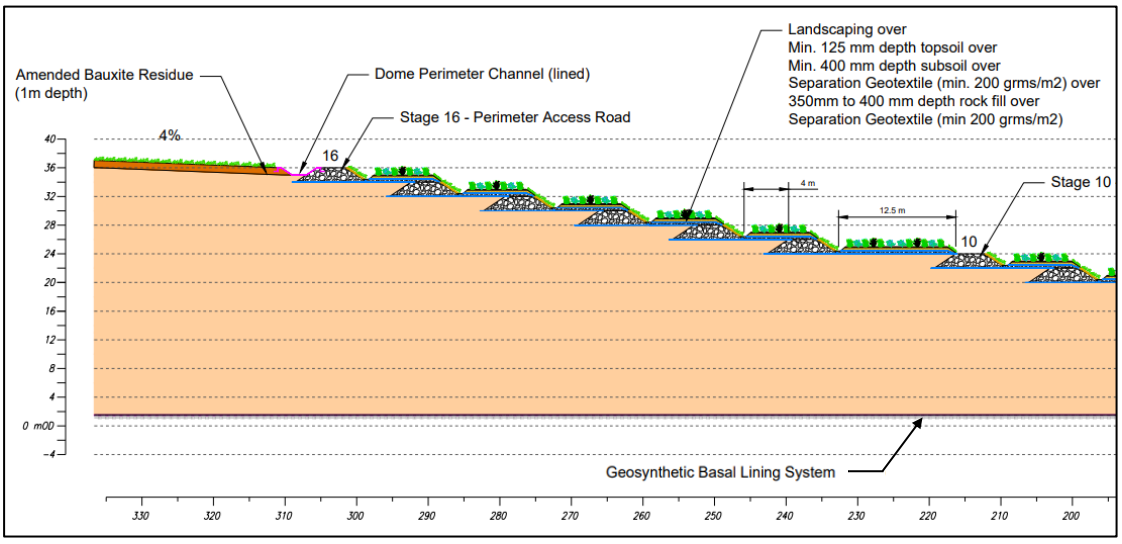


Figure 5.2: Section of Proposed BRDA Raise from Stage 11 to Stage 16 (Source: Golder, 2021).

The proposed BRDA Raise Development will provide an additional estimated 8.04 million m^3 of void for bauxite residue disposal (discounted for volume of rock fill stage raises) following from the April 2021 aerial survey, which represents an additional c. 13.1 million tonnes of bauxite residue disposal. The estimated total remaining void for bauxite residue disposal is proposed to increase to c. 17.16 million m^3 (discounted for volume of rock fill stage raises) following from the April 2021 aerial survey, which would represent an additional c. 28 million tonnes of bauxite residue capacity and a remaining life of c. 18 years up to 2039, based on the current rate of residue disposal and production.

The current BRDA water management infrastructure was designed to accommodate the BRDA development to Stage 10 and for an inflow design flood (IDF) with a return period of 1 in 200 years. As outlined in chapter 10 of the submitted EIAR, it is proposed to modify the existing water management infrastructure to accommodate the BRDA development to Stage 16 and for an IDF of a greater return period, in accordance with Canadian Dam Association (CDA) guidelines, based on the classification of the BRDA.

5.2.1 Stage Raise Construction Methodology

The stage raises are constructed of hard, durable, well graded limestone rock fill, free of deleterious materials and with a maximum particle size of 300mm that is termed Type B material. The Type B material is sufficiently permeable to permit the initial draining of the bauxite residue paste and surface water runoff but becomes less effective as the deposition elevation increases due to fines content of the bauxite residue.

The required rock fill will be sourced from the permitted borrow pit and the proposed expanded borrow pit located at the north east of the subject site.

As noted in Chapter 2 of the submitted EIAR, the rate of consumption of rock fill for stage raise construction in recent years has been in the 30,000 to 40,000 m^3 / year range. The permitted Borrow Pit footprint will provide 374,000 m^3 of rock fill material which is considered to be sufficient to construct the permitted BRDA to Stage 10 (198,000 m^3), to implement the closure design (106,000 m^3) with a contingency available (70,000 m^3).

The rock fill for the proposed BRDA Raise Development is expected to be sourced from the permitted Borrow Pit and the proposed Borrow Pit Extension and an estimated volume of 380,000m^3 is required to construct the BRDA to Stage 16. Additional volumes are required to implement the closure design (62,000 m^3) and raise the SCDC (27,000m^3), above the rock fill requirements for the construction of the BRDA to Stage 10. The total rock fill demand for the BRDA constructed to Stage 16 and for closure requirements is 778,000m^3 (from April 2021). The existing and proposed Borrow Pits will provide 754,000m^3 and there is 30,000m^3 currently stockpiled on site.

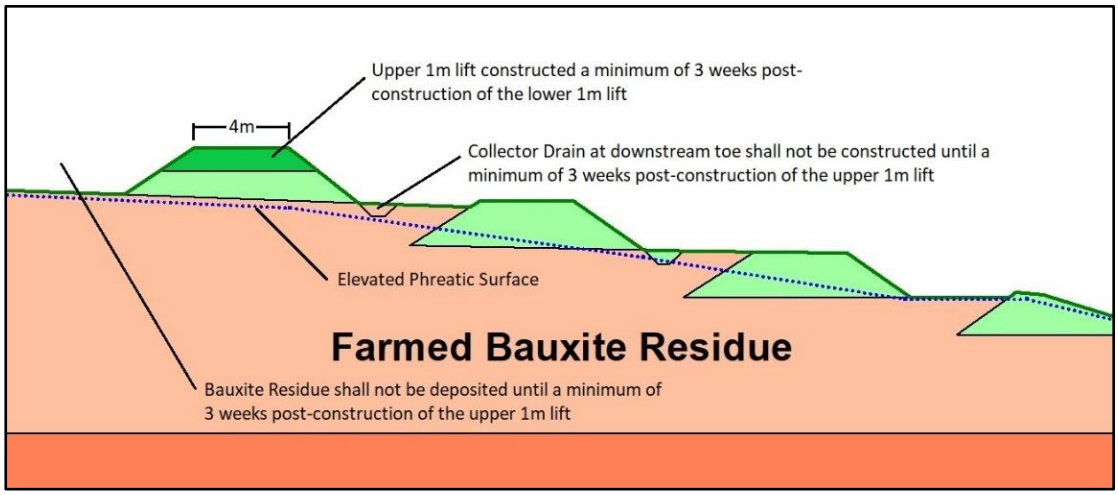


Figure 5.3: Stage Raise Construction Methodology (Source: Golder, 2021).

Stage raise construction follows the methodology described below and shown in Figure 3.3 above:

As outlined in Chapter 2 of the submitted EIAR, bauxite residue is pumped from the alumina refinery plant to the BRDA area. The bauxite residue can be directed into selected areas of the BRDA by valve operated piped discharge points.

The farmed and compacted bauxite residue is filled to the elevation of the inner crest of a constructed stage raise.

A minimum 14m width of subgrade, for the lateral extent of the stage raise to be constructed, is prepared for the construction of the subsequent stage raise, allowing 4m offset for the bench, 3m for the downstream slope at 1.5(H):1(V), 4m crest width and 1.5(H):1(V) upstream slope. Additional farmed mud is bulldozed into place and compacted to provide a level subgrade and/or to fill any low spots.

A minimum 200 grms/m2 separation geotextile is placed on the subgrade in the footprint of the proposed stage raise, approx. 10m width.

The lower 1m lift of the stage raise is constructed with Type B rock fill and trimmed to the design profile. The rock fill is nominally compacted by tracking over with heavy mechanical plant.

The upper 1m lift of the stage raise is constructed in a similar fashion following a minimum of 3 weeks has passed to allow for pore pressure dissipation. The final crest width is 4m at the design elevation.

The excavation of the collector drain at the toe of the downstream slope and the deposition of bauxite residue ensues after a minimum of 3 weeks has passed since the construction of the upper 1m lift.

In addition to the deposition of the bauxite residue in the BRDA area, process sand which is also a by-product of the alumina production process, will be used to construct additional ramps and access roads within the expanded BRDA. The process sand will be transported from the refinery plant by truck using the existing road network at the subject site and the wider AAL facility.

Please refer to the enclosed Engineering Design Report, prepared by Golder Associates and enclosed in Appendix A of the submitted EIAR.

5.2.2 Phasing of Stage Raise Construction/Operation

It is expected that the Phase 1 BRDA will be fully constructed to Stage 10 and that all of Phase 2 BRDA will be raised to Stage 4 by the end of 2021.

For the permitted BRDA development to Stage 10, the bulk of bauxite residue will continue to be deposited in the Phase 2 BRDA (90%) and the rate of rise can be expected to be approximately 2m per year or one stage raise per year constructed in the Phase 2 BRDA until 2027.

The phasing for the BRDA Raise Development would allow a more balanced deposition strategy as the availability of capacity in the phase 1 BRDA area would reduce the reliance on the phase 2 BRDA area.

Under the proposed development strategy, the stage raise construction for the Phase 2 BRDA will continue to lag behind that of the Phase 1 BRDA by 4m to 6m (2 to 3 stage raises) until the Phase 1 BRDA reaches its design perimeter elevation of 36m OD (Stage 16). The bulk of the bauxite residue deposition will then be deposited in the Phase 2 BRDA until the Stage 16 elevation is reached.

Detail regarding the proposed construction phasing of the stage raises can be found in the Engineering Design Report enclosed in Appendix A. This phasing approach is based on the following assumptions:

- Approval for BRDA Raise Development.
- 14 m^3 of rock fill required per metre length of stage raise constructed.
- Internal stage raises will continue to be constructed in Phase 1 in the zone north of the Phase 2 BRDA.
- Bauxite residue is deposited in approximately equal thickness layers in both the Phase 1 BRDA and Phase 2 BRDA.

5.2.3 Proposed Water Management Works

The existing drainage arrangement related to the BRDA is outlined in Chapter 2 of the submitted EIAR. In summary, the BRDA is surrounded by the Perimeter Interceptor Channel (PIC) which collects water emerging from the BRDA (seepage, bleed water, sprinkler water and surface water runoff) and conveys it via pumps either to the Effluent Clarification System (ECS) located in the plant and/or to the Storm Water Pond (SWP) / Liquid Waste Pond (LWP).

Golder Associates has undertaken a hydrological assessment to appraise the capacities of the existing water management structures, to inform the feasibility level design of the proposed BRDA Raise Development constructed to Stage 16.

Arising from this assessment, a number of improvements to the water management system for the proposed BRDA development will be implemented to allow for the existing water management system to accommodate an Inflow Design Flood (IDF) of a greater return period, in accordance with Canadian Dam Association (CDA) guidelines. At present the IDF allows for a 1 in 200 year flood event; the proposed modifications will allow for a revised IDF which will be 1/3 between the 1,000-year and the probable maximum flood (PMF)[7] event.

Proposed modifications to the water management system are outlined in full within Section 7.8.2 of the Engineering Design Report enclosed in Appendix A of the submitted EIAR. In summary, these upgrades will consist of modifications to existing perimeter interceptor channels (PICs), construction of additional PICs, alterations to culverts, increased crest elevations on PICs, installation of a pump and overflow culverts, alterations to discharge points and upgrades to pump arrangements.

Further details in relation to hydrology and the proposed development including details of the hydrological assessment undertaken by Golder Associates can be found in Chapter 10 of the submitted EIAR.

In addition to the above, the existing sprinkler system network installed to manage the surface of the BRDA will be extended to serve the raised BRDA. As is currently the case, this revised system will use treated BRDA run-off water which will be distributed to separate sprinkler rows each with fixed point sprinkler heads. As outlined in further detail within Chapter 11 of the submitted EIAR, this system minimises dust generation across the BRDA.

5.2.4 Landscaping and Restoration of the BRDA

As the bauxite residue is deposited and the stages are raised, it is intended that the side slopes and terraces of the BRDA will be progressively restored. This progressive restoration will consist of the installation of a permeable rock filter layer and the deposition of subsoil and topsoil to provide general cover. This subsoil and topsoil deposition will also consist of localised building up and profiling of BRDA stage raises to provide pockets of more organic terrain to mitigate the linear character of the underlying rock stages.

The final restoration will include the completion of the proposed side slope restoration planting scheme and the implementation of grassland and planting on the BRDA dome. Upon final restoration, the industrial character of the BRDA will be greatly reduced and the subject site will integrate sensitively into the surrounding green pastoral landscape.

Further details regarding the proposed landscaping and restoration of the BRDA can be found in Chapter 9 of the submitted EIAR.

[7] The PMF is the most extreme meteorological event, among extreme events, corresponding to a theoretical maximum flood with an undefined return period (i.e., greater than 1 in 10,000 years). The methods for estimating the PMF include accounting for climate change (WMO 2009) and no additional factors are required to be applied to the PMF or the IDF (which is derived from the PMF).

5.3 Proposed Works to Salt Cake Disposal Cell (SCDC)

As noted in Chapter 2 of the submitted EIAR, salt cake consists of the organic degradation products from naturally occurring humates in the bauxite, including sodium hydroxide, aluminium oxide, sodium carbonate, sodium sulphate and sodium oxalate.

As salt cake is classified as hazardous according to the European Waste Catalogue, it is therefore deposited within a specially engineered composite lined cell (Salt Cake Disposal Cell, "SCDC") within the BRDA.

As noted in Chapter 2 of the submitted EIAR, a Wet Air Oxidation (WAO) System has been developed to avoid the production of salt cake from the bauxite refinery process. A detailed project schedule has been developed with commissioning to be completed in 2023. In the interim and during periods of maintenance necessitating the down time of the WAO system, an extension to the SCDC is proposed as part of this application to provide headroom disposal.

The total current volume of the SCDC is estimated to be 72,800m^3 at the crest level. The remaining capacity of the SCDC is expected to expire during 2023. The existing crest height of the SCDC is 29.00m OD which ties into the overall height of the permitted BRDA at 32.00m OD. The proposed development comprises the vertical extension of the existing SCDC to a crest height of c. 31.25m OD which will have a maximum overall height of c. 35.50mOD when capped at cell closure. The extension of the SCDC will accommodate disposal for an additional c. 22,500 m^3 of salt cake in total.

The construction of the SCDC extension will be undertaken in one step as opposed to the staged BRDA construction. Approximately 27,000m^3 of processed rock fill material will be required to construct the perimeter wall of the SCDC raise. It is proposed that this rock material will be sourced from the adjoining borrow pit. The composite lining which will be placed inside the raised SCDC will comprise 4,500m^2 of a mixture of geosynthetic materials.

Additional ancillary materials which will be used in the construction of the SCDC include a non-calcareous drainage and gabion rock fill, a decant tower consisting of a high density polyethelene (HDPE) structured wall pipe, a crash barrier, concrete for posts, plinths and paths, and a conveyor belt.

5.3.1 Transportation of Salt Cake

As is currently the case, salt cake will be loaded at the refinery plant with a loading shovel into a dumper truck and transported to the composite lined SCDC by a designated Process Material and Handling Contractor (PMHC). This activity currently occurs approx. 3 days per week, however as the WAO system is commissioned, the frequency of this activity will decrease.

In order to ensure that the risk of potential spillages is ameliorated the transportation process of the salt cake will continue to be closely monitored with all movements logged and recorded. Taking into consideration the geometry and gradient of the route to the SCDC within the BRDA a free board of at least 300mm will continue to be maintained on all sides of the truck and the tailboard will be sealed closed with a hydraulic locking ram to prevent

spillages. In the unlikely event of a spillage occurring during transportation the PMHC must immediately cordon off the area and recover the spillage by scraping the road surface with mechanical plant and removing the material in a sealed truck to the SCDC.

5.3.2 Deposition of Salt Cake within the SCDC

Once transported to the SCDC, the salt cake will be tipped by a dumper truck into the cell. This operation is carried out by the driver reversing the dumper truck onto a stop-end steel tipping plate (see Figure 3.4 below). Once the vehicle has reversed to the stop-end the driver raises the tipper body and empties the contents of the truck in to the designated cell. Once the dumper truck has tipped all of its content the tipper body is lowered and the tailboard sealed shut before returning to the refinery plant for loading or final washing. Three tipping plates are located on the west side of the SCDC to avoid salt cake build up, a long reach excavator operated by the designated BRDA Contractor pushes the salt cake in to the cell following tipping in order to keep the tipping plates clear.

As protection to the SCDC lining system along the tipping edge, tyres are positioned over a protection geotextile for the footprint of the three tipping areas. The tyres are tied together with a continuous length of nylon rope. In addition, re-used conveyor belts are deployed over the tyres giving extra protection at the designated tipping locations. Materials used are not impacted by the waste material itself.

A sprinkler ring main is currently placed around the perimeter of the SCDC. This sprinkler system will be maintained within the expanded SCDC which is proposed as part of this application and is purely a precautionary measure for dust suppression, despite the high moisture content of the salt cake. Further detail regarding dust suppression measures in the SCDC is contained in Chapter 11 of the submitted EIAR.

When rain water or sprinkler system water comes in contact with salt cake, leachate is generated which is contained within the cell and is collected in a decant chamber (Volume capacity of 8.6m^3) within the SCDC. The leachate is then transferred by an enclosed pipeline to a holding Tank (Volume capacity of 28m^3) From here the leachate is pumped back to the plant via enclosed pipeline as a caustic recovery stream.

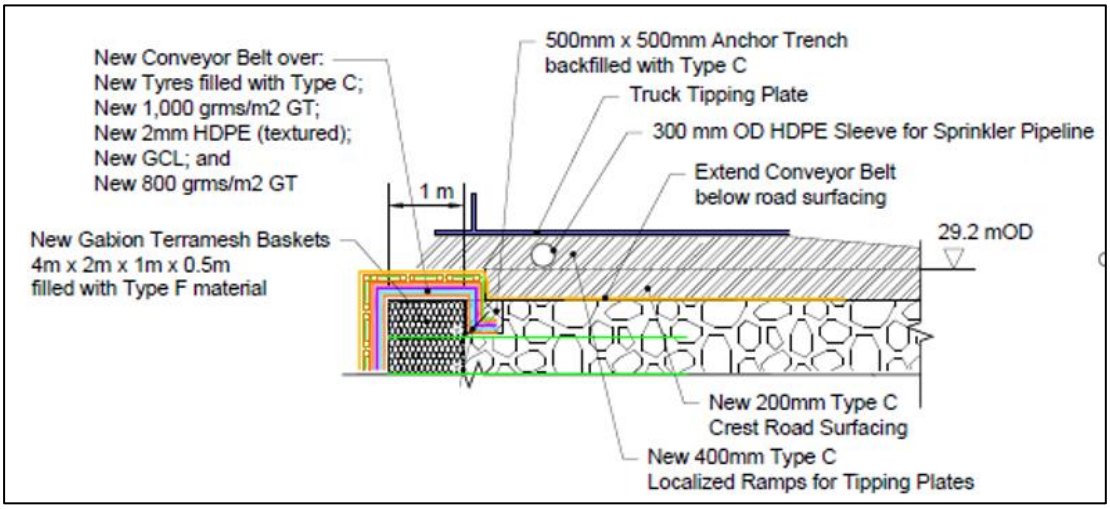


Figure 5.4: Typical Tipping Plate Section at SCDC (Source: AAL, 2021).

5.3.3 Cleaning of Equipment

As is currently the case, all equipment will be cleaned each day following task completion. The loading shovel and dumper truck will be washed at three designated hosing points which are located within a contained area beside the refinery plant. All washings will be collected in a collection sump and returned to the process preventing any contamination to ground.

Following contact with salt cake the long reach excavator located within the BRDA will be washed with a mobile water bowser, the excavator arm and bucket will be suspended over the designated salt cake and cleaned with the pressure washer from the tank, all washing will therefore be contained within the SCDC.

5.3.4 Closure Plan

A specific capping containment design, appropriate for the capping of a hazardous waste material, is proposed for the SCDC Raise which is in accordance with the EPA approved design for the current SCDC (Golder Associates, 2017B).

The proposed capping containment design takes into account Condition 8.5.21 of the licence (IEL P0035-07) requiring the final 1m of all exposed bauxite residue deposited in Phases 1 and 2 of the BRDA shall comprise 'amended mud' and the on-going 'amended' layer trials at Aughinish.

The final 1m depth of all exposed bauxite residue is required to comprise 'amended mud' or the 'amended layer'. As outlined in Section 8.2 of the Engineering Design Report, contained in Appendix A, large scale trials were carried out on the wide Stage 5 bench on the north and west sides of the Phase 1 BRDA. These trials determined that the current specification for the amended layer meet the following requirements:

- Farmed or carbonated bauxite residue that has a pH < 11.5.
- Addition of washed process sand at rate of 1,250 m3 / hectare / 0.5m depth layer and mixed thoroughly using a spader.
- Addition of gypsum at a rate of 90 tonnes / hectare / 0.5m depth layer and mixed thoroughly using a spader.
- Addition of approved organic soil improver / compost at a rate of 550 tonnes / hectare / upper 0.5m depth layer and mixed thoroughly using a spader.
- Rotovation of the top surface prior to grass seeding.

The proposed SCDC Raise dome blends into the overall BRDA dome at Stage 16. Further detail regarding the closure plan can be found in the Engineering Design Report prepared by Golder Associates and enclosed in Appendix A of the submitted EIAR.

5.4 Proposed Borrow Pit Extension

As outlined in Chapter 2 of the submitted EIAR, a borrow pit is located at the north east of the application site with an extraction area measuring c.4.5ha in size. This borrow pit is permitted under LCCC Reg. Ref. 17/714; ABP Ref. 301011-18 and serves the construction and operation of the BRDA by providing processed rock which is required to cover and build up the stage raises as residue is deposited.

The current borrow pit area has a permitted depth of c.8.5m OD and is expected to provide 374,000 m^3 of rock fill material which is considered to be sufficient to construct the permitted BRDA to Stage 10.

As part of the current application and in order to serve the expanded BRDA volume, it is proposed to extend the existing borrow pit eastwards into the adjoining areas which are currently covered in vegetation. The extended borrow pit extraction area will measure a total of 8.4ha in size, an increase in area of 3.9ha. This expansion will provide an additional 380,000m^3 of rock fill material which is needed to satisfy the requirements of the construction and operation of the BRDA.

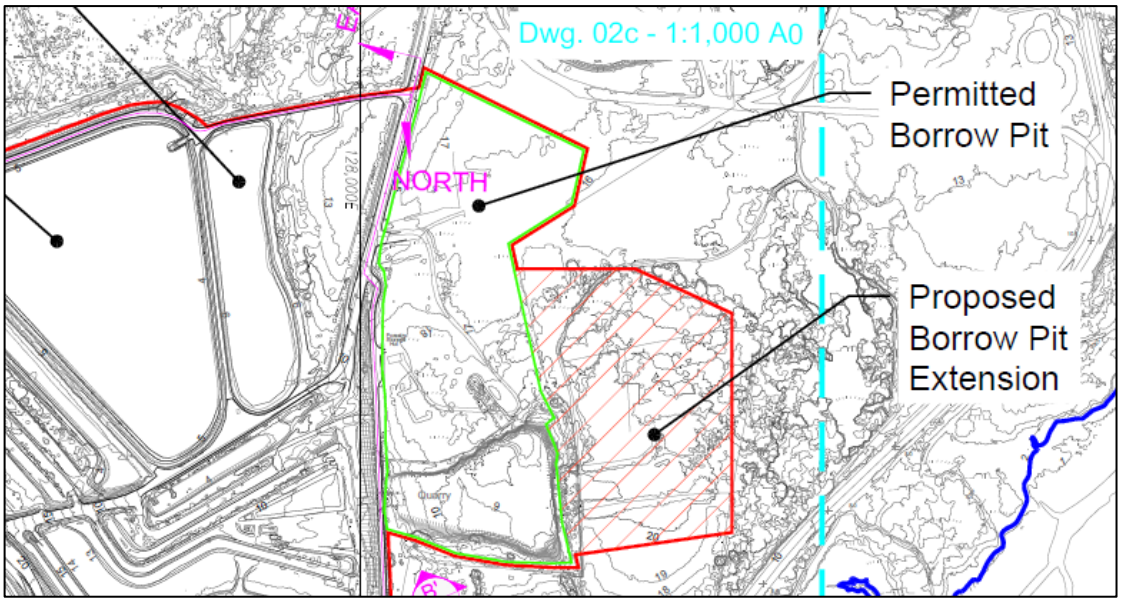


Figure 5.6: Permitted and Proposed Borrow Pit Extension (Source: Golder Associates – Drawing No. 02).

5.4.1 Phasing

It is proposed that the Borrow Pit will be extracted over a number of phases during the lifetime of the development. The Pit will be extracted first in a northern direction, from the existing former Borrow Pit area toward the plant after which the pit will be extracted alternately in an easterly direction. It is expected that the extraction of the Pit will be phased over the lifetime of the adjoining BRDA operations.

5.4.2 Volume Calculations

The volume of material to be extracted from the proposed extension to the Borrow Pit site has been calculated by Golder Associates. The calculations indicate that there is 380,000m^3 of material to be extracted within the proposed extension area. The extended and existing borrow pit will have a depth of 8.5m OD and provide a total of c. 754,000m^3 of rock.

An extraction rate of c.50,000m^3 is expected per annum for the ongoing raising of the BRDA. As such, it is requested that the lifetime of the borrow pit runs in parallel to the lifetime of the proposed BRDA (based on current residue disposal and production rates).

5.4.3 The Quarrying Process

The quarrying process in the extended borrow pit will mirror the permitted processes ongoing at the existing borrow pit. There are three broad stages in this quarrying process:

1) Blasting of rock faces;
2) Crushing and screening of Rock; and
3) Stockpiling of Rockfill.

Each of these steps is summarised below.

5.4.3.1 Blasting of Rock Faces

In order to extract the limestone, the active rock face must be blasted using explosives. The blast charges will be placed at regular intervals with no more than one blast per week. The operational period of the Borrow Pit (blasting, crushing and stockpiling) will be restricted to between April and September each year.

The Applicant will employ specialist blasting contractors to design and carry out each blast in the Borrow Pit. All blasts at the site are subject to a specific design, which is carried out in accordance with the relevant design standards, which establish best practice and safety, and has regard to the built environment.

A site-specific protocol for blasting in cooperation with the blasting contractor and in accordance with current international best practice has been developed as part of the operation of the existing borrow pit and will be amended to apply to the extended borrow pit area. The protocol will consider all activities related to blasting, especially the selection of explosives (including forms such as slurries or emulsions), storage and handling controls, blast design considerations and loading controls.

Details in relation to the blasting on site are provided in the Engineering Design Report, enclosed in Appendix A of the submitted EIAR.

5.4.3.2 Crushing of Rock

Once blasting has occurred, the blasted rock is fed into the mobile primary crusher (by way of a wheel loading shovel), which is located on the Borrow Pit floor. There are two crushing stages, primary crushing and secondary crushing. Each crusher consists of a set of electrically operated rotating drums, which function to reduce the particle size of the rock to a scale that can be easily transported using belt conveyors. The crushing and screening rate is expected to be c. 450 to 550m³ per day.

5.4.4 Stockpiling of Rock

The crushed rock will be stockpiled to the south of the proposed extraction area (within the existing former Borrow Pit area) using a wheeled loading shovel. The stockpiles rockfill will excavated out and loaded into dumper trucks as required to be deposited on site in the ongoing construction of the BRDA and other associated works within the Applicant's landholding. None of the rock will be transported for use off site.

5.4.5 Borrow Pit Operations

In this regard, the operation of the Borrow Pit will normally take place between 08:00 and 18:00 hours on Monday to Friday. No operations will take place on site on Sundays and Public Holidays.

5.4.6 Borrow Pit Safety and Security Infrastructure

In order to ensure that access to the borrow pit is restricted for safety and security reasons fences and landscaping berms will be located and regularly maintained along all boundaries of the extended borrow pit area, thereby discouraging inadvertent access to the Borrow Pit.

5.4.7 Borrow Pit Landscaping and Restoration Plan

A restoration landscaping proposal was prepared by Brady Shipman Martin Landscape Architects (BSM) for the original Borrow Pit development which comprised a combination of natural regeneration of vegetation with additional hedge and tree planting.

BSM have updated the restoration landscaping proposal to encompass the enlarged footprint provided by Borrow Pit Extension and the drawing and details are provided in Chapter 9.0 of the EIAR.

5.5 Works at Existing Stockpile Area

Existing rockfill stockpiles areas are located at the southeast of the application site. This area is accessed via a security gate in the perimeter fencing. These rockfill stockpiles will be depleted for BRDA Stage raising. This area also has existing stockpiles of soil which are used in the progressive restoration of the adjoining BRDA. As part of the subject application, it is

proposed to continue the use of the soil from this area to satisfy the additional restoration requirements of the extended BRDA.

5.6 Site Access and Access Road

The proposed development including the borrow pit and BRDA area will be accessed via the existing access arrangements. Access to the proposed development will thus be provided from the L1234 Aughinish Road to the south east of the application site which links to the N69. The Borrow Pit itself can only be accessed via the internal road system with the Applicant's landholding.

The extracted rock will not be transported outside of the Applicant's landholding and will be used solely for construction projects within the applicant's landholding. The haul route associated with the proposed development will relate to trucks exiting the application site and turning left (south) and joining the one-way internal haul route which runs around the perimeter of the BRDA.

Vehicles exiting the AAL facility (from the application site) shall make use of the existing wheel wash facilities within the plant area.

Similarly, access to the BRDA area will be possible through the existing internal road system on the wider AAL facility. Further detail regarding the proposed traffic arrangements on site can be found in Chapter 14 of the submitted EIAR.

6.0 ENVIRONMENTAL CONSIDERATIONS

As noted in Section 1.0 of this report, an EIAR has been prepared in respect of the proposed development. In addition, a Natura Impact Statement (NIS) has also been prepared and is enclosed within this Planning Application.

6.1 Environmental Impact Assessment Report

In order to ensure that all potential impacts associated with the proposed development are identified and addressed an Environmental Impact Assessment Report (EIAR) has been prepared (submitted with this planning application). The submitted EIAR provides a systematic and integrated evaluation of the direct, indirect and secondary effects (positive and negative) of the project on the natural and socio-economic environment.

The aim of the EIAR is to:

- Describe the project using information on the site, design and size of the proposed development;
- Identify and predict any impacts on environmental features likely to be affected, having regard to the specific characteristics of the proposed development;
- Describe the measures envisaged in order to avoid, reduce and, where possible, remedy significant adverse effects;
- Provide the data required to identify and assess the main effects which the proposed development is likely to have on the environment; and
- Provide a Non-Technical Study of the information.

The proposed development is covered by the following classes of development in the EIA Directive.

- Schedule 5, Part 2 Class 11(b) of the *Planning and Development Regulations, 2001 (as amended),* an EIAR is a mandatory requirement for *"Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule".* The proposal seeks the disposal of c. 1.57 million tonnes of bauxite residue per annum which would exceed this threshold.

- Schedule 5, Part 2, 2(b) of the *Planning and Development Regulations, 2001 (as amended),* an EIAR is a mandatory requirement for the "*Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares".* The proposal seeks to extend the permitted borrow pit by c. 3.9 hectares which would create an overall borrow pit of c. 8.4 hectares and thus exceed the threshold.

Consultation was undertaken with An Bord Pleanála in respect of the proposed development and correspondence was subsequently issued by the Board confirming that the development fell within the scope of paragraphs 37A(2) of the Acts and thus constituted Strategic Infrastructure Development. As such, the subject application is an SID application submitted directly to the Board and must therefore be accompanied by an EIAR.

A Non-Technical Summary of the EIAR has also been submitted.

A core objective of that EIAR is to provide the appropriate information and evaluation of the proposed development, having regard to the specific characteristics of the development, the scale of the development and the potential for significant effects arising from the development.

It is considered that the EIAR demonstrates that there is no adverse impact associated with the proposed development on the environment or surrounding residential amenity.

6.2 Natura Impact Statement

A preliminary Screening for Appropriate Assessment (AA) found that it could not be excluded, on the basis of objective scientific information that the proposed works, individually or in combination with other plans or projects, would have a significant effect on three Natura 2000 sites: Lower River Shannon SAC, River Shannon & River Fergus Estuaries SPA and Barrigone SAC. Therefore, a NIS was required to ascertain whether the proposed works would have an adverse effect on the integrity of the Natura 2000 sites.

This NIS examines in detail the potential impacts of the development on Natura 2000 sites in the potential Zone of Influence (ZoI) of the proposed development. The potential impacts include those associated with sources of emission from the development site (e.g., noise, dust etc).

The AA process considers whether a proposed development, in view of best scientific knowledge and in light of the conservation objectives of any relevant European sites, when considered as an individual project, or in combination with other plans and projects, will have an adverse effect on the integrity of any European Site. At the NIS stage, all mitigation measures necessary to avoid, reduce or offset negative effects are considered.

The conservation objectives of Natura 2000 sites have been compiled by the National Parks & Wildlife Service (NPWS) in relation to the habitats and species (i.e., qualifying interests) for which the sites are selected. These conservation objectives are referred to when carrying out appropriate assessments for plans and projects that might impact on these sites.

The NIS considers the emissions to air, water, noise and vibration and light associated with the proposed development operation and the potential impacts of these emissions on Natura 2000 sites and their conservation objectives. In addition, the potential for cumulative and in-combination impacts are considered from the operation of the overall refinery plant and in relation to other projects and plans in the wider area.

It has been objectively concluded that the proposed project will not adversely affect the integrity of any Natura 2000 site, and there is no reasonable scientific doubt in relation to this conclusion.

7.0 DOCUMENTS SUBMITTED AS PART OF THIS APPLICATION

The following documents (2 No. hard copies and 7 No. digital copies) are submitted as part of this planning application:

- **Planning Fee:** The maximum Planning Fee for Strategic Infrastructure Development (SID) proposals is €100,000. An Bórd Pleanala has confirmed that it is in receipt of this fee from Aughinish Alumina. Please see Appendix 2 for proof of payment, including Payment Reference Number.

- **Notices:**

    - An original page of the *Irish Times* dated Wednesday, 8 December 2021, and *Irish* Independent, 8 December 2021 in which notice of the application has been published pursuant to article 17(1)(a) of the *Planning and Development Regulations 2001-2021*.

    - One copy of the Site Notice dated Tuesday, 7 December 2021 and erected or fixed on the land or structure pursuant to article 17(1)(b) of the *Planning and Development Regulations 2001-2021*.

- **Planning Application Form:** A duly completed Strategic Infrastructure Development Planning Application Form, signed and dated Tuesday, 8 December 2021.

- **Planning Report:** Two copies of this *Planning Report*, prepared by Tom Phillips + Associates, dated Wednesday, 8 December 2021.

- **Letter of Consent:** Two copies of a Letter of Consent from Limerick Alumina Refining Limited for the inclusion of their lands within this Planning Application, dated Wednesday, 1 December 2021 (appended to Application Form)

- **Environmental Impact Assessment Report:** Two copies of the Environmental Impact Assessment Report (including Appendices and Non-Technical Summary) dated November 2021.

- **EIA Portal:** Two copies of the EIA Portal Confirmation Notice (appended to Application Form).

- **Natura Impact Statement:** Two copies of the Reports in support of the Appropriate Assessment Process including a Report on Screening for Appropriate Assessment and a Natura Impact Assessment, prepared by Ecology Ireland and dated November 2021.

- **Photomontages:** Two copies of BDRA Raise – Accurate Visual Representations, prepared by Brady Shipman Martin and dated Wednesday, 1 December 2021.

- **Planning Application Drawings:** Two copies of the following drawings, prepared by Golder, are enclosed with this application:

Drawing No.	Drawing Title	Scale
01	Existing Conditions – Site Location Plan – Overall	1:5,000 @ A0
01a	Existing Conditions – Site Location Plan – Overall with Aerial	1:5,000 @ A0
02	Existing Conditions – Site Layout Plan - BRDA	1:3,000 @ A0
02a	Existing Conditions – Site Location Plan – BRDA Tile 1 of 6	1:1,000 @ A0
02b	Existing Conditions – Site Location Plan – BRDA Tile 2 of 6	1:1,000 @ A0
02c	Existing Conditions – Site Location Plan – BRDA Tile 3 of 6	1:1,000 @ A0
02d	Existing Conditions – Site Location Plan – BRDA Tile 4 of 6	1:1,000 @ A0
02e	Existing Conditions – Site Location Plan – BRDA Tile 5 of 6	1:1,000 @ A0
02f	Existing Conditions – Site Location Plan – BRDA Tile 6 of 6	1:1,000 @ A0
03	Permitted Conditions – Site Location Plan – BRDA	1:3,000 @ A0
03a	Permitted Conditions – Site Location Plan – BRDA Tile 1 of 6	1:1,000 @ A0
03b	Permitted Conditions – Site Location Plan – BRDA Tile 2 of 6	1:1,000 @ A0
03c	Permitted Conditions – Site Location Plan – BRDA Tile 3 of 6	1:1,000 @ A0
03d	Permitted Conditions – Site Location Plan – BRDA Tile 4 of 6	1:1,000 @ A0
03e	Permitted Conditions – Site Location Plan – BRDA Tile 5 of 6	1:1,000 @ A0
03f	Permitted Conditions – Site Location Plan – BRDA Tile 6 of 6	1:1,000 @ A0
04	Proposed Conditions – Site Layout Plan - BRDA	1:3,000 @ A0
04a	Proposed Conditions – Site Layout Plan – BRDA Tile 1 of 6	1:1,000 @ A0
04b	Proposed Conditions – Site Layout Plan – BRDA Tile 2 of 6	1:1,000 @ A0
04c	Proposed Conditions – Site Layout Plan – BRDA Tile 3 of 6	1:1,000 @ A0

Drawing No.	Drawing Title	Scale
04d	Proposed Conditions – Site Layout Plan – BRDA Tile 4 of 6	1:1,000 @ A0
04e	Proposed Conditions – Site Layout Plan – BRDA Tile 5 of 6	1:1,000 @ A0
04f	Proposed Conditions – Site Layout Plan – BRDA Tile 6 of 6	1:1,000 @ A0
05a	Cross Sections: Existing and Permitted Raises to Stage 10	1:1,000 @ A0
05b	Cross Sections: Existing, Permitted and Proposed Raises to Stage 16	1:1,000 @ A0
05c	Side Slope Profiles: Zoomed – Permitted and Proposed Raises – 1 of 2	1:400 @ A0
05d	Side Slope Profiles: Zoomed – Permitted and Proposed Raises – 2 of 2	1:400 @ A0
06	Elevations: Existing, Permitted and Proposed BRDA to Stage 16	1:1,000 @ A0
07	Existing Conditions: BDRA Lighting Plan	1:3,000 @ A0
07a	Proposed Conditions during Operations: BDRA Lighting Plan	1:3,000 @ A0
08	Existing Conditions: BDRA Monitoring Instruments Plan	1:3,000 @ A0
08a	Permitted Conditions: BDRA Monitoring Instruments Plan	1:3,000 @ A0
08b	Proposed Conditions: BDRA Monitoring Instruments Plan	1:3,000 @ A0
09a	Existing Conditions: Mud Points and Sprinkler Heads Layout	1:3,000 @ A0
09b	Proposed Conditions during Operations: Mud Points and Sprinkler Heads Layout	1:3,000 @ A0
10	Proposed Conditions: BDRA Closure Layout at Stage 16	1:3,000 @ A0
11	BRDA Details: Operational	1:25 / 1:40 @ A0
12a	BRDA Details: Closure – Spillway Sections (SP-1 to SP-4)	1:400 @ A0
12b	BRDA Details: Closure – Spillway Sections (SP-5 to SP-8)	1:400 @ A0

Drawing No.	Drawing Title	Scale
12c	BRDA Details: Closure – 4 m width Spillway (SP-8)	1:50 / 1:100 @ A0
12d	BRDA Details: Closure – 6 m width Spillway (SP-4), Analogous to SP-2, SP-3 & SP-5	1:50 / 1:100 @ A0
12e	BRDA Details: Closure – 8 m width Spillway (SP-1), Analogous to SP-7 & SP-8	1:50 / 1:100 @ A0
12f	BRDA Details: Closure – 6 m width Spillway (SP-4) discharge to PIC & Wetlands in PIC	1:100 @ A0
12g	BRDA Details: Closure – PIC Breach Spillway #1	1:25 / 1:50 / 1:100 @ A0
12h	BRDA Details: Closure – PIC Breach Spillway #2	1:25 / 1:50 / 1:100 @ A0
12i	BRDA Details: Closure – Side-Slope Capping Containment	1:50 / 1:75 @ A0
13a	Borrow Pit Extension: Existing Conditions, Permitted and Proposed Layout Plan	1:1,000 @ A0
13b	Borrow Pit Extension: Existing Condition and Proposed Cross Sections	1:50 / 1:400 @ A0
13c	Borrow Pit Extension: Indicative Development Phasing	1:1,000 @ A0
13d	Borrow Pit Extension: Estimated PPV Contour Plot	1:3,000 @ A0
14a	SCDC Raise: Existing Conditions – Layout Plan	1:500 @ A0
14b	SCDC Raise: Proposed Conditions – Layout Plan	1:500 @ A0
14c	SCDC Raise: Closure Conditions – Layout Plan & Sections	1:500 @ A0
14d	SCDC Raise: Existing and Proposed Sections – 1 of 3	1:50 / 1:100 @ A0
14e	SCDC Raise: Existing and Proposed Sections – 1 of 3	1:50 / 1:100 @ A0
14f	SCDC Raise: Existing and Proposed Sections – 1 of 3	1:50 / 1:100 @ A0

- **Landscape Drawings:** Two copies of the following drawings, prepared by Brady Shipman Martin, are enclosed with this application:

Drawing No.	Drawing Title	Scale
350	Landscape Masterplan	1:3,500 @A0
351	Landscape Masterplan – Sheet 1 of 6	1:1,000 @ A0
352	Landscape Masterplan – Sheet 2 of 6	1:1,000 @ A0
353	Landscape Masterplan – Sheet 3 of 6	1:1,000 @ A0
354	Landscape Masterplan – Sheet 4 of 6	1:1,000 @ A0
355	Landscape Masterplan – Sheet 5 of 6	1:1,000 @ A0
356	Landscape Masterplan – Sheet 6 of 6	1:1,000 @ A0
357	Cross Section 1-1	1:100 @ A1 / 1:1,000 @ A0

8.0 CONCLUSION

8.1 Proposed Development Complies with Policy, has no Significant Negative Effects and Will Strengthen the Applicant's Investment in the Area

In conclusion, having regard to:

- The importance of the proposed development to the long-established Aughinish Alumina Ltd facility.
- The compliance of the proposed development with the provisions of the *Limerick City and County Development Plan*, the *Strategic Integrated Framework Plan for the Shannon Estuary*, the *Regional Spatial and Economic Strategy of the Southern Region* and the *National Planning Framework*.
- The lack of significant impact on environmental or residential amenity in the area as demonstrated in the Environmental Impact Assessment Report.
- The Natura Impact Assessment that concludes that the proposed development will not adversely affect the integrity of any *Natura 2000* sites.
- The fact that there will be no increase in alumina production as a result of the proposed development.

We consider that the proposed development is wholly compliant with the relevant policy documents and will not seriously injure the amenities of the area or property in the vicinity, and would be acceptable in terms environmental and residential amenity impacts.

The proposed development will assist in the long-term economic sustainability of Aughinish Alumina Ltd, an operator of strategic importance in the Region. We contend, therefore, that the proposal should be granted Planning Permission in the interests of the proper planning and sustainable development of the area.

We trust you will find this application in order. Please do not hesitate to contact me should you require any further information or clarification on the proposal.

Yours faithfully

Gavin Lawlor
Director
Tom Phillips + Associates

Appendix 1

Planning History

File No.	Application Date	Description	Decision	Decision Date
74/8580	15/02/74	A complete plant for the processing of bauxite to alumina including ship berthing pier, bulk storages, handling services and all ancillary equipment and buildings	Grant	30/09/74
79/15737	21/12/78	Partial change of location of Bauxite Impoundment Area on Aughinish Island to move same further in on island	Grant	09/02/79
79/15820	21/12/78	Erection of sign adjoining public road indicating Aughinish Alumina Project	Grant	09/02/79
84/24461	14/06/84	Erection of sports complex and site works	Grant	03/08/84
85/24933	19/12/84	Alterations and erection of extension to dwelling house	Grant	01/02/85
88/29312	11/10/88	Erection of three bay portal framed sheeted shed over retained in-site cast concrete for slab for filter sand drainage	Grant	02/12/88
89/510	31/03/89	Erection of 3 heater towers adjacent to existing bauxite pre-desilication tanks and a replacement sand classification building	Grant	26/05/89
89/511	04/04/89	Upgrade existing alumina plant to a rated processing capability of one million metric tonnes alumina per annum	Grant	26/05/89
90/242	31/01/90	Erection of single storey metal corrosion testing shed at plant	Grant	16/03/90
90/811	01/06/90	Construction of second storey office extension over existing single storey service building	Grant	20/07/90
90/871	14/05/90	Construction and operation of an auxiliary liquor quality control facility within existing Alumina Extraction Plant	Grant	03/08/90
90/966	05/07/90	Erection of one storey office and control room building within section 5 of existing Aughinish Alumina Plant	Grant	31/08/90
91/154	21/12/90	Erection of single storey instrument/electrical maintenance workshop within Section 1 of existing alumina plant	Grant	15/02/91
93/465	23/04/93	Construction and operation of a clarifier feedwater surge pond as part of effluent treatment system	Grant	21/05/93
93/1133	17/09/93	Extension of existing bauxite residue storage area	Grant	12/11/93
95/737	06/06/95	Construction of alumina hydrate seed filtration plant	Grant	21/07/95
95/839	19/06/95	Installation of product conveyor and loading machine on marine terminal	Grant	11/08/95
95/1021	08/08/95	Extension to sports complex	Grant	29/09/95
96/1781	07/06/96	Construction of first floor extension to existing marine terminal administration building	Grant	26/07/96
96/1946	10/07/96	Extension to Red Mud Processing building	Grant	30/08/96
96/2165	29/08/96	Erection of Hydrate storage building	Grant	04/10/96
97/672	06/05/97	Extension to existing sports complex	Grant	27/06/97
97/961	20/06/97	Ground floor & first floor extension to existing Local Two Amenity Building	Grant	10/10/97
00/900	20/04/00	Construction of a 300 MW CHP Plant & conversion later to a 390 MW gas turbine station to include a gas turbine generator, stacks, control building, gas & switchgear compounds, oil tank, etc.	Grant	09/06/00
04/262	30/01/04	Construction of a) extensions to north and south ends of existing bauxite storage shed no. 2; b) covered and elevated conveyor; c) bauxite storage silo; d) grinding mill building; e) slurry storage tank	Grant	26/03/04

05/1836	28/06/05	Construction of a Bauxite residue disposal area (circa 80 ha in area to 32m in height above mean sea level) on adjoining lands to south of existing BRDA; ancillary mud distribution pipes and water sprinkler pipes, 2.5m high electrical package substation; 4 no. 6m high street lights; 6 no. 2m high walkway lights; operating platform; perimeter roadway, site perimeter fence, extraction of topsoil & subsoil from borrow area & site development works; increase in height of existing and permitted BRDA (circa 104 ha in area to 32m in height above mean sea level); relocation of existing salt cake disposal area to location (1 ha in area) within existing BRDA; realignment of 310m of existing flood tidal defence berm adjacent to the Robertstown River; an increase in height of existing storm water pond (circa 6.5 ha in area to 6.0 m in height above mean sea level); increase in height of existing liquid waste pond (circa 1.3 ha in area to circa 6.0 m in height above mean sea level) and landscaping treatments over a period to 2027; RETENTION of existing Alumina production capacity of 1.60m metric tonnes per annum; PERMISSION for increase in existing Alumina production capacity to 1.95m metric tonnes per annum	Grant	15/05/06
10/548	03/06/10	Construction of one sodium hydroxide cleaning process steel tank 18.4m diameter by 24.2m high and associated foundation and bunded slab	Withdrawn	
12/343	02/05/12	Installation of a 150 tonne per hour gas-fired steam boiler with a maximum length of 31.32m, maximum width of 24.15m and maximum height above ground of 18.00m, and a 32m high exhaust stack with an external diameter of 3.0m and all other site development works above or below ground	Grant	25/06/12
12/992	17/12/12	Installation of a 150 tonne per hour gas-fired steam boiler with a maximum length of 31.32m, maximum width of 24.15m and maximum height above ground of 18.00m, including a 32m high exhaust stack with an external diameter of 3.0m, and all other associated site development works above and below ground	Withdrawn	
13/161	22/03/13	Demolition of all structures within a disused farm complex including a disused dwelling house, 7 no. outbuildings/sheds, a corrugated iron clad barn and the concrete walls surrounding the yard areas. The development will also consist of the breaking up of concrete hardstandings and yard areas and restoration of the site to a greenfield state. Concrete foundations, where they exist, will be covered over during the restoration stage. The septic tank associated with the disused dwelling house will be emptied and backfilled with stone. All mature trees and hedgerows within or bounding the site will be retained together with the site's boundary walls, access pathways and the agricultural gate entrance	Grant	15/05/13

13/164	22/03/13	Amendment of planning reference no. 12/343 for provision of 2 no. 150 tonne per hour gas-fired steam boilers, all within a maximum width of 30.00m and maximum height above ground of 18.00m; including 2 no. 32m high exhaust stacks with an external diameter of 3.0m each; and all other associated site development works above and below ground	Grant	15/05/13
14/1083	15/10/14	Installation of a second gantry crane ship unloader on the northern side of the Marine Terminal. The gantry crane ship unloader comprises a prefabricated steel structure with a liftable boom, control cabin, mechanical and electrical equipment and other elements. It will have a maximum height of c. 57.2 metres with the boom in the horizontal position (which will be the typical situation) and c. 74.2 metres with the boom lifted. The unloader will be positioned on existing crane rails to the east of the existing gantry crane ship unloader, which is c. 47.7 metres high (and c. 63.3 metres high with its boom lifted) to enable both unloaders to move along the Marine Terminal. An existing unutilised alumina loader (c. 30.2 metres high) is currently located on the same crane rails, but will be removed as part of the proposed development. The proposed development includes all other ancillary site development works.	Grant	09/12/14
16/418	18/05/16	Ten year permission for the development will consist of the installation of 2 No. deep thickeners (steel vessels with a diameter of c. 22m and maximum overall height of c.21.9m) and ancillary elements, including stairs, access platforms and walkways linking to adjacent vessels, pumps, cabling and pipework. The development will also consist of: the provision of a hardstanding; an internal road (c. 6.1m wide and c. 40.6m long) to the east of the thickeners; and all other site development works above and below ground.	Grant	15/08/16
17/714	26/07/17	Ten year permission for the provision of a Borrow Pit with an extraction area of c. 4.5 hectares to extract c. 374.000 m^3 of rock over a 10 year period. The extraction area is sought up to a maximum depth of c. 8.5 m O.D., with extraction to occur between April and September each year. The proposed development includes the demolition of a contractors shed and all ancillary site development, areas of stockpiling, landscaping and boundary treatment works above and below ground, including restoration of the extraction area.	Grant	22/02/18
20/1325	11/12/20	The provision of nature trail and upgrade of existing nature trail, construction of a car park comprising 29 no. car parking spaces, new vehicular access and associated landscaping and boundary treatment works. It is also sought to demolish existing derelict structures and a bird hide and construct a new bird hide in its place. A Natura Impact Statement(NIS) was submitted to the planning authority with the application	Grant	18/05/21

Appendix 2

Planning Fee – Payment Receipt

18/11/2021 11:50:03

AIB

Transaction Details - Incoming Payments

Sender Details:	
Senders Name:	Aughinish Alumina Ltd
Senders Reference:	AUGHINISH ALUMINA
Beneficiary Details:	
Beneficiary Name:	AN BORD PLEANALA
Beneficiary BIC:	AIBKIE2DXXX
Beneficiary IBAN:	IE70AIBK93105500316067
Payment Details:	
Payment Amount:	100,000.00
Payment Currency:	EUR
Settlement Date:	17/11/2021
AIB Reference:	0J1V4U853GFL9MS3
Payment Reference:	IE21111787044722