TOWN AND COUNTRY PLANNING ACT 1990

ENVIRONMENTAL STATEMENT VOLUME 3

Lithium Hydroxide Monohydrate Refinery

Green Lithium Refining Limited

Kinkerdale Road, Teesport, TS6 6UE

Prepared for:
Green Lithium Limited

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1. INTRODUCTION

1.1. Green Lithium Ltd (the '*Applicant*') is seeking formal planning approval in support of an outline planning application that has been submitted to Redcar and Cleveland Borough Council (the 'RCBC'').

1.2. The Applicant is seeking planning permission (under the provisions of the Town and Country Planning Act 1990) for a 3 line Lithium Hydroxide Refinery Plant processing spodumene ore, located on land owned and operated by PD Ports Ltd, in Teesport, Teesside (henceforth known as '*Site*').

1.3. This Environmental Statement (ES) has been prepared on behalf of The Applicant by Sol Environment Ltd, independent environmental and sustainability consultants, to accompany their planning application for the proposed 'Construction and operation of a Lithium Hydroxide Monohydrate ('*LHM*') Plant."

1.4. It is anticipated that the proposed development will generate up to 1000 jobs during the construction phase and up to 250 high-value direct full time jobs during operation of the plant.

THE APPPLICANT

1.5. Green Lithium Limited, founded in 2017, is an innovative technology development company with a vision to become one of Europe's first manufacturers and suppliers of battery-grade Lithium Hydroxide to EV manufacturing in Europe.

1.6. Details about Green Lithium can be found on their website https://www.greenlithium.co.uk

LOCATION

1.7. The Application Site (the *'Site'*) is located on land to the south of Kinkerdale Road, within Teesport on the south bank of the River Tees. The area is on the outskirts of urban areas including Redcar (approximately 3.8km east of the site) and Grangetown (approximately 2.5km southwest of the site). The city of Middlesbrough is located approximately 6.5km southwest of the site.

PLANNING POLICY

1.8. The planning policy framework relevant to the proposed development has been set out in Chapter 6 of the Environmental Statement for information. The Planning Statement submitted separately as part of the planning application provides an assessment of the proposed development against the policy context.

PLANNING APPLICATIONS AND EIA DEVELOPMENTS

1.9. The EIA Regulations require that, before consent is granted for certain types of development, an EIA must be undertaken. The EIA Regulations set out the types of development which must always be subject to an EIA (Schedule 1 development) and other developments which may require assessments if they give rise to significant environmental impacts (Schedule 2 development). The reporting of an EIA takes the form of an Environmental Statement (ES).

1.10. The proposed development has been screened by both the applicant and by RCBC who concur that the Installation meets the definition of a Schedule 1 EIA development.

1.11. The main objectives of the ES comprise, establishing the existing baseline environmental conditions and the sensitivity of receptors, identifying, predicting, and assessing the significance of the environmental impacts potentially caused by the development, determining mitigation and management measures, and identifying any residual significant effects once mitigation has been taken into account.

1.12. The following technical chapters have been included in the EIA, determined through the Scoping Stage by consultation with RCBC;

- Air Quality;
- Ecology and Nature Conservation;
- Flood Risk, Hydrology and Drainage;
- Landscape and Visual Impact;
- Waste Resources;
- Noise and Vibration;
- Greenhouse Gas and Climate Change; and
- Contaminated Land.

2. DESCRIPTION OF THE DEVELOPMENT

2.1. Planning permission is being sought for the establishment of a 3 line Lithium Hydroxide production plant utilising spodumene concentrate. The final product of the process is Battery Grade Lithium Hydroxide monohydrate with an option to produce approximately 10% of the total capacity as Battery Grade Lithium Carbonate.

2.2. The primary raw material of the Lithium Hydroxide plant is calcined spodumene concentrate with an option to also feed Technical Grade Lithium Carbonate to the process. The production capacity of the plant will be up to 75,000 tonnes per annum of Battery Grade Lithium Hydroxide monohydrate with an option to produce approximately 10% of the total capacity as Battery Grade Lithium Carbonate.

2.3. Further technical details of the facility are described in Chapter 5 – The Proposed Development.

2.4. The site location is shown in Figure 2.1 below.

Figure 2.1: Site Location

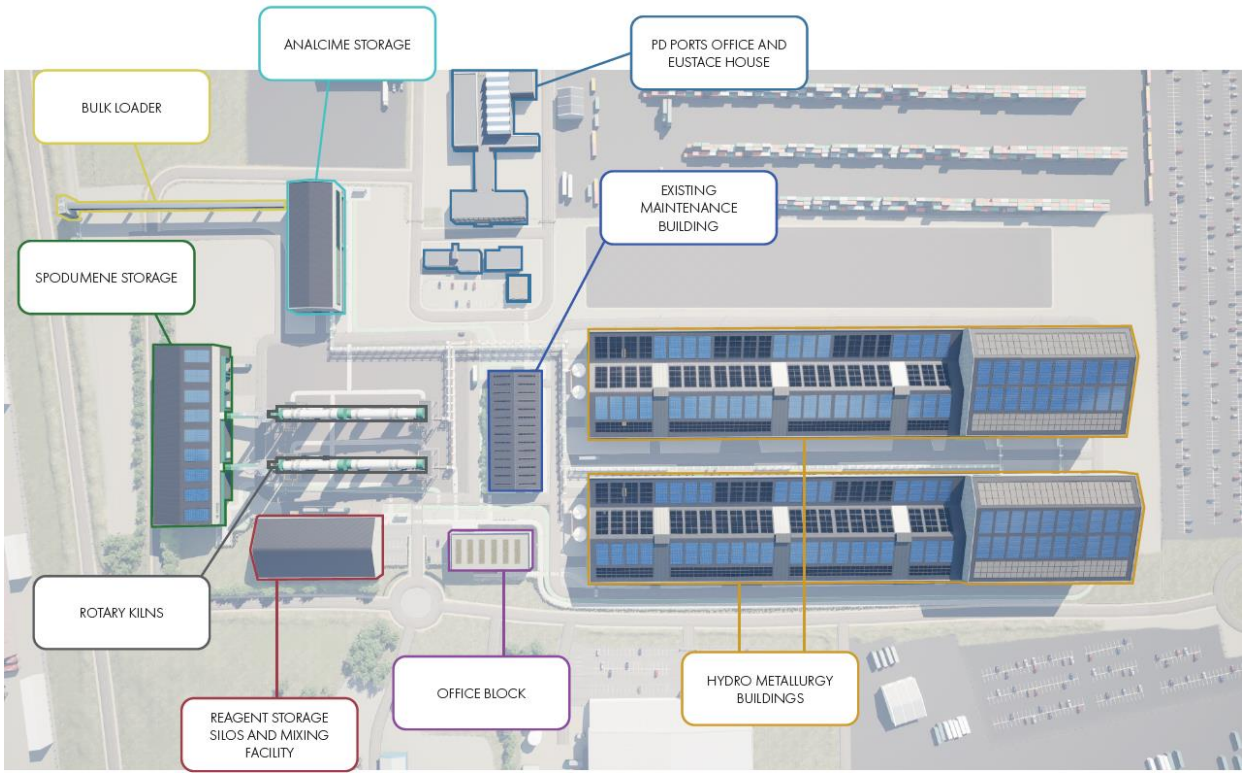

Figure 2.2: Model of site layout orientated East-West

2.5. A model of the site layout can be seen in Figure 2.2 below, showing the approximate layout of the site. The site is orientated North-South, with each of the three lines being identical to one another.

2.6. The south of the site sees storage areas for spodumene and analcime, the center of the site resides the office block area. The northern extent of the site sees the Hydro Metallurgy Buildings as well as product drying and packing areas.

2.7. The orientation of the site provides minimal visual harm to the wider area and allows seamless access to all parts of the site.

PROPOSED SCHEME

2.8. The principal components of the proposed development are described below.

- *Technology:* The use of Metso Outotec's proprietary technologies to refine fresh α-spodumene into Lithium Hydroxide Monohydrate, technology includes pressure leaching, conversion and ion exchange process stages.

- *Layout:* All plant and equipment will be located upon an impermeable concrete slab. Where appropriate, equipment and plant is housed within enclosed buildings. The site will be built as specified in the approved parameters plan.
- *Buildings:* The site will consist of buildings ranging between 25m to 45m in height.
- *Drainage:* The site uses a Zero Liquid Discharge process, meaning that there will no process effluent to controlled waters. Surface water runoff as well as foul sewage will be discharged to the existing drainage system, which further connects to Northumbrian Waters sewage connection.
- *Elevation of stack:* There will be fourteen stacks located onsite for the calcination rotary kiln, nitrogen gas scrubber, dryer, oxidiser stack and amine unit. These range between 30 – 38 m in height, in line with the proposed phasing and outline layout plans.

3. SITE SELECTION

SITE SELECTION AND ALTERNATIVES

3.1. The applicant has actively pursued a number of alternative site locations but has selected this site following consultation with the RCBC Sustainability Team and having regard to a series of practical and commercial considerations.

3.2. At feasibility stage the development team engaged with local land agents and major industrial landowners to explore land availability and suitability options across a broad range of physical, legal, and planning constraints.

3.3. The applicant has also assessed sites in Newcastler, Sunderland and in Scotland (Rosyth), as well as several other sites around Teesside.

3.4. An alternative location within Teesworks had been considered for this development, however, this location was unable to be pursued due to site constraints.

3.5. The proposed location, being allocated within the local plan as being suitable for industrial employment use and within the vicinity of the PD Ports, is considered suitable as it provides a suitable port for the international import of materials, as well as good access to the local highway for export of final product.

3.6. In concluding the development appraisal, the applicant site offers low potential negative environmental impact, sits within a supportive planning policy context, and offers a simple freehold legal interest when compared against the other sites being appraised.

3.7. The proposed development would be constructed within a largely undeveloped and underutilised area within PD Ports land holdings.

3.8. The Applicant has considered national and local planning policies which have been assessed and set out in the Planning Statement in support of this planning application. The proposals are compliant with the Development Plan.

3.9. The Site does not contain any designated ecological habitats, heritage features, landscapes, or sensitive views.

3.10. Due to the nature of the proposed development, there will be no direct impact to off-site habitats.

3.11. In summary the site was chosen to take advantage of the following:

- Presence in the Tees Valley Freeport, facilitating material flows from suppliers and products to customers in either the European Union or the UK;

- Geographic location providing localised end product to customers, de-risking shelf-life limits and enabling customer quality control/inspections;
- Enterprise Zone financial incentives;
- Resilient onsite power generation and supply including direct access to renewable, cost-competitive energy;
- Direct access to a major deep-water port and bulk freight terminals; and
- Presence of large-scale skilled and specialist workforce.

4. AIR QUALITY

4.1. The EIA provides an air quality assessment, which presents the potential effects and impacts of the Proposed Development. The potential impacts of the Proposed Development on local air quality during both the construction and operational phases have been assessed. For both phases, the type, source and significance of potential impacts are identified and the measures that should be employed to minimise these impacts are described.

4.2. The proposed development is in an area surrounded by a number of designated sites, most notably the Teesmouth Estuary, which has SPA, SSSI and RAMSAR designations approximately 0.5km north of the proposed site.

4.3. The scope of the assessment has been determined in the following way:

- Review of air quality data for the area surrounding the Site, including data from the Defra Air Quality Information Resource (UK-AIR);
- Desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- Review and modelling of emissions data which have been used as input to the ADMS Roads Extra dispersion modelling assessment.

4.4. In conclusion it was determined that due to the Site being situated in an existing industrial location, with no immediate nearby sensitive (residential) receptors. The construction works on site would represent a low risk to dust soiling and human health effects. However, with the proposed mitigation measures incorporated into a Construction Environmental Management Plan (CEMP), the residual impact would be negligible.

4.5. Detailed air quality modelling using the ADMS Roads Extra dispersion model has been undertaken to predict the impacts associated with stack emissions from the Proposed Development. The process contributions are assessed as negligible at all sensitive human receptor locations for all pollutants.

4.6. The impacts on nearby sensitive ecological habitat sites / Tees Estuary have been assessed through a Shadow Habitats Risk Assessment and have been assessed to be insignificant.

4.7. Further detailed air quality and habitats will be completed as part of the reserved matters application that accompanies each phase of the Proposed Development.

5. ECOLOGY

5.1. The EIA provides an Ecological Impact Assessment (EcIA) and presents the current ecological baseline at the application site (the Site) and informs a complete assessment of the potential effects of the scheme on those ecological features (including legally protected species) associated with the site.

5.2. The proposed development is in an area surrounded by a number of designated sites, most notably the Teesmouth Estuary, which has SPA, SSSI and RAMSAR designations approximately 0.5km north of the proposed site.

5.3. The Biodiversity Net Gain legislation which will be put into power in Q4 of 2023, calls for 10% net gain of any biodiversity present on a site, covered either on or off site. All of the sites biodiversity is seen at the southern tip, where habitats primarily consist of '*Other Neutral Grassland and Mixed scrub*'. The total HU's of the 8.10 ha area if calculated to be 47.48.

5.4. These are expected to be impacted by the proposed development, however, will be compensated for via both on site or off site measures. The development will also potentially impact a small area of breeding bird territories, and the loss of a population of Dingy Skipper of County importance.

5.5. A detailed design and mitigation proposal will be provided to the planning authority as part of the reserved matters application and will aim to avoid these losses, and if they cannot be mitigated, compensatory measures will be agreed to address any deficit.

6. FLOOD RISK, HYDROLOGY AND DRAINAGE

6.1. This Chapter assesses the likely significant effects of the proposed development on the environment with regard to water quality, water resources and flood risk. In particular, it considers the likely significant effects of the construction and operational phases of external flood risk from fluvial, surface water and groundwater impacting the Site and surrounding area, the increase in surface water runoff rates from the development, the potential for groundwater interruption and the increase in water demand and foul drainage demand.

6.2. The potential effects of the proposed development on water resources are scoped out of this assessment due to the lack of active surface water and groundwater abstractions within a 2 km radius of the Site.

6.3. A Zero Liquid Discharge system is planned for use in the process, meaning that there will no process effluent discharged to controlled waters from the plant. Showing that the only material discharged to controlled waters will be foul effluent. This will be released to existing sewage network at the site, eventually connecting to Northumbrian Water, under an approved proposed discharge consent.

6.4. This assessment has therefore considered the potential effects of the proposed development on Water Quality and Flood Risk. The key considerations are the potential effects on water quality, water supply, infrastructure, flood risk and surface water drainage.

6.5. The plant has been designed with a sealed drainage system fitted with pollution prevention measures that ensures that all discharges to controlled waters are protected from uncontrolled contaminants.

6.6. All identified potential construction and operational effects of the proposed development has been assessed, given the location and nature of the receptors, the overall residual effects of the proposed development with regard to water quality, water resources and flood risk is considered to be **Negligible** for both construction and operational phases.

7. LANDSCAPE AND VISUAL IMPACT

7.1. This chapter has been produced by Tyler Grange Group Ltd to assess the likely significant effects of the Proposed Development in terms of Townscape and Views in the context of the Site and the surrounding area. In particular, it considers the likely significant effects on the character and features of the townscape; and on people's views and visual amenity within the Study Area.

7.2. During the 1950s, the land was reclaimed using slag from the Pig Iron processing facility. The northern part of the Site became a refinery tank farm (occupied by Shell Oil in 1968), although has since been cleared and capped with permeable tarmac after its closure as a refinery in 1989. The southern portion of the Site, formerly used for railing sidings and storage, has been cleared and remains undeveloped.

7.3. The landscape and visual impact assessment has conservatively modelled and assessed the impacts of the proposed scheme assuming the large potential buildings will be constructed and that all 3 lithium production lines will be developed.

7.4. Based on the above assessment, the following additional mitigation has been proposed as part of the Landscape Strategy Plan:

- Tree-lined streets and trees added to areas of open space to add visual interest and support SuDS measures within the Proposed Development;
- Avoidance of overly reflective materials to avoid glare or adverse visual effects;
- Inclusion of appropriate building cladding to assimilate into the surrounding context;
- Articulation and orientation of buildings to be consistent with that of the surrounding context; and
- The selection of building materials and colour schemes that align with the approved Teesside industrial palette.

7.5. No significant residual townscape or visual effects are predicted.

7.6. No significant residual townscape or visual effects are predicted.

7.7. It is proposed that each phase of the development will be accompanied with a set of detailed planning drawings, revised landscape strategy and updated LVIA (if required).

8. WASTE RESOURCES

8.1. The Proposed Development will process up to 510,000 tonnes of spodumene each year, to result in the final production of up to 75,000 tonnes of Lithium Hydroxide Monohydrate, this process produces minimal waste.

8.2. The EIA included an assessment of the generation of wastes from the proposed development and the capacity of existing facilities to manage them.

8.3. During construction, the largest waste stream will be surplus excavated soil/soils not suitable for reuse; these will be minimised where possible. Sustainable solutions will be implemented to enable, as far as reasonable, the reuse of waste materials and avoidance of landfill disposal. Other waste streams generated during the construction phase will be managed in accordance with the waste hierarchy and, where necessary, recycled and/or disposed of off-site.

8.4. During each phase of construction, site waste management activities will be controlled and managed through a dedicated Site Waste Management Plan and form part of a wider Construction Environmental Management Plan (CEMP).

8.5. In the operational phase, the plant's largest waste stream (estimated at circa 714,000 tonnes per annum based on input of 510,000 tonnes per annum) will be analcime sand. All analcime produced by the refinery will be tested for composition and exported off site as secondary aggregate materials.

8.6. The analcime sand by-product materials will be removed off-site for direct use in the aggregate industry.

8.7. The main waste water stream once the site is operational will be sanitary, and site washdown water from the bin cleaning facilities. Any liquids that are arising that cannot be disposed of to sewer will be removed by specialist contractor and treated off site. The operation will employ a Zero Liquid Discharge process, meaning there will be no process effluent arising from the proposed development.

8.8. All operational wastes associated with the process will be controlled and regulated as part of the sites EPR Permit.

8.9. The impacts of the proposed development are therefore considered to be **Negligible** in terms of waste management.

8.10. A detailed CEMP and associated SWMP will be produced as part of each phase of the Proposed Development.

9. NOISE AND VIBRATION

9.1. This chapter has considered the potential impact of noise and vibration generated during the construction phases and identified threshold limits for proposed fixed plant items pertaining to the proposed development.

EFFECT DURING CONSTRUCTION PHASE: SHORT TO MEDIUM TERM

9.2. The appraisal of noise and vibration levels associated with construction activities indicates that there is low likelihood of noise impacts associated with construction activities. Negligible effects are calculated during all construction activities.

EFFECT DURING OPERATIONAL PHASE: LONG TERM

9.3. All plant items will be specified such that rating levels at the nearest residential receptors fall below the adopted limits, such that the resulting effect is Negligible. Such consideration will be undertaken during the progression of the detailed design.

9.4. All operational noise emissions resulting from the plant will be regulated as part of the sites EPR Permit and be controlled through a detailed noise mitigation plan (NMP).

MITIGATION

9.5. Measures to limit noise emissions will be included within a CEMP which will be agreed with the local authority.

9.6. Effects from fixed plant would be negligible following specification and assessment of proposed plant items. Mitigation options will be specified, as appropriate, during the progression of the detailed design.

SUMMARY OF EFFECTS

9.7. The impact of noise and vibration during construction activities has been calculated and assessed in accordance with BS 5228. Generic mitigation measures have been recommended, which when implemented are capable of ensuring that the impact of noise and vibration during construction activities is adequately controlled such that calculated effects remain Negligible.

9.8. Proposed plant items will be specified such that the likelihood of impacts is low. The resultant effect is considered to be Negligible.

10. CLIMATE CHANGE & CARBON

10.1. This chapter has considered the potential impact of the proposed development will have on the Climate Change from the associated carbon emissions. A Life Cycle Assessment has been conducted to calculate the expected annual carbon emissions to produce the final product during the proposed plants operation, in comparison to the current process Greenhouse Gas (GHG) emissions.

EFFECT DURING CONSTRUCTION & OPERATION

10.2. The development of a regional LMH Production facility would deliver carbon benefits over the current management method (baseline scenario) involving the transport of Australian-sourced[1] spodumene to a traditional Lithium refinery.

10.3. Construction impacts shall be considered in the design of the plant and selection of materials during procurement. Although the climate impacts of construction have not been directly assessed in this chapter, it is expected that the carbon savings and benefits from operating the proposed plant will offset these impacts.

MITIGATION

10.4. There are plans to transition the operational phase of the development from natural gas to utilise both hydrogen and renewable electrical supplies, meaning the process would have a further reduced carbon output.

10.5. Additional carbon reductions from the manufacture of usable aggregate by-products (analcime sands) further reduce operational GHG emissions in relation to waste products.

10.6. Mitigation measures to reduce the Construction phase GHG emissions will be confirmed as procurement policy develops; these may include where technically feasible the uptake of battery and fuel cell vehicles and plant and the substitution of virgin bulk materials with those with a higher recycled content.

SUMMARY

1 Australia is considered to be the 'reasonable worst case' scenario.

10.7. The impact of the resulting GHG emissions from the project are considered to be Beneficial, as the results of the Life Cycle Assessment demonstrate that the project will achieve the definition provided by Institute of Environmental Management and Assessment (IEMA).

10.8. The project's GHG impacts cause a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the baseline scenario. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

11. CONTAMINATED LAND

11.1. This chapter discusses the historical and current use of the Site with respect to contaminated land and the underlying geology and hydrogeology and the development of the Proposed Development. This chapter details the objectives, methodology and findings of a Phase 1 desk-based environmental review and considers the potential constraints as a result of contamination at the Site associated with the Proposed Development.

POTENTIAL CONTAMINATION

11.2. The Conceptual Site Model and preliminary risk assessment has identified potential sources of contamination associated with the historical land use and the presence of Made Ground within the site. The preliminary risk assessment identified 24 potentially unacceptable pre-existing contaminant linkages representing Moderate or higher risks to receptors that are related to the onsite historical land use. In addition, 12 potentially unacceptable contaminant linkages were identified in association with potential offsite sources of contamination.

MITIGATION

11.3. Further ground investigation is required in order to characterise the potential contamination and groundwater as well as ground gas regimes beneath the site.

SUMMARY

11.4. The overall effect of the scheme is generally positive and will bring about effective land remediation and will minimise further leaching/mobilisation of residual soil and groundwater contamination located at depth.

12. CONCLUSIONS

12.1. In summary the ES concludes that the Proposed Development has an overall negligible effect, when the proposed mitigation is put in place that is specified throughout this Environmental Statement.

12.2. None of the specified areas of interest have shown a specific issue, with full detail being provided in the Full Planning Application submitted at a later date. It is confirmed that the Proposed Development will comply with all national limits for the various Chapters.