REPORT

NEW HOPE COAL AUSTRALIA
ABN 90 081 022 380

New Acland Coal Mine

Operations and Monitoring Plan (OMP) for Regulated Structures

(2022 – 2027)

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TAILINGS.WATER.WASTE.

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OVERVIEW – REGULATED STRUCTURES OPERATIONS AND MANAGEMENT PLAN

Purpose of Document

This Operations and Monitoring Plan (referred to herein as the OMP) has been prepared on behalf of New Acland Coal (NAC) as the basis for operation and ongoing management and monitoring of regulated structures at the New Acland Coal Mine. The document describes the obligations of the operator with respect to acceptable standards for operation specifically of IPT3 as the only regulated structure associated with the New Acland operation. The OMP provides the basis for maintaining long term integrity and operating effectiveness of IPT3, being used to inform and train operational staff in matters related to management of the facility and the upkeep of appropriate operating records.

Specifically, the purpose of the OMP is as follows:

- to provide relevant background to IPT3, relating to specific regulatory requirements and performance expectations;
- to identify the principal components of IPT3 for the purpose of deposition and safe storage of tailings, describing the contribution of these components to effective system operation;
- to provide general guidelines for tailings deposition and associated water management/recovery practices, so developed to facilitate efficient storage utilisation and to enable timely rehabilitation after storage capacity has been reached; and
- to outline minimum inspection and monitoring requirements for IPT3

OMP Application

A Regulated Dam (or Structure) is defined in the *Manual for assessing consequence categories and hydraulic performance of structures* (Department of Environment and Science, 2016) as possessing a SIGNIFICANT or HIGH consequence category.

The consequence category for IPT3 is SIGNIFICANT, therefore is classified as regulated. All other structures within the New Acland site possess consequence categories of LOW, with the majority of these structures having been rehabilitated, or in an advance stage of rehabilitation with no available storage capacity.

This OMP has therefore been prepared and applies specifically to IPT3.

Reviews and Updates

The effective life of the OMP is summarised as follows:

- Operating Phase — 1 November 2022 extending to 1 November 2024, being the nominal period adopted for completion of tailings deposition into IPT3 based on a remaining operating period of 2 years. (*Although a later date for completion of filling into IPT3 may be achieved subject to actual mine production and tailings storage efficiencies achieved.)*
- Post-Closure Phase — 1 November 2024 to 1 November 2027 (being subject to the above), being the period expected for decommissioning of IPT3, and completion of effective closure and rehabilitation works.

The OMP is a working document, with the operating and monitoring practices as outlined subject to periodic review and updating to reflect modifications to the conditions on which the document is based. The timing for such updates includes, but is not necessarily limited to the following:

- Development/construction of any additional regulated structures as part of the operation.
- Alteration (either increase or decrease) of the capacity of any regulated structure covered by the OMP, by change in operational status, increased footprint or storage height.
- A significant incident with respect to the operation and/or performance of any regulated structure.

- A significant change to the Environmental Authority for the New Acland operation, or conditions contained therein, as related to regulated structures.

Notwithstanding these conditions, review and updating of the OMP should be undertaken as a minimum requirement on filling of IPT3, in preparation for the post-closure phase of this facility.

Compliance Checklist

The New Acland Coal Mine operates under Environmental Authority (EA) Permit No EPML00335713, with the effective date for the EA version on which this OMP being 26 August 2022. This version of the EA covers Stage 3 development of the New Acland project.

A summary of specific EA requirements related to the design, construction, operation and closure of IPT3 is provided in **Table ES1**. This table also provides references to the section of this OMP addressing EA requirements.

TABLE ES1: EA COMPLIANCE CHECKLIST FOR REGULATED STRUCTURES

Aspect	EA Reference	Operations and Management Approach	OMP Reference
Regulated Dams	J1	The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for Assessing Categories and Hydraulic Performance of Structures (EM635) at the following times: a) prior to the design and construction of the structure, if it is not an existing structure; or b) if it is an existing structure, prior to the adoption of this schedule; or prior to any change in its purpose or the nature of its stored contents.	Overview Section (Consequence Category not addressed in the OMP)
	J2	A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence for more than one structure.	
	J3	Certification must be provided by the suitably qualified and experienced person who undertook the assessment	
Operation	J11	For existing structures that are regulated structures: a) <N/A>; and b) there must be a current operational plan for the existing structures	Whole document
	J12	Each regulated structure must be maintained and operated for the duration of its operational life until decommissioned and rehabilitated in a manner that is consistent with the current operational plan and if applicable the current design plan and associated certified 'as constructed' drawings	Whole document (Refer Condition J29 related to rehabilitation))
Mandatory Reporting Level (MRL)	J16	The Mandatory Reporting Level (MRL) must be marked on a regulated dam in such a way that	Sections 5.2.2, 6.2.6 and 6.3.5

Aspect	EA Reference	Operations and Management Approach	OMP Reference
		during routine inspections of the dam it is clearly observable.	
	J17	The environmental authority holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.	Sections 7.1.1 and 7.2.1
	J18	The environmental authority holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence on any unauthorised discharges from the regulated dam.	Emergency response not addressed in the OMP
	J19	The environmental authority holder must record any changes to the MRL in the Register of Regulated Structures.	Sections 6.2.6 and 6.3.5
Design Storage Allowance (DSA)	J20	The environmental authority holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.	Section 7
	J21	By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume) to meet the DSA volume of the dam (or network of linked containment systems).	Section 5.2.1, 6.2.6, 6.3.5, 7.1.4
	J22	The environmental authority holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated dam (or network of linked containment system) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.	Section 7.1.4
	J23	The environmental authority holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.	
Annual Inspection Report	J24	Each regulated structure must be inspected each calendar year by a suitably qualified and experienced person.	Section 7.1.4
	J25	At each inspection the condition and adequacy of all components of the regulated structure must be assessed and a suitably qualified and experienced person must prepare an annual inspection report containing details of the	

Aspect	EA Reference	Operations and Management Approach	OMP Reference
		assessment and include recommended actions to ensure the integrity of the regulated structure.	
	J26	The suitably qualified and experienced person who prepared the annual inspection report must certify the report in accordance with the Manual for Assessing Consequence Categories and Hydraulic Performance of Structures (EM635).	
	J27	The environmental authority holder must: a) Within twenty (20) business days of receipt of the annual inspection report provide to the administering authority: (i) the recommendation section of the annual inspection report; and (ii) if applicable, any actions being taken in response to those recommendations; and b) If, following receipt of the recommendations and (if applicable) actions, the administering authority requests a full copy of the annual inspection report from the environmental authority holder, provide this information to the administering authority within ten (10) business days of receipt of the request.	
Decommissioning and Rehabilitation	J29	Dams must not be abandoned but be either: a) decommissioned and rehabilitated to achieve compliance with condition J30; or b) be left in-situ for a beneficial use(s) provided that: (i) it no longer contains contaminants that will migrate into the environment; and (ii) it contains water of a quality that is demonstrated to be suitable for the intended beneficial use(s); and (iii) the administrating authority, the environmental authority holder and the landholder agree in writing that the dam will be used by the landholder following cessation of the resource activity.	Section 4.3
Regulated Structures	J30	After decommissioning, all significantly disturbed land caused by carrying out of the resource activity must be rehabilitated to meet the final acceptance criteria: a) the landform is safe for humans and fauna;	Section 4.3

Aspect	EA Reference	Operations and Management Approach	OMP Reference
		b) the landform is stable with no subsidence of erosion gullies for at least three (3) years; c) any contaminated land (e.g., contaminated soils) is remediated and rehabilitated; d) not allowing for acid mine drainage; or e) there is no ongoing contamination to waters (including groundwater); f) all significantly disturbed land is reinstated *as required;* g) for land that is not being cultivated by the landholder: (i) groundcover, that is not a declared pest species is established and self-sustaining; (ii) vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining; and (iii) the maintenance requirements for rehabilitated land are no greater than that required for the land prior to its disturbance caused by carrying out of the resource activity. h) for land that is cultivated by the landowner, cover crop is revegetated, unless the landholder will be preparing the site for cropping within three (3) months of resource activities being completed.	
Register of Regulated Structures	J31	A Register of Regulated Structures must be established and maintained by the environmental authority holder for each regulated structure	Not addressed in the OMP
	J34	The environmental authority holder must ensure that the information contained in the Register of Regulated Structures is current and complete on any given day	
	J35	All entries in the Register of Regulated Structures must be approved by the Chief Executive Officer for the environmental authority holder, or the delegate, as being accurate and correct.	
	J36	The environmental authority must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format as required by the administering authority	

Document Structure

The OMP is structured as follows:

Section 1.0: Provides project background and lists relevant approvals requirements and technical references.

Section 2.0: Describes the site characteristics that influence IPT3 design and operations, specifically geological and hydrogeological conditions.

Section 3.0: Provides tailings production and describes tailings characteristics.

Section 4.0: Describes the key components and current status of IPT3, as well as operating systems associated with this facility, developed in accordance with general development and operating criteria as outlined in **Section 2.0**. Principles for closure and rehabilitation of IPT3 are also described.

Section 5.0: Outlines the operating principles and objectives related to the facility aligned to regulatory constraints/approvals conditions. These constraints relate specifically to Design Storage Allowance, Mandatory Reporting Level and Emergency Spillway requirements.

Section 6.0: Presents procedures for operation of the IPT3 storage.

Section 7.0: Outlines inspection and monitoring requirements to be implemented.

A series of figures, diagrams and photos are also included to show the layout and relevant components of IPT3.

CONTENTS

TABLES

PHOTOS

DIAGRAMS

FIGURES

1 INTRODUCTION

1.1 Background

New Acland Coal Mine is an open cut mining and processing project owned and operated by New Acland Coal Pty Ltd (NAC), a wholly owned subsidiary of New Hope Group Pty Ltd. The New Acland mine site is located approximately 15km northeast of the Jondaryan township, in southern Queensland. Site locality and general site layout details are shown on **Figure 1**.

The New Acland coal mining operation accesses economic coal measures of the Surat Basin. Mining commenced on the project in 2002, following acquisition of the site from Shell Coal Australia Pty Ltd. Mining occurs within four pits, located within 2 mining leases (ML50170 and ML 50216) covering a total area of some 2,278ha.

Open-cut mining utilises conventional truck and shovel methods. ROM coal is washed though the coal handling and processing plant (CHPP), located within the mining lease. This product is railed to the Port of Brisbane, some 250km to the east.

Water used in processing and other activities around the operation is sourced from rainfall collected from active mining and processing areas, which is supplemented by treated wastewater pumped into the site from the Wetalla sewage treatment plant. Other sources include return water from other active mine areas.

Two waste streams are generated from the CHPP; coarse reject (material >2mm size), and fine reject or tailings (<2mm size). Coarse reject is co-disposed in-pit, with tailings pumped to dedicated in-pit tailings storages.

The operational facility for deposition of tailings associated with the New Acland Project, within the context of this Operations and Management Plan (referred to herein as the OMP), is In-Pit Tailings Dam 3 (IPT3).

1.2 Basis of Operations and Management Plan

1.2.1 Environmental Authority

The New Acland Coal Mine operates under Environmental Authority (EA) Permit No EPML00335713, with the effective date for the EA version on which this OMP is based being 26 August 2022. This version of the EA covers Stage 3 development of the New Acland project.

Conditions of the EA related to the Operations and Management Plan (OMP) for IPT3 are listed in **TABLE 1**.

TABLE 1: EA COMPLIANCE CHECKLIST FOR OPERATIONS AND MANAGEMENT PLAN

Aspect	EA Reference	Operations and Management Approach
Regulated Dams	J1	The consequence category of any structure must be assessed by a suitably qualified and experienced person in accordance with the Manual for Assessing Categories and Hydraulic Performance of Structures (EM635) at the following times: a) prior to the design and construction of the structure, if it is not an existing structure; or b) if it is an existing structure, prior to the adoption of this schedule; or a) prior to any change in its purpose or the nature of its stored contents.
	J2	A consequence assessment report and certification must be prepared for each structure assessed and the report may include a consequence for more than one structure.
	J3	Certification must be provided by the suitably qualified and experienced person who undertook the assessment
Operation	J11	For existing structures that are regulated structures: a) <N/A>; and b) there must be a current operational plan for the existing structures
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Mandatory Reporting Level (MRL)	J16	The Mandatory Reporting Level (MRL) must be marked on a regulated dam in such a way that during routine inspections of the dam it is clearly observable.
	J17	The environmental authority holder must, as soon as practical and within forty-eight (48) hours of becoming aware, notify the administering authority when the level of the contents of a regulated dam reaches the MRL.
	J18	The environmental authority holder must, immediately on becoming aware that the MRL has been reached, act to prevent the occurrence on any unauthorised discharges from the regulated dam.
	J19	The environmental authority holder must record any changes to the MRL in the Register of Regulated Structures.
Design Storage Allowance (DSA)	J20	The environmental authority holder must assess the performance of each regulated dam or linked containment system over the preceding November to May period based on actual observations of the available storage in each regulated dam or linked containment system taken prior to 1 July of each year.
	J21	By 1 November of each year, storage capacity must be available in each regulated dam (or network of linked containment systems with a shared DSA volume) to meet the DSA volume of the dam (or network of linked containment systems).
	J22	The environmental authority holder must, as soon as possible and within forty-eight (48) hours of becoming aware that the regulated

Aspect	EA Reference	Operations and Management Approach
		dam (or network of linked containment system) will not have the available storage to meet the DSA volume on 1 November of any year, notify the administering authority.
	J23	The environmental authority holder must, immediately on becoming aware that a regulated dam (or network of linked containment systems) will not have the available storage to meet the DSA volume on 1 November of any year, act to prevent the occurrence of any unauthorised discharge from the regulated dam or linked containment systems.
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Regulated Structures	J30	After decommissioning, all significantly disturbed land caused by carrying out of the resource activity must be rehabilitated to meet the final acceptance criteria: a) the landform is safe for humans and fauna;

Aspect	EA Reference	Operations and Management Approach
		b) the landform is stable with no subsidence of erosion gullies for at least three (3) years; c) any contaminated land (e.g., contaminated soils) is remediated and rehabilitated; d) not allowing for acid mine drainage; or e) there is no ongoing contamination to waters (including groundwater); f) all significantly disturbed land is reinstated *as required;* g) for land that is not being cultivated by the landholder: (i) groundcover, that is not a declared pest species is established and self-sustaining; (ii) vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining; and (iii) the maintenance requirements for rehabilitated land are no greater than that required for the land prior to its disturbance caused by carrying out of the resource activity. h) for land that is cultivated by the landowner, cover crop is revegetated, unless the landholder will be preparing the site for cropping within three (3) months of resource activities being completed.
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	J36	The environmental authority must, at the same time as providing the annual return, supply to the administering authority a copy of the records contained in the Register of Regulated Structures, in the electronic format as required by the administering authority

1.2.2 Reference Documentation

The key reference documents, supporting compliance with the EA and on which the principles of the OMP are based includes the following:

- *Manual for assessing consequence categories and hydraulic performance of structures* (DES, 2016) **[2]**
- *Guidelines on Tailings Dams – Planning, Design, Construction, Operation and Closure*, Revision 1, July 2019 (ANCOLD, 2019) **[1]**.

2 SETTING

The following sections describe aspects of the New Acland mine site that are relevant to IPT3.

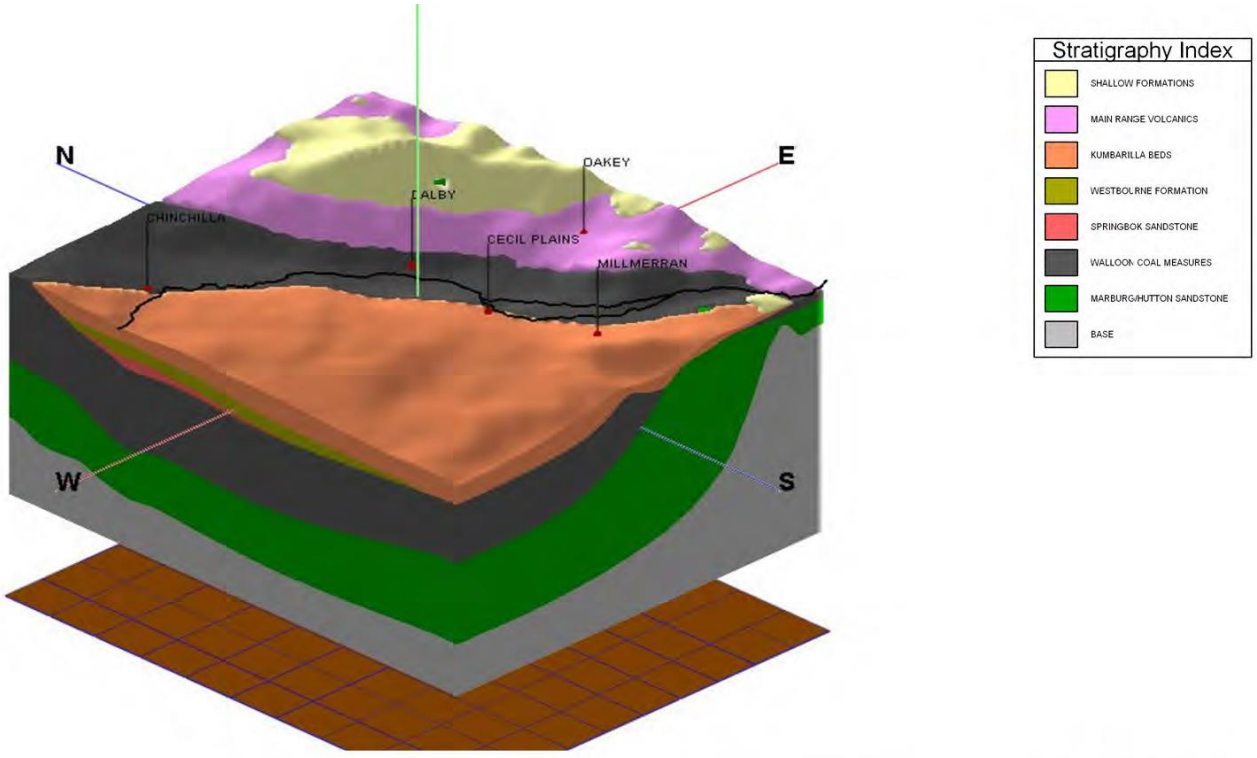
2.1 Geology

2.1.1 Regional Setting

Maps from the Geological Survey of Queensland indicates that the region in which the New Acland Coal Mine site is located is underlain with soils and rocks of the Surat Basin. The Surat Basin occupies an area of approximately 300,000 square kilometres, extending from the southern part of central southern Queensland to central northern NSW. Early deposition comprised mostly fluvial (river) and lake-bed deposition followed by coal swamp environments, except in the north where sedimentation continued. Fluvial deposition then occurred again and continued until a period of relative sea level drop occurred, depositing near-shore and marine sediments. The subsequent regression caused a fairly abrupt return to fluvial, lakebed and marshy conditions before sedimentation ceased.

As a result of the depositional conditions and subsequent geological history, the basin sediments lithified to form a succession of sedimentary rocks including mudstone, siltstone, sandstone and conglomerate. Some recent volcanic rock (basalt) is also present. The basins have also accumulated numerous deposits of coal, hydrocarbons and associated gas. These sediments have subsequently been overlain in areas by tertiary and quaternary sediments. A typical regional stratigraphic is shown in **DIAGRAM 1**.

DIAGRAM 1: TYPICAL REGIONAL STRATIGRAPHIC



2.1.2 Local Geology

The Walloon Coal Measures are predominant within the local area, being laterally continuous across the Surat Basin.

The major coal bearing unit within the New Acland mine site is the Acland-Sabine Sequence, occurring as the lower coal bearing unit of the Walloon Coal Measures. This sequence typically

comprises 20 to 30 m of alternating coal and non-coal rocks of which approximately half comprises coal.

Tertiary Basalts unconformably overlie the Walloon Coal Measures in some areas of the site. The Tertiary age was a period of intense volcanic activity during which basalt flows infilled depressions within the surface. Basalt filled paleo-channels occur within the north-western and southern margins of the site. In addition, Quaternary age alluvium is associated with present day natural drainage channels.

It is noted that insitu sequences exposed within highwalls forming the IPT3 containment area are formed generally by sandstone, siltstones and shales of the Walloon Coal Measures. Excavated materials from this formation, derived from mining, have been used to construct IPT3 embankments.

2.2 Hydrogeological Setting around IPT3

2.2.1 Structural Geology

Faulting influences hydrogeological setting and general groundwater occurrence.

Mapping of geological structure within the IPT3 area was undertaken as part of mine development, which has indicated two main development trends, from northeast-southwest and northwest-southeast. Fault mapping in the IPT3 footprint is shown on **DIAGRAM 2,** which shows that the alignment of the F5 fault, being the most significant mapped within this portion of the mining area. This fault is down thrust on the south-eastern side of the area, with displacement of up to 45m.

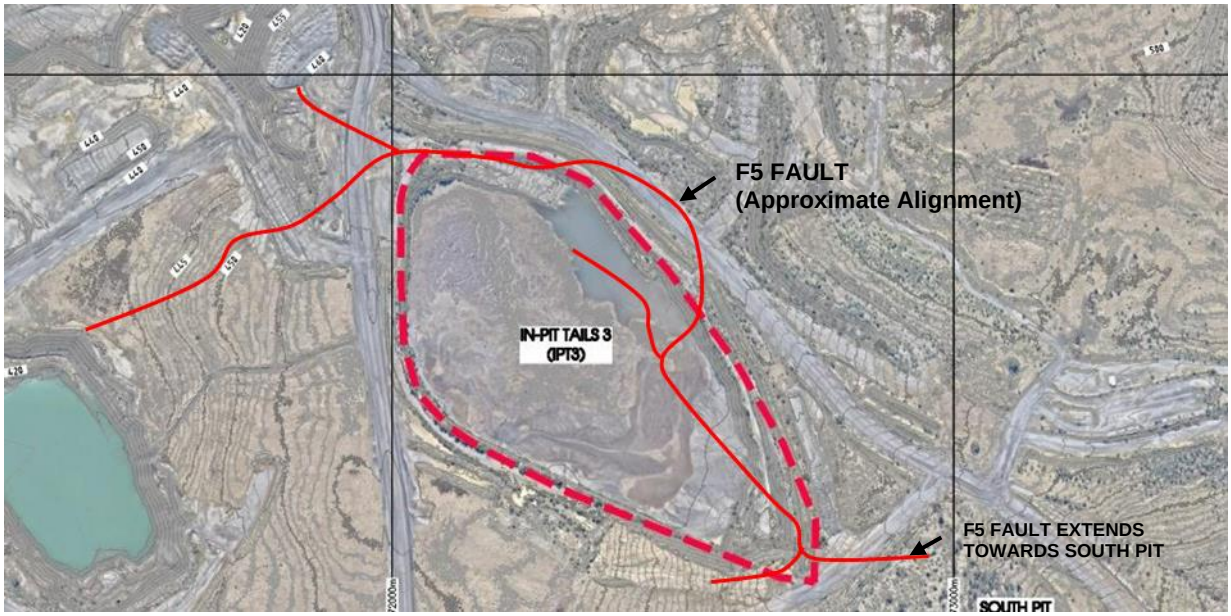
The F5 fault intersects the IPT3 containment area as follows:

- General intersection along the north-eastern portion of the containment area, coinciding with a change in floor height as displacement within the coal sequence occurs; and
- Intersection with the eastern high wall, near to the southern abutment of the IPT3 embankment.

It is understood that the F5 fault extends further to the south-east, eventually subcropping within the South Pit. It is noted however that this fault does not intersect the storage embankment, which is formed across the south-western portion of the area.

Several other minor faults have been mapped, although with minimal displacement and therefore not considered to be of significance with respect to any of the in-pit storages.

DIAGRAM 2: MAJOR FAULTS WITHIN THE AREA OF THE IPT3 STORAGE AREA



2.2.2 Groundwater Occurrence

Five different aquifers occur within or proximal to the New Acland Coal Mine site as following:

- Quaternary Alluvial Aquifer

  The Quaternary Alluvial aquifer is located within the Quaternary Alluvium which consists of clay, silt, sand and gravel deposited by creeks and rivers. The Quaternary Alluvium is limited in extent. The nearest alluvium with significant groundwater supplies is associated with Oakey Creek approximately 15 km southeast of Acland Township. This aquifer may exist in association with Lagoon Creek.

- Tertiary Basalt Aquifer

  The Tertiary Basalt aquifer consists of olivine basalts and varies in thickness from 1 m to 90 m. The Tertiary Basalt aquifer is interbedded with clay which has the potential to act as an aquitard within the Tertiary Basalt. There is a minor outcrop of the Tertiary Basalt aquifer in the northern section of the mine site.

- Walloon Coal Measures Aquifer

  The Walloon Coal Measures aquifer consists of shale, siltstone, carbonaceous mudstone, minor sandstone and coal layers. This geological unit outcrops over much of the mine site with the coal seams being the principal conduit for groundwater.

- Marburg Sandstone Aquifer

  The Marburg Sandstone aquifer consists of sandstone, minor coal and conglomerate rock types. These water bearing units are interbedded with less permeable rock units such as mudstone, siltstone and shale. The Marburg Sandstone aquifer is a confined aquifer which occurs at a depth of approximately 150 m below ground level within the site. Aquitards within the Walloon Coal Measures act as effective confining layers for the Marburg Sandstone aquifer.

- Helidon Sandstone Aquifer

  The Helidon Sandstone aquifer is the deepest aquifer underlying the mine site and underlies the Marburg Sandstone Aquifer. This aquifer is extensive within the Cecil Plains Sub-Basin and has been divided into two sub-aquifers. The upper aquifer consists of interbedded shale and sandstone. The lower section is made up of fine to very coarse quartz sandstone. Groundwater occurs within a confined, primary porosity aquifer and is isolated from the overlying aquifers by the relatively impermeable Evergreen Formation.

In general, groundwater aquifers of significance within the region (e.g., the Marburg Sandstone and Helidon Sandstone aquifers) are hosted within sandstone units located at significant depths and vertically separated from the zone of mining by a substantial thickness of fine-grained sedimentary rocks, acting as aquitards.

The sequences accessed during mining (Walloon Coal Measures) form a poor aquifer system. The only notable groundwater quantities are hosted within the coal seams themselves, although with groundwater yields being very low and with saline water quality. It is possible that cross-faulting that intersects coal seams along with coal seam bedding provide low-capacity groundwater flow conduits, as secondary porosity.

In relation to the IPT3 storage area, other than minor flows of groundwater from intersected coal seams, no evidence of groundwater occurrence exists. A potential however for lateral migration of tailings water moving out of the storage area is recognised, which may have connection to local, upper sequence groundwater aquifers (such as coal seams). In this case, the F5 fault exists as a potential preferential flow pathway, as the deposition of tailings into the IPT3 storage rises and the pressure head against the fault zone increases. The South Pit (located to the south-east of IPT3) is the likely receiving environment. The very low capacity of this fault and associated geological structure is such that the risk that seepage from IPT3 to the South Pit is very low, particularly as the South Pit continues to be backfilled.

In summary, the risk of groundwater impacts, in terms of seepage of tailings water from IPT3, is low, with the risk of potential degradation of any sensitive environments (either surface water or groundwater) beyond the New Acland mine site boundary being very low.

3 TAILINGS PRODUCTION AND TAILINGS CHARACTERISTICS

3.1 Mine Production

The New Acland Coal Mine completed operation under the past EA, which addressed Stage 2 project development, in 2022. Stage 3 approvals were confirmed in October 2022, with production to recommence in 2023. NAC has indicated that tailings deposition into IPT3 will continue around August 2023, although it is recognised that this date may vary subject to completion of start-up commitments/needs.

Based on EA, the maximum Stage 3 production rate is 5 Mtpa (million tonnes per annum) of product coal, from a maximum mining rate of 7.5 Mtpa ROM coal over a project life of approximately 12 years. NAC has indicated that the nominal ROM coal production rate will be 5.1 Mtpa, with a yield of around 50%, which are within the EA requirement.

3.2 Tailings Production

Both coarse reject and fine reject (tailings) will continue to be produced through the CHPP during Stage 3. Rejects production rates as a proportion of total ROM coal feed to the plant are understood to be as follows:

- Coarse Reject — Approximately 35%
- Fine Reject (Tailings) — Approximately 15%

Based on a ROM coal mining rate of 5.1 Mtpa, a baseline tailings production rate of 0.75 (dry) Mtpa can be expected. It is likely that ramp up to this production rate will occur over a period following project recommencement.

Tailings under this Stage 3 condition will be deposited into IPT3 until such time as the storage reaches capacity.

3.3 Tailings Characteristics

A range of tailings/slurry characteristics and behaviours for the New Acland tailings stream are summarised below.

- Grading — Typically, p_{80} less than 100µm
- Constituents/ Geotechnical Classification — Typically, carbonaceous reject, fine soil (clay) and ground sandstone/siltstone.

  Geotechnically, the tailings would be characterised as a CLAYEY SILT of low plasticity.
- Slurry Density/Solids Concentration — 30% (wt/wt) as underflow from the tailings thickener
- Specific Gravity — Estimated to be 1.8 t/m^3, based on coal SG of 1.5t/m^3 and sandstone/siltstone SG of between 2.3 and 2.6t/m^3.
- Slurry Treatment — With the application of pipe head flocculation (i.e., at the point of discharge of tailings slurry), the objective is to increase the rate of solids settlement and improved supernatant water clarity.

  An estimate from NAC is that a solids concentration of 50 to 60% (wt/wt) is achieved at the point of discharge as a result of flocculation.

- Depositional Behaviour/ Tailings Densities

  As a result of flocculation, rapid segregation between solids and liquor, is achieved, with deposition of solids to the beach and drainage of supernatant to the decant area. It is understood that the supernatant is substantially clarified.

  Beach densities are controlled by the mineralogy of the tailings material, being dominated by coal rejects, which possess a low SG. This is despite the use of flocculation. The tailings mass is very fine grained and therefore retains high water content and is of low permeability. Subject to self-weight consolidation under the mass of the beach, achievable in-storage densities of the order of 1.0t/m^3 (average across the storage) are considered achievable. Such densities may increase with exposure to air-drying.

  An average in-storage dry density for tailings of 1.0t/m^3 has been adopted for the purpose of management planning for IPT3 based on:

  (i) Configuration of storage

  (ii) Multiple single-point discharge locations

  (iii) Use of pipe head flocculation.

  Note that this density is consistent with measured conditions at other projects under similar operating conditions.

- Beach Slope

  Nominal beach slopes across the tailings surface are considered to be achievable:

  - Exposed beach at point of deposition 0.5 to 2%
  - Fines or submerged beach 0.5% (average)

3.4 Tailings Storage Demand

Based on the tailings production characteristics as outlined in **Section 3.2**, the demand for tailings storage capacity under the current development approach is as follows:

- Tailings Production 0.75 Mtpa
- Tailings Dry Density 1.0 t/m^3
- Total Storage Demand 750 ML per annum

For the first year of production following project recommencement, during the ramp-up period, it can be assumed that a reduced tailings storage demand will exist.

4 IPT3 DESCRIPTION

4.1 IPT3 Development

4.1.1 IPT3 Design

IPT3 was designed in compliance with the requirements of the *Code of Environmental Compliance for Environmental Authorities for High Hazard Dams Containing Hazardous Waste* (2012), which has since been superseded by the *Manual for assessing consequence categories and hydraulic performance of structures* (DES, 2016) **[2]**. All design elements of IPT3 remain in compliance with the DES manual.

The design (and as-built) layout of IPT3 is shown on **Figure 2**.

The potential for migration or loss of tailings water from IPT3 to the external environment was considered in design. It was assessed that the geology in which the mine void and ultimate IPT3 development is hosted (as described in **Section 2.1.2**), is of low permeability and inhibits primary porosity. The potential for preferred migration pathways was also assessed, such as existing faulting (as described in **Section 2.2.2**), indicating that although the backfilled South Pit may receive seepage, the risk to the receiving environment would be low. Based on these conditions, other than careful planning to use embankment construction fill of low permeability, no specific treatment and the base and walls of IPT3 was undertaken.

4.1.2 IPT3 Construction

IPT3 was constructed during 2014 and 2015, after which operation within IPT3 commenced.

The IPT3 storage is formed by a semi-engineered embankment as a western partition within the Centre Pit, as shown in **Figure 002**. Key features of embankment construction are described as follows:

- The embankment was constructed using run-of-mine (ROM) waste rock material, typically comprising weathered mudstone/sandstone, with the embankment founded onto an insitu floor;
- Mine waste was placed and compacted utilising the mobile mining fleet. The inner batter was progressively shaped and trimmed; and
- Over time, the downstream batter of the embankment was buttressed by mine waste, placed as part of the ongoing Centre Pit operation.

The as-constructed embankment configuration is summarised as follows:

- Embankment crest level — RL 460m
- Upstream Batter — 1.5(H) to 1(V) slope
- Downstream Batter — The as-constructed downstream batter was 2(H) to 1(V) prior to buttressing as part of Centre Pit development.
- Embankment Crest Width — Based on current (July 2022) survey as shown on **Figure 002**, the embankment crest width (northern portion) is at least 100m, buttressed as part of Centre Pit development, transitioning onto a downstream batter with slope of around 10(H) to 1(V). The southern portion of the embankment is in excess of 250m wide.
- Drainage catchment reporting to IPT3 32.2ha
- Total As-Constructed Storage Capacity — 6,850ML (pre-deposition) to emergency spillway level of RL459m)

The northern and southern ends of the storage are formed by a portion of highwall, with the eastern edge comprising an exposed batter of the overburden waste dump area.

4.1.3 Construction of IPT3 Emergency Spillway

Construction of the IPT3 emergency spillway was initially deferred, permitting the proposed spillway alignment to be used as part of the Centre Pit haul road. A tailings level of RL449m (10m below the design emergency spillway level of RL459m) was adopted as a trigger, whereby as tailings reached this level, construction of the spillway was to be undertaken. This trigger level was reached during 2019, therefore emergency spillway construction was completed in June 2020.

The design configuration for the spillway was adopted in construction, with the as-built modifications made to accommodate current conditions:

- The total length of the spillway was extended across the full width of embankment buttressing to ensure daylighting into Centre Pit. The total length of the spillway channel is therefore around 100m.
- The spillway section adjacent to the upstream crest edge of the IPT3 embankment incorporates “cut out” bunds to provide a safety windrow.

The location of the emergency spillway is shown on **Figure 002**.

4.2 Status of IPT3

4.2.1 Overall

The geometry of the IPT3 embankment has not changed since construction, other than emplacement of a safety bund, some 2 m height and 5m crest width along the upstream embankment edge.

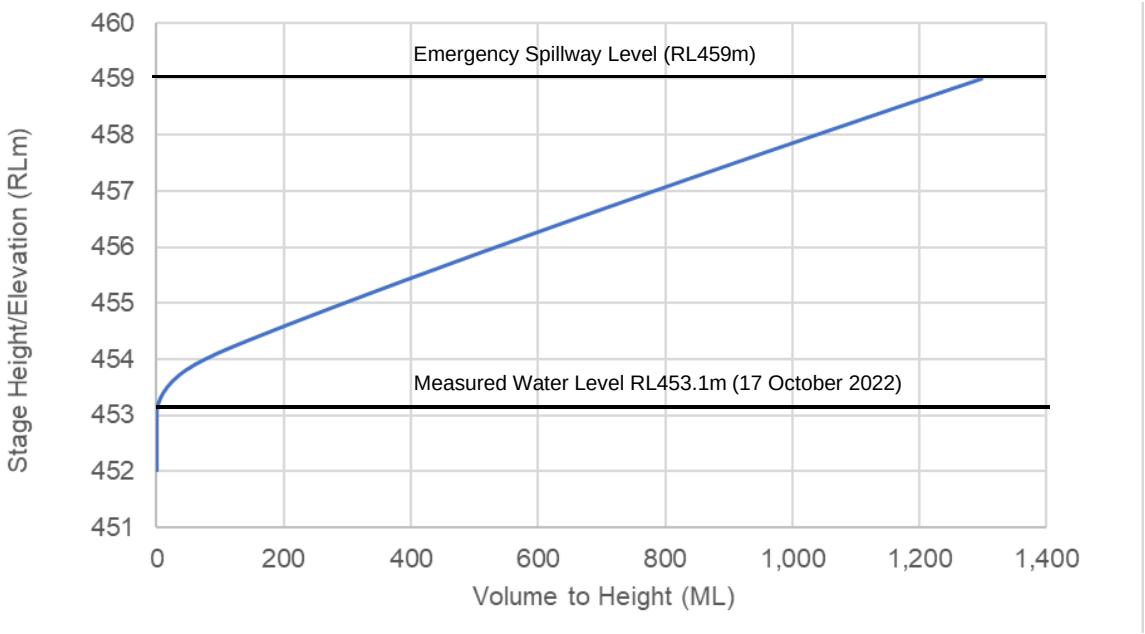
The crest of the embankment adjacent to the safety bund has been sheeted, with access available along the full length of the embankment. This access road is some 10m wide and is currently well grassed.

Available storage capacity within IPT3, representing the 1 November 2022 condition, is indicated in **DIAGRAM 3**. The available storage capacity between the tailings/water surface and the nominated emergency spillway level (RL459m) based on this storage capacity plot is 1,298ML. This capacity accounts for a water level within the storage of RL453.1m (measured on 17 October 2022). Additional capacity is available as the water retained within the storage is displaced, and as consolidation of the tailings beach occurs over the period leading up to recommencement of deposition. This gain in capacity is realised during periods when tailings deposition into the storage is not occurring.

4.2.2 Current (November 2022) Situation

The current (November 2022) situation with respect to IPT3 is that no tailings have been deposited since June 2022, after mine production ceased waiting for Stage 3 development approvals for the New Acland mine. Production is scheduled to recommence in August 2023 and will ramp up to full production over a period of some 18 months thereafter.

DIAGRAM 3: STAGE HEIGHT VS CAPACITY RELATIONSHIP FOR IPT3 (AS AT 1 NOVEMBER 2022)



4.3 Final Landform Development and Rehabilitation Goals for IPT3

The concept for closure of IPT3 is to develop a landform that integrates with the overall rehabilitated landform for the mine site, with the key objectives for rehabilitation being as follows:

- Safe
- Non-polluting
- Stable
- Self-sustaining

These objectives can be expressed broadly in relation to the following Rehabilitation Goals:

- Rehabilitation Goal 1

  Create a geotechnically stable and free-draining landform, with adequate capping to maintain safety for humans and animals.

- Rehabilitation Goal 2

  Create a landform that is non-polluting through effects of acid mine drainage, and therefore protect the receiving environment.

- Rehabilitation Goal 3

  Form capping layers across the final surfaces formed within regulated structures using soils of adequate quality that minimise erosion, support vegetation cover and promote effective (non-disturbing) stormwater management.

- Rehabilitation Goal 4

  Promote self-sustaining vegetation cover, in terms of growing conditions (including soils as per Goal 3) and vegetation species, whilst minimising weeds and other invasive plant growth.

Capping and rehabilitation works to achieve these goals will be consistent with those adopted for the other regulated structures within the site that have been rehabilitated and will be applied at the time when IPT3 is filled to capacity.

5 BASIS FOR SYSTEM DEVELOPMENT AND OPERATION

5.1 Operating Objectives

Operating objectives adopted for IPT3 are as follows:

- The approach adopted for tailings deposition will maximise storage efficiency;
- Tailings beach development is such that the extent of the quantity of tailings water contained within any storage at all times is minimised, with pumping capacity for removal of water to be adapted as required commensurate with climatic conditions and volume of contained water; and
- Freeboard between the tailings/water surface and the crest of the emergency spillway to be maintained in compliance with EA containment requirements. Maintaining freeboard between the tailings solids level and the full supply level for the storage will also provide sufficient freeboard to facilitate rehabilitation.

To achieve, or significantly contribute to the above objectives, the subaerial deposition of tailings shall be maintained as a minimum operating standard. Subaerial deposition involves discharge of tailings via moveable single-point deposition pipelines into each individual storage. At each discharge location, under sub-aerial conditions, near-laminar flow of tailings slurry over a gently sloping tailings beach is targeted to enable segregation and deposition of tailings solids. Subsequent evaporation from the exposed beach surface dries and consolidates the tailings as a means of increasing insitu deposited densities and beach strengths. Water liberated from the tailings through the deposition phase accumulates within a water pond at the toe of the beach. From this pond, water can be decanted and is available for reuse. The benefits of such a deposition method are as follows:

- Maximises tailings densities, therefore, maintains operational efficiency;
- Maximises the geotechnical strength/integrity of the tailings beach to enable future rehabilitation; and
- Allows the recovery of tailings water to be maximised for recycling (process make-up) purposes.

At New Acland, flocculation of the tailings stream will continue, where relevant, to enhance the depositional characteristics of the tailings through segregate of solids and liquor, thus increasing deposited densities of the solids and maximising the recovery of water.

5.2 Minimum Operating Conditions

Based on EA conditions as summarised in **Section 1.2.1** and with reference to relevant practice standards in **Section 2.1.2**, operating criteria for IPT3 includes the following:

- Containment Capacity (Design Storage Allowance, DSA)
- Mandatory Reporting Level (MRL)
- Emergency Spillway Capacity

These aspects are addressed below:

5.2.1 Containment Capacity

Design Storage Allowance (DSA) is a storage constraint applying to the operating phase of the regulated structure. The DSA is calculated utilising the “method of deciles” as described in DES (2016) **[2]**, and is equivalent to the excess storage required as at 1 November of each year that is filled by process inputs, in addition to runoff from the design critical wet period. The design risk for assessment of the design critical wet period for a SIGNIFICANT hazard is an AEP of 0.05 (1 in 20 years). The basis for DSA assessment is outlined below:

- Critical wet season 4 months
- Annual Exceedance Probability (AEP) 0.05[1] (1 in 20-year recurrence interval)
- DSA determined by adding the process inputs for the wet season period and the rainfall runoff (assuming no losses) for the critical wet season period.

A summary of containment capacity in terms of DSA for IPT3 is provided in **TABLE 2**.

TABLE 2: DESIGN STORAGE ALLOWANCE (DSA) FOR IPT3

(A) First Year following Recommencement of Operation

Aspect	IPT3
Critical Wet Period	4 months
Design Risk	0.05
Runoff from Design Critical Wet Period	
- Rainfall Total	590mm
- Catchment Area	32.2ha
- Runoff Coefficient	1.0
- Calculated Runoff	190ML
Storage demand for process inputs over design critical wet period	125ML*
Design Storage Allowance (DSA)	**315ML**

* The storage demand for tailings disposal estimated for the purpose of DSA assessment is based on the following:

- Tailings production of 750,000tpa (refer **Section 3.2**), with assumption that 50% production will be achieved in first year following recommencement (refer **Section 3.4**).
- In-storage tailings dry density of 1.0/m^3 (refer **Section 3.3**).

(B) Post-Recommencement of Operation – Full Scale Production Scenario

Aspect	IPT3
Critical Wet Period	4 months
Design Risk	0.05
Runoff from Design Critical Wet Period	
- Rainfall Total	590mm
- Catchment Area	32.2ha
- Runoff Coefficient	1.0
- Calculated Runoff	190ML
Storage demand for process inputs over design critical wet period	250ML*
Design Storage Allowance (DSA)	**440ML**

* The storage demand for tailings disposal estimated for the purpose of DSA assessment is based on the following:

- Tailings production of 750,000tpa (refer **Section 3.2**) based on full scale production.
- In-storage tailings dry density of 1.0/m^3 (refer **Section 3.3**).

[1] Note that the design criteria for DSA based on the current EA is greater than under the previous EA, increasing from a 1 in 10 year to a 1 in 20-year AEP.

The interpretation of this containment requirement is that regardless of the date of production recommencement, it will be necessary for the following minimum capacities to be available prior to any deposition occurring:

- First year following recommencement of production in August 2023 (covering 2023/24 wet season, i.e., operationally to 31 October 2024 subject to confirmation of projected tailings production as at 1 November 2023) 315ML
- Subject to full scale production post 2023/23 wet season 440ML

DSA under these scenarios is relevant:

- While the defined DSA capacity is available, to enable ongoing tailings deposition into IPT3; or
- If the defined DSA capacity is unavailable, to trigger the need for development of a new regulated structure.

5.2.2 Mandatory Reporting Level

The mandatory reporting level (MRL) is a level within any storage that, when reached, reporting to the administering authority (DES, or delegated entity) is required, with corrective action to be prompted such that risk of release from the regulated structure is minimised.

The design criteria for the MRL in IPT3 is to provide capacity below the emergency spillway level greater than or equal a storm event with 0.01 AEP (i.e. 1 in 100 years) and duration of 72 hours based on a SIGNIFICANT consequence category **[2]**.

MRL details for IPT3 is summarised in **TABLE 3**.

TABLE 3: MANDATORY REPORTING LEVEL (MRL) FOR IPT3

Regulated Structure	IPT3
Design Risk	0.01
Runoff from Design Storm Event (Emergency Storm Storage, ESS)	
– Rainfall Total	225mm
– Catchment Area	32.2ha
– Runoff Coefficient	1.0
– Equivalent Volume (ESS)	87.5ML
Depth below Spillway Level to achieve ESS	0.4m
Emergency Spillway Level	RL459.0m
Mandatory Reporting Level (MRL)	**RL458.6m**

5.2.3 Emergency Spillway

An emergency spillway is a mandatory requirement for any regulated structure. IPT3 therefore requires a spillway and based on a SIGNIFICANT consequence category, is to be designed for a return interval of between 1 in 100 and 1 in 1,000-year event of critical duration **[2]**.

Dimensional details for emergency spillways to accommodate an upper bound design AEP of 1 in 1,000 and summarised in **TABLE 4**.

TABLE 4: DETAILS OF EMERGENCY SPILLWAYS FOR IPT3

Emergency Spillway Crest Level	Minimum Spillway Dimensions
RL459.0m	30m wide x 1m deep Trapezoidal shaped with batters of 2(H) to 1(V)

The IPT3 spillway is located across the western embankment, as shown on **Figure 2**.

As indicated in **Section 4.1.3**, the emergency spillway was constructed in June 2020, with these works including extension of the spillway across the embankment buttressing to daylight into the Centre Pit. The spillway channel length is around 100m.

Measures were also incorporated to provide safe movement along the embankment crest, with the placement of a cut-out safety windrow.

In summary, it has been assessed that the as-constructed geometry of the emergency spillway, taking into account the longer channel length and the presence of the cut-out safety windrow, exceeds the capacity required to meet the design criteria.

6 OPERATING PROCEDURES FOR IPT3

The operational structure for IPT3 is described in **Section 6.1**.

The two key operational aspects related to IPT3 are:

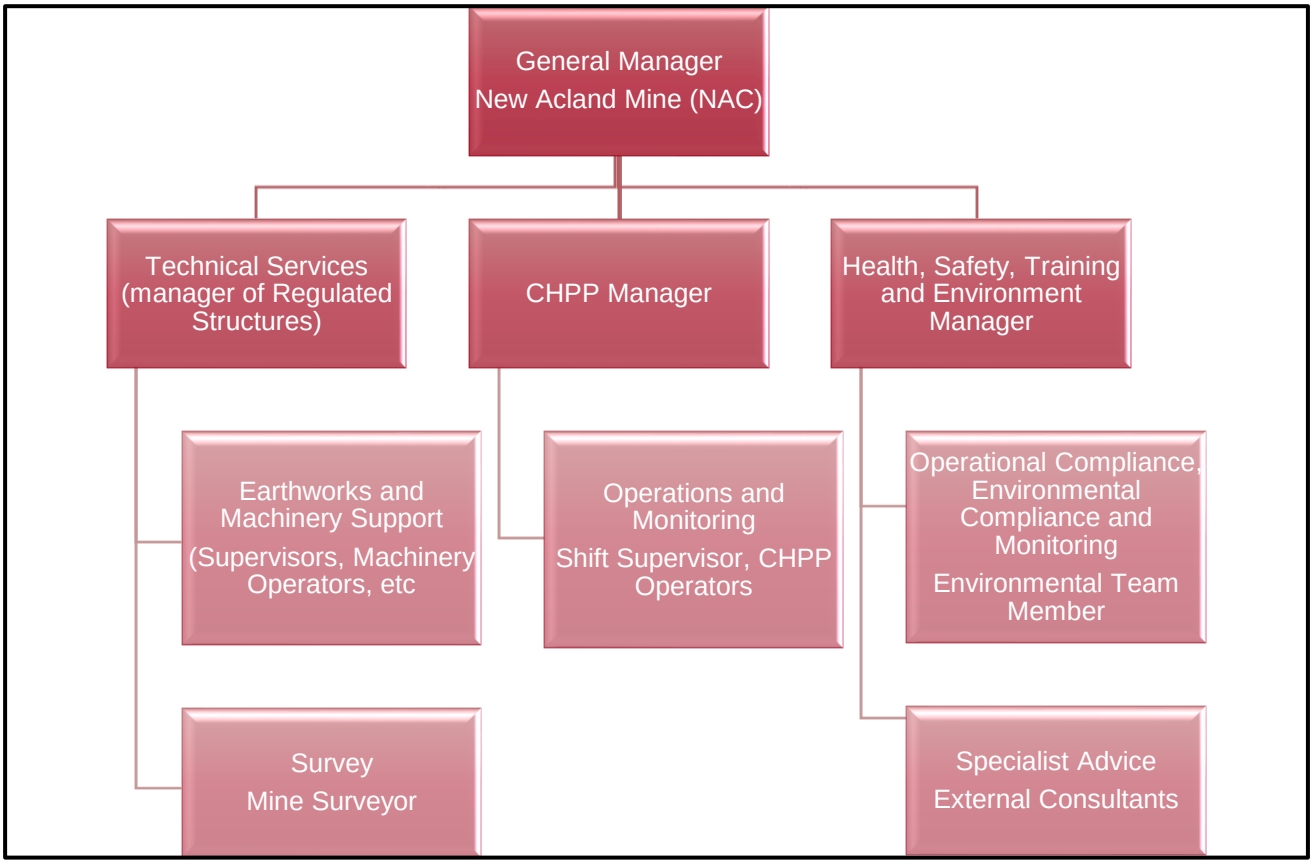
- Deposition of Tailings
- Operation of Decant System (Return Water Management)

These aspects are discussed in **Sections 6.2** and **6.3**.

6.1 Operational Structure

DIAGRAM 4 shows the operational structure for the management of IPT3, covering operational and environmental compliance, day to day operation and monitoring activities.

DIAGRAM 4: ORGANISATIONAL STRUCTURE FOR THE MANAGEMENT OF IPT3



Roles and responsibilities related to this operation are summarised as follows:

Technical Services (Manager of Regulated Structures)	• Nominated Regulated Structures Manager, accountable for the overall management of the system
Earthworks/Machinery Supervisor	• Responsible for providing operational/logistical support, providing specific machinery and earthworks functions required for proper system operation
Health, Safety, Training and Environment Manager	• Accountable for environmental compliance based on EA and other regulations and operating standards

Environmental Team Member	• Responsible for monitoring the functioning of the system in compliance with environmental standards
CHPP Manager	• Accountable for effective operation of the regulated structures
Shift Supervisor	• Responsible for general duties/activities associated with the daily functioning of tailings deposition
Mine Surveyor	• Responsible for conducting survey and technical monitoring functions
Off-site specialist or consultants	• Engaged as required for technical assistance and specific monitoring/audit functions

The relationship between IPT3 operation and protection of environmental values surrounding the mining area, including surface water, groundwater and air (dust), are not explicitly covered by the OMP, although IPT3 tailings and water management clearly influences environmental performance outcomes.

6.2 Deposition of Tailings

6.2.1 System Description

The CHPP control room manages the operation of the (fine) tailings transfer system via a computerised control system. CHPP operations and maintenance personnel are responsible for the safe operation of the transfer system, including routine maintenance, identification of pump breakdowns, blockages, and other defects.

The tailings slurry reporting as tailings thickener underflow is transferred to IPT3 using centrifugal slurry pumps with variable frequency drives through a dedicated HDPE pipeline.

Overall, the majority of the tailings slurry pipeline is positioned above ground to assist efficient inspection. Bunding of these pipeline paths needs to be maintained to ensure that release from a pipeline burst is minimised. As required, small sections of the pipeline are buried and/or protected by steel/concrete casing to allow heavy vehicle crossings of the pipeline.

6.2.2 Overview of Tailings Deposition Approach

The method of tailings disposal adopted is by ‘subaerial deposition’ methods (refer **Section 5.1**). This tailings disposal method facilitates effective water recovery from a dedicated decant pond area and improves overall tailings desiccation and consolidation.

Tailings deposition will occur within IPT3 from multiple single point discharge locations established along the western embankment. Discharge from these locations will form a tailings beach that grades away from the embankment, generally towards the east – northeast.

The key objectives of tailings deposition within IPT3, as a means of maximising storage utilisation and depositional efficiencies, are to:

- Establish points of discharge such that scouring of any internal surface including tailings storage walls is prevented. The configuration shown on **PHOTO 1**;
- Rotate the deposition of tailings along the alignment of deposition (i.e., along the western embankment) to maximise access to available storage areas, to achieve a consistent rate of tailings surface rise around the storage and to form a conveniently located decant pond that will enable efficient water recovery.

PHOTO 1: TYPICAL TAILINGS DISCHARGE APPROACH

In general, when discharging adjacent to embankment faces, scouring of the walls will be preventable by discharging directly onto the tailings beach (or less favourably into the tailings water pond) – refer **PHOTO 1**. Otherwise, the internal walls of IPT3 can be protected by synthetic material, or otherwise by slotting the deposition spigot.

A constant rate of tailings surface rise (i.e., equal tailings loading) will be achieved by distributing discharge locations around the perimeter of IPT3 to improve distribution of deposited tailings and overall beaching.

Tailings need to be deposited systematically to direct supernatant away from the constructed walls (i.e., to prevent ponding against or near to the embankment, which may cause local batter saturation and slumping, or may increase the risk of seepage through the wall).

Although IPT3 has been appropriately certified as fit for purpose, the operational aspects as outlined above will minimise the risk of loss of integrity of constructed embankment batters or seepage through the embankment. Conversely, should these operational aspects be ignored or compromised, it is possible that performance issues will be experienced.

6.2.3 Flocculant Dosing

As indicated in **Section 6.2.2**, flocculant dosing will continue to operate, with the principal purpose being to promote segregation of solids and liquor, thus increasing deposited densities of the solids and maximising the opportunity for recovery of water. The specific operating protocols for the flocculant dosing system have been developed by NAC, therefore do not form part of this operational document.

A typical layout of the dosing equipment is shown on **PHOTO 2**.

PHOTO 2: FLOCCULANT DOSING EQUIPMENT

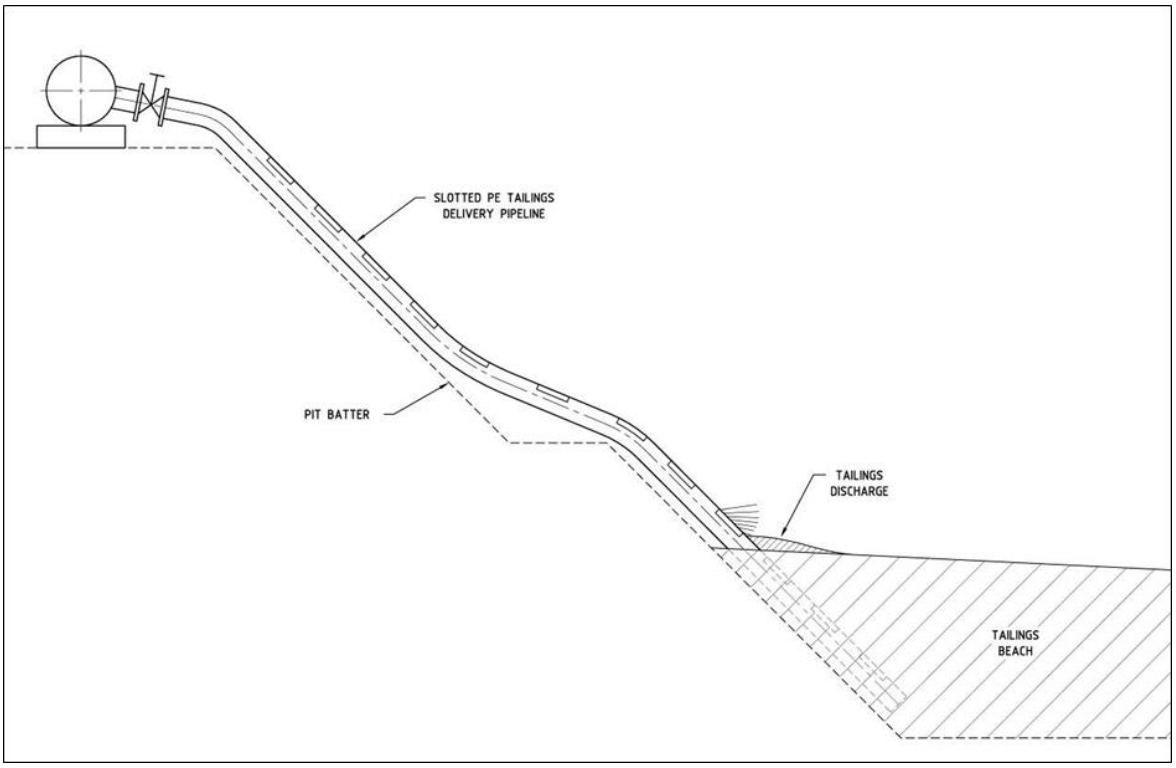
The dosing of flocculant to the tailings stream occurs at the point of deposition.

6.2.4 Operating Guideline for Tailings Deposition

Tailings deposition into IPT3 will occur from a single tailings deposition line, accessing a single deposition site at any one time. A “dropper type” deposition system is utilised, as shown on **DIAGRAM 5**.

Slots in the delivery pipeline may or may not be utilised, as indicated in **DIAGRAM 5**, where deposition is occurring from over any internal embankment surface. Either system will be applied depending on the location of deposition

DIAGRAM 5: TYPICAL TAILINGS DEPOSITION SYSTEM



General guidelines for tailings deposition are provided as follows:

- Deposition is to comprise pumping through the single discharge line, with deposition onto the rising tailings beach surface. No further control can be applied beyond the discharge pipeline, with the tailings beach development dependent on the deposition location.
- The overall tailings beach profile will be controlled by systematic relocation of tailings deposition locations. The deposition site will be relocated along the alignment of deposition, placed on the western embankment crest, to promote a tailings beach profile that slopes towards a decant pond location, to be located at the north-eastern corner of the storage, adjacent to the access ramp.
- Visual assessment of the decant pond location will be made as part of the deposition process, to prompt the relocation of deposition sites as a means of optimising pond location and extent. Decant water recovery is to be consistently maintained as described in **Section 6.3.3**.

It is acceptable that the tailings delivery pipeline is positioned above ground to allow ease of inspection. It is necessary to contain the pipe within a bunded trench, with sumps positioned along the trench as required to recover discharge from any pipe breaches. As required, small sections of delivery pipeline may be buried to allow for heavy vehicle crossing over the pipeline, provided that effective protection at these cross overs is provided (i.e., such that crushing, or breakage of the pipe does not occur).

Further to the above general guidelines, on completion of pumping through a single or isolated section of delivery pipeline (i.e., at a plant shutdown or when transferring of deposition from site to site), the delivery pipeline should be immediately flushed to assist in the prevention of settlement of tailings solids within and blockage of the pipe. Flushing should occur using decant water.

6.2.5 Summary Details of Tailings Deposition into IPT3

Key operational aspects related to tailings deposition in to IPT3 based on **Sections 6.2.1** through **6.2.4** are as provided below:

- Deposition will continue into IPT3 from the western margin of the storage, along the IPT3 embankment. Deposition from the northern end of the storage will be avoided, to ensure that decanting from the access ramp into the storage area, at the north-eastern corner, is not compromised.
- The zone of deposition is indicated by nominal deposition locations shown on **Figure 002**. At these locations, deposition will occur across formed earthworks surfaces.
- Based on the nominated deposition extents, a tailings beach sloping generally from west to east and south to north would form, with a decant pond developed at the northern end of the storage ponded against the access ramp within the north-eastern portion of the storage.
- The ultimate tailings beach surface shown on **Figure 002** will be targeted based on the above deposition approach, with final beach levels falling from RL459m at the southern end to RL456m at the southern end (based on a net beach slope of 0.5%).

6.2.6 Key Performance Indicators for Tailings Deposition within IPT3

The key performance indicators related to decant pond operation will be to maintain DSA and MRL for IPT3 as described in **Sections 5.2.1** and **5.2.2**. These requirements are summarised as follows:

- DSA:
  - First year following recommencement of production in August 2023 (covering 2023/24 wet season, i.e., operationally to 31 October 2024 subject to confirmation of projected tailings production as at 1 November 2023) — 315ML
  - Subject to full scale production post 2023/23 wet season — 440ML
- MRL: RL458.6m

Other indicators include the following:

- No scouring of internal walls of the western embankment of IPT3; and
- Decant pond formed and isolated to the northern/north-eastern corner of the storage.

Also:

- It is necessary that the MRL is clearly marked at a convenient location within the storage (nominally along the access ramp adjacent to the decant pump); and
- Any changes to the DSA or MRL based on changes to IPT3 layout of operating conditions shall be assessed and operational approach modified accordingly.

6.3 Operation of Decant Water (Return Water Management)

6.3.1 System Description and Operating Objectives

The philosophy for water management within IPT3 is to maximise recovery of available recoverable water quantities, with this water transferred for re-use at the CHPP, either directly to the CHPP or via Pond Return Dam. Transfer of decant water occurs using skid mounted centrifugal pumps located on the access ramp within the storage at the north-eastern corner of the storage. The target maximum recovery/transfer rate is 5ML per day. This transfer occurs when sufficient quantities of decant water are available, and when storage capacity is available either at the plant or within Pond Return Dam.

It is noted that the operation of the return water system is reliant on suitable clarity in the tailings/decant water to prevent blockage of return water pump screens and the return water pipeline through suspended fines. Decant return quantities will therefore vary depending on prevailing conditions, including rainfall conditions, which will impact on the quality of available decant water. Notwithstanding, the overall objective of decant operation is to minimise the quantity of water contained within the storage, as a means of reducing the risk of seepage or local slumping of internal batters.

6.3.2 Overview of Operation

Subaerial deposition relies on effective water recovery from a dedicated decant pond area, to maximise the exposure to tailings drying/desiccation and consolidation. As described in **Section 6.2**, tailings deposition will occur from multiple single-point discharge locations. A flocculant dosing system (described in **Section 6.2.3**) is operated in conjunction with deposition, the purpose of which is to readily segregate solids and liquor, thus increasing deposited densities of the solids and maximising the opportunity for recovery of water.

The key aspects of decant water recovery, as a means of maximising storage utilisation and depositional efficiencies, are to:

- Rotate the points of tailings deposition around the storage to encourage decant pond development within the defined location.
- Reduce decant pond water levels as much as possible by prompt recovery of decant water subject to suitable quantities and quality, as a means of achieving effective tailings beach exposure, to enhance tailings consolidation and desiccation.

A key operating objective for the decant pond is to ensure return water is of best quality achievable. This will be assisted by the use of flocculation at the point of tailings deposition, and by limiting the deposition of tailings near to or around the decant pond. Decant water will therefore be returned as soon as possible, to maximise tailings beach exposure.

6.3.3 Routine Operation (Operating Guideline for Decant Water Recovery)

The operating objectives for the decant system are:

- to minimise the volume of water contained within the storage, thus contributing to maintenance of freeboard levels, and facilitating exposure of the deposited tailings beach to consolidation and air-drying, particularly as the capacity of the storage is approached; and
- to minimise the capture of suspended solids within return water.

General guidelines for decant pond operation are as follows:

- Decanting is to occur from skid mounted centrifugal pumps established on the access ramp into the north-eastern corner of the storage. Care must always be taken in setting pumps on the ramp to prevent inundation from short term deposition or significant rainfall events.
- The decanting of liquor from the storage shall aim to maintain a nominal maximum pond surface area of 2ha. This area may increase marginally if:
  - high turbidity (highly coloured) water reporting to the sump is being observed, although the period during which this increased surface area occurs should be minimised; and/or
  - A significant/prolonged rainfall period is experienced;

  provided that prompt action is taken thereafter to reduce the pond area to within acceptable/ defined limits.
- Decant/supernatant water from the storage is to be transferred either directly to the CHPP, or to Pond Return Dam (as a surge pond for later transfer to the CHPP).

The water recovery pipeline will be positioned above ground to allow ease of inspection. As required, small sections of the pipeline may be buried to allow for heavy vehicle crossing over the pipeline provided that these pipe sections are protected (i.e., such that crushing, or breakage of the pipe does not occur).

6.3.4 Summary Details of Decant Pond Operation within IPT3

Key operational aspects related to decant pond management within IPT3 are as follows:

- Deposition will encourage a decant pond to be formed at the north-eastern corner of the storage ponded against the internal access ramp.
- Points of tailings deposition along the western embankment forming IPT3 will be relocated as required to maintain the decant pond extent, with a nominal maximum decant pond surface area of 2ha to be maintained.
- Decant water recovery will occur using skid mounted centrifugal pumps established on the access ramp surface. A typical set-up for these pumps is shown on **PHOTO 3**.

PHOTO 3: TYPICAL DECANT PUMP SET-UP

6.3.5 Key Performance Indicators for Decant Water Recovery within IPT3

The key performance indicators related to decant pond operation will be to maintain DSA and MRL for IPT3 as described in **Sections 5.2.1** and **5.2.2**. These requirements are summarised as follows:

- DSA:
  - First year following recommencement of production in August 2023 (covering 2023/24 wet season, i.e., operationally to 31 October 2024 subject to confirmation of projected tailings production as at 1 November 2023) 315ML
  - Subject to full scale production post 2023/23 wet season 440ML
- MRL: RL458.6m

Other indicators include the following:

- Decant pond formed and isolated generally to the northern/north-eastern corner of the storage; and
- Nominal maximum pond surface area of 2ha to be maintained using high wall pumps located on the western edge of the storage.

Also:

- It is necessary that the MRL is clearly marked at a convenient location within the storage (nominally along the access ramp adjacent to the decant pump); and
- Any changes to the DSA or MRL based on changes to IPT3 layout of operating conditions shall be assessed and operational approach modified accordingly.

7 INSPECTIONS AND MONITORING

The key inspection and monitoring aspects related to IPT3 include:

- Inspections to ensure ongoing safety and serviceability.
- Monitoring of key infrastructure including embankments, emergency spillway and pumping and pipeline systems.
- Inspections to ensure that progressive capping and rehabilitation works do not compromise storage integrity or water management/storage systems.

These aspects are discussed below.

7.1 Inspections

Visual inspections of IPT3 are required as presented in **TABLE 5**.

TABLE 5: INSPECTION SCHEDULE FOR IPT3

Inspection Type	Frequency	Inspection Responsibility (Refer Section 6.1)
Daily Inspection	Once per day	CHPP Manager (delegated to Shift Supervisor or subordinate)
Quarterly Inspections	Once per quarter	Technical Services (Manager of Regulated Structures)
Annual/Engineering Inspection	Once per year	Registered Professional Engineer of Queensland (RPEQ) suitably qualified in the engineering of regulated structures

Inspections would focus on the key components of the IPT3 storage, with action required in relation, but not necessarily limited to, the following:

- The water level within ITP3 is at the MRL (or within a depth of 0.3m of the MRL).
- Any significant difference to the tailings deposition regime (i.e. in terms of tailings beach development characteristics);
- Any excessive settlement observed/recorded within any significant earthworks structure (i.e. perimeter embankments);
- Any evidence of cracking or deformation within any visible earthworks surface or any high wall section of the former mine pit;
- Any excessive, concentrated or sediment-laden seepage from embankment surfaces;
- Scouring or visible erosion on any formed or natural surface, most notably on the batters of the embankment or the edges of high wall areas.
- Any obstruction to the emergency spillway (including the growth of trees or vegetation across the spillway crest or on the internal embankment batter adjacent to the spillway;
- Development of the decant pond other than around the decant pump at the northern/north-eastern corner of the storage;
- Inoperability of any pumping system.

The scope of inspections as outlined above is described as follows:

7.1.1 Daily Inspections

The standard procedure for daily inspections will include a drive-around inspection of the entire IPT3 storage, with results of observations to be recorded on an inspection form. The daily inspection will focus on the following:

- serviceability of pipelines (tailings delivery and return water lines);
- general integrity of embankments (e.g., observable deformation or settlement etc.) specifically for the operating regulated structures;
- serviceability of perimeter bunding, pipe containment bunds and emergency spillway;
- indication of any seeps or expression of water at any location around the operating regulated structures
- location and current status of tailings deposition;
- location and size of decant pond/operability of return water system; and
- current integrity of fencing and barriers, preventing livestock and other fauna access into the storage area.

A specific requirement of the daily inspection will include measurement and recording of current tailings and water levels within the storage, at the following locations:

- At the point of tailings deposition; and
- At the decant pump location.

An inspection form template shall be prepared and used as a guide for Daily Inspections and exist as a “chain-of-command” for reporting issues and variances in operation or performance. One form per inspection shall be completed and maintained as a permanent record of the inspection, and as justification for work orders to be raised for appropriate maintenance works.

In the event that the water level within the storage during any daily inspection is observed to be at or within a depth of 0.3m from the MRL (as defined in Section **6.3.5**), this must be reported immediately to the Health, Safety, Training and Environment Manager . As required by the EA (**Section 1.2.1**) reporting to the administering authority is required if the water level reaches the MRL. In response to this advice, an action plan must be formulated to prevent further rise of the water level, and particularly to prevent release of water through the emergency spillway.

7.1.2 Quarterly Inspections

Manager of Regulated Structures or an approved delegate will undertake inspections on a quarterly basis of IPT3, or at other times where any particular issue (notionally identified through the daily or monthly inspection) is identified. The quarterly inspection would focus on any previously identified issue or incident and the condition of any action undertaken. In addition to daily and monthly inspection issues, the quarterly inspections would include:

- inspection of the embankment to confirm integrity, and in particular, any cracking on the upstream embankment face or crest;
- any local slumping on any embankment/internal storage surface;
- the downstream toe of the embankment for indication of seeps/ expression of water.

The results of the quarterly inspection are to be compiled within a formal checklist, with work orders raised for completion of any works required.

Where required or deemed necessary, independent review or inspection of any condition considered to represent a potential regulated structure safety or environmental hazard is to be undertaken. Such a review should be undertaken in addition to the Annual/Engineering Inspection as outlined below.

7.1.3 Annual/Engineering Inspections

Annual engineering inspections will take the form of a regulated structure safety review and operational audit. The requirement for a regulated structure safety review and operational audit is in accordance with the EA (refer **Section 1.2.1**). The scope of such a review will be as follows:

- to identify any elements of the tailings management system that are of concern or are deficient from a regulated structure safety perspective, with emphasis on storage embankments and hydraulic controls;
- to assess available inspection/monitoring data, against design expectations or predictions; and
- where applicable, to evaluate available storage capacities in relation to predicted air-space consumption over the next 12-month period, to satisfy relevant approvals conditions.

The review/audit report is to be prepared for submission to the administering authority (currently DES) as required under the EA. Included in the report will be a list of any remedial or repair works that have been identified.

7.2 Monitoring of Key Elements of IPT3

7.2.1 Emergency Spillway

An emergency spillway exists as part of IPT3. The purpose of the emergency spillway is to allow spill from the storage only in the event of an emergency occurring under extreme rainfall conditions. It is emphasised that the emergency spillway is provided exclusively for such extreme conditions. In any event, there is an expectation that any spill will not be viewed favourably by the administering authority (in this case DES) under any circumstances.

To this end, and as required by the conditions of the EA (**Section 1.2.1**), a Mandatory Reporting Level (MRL) exists for IPT3. Reaching will trigger a need for notification to the administering authority (DES). With background provided in **Section 5.2.2**, the MRL for IPT3 is RL458.6m.

As indicated in **Section 7.1**, in the event that the water level within the storage during any daily inspection is observed to be at or within a depth of 0.3m from the MRL, this must be reported immediately to the Health, Safety, Training and Environment Manager, who would then advise the administering authority. In conjunction with this advice, an action plan must be formulated to prevent further rise of the water level, and particularly to prevent release of water through the spillway.

7.2.2 Pumping and Piping Systems

The principle pumping and pipeline system associated with IPT3 comprises the tailings delivery line and return water lines. General surveillance of pumping and pipeline systems is to be undertaken to confirm effective operability of these systems. Such inspections are covered under **Section 7.1.1**.

7.3 Inspection and Monitoring Summary

TABLE 6, TABLE 7 and **TABLE 8** present the statutory, operational and environmental monitoring and reporting requirements for the operation and management of IPT3.

Monitoring and reporting records will be kept for general review by the administering authority and requests for information as required under the EA. NAC's Health, Safety, Training and Environment Manager is responsible for the maintenance and upkeep of all monitoring records.

TABLE 6: STATUTORY MONITORING AND REPORTING REQUIREMENTS

Parameter	Structural Integrity, Mandatory Reporting Level (MRL) and Design Storage Allowance (DSA)
Monitoring Method	Inspection and certification by suitably qualified engineer
Interval	Annual
Responsible Officer	Technical Services – Manager of Regulated Structures (Inspection and reporting to be undertaken by a Registered Professional Engineer of Queensland (RPEQ) suitably qualified in engineering of regulated structures)
Reporting Requirements	Report to be submitted to administering authority (currently DES) within 20 business days of receiving the annual inspection report from the RPEQ.

TABLE 7: OPERATIONAL MONITORING AND REPORTING REQUIREMENTS

Parameter	Monitoring Method	Interval	Responsible Officer	Reporting Requirements (exceptions only)
Tailings production	CHPP Computerised Control	Daily (continuous)	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Pipeline integrity (tailings slurry & return water lines)	Field Inspection	Daily	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Tailings slurry pump operation	CHPP Computerised Control and Inspections	Daily (continuous)	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Tailings outlet placement/deposition	Field Inspection	Daily	CHPP Operator r	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Decant water pump operation	Field Inspection	Daily (continuous)	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Decant water level	Field Inspection	Daily	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Overall function	Field Inspection	Daily	CHPP Operator	CHPP Manager Coal (delegated to Shift Supervisor or subordinate)
Structural integrity of the Regulated Structure and associated infrastructure	Field Inspection	Quarterly and following rainfall events	Technical Services team member	Technical Services (Manager of Regulated Structures)

TABLE 8: ENVIRONMENTAL MONITORING AND REPORTING REQUIREMENTS

Parameter	Monitoring Method	Interval	Responsible Officer	Reporting Requirements (exceptions only)
Seepage Recovery (if required – currently no requirement exists)	Field Inspection	Daily (each shift while seepage recovery pumps operating/Weekly otherwise)	Mining Supervisor CHPP Operator Environmental team member	Technical Services (Manager of Regulated Structures)

REFERENCES

[1] ANCOLD (1999), Guidelines on Tailings Dam Design, Construction, Operation and Closure.

[2] Department of Environment and Science (2016), *Manual for Assessing Consequence Categories and Hydraulic Performance of Structures, ESR/2016/1933* (Version 5.02), March

CONDITIONS OF REPORT

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FIGURES

SURVEY NOTES:
1. GRID COORDINATE SYSTEM IN USE AMG-56 AGD84.
   HEIGHT DATUM AHD
2. SURVEY DATA & AERIAL IMAGERY PROVIDED BY NEW HOPE GROUP.
   FILE NAME:X_Acland_210730_1m_Conts.dwg
   DATE OF SURVEY: 21.07.2021
3. AERIAL IMAGERY PROVIDED BY NEW HOPE GROUP
   FILE NAME: Acland_July9_2022.jpg
   DATE OF IMAGERY: 09 JULY 2022

EXISTING WASHPLANT (CHPP)
EXISTING DUCK POND
EXISTING SEDIMENT DAM
EXISTING HAUL ROAD
POND RETURN DAM
IN-PIT TAILS 1 (IPT1)
EXISTING SPILL CHANNEL
TSF 1
TSF 1 EXTENSION
IN-PIT TAILS 2/1 (IPT2/1)
IN-PIT TAILS 2/2 (IPT2/2)
CENTRE PIT
IN-PIT TAILS 3 (IPT3)
ENVIRONMENTAL DAM 4
EXISTING SOUTH PIT
SOUTH PIT

E 371000m
E 372000m
E 373000m
N 6982000m
N 6981000m

SITE LOCALITY

ISSUED FOR REPORTING
NOT FOR CONSTRUCTION

No.	DESCRIPTION	DATE	DRAWN	CHECK'D	APPR'D
A	ISSUED FOR REPORTING	02/02/23	JC	AW	AW

SCALE:	1:10,000
JOB No.	111319-20
DATE	OCT. 2022
DESIGN	10/27/2022
DRAWN	CLC
CHECKED	AW
APPROVED	AW

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NEW HOPE COAL PTY LTD
NEW ACLAND COAL MINE

OPERATIONS AND MANAGEMENT PLAN (OMP) FOR 1PT3 (2022 TO 2027)
SITE LAYOUT PLAN SHOWING LOCATION OF 1PT3

DWG. No. FIGURE - 001

SHEET SIZE A3 | Rev. A

SHEET 1 OF 1

M:\Synergy\Projects\111\111319 New Acland Coal Mine\20 Tailings Mgmt Plan Update\CADD\CAD\111319-20-FIG-001.dwg

Printed on: Thursday, 02 February 2023 10:55:00 AM By: James Camille

SURVEY NOTES:
1. GRID COORDINATE SYSTEM IN USE AMG-56 AGD84. HEIGHT DATUM AHD
2. SURVEY DATA PROVIDED BY NEW HOPE GROUP. FILE NAME: ipt3_220731.dxf DATE OF SURVEY: 31 July 2022
3. AERIAL IMAGERY PROVIDED BY NEW HOPE GROUP FILE NAME: Acland_July9_2022.jpg DATE OF IMAGERY: 09 JULY 2022

NOMINAL DECANT POND LOCATION (EXTENT VARIES SUBJECT TO SEASONAL RAINFALL CONDITIONS AND OPERATIONAL APPROACH)

CENTRE PIT ACCESS RAMP

EMERGENCY SPILLWAY. CREST LEVEL RL 459m. (REPORTING TO CENTRE PIT)

CENTRE PIT

IN-PIT TAILS 3 (IPT3) FULL SUPPLY LEVEL RL 459m

EXTENT OF PONDED WATER (AT TIME OF CAPTURE)

IPT3 EMBANKMENT (CREST LEVEL RL 460.0m NOM.)

N 6981000m
N 6980500m
N 6980000m
E 371500m
E 372000m
E 372500m
E 373000m

N
W E
S

NOTES:

1. STORMWATER DRAINAGE AROUND IPT3 PROVIDED BY HAUL ROAD PROFILING, WITH DISCHARGE TO MINING AREA.

LEGEND:

- TAILINGS STORAGE AREA
- PREDICTED FINAL TAILINGS BEACH PROFILE (BASED ON NOMINAL BEACH SLOPE OF 0.5%)
- NOMINAL DEPOSITION LOCATIONS

ISSUED FOR REPORTING
NOT FOR CONSTRUCTION

No.	DESCRIPTION	DATE	DRAWN	CHECK'D	APPR'D
A	ISSUED FOR REPORTING	02/02/23	JC	AW	AW

SCALE: 1:5,000	
JOB No.	111319-20
DATE	OCT. 2022
DESIGN	10/27/2022
DRAWN	CLC
CHECKED	AW
APPROVED	AW

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OPERATIONS AND MANAGEMENT PLAN (OMP) FOR IPT3 (2022 TO 2027)
LAYOUT AND FUTURE DEPOSITIONAL APPROACH FOR IN-PIT TAILINGS DAM 3

DWG. No. FIGURE - 002

SHEET SIZE A3 Rev. A

SHEET 1 OF 1

M:\Synergy\Projects\111\111319 New Acland Coal Mine\20 Tailings Mgmt Plan Update\CADD\CAD\111319-20-FIG-002.dwg

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