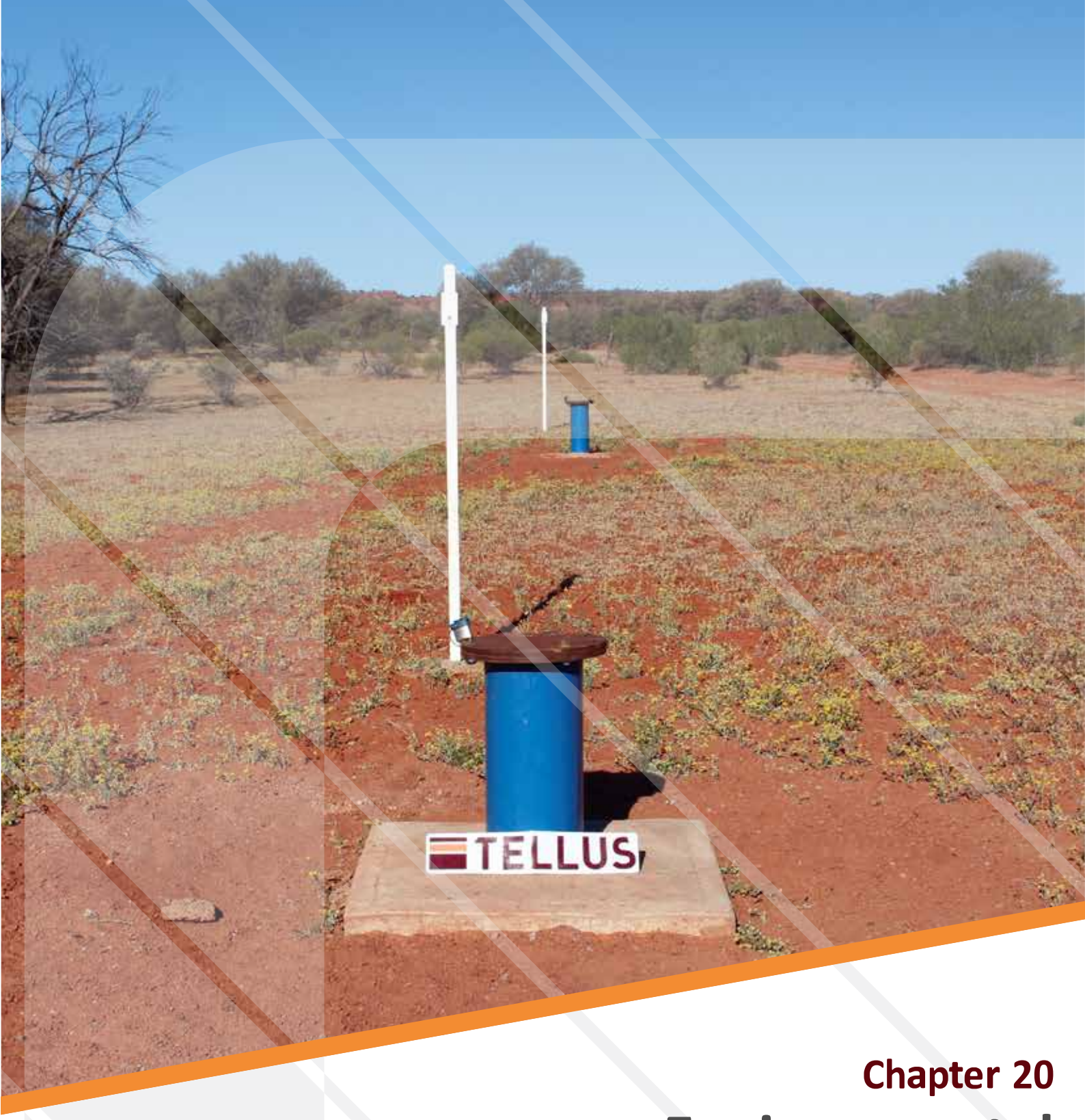

Chapter 20

Environmental Mangement

This page has been left intentionally blank

Contents

Abbreviations ..... **ii**

20 Environmental Management **20-1**

20.1 Overview 20-1

20.2 Summary of mitigation measures that would be implemented for the Proposal 20-2

LIST OF TABLES

Table 20-1 Collation of mitigation and management measures for the Proposal 20-3

ABBREVIATIONS

AQMP	Air Quality Management Plan
CEMP	Construction Environmental Management Plan
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
LCP	Landscape Concept Plan
NT	Northern Territory
OEMP	Operational Environmental Management Plan
PFS	Pre-Feasibility Study
PPE	Personal Protective Equipment
RCP	Rehabilitation Closure Plan
TMP	Traffic Management Plan
ToR	Terms of Reference
WAC	Waste Acceptance Criteria
WAP	Waste Acceptance Procedure
WZG	Waste Zoning Guide

20 ENVIRONMENTAL MANAGEMENT

20.1 Overview

The environmental assessment has indicated that the Proposal would result in environmental impacts during construction, operation, and closure and rehabilitation. A range of management plans, protocols and procedures to manage the environmental impacts of the Proposal would be implemented. Specifically, a CEMP, OEMP and RCP would be prepared and implemented for the Proposal. The CEMP, OEMP and RCP are discussed in Section 20.1.1. Mitigation measures to minimise the impact of the Proposal are listed in Table 20-1.

20.1.1 Environmental management plans and monitoring

A CEMP, OEMP and RCP would be prepared and implemented for the Proposal. The plans would include:

- Environmental objectives and performance targets for construction and operation.
- Required statutory and other obligations, including consents, licences, approvals and voluntary agreements.
- Management policies, procedures and review processes to assess the implementation of environmental management practices and the environmental performance of the Proposal against the objectives and targets.
- Requirements and guidelines for management in accordance with:
    - Conditions of consent for the Proposal.
    - Mitigation measures specified by this environmental assessment.
    - Relevant construction management guidelines.
- Requirements in relation to incorporating environmental protection measures and instructions in all relevant standard operating procedures and emergency response procedures.
- Specific procedures, including monitoring, as defined by the environmental assessment and the conditions of consent.
- Roles and responsibilities of all personnel and contractors to be employed on-site.
- Procedures for complaints handling and ongoing communication with the community.
- Environmental sub-plans, including (but not limited to):
    - Mine Management Plan.
    - Biodiversity Management Plan.

- Bushfire Management Plan.
- Water Management Plan.
- Sediment and Erosion Management Plan.
- Cultural Heritage Management Plan.
- Safety Case.
- Air Quality Management Plan.
- Noise and Vibration Management Plan.
- Social Impact Management Plan.
- Rehabilitation and Closure Plan.
- Biting Insect Management Plan.
- Traffic Management Plan.

- Incident response procedure.
- Monitoring and auditing program.

An environmental monitoring program enables auditing of mitigation measures to ensure they achieve their objectives and to facilitate modification, where necessary. An environmental monitoring program would be established for both the construction and operational phase of the Proposal. Monitoring would continue through closure and rehabilitation of the Proposal. Monitoring requirements would be listed within the CEMP, OEMP and RCP.

20.2 Summary of mitigation measures that would be implemented for the Proposal

Mitigation measures to minimise the effects of the Proposal are presented in Table 20-1. These measures would be implemented prior to and during construction, operation, and/or closure and rehabilitation of the Proposal. They would be incorporated into the CEMP, OEMP and/or RCP, as appropriate.

Table 20-1 Collation of mitigation and management measures for the Proposal

ID	Outcome	Mitigation/management measure	Timing
Biodiversity			
B.1	Preservation of biodiversity.	Finalise draft Biodiversity Management Plan prior to construction and incorporate into the CEMP, OEMP and/or RCP for the Proposal. The plan collates measures to mitigate and manage potential impacts on biodiversity.	Pre-construction
B.2	Reduced incidence of bushfire.	Finalise draft Bushfire Management Plan prior to construction and incorporate into the CEMP, OEMP and RCP. The plan collates measures to mitigate and manage potential impacts on biodiversity.	Pre-construction
B.3	Preservation of biodiversity.	Provide workers with an environmental induction prior to starting construction activities. This would include information on the ecological values of the site and protection measures to be implemented to protect biodiversity during construction.	Pre-construction and construction
B.4	Protection of threatened species.	Undertake pre-clearance surveys for threatened species by a qualified ecologist.	Pre-construction and construction
B.5	Minimisation of vegetation removal and habitat loss.	Defer vegetation removal until necessary.	Pre-construction and construction
B.6	Minimisation of vegetation removal and habitat loss.	Locate site offices and stockpiles in already cleared and disturbed areas, where possible.	Pre-construction and construction
B.7	Minimisation of vegetation removal and habitat loss.	Provide maps to construction staff clearly showing vegetation clearing boundaries.	Pre-construction and construction
B.8	Minimisation of vegetation removal and habitat loss.	Leave mature trees, where possible, especially desert oaks, bloodwoods and bush tucker species.	Construction
B.9	Minimisation of vegetation removal and habitat loss.	Leave fallen logs greater than 15 cm diameter or relocate to surrounding environment.	Construction
B.10	Minimise vegetation removal and habitat loss.	Relocate bird nests found in trees or shrubs to be cleared to surrounding environment.	Construction
B.11	Reduced incidence of fauna injury/mortality.	Ensure fauna is removed from areas intended to be cleared by a qualified ecologist.	Pre-construction and construction
B.12	Reduced incidence of fauna injury/mortality.	Avoid driving during high risk times; dawn, dusk and at night, where possible.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
B.13	Reduced incidence of fauna injury/mortality.	Prohibit off-road driving.	Construction, operation, closure and rehabilitation
B.14	Reduced incidence of fauna injury/mortality.	Develop and maintain a fauna strike register.	Construction, operation, closure and rehabilitation
B.15	Reduced incidence of fauna injury/mortality.	Limit access of third parties on-site.	Construction, operation, closure and rehabilitation
B.16	Reduced incidence of fauna injury/mortality.	Ensure traffic adheres to speed limits and local road rules.	Construction, operation, closure and rehabilitation
B.17	Reduced incidence of fauna injury/mortality.	Ensure speed limit and potential fauna crossing signs clearly are displayed on Chandler Haul Road, Henbury Access Road and other access tracks, as necessary.	Construction, operation, closure and rehabilitation
B.18	Reduced habitat fragmentation and edge effects.	Implement weed and invasive species mitigation measures listed above.	Construction, operation, closure and rehabilitation
B.19	Reduced habitat fragmentation and edge effects.	Implement introduced fauna mitigation measures listed above.	Construction, operation, closure and rehabilitation
B.20	Reduced habitat fragmentation and edge effects.	Undertake routine inspections for weeds and invasive species.	Construction, operation, closure and rehabilitation
B.21	Elimination of waste left uncontained on-site.	Develop and implement a Waste Management Plan.	Pre-construction
B.22	Elimination of waste left uncontained on-site.	Ensure domestic waste stored in fauna proof bins.	Construction, operation, closure and rehabilitation
B.23	Elimination of waste left uncontained on-site.	Ensure waste stored is stored in appropriately labelled containers.	Construction, operation, closure and rehabilitation
B.24	Elimination of waste left uncontained on-site.	Bund liquid waste, where required.	Construction, operation, closure and rehabilitation
B.25	Elimination of waste left uncontained on-site.	Implement waste hierarchy of avoid/minimise, reuse, recycle, recovery, and then disposal.	Construction, operation, closure and rehabilitation
B.26	Elimination of waste left uncontained on-site.	Ensure waste is disposed off-site by licensed contractor(s).	Construction, operation, closure and rehabilitation
B.27	Elimination of waste left uncontained on-site.	Ensure hazardous waste and hydrocarbons are stored separately in bunding, with appropriate signage.	Construction, operation, closure and rehabilitation
B.28	Minimised dust.	Stage vegetation removal (clearing) to reduce total exposed cleared surface at any one time.	Construction
B.29	Minimised dust.	Avoid clearing during dry windy conditions.	Construction

ID	Outcome	Mitigation/management measure	Timing
B.30	Minimised dust.	Clear with blade up, where possible.	Construction
B.31	Minimised dust.	Leave vegetation 10 centimetres in height on firebreaks and non-crucial tracks.	Construction
B.32	Minimised dust.	Use water trucks during construction and closure and rehabilitation to control dust.	Construction, closure and rehabilitation
B.33	Elimination of unnecessary lighting in surrounding environment.	Use lower intensity lights, e.g. yellow or red lighting, where possible. This would reduce impacts on nocturnal species and limit insect attraction.	Construction
B.34	Elimination of unnecessary lighting in surrounding environment.	Only have minimal lights on needed for safe operation of facilities.	Operation
B.35	Elimination of unnecessary lighting in surrounding environment.	Direct lights towards the ground (where possible) or use shields to direct lights to only where light is required. Have lights positioned as low as possible.	Construction, operation, closure and rehabilitation
B.36	Elimination of unnecessary lighting in surrounding environment.	Turn lights off when not in use.	Construction, operation, closure and rehabilitation
B.37	Elimination of unnecessary lighting in surrounding environment.	Restrict work to daylight hours, where possible.	Construction, operation, closure and rehabilitation
B.38	Reduce noise and vibration.	Turn off machinery when not in use.	Construction, operation, closure and rehabilitation
B.39	Reduce noise and vibration.	Maintain and regularly service all generators, engines and vehicles on-site.	Construction, operation, closure and rehabilitation
B.40	Reduce noise and vibration.	Ensure vehicles carry full loads were possible to limit the number of vehicles on the Chandler Haul Road and Henbury Access Road.	Construction, operation, closure and rehabilitation
B.41	Prevention of the introduction and spread of weeds and invasive species.	Vehicle/machinery wash-down prior to leaving Alice Springs or entering an area uncontaminated by weeds.	Construction, operation, closure and rehabilitation
B.42	Prevention of the introduction and spread of weeds and invasive species.	Avoid contact with weed or invasive species seed, plant matter or soil potentially contaminated with weed seeds.	Construction, operation, closure and rehabilitation
B.43	Prevention of the introduction and spread of weeds and invasive species.	Avoid clearing or removal of any weed or invasive species during seeding, or put plastic bag over seed heads before removing plant.	Construction, operation, closure and rehabilitation
B.44	Prevention of the introduction and spread of weeds and invasive species.	Remove seed and mud from vehicle tyres and front grill daily.	Construction, operation, closure and rehabilitation
B.45	Prevention of the introduction and spread of weeds and invasive species.	Undertake annual weed mapping in the vicinity of the proposed development footprint.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
B.46	Prevention of the introduction and spread of weeds and invasive species.	Remove weeds following specialist advice from qualified ecologist or Weeds Branch, NT Government.	Construction, operation, closure and rehabilitation
B.47	Prevention of the introduction and spread of weeds and invasive species.	Remove weed or invasive species before seeding times, where possible.	Construction, operation, closure and rehabilitation
B.48	Prevention of the introduction and spread of weeds and invasive species.	Avoid driving in wet and muddy conditions, where possible.	Construction, operation, closure and rehabilitation
B.49	Prevention of an increase in the number or frequency of introduced fauna.	Prevent access to artificial water and heat sources through construction of fences.	Construction, operation, closure and rehabilitation
B.50	Prevention of an increase in the number or frequency of introduced fauna.	Dispose of all waste in predator-proof bins.	Construction, operation, closure and rehabilitation
B.51	Prevention of an increase in the number or frequency of introduced fauna.	Develop and implement a no tolerance policy to the introduction of pest species by contractors, suppliers and personnel.	Construction, operation, closure and rehabilitation
B.52	Prevention of an increase in the number or frequency of introduced fauna.	Place brush or vegetation stockpiles across linear developments no longer required (access tracks etc.) to inhibit movement of predators and introduced herbivores.	Construction, operation, closure and rehabilitation
B.53	Prevention of an increase in the number or frequency of introduced fauna.	Undertake annual flora and fauna survey to record numbers of introduced fauna species.	Construction, operation, closure and rehabilitation
B.54	Prevention of an increase in the number or frequency of introduced fauna.	Develop, implement and maintain fauna sighting register.	Construction, operation, closure and rehabilitation
B.55	Prevention of an increase in the number or frequency of introduced fauna.	Develop and implement an introduced fauna control program.	Construction, operation, closure and rehabilitation
B.56	Prevention of an increase in the number or frequency of introduced fauna.	Carry out feral animal control as required in consultation with stakeholders.	Construction, operation, closure and rehabilitation
B.57	Prevention of an increase in the number or frequency of introduced fauna.	Install fauna proof fence around all infrastructure.	Construction
B.58	Prevention of an increase in the number or frequency of introduced fauna.	Reduce artificial standing water.	Construction, operation, closure and rehabilitation
B.59	Prevention of an increase in the number or frequency of introduced fauna.	Close off and rehabilitate any cleared areas no longer required for safe operation.	Construction, operation, closure and rehabilitation
B.60	Prevention of an increase in the number or frequency of introduced fauna.	Ensure waste receptacles are fauna proof.	Construction, operation, closure and rehabilitation
B.61	Prevention of an increase in the number or frequency of introduced fauna.	Do not feed fauna.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
B.62	Prevention of an increase in the number or frequency of introduced fauna.	Remove any dead fauna or insects and either dispose off-site or bury greater than 50 centimetres deep to avoid predators uncovering.	Construction, operation, closure and rehabilitation
B.63	Prevention of an increase in the number or frequency of introduced fauna.	Trap and relocate predator species if they are noticed to have increased in numbers and habituate around facilities. Trapping and relocating of fauna would be undertaken by a qualified ecologist.	Construction, operation, closure and rehabilitation
B.64	Prevention of fires resulting from the Proposal.	Keep up to date with bushfire website and state services.	Construction, operation, closure and rehabilitation
B.65	Prevention of fires resulting from the Proposal.	Construct and maintain firebreaks around infrastructure and significant habitats.	Construction, operation, closure and rehabilitation
B.66	Prevention of fires resulting from the Proposal.	No open flames outside of designated areas unless hot works permit is approved.	Construction, operation, closure and rehabilitation
B.67	Prevention of fires resulting from the Proposal.	Ensure flammable material is clearly labelled.	Construction, operation, closure and rehabilitation
B.68	Prevention of fires resulting from the Proposal.	Ensure adequate firefighting equipment is stored on-site and staff trained in use.	Construction, operation, closure and rehabilitation
B.69	Prevention of fires resulting from the Proposal.	Provide designated smoking area.	Construction, operation, closure and rehabilitation
B.70	Prevention of fires resulting from the Proposal.	Organise and implement strategic back burning with traditional owners and Central Land Council.	Construction, operation, closure and rehabilitation
B.71	Prevention of fires resulting from the Proposal.	Implement and carry out annual fuel load surveys before high risk fire season.	Construction, operation, closure and rehabilitation
B.72	Prevention of impacts to surrounding flora or watercourses from salt.	Survey/monitor flora in dominant down wind direction from salt stockpiles for impacts.	Construction, operation, closure and rehabilitation
B.73	Prevention of impacts to surrounding flora or watercourses from salt.	Cover all salt during transport.	Construction, operation, closure and rehabilitation
B.74	Prevention of impacts to surrounding flora or watercourses from salt.	Monitor dust and airborne particles.	Construction, operation, closure and rehabilitation
B.75	Prevention of impacts to surrounding flora or watercourses from salt.	Store salt in open stockpile for minimum time required.	Construction, operation, closure and rehabilitation
B.76	Prevention of unauthorised third party access.	Inspect site for signs of unauthorised entry.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
B.77	Prevention of unauthorised third party access.	Record all access to site in a site register.	Construction, operation, closure and rehabilitation
B.78	Prevention of unauthorised third party access.	Ensure visitors complete induction or are accompanied by Tellus employee whilst on-site.	Construction, operation, closure and rehabilitation
B.79	Prevention of unauthorised third party access.	Dog leg smaller access tracks when joining larger roads to limit third party access by reducing access tracks visibility from the main road.	Construction
B.80	Prevention of unauthorised third party access.	Mark access tracks and roads as private property.	Construction
B.81	Prevention of unauthorised third party access.	Erect clear signage indicating prohibition of unauthorised entry.	Construction
B.82	Prevention of soil compaction and topsoil loss.	Locate roads, access tracks and required operational areas on solid surfaces, where possible.	Construction
B.83	Prevention of soil compaction and topsoil loss.	Limit compacted areas to minimum required.	Construction
B.84	Successful rehabilitation of disturbed areas.	Develop and implement a closure and Rehabilitation Management Plan.	Pre-closure and rehabilitation
B.85	Successful rehabilitation of disturbed areas.	Install erosion and sediment control temporary structures to assist with rehabilitation.	Closure and rehabilitation
B.86	Successful rehabilitation of disturbed areas.	Respread spoil first, then top soil and last cleared vegetation over surfaces.	Closure and rehabilitation
B.87	Successful rehabilitation of disturbed areas.	Leave any infrastructure, plant or cleared area as so detailed in a land use agreement with the land manager.	Closure and rehabilitation
B.88	Successful rehabilitation of disturbed areas.	Remove all infrastructure, plant, machinery and operational and construction wastes.	Closure and rehabilitation
B.89	Successful rehabilitation of disturbed areas.	Re-contour all cleared surfaces to match surrounding topography, as close as possible.	Closure and rehabilitation
B.90	Successful rehabilitation of disturbed areas.	Rip any compacted areas.	Closure and rehabilitation
B.91	Successful rehabilitation of disturbed areas.	Ensure final surface is rough to increase infiltration.	Closure and rehabilitation
B.92	Successful rehabilitation of disturbed areas.	Block all access points to roads and tracks, unless agreed with land manager.	Closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
B.93	Successful rehabilitation of disturbed areas.	Fill in sumps or turkey nest, unless agreed otherwise with land manager.	Closure and rehabilitation
B.94	Successful rehabilitation of disturbed areas.	Close off and seal all groundwater wells.	Closure and rehabilitation
B.95	Successful rehabilitation of disturbed areas.	Re-spread top soil.	Closure and rehabilitation
Groundwater			
GW.1	Sustainable use of groundwater reserves.	Apply for water abstraction licences and permits under the Water Act.	Pre-construction
GW.2	Avoid groundwater contamination.	Grout and seal production bores during construction, operation and post closure (as indicated in Sections 8.1.1 and 8.1.2).	Pre-construction
GW.3	Monitor and record groundwater drawdown.	Ensure localised depressurisation of groundwater systems are monitored with data loggers in monitoring bores to ascertain potential of the Proposal to impact local groundwater users. Ensure groundwater level data is reviewed and reported in an Annual Environmental Monitoring Report (AEMR).	Pre-construction, construction, operations, post-closure
GW.4	Develop of detailed groundwater quality database.	Report groundwater quality results to the DPIR and the NT EPA every four months (April, August and December) to compare seasonal data against project activities.	Seasonal (on a rolling basis over the life of the mine).
GW.5	Consultation to develop a local groundwater database.	Undertake a hydro-census (condition) survey of local groundwater users prior to construction to ascertain bore condition and current status of the bores located within a 25 kilometre spatial buffer around the proposed Chandler Facility. Involve consultation with local groundwater users, with an end purpose of establishing baseline conditions of existing local groundwater users.	Pre-construction
GW.6	Develop a detailed groundwater database.	Construct four additional water monitoring sites (as nested sites) to observe shallow groundwater and to monitor deeper systems predicted to be intercepted through mining activities. Monitor groundwater levels and quality near Titjikala, the Finke River, and within the deeper groundwater systems (Stairway Sandstone and Jay Creek Formations) near the proposed mine portal. Undertake shallow monitoring of ephemeral groundwater in aeolian/alluvial sediments at the Chandler Facility and Apirnta Facility to monitor any pollutant losses into the sub-surface.	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
GW.7	Develop a detailed groundwater database.	Complete a groundwater isotope study for monitoring bores prior to construction to confirm the relationship between shallow and deeper groundwater systems, and to confirm the origin and residence time of groundwater.	Pre-construction
GW.8	Develop a detailed groundwater database.	Despite there being no known groundwater dependent ecosystems in the immediate vicinity of the Proposal, potential groundwater dependent ecosystems should be monitored and modelled through detailed design if identified to be potentially impacted by the Proposal. Establish a monitoring program if potential groundwater dependent ecosystems are identified to be impacted through the construction, operation or closure and rehabilitation of the Proposal.	Pre-construction (detailed design)
GW.9	Avoid groundwater contamination.	Ensure that the management of groundwater and surface water inflow into the mine portal and ventilation shafts, including the design and capture of this water is undertaken in consultation with the DPIR who administer the Mine Management Plan.	Construction
GW.10	Sustainable use of groundwater reserves.	Ensure preference is given to re-use groundwater inflows over potable water for construction activities, where reasonable and feasible.	Construction
GW.11	Develop a more detailed understanding of local groundwater network.	Refine or further develop the groundwater model to verify the predictions within the EIS (if water level variations outside of the natural range are observed). Ensure modelling is consistent with established guidelines, which allow for analytical or numerical modelling if appropriate for the project context and risks, subject to discussion and agreement with government agencies.	Operations
GW.12	Develop a detailed groundwater database.	Monitor groundwater abstraction in production bores. Fit a cumulative flow meter to each production bore, and install pressure transducers in each bore to monitor groundwater drawdown at source.	Construction, operations, post-closure
Surface water			
SW.1	Management of floodwater draining towards the Chandler Facility from the Maryvale Hills upstream of the mine site.	Formalise drainage channels through or around the site so that upstream runoff does not cause flooding of the site, and so that it is not contaminated by site runoff or sedimentation. Raise flood prone site infrastructure above surrounding ground level.	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
SW.2	Improved water quality and attenuation of surface water flow.	Treat runoff to improve water quality resulting in an attenuation of flows, mitigating any increase in runoff peak flows or volumes.	Pre-construction
SW.3	Movement or reconfiguration of Halfway Dam.	Investigate current and future use of the Halfway Dam. Develop proposals to move or reconfigure the dam and intake.	Pre-construction
SW.4	Management of floodwater on Chandler Haul Road.	Manage floodwater by: • Raising the road above surrounding ground level to prevent flooding. • Installing culverts to pass flood flow and reduce/minimise upstream ponding. • Installing causeways over which floodwaters in excess of the design event can pass, but that raise the road above frequent flood levels. Carrying out repairs, following flood events, as necessary.	Pre-construction
SW.5	Minimisation of impacts from the Henbury Access Road at the Finke River crossing.	Limit the engineering required to cross the river.	Construction
SW.6	No long term alterations to local hydrology.	Allow natural surface drainage to continue without interruption, where possible.	Construction
SW.7	No long term alterations to local hydrology.	Avoid clearing or disturbance to watercourses or drainage depressions, where possible.	Construction
SW.8	No long term alterations to local hydrology.	Avoid infrastructure developments in any watercourse or drainage depressions, where possible.	Construction
SW.9	No long term alterations to local hydrology.	Ensure no impedance to natural creek flow, where possible.	Construction
SW.10	No long term alterations to local hydrology.	Develop creek crossings to natural contours of creek bed.	Construction
SW.11	No long term alterations to local hydrology.	Remove any concentrations points that would impede natural sheet flow.	Construction
SW.12	No long term alterations to local hydrology.	Ensure minimal disturbance within watercourse buffer zones.	Construction
SW.13	No long term alterations to local hydrology.	Leave large mature trees and shrubs, where possible.	Construction
SW.14	No long term alterations to local hydrology.	Conduct routine inspection and maintenance of drains and watercourses.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
SW.15	Avoidance of spills or accidental loss of hazardous materials.	Store hazardous waste within a bunded area sufficient to hold 110% of all material.	Construction, operation, closure and rehabilitation
SW.16	Additional monitoring.	Undertake level/flow measurements on Halfway Dam catchment and three to four catchments draining to the Chandler Haul Road or Chandler Facility, and including the catchment draining through the Apirnta Facility.	Pre-construction; construction, closure and rehabilitation.
SW.17	Additional investigations during detailed design.	Develop stormwater models of the Chandler Facility and Apirnta Facility, including the management of site runoff and the diversion /conveyance of floodwaters from upstream catchments around the sites.	Pre-construction
SW.18	Additional investigations during detailed design.	Develop two-dimensional modelling of flow paths and inundation in the mine lease area, including the 'washout area' to better understand the potential for floodwaters to reach the Hugh River near Titjikala. This investigation would include an assessment of infiltration and evaporation.	Pre-construction
SW.19	Additional investigations during detailed design.	Model flood risk and scour protection at the crossing of the Finke River.	Pre-construction
SW.20	Additional investigations during detailed design.	Model flood risk[1] of haul crossings (bridges, culverts, causeways) of drainage lines.	Pre-construction
SW.21	Develop site specific water quality guidelines.	Develop guidelines for both the no-flow and flowing phases. This could be done by collecting and interrogating monitoring data and developing conceptual, probabilistic and/or numerical models that incorporate flow, catchment and in-stream influences. This site-specific system would be developed during detailed design and as part of the Water Management Plan and relies on obtaining more site data.	Pre-construction
SW.22	No offsite sedimentation.	Improving water retention by slowing upstream surface flow and improving transmission properties, which provides more time for water to infiltrate.	Pre-construction and Construction

[1] *The modelling would include an expanded suite of design events, including extreme events such as the Probable Maximum Flood*

ID	Outcome	Mitigation/management measure	Timing
SW.23	Preventing erosion and sedimentation.	Decreasing runoff rate and its velocity by providing appropriate surface drainage systems for safe conduct of water into pre-designed surface storage systems.	Pre-construction
SW.24	No offsite pollution.	Silty or oily water should not be used for dust suppression purposes, because this would transfer pollutants to the haul roads or generate more dust.	Construction and operation
SW.25	No offsite release of salt laden sediment.	A clay lined drainage swale would be constructed around the perimeter of the run of mine salt stock pile to prevent offsite release of salt laden sediment.	Operation
SW.26	Prevent sediment from being tracked off site and onto the road.	It is recommended that one entry / exit point to the Apirnta Facility and Chandler Facility sites should be established. If the site slopes towards this entry / exit, drainage and sediment control devices should be installed so that all sediment laden runoff can be fully contained and treated on-site.	Pre-construction
SW.27	Prevent sediment from being tracked off site and onto the road.	Vehicles and construction equipment may require washing to prevent transfer and accumulation of mud on the haulage and access roads. Alternatively, manned jet washes or lance sprays could be used in a bunded area where the runoff can be contained and channelled to a treatment area, such as a settlement pond.	Construction and operation
SW.28	Best practice in stockpile management.	Soil and sand stockpiles need to be located within the compound and upslope of a sediment control. Impervious covers, filter fences, mulch berms or sediment fences.	Construction and operation
SW.29	Prevent sediment runoff.	Provision of a sediment trap, such as a mulch bank or a sediment fence, on the downslope boundaries of the Apirnta Facility, Chandler Facility and haulage roads is recommended. The mulch banks and sediment fencing should be positioned on the contour where possible.	Construction and operation and closure
SW.30	Prevent sediment runoff.	Onsite drop inlet pits and haulage road side entry pits should be protected prior to the commencement of works or as soon as constructed.	Construction and operation and closure
SW.31	Prevent sediment runoff.	Buffer strips and vegetation filters should be employed, where practical, along the haulage road instead of sediment trapping structures (DLRM, 2013b).	Construction and operation and closure
SW.32	Best possible location for the replacement of Halfway Dam.	Make use of a similar gully or depression off-line from an adjacent to a creek with similar catchment area nearby on gently sloping	Detailed design

ID	Outcome	Mitigation/management measure	Timing
		terrain (<15%). A site investigation and selection should be undertaken to optimise the sustainable use of available water within a dam's catchment. The size of the catchment, soil and vegetation characteristics and path of surface run-off water determines what water is available within a catchment. Contour maps should be used to predict the path of rainfall and irrigation run-off within the dam's catchment.	
SW.33	Prevent the release of stormwater offsite.	Stormwater from disturbed areas would not be discharged into down-gradient properties. To capture 'dirty' surface runoff, u-shaped earth banks would be constructed to pond water (DLRM, 2013b).	Detailed design and pre-construction
SW.34	Provide habitat and prevent erosion.	Retained vegetation can have the dual purpose of not only assisting in the settling of sediment from overland flows, but also provide a refuge for flora and fauna.	Construction and operation.
SW.35	Prevent erosion and sedimentation.	A disturbance plan would be prepared following the completion of detailed design. This would be done to retain or preserve as much of the existing vegetation as possible would be implemented, especially adjacent to drainage lines. Identification of any areas to be used as 'turn around' or laydown areas should be completed with an indication in the Construction Notes how cleared and NO-GO areas would be implemented e.g. GPS data provided to clearing contractors and areas flagged on the ground prior to any clearing activity.	Pre-construction
SW.36	Retain riparian vegetation and prevent offsite release of sediments.	DLRM Land Clearing Guidelines provide information on required buffer zones for watercourses (DLRM, 2013a and DLRM, 2013b). To be effective as a sediment control, the area for retention should contain at least 80% ground cover. Buffer zones for the Apirnta Facility, Chandler Facility, and Haulage Roads have been developed based on stream order. The bulk of buffer zones are 25 metres. The exception is Charlotte Creek, a second order stream, requiring a buffer of 50 metres.	Construction and operation
Historic and cultural heritage			
CH.1	Reduce the risk of inadvertently disturbing archaeological material during construction.	Undertake additional surveys of areas that would be impacted but have not yet been surveyed and which have a moderate to high probability of containing archaeological material (e.g. sections of	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
		the proposed Chandler Haul Road and eastern end of the proposed Henbury Access Road).	
CH.2	Preservation of areas of cultural sensitivity.	Clearly mark cultural heritage exclusion zones and ensure there is no intrusion into cultural heritage exclusion zones.	Pre-construction, construction, operation, and closure and rehabilitation
CH.3	Appropriate consent obtained to impact or potentially disturb archaeological material.	Ensure that appropriate consent is obtained for all sites that would be directly impacted or vulnerable to disturbance and require protective measures. Consent would be obtained from the NT Heritage Branch under section 72 of the NT *Heritage Act.*	Pre-construction
CH.4	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Undertake additional mitigative works as part of conditions associated with gaining consent to impact or disturb particular archaeological material. For example, establishing "no-go" areas, undertaking mitigative recording of sites, relocating artefacts and establishing protective fencing (refer to Table 11a through Table 11d of Cultural Heritage Management Plan, Appendix S).	Pre-construction
CH.5	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Ensure that all cultural heritage resources within and in the vicinity of the proposed development footprint are identified on general site maps and that no-go areas (i.e. sites or parts of sites to be protected, restricted areas) are also shown on all construction drawings.	Pre-construction
CH.6	Facilitate the ongoing management of cultural heritage resources.	Establish a database of cultural heritage resources within and in the vicinity of the proposed development footprint.	Pre-construction
CH.7	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Establish a cultural awareness induction program for all contractors, employees and agents working on-site. Maps and drawings showing cultural heritage resources within the proposed development footprint would be provided to all contractors and employees working on-site.	Pre-construction and construction
CH.8	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Implement protocols for the unanticipated discovery of archaeological material and skeletal remains as per the Cultural Heritage Management Plan at Appendix S.	Pre-construction, Construction
CH.9	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Ensure that sites identified as vulnerable to disturbance are subject to regular monitoring at monthly intervals. Implement management measures, if necessary (e.g. implementing works to stem erosion, reviewing the efficacy of site protection measures	Construction

ID	Outcome	Mitigation/management measure	Timing
		including fencing, the cultural heritage induction program and mapping).	
CH.10	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Ensure that sites identified as vulnerable to disturbance are subject to monitoring on an annual basis. Implement conservation and management measures for other sites as appropriate (e.g. detailed recording, conservation works).	Operation
CH.11	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Ensure any new areas subject to ground disturbance in the future are assessed and surveyed in accordance with the predictive models and appropriate actions taken in relation to the NT *Heritage Act*.	Operation
CH.12	Mitigation and management of archaeological material within and in the vicinity of the proposed development footprint.	Ensure that the condition of all sites are recorded one last time. Remove protective fencing once all infrastructure had been dismantled and removed from site and other rehabilitation works are complete. Forward all data pertaining to each site including site records, documentation (e.g. results of monitoring), photographs, records of action taken, etc. are forwarded to the NT Heritage Branch.	Decommissioning
Human health and safety			
HS.1	Minimisation of potential impacts on human health and the environment through responsible storage and handling of hazardous materials.	Finalise Safety Case for a Major Hazard Facility in accordance with the NT *Work Health Safety Act* and the NT WHS Regulations 536, 537 and 547 administered by NT WorkSafe and the Australian Dangerous Goods Code 2007.	Detailed design
HS.2	Minimisation of potential impacts on human health and the environment.	Finalise Emergency Response Management Plan.	Pre-construction
HS.3	Minimisation of potential impacts on human health and the environment.	Update Environmental Management System with management plans and procedures relevant to the construction, operation and closure and rehabilitation of the Proposal.	Pre-construction, construction, operation, closure and rehabilitation
HS.4	Minimisation of potential impacts on human health and the environment through responsible transportation, storage and handling of hazardous materials.	• Transport, store and handle hazardous materials in accordance with industry regulations, codes and standards (e.g. *Work Health and Safety (National Uniform Legislation)* Act and the NT WHS Regulations. • Adhere to Chandler Safety Case.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
		• Adhere to Chandler Waste Acceptance Procedure (WAP), Waste Acceptance Criteria (WAC) and Waste Zoning Guide (WZG). • Adhere to Emergency Response Management Plan.	
HS.5	Minimisation of potential impacts on human health and the environment through responsible transportation of hazardous materials.	• Transport hydrocarbons in compliance with the Australian Dangerous Goods Code 2007. • Ensure all vehicles are registered and carry appropriate equipment to respond to a spill, including personal protective equipment (PPE).	Construction, operation, closure and rehabilitation
HS.6	Minimisation of potential impacts on human health and the environment through responsible handling of hazardous materials.	Ensure personnel are trained in the appropriate handling of hazardous materials and in clean-up procedures in the event of a spill.	Construction, operation, closure and rehabilitation
HS.7	Minimisation of potential impacts on human health and the environment through responsible storage of hazardous materials.	Store diesel in 30,000 litre self-bunded tanks manufactured in compliance with Australian Standard (AS)1692 (Steel Tanks for Flammable and Combustible Liquids) and installed in compliance with AS1940 (The Storage and Handling of Flammable and Combustible Liquids).	Construction, operation
HS.8	Minimisation of potential impacts on human health and the environment through responsible storage of hazardous materials.	• Store lubricating oil in bulk containers inside a bunded area with spill protection and recovery kits. • Ensure waste hydrocarbons are stored in tanks inside a bunded area and held for collection by an appropriately licensed contractor for reprocessing and recycling.	Construction, operation
HS.9	Minimisation of potential impacts on human health and the environment through responsible storage and handling of hazardous materials.	Store ammonium nitrate in a dedicated building and in accordance applicable regulations, codes and standards. Ensure that ammonium nitrate is handled by appropriately trained personnel.	Construction, operation
HS.10	Minimisation of potential impacts on human health and the environment through appropriate clean-up of spills in	In the event of a spill of hazardous material, implement the strategies outlined in the Emergency Response Management Plan. These strategies would include (but would not be limited to): • Isolating and containing spill using spill kit.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
	accordance with Emergency Response Management Plan.	• Evacuating area if potential danger exists. • Notifying Environmental Manager. Provide location, extent, substance type, quantity, environments impacted (e.g. soils, surface watercourses, groundwater) and spill kit contents used. • Using spill kit to remove the contamination source or, where relevant, excavate and appropriately dispose of contaminated sediments. • Commencing investigation into soil, surface and/or groundwater impacts from the spill. Detail spill quantity, determine extent and significance of impact to human health and/or environment (including upstream/control samples, as required). • Providing DPIR with Section 29 Notification and NT EPA with Section 14 Incident Report Form within 24 hours of incident occurring if the incident caused or is threatening or may threaten to cause pollution resulting in minor or serious environmental harm. • Ensuring spill kits are located at all hazardous material storage locations. Spill kits would be available to be relocated to specific areas in accordance with scopes of work.	
HS.11	Minimisation of potential impacts on human health and safety (general).	Establish emergency medical safety points containing eye flush/body flush stations and first aid kits at easily identifiable key locations above and underground.	Construction, operation, closure and rehabilitation
HS.12	Minimisation of potential impacts on human health and safety (exposure from fuel spills).	• Adhere to WAP and WAC. • Wear appropriate PPE.	Construction, operation, closure and rehabilitation
HS.13	Minimisation of potential impacts on human health and safety (pedestrian and vehicle interactions).	• Develop Traffic Management Plan. The plan would include standard traffic rules, signage etc. It would also include collision avoidance system (refer to Chapter 18).	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
		• Prepare and submit Construction Traffic Management Plan. • Prepare and submit Operational Traffic Management Plan (once detailed design has been completed). • Mark designated pedestrian areas. • Promote driver competency through training programs, as necessary.	
HS.14	Minimisation of potential impacts on human health and safety (exposure from mine gas extraction).	• Wear and maintain correct PPE (including breathing apparatus). • Aerate decline and shafts. • Undertake gas monitoring.	Construction and operation
HS.15	Minimisation of potential impacts on human health and safety (ventilation failure).	• Ensure there is a back-up supply of power. • Wear and maintain correct PPE (including breathing apparatus).	Construction, operation, closure and rehabilitation
HS.16	Minimisation of potential impacts on human health and safety (underground vehicle fire).	• Establish underground escape routes and isolation zones. • Ensure fire extinguishers and suppression systems are installed.	Construction, operation, closure and rehabilitation
HS.17	Minimisation of potential impacts on human health and safety (underground vehicle exhaust exposure).	• Consider use of electrical vehicles underground. • Wear and maintain correct PPE (including breathing apparatus, as appropriate). • Aerate decline and shafts. • Undertake gas monitoring.	Construction, operation, closure and rehabilitation
HS.18	Minimisation of potential impacts on human health and safety (heat stress - above and below ground).	• Remain hydrated and have a sufficient supply of water. • Wear and maintain correct PPE.	Construction, operation, closure and rehabilitation
HS.19	Minimisation of potential impacts on human health and safety (construction accidents).	• Install machine guarding.	Construction

ID	Outcome	Mitigation/management measure	Timing
		• Adhere to operational and maintenance procedures. • Ensure operator competency through training, as necessary.	
HS.20	Minimisation of potential impacts on human health and the environment (underground ignition).	• Adhere to Chandler WZG. • Undertake weekly gas monitoring in storage areas. • Ensure fire extinguishers and suppression systems are installed. • Install aeration system to maintain ventilation and restrict temperature rise.	Operation
HS.21	Minimisation of potential impacts on human health and safety (bites and stings).	• Wear appropriate PPE. • Use insect repellent.	Construction, operation, closure and rehabilitation
HS.22	Minimisation of potential impacts on human health and safety (drugs and alcohol abuse).	• Develop Drug and Alcohol Management Plan. • Implement daily testing for drugs and blood alcohol levels.	Construction, operation, closure and rehabilitation
HS.23	Minimisation of potential impacts on human health and safety (strata and ground stability).	• Correct design of room and pillar in the salt formation. • Wear and maintain correct PPE (including two-way radio).	Construction, operation, closure and rehabilitation
HS.24	Minimisation of potential impacts on human health and safety (mine and drill blasting).	• Ensure there is an adequate separation zone whilst blasting occurs. • Wear hearing protection. • Wear and maintain correct PPE.	Construction and operation
HS.25	Minimisation of potential impacts on human health and the environment (ignition of flammable materials).	• Adhere to Chandler WZG and Dangerous Goods Regulations. • Ensure fire extinguishers and suppression systems are installed.	Construction, operation, closure and rehabilitation
HS.26	Minimisation of potential impacts on human health and safety (fall from height).	• Ensure operator competency for working at heights. • Implement work at heights procedures. • Use suitable work at heights equipment e.g. fall protection.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
HS.27	Minimisation of potential impacts on human health and safety (electrical incident).	• Design and maintain all electrical systems as per legislative requirements. • Install physical protection (cabinets, bollards etc.) around high risk electrical installations.	Construction, operation, closure and rehabilitation
HS.28	Minimisation of potential impacts on human health and safety (exposure from radiation).	• Adhere to WAP and WAC. • Wear and maintain correct PPE.	Operation
HS.29	Minimisation of potential impacts on human health and safety (windblown materials).	• Factor local wind directions during placement of stockpiles. • Consider vegetation cover for long term stockpiles.	Construction and operation
HS.30	Minimisation of potential impacts on human health and safety (confined space).	• Ensure operational procedures are adhered to including those listed in the Air Quality Management Plan. • Ensure workers obtain confined space permits. Ensure operator competency in confined space entry. • Use breathing apparatus, where necessary. • Aerate decline and shafts. • Undertake gas monitoring.	Construction, operation, closure and rehabilitation
Economic and social			
ES.1	Management of expectations and maintenance of good working relationship with stakeholders.	Continue to engage in stakeholder consultation to inform stakeholders of forced or unpredicted delays. In particular, work with the NT Chamber of Commerce, the NT Government and the Industry Capability Network through the progression of the Proposal.	Pre-construction and construction
ES.2	High local content during construction and operation.	Commit to spending in the local region. Spending would directly benefit local businesses and their employees. It would also indirectly benefit other businesses in the local region through the spending on goods and services by these businesses.	Construction and operation
ES.3	Direct employment opportunities during construction and operation.	Commit to local employment. Provide opportunities to gain experience in construction and also long term work experience during operation.	Construction and operation

ID	Outcome	Mitigation/management measure	Timing
ES.4	Creation of opportunities for indigenous people from the local region to gain long term employment in a new industry.	Set target of 10% indigenous employment from the local region during construction and operation.	Construction and operation
ES.5	Creation of opportunities for employment of local people as well as indirect opportunities from flow on impacts.	Commit to local employment. This would increase job creation within the local region and NT.	Construction and operation
ES.6	Creation of large economic flow on impact from the Proposal. Some drawing of resources away from the rest of the local region and NT.	Commit to spending and employment in the local region. This would increase the economic value created in the local region and in the NT.	Construction and operation
ES.7	Increase in the ability of local people to purchase goods and services and to accumulate wealth.	Commit to local employment.	Construction and operation
ES.8	Boost to payroll taxation in the NT.	Commit to local employment. This would increase revenue from payroll taxation.	Construction and operation, and closure and rehabilitation
ES.9	Minimisation of stress on housing market (however there would be a low risk of impacting this market).	Commit to maximise the use of drive in – drive out employment over fly in – fly out employment which may encourage additional population to Alice Springs.	Construction and operation, and closure and rehabilitation
ES.10	Increased demand for goods and services through direct and indirect spending in the local region and NT.	Commit to local spending and employment as well as commit to ongoing consultation with local business organisations and government to maximise benefit to NT.	Construction and operation, and closure and rehabilitation
ES.11	Opportunities for new and existing businesses (e.g. agribusiness, tourism and conservation including ranger services and cultural and traditional tourism ventures) to support the Proposal.	Execute land use agreements with relevant parties. Land use agreements would generate a range of potential business opportunities for businesses in the local region and in the NT.	Pre-construction
ES.12	Opportunities for education and training of local people, in addition to new business opportunities for local businesses involved in the education and training sector.	Develop a Workforce Management Plan. Measures included in the plan would include a commitment to conduct training for employees in the local region and to also source training providers from the local region.	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
ES.13	Benefits to local road users including tourists from residual road infrastructure (including the Henbury Access Road, Chandler Haul Road and upgrades to Maryvale Road).	Ensure Henbury Access Road and Chandler Haul Road are made available to pastoralists post closure and rehabilitation of the Proposal.	Closure and rehabilitation
ES.14	Positive health and education impacts within the local region.	Commit to the sponsorship of sporting and academic programs within the community of Titjikala.	Construction and operation, and closure and rehabilitation
ES.15	Reduced impacts from increased vehicle movements on Maryvale Road, Chambers Pillar Road, Stuart Highway.	Commit to workplace programs regarding road safety and develop and implement a Traffic Management Plan.	Pre-construction, construction and operation, and closure and rehabilitation
ES.16	Protection of culturally important sites.	Maintain and respect cultural heritage exclusion zones. Continue consultation with Traditional Owners and nearby residents throughout the life of the Proposal.	Construction and operation, and closure and rehabilitation
ES.17	Some interaction between workers and local residents possible, but unlikely.	House workers in accommodation village. Maintain strict workplace regulations which minimise interaction with local residents and promote responsible behaviour.	Construction and operation, and closure and rehabilitation
Closure and rehabilitation			
CR.1	Return of the development footprint to near original condition.	Adopt the principles set out in the draft RCP (refer to Appendix L). Such principals would include (but would not be limited to): • Decontaminate structures (if necessary) and wash down prior to the commencement of demolition works. • Determine safe and efficient dismantling procedures and prepare a demolition plan. • Pull structures to ground and dismantle. • Break down concrete slabs and footings to a depth of one metre below the finished ground surface. • Remove or bury services at a depth of at least one metre below the final ground surface. • Leave buried pipes *in situ* and flush and seal each end.	Closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
		• Dispose of non-recyclable and inert waste in an on-site landfill, or similar. • Ensure access roads required to be left for post closure monitoring purposes are defined and retained. All areas are ripped to break compaction prior to overburden and/or topsoil application.	
CR.2	Monitoring of rehabilitation and annual reporting on performance and objectives.	Undertake monitoring of rehabilitation (including vegetation regrowth) and annual reporting on performance and objectives. Includes monitoring of vegetation regrowth and surface water and groundwater monitoring as per the requirements of the Water Management Plan (refer to Appendix Q).	Closure and rehabilitation
CR.3	Maintenance works/remedial action taken, if needed.	Should visual inspections or monitoring results indicate the need for maintenance works or remedial action to be undertaken, mobilise contractors to site to undertake these works. Works may include: • Vegetation – if rehabilitation is failing, additional application of fertiliser, additional seeding or planting may be required. • Erosion - if significant erosion is identified or rehabilitation is not progressing towards a self-sustaining community, the following remedial actions may be considered: o Construct, improve, or repair drainage control measures to reduce water movement down outer slopes of the landform. o Remediate areas of deep erosion and/or instability with appropriate material. Access - remedial works would be required if access prevention measures fail to restrict unauthorised access.	Closure and rehabilitation
Bushfire			
BF.1	Reduced incidence of bushfire (protection of human life, assets and the environment).	Finalise draft Bushfire Management Plan prior to construction and incorporate into the CEMP, OEMP and RCP. The plan collates	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
		measures to mitigate and manage potential impacts on the humans, assets and the environment.	
BF.2	Reduced incidence of bushfire (protection of human life, assets and the environment).	Undertake fuel load assessments annually to assess bushfire potential and need for pro-active controls, e.g. back burning.	Construction, operation, closure and rehabilitation
BF.3	Reduced incidence of bushfire (protection of human life, assets and the environment).	Create fire breaks/asset protection zones with reference to prevailing wind directions, highest wind speeds and vegetation types.	Construction, operation, closure and rehabilitation
BF.4	Reduced incidence of bushfire (protection of human life, assets and the environment).	Consult with the NT Fire and Rescue Service on issues relating to: • Strategic planning of bushfire with respect to the layout of the Chandler Facility. • Fire safety. • Hazard abatement. • Firefighter training. Operations support and administration.	Pre-construction, construction and operation
BF.5	Reduced incidence of bushfire (protection of human life, assets and the environment).	Ensure bushfire suppression equipment is available on-site.	Construction, operation, closure and rehabilitation
BF.6	Reduced incidence of bushfire (protection of human life, assets and the environment).	Ensure fuels and other flammable materials are stored appropriately and in accordance with applicable regulations.	Construction, operation, closure and rehabilitation
Air quality			
AQ.1	Minimisation of air quality and human health impacts.	Prepare an Air Quality Management Plan.	Pre-construction
AQ.2	Minimisation of dust and associated human health risks.	Ensure effective communication between potentially affected communities and the proponent.	Construction
AQ.3	Minimisation of dust and associated human health risks.	Perform daily on-site and off-site inspections.	Construction
AQ.4	Minimisation of dust and associated human health risks.	Promote a program of considerate vehicle operation and sustainable travel.	Construction
AQ.5	Minimisation of dust and associated human health risks.	Use enclosed tankers for the transportation of bulk materials.	Construction

ID	Outcome	Mitigation/management measure	Timing
AQ.6	Minimisation of dust and associated human health risks.	Implement measures to ensure that vehicle track-out is adequately controlled.	Construction
AQ.7	Minimisation of dust and associated human health risks.	Establish a dust monitoring network to monitor dust emissions within the development envelope. Dust monitors would likely be installed at: • Chandler Facility • Apirnta Facility • Accommodation village • Community of Titjikala.	Construction
AQ.8	Minimisation of particulate emissions from mine surface operations.	Ensure use of diesel engines that comply with the emission standards of the United Stated Environmental Protection Agency (Tier 4 Emission Standards).	Operation
AQ.9	Minimisation of particulate emissions from mine surface operations.	Install windbreaks at run-of-mine salt stockpiles.	Operation
AQ.10	Minimisation of particulate emissions from mine surface operations.	Install windbreaks at sandstone, shale, limestone and topsoil stockpiles. In addition to windbreaks, shape and profile and rehabilitate stockpiles, as necessary.	Operation
AQ.11	Minimisation of dust and associated human health risks.	Enforce vehicle speed restrictions, undertake surface improvements or surface treatments (including wet suppression and chemical stabilisation).	Operation
AQ.12	Minimise risk of loss of containment of waste materials.	Ensure handling of IBC/FIBC from TEU containers is performed on a strict one-at-a-time basis, to avoid the potential for spillage of contents of multiple containers.	Operation
AQ.13	Minimise risk of loss of containment of waste materials.	Ensure containers are removed from trucks in an appropriately bunded area to minimise the surface area of any spills and to enable efficient clean-up of any spilled materials. Ensure liquid waste is managed through a liquid waste collection system designed to allow for sufficient capacity of liquids to be removed (e.g. 110% of potential spill volume).	Operation
AQ.14	Minimise risk of loss of containment of waste materials (transportation).	Develop a collision avoidance system that provides a visible and audible positive confirmation of the presence of other vehicles travelling along the proposed Chandler Haul Road. Visible and audible alarm would alert drivers when haul trucks are within 500 metres of each other, requiring a reduction in speed.	Operation

ID	Outcome	Mitigation/management measure	Timing
AQ.15	Minimise risk of loss of containment of waste materials (transportation).	Restrict loads containing common and/or more toxic waste components, such that: • Less than one TEU equivalent is carried in one movement. Less than one TEU equivalent is carried in any two sequential movements (to manage out the potential of loss of containment from collisions).	Operation
AQ.16	Minimise risk of loss of containment of waste materials (transportation).	Manage loss of containment at Orange Creek, Desert Oaks Motel, Stuart Wells and at the Apirnta Facility through the implementation of specific mitigation measures, which include: • A pre-prepared management response plan would be prepared for each location. • Restrictive speed limits imposed for road transport as it passes each of the locations. • The content of the response plan would need to be communicated to the respective residents, and also posted prominently for public reference in the unlikely event of a loss of containment at those locations. The provision of spill kits at each location.	Operation
Noise and vibration			
NV.1	Workers safeguarded from occupational noise.	Prepare Noise Management Plan (in accordance with the NT *Work Health Safety Act*) prior to construction and incorporate into the CEMP, OEMP and/or RCP for the Proposal.	Pre-construction
NV.2	Workers safeguarded from occupational noise.	Select mobile mechanical equipment to minimise noise emissions and ensure equipment is appropriately maintained to ensure excessive noise is not generated.	Construction, operation, closure and rehabilitation
NV.3	Workers safeguarded from occupational noise.	Check noise emission levels of all critical items of mobile mechanical equipment for compliance with noise limits appropriate to those items prior to the equipment going into regular service.	Construction, operation, closure and rehabilitation
NV.4	Workers safeguarded from occupational noise.	Where practicable, operate mechanical equipment at low speed/power and switch off when not being used rather than leave idling for prolonged periods of time.	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
NV.4	Workers safeguarded from occupational noise.	Provide appropriate training for operators in order to raise their awareness of potential noise problems and to increase their use of techniques to minimise noise emissions.	Construction, operation, closure and rehabilitation
NV.5	Workers safeguarded from occupational noise.	Where practicable, optimise the layout and positioning of noise-producing equipment and activities on-site to minimise noise emission levels.	Construction, operation, closure and rehabilitation
NV.6	Workers safeguarded from occupational noise.	Ensure workers wear and maintain appropriate PPE.	Construction, operation, closure and rehabilitation
NV.7	Workers safeguarded from occupational noise.	Where noise from a particular activity is identified, measures to mitigate the impact would be investigated, implemented and recorded.	Construction, operation, closure and rehabilitation
Visual amenity			
LV.1	Landscape management.	Prepare a Landscape Concept Plan as part of the detailed design of the Proposal. Measures in the plan would include the consideration of existing landscape features when siting infrastructure and choosing building materials and treatments to minimise the potential visibility of the Proposal.	Detailed design
LV.2	Avoid visual impacts on potential items of cultural sensitivity.	Consult with Traditional Owners during the detailed design of the Proposal.	Detailed design
LV.3	Screening of infrastructure.	Where possible, utilise existing features of the landscape, such as existing shrubs and trees, to screen and minimise visual impacts of infrastructure and/or permanent structures.	Detailed design
LV.4	Complement the existing landscape.	Choose external building finishes to minimise visual impact. Recessive, low reflectivity finishes that blend with the adjoining bushland wold be used. Roof colours and finishes would complement the colour of the building facades and the hues would aim to blend with the colours prevailing in the surrounding landscape.	Detailed design
LV.5	Minimise the impact of uncharacteristic features in the landscape.	Avoid the use of highly reflective surfaces/colours, brightly coloured or strongly contrasting materials, and unpainted metal.	Detailed design
LV.6	Minimise the impact of uncharacteristic features in the landscape.	Ensure boundary fences are simple, non-reflective and have a high degree of transparency.	Detailed design
LV.7	Mitigate plant loss and screening of infrastructure.	Plant trees (in accordance with the recommendations of the Biodiversity Management Plan) to reduce the visual impacts of the	Prior to operation

ID	Outcome	Mitigation/management measure	Timing
		Proposal. Tree planting would give scale to the buildings, provide amenity (shade) for employees, and screen areas, such as stockpiles and hardstand areas.	
LV.8	Provide future ecological opportunities.	Ensure native and endemic species are used during tree planting to ensure that the existing landscape character is retained.	Prior to operation
LV.9	Avoidance of bushfires.	Ensure trees are planted on the perimeter of hardstand areas and out of the bushfire buffer zones.	Construction and operation
Public health and food			
PHF.1	Adherence with the environmental health requirements of the NT Department of Health – Environmental Health.	Design, construct and operate the Proposal in accordance with the requirements set out in the NT Department of Health – Environmental Health *Environmental Fact Sheet No. 700: Requirements for Mining and Construction Projects* (2014).	Pre-construction, construction and operation
PHF.2	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Register the proposed accommodation village with the NT Department of Health – Environmental Health in accordance with the NT *Food Act.*	Pre-construction
PHF.3	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Design accommodation village to meet the minimum standards prescribed by the National Food Safety Standards prescribed by Food Standards Australia New Zealand and in accordance with Australian Standard (AS) 4674 *Design, Construction and Fit-out of Food Premises.*	Pre-construction
PHF.4	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Submit detailed plans and specifications of the accommodation village with regard to food safety (prior to construction) to the relevant Environmental Health Officer within the NT Department of Health.	Pre-construction
PHF.5	Adherence with food safety requirements of the NT Department of Health – Environmental Health.	Register accommodation village following assessment and approval (prior to operation) with the relevant Environmental Health Office.	Pre-operation
PHF.6	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Maintain accommodation village in accordance with the NT *Public and Environmental Health Act* and with the requirements set out by NT Department of Health – Environmental Health in the *Public and Environmental Health Guidelines for Public Accommodation* (2014).	Operation

ID	Outcome	Mitigation/management measure	Timing
PHF.7	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Provide an adequate number of sanitary facilities at the proposed accommodation village in accordance with the Building Code of Australia.	Operation
PHF.8	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Submit detailed plans and specifications of the accommodation village with regard to staff accommodation and sanitary facilities (prior to construction) to the relevant Environmental Health Officer within the NT Department of Health.	Pre-construction
PHF.9	Adherence with staff accommodation and sanitary facilities requirements of the NT Department of Health – Environmental Health.	Register accommodation village following assessment and approval (prior to operation) with the relevant Environmental Health Office.	Pre-operation
PHF.10	Adherence with on-site wastewater disposal requirements of the NT Department of Health – Environmental Health.	Submit aerated wastewater treatment system for wastewater works design approval by the NT Department of Health – Environmental Health in accordance with the provisions of the NT *Public and Environmental Health Act* and Public and Environmental Health Regulations.	Pre-construction
PHF.11	Adherence with on-site wastewater disposal requirements of the NT Department of Health – Environmental Health.	Obtain approval for liquid trade waste pre-treatment device(s) at the accommodation village from the NT Power and Water Corporation – Trade Waste Section.	Pre-construction
PHF.12	Adherence with potable water supply requirements of the NT Department of Health – Environmental Health.	Potable water would be routinely analysed to ensure that it meets the requirements of the *Australian Drinking Water Guidelines (2011) – Updated February 2016* developed by the by the National Health and Medical Research Council in collaboration with the Natural Resource Management Ministerial Council. In addition, a general chemical and metals analysis would also be routinely undertaken.	Construction and operation
PHF.13	Adherence with bores requirements of the NT Department of Health – Environmental Health.	Ensure that bores within the borefield are constructed to the standards outlined in the *Minimum Construction Requirements for Water Bores in Australia, Third Edition* (Australian Government National Water Commission 2012).	Pre-construction
PHF.14	Adherence with bores requirements of the NT Department of Health – Environmental Health.	Ensure that bore setbacks to on-site wastewater disposal would be in accordance with the NT *Code of Practice for On-site*	Pre-construction

ID	Outcome	Mitigation/management measure	Timing
		Wastewater Management (Environmental Health Program Directorate Territory Health Services 2014).	
PHF.15	Adherence with fuel storage requirements of the NT Department of Health – Environmental Health.	Ensure that fuels are stored and handled on-site in accordance with AS 1940-2004 *Storage and Handling of Flammable and Combustible Liquids.*	Construction, operation, and closure and rehabilitation
PHF.16	Responsible disposal of solid waste.	Solid waste would be collected in designated bins and trucked off-site to appropriately licenced waste facilities in Titjikala or Alice Springs, as appropriate.	Construction, operation, and closure and rehabilitation
PHF.17	Reduce off-site disposal of food waste.	Explore opportunities for composting food waste during detailed design of the Proposal.	Construction
PHF.18	Adherence with public health nuisance abatement requirements of the NT Department of Health – Environmental Health.	Implement mitigation measures listed under groundwater, surface water and air quality.	Construction, operation, and closure and rehabilitation
PHF.19	Adherence with occupational health and safety requirements of the NT Department of Health – Environmental Health.	Ensure that activities associated with construction, operation, and closure and rehabilitation are carried out in accordance with occupational health and safety legislation administered by NT WorkSafe and in accordance with the Safety Case.	Construction, operation and, and closure and rehabilitation
PHF.20	Adherence with environmental management plan requirements of the NT Department of Health – Environmental Health.	Provide relevant sections of the CEMP and OEMP to the Environmental Health Office for review and comment prior to construction and operation.	Pre-construction and pre-operation
Biting insects			
BI.1	Negligible increase in biting insects and protection of personnel from biting insects.	Finalise draft Biting Insect Management Plan prior to construction and incorporate into the CEMP and OEMP. The plan collates measures to mitigate and manage potential impacts on biodiversity.	Pre-construction
BI.2	Protection of personnel from biting insects.	Implement personnel protection measures in accordance with the NT Government Department of Health Guidelines *Personal Protection From Mosquitoes and Biting Insects in the NT*.	Construction, operation, closure and rehabilitation
BI.3	Negligible increase in biting insects.	Control and manage potential mosquito breeding sites in accordance with the NT Government Department of Health *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites.*	Construction, operation, closure and rehabilitation

ID	Outcome	Mitigation/management measure	Timing
BI.4	No ponding of water (no breeding habitat for mosquitos).	Ensure containers capable of ponding water are stored under cover, contain drainage holes, are emptied within five days, are treated with appropriate insecticide or disposed of appropriately according to the Waste Management Plan.	Construction, operation, closure and rehabilitation
BI.5	Protection of personnel from biting insects.	Ensure accommodation village is adequately screened.	Construction
BI.6	Negligible increase in biting insects.	Ensure no actual or potential mosquito breeding sites remain after decommissioning of the Proposal. Ensure disturbed areas are rehabilitated and free draining. Remove infrastructure that has the potential to pond water.	Closure and rehabilitation
Greenhouse gas			
GHG.1	Minimise greenhouse gas emissions.	Ensure vehicles/plant and machinery are turned off when not in use and regularly serviced to ensure efficient operation.	Construction, operation, closure and rehabilitation
GHG.2	Minimise greenhouse gas emissions.	Design truck routes and loading capacity to reduce the distance and effort required by vehicles.	Construction
GHG.3	Minimise greenhouse gas emissions.	Use B5 and E10 fuel in plant and equipment, where possible.	Construction, operation, closure and rehabilitation
GHG.4	Minimise greenhouse gas emissions.	Perform regular energy and water audits.	Operation
GHG.5	Minimise greenhouse gas emissions.	Install window blinds in all office areas.	Construction
GHG.6	Minimise greenhouse gas emissions.	Maximise the area covered by the solar farm to minimise fuel used in electricity generation.	Construction
GHG.7	Minimise greenhouse gas emissions.	Install sensor lighting to minimise the number of lights being operated when not required.	Construction
GHG.8	Minimise greenhouse gas emissions.	Use, energy efficient lighting, where possible.	Construction
GHG.9	Minimise greenhouse gas emissions.	Develop building maintenance policies and a building user guide to ensure efficient operation of plant and equipment.	Operation
GHG.10	Minimise greenhouse gas emissions.	Develop heating, ventilation and air conditioning key performance indicators and building performance targets.	Operation

ID	Outcome	Mitigation/management measure	Timing
GHG.11	Minimise greenhouse gas emissions.	Ensure sub-metering is in place to monitor electricity and water consumption throughout the Proposal.	Operation
Traffic			
T.1	Minimise traffic and transportation impacts.	Prepare and implement a Traffic Management Plan in consultation with the NT Department of Transport.	Pre-construction
T.2	Minimise traffic and transportation impacts.	Install appropriate speed and warning signage prior to and at the crossing of Chambers Pillar Road.	Construction
T.3	Prevention of accidents between trucks hauling waste and salt along the Chandler Haul Road.	Develop a collision avoidance system for the Chandler Haul Road. Include the provision of a visible and/or audible alarm system to confirm the presence of vehicles traveling along the proposed Chandler Haul Road. Alarm system would alert drivers of haul trucks when another truck is within 500 metres, requiring a reduction in speed.	Operation
T.4	Minimise traffic and transportation impacts.	Restrict speed limits to no more 60km/hr on the proposed Chandler Haul Road and Henbury Access Road. Ensure vehicles reduce speed and come to a complete stop at the crossing of Chambers Pillar Road.	Construction, operation, closure and rehabilitation
T.5	Minimise traffic and transportation impacts.	Commit to workplace programs regarding road safety.	Construction, operation, closure and rehabilitation
T.6	Access to surrounding properties maintained.	Maintain access to surrounding properties for the duration of the Proposal.	Construction, operation, closure and rehabilitation