

# Referral of proposed action

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**Project title:** Lake Disappointment Potash Project

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## 1 Summary of proposed action

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### 1.1 Short description

Reward Minerals Limited (Reward) proposes to abstract potassium-rich brines from sediments associated with Lake Disappointment, approximately 320 km east of the town of Newman WA and to produce sulphate of potash by means of solar evaporation of the brine.

The proposal includes the construction and use of associated mine infrastructure (evaporation ponds, water supply borefield, processing plant, offices, workshop, accommodation and roads). Waste salt would be stored in permanent stockpiles on the Lake Disappointment playa. Potash product would be transported by road to Newman and then to export facilities at Port Hedland or Geraldton.

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**On-playa infrastructure  
(Figure 2)****Access Road (Figure 6)****Off-playa infrastructure  
(Figure 4)**

Location Point	Latitude	Longitude	Location Point	Latitude	Longitude	Location Point	Latitude	Longitude
1	-23.42	122.666	1	-22.825	120.823	1	-23.038	122.856
2	-23.408	122.763	2	-22.845	120.965	2	-23.036	122.858
3	-23.367	122.777	3	-22.836	121.128	3	-23.042	122.863
4	-23.365	122.734	4	-22.841	121.256	4	-23.047	122.861
5	-23.36	122.73	5	-22.878	121.367	5	-23.057	122.85
6	-23.347	122.733	6	-22.877	121.439	6	-23.066	122.849
7	-23.346	122.75	7	-22.856	121.514	7	-23.066	122.855
8	-23.343	122.754	8	-22.848	121.661	8	-23.044	122.869
9	-23.331	122.746	9	-22.83	121.749	9	-23.045	122.892
10	-23.331	122.738	10	-22.853	121.881	10	-23.048	122.869
11	-23.328	122.739	11	-22.897	122.006	11	-23.056	122.891
12	-23.323	122.746	12	-22.884	122.049	12	-23.055	122.866
13	-23.318	122.742	13	-22.909	122.117	13	-23.069	122.876
14	-23.318	122.738	14	-22.9	122.191	14	-23.06	122.861
15	-23.315	122.74	15	-22.92	122.349	15	-23.067	122.858
16	-23.313	122.738	16	-22.908	122.426	16	-23.074	122.875
17	-23.303	122.714	17	-22.96	122.579	17	-23.069	122.852
18	-23.263	122.743	18	-22.96	122.631	18	-23.122	122.847
19	-23.265	122.763	19	-22.98	122.653	19	-23.198	122.819
20	-23.288	122.811	20	-22.979	122.673	20	-23.198	122.849
21	-23.283	122.814	21	-22.997	122.743	21	-23.204	122.849
22	-23.292	122.836	22	-23.027	122.806	22	-23.204	122.816
23	-23.302	122.84	23	-23.038	122.857	23	-23.264	122.819
24	-23.313	122.835				24	-23.267	122.836
25	-23.306	122.815				25	-23.277	122.85
26	-23.309	122.81				26	-23.28	122.819
27	-23.347	122.814				27	-23.268	122.815
28	-23.369	122.8				28	-23.253	122.814
29	-23.39	122.79				29	-23.273	122.808
30	-23.404	122.79				30	-23.28	122.814
31	-23.419	122.798				31	-23.284	122.809
32	-23.481	122.824				32	-23.277	122.801
33	-23.512	122.817				33	-23.27	122.806
34	-23.589	122.74				34	-23.252	122.809
35	-23.591	122.726				35	-23.247	122.814
36	-23.524	122.676				36	-23.21	122.81
37	-23.534	122.666				37	-23.146	122.829
38	-23.525	122.648				38	-23.146	122.815
39	-23.514	122.66				39	-23.122	122.831
40	-23.519	122.615				40	-23.122	122.839
41	-23.468	122.625				41	-23.084	122.848
42	-23.448	122.621				42	-23.057	122.845
43	-23.44	122.675				43	-23.042	122.86

See also Figures 1 through 7 for project location and extent.

1.3

**Locality and property description**  
Lake Disappointment is in the northern Little Sandy Desert approximately 140 km south of Telfer, WA and 70 km south of the Rudall River National Park. The project lies entirely within the Shire of East Pilbara.  
  
The whole of the project area lies within determined native title claim areas (Determination numbers FCA 1208 and FCA 518). Lake Disappointment and the associated Savory Creek system is listed by the Department of the Environment (DoE) as a Nationally Important Wetland.  
  
The southern extremity of Lake Disappointment is located within the proposed Lake Disappointment Nature Reserve (listed under the Environmental Protection Authority (EPA) Red Book recommendations for Conservation Reserves 1975-1993). The proposed Lake Disappointment Nature Reserve has not been gazetted.  
  
The boundaries of the determined Native Title area, the extent of the Savory Creek / Lake Disappointment wetland and boundaries of other declared or proposed conservation areas are shown on **Figure 7**.

1.4

**Size of the development footprint or work area (hectares)**  
The proposed development footprint occupies an area of approximately 7222 ha. Only about 5.2% of the project footprint (377.24 ha) is vegetated. The remainder comprises bare or salt-crusted sediment of the Lake Disappointment playa surface.

1.5

**Street address of the site**  
Vehicular access to the Project will be via public roads including the Great Northern Highway, Jigalong Road, Marble Bar Road and existing tracks (Talawanna Track, Wiljabu Track). Brine abstraction and processing activity will occur on mining tenements M45/1227, L45/302 and mining tenements (yet to be granted) over parts of tenements E45/2801, E45/2802, E45/2803 and E69/2158.

1.6

**Lot description**  
Brine abstraction and processing activity will occur on mining tenements M45/1227, L45/302 and mining tenements (yet to be granted) over parts of tenements E45/2801, E45/2802, E45/2803 and E69/2158.

1.7

**Local Government Area and Council contact (if known)**  
Any planning approvals required for the proposal (for example, building approvals) would be administered by the Shire of East Pilbara. Contacts at the Shire include:  
Manager Development Services Planning (Roy Winslow - [planning@eastpilbara.wa.gov.au](mailto:planning@eastpilbara.wa.gov.au))  
Manager Development Services Building (David Evrett - [mds@eastpilbara.wa.gov.au](mailto:mds@eastpilbara.wa.gov.au))  
Manager Development Services Health (Edmore Masaka - [mdsh@eastpilbara.wa.gov.au](mailto:mdsh@eastpilbara.wa.gov.au))

1.8

**Time frame**  
The estimated duration of disturbance is in the order of 23 years (the estimated life of project, plus 3 years to allow for construction and rehabilitation).. Subject to necessary environmental and other approvals, it is proposed to start on-ground works for the project in mid-2018.

1.9

<b>Alternatives to proposed action</b> Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?	✓	No
		Yes, you must also complete section 2.2

1.10

<b>Alternative time frames etc</b> Does the proposed action include alternative time frames, locations or activities?		No
	✓	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).

1.11

<b>State assessment</b> Is the action subject to a state or territory environmental impact assessment?		No
	✓	Yes, you must also complete Section 2.5

1.12	<b>Component of larger action</b> Is the proposed action a component of a larger action?	✓	No
			Yes, you must also complete Section 2.7
1.13	<b>Related actions/proposals</b> Is the proposed action related to other actions or proposals in the region (if known)?	✓	No
			Yes, provide details:
1.14	<b>Australian Government funding</b> Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	✓	No
			Yes, provide details:
1.15	<b>Great Barrier Reef Marine Park</b> Is the proposed action inside the Great Barrier Reef Marine Park?	✓	No
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

## 2 Detailed description of proposed action

### 2.1 Description of proposed action

Approximately 60,000,000 m<sup>3</sup> of brine will be abstracted annually from sediments beneath the Lake Disappointment playa to produce 400,000 tpa of sulphate of potash (SOP). Brine will be collected from a network of shallow trenches across the lake totalling around 200 km in length. The brine will be pumped into shallow evaporation ponds to concentrate the brine by evaporation and crystallise out approximately 15,000,000t solid waste salts (halite) per annum and 2,000,000t crude potash salts.

The overall disturbance footprint for project implementation would be up to 7222 ha, of which approximately 377.24 ha is vegetated, with the remainder comprising bare or salt-encrusted playa surface.

Evaporation ponds, brine abstraction trenches and reject salt storage facilities occupy approximately 6,848Ha of the lake playa (less than 5% of the lake's natural surface) (**Figure 2**). The salar surface where ponds, trenches and salt storage piles are to be located is a barren salt crust playa. Effectively no clearing of vegetation is required on the lake to establish project infrastructure (**Figure 3**). The salt storage facility will occupy approximately 2752ha and will stand up to 8m above natural surface of the lake. On completion of operations these storage facilities will gradually dissolve and return to the lake bed sediments.

Operational infrastructure (SOP crystallisation plant, offices, workshops, etc) will be located inland from the lake adjacent to the crystallisation ponds (**Figures 4 and 5**). The area selected is naturally elevated above peak flood levels on the lake and involves the clearing of a maximum of 52ha of native vegetation.

The SOP crystallisation plant requires approximately 3,000,000 m<sup>3</sup> pa 'fresh to brackish' water to separate SOP from the crude potash harvest product. This water will be supplied from a bore field requiring the clearing of no more than 12ha. Two alternative borefield locations have been identified (**Figure 4**) and will be assessed as part of continuing investigations into the environmental impacts of implementing the proposal. No solid tailings are generated from the SOP crystallisation plant. No introduced chemical reagents are used in the SOP crystallisation plant.

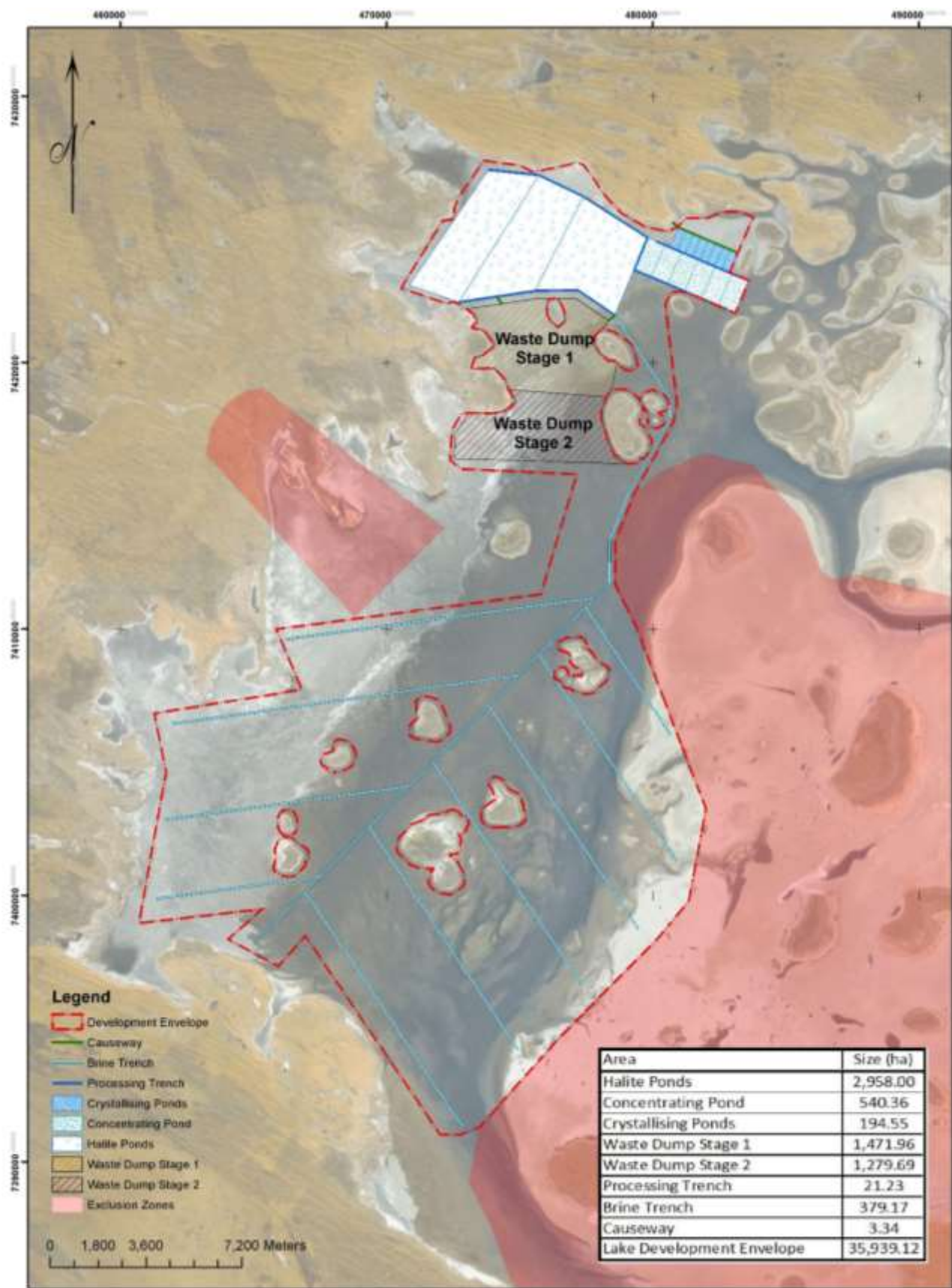
Two liquor streams emanating from the plant will recycle to the evaporation pond system for further potash recovery. Excess magnesium sulphate crystallises out with sodium chloride and reports to the halite storage facilities. A brine waste stream high in magnesium chloride is produced from the final evaporation ponds. A portion of this brine will be used for dust suppression / road compaction and the balance will be directed to holding ponds on the playa. Approximately 464,000t of magnesium chloride in 1,277,920m<sup>3</sup> of brine will be generated per annum from the operation. This liquor can be pumped to the halite storage facilities where it will remain as entrained brine in the stockpile until mine closure measures are implemented.

Up to 94 ha of native vegetation will be cleared to establish an airstrip, accommodation and haul road access from the Talawana Track. The Talawana track (public road) will also need to be upgraded to enable the transport of SOP products to ports for subsequent shipping. No more than 190 ha will be cleared for the Talawana Track upgrade (**Figure 6**).

A range of baseline studies have been conducted to characterise the environmental values of the project area and to provide a basis for assessing the potential impacts of project implementation. **Table 1** lists the technical studies appended to this referral. Reward referred the Lake Disappointment Potash Project to the WA Environmental Protection Authority (EPA) on 13 June 2016. It is likely that the proposal will be formally assessed under Part IV of the *Environmental Protection Act* 1986.





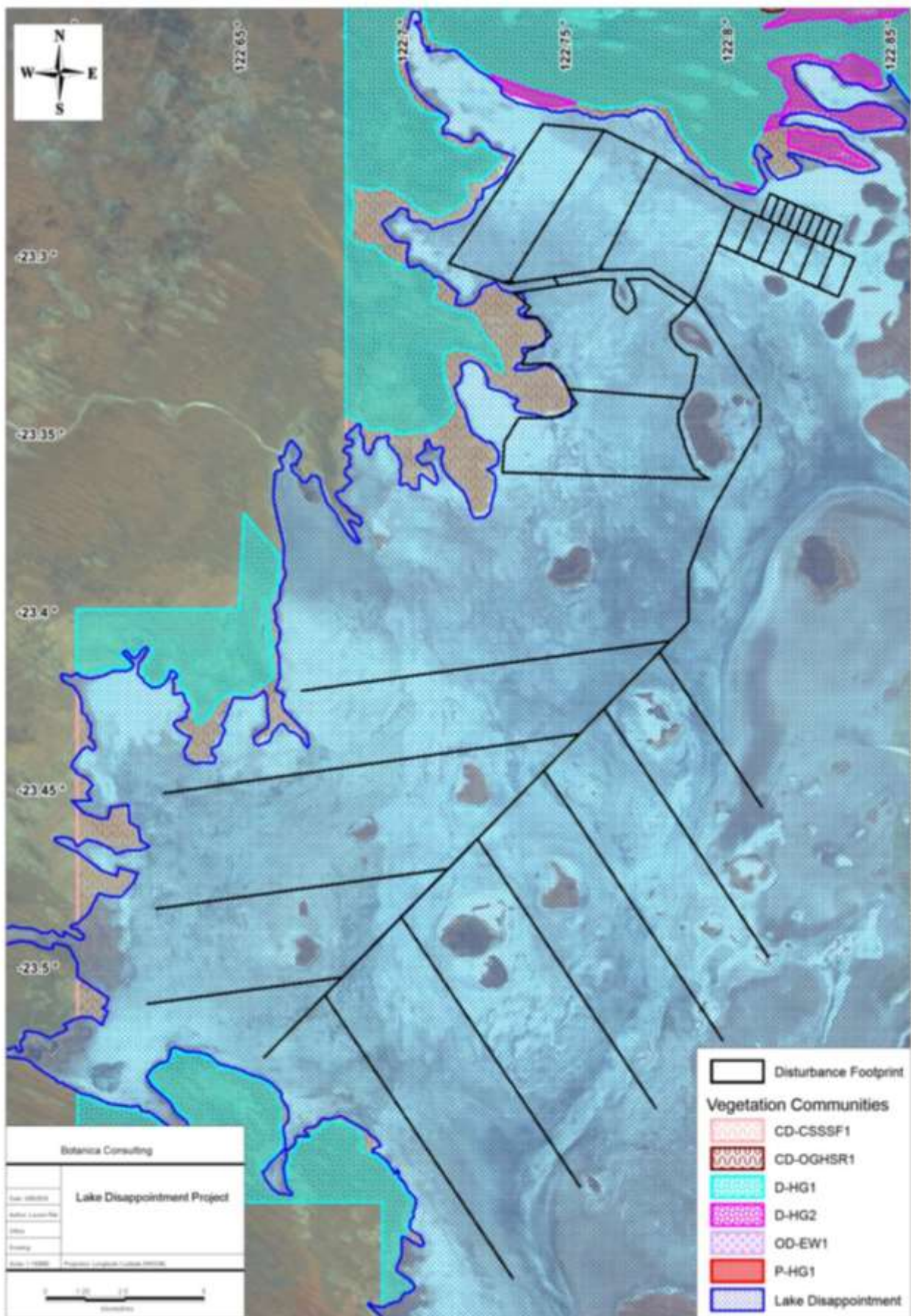


Lake Disappointment Site Plan  
EPA Lake General Arrangement  
SGRMI15002-029-EPA Lake Arrangement  
16/05/2016



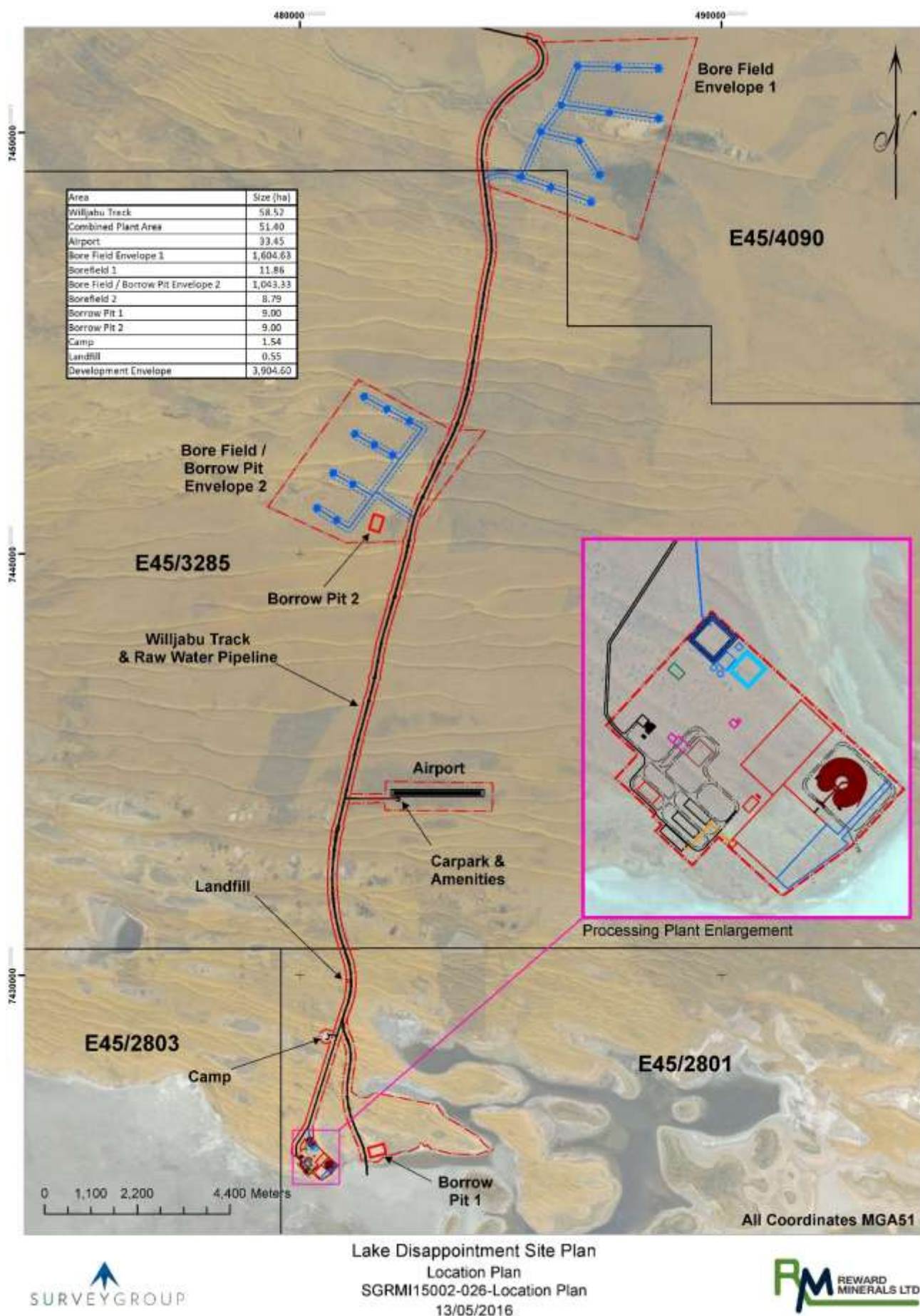
**Figure 2: On-playa infrastructure**

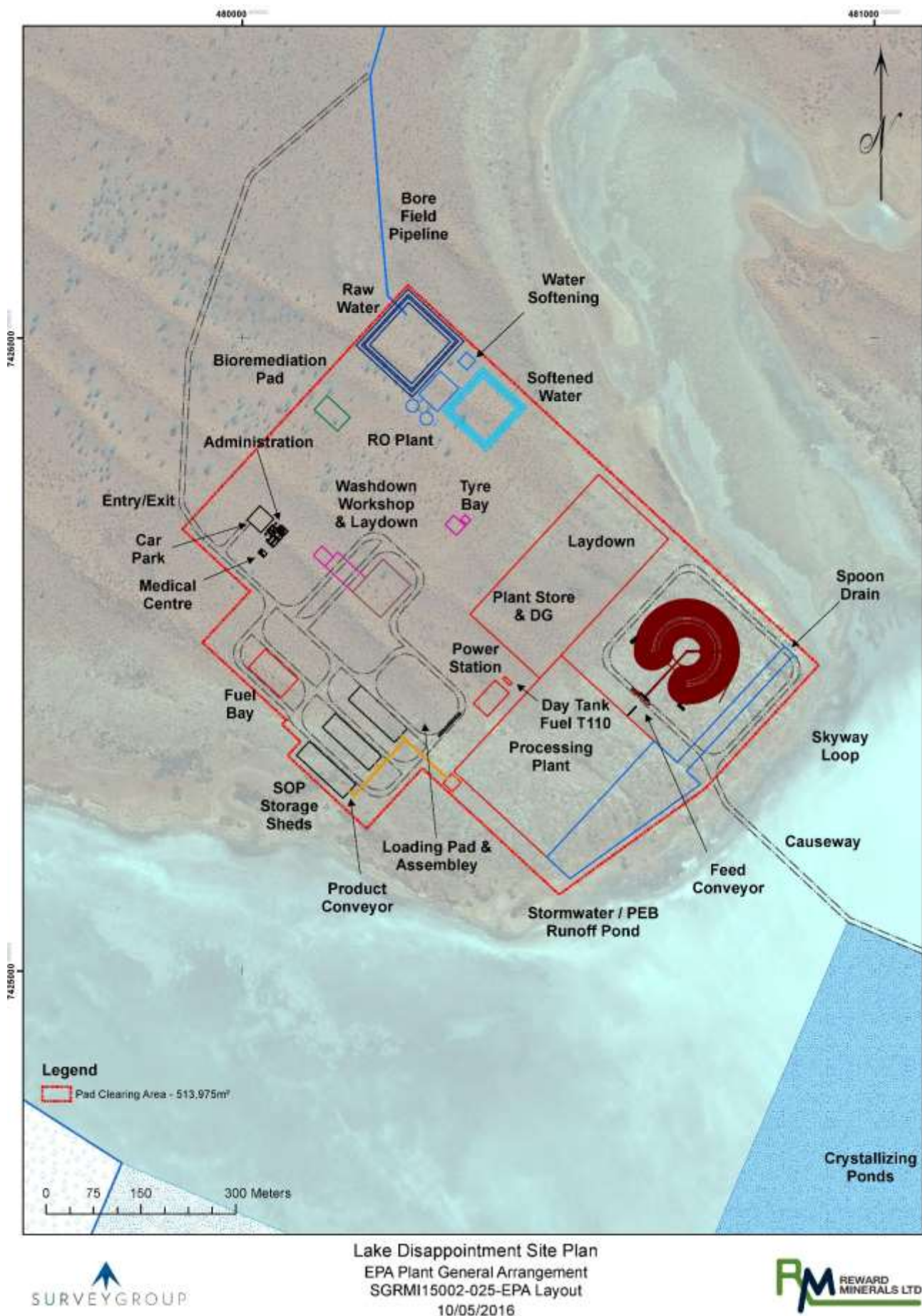




**Figure 3: Extent of vegetated areas near playa**





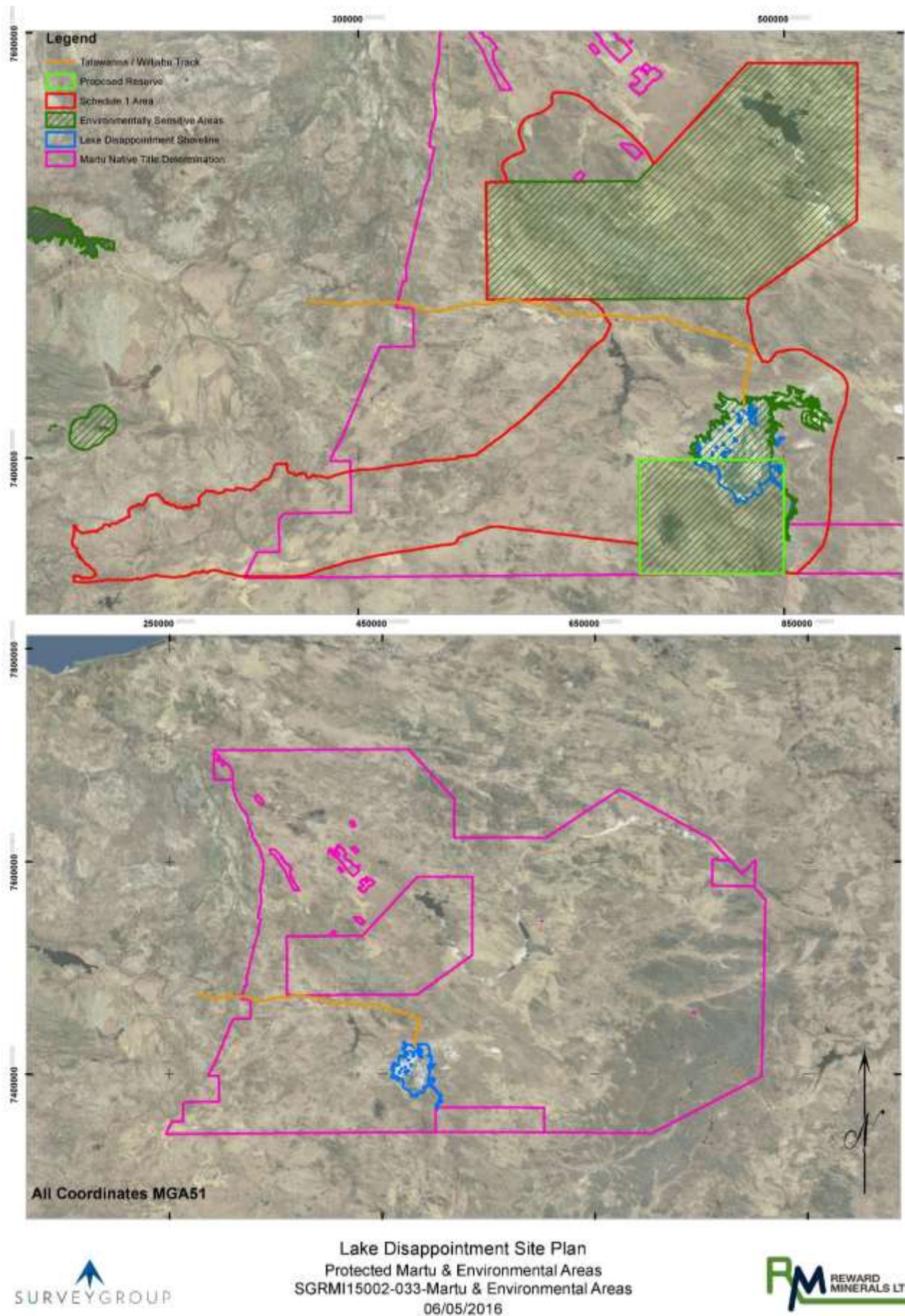


**Figure 5: Indicative plant layout**





**Figure 6: Access road: Talawana Track**



**Figure 7: Reserves and other protected areas**



**Table 1: List of studies completed to date: Lake Disappointment Potash Project**

<b><i>Title</i></b>	<b><i>Author</i></b>	<b><i>Document Description</i></b>
Level 2 Flora & Vegetation Survey - Lake Disappointment, Tenements: E45/2801 E45/3036, E45/3285, E45/3492, L45/302 & M45/1227, report prepared for Reward Minerals Limited, May 2016, V3	Botanica Consulting	Presents results of a Level 2 flora and vegetation survey covering an area of approximately 89,130ha in and around Lake Disappointment. The survey was initially conducted in April 2013. The 43 quadrats established in April 2013 were revisited in October 2013. <b>Attachment A</b>
Sand Dune Vegetation Monitoring - Lake Disappointment Potash Project, report prepared for Reward Minerals Limited, September 2015	Botanica Consulting	Presents results of a 3-year baseline vegetation monitoring program aimed at assessing the biodiversity and health of native vegetation immediately surrounding the site access track (within 250m of track).
Riparian Vegetation Monitoring - Lake Disappointment Potash Project, report prepared for Reward Minerals Limited, September 2015	Botanica Consulting	Presents results of a 3-year baseline vegetation monitoring program aimed at assessing the biodiversity and health of native riparian vegetation immediately surrounding the Lake Disappointment playa to assess impacts of lake based exploration activities and potential future mining developments on the surrounding riparian vegetation.
Fauna Survey (Level 2), Phase 1 (May 2013) and Phase 2 (October 2013) - Lake Disappointment Potash Project, report prepared for Reward Minerals Ltd, report number SF 009514, VERSION 2, June 2016	G Harewood	Report details the results of a two phase (seasonal), Level 2 terrestrial fauna survey over a nominal 89,130ha survey area in and around Lake Disappointment. <b>Attachment B</b>
Ecological Character of Lake Disappointment, report prepared for Reward Minerals Ltd, [June 2016]	Bennelongia Environmental Consultants	Presents the results of baseline studies, including surveys of aquatic invertebrates, to characterise the overall biological value of the Lake Disappointment playa and its surroundings. <b>Attachment C</b>
Lake Disappointment - Subterranean Fauna Desktop Assessment, June 2016	Bennelongia Environmental Consultants	Documents the results of a search of the Western Australian Museum records and publicly available information on occurrence of stygofauna within 240 km of the proposed Lake Disappointment Potash Project.
Hydrological Investigation and Assessment - Lake Disappointment, report prepared for Reward Minerals Ltd, Revision No 2, May 2016	Pendragon Environmental Solutions	Report describes hydrological investigations and assessments at Lake Disappointment and presents a preliminary assessment of the potential impacts on inland waters of implementing the proposed Lake Disappointment Potash Project. <b>Attachment D</b>
Acid Sulfate Soil Investigation- Lake Disappointment, report prepared for Reward	Pendragon Environmental Solutions	Report presents the results of field and laboratory investigations to assess acid sulphate soil hazard at Lake Disappointment.

<b>Title</b>	<b>Author</b>	<b>Document Description</b>
Minerals Ltd, Revision No 2, May 2016.		
Process Water Review – Report for Reward Minerals Limited, May 2016	Strategic Water Management WA	Preliminary hydrogeological review of three options for supply of up to 3.1 GLpa of process water required for ore processing and related purposes.

## 2.2 Alternatives to taking the proposed action

Not applicable

## 2.3 Alternative locations, time frames or activities that form part of the referred action

Two possible borefield locations have been identified (refer Figure 4, above). Both locations will be investigated as part of further environmental impact assessment.

## 2.4 Context, planning framework and state/local government requirements

Table 2 summarises existing approvals in place for exploration and related works on the project tenements and also list the additional environmental approvals likely to be required for full scale project implementation.

**Table 2: Existing and future approvals – Lake Disappointment Potash Project**

<b>Aspects* of the proposal</b>	<b>Type of approval</b>	<b>Legislation regulating this activity</b>	<b>Which State agency /entity regulates this activity?</b>
<b>Existing approvals</b>			
Exploration drilling, sampling, survey and related investigative work.	Programmes of work. Approved PoWs are: 54230, 55875, 56505, 57815, 58188, 58800, 59071, 59221.	<i>Mining Act 1978</i>	DMP
Clearing of vegetation to enable exploration drilling, sampling, survey and related investigative work.	Native vegetation clearing permit. Approved permits are: COS 5111/1, 5111/2 and 5111/3.	<i>EP Act 1986 – Part V</i>	DMP/DER (with advice from DPaW)
Construction of water bores	Licences to construct water bores. Approved 26D permits are: 175644, 175702, 178842, 178843, 178844, 181369, 181603, 181733, 181738, 182168, 182578	<i>RIWI Act 1914</i>	DoW
Groundwater abstraction	Licences to take water. Approved 5C licences are: 175646, 175648, 175703, 181370, 181604, 181736, 181739, 182580	<i>RIWI Act 1914</i>	DoW
Land access and ground disturbance in areas of cultural significance to Aboriginal people.	Section 18 approval 9 January 2013.	<i>AHA 1972</i>	DAA
<b>Future approvals (to be sought)</b>			
<i>Brine abstraction, ore processing and related support activities</i>	<i>Ministerial consent</i>	<i>Part IV of the Environmental Protection Act 1986.</i>	<i>EPA / Office of the EPA</i>

<b>Aspects* of the proposal</b>	<b>Type of approval</b>	<b>Legislation regulating this activity</b>	<b>Which State agency /entity regulates this activity?</b>
<i>Ground disturbance for mining and ore processing</i>	<i>Grant of tenure</i>	<i>Mining Act 1978</i>	<i>DMP</i>
<i>Mining and ore processing</i>	<i>Environmental approval via mining proposal and mine closure plan</i>	<i>Mining Act 1978</i>	<i>DMP</i>
<i>Mining and ore processing</i>	<i>Approval to operate via project management plan</i>	<i>Mines Safety and Inspection Act 1994</i>	<i>DMP</i>
<i>Construction of production bores</i>	<i>26D licence</i>	<i>RIWI Act 1914</i>	<i>DoW</i>
<i>Groundwater and brine abstraction</i>	<i>5C licences</i>	<i>RIWI Act 1914</i>	<i>DoW</i>
<i>Potash production by solar evaporation</i>	<i>Works approval and licence</i>	<i>EP Act 1986 – Part V</i>	<i>DER</i>
Land access and ground disturbance in areas of cultural significance to Aboriginal people (areas not covered by existing consents)	<i>Additional Section 18 approval(s) for areas not included in current consent.</i>	<i>AHA 1972</i>	<i>DAA</i>

## 2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

Reward referred the Lake Disappointment Potash Project to the WA EPA on 13 June 2016. In its referral, Reward identified eight “key environmental factors”, as follows:

- Flora and Vegetation
- Landforms
- Subterranean Fauna
- Terrestrial Fauna
- Hydrological Processes
- Inland Waters Environmental Quality
- Heritage
- Rehabilitation and Decommissioning

Reward has advised the EPA that it (Reward) considers that the proposal meets criteria for assessment under the “Public Environmental Review” process. As at the date of this EPBC referral, the WA EPA had not issued a formal decision on whether or not it will assess the proposal or at what level of assessment. No assessment officer had been assigned as at the date of this EPBC referral.

## **2.6 Public consultation (including with Indigenous stakeholders)**

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

Details of stakeholder consultation conducted to date are provided in **Attachment E**.

Reward has entered into an Indigenous Land Use Agreement (ILUA) with the Martu People to guide project activities including, but not limited to, land access. The ILUA between Reward and the Martu People establishes exclusion areas over parts of the tenements held by Reward. The company has agreed not to access these areas for exploration, project implementation or other purposes, including for the purpose of baseline environmental studies.

Reward Minerals provides regular project updates to Traditional owners through the native title representative body and on country meetings. The company engages both formally and informally with local communities.

## **2.7 A staged development or component of a larger project**

The proposed action is not part of a staged development or component of a larger project.



## 3 Description of environment & likely impacts

### 3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

**Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.**

#### 3.1 (a) World Heritage Properties

##### Description

Approval under the EPBC Act is required for any action occurring within a World Heritage Property or outside a World Heritage Property if the action has the potential to have a significant impact on the World Heritage Values of the World Heritage property.

There are no World Heritage Properties in the vicinity of the proposed action.

##### Nature and extent of likely impact

No impacts on World Heritage Properties are likely.

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#### 3.1 (b) National Heritage Places

##### Description

There are no National Heritage Places in the vicinity of the proposed action. The closest National Heritage listed place is the Dampier Archipelago, approximately 700 km northwest of the project area.

##### Nature and extent of likely impact

No impacts on any National Heritage Places are likely.

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### **3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)**

#### **Description**

The closest declared Ramsar wetland is Eighty Mile Beach, approximately 460 km north-northwest of the project area.

#### **Nature and extent of likely impact**

No impacts on any Ramsar wetland are likely.

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### 3.1 (d) Listed threatened species and ecological communities

#### Descriptions

Level 2 flora and fauna surveys have been completed in the project area and are provided in **Attachments A** and **B** to this referral.

None of the vegetation communities observed during baseline flora / vegetation surveys are recognised as having National Environmental Significance as defined by the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999. No Threatened Flora or Threatened Ecological Communities (TEC) listed under the EPBC Act have been identified within the project area. The most recent search for threatened flora and ecological communities using the EPBC search tool was conducted on 30 May 2016. A copy of the search results is provided in Attachment B.

A single flock of four princess parrots (*Polytelis alexandrae*) were observed flying overhead during the Phase 1 survey in May 2013. This species is listed as Vulnerable under the EPBC Act.

The only mammal species of national conservation significance considered likely to occur in the general area (though not necessarily within the area that would be affected by implementation of the proposed action) is the bilby (*Macrotis lagotis*), which is listed a Schedule 1 and Vulnerable under state and federal legislation. Targeted surveys were conducted for *Macrotis lagotis* in 2012 prior to the construction of the Willjabu Track (Harewood 2012). Additional searches were conducted during the Level 2 survey presented in Attachment B. No evidence of the presence of bilbies was observed during any of the surveys.

The only reptile species of conservation significance that is considered likely to occur in the general project area (though not necessarily within the Project area) is the great desert skink (*Liopholis kintorei*) which is listed a Schedule 1 and Vulnerable under state and federal legislation. This species was the subject of a targeted survey prior to the construction of Willjabu Track (Harewood 2012) and additional searches during the Level 2 survey (**Attachment B**), with no evidence of its presence being found. The great desert skink lives in family groups and builds distinctive burrow systems with associated scat latrines which make its presence relatively easy to confirm. Habitat in some sections of the survey area appears superficially suitable (sand plains and sand dunes vegetated with spinifex) and the site falls within the documented range of the species, but a lack of actual observations would suggest the species is absent from the areas investigated.

#### Nature and extent of likely impact

Address any impacts on the members of any listed threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

A preliminary impact assessment (Harewood, 2016, in **Attachment B**) suggests that no "significant impacts" on any EPBC Act listed threatened vertebrate species are likely. This conclusion is primarily based on the fact that the area of vegetation clearing required is relatively small and scattered over a wide area.

Most of the project area appears to represent marginal habitat for Princess parrots, due to a lack of large trees required for roosting and nesting. Princess parrots are highly nomadic, and its frequency of occurrence within the Project area would be very low and generally only temporary. Accordingly, Reward has concluded that no important populations of Princess parrots are likely to exist in areas potentially affected by the proposed action.

Given the lack of observations of bilbies during baseline and targeted surveys and lack of evidence of bilby presence in the project area, Reward has concluded that no important populations of bilby are present in the project area, although populations may persist in the wider area outside of the defined Lake Disappointment Potash Project area.

Similarly, the lack of any evidence of the presence of the great desert skink, despite targeted investigations, suggests that no important population of the species occurs within the project area.

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### 3.1 (e) Listed migratory species

#### Description

Four migratory waders were recorded during the course of the two phase survey. These were:

- the common greenshank (*Tringa nebularia*) (two sightings - total of four individuals)
- the marsh sandpiper (*Tringa stagnatilis*) (one sighting – total of three individuals)
- red-necked stint (*Calidris ruficollis*) (three sightings – total of 21 individuals), and
- the sharp-tailed sandpiper (*Calidris acuminata*) (two sightings – total of 15 individuals).

All four species are listed as Migratory under the EPBC Act in addition to being listed in several international agreements to which Australia is a signatory. All four species were recorded in flooded freshwater claypans, in some cases well away from the main study area. Only the red-necked stint and the common greenshank were recorded on Lake Disappointment itself (refer Figure 9 in Attachment B).

Several other species of migratory waders are also recorded in inland areas, albeit in some cases infrequently, in inland areas and therefore have the potential to occur in the general project area on occasions. The most likely species are:

- the common sandpiper *Tringa hypoleucos*,
- the curlew sandpiper *Calidris ferruginea*; and
- the wood sandpaper *Tringa glareola*.

As with other birds which rely on wetlands, the presence of suitable habitat (and therefore the birds themselves) in freshwater claypans or on the Lake Disappointment play is totally dependent on unpredictable, episodic rain events of a magnitude sufficient to supply the required amount of water.

All of the above mentioned migratory waders only breed in the northern hemisphere, and migrate to the southern hemisphere around spring onwards (~September) before returning north in summer/early autumn (~March).

The oriental plover (*Charadrius veredus*), another listed seasonal migratory species, also has the potential to occur but is less reliant on the presence of water and so could occur irrespective of flooded areas being present, in particular within areas of samphire which appears to be the only suitable alternative habitat available. This species' actual status in the area and frequency of occurrence is unknown and difficult to determine given the area's remoteness and lack of records. However, the area is unlikely to represent a location of special significance to *Charadrius veredus*.

The rainbow bee-eater (*Merops ornatus*), a listed migratory species under the EPBC Act, was observed on 12 occasions (38 individuals) over both phases of the survey, with all but one sighting being at McKay Creek. The rainbow bee-eater is not a threatened species and can be regarded as common. It may be resident in the area and possibly breeds in suitable areas such as the banks of McKay Creek.

#### Nature and extent of likely impact

[Address any impacts on the members of any listed migratory species, or their habitat.](#)

The degree to which migratory waders rely on the Lake when inundated also appears to be low, based on currently available information (Harewood, 2016 and Bennelongia, 2016b, in **Attachments B and C**, respectively).

Although the footprint of project infrastructure on the Lake Disappointment playa occupies a large area, measures have been put in place to avoid significant impacts on waders: the EPBC-listed migratory Marsh Sandpiper, Common Greenshank and Sharp-tailed Sandpiper are unlikely to use Lake Disappointment except in times of major floods. Instead these species utilise surrounding claypans. Project infrastructure has been sited to avoid impacts on the freshwater clay pans. A substantial exclusion area has been put in place to protect parts of the Lake Disappointment playa used for breeding by banded stilts (not an EPBC-listed species). The exclusion area also protects areas of cultural significance to the Martu People. Additionally, the on-playa infrastructure has been located with an offset of 200m from the lake edge, as a means of preserving hydrological flows and avoiding impacts on riparian vegetation communities which may provide habitat for species of conservation significance.



### **3.1 (f) Commonwealth marine area**

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

#### **Description**

The proposed action is not located within, or in the vicinity of, a Commonwealth marine area. The project area is located in an inward-draining inland catchment, at least 400km from the nearest Commonwealth marine area.

#### **Nature and extent of likely impact**

Implementation of the action will have no impact on any Commonwealth marine area.

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### **3.1 (g) Commonwealth land**

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

#### **Description**

The action is not located on or in proximity to Commonwealth land. The nearest national park (Karlamilyi National Park), approximately 70 km to the north, is on WA Crown land managed by the WA Department of Parks & Wildlife.

#### **Nature and extent of likely impact**

Implementation of the action will not result in impacts on any Commonwealth land

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### **3.1 (h) The Great Barrier Reef Marine Park**

#### **Description**

The project area is located in the Little Sandy Desert region of Western Australia, at least 2500 km from the Great Barrier Reef Marine Park.

#### **Nature and extent of likely impact**

Implementation of the action will not result in impacts on the Great Barrier Reef Marine Park.

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### **3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development**

#### **Description**

The proposed action relates to solar salt production of potash. No mining of coal or abstraction of coal seam gas is proposed.

#### **Nature and extent of likely impact**

No impacts arising from coal mining or abstraction of coal seam gas will result from implementation of the action.

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**3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park**

3.2 (a)	Is the proposed action a nuclear action?	✓	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment			
3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	✓	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment			
3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	✓	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))			
3.2 (d)	Is the proposed action to be taken on Commonwealth land?	✓	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))			
3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	✓	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))			

**3.3 Other important features of the environment**

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

**3.3 (a) Flora and fauna**

**Flora**

No Threatened Flora taxa were recorded within the project area during Level 2 baseline studies. Refer **Attachment A**.

One Priority Flora taxon (*Tecticornia* sp. Sunshine Lake (K.A. Shepherd et al KS 867) (P1)) was identified within the Heath of mixed *Tecticornia* spp. on salt lake edge vegetation community.

Two unrecognised taxa of *Tecticornia* (*Tecticornia* sp. Nov A and *Tecticornia* sp. Nov B, as identified by K.A. Shepherd 867) were also identified in the area, and are considered by the WA Herbarium to be of Conservation Significance. These taxa are presently undergoing further taxonomic work by the Western Australian Herbarium. A third *Tecticornia* specimen (*Tecticornia* aff. *calyptata*, identified by K Shepherd as a potentially

distinct taxon related to *Tecticornia calyptata*) is also considered to be of Conservation Significance and is also presently undergoing further taxonomic work by the WA Herbarium.

### **Fauna**

Characterisation of terrestrial fauna and fauna habitat has been carried out through a Level 2 fauna survey conducted in May and October 2013 over an area of about 89,130 ha in and around Lake Disappointment (refer **Attachment B**). At the request of the Traditional Owners of the land, the baseline survey did not include ground-based surveys of land within the exclusion areas agreed between Reward and the Martu people. A further survey targeting mainly invertebrate fauna of the Lake Disappointment playa and surrounding claypans and smaller salt lakes was conducted in January 2016 (refer **Attachment C**).

The field surveys for terrestrial fauna recorded 171 native and five introduced vertebrate species. The identified assemblage included five species of frog, 50 species of reptiles, 98 species of birds and 18 native mammals (includes 8 species of bat). Evidence of 14 species of conservation significance was recorded in or near the project area.

Twenty-nine species of waterbirds were recorded at Lake Disappointment and its surrounds during surveys between 2012 and 2016, with many species recorded only outside the lake. Four migratory shorebirds listed under the Commonwealth EPBC legislation have been recorded (Sharp-tailed Sandpiper, Red-necked Stint, Common Greenshank and Marsh Sandpiper). Of the birds observed during baseline study, the records of the endemic Banded Stilt probably have greatest conservation significance. The Banded Stilt has been recorded breeding at Lake Disappointment on several occasions, including in 2013 and 2015.

Fifty five individual invertebrate specimens from groups often representing SREs were collected during the fauna and targeted invertebrate survey. None of the invertebrates collected were confirmed as SREs however five of the species have been classified as potential SREs. All five of the potential SREs collected in the field survey were from sand dune habitat which is widespread outside the study area.

A small amount of aquatic invertebrate surveying was done in 2004 and more intensive survey was conducted in late 2015 and early 2016 when, in addition to sweep sampling, hatching trials were conducted using samples of lakebed. A total of 76 species were collected from Lake Disappointment and surrounding waterbodies, with 10 species at the lake itself, 15 species in Savory Creek and 66 species in surrounding claypans. Diatoms were also sampled in early. Altogether, 20 species of diatom were collected, with 18 species found in Lake Disappointment, four species at Savory Creek and 13 species in claypans.

Overall, the available information on waterbirds, aquatic invertebrates and diatoms suggests that Lake Disappointment itself has relatively low biological values, except for its role for Banded Stilts, which are not listed under the EPBC Act. In addition to the occasional breeding events by Banded Stilts on islands in Lake Disappointment, at least one new species of ostracod occurs in the lake. It is possible that new species of diatom are also present. The biological values of Lake Disappointment are mostly limited by the high salinity of the lake when it floods.

### **3.3 (b) Hydrology, including water flows**

The Lake Disappointment catchment is situated in the Little Sandy Desert, at the north-west corner of the Western Shield, and is underlain geologically by the Savory (geological) Basin and the Paterson Orogen, both containing Late Proterozoic rocks (Beard 2005). The Savory Basin mainly comprises gently east dipping medium to coarse-grained sandstone and pebbly conglomerate.

The Disappointment Palaeoriver, which contains Lake Disappointment itself, was suggested by Beard (2005) to be a palaeoriver that drained into Rudall River via Savory Creek. Little detailed information on the hydrogeology of the Disappointment Palaeoriver is available. There are no flow or water quality gauging stations located within close proximity. The former connection to Rudall River was disrupted in the Miocene (23 million to 5 million before present) by one or more factors including tectonic movement, a slight uplift of ridges to the north and sinking of the lake basin. This resulted in Lake Disappointment becoming a terminal basin within an internally draining catchment with a hypersaline brine reservoir under the lake because of prolonged concentration by evaporation.

Lake Disappointment and its tributaries lie within the Savory Creek surface catchment are classified as Priority 1 wild rivers. These rivers are afforded a high level of regulatory protection. Lake Disappointment itself and the associated Savory Creek system are listed in the Directory of Nationally Important Wetlands (<http://www.environment.gov.au/water/wetlands/australian-wetlandsdatabase>). The directory does not

differentiate between the Lake Disappointment playa and the Savory Creek drainage system. Neither Savory Creek nor Lake Disappointment is listed as a wetland under the Ramsar Convention.

The lake lies within a proclaimed groundwater area under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Lake Disappointment is not located within a proclaimed area surface water area.

### **3.3 (c) Soil and Vegetation characteristics**

The project area lies predominantly with the Rudall River soil-landscape zone and the Yeneena soil-landscape zone. The former, which extends to the north of the Lake Disappointment playa, is characterised by stony soils, red shallow loams and bare rock with red shallow sands, red loamy earths and red sandy earths. The latter, which includes the playa, is characterised by red sandy earths, with red deep sands and salt lake soils, stony soils, red loamy earths, red shallow loams and bare rock. The shallow sediments of the playa typically comprise poorly consolidated saline lake sediments (clay, silt, sand and gypsum).

Six floristic communities were identified during baseline flora and vegetation studies within a 89,130ha baseline survey area. These communities comprised four major vegetation groups and were represented by a total of 38 Families, 104 Genera and 208 Taxa (including sub-species and variants).

None of the vegetation communities have National Environmental Significance as defined by the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999. No Threatened Flora or Threatened Ecological Communities (TEC) listed under Commonwealth legislation were identified within the survey area.

No Priority Ecological Communities (PEC) as listed by DPaW were recorded within the survey area. The nearest recorded PEC is the Priority 3 'Riparian vegetation including phreatophytic species associated with creek lines and watercourses of Rudall River' community which is located approximately 20km north of the survey area.

### **3.3 (d) Outstanding natural features**

Lake Disappointment has been listed in the Directory of Important Wetlands in Australia (DIWA) (Environment Australia 2001) under two criteria:

1. It is a good example of a wetland type occurring within a biogeographic region in Australia
3. It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.

DIWA recognises Lake Disappointment as containing two types of inland (category B) wetlands:

- Seasonal and irregular rivers and streams (category B2)
- Seasonal/intermittent saline lakes (category B8)

Seasonal, freshwater claypans also exist around Lake Disappointment and these are best treated as belonging to category B6 (Seasonal/intermittent freshwater lakes (> 8 ha), floodplain lakes) although some pans are <8 ha in area.

### **3.3 (e) Remnant native vegetation**

Effectively the whole of the project area (excluding the lake playa, which is not vegetated) is characterised by intact native vegetation. Refer Section 3.3(a) for description of flora and vegetation.

### **3.3 (f) Gradient (or depth range if action is to be taken in a marine area)**

The topography of the Little Sandy Desert region generally consists of sandplains with numerous low hills and small ranges. The landscape in the project area is dominated by the Lake Disappointment playa, an inward-draining mega sumpland. The playa surface is mostly flat, but dunes on the lake form islands rising to between 5m and 18 m above the lake bed. The surrounding terrain is characterised by longitudinal aeolian dunes trending east-west, interspersed with minor salt lakes and claypans (Directory of Nationally Important Wetlands, <https://www.environment.gov.au/cgi-bin/wetlands/report.pl>).



### **3.3 (g) Current state of the environment**

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

Effectively the whole of the project area (excluding the lake playa, which is not vegetated) is characterised by intact native vegetation. Refer Section 3.3(a) for description of flora and vegetation. Based on the vegetation health rating scale adapted from Keighery, 1994 and Trudgen, 1988 (1 'pristine' to 7 'completely degraded'), four of the six floristic communities had a health rating of 4 ("Good"). The remaining two floristic communities had a health rating of 5 ("Degraded"). One introduced species (*Cenchrus ciliaris* (Buffel grass)) was identified within the survey area.

Five introduced vertebrate animal species were identified in the project area during baseline field surveys, these being the camel, cat, fox, house mouse and the Asian house gecko.

### **3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values**

According to the Directory of Nationally Important Wetlands, the Lake Disappointment / Savory Creek system is a proposed A Class Reserve for conservation and Aboriginal anthropological sites, with joint vesting in the National Parks and Nature Conservation Authority (WA) and the WA Museum. The site is listed on the Register of the National Estate (Place ID 9894).

### **3.3 (i) Indigenous heritage values**

Lake Disappointment ("Kumpupirntily") has important Aboriginal cultural and heritage values for the Martu People, who hold Native Title over the area (refer **Figure 7**). Reward Minerals has entered into an Indigenous Land Use Agreement (ILUA) with Traditional Owners and has agreed to recognise and respect exclusion areas of particular significance to the Martu.

Durba Spring, a series of rockpools, is located approximately 25 km southwest of Lake Disappointment. It is a culturally significant location with important Aboriginal paintings and petroglyphs. It is located within the proposed Lake Disappointment conservation reserve and will not be impacted by implementation of the Lake Disappointment potash project.

### **3.3 (j) Other important or unique values of the environment**

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

Lake Disappointment lies approximately 70 km south of the Karlamilyi (Rudall River) National Park, which is managed by the WA Department of Parks & Wildlife.

Lake Disappointment and the associated Savory Creek system are listed in the Directory of Nationally Important Wetlands (<http://www.environment.gov.au/water/wetlands/australian-wetlandsdatabase>).

### **3.3 (k) Tenure of the action area (eg freehold, leasehold)**

The whole of the project area lies on Vacant Crown Land within determined native title claim areas (Determination numbers FCA 1208 and FCA 518). The extent of native title determination areas is shown in **Figure 7**.

### **3.3 (l) Existing land/marine uses of area**

The main existing land use is customary Aboriginal uses. Reward has negotiated an Indigenous Land Use Agreement (ILUA) with the native title holders, including the establishment of exclusion areas which would be exempt from any development activities, in recognition of their cultural significance.

### **3.3 (m) Any proposed land/marine uses of area**

The southern extremity of Lake Disappointment is located within the proposed Lake Disappointment Nature Reserve (listed under the Environmental Protection Authority (EPA) Red Book recommendations for Conservation Reserves 1975-1993). The proposed Lake Disappointment Nature Reserve has not been gazetted. The proposed conservation reserve lies outside the area that would be affected by the proposed action. (Refer **Figure 7**.)

## 4 Environmental outcomes

Provide descriptions of the proposed environmental outcomes that will be achieved for matters of national environmental significance as a result of the proposed action. Include details of the baseline data upon which the outcomes are based, and the confidence about the likely achievement of the proposed outcomes. Where outcomes cannot be identified or committed to, provide explanatory details including any commitments to identify outcomes through an assessment process.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the draft *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015* (<http://www.environment.gov.au/epbc/consultation/policy-guidance-outcomes-based-conditions>), including about environmental outcomes to be achieved, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included.

General commitments to achieving environmental outcomes, particularly relating to beneficial impacts of the proposed action, CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, and conditions of approval, if your proposal proceeds to these stages).

The proposed action is not anticipated to have any significant impacts upon Matters of National Environmental Significance. Measures to avoid or reduce the likelihood of significant impacts are described in Section 5, below.

### Endangered fauna

The EPBC search tool indicated the possible presence of the endangered Night Parrot (*Pezoporus occidentalis*) in the project area. However no evidence of the species was found during baseline investigations and relevant literature (cited in **Attachment B**) suggests that the species is locally extinct. Accordingly, there is no real likelihood that project implementation would materially affect the species.

### Vulnerable fauna

Although a single flock of four Princess parrots were observed overflying the project area, there is no evidence of an important population in the locality (as defined in the *Matters of National Environmental Significance Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999*, DoE, 2013). Princess parrots are highly nomadic and most of the project area appears to represent marginal habitat for Princess parrots, due to a lack of large trees required for roosting and nesting. Given this, there is no real chance that implementation of the project will:

- lead to a long-term decrease in the size of an important population of a species
- reduce the area of occupancy of an important population
- fragment an existing important population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of an important population
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- introduce disease that may cause the species to decline, or
- interfere substantially with the recovery of the species.

One vulnerable mammal species listed under the EPBC Act (the Greater bilby, *Macrotis lagotis*) and one vulnerable reptile (the great desert skink, *Liopholis kintorei*) were identified as potentially occurring in the project area. The two species have yet to be recorded in any of the areas that would be impacted by project

implementation. The habitat that would support these species (sand plains and sand dunes vegetated with spinifex) is very extensive and intact in the locality and the clearing of vegetation required for project implementation is unlikely to result in a "significant impact" on the species (if they are present, which has not yet been demonstrated).

### **Migratory birds**

Five migratory bird species have been observed in the general project area. Four of these are waders:

- Common Greenshank (*Tringa nebularia*) (S5, Migratory);
- Marsh Sandpiper (*Tringa stagnatilis*) (S5, Migratory);
- Red-necked Stint (*Calidris ruficollis*) (S5, Migratory);
- Sharp-tailed Sandpiper (*Calidris acuminata*) (S5, Migratory)

The baseline fauna and lake ecology studies completed to date (Attachments B and C) have found no evidence to suggest that Lake Disappointment itself represents a site of significance to EPBC Act listed migratory waders. The lake bed/shoreline habitat is for most of the time unsuitable for use by these species. The birds are only present on an irregular basis (following major rainfall events) and then only in small numbers. It should also be noted that all the migratory waders recorded during the course of the baseline surveys were observed on freshwater claypans in areas surrounding the Lake, but only two species (the red-necked stint and the common greenshank) were recorded on Lake Disappointment itself. Based on currently available information it has therefore been concluded that "significant impact" on migratory waders, as defined by the DotE, is unlikely to occur as a consequence of the proposed proceeding in its current form.

The rainbow bee-eater (*Merops ornatus*), a listed migratory species, was observed on 12 occasions (38 individuals) during baseline surveys. All but one sighting was in the area near McKay Creek. The rainbow bee-eater is not a threatened species and can be regarded as common. It may be resident in the area and possibly breeds in suitable areas such as the banks of McKay Creek. No material impact on the species is predicted as a result of project implementation.

## 5 Measures to avoid or reduce impacts

**Note:** If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Provide information about the level of commitment by the person proposing to take the action to achieve the proposed environmental outcomes and implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the *Outcomes-based Conditions Policy 2016* (<http://www.environment.gov.au/epbc/publications/outcomes-based-conditions-policy-guidance>), including information about the environmental outcomes to be achieved by proposed avoidance, mitigation, management or offset measures, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included in the description of the proposed measures.

More general commitments (e.g. preparation of management plans or monitoring), commitments to achieving environmental outcomes and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

Reward Minerals proposes following measures to reduce the potential for impacts to Matters of National Environmental Significance:

### Site selection

- Playa-based infrastructure has been positioned so as to avoid riparian habitats and maintain hydrological flow regimes (refer **Attachment D**). Reward commits to maintaining a 200m offset from the lake edge so as to minimise hydrological changes and avoid damage to lake edge vegetation. buffer)
- Land-based (off-playa) infrastructure has been sited to avoid direct or indirect impacts on freshwater clay pans, as these may offer important habitat to water birds and the species upon which they feed.
- Through its Indigenous Land Use Agreement (ILUA), Reward has made a binding commitment to avoiding disturbance to all islands on the Lake Disappointment playa. The exclusion areas will protect Aboriginal cultural heritage values as well as habitat used by banded stilts (not EPBC-listed) for breeding.

### Minimisation of vegetation clearing and habitat disturbance

Notwithstanding the apparent absence of vulnerable or endangered flora and fauna in the project area, Reward will seek to minimise the potential for impacts on terrestrial biodiversity values by:

- Siting road infrastructure to coincide with existing cleared tracks, to the extent practicable
- Adopting a compact configuration for project infrastructure, to avoid habitat fragmentation and minimise clearing
- Avoiding disturbance of lake edge / riparian habitats, which may support conservation significant fauna
- Positioning off-playa infrastructure outside the 1 in 100 year flood zone of any watercourses.

### Compliance with regulatory requirements

The following Western Australian environmental authorisations will be required for the proposed action to be implemented and provide an adequate framework for the regulation of potential environmental impacts:

- Ministerial Statement (Part IV of the Environmental Protection Act 1986)
- Licence (operation of solar salt production – Part V of the Environmental Protection Act 1986)
- Mining proposal and mine closure plan (under the Mining Act 1978)
- Licences to construct and operate groundwater bores / trenches (under the Rights in Water and Irrigation Act 1914)

As part of the conditions of, the abovementioned consents and licences, Reward will develop and implement Construction and Environmental Management Plans (EMPs) under an ISO 14001-compliant Environmental Management System (EMS). Sub-plans to guide the management of activities affecting flora, fauna, habitats, vegetation and water quality / flows will be required under the EMS. The environmental management documentation will be prepared and implemented in accordance with applicable WA government guidelines. The Western Australian regulatory system has a well-established set of guidance documents which specify the requirement for management plans to include details of the environmental outcomes to be achieved, performance criteria, monitoring and adaptive management to ensure the attainment of outcomes.

## 6 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

### 6.1 Do you THINK your proposed action is a controlled action?

<input checked="checked" type="checkbox"/>
<input type="checkbox"/>

No, complete section 6.2

Yes, complete section 6.3

### 6.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

1. None of the following exist within, or in proximity to the proposed action:
  - World Heritage Properties
  - National Heritage Places
  - Wetlands of international importance
  - Commonwealth and or marine areas
  - Great Barrier Marine Park
2. The proposed action does not involve:
  - Coal seam gas development or coal mining
  - Uranium mining or other nuclear actions
3. No EPBC listed plant species or vegetation communities occur in, or in proximity to, area potentially impacts by the proposed action.
4. Although a number of migratory species are known to occur in the locality, the implementation of the action is unlikely to materially alter available habitat for these species or to otherwise result (directly or

indirectly) in impacts that meet the definition of "significant" under the *Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999* (DoE, 2013).

5. No important populations of endangered or vulnerable fauna listed under the EPBC Act are likely to occur in the project area. Even if some of the protected fauna identified in the EPBC search tool do occur in the area, the extent and character of impacts likely to arise from project implementation do not give rise to a real likelihood of significant direct or indirect impacts on the listed species.

### 6.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

#### Matters likely to be impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)
<input type="checkbox"/>	Commonwealth marine environment (sections 23 and 24A)
<input type="checkbox"/>	Great Barrier Reef Marine Park (sections 24B and 24C)
<input type="checkbox"/>	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
<input type="checkbox"/>	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
<input type="checkbox"/>	Protection of the environment from Commonwealth actions (section 28)
<input type="checkbox"/>	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.



## 7 Environmental record of the responsible party

**NOTE:** If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

	Yes	No
<p><b>7.1 Does the party taking the action have a satisfactory record of responsible environmental management?</b></p> <p>Reward Minerals has operated in the minerals exploration industry for over 10 years without any environmental non-compliance recordings or corrective orders issued. The company has proactively consulted with a range of stakeholders (including SEWPAC / DoE) to discuss planned exploration activities for Department of Mines PoWE submissions and pilot scale works. Reward Minerals has worked meticulously to minimise environmental impacts on all its leases and to complete subsequent rehabilitation to a high standard.</p>	✓	
<p><b>7.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</b></p> <p>If yes, provide details</p>		✓
<p><b>7.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</b></p> <p>If yes, provide details of environmental policy and planning framework</p> <p>A copy of Reward's environmental policy is provided in <b>Attachment H</b>.</p>	✓	
<p><b>7.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</b></p> <p>Provide name of proposal and EPBC reference number (if known)</p>		✓

## 8 Information sources and attachments

(For the information provided above)

### 8.1 References

Project-specific references used in preparing this referral are listed in Table 1, above. All of these documents have been appended to the referral made to the WA EPA on 10 June 2016 and will be made publicly available through administrative processes established under the *Environmental Protection Act 1986*.

The Level 2 fauna assessment also took into account results of the following studies conducted in the Lake Disappointment area:

- Actis Environmental and Alexander Holm & Associates (2009). Lake Disappointment Potash Project Environmental Review and Program of Works.
- Blyth, J., A. Burbidge & W. Boles (1997). Report on an expedition to the western desert and eastern Pilbara areas in search of the Night Parrot *Pezoporus occidentalis*. *Eclectus*. 2:25-30.
- Davies, S.J.J.F., M. Bamford & M. Bamford (1988). The Night Parrot: a search in the Lake Disappointment area, September 1987. Royal Australasian Ornithologists Union Report (RAOU) Series. 49. Melbourne.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008a). Rangelands 2008 - taking the pulse. Little Sandy Desert bioregion. Department of Environment, Water, Heritage and the Arts, Parkes, ACT.
- Harewood, G. (2012). Targeted Fauna Survey Proposed Access Track, Camp Site and Borrow Pit Lake Disappointment.
- Harewood, G. (2015). Marsupial Mole Monitoring Survey (April 2014). Lake Disappointment Potash Project. Unpublished report for Reward Minerals Ltd.
- Phoenix Environmental Sciences (PES) (2013a). Short-range endemic invertebrate fauna survey of the Lake Disappointment Potash Project. Prepared for Botanica Consulting, on behalf of Reward Minerals Ltd. July 2013.
- Phoenix Environmental Sciences (PES) (2013b). Subterranean fauna desktop review of the Lake Disappointment Potash Project. Prepared for Botanica Consulting, on behalf of Reward Minerals Ltd. August 2013.
- Start, A. N. *et al.* (2013). Terrestrial mammals of the south-western Little Sandy Desert, Western Australia *Australian Mammalogy*, 2013, 35, 54–64.

The works by DEWHA (2008) and by Blyth *et al* (1997), Davies *et al* (1988) and Start *et al* (2013) are publicly available. Copies of the Phoenix reports and of Harewood (2015) are provided in **Attachment B**. Reward can provide copies of the reports by Actis (2009) and Harewood (2012) on request.

Additional **public information sources and guidelines** used in preparing this referral include:

- Bureau of Meteorology data for Telfer Aero station (#13030) (<http://www.bom.gov.au/climate>)
- Department of the Environment (DoE) (2016). Department of the Environment (DoE) (2016). EPBC Act Protected Matters Report: Point Search -23.28352 122.83408 (10km Buffer) Available from: <http://www.environment.gov.au>. Accessed 30/05/16 16:12:24
- Directory of Nationally Important Wetlands (<https://www.environment.gov.au/cgi-bin/wetlands/report.pl>)
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008b). Approved Conservation Advice for *Pezoporus occidentalis* (Night Parrot). Canberra.
- Department of Parks and Wildlife (DPaW) (2015). Threatened and Priority Fauna Rankings. 3 November 2015
- Department of Parks and Wildlife (DPaW) (2016). NatureMap Database search. "By Circle" 122°49' 30" E, 23°16' 09" S – Study area (plus 40 km buffer). 30/05/2016. Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011a). *Environment Protection and Biodiversity Conservation Act 1999* referral guidelines for the endangered northern quoll, *Dasyurus hallucatus*. EPBC Act policy statement 3.25.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011b). Survey Guidelines of Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011c). Survey Guidelines of Australia's threatened reptiles. Guidelines for detecting reptiles listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

Highlight documents that are available to the public, including web references if relevant.

## 8.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

The information used in Section 3 to describe Matters of National Environmental Significance and other important features of the environment is listed in Table 1 of this referral. The date of each report is provided in **Table 1**. Details of information reliability and uncertainties in the information are provided in each individual report.

The only report specifically relevant to a Matter of National Environmental Significance potentially affected by implementation of the proposed action is the Level 2 fauna survey by G Harewood (2016), a copy of which is provided in **Attachment B**. The fauna assessment was designed and carried out to conform with a Level 2 survey as defined in EPA Guidance statement No. 56 (EPA 2004). The assessment included a desktop analysis aimed at providing a list of expected species and the completion of two phase seasonal survey involving a detailed trapping program, targeted and opportunistic fauna observations, and the use of motion sensing cameras and bat detector recordings.

The fauna assessment provided in Attachment B describes fauna as being potentially present based on there being suitable habitat (quality and extent) within the study area. The report recognises that certain species may not have been detected during field trapping and/or targeted and opportunistic observations due to:

- seasonal inactivity during field survey;
- species present within micro habitats not surveyed;
- cryptic species able to avoid detection; and
- transient wide-ranging species not present during survey period.

The lack of observational data on some species has not been taken as necessarily indicating that a species is absent from the site. A precautionary approach was adopted: any fauna species that would possibly occur within the study area as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the lead investigator was assumed to potentially occur in the study area. The report in Attachment B provides the following assessment of the reliability information on terrestrial fauna in the project area and uncertainties in the information and/or the assessment of potential impacts:

**Table 3: Assessment of reliability and uncertainty – EPBC listed fauna**

Potential limitation, constraint or uncertainty	Assessment of information used in this referral
Scope of survey	Reliable, low uncertainty: the survey carried out was a Level Two survey, comprising of a desktop survey and a two phase seasonal survey that has included a habitat assessment, trapping program, and opportunistic observations.
Competency/experience of the consultant carrying out the survey.	Highly reliable: Consultant Zoologists that executed the survey have conducted many level 1 and level 2 surveys in WA and are suitably qualified.
Proportion of fauna identified, recorded and/or collected.	Reliable; low uncertainty: The field surveys recorded about 68% of listed potential vertebrate species considered likely to be present on site (based on searches of public databases and published records). It should be noted that the potential species list in public databases is very likely an over estimation of the species that use the proposal area on a regular basis.

Potential limitation, constraint or uncertainty	Assessment of information used in this referral
Availability of information	Reliable, but moderate uncertainty: The Project area has not been subject to detailed surveys in the past and specific fauna values are not well documented.
Completeness of survey	Access restrictions (due to cultural constraints) made it difficult to survey entire project area to same degree. Some additional surveys targeting specific areas and species maybe warranted.
Survey timing	Reliable. The survey was carried out in May and October to coincide with the recommended survey periods (EPA/DeC 2010).
Disturbances (e.g. fire, flood, human intervention etc.) which affected results of survey.	High level of reliability and certainty: No significant disturbances were present during the field survey.
Survey intensity, completeness, availability of resources (information and/or expertise)	Work conducted to date is considered reliable, but some areas of uncertainty remain. Access to many areas (outside the proposed disturbance footprint) not allowed due to cultural sensitivities and/or difficult, which contributed some uncertainty to the assessment of fauna occurrence at a local scale. Because the region has not been the subject of many surveys in the past, the invertebrate fauna is not well known. Invertebrates present may pose identification problems and establishing local and regional significance could be difficult.

### 8.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
<b>You must attach</b>	figures, maps or aerial photographs showing the project locality (section 1)	✓	GIS files are provided in <b>Attachment F</b> .
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Refer <b>Figure 9, in Attachment B</b> for locations of migratory birds observed in or near the project site.
<b>If relevant, attach</b>	copies of any state or local government approvals and consent conditions (section 2.5)	✓	No consent has yet been issued. A copy of the EPA referral document is provided in Attachment G.
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		Not applicable
	copies of any flora and fauna investigations and surveys (section 3)	✓	<b>Attachments A, B and C</b>
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	✓	<b>Attachments A, B and C</b>
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	✓	<b>Attachment E</b>

## 9 Contacts, signatures and declarations

**NOTE:** Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action<sup>1</sup>.

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### Project title: Lake Disappointment Potash Project

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#### 9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act<sup>2</sup>, this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person. If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action<sup>3</sup>.

- |   |   |
|---|---|
| 1. Name and Title:  | Dr Michael Ruane, Managing Director   |
| 2. Organisation (if applicable):  | Reward Minerals Ltd<br>Organisation name should match entity identified in ABN/ACN search |
| 3. EPBC Referral Number (if known):   | No referral number assigned yet   |
| 4. ACN / ABN (if applicable):   | 009 173 602   |
| 5. Postal address   | PO Box 1104, Nedlands WA 6909   |
| 6. Telephone:   | (08) 9386 4699  |
| 7. Email:   | michael.ruane@intermin.com.au   |
| 8. Name of proposed proponent (if not the same person at item 1 above and if applicable): | Not applicable  |
| 9. ACN/ABN of proposed proponent (if not the same person named at item 1 above):          | Not applicable  |

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<sup>1</sup> If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

<sup>2</sup> If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see [http://www.gbrmpa.gov.au/privacy/privacy\\_notice\\_for\\_permits](http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits).

**COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION  
FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE**

I qualify for exemption from  
fees under section  
520(4C)(e)(v) of the EPBC  
Act because I am:

- ☐ an individual; OR
- ☐ a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR
- ☐ not applicable.

If you are small business  
entity you must provide the  
Date/Income Year that you  
became a small business  
entity:

**Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth)).**

**COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO  
APPLY FOR A WAIVER**

I would like to apply for a  
waiver of full or partial fees  
under Schedule 1, 5.21A of  
the [EPBC Regulations](#). Under  
sub regulation 5.21A(5), you  
must include information  
about the applicant (if not  
you) the grounds on which  
the waiver is sought and the  
reasons why it should be  
made:

- ☐ not applicable.

Declaration

I declare that to the best of my knowledge the information I have  
given on, or attached to this form is complete, current and correct.  
I understand that giving false or misleading information is a serious  
offence.  
I agree to be the proponent for this action.  
I declare that I am not taking the action on behalf of or for the  
benefit of any other person or entity.

Signature



Date 21/06/2016

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**9.2 Person preparing the referral information (if different from 9.1) Same as 9.1**  
[Individual or organisation who has prepared the information contained in this referral form.](#)

Name



Title  
Organisation  
ACN / ABN (if  
applicable)  
Postal address  
Telephone  
Email  
Declaration

I declare that to the best of my knowledge the information I have given on, or  
attached to this form is complete, current and correct.  
I understand that giving false or misleading information is a serious offence.

Signature

Date

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## REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

### HAVE YOU:

- ✓ Completed all required sections of the referral form?
- ✓ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ✓ Provided a map showing the location and approximate boundaries of the project area?
- ✓ Provided a map/plan showing the location of the action in relation to any matters of NES?  
**Refer figure 9 in attachment B Part 1**
- ✓ Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at [Attachment A](#)) delineating the boundaries of the referral area?
- ✓ Provided complete contact details and signed the form?
- ✓ Provided copies of any documents referenced in the referral form?
- ✓ Ensured that all attachments are less than three megabytes (3mb)?
- ✓ Sent the referral to the Department (electronic and hard copy preferred)?

## **Geographic Information System (GIS) data supply guidelines**

### **Spatial data are provided in Attachment F**

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
  - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
  - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile. ([http://www.anzlic.org.au/policies\\_guidelines#guidelines](http://www.anzlic.org.au/policies_guidelines#guidelines)).

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

All data will be provide under a Creative Commons license (<http://creativecommons.org/licenses/by/3.0/au/>)