

Wonnerup North Project

Referral to the Environmental Protection Authority

April 2014



Environmental Protection Authority

Referral of a Proposal by the Proponent to the Environmental Protection Authority under Section 38(1) of the *Environmental Protection Act 1986*.

EPA REFERRAL FORM
PROPONENT

PURPOSE OF THIS FORM

Section 38(1) of the *Environmental Protection Act 1986* (EP Act) provides that where a development proposal is likely to have a significant effect on the environment, a proponent may refer the proposal to the Environmental Protection Authority (EPA) for a decision on whether or not it requires assessment under the EP Act. This form sets out the information requirements for the referral of a proposal by a proponent.

Proponents are encouraged to familiarise themselves with the EPA's *General Guide on Referral of Proposals* [see Environmental Impact Assessment/Referral of Proposals and Schemes] before completing this form.

A referral under section 38(1) of the EP Act by a proponent to the EPA must be made on this form. A request to the EPA for a declaration under section 39B (derived proposal) must be made on this form. This form will be treated as a referral provided all information required by Part A has been included and all information requested by Part B has been provided to the extent that it is pertinent to the proposal being referred. Referral documents are to be submitted in two formats – hard copy and electronic copy. The electronic copy of the referral will be provided for public comment for a period of 7 days, prior to the EPA making its decision on whether or not to assess the proposal.

CHECKLIST

Before you submit this form, please check that you have:


	Yes	No
Completed all the questions in Part A (essential).	<input checked="" type="checkbox"/>	
Completed all applicable questions in Part B.	<input checked="" type="checkbox"/>	
Included Attachment 1 – location maps.	<input checked="" type="checkbox"/>	
Included Attachment 2 – additional document(s) the proponent wishes to provide (if applicable).	<input checked="" type="checkbox"/>	
Included Attachment 3 – confidential information (if applicable).		
Enclosed an electronic copy of all referral information, including spatial data and contextual mapping but excluding confidential information.	<input checked="" type="checkbox"/>	

Following a review of the information presented in this form, please consider the following question (a response is optional).

Do you consider the proposal requires formal environmental impact assessment?	
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input type="checkbox"/> Not sure	
If yes, what level of assessment?	
<input type="checkbox"/> Assessment on Proponent Information	<input type="checkbox"/> Public Environmental Review

PROPONENT DECLARATION (to be completed by the proponent)

I, KEN BELL, (full name) declare that I am authorised on behalf of CRISTAL MINING (being the person responsible for the proposal) to submit this form and further declare that the information contained in this form is true and not misleading.

Signature 	Name (print) <u>Ken Bell</u>
Position <u>OPERATIONS MANAGER - WEST</u>	Company <u>Cristal Mining Australia Ltd</u>
Date <u>22/4/2014.</u>	

SUPPORTING DOCUMENTATION

- Attachment 1 Figure 1-1: Regional Locality Plan
 Figures 1-2a and 1-2b: Locality Plan
 Figure 1-3: Site Plan – Project Details
 Figure 1-4: Site Plan – Lot Details

- Attachment 2 Wonnerup North Mineral Sands Project - Environmental Referral Document

PART A - PROPONENT AND PROPOSAL INFORMATION

(All fields of Part A must be completed for this document to be treated as a referral)

1 PROPONENT AND PROPOSAL INFORMATION

1.1 Proponent

Name	Cristal Australia Pty Ltd (Cristal)
Joint Venture parties (if applicable)	
Australian Company Number (if applicable)	ACN 009 247 858
Postal Address (where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State)	PO Box 133, Bunbury WA 6231
Key proponent contact for the proposal: <ul style="list-style-type: none"> • name • address • phone • email 	Phil Johnston Safety Health and Environment Manager Cristal Mining Australia PO Box 133, Bunbury WA 6231 08 9791 0200 Phil.Johnston@cristal.com
Consultant for the proposal (if applicable): <ul style="list-style-type: none"> • name • address • phone • email 	Richard Kirwood Resource Strategies c/- PO Box 133, Bunbury WA 6231 0408 882 275 rkirwood@resourcestrategies.com.au

1.2 Proposal

Title	Wonnerup North Mineral Sands Project (the Project)
Description	<p>The Project would involve dry mining and processing of mineral sands ore from the Wonnerup North deposit at a rate of approximately 2.3 million tonnes (Mt) per annum over eight years.</p> <p>The Wonnerup North orebody is typically 1.5 to 3.5 metres (m) thick and has no overburden. In some areas it can extend as deep as 5 to 6 m from the surface.</p> <p>The natural groundwater table typically occurs within 3.5 m of the surface, therefore some interaction with the watertable is expected.</p> <p>Extracted mineral sands ore would be processed on-site using a wet separation plant to produce heavy mineral concentrate (HMC). The HMC would be transported off-site via the Bussell Highway to Cristal's Mineral Separation Plant (MSP) located in Bunbury.</p> <p>Please refer to Figures 1-1, 1-2, 1-3 and 1-4 in Attachment 1 and Section 2 in Attachment 2 for a more detailed description of the Project.</p>

Extent (area) of proposed ground disturbance.	515 hectares (ha)
Timeframe in which the activity or development is proposed to occur (including start and finish dates where applicable).	<p>Cristal plans to commence the initial construction period in 2018 subject to the grant of all required approvals. Construction would be approximately six to nine months in duration.</p> <p>The proposed life of the Project is approximately eight years, with mining assumed to commence in the fourth quarter (Q4) of 2018.</p> <p>Mine closure works would occur over the period from 2025 and 2027 based on the proposed mining rate and current heavy mineral reserve (refer to Section 2.8 in Attachment 2).</p>
Details of any staging of the proposal.	N/A
Is the proposal a strategic proposal?	No
<p>Is the proponent requesting a declaration that the proposal is a derived proposal?</p> <p>If so, provide the following information on the strategic assessment within which the referred proposal was identified:</p> <ul style="list-style-type: none"> • title of the strategic assessment; and • Ministerial Statement number. 	No
Please indicate whether, and in what way, the proposal is related to other proposals in the region.	<p>Cristal's existing Wonnerup Mineral Sands Mine is located immediately to the west of the Project.</p> <p>The Project is scheduled to commence once operations at the Wonnerup Mineral Sands Mine cease (in approximately 2018). It is therefore expected that the majority of the mobile equipment, workforce, mineral separation plant and associated infrastructure would be transferred across and used at the Project.</p> <p>HMC would be transported by road to Cristal's MSP at Bunbury for further processing and dispatch to domestic and overseas customers. The Project would include back-loading of tailings generated during the processing of Project HMC at the Bunbury MSP to the Project site and burial of the tailings within the mined-out areas of the pit.</p>
Does the proponent own the land on which the proposal is to be established? If not, what other arrangements have been established to access the land?	The Project involves activities within mining leases M70/360 and M70/569, which were granted in 1987 and 1989 respectively. The underlying land tenure in the Project area is predominantly privately-owned freehold land. Cristal (via its subsidiary Cable Sands [WA] Pty Ltd) currently owns Lot 6 on D88371, Lot 10 on DP37187, Lot 1124 on P81921 and Lot 850 on P134119 within the Project area, and has entered into access agreements with the owners of the remaining lots.
What is the current land use on the property, and the extent (area in hectares) of the property?	The maximum Project disturbance footprint is approximately 575 ha in size. The land use within the Project area is primarily cattle grazing on native and improved pastures.

1.3 Location

Name of the Shire in which the proposal is located.	City of Busselton
For urban areas: <ul style="list-style-type: none"> • street address; • lot number; • suburb; and • nearest road intersection. 	N/A
For remote localities: <ul style="list-style-type: none"> • nearest town; and • distance and direction from that town to the proposal site. 	The Project is located approximately 44 kilometres (km) south of Bunbury and 10 km east of Busselton. Relevant land tenure is shown on Figure 1-4 in Attachment 1.
Electronic copy of spatial data - GIS or CAD, geo-referenced and conforming to the following parameters: <ul style="list-style-type: none"> • GIS: polygons representing all activities and named; • CAD: simple closed polygons representing all activities and named; • datum: GDA94; • projection: Geographic (latitude/longitude) or Map Grid of Australia (MGA); • format: Arcview shapefile, Arcinfo coverages, Microstation or AutoCAD. 	Enclosed.

1.4 Confidential Information

Does the proponent wish to request the EPA to allow any part of the referral information to be treated as confidential?	No
If yes, is confidential information attached as a separate document in hard copy?	N/A

1.5 Government Approvals

Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.	N/A
Is approval required from any Commonwealth or State Government agency or Local Authority for any part of the proposal? If yes, please complete the table below.	Yes

Agency/Authority	Approval required	Application lodged Yes / No	Agency/Local Authority contact(s) for proposal
DMP	<i>Mining Act, 1978: Mining Proposal</i>	No	General Manager Environmental Approvals and Compliance 100 Plain Street East Perth WA 6004 (08) 9222 3142
DMP	<i>Environmental Protection Act, 1986: Vegetation Clearing Permit</i>	No	As above.
DER	<i>Environmental Protection Act, 1986 – Part V: Works Approval</i>	No	Neville Welsh / Daniel Hartnup (Greater Swan Region) PO Box 1693 Bunbury WA 6231 (08) 9725 4300
DoW	<i>Rights in Water and Irrigation Act, 1914: Licence to Take Groundwater (Section 5C)</i>	No	Richard Watson South-West Regional Office PO Box 261 Bunbury WA 6231 (08) 9726 4111
DAA	<i>Aboriginal Heritage Act, 1972: Section 18 Consent to Certain Uses</i>	No	To be advised PO Box 3153, East Perth, Western Australia 6892 1300 651 077
DotE	<i>Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act): Referral of Proposed Action</i>	No	Con Voutas Environmental Assessment Branch GPO Box 787 Canberra ACT 2601 Australia 1800 803 772

DMP – Department of Mines and Petroleum (WA)
 DER – Department of Environment Regulation (WA)
 DoW – Department of Water (WA)
 DAA – Department of Aboriginal Affairs (WA)
 DotE – Department of the Environment (Commonwealth)

PART B - ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

2. ENVIRONMENTAL IMPACTS

Describe the impacts of the proposal on the following elements of the environment, by answering the questions contained in Sections 2.1-2.11:

- 2.1 flora and vegetation;
- 2.2 fauna;
- 2.3 rivers, creeks, wetlands and estuaries;
- 2.4 significant areas and/ or land features;
- 2.5 coastal zone areas;
- 2.6 marine areas and biota;
- 2.7 water supply and drainage catchments;
- 2.8 pollution;
- 2.9 greenhouse gas emissions;
- 2.10 contamination; and
- 2.11 social surroundings.

These features should be shown on the site plan, where appropriate.

For all information, please indicate:

- (a) the source of the information; and
- (b) the currency of the information.

2.1 Flora and Vegetation

2.1.1 Do you propose to clear any native flora and vegetation as a part of this proposal?

[A proposal to clear native vegetation may require a clearing permit under Part V of the EP Act (Environmental Protection (Clearing of Native Vegetation) Regulations 2004)]. Please contact the Department of Environment and Conservation (DEC) for more information.

(please tick) Yes **If yes**, complete the rest of this section.

No **If no**, go to the next section

2.1.2 How much vegetation are you proposing to clear (in hectares)?

[Approximately 45 hectares of native vegetation communities will be cleared as a result of the Project.](#)

2.1.3 Have you submitted an application to clear native vegetation to the DEC (unless you are exempt from such a requirement)?

Yes No **If yes**, on what date and to which office was the application submitted of the DEC?

[An application to clear native vegetation would be prepared and submitted to the DMP if it is determined by the EPA that the Project does not require formal assessment.](#)

2.1.4 Are you aware of any recent flora surveys carried out over the area to be disturbed by this proposal?

Yes

No

If yes, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DEC.

Cristal commissioned Astron Environmental Services Pty Ltd (Astron) to conduct a two-phase Level 2 flora and vegetation survey of the Project area, comprised of:

- Phase 1: an initial field survey was conducted in June 2013; and
- Phase 2: a follow-up survey was conducted in October 2013.

Please refer to Section 3.2.2 in Attachment 2 for a description of the survey findings and references, and Section 3.2.4 in Attachment 2 for the proposed environmental management measures (relevant to flora and vegetation) for the Project.

2.1.5 Has a search of DEC records for known occurrences of rare or priority flora or threatened ecological communities been conducted for the site?

Yes

No

If you are proposing to clear native vegetation for any part of your proposal, a search of DEC records of known occurrences of rare or priority flora and threatened ecological communities will be required. Please contact DEC for more information.

A desktop assessment has been completed that included database searches of the DEC (now DPaW) databases and the Commonwealth Protected Matters search tool to identify occurring and potentially occurring threatened ecological communities and flora species listed under the WA *Wildlife Conservation Act, 1950* (WC Act) and/or the EPBC Act. These searches also identified occurring and potentially occurring priority ecological communities and priority flora species recognised by DPaW. A summary of the findings is provided in Section 3.2.2 in Attachment 2.

2.1.6 Are there any known occurrences of rare or priority flora or threatened ecological communities on the site?

Yes

No

If yes, please indicate which species or communities are involved and provide copies of any correspondence with DEC regarding these matters.

Astron recorded the Declared Rare Flora species *Chamelaucium* sp. C Coastal Plain adjacent to Wonnerup South Road near to where it crosses the Abba River. This species is also listed as Vulnerable under the EPBC Act. The Project does not involve disturbance to this area.

Three priority flora species were recorded within the Ruabon Road verges in the vicinity of the proposed section of road that would be widened. These included:

- *Isopogon formosus* subsp. *dasylepis*, which is listed as P3 by the DPaW;
- *Jacksonia gracillima*, which is listed as P3 by the DPaW; and
- *Verticordia attenuate*, which is listed as P3 by the DPaW.

A fourth priority species, *Tripterooccus paniculatus* (listed as P4 by the DPaW) occurs in the northern extent of the Project mining area.

No priority or threatened ecological communities were recorded in the Project area.

Please refer to Section 3.2.2 in Attachment 2 for further information, location figures and references.

2.1.7 If located within the Perth Metropolitan Region, is the proposed development within or adjacent to a listed Bush Forever Site? (You will need to contact the Bush Forever Office, at the Department for Planning and Infrastructure)

Yes

No

If yes, please indicate which Bush Forever Site is affected (site number and name of site where appropriate).

2.1.8 What is the condition of the vegetation at the site?

The Project area has been significantly altered from its pre-European condition through a long history of agricultural practices. The understorey of most of the remnant vegetation that occurs within the Project area was found by Astron to be in degraded or completely degraded condition. Small areas of remnant vegetation that are less degraded (i.e. 'Degraded to Good' condition) occur in the northern part of M70/569 near Ruabon Road.

Please refer to Section 3.2.2 in Attachment 2 for further information.

2.2 Fauna

2.2.1 Do you expect that any fauna or fauna habitat will be impacted by the proposal?

(please tick)

Yes

If yes, complete the rest of this section.

No

If no, go to the next section.

2.2.2 Describe the nature and extent of the expected impact.

The Project would involve clearance of approximately 45 ha of native vegetation communities. The Project predominantly occurs in already cleared pasture (approximately 87.5% of the total Project disturbance area).

The following six broad fauna habitats were identified by Biologic Environmental Survey Pty Ltd (Biologic) within the Project area:

- cleared pasture;
- Marri – Jarrah – Peppermint open forest;
- Flooded Gum – *Melaleuca* spp. – Marri open woodland;
- *Melaleuca* low open woodland;
- Marri – Jarrah – Banksia forest; and
- non-native planted vegetation.

Please refer to Section 3.4.2 in Attachment 2 for further information, figures and references.

2.2.3 Are you aware of any recent fauna surveys carried out over the area to be disturbed by this proposal?

Yes

No

If yes, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DEC.

Cristal commissioned Biologic to conduct a two-phase Level 2 fauna survey of the Project area, comprised of:

- Phase 1: an autumn survey was conducted in May 2013; and
- Phase 2: a spring survey was conducted in October 2013.

Please refer to Section 3.4.2 in Attachment 2 for further information.

2.2.4 Has a search of DEC records for known occurrences of Specially Protected (threatened) fauna been conducted for the site?

Yes No (please tick)

The database searches and literature reviews conducted by Biologic indicated 230 vertebrate fauna species have the potential to occur in the general locality. This list comprises 22 native mammal species, eight introduced mammal species, 147 bird species (excluding the strictly marine species), 42 reptile species and 11 amphibian species. The database searches and previous survey records also indicates 35 of the 230 vertebrate species are of conservation significance (i.e. eight mammals, 25 birds and three reptiles). However, due to a lack of suitable habitat in the Project area, only 21 are considered to possibly occur in the Project area.

Please refer to Section 3.4.2 in Attachment 2 for further information and references.

2.2.5 Are there any known occurrences of Specially Protected (threatened) fauna on the site?

Yes No **If yes**, please indicate which species or communities are involved and provide copies of any correspondence with DEC regarding these matters.

The Phase 1 (autumn) and Phase 2 (spring) surveys conducted by Biologic recorded the following five conservation significant fauna species (i.e. two mammals and three birds):

- Southern Brush-tailed Phascogale (*Phascogale tapaoatafa*): listed under Schedule 1 of the WC Act. Present in low numbers within Marri – Jarrah – Peppermint open forest in the Project area.
- Western Ringtail Possum (*Pseudocheirus occidentalis*): listed under Schedule 1 of the WC Act and Endangered under the EPBC Act. Present in low numbers within Marri – Jarrah – Peppermint open forest in the Project area.
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*): listed under Schedule 1 of the WC Act and Endangered under the EPBC Act. Observed foraging on-site during the survey period.
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*): listed under Schedule 1 of the WC Act and Vulnerable under the EPBC Act. Observed foraging within the survey period.
- Rainbow Bee-eater (*Merops ornatus*): listed under Schedule 3 of the WC Act and Migratory under the EPBC Act. Seasonal visitor, observed during the Spring 2013 survey, assumed to use woodland remnants for foraging and roosting.

Please refer to Sections 3.4.2 and 3.4.4 in Attachment 2 for further information, figures and references.

2.3 Rivers, Creeks, Wetlands and Estuaries

2.3.1 Will the development occur within 200 metres of a river, creek, wetland or estuary?

(please tick) Yes If yes, complete the rest of this section.
 No **If no**, go to the next section.

Mining operations would be conducted on either side of the Abba River, which is an ephemeral watercourse that enters through the south-east corner and flows in a westerly direction through the majority of the Project area. Mining operations would be set back from the Abba River so that it could flow uninterrupted through the mine site. The undisturbed corridor would be approximately 40 to 175 m wide (refer to Figure 1-3 in Attachment 1). Three internal haul/access road crossings of the Abba River would be constructed during the mine life, designed with the consideration of minimising potential disturbance and maintaining water flows.

2.3.2 Will the development result in the clearing of vegetation within the 200 metre zone?
 Yes No **If yes**, please describe the extent of the expected impact.

Vegetation would be cleared outside of the undisturbed corridor on either side of the Abba River. Vegetation to be cleared within 200 m of the Abba River for the Project would be predominately cleared pasture, with occasional individual paddock trees. Remnant riparian vegetation does occur within 40 m of the Abba River but would not be disturbed. Cristal would also undertake enhancement works in and adjacent to the riparian vegetation along the Abba River in the areas that would not be disturbed by the Project.

2.3.3 Will the development result in the filling or excavation of a river, creek, wetland or estuary?
 Yes No **If yes**, please describe the extent of the expected impact.

The Project would, however, include the construction of three internal haul/access road crossings of the Abba River (refer to Figure 1-3 in Attachment 1). These would be designed with the consideration of minimising potential disturbance and maintaining water flows. The river crossings are expected to be constructed as a box culvert or spiral pipe design.

2.3.4 Will the development result in the impoundment of a river, creek, wetland or estuary?
 Yes No **If yes**, please describe the extent of the expected impact.

2.3.5 Will the development result in draining to a river, creek, wetland or estuary?
 Yes No **If yes**, please describe the extent of the expected impact.

2.3.6 Are you aware if the proposal will impact on a river, creek, wetland or estuary (or its buffer) within one of the following categories? (please tick)

Conservation Category Wetland	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Perth's Bush Forever site	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (Swan & Canning Rivers) Policy 1998	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
The management area as defined in s4(1) of the <i>Swan River Trust Act 1988</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Which is subject to an international agreement, because of the importance of the wetland for waterbirds and waterbird habitats (e.g. Ramsar, JAMBA, CAMBA)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure

2.4 Significant Areas and/ or Land Features

2.4.1 Is the proposed development located within or adjacent to an existing or proposed National Park or Nature Reserve?
 Yes No **If yes**, please provide details.

2.4.2 Are you aware of any Environmentally Sensitive Areas (as declared by the Minister under section 51B of the EP Act) that will be impacted by the proposed development?
 Yes No **If yes**, please provide details.

2.4.3 Are you aware of any significant natural land features (e.g. caves, ranges etc) that will be impacted by the proposed development?

Yes No **If yes**, please provide details.

2.5 Coastal Zone Areas (Coastal Dunes and Beaches)

2.5.1 Will the development occur within 300metres of a coastal area?

(please tick) Yes **If yes**, complete the rest of this section.

No **If no**, go to the next section.

2.5.2 What is the expected setback of the development from the high tide level and from the primary dune?

N/A

2.5.3 Will the development impact on coastal areas with significant landforms including beach ridge plain, cusped headland, coastal dunes or karst?

Yes No **If yes**, please describe the extent of the expected impact.

2.5.4 Is the development likely to impact on mangroves?

Yes No **If yes**, please describe the extent of the expected impact.

2.6 Marine Areas and Biota

2.6.1 Is the development likely to impact on an area of sensitive benthic communities, such as seagrasses, coral reefs or mangroves?

Yes No **If yes**, please describe the extent of the expected impact.

2.6.2 Is the development likely to impact on marine conservation reserves or areas recommended for reservation (as described in *A Representative Marine Reserve System for Western Australia*, CALM, 1994)?

Yes No **If yes**, please describe the extent of the expected impact.

2.6.3 Is the development likely to impact on marine areas used extensively for recreation or for commercial fishing activities?

Yes No **If yes**, please describe the extent of the expected impact, and provide any written advice from relevant agencies (e.g. Fisheries WA).

2.7 Water Supply and Drainage Catchments

2.7.1 Are you in a proclaimed or proposed groundwater or surface water protection area?

(You may need to contact the Department of Water (DoW) for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

Yes No **If yes**, please describe what category of area.

2.7.2 Are you in an existing or proposed Underground Water Supply and Pollution Control area?

(You may need to contact the DoW for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

Yes No **If yes**, please describe what category of area.

2.7.3 Are you in a Public Drinking Water Supply Area (PDWSA)?

(You may need to contact the DoW for more information or refer to the DoW website. A proposal to clear vegetation within a PDWSA requires approval from DoW.)

Yes No **If yes**, please describe what category of area.

2.7.4 Is there sufficient water available for the proposal?

(Please consult with the DoW as to whether approvals are required to source water as you propose. Where necessary, please provide a letter of intent from the DoW)

Yes No (please tick)

During periods where the amount of mine water generated is less than the Project water demand, Cristal would extract make-up water from a licensed bore within the deeper Yaragadee aquifer. Cristal intends to obtain a licence to fit-out one of two existing bores located within the Project area (refer to Figure 1-3 in Attachment 1). The DoW has been consulted with regard to a licence application for the new bore(s).

2.7.5 Will the proposal require drainage of the land?

Yes No **If yes**, how is the site to be drained and will the drainage be connected to an existing Local Authority or Water Corporation drainage system? Please provide details.

2.7.6 Is there a water requirement for the construction and/ or operation of this proposal?

(please tick) Yes **If yes**, complete the rest of this section.

No **If no**, go to the next section.

2.7.7 What is the water requirement for the construction and operation of this proposal, in kilolitres per year?

Up to approximately 1.6 gigalitres per annum is predicted to be extracted to meet the Project make-up water demand.

2.7.8 What is the proposed source of water for the proposal? (e.g. dam, bore, surface water etc.)

Some dewatering of the open pit mining area is expected to be required for the Project. Groundwater inflows and incident rainfall that collects in the open pits (i.e. mine water) would be collected via sumps and would be preferentially used to meet the Project water demand (i.e. use in the wet separation plant and for dust suppression).

During periods where the amount of mine water generated is less than the Project water demand, Cristal would extract make-up water from a licensed bore within the deeper Yaragadee aquifer. Cristal intends to obtain a licence to fit-out one of two existing bores located within the Project area (refer Section 2.7.4 and 2.7.7 above).

Water extracted from the Yarragadee aquifer would be transferred to the process water dam (located in the mine infrastructure area) and/or reticulated by pump and pipeline systems via service corridors to the dry mining units and wet separation plant. Pump and pipeline systems to convey the make-up water would be installed and then progressively extended/relocated as the mine advances.

2.8 Pollution

2.8.1 Is there likely to be any discharge of pollutants from this development, such as noise, vibration, gaseous emissions, dust, liquid effluent, solid waste or other pollutants?

(please tick) Yes **If yes**, complete the rest of this section.
 No **If no**, go to the next section.

2.8.2 Is the proposal a prescribed premise, under the Environmental Protection Regulations 1987?

(Refer to the EPA's *General Guide for Referral of Proposals to the EPA under section 38(1) of the EP Act 1986* for more information)

Yes No **If yes**, please describe what category of prescribed premise.

Category 6 Mine dewatering

Category 8 Mineral sands mining or processing

2.8.3 Will the proposal result in gaseous emissions to air?

Yes No **If yes**, please briefly describe.

2.8.4 Have you done any modelling or analysis to demonstrate that air quality standards will be met, including consideration of cumulative impacts from other emission sources?

Yes No **If yes**, please briefly describe.

Notwithstanding, the following dust management measures would be implemented to minimise dust emissions:

- the use of water carts for dust suppression on haul roads;
- stabilisation of open areas and stockpiles subject to wind erosion using clay fines or other additives, and
- progressive rehabilitation of mine voids.

2.8.5 Will the proposal result in liquid effluent discharge?

Yes No **If yes**, please briefly describe the nature, concentrations and receiving environment.

Liquid wastes from hydrocarbon/chemical spills and leaks, and truck wash down areas would be contained by purpose-built oil/water separator systems which would be inspected and maintained regularly.

2.8.6 If there is likely to be discharges to a watercourse or marine environment, has any analysis been done to demonstrate that the State Water Quality Management Strategy or other appropriate standards will be able to be met?

Yes No **If yes**, please describe.

For the majority of the mine life there would be a water deficit, which would be met through extraction from the Yarragadee production bore(s). However, two peaks in groundwater inflow to the open pit have been predicted in Q1 2019 and Q3 2022. If these peaks eventuate, the amount of water that drains to the open pit may exceed the Project demand, in which case controlled discharge

to the environment would be required. The neighbouring Wonnerup Mineral Sands Mine has a similar situation, with the controlled discharge being conducted in accordance with Cristal's existing Part V EP Act licence (L8739/2013/1).

Cristal anticipates that the Part V EP Act licence issued for the Project would include specific conditions pertaining to controlled discharge (i.e. approved release point location and target and maximum criteria for key water quality parameters). Cristal would manage its mining operations during the predicted mine inflow peak periods in Q1 2019 and Q3 2022 to minimise the potential for excess water discharge being required.

2.8.7 Will the proposal produce or result in solid wastes?

Yes

No

If yes, please briefly describe the nature, concentrations and disposal location/ method.

Waste materials generated by the Project would include:

- sand residues generated on-site from the wet processing plant and tailings back-loaded from the Bunbury MSP;
- recyclable and non-recyclable general wastes; and
- other wastes from mining operations and workshop activities (e.g. used tyres, scrap metal, waste hydrocarbons and oil filters).

With the exception of the sand residues and MSP tailings, no waste would be buried on-site.

All general domestic waste and general recyclable products would be collected from the Project by an appropriately licensed contractor.

Waste tyres would be stockpiled (and/or re-used as delineators on-site), prior to collection by contractors and removal from site. Scrap metal produced at the workshops during the life of the mine would be collected by a scrap metal merchant for recycling.

Waste hydrocarbons and oil filters would be collected by licensed contractors. Workshop hydrocarbon spills and leaks, and truck washdown areas would be contained by purpose-built oil/water separator systems which would be inspected and maintained regularly.

2.8.8 Will the proposal result in significant off-site noise emissions?

Yes

No

If yes, please briefly describe.

Cristal would manage its mining operations and implement appropriate noise management controls as required in order to comply with the prescribed noise criteria.

Please refer to Section 3.5.4 in Attachment 2 for further information.

2.8.9 Will the development be subject to the Environmental Protection (Noise) Regulations 1997?

Yes

No

If yes, has any analysis been carried out to demonstrate that the proposal will comply with the Regulations?

Please attach the analysis.

A noise assessment has been undertaken by SVT Engineering Consultants Pty Ltd and a discussion of the preliminary findings is provided in Section 3.5.4 in Attachment 2.

2.8.10 Does the proposal have the potential to generate off-site, air quality impacts, dust, odour or another pollutant that may affect the amenity of residents and other "sensitive premises" such as schools and hospitals (proposals in this category may include intensive agriculture, aquaculture, marinas, mines and quarries etc.)?

Yes

No

If yes, please describe and provide the distance to residences and other "sensitive premises".

The Project has the potential to generate dust. However this potential would be managed through measures outlined in Section 2.7 in Attachment 2.

SVT Engineering Consultants Pty Ltd has considered the closest residences to the Project boundary as “sensitive premises” in relation to noise. Please refer to Section 3.5.4 in Attachment 2 for further information.

2.8.11 If the proposal has a residential component or involves “sensitive premises”, is it located near a land use that may discharge a pollutant?

Yes No Not Applicable

If yes, please describe and provide the distance to the potential pollution source

2.9 Greenhouse Gas Emissions

2.9.1 Is this proposal likely to result in substantial greenhouse gas emissions (greater than 100 000 tonnes per annum of carbon dioxide equivalent emissions)?

Yes No

If yes, please provide an estimate of the annual gross emissions in absolute and in carbon dioxide equivalent figures.

2.9.2 Further, if yes, please describe proposed measures to minimise emissions, and any sink enhancement actions proposed to offset emissions.

2.10 Contamination

2.10.1 Has the property on which the proposal is to be located been used in the past for activities which may have caused soil or groundwater contamination?

Yes No Unsure **If yes**, please describe.

Simto Resources Limited was the former owner of the tenements M70/360 and M70/569, who commenced construction of an administrative facilities area, wet processing plant area, mine access road and the sinking of a production bore to the Yaragadee aquifer within the northern portion of M70/360 in the 1990s. However, mining operations were never commenced in the Project area due to unfavourable market conditions at the time.

2.10.2 Has any assessment been done for soil or groundwater contamination on the site?

Yes No **If yes**, please describe.

However, Aurora Environmental has been engaged by Cristal to conduct an acid sulphate soil (ASS) investigation for the Project, in accordance with the DER ASS guideline for mineral sands mining viz. *Investigation and Management of Acid Sulphate Soils Hazards Associated with Silica and Heavy Mineral Sands Operations* (DEC, 2012). Please refer to Section 3.3.2 in Attachment 2 for further information.

2.10.3 Has the site been registered as a contaminated site under the *Contaminated Sites Act 2003*? (on finalisation of the CS Regulations and proclamation of the CS Act)

Yes No **If yes**, please describe.

2.11 Social Surroundings

2.11.1 Is the proposal on a property which contains or is near a site of Aboriginal ethnographic or archaeological significance that may be disturbed?

Yes No Unsure **If yes**, please describe.

The Abba River is a registered Aboriginal site (DAA Site ID 17354) and occurs within the Project Area (refer Figure 3-8 in Attachment 2). Mining operations and vegetation clearing would be avoided within the undisturbed corridor along the Abba River, with the exception of three internal haul/access roads which would be designed and constructed to minimise disturbance and maintain water flows.

Cristal would lodge an application under Section 18 of the AH Act for approval to undertake Project-related activities within the registered Abba River site (DAA Site ID 17534). No indigenous cultural material was recorded in the Project area during the archaeological survey conducted by Snappy Gum Heritage Services.

Please refer to Section 3.6 in Attachment 2 for further information, figures and references.

2.11.2 Is the proposal on a property which contains or is near a site of high public interest (e.g. a major recreation area or natural scenic feature)?

Yes No **If yes**, please describe.

The Vasse-Wonnerup Wetland System is located approximately 2 km downstream of the western edge of M70/360. The Project is also located approximately 7 km from the Whicher Scarp and adjoining Blackwood Plateau (refer Figure 1-2 in Attachment 1). The Tuart Forest National Park is (at its closest point to the Project) located on the western side of the Bussell Highway opposite the junction of Ruabon Road (refer Figure 1-2 in Attachment 1). None of these areas would be directly disturbed or otherwise impacted by the Project.

2.11.3 Will the proposal result in or require substantial transport of goods, which may affect the amenity of the local area?

Yes No **If yes**, please describe.

Approximately 683,000 t of HMC would be produced over the life of the mine. The Project would require road transportation of the HMC to the Bunbury MSP via the Bussell Highway. The road haulage operation would be similar to the existing Wonnerup Mineral Sands Mine and would be conducted using 60 t trucks operating between the hours of 7.00 am and 7.00 pm.

3. PROPOSED MANAGEMENT

3.1 Principles of Environmental Protection

3.1.1 Have you considered how your project gives attention to the following Principles, as set out in section 4A of the EP Act? (For information on the Principles of Environmental Protection, please see EPA Position Statement No. 7, available on the EPA website)

- | | | |
|----------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------|
| 1. The precautionary principle. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. The principle of intergenerational equity. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. The principle of the conservation of biological diversity and ecological integrity. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Principles relating to improved valuation, pricing and incentive mechanisms. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. The principle of waste minimisation. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

3.1.2 Is the proposal consistent with the EPA's Environmental Protection Bulletins/Position Statements and Environmental Assessment Guidelines/Guidance Statements (available on the EPA website)?

- Yes No

3.2 Consultation

3.2.1 Has public consultation taken place (such as with other government agencies, community groups or neighbours), or is it intended that consultation shall take place?

- Yes No **If yes**, please list those consulted and attach comments or summarise response on a separate sheet.

[Please refer to Section 1.5 in Attachment 2 for a summary of consultation activities conducted to date.](#)