

Mining Management Exploration Activities

Northern Territory of Australia – Mining Management Act 2001

It is recommended that the Mining Management Plan (MMP) is completed in conjunction with the user guide available on the [Northern Territory Government website](#).

Section 1 – Project Details

Project Name Provide new or existing project name	Jessica & Carrara
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Authorisation Number Insert existing authorisation number, where applicable	N/A
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Operator Name Use ASIC-ABR registered name (if a company), or name of the applicant	SOUTH32 GROUP OPERATIONS PTY LTD
Operator ABN and ACN numbers	ABN: 74 601 343 202 ACN: 601 343 202

Location and Access Details Include brief description of the location, access details, and distance to nearest town or community	<p>The Jessica & Carrara Projects are located in the Barkly Tablelands, approximately 240km ENE of Tennant Creek, 650km Southeast of Katherine and 570km Northeast of Alice Springs. The project areas extend across Brunette Downs, Mount Drummond and Alexandria pastoral stations.</p> <p>The projects can be accessed via the Barkly Highway from Camooweal in the east or Threeways Roadhouse from the west to the Barkly Homestead Roadhouse, then north via the Tablelands Highway.</p>
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Target Commodity Details Include target mineral commodities (i.e. gold, copper etc.)	South32 in partnership with Encounter Resources are targeting Sedimented Hosted and Iron Oxide Copper +/- Gold mineralisation and sediment hosted Lead & Zinc similar to Century and McArthur River.
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<p>Mining Activities Summarise the mining activities (exploration) to be the subject of the proposed Authorisation or Variation.</p> <p>Drilling programs over a maximum of four years are supported and encouraged and can be staged. Please refer to the guidelines for further information.</p>	<p>Exploration diamond drilling on exploration licences EL32386, EL32339, EL32493 and EL32476.</p> <p>1x diamond drillhole on EL32386 (587000E, 7979750N)</p> <p>1x diamond drillhole on EL32339 (648879E, 7921790N)</p> <p>2 x diamond drillholes on EL32493 (715502E, 7899480N & 705699E, 7902907N).</p> <p>3 x diamond drillholes on EL32476 (778600E, 7903188N & 755768E, 7900399N & 765322E, 7900276N)</p> <p>MGA Z53</p>
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<p>Proposed Schedule Include start and finish dates of ground disturbing work</p>	<p>Drilling activities are expected to commence on the 1st June 2023 and are expected to take approximately 6 months to complete with a planned completion date of 30th November 2023.</p>
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Mining Interest and Land Ownership

List the mining interests (titles), the title holder name/s, the title expiry date and the Property name/Land holder (e.g. pastoralist or Aboriginal land trust) for each title.

The Jessica and Carrara Projects currently comprise of 12 granted Exploration Licences; EL32386, EL32387, EL32388, EL32339, 32317, EL32273, EL32338, EL32493, EL32476, EL32701, EL32477 & EL32813. Exploration drilling subject to this MMP is planned on the four exploration licences listed below.

The tenements are 100% owned by Baudin Resources Pty Ltd and are operated by South32 Group Operations Pty Ltd under the Jessica and Carrara Farm in Agreements executed between the two companies in June 2022.

Title Number	Title Holder	Expiry Date	Underlying Property Name or Land Holder
EL32386	Baudin Resources Pty Ltd	29/07/27	Brunette Downs Station
EL32339	Baudin Resources Pty Ltd	1/06/27	Brunette Downs Station
EL32493	Baudin Resources Pty Ltd	30/08/27	Alexandria
EL32476	Baudin Resources Pty Ltd	19/09/27	Alexandria and Mount Drummond

Delete or add rows as required

Please note a Land Access Agreement (LAA) is required for disturbance proposed on Pastoral Properties on Exploration Licence (EL).

Organisational Structure

Position Title	Name
VP Exploration	Mirek Wozga
Exploration Manager – Eastern	Daniel Goddard
Lead Greenfields Exploration Geologist	Danny Huisman
Senior Geologist	Luke Pickering
Principal Operations & Compliance	Brett Kipping
Specialist Tenement Management	Narrelle Bevan

Delete or add rows for various position titles as required

Section 2 – Operator Self-Assessment of the Environmental Risk

The purpose of this self-assessment is to ensure Operators complete a project risk assessment of potential environmental impacts and are aware of other legislative obligations from various Agencies. As a result of this self-assessment, further information may be required in the form of a management plan to enable full assessment of the MMP. If you have any queries please contact a Mining Officer prior to submitting the MMP. Useful resources to assist with this self-assessment are provided in the User Guide.

Environmental considerations

ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION (e.g. evidence of consultation with DEPWS and/or management plan where required).
Step 1: Are there any threatened flora and fauna species or habitats of significance that may occur in the proposed work area?	Yes	<ul style="list-style-type: none"> - 18 listed threatened species have been identified from a search of the EPBC Act Protected Matters Report search of the project area - A Project Environmental Management Plan for managing and minimising the impact on the Grey Falcon and the Yellow Spotted Monitor has been completed. - All flora and fauna will be managed under the South32 Environment and Climate Change Standard. 	Project Environmental Management Plan for managing and minimising the impact on the Grey Falcon and the Yellow Spotted Monitor.

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ASSESSMENT ASPECT	YES or NO	ACTIONS REQUIRED (if answered YES)	APPENDED INFORMATION <small>(e.g. evidence of consultation with DEPWS and/or management plan where required).</small>
Step 2: Are there any known declared weeds within the proposed work area?	Yes	<ul style="list-style-type: none"> - Prickly Acacia is likely to be encountered throughout the project area with other possible species including; Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean, Blackthorn, Prickly Mimosa, Black, Piquant, Babul, Mesquite and Athel Pine. - A Project Environmental Management Plan for managing spread of Prickly acacia, Mesquite and Athel Pine has been completed - All South32 staff have completed AHC BIO203 Inspect and clean machinery, tools and equipment to preserve biosecurity training - Weed management detailed in the Jessica & Carrara Project site induction; includes washdown of all vehicles and equipment prior to arriving on site. - Vehicle wash-downs will occur in Mount Isa before departure to the project, or where best accessible. Weeds and Seeds vehicle wash-down logs will be retained in accordance with South32 policy.	Project Environmental Management Plan for managing spread of Prickly acacia, Mesquite and Athel Pine
Step 3: Will you be using water from bores or other sources for the operation?	Yes	<ul style="list-style-type: none"> - Water will be extracted from existing bores / turkey's nests approved by the landholders to enable diamond drilling activities to take place - Water usage will be monitored and recorded. 	

Environmental assessment and cultural considerations

ASSESSMENT ASPECT	YES or NO	MANAGEMENT REQUIREMENTS
Step 4: Is your project likely to have a significant impact on the environment?	No	<ul style="list-style-type: none"> - Exploration Program includes a detailed assessment of potential impacts and was prepared in accordance with the NT EPA Environmental Factors and Objectives Guideline - All earth works will be completed by a landholder with experience in drill site preparation and will be supervised by South32 employees - Overall, this drilling program is considered to have a very low impact on the environment based on the controls implemented by South32

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ASSESSMENT ASPECT	YES or NO	MANAGEMENT REQUIREMENTS
Step 5: Are there Aboriginal sacred sites in the Project area?	Yes	<ul style="list-style-type: none"> - A request for records was lodged with the Aboriginal Areas Protection Authority (AAPA). Although registered sacred sites exist within the project area none are located within close proximity to the planned drilling locations.
Step 6: Are there archaeological and heritage sites in the Project area?	Yes	<ul style="list-style-type: none"> - Although archaeological and heritage sites occur in the Project Area, the 2023 Jessica and Carrara drilling program has been designed to avoid these areas, and no impacts on archaeological and heritage sites are therefore predicted. - An Authority Certificate was lodged with the Aboriginal Areas Protection Authority (AAPA) on the 19th October 2022. Field heritage surveys are expected to commence during May prior to drill site and access earthworks.

Section 3 – Amendments

As per Section 41(3) of the *Mining Management Act*, an MMP reviewed and amended under Section 41(1)(a) is to have amendments made since the previous MMP submission clearly identified.

Section	Amendment

Delete or add rows as required

Section 4 – Activities Proposed for this MMP only

Provide relevant EL numbers

Mining Interests (i.e. titles)	EL32386	EL32339	EL32493	EL32476
Number and type of proposed exploration drill holes	1 x Rotary Mud & Diamond Drillhole	1 x Rotary Mud & Diamond Drillhole	2 x Rotary Mud & Diamond Drillholes	3 x Rotary Mud & Diamond Drillholes
Maximum depth of proposed holes (m)	700m	1000m	1300m	1000m
Number and size of drill pads to be cleared (Length: m x Width: m)	1 drill pad 50m x 50m in size	1 drill pad 50m x 50m in size	2 drill pads each being 50m x 50m in size	3 drill pads each being 50m x 50m in size
Total area of drill pads to be cleared (ha)	0.25Ha	0.25Ha	0.5Ha	0.75Ha
Number of proposed water bores	0	0	0	0
Is drilling likely to encounter groundwater in multiple or confined aquifers? (Y, N, unsure) If answering yes, please provide the number of exploration holes where this is likely to occur	Y	Y	Y	Y
Number of costeans	Nil	Nil	Nil	Nil
Volume to backfill costeans (Length: m x Width: m x Depth: m)	Nil	Nil	Nil	Nil
Number of bulk sample pits	Nil	Nil	Nil	Nil
Volume to backfill bulk sample pits (Length: m x Width: m x Depth: m)	Nil	Nil	Nil	Nil
Bulk sample pits approved under <i>Mineral Titles Act</i> ? (Y or N). If Yes provide approval				

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Mining Interests (i.e. titles)	EL32386	EL32339	EL32493	EL32476
Line/track clearing: (length m x width m)	315m x 3m	50m x 3m	100m x 3m	100m x 3m
Area of proposed line/track clearing (ha)	0.0945Ha	0.015 Ha	0.03 Ha	0.03 Ha
Camp area to be cleared (ha)	nil (amenable nearby pre existing camp locations determined via discussion with pastoralist)	nil (amenable nearby pre existing camp locations determined via discussion with pastoralist)	nil (amenable nearby pre existing camp locations determined via discussion with pastoralist)	nil (amenable nearby pre existing camp locations determined via discussion with pastoralist)
Camp Infrastructure (i.e. demountable, tents) Please provide a complete list with measurements as required in the security calculation	Caravans and swags	Caravans and swags	Caravans and swags	Caravans and swags
Other	N/A	N/A	N/A	N/A
Total proposed area of disturbance (ha)	0.3445Ha	0.265Ha	0.53Ha	0.78Ha

Staging approach based on disturbance can be proposed and will be considered by the Department.

Section 5 – Previous Disturbance (for existing Authorisations only)

The 'Disturbance Tracking' spreadsheet must be completed and attached to the MMP submission to complete this section. The spreadsheet is available on the departmental web page where this template is located.

Section 6 – Environmental Management

By checking these shaded boxes, you are agreeing to implement the following minimum environmental management standards on the project area. Where boxes have been left unchecked, justification is required.

6.1	N. Not always suitable. Blade up approach will be used when possible however, some drainages and rough ground etc will need to be bladed to provide a safe access track for the drill rig.	Blade-up approach for clearing will be used (i.e. no windrows, leave root stock and topsoil)
6.2	Y	Significant vegetation will be avoided during clearing (i.e. large trees, specimens providing habitat or food sources, riparian vegetation, and threatened species)
6.3	Y	Vegetation clearing during, and immediately after rainfall events, will be avoided
6.4	Y	Vegetation clearing will be kept to the minimum required to safely traverse vehicles and drill rigs along tracks and drill pads
6.5	Y	Where blade-up techniques cannot be employed, topsoil and vegetation will be stockpiled appropriately for rehabilitation purposes
6.6	Y	All employees and contractors will be trained and inducted in relation to the management of environmental risks in the work area, including weeds, waterways, threatened species, soil erosion, sacred sites and heritage areas
6.7	Y	Sumps will be lined or tanks of appropriate size to contain water, sediment and drilling fluids encountered during drilling, will be used
6.8	Y	Sumps, drill holes, and fuel stores will be located away from environmentally significant areas and water courses
6.9	Y	Excavations (sumps, costeans and pits) will be appropriately ramped to allow fauna egress
6.10	Y	Drill holes will be securely capped immediately after drilling
6.11	Y	Vehicle hygiene measures will be employed to prevent the introduction and spread of invasive species and pathogens when mobilising vehicles and equipment from one location to another

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6.12	Y	Hydrocarbon spills will be minimised using liners and drip trays under machinery, and appropriately sized spill-kits available in the event of a spill
6.13	Y	Hazardous substances (including hydrocarbons) will be stored and handled in accordance with relevant Australian Standards
6.14	Y	Hydrocarbons will be stored in lined and bunded areas
6.15	Y	Waste will be stored securely while on-site to minimise windblown rubbish and access by feral animals
6.16	Y	Waste will be removed off-site and disposed of at an appropriate waste management facility
6.17	Y	All environmental incidents will be reported to the Department in accordance with Section 29 of the <i>Mining Management Act</i> .
6.18	Y	Acid and Metalliferous Drainage (AMD) and Potentially Acid Forming (PAF) material derived from drilling cuts will be managed to avoid AMD and PAF related issues on site.
6.19	Y	Radioactive/NORM drill cuttings will be managed to avoid radiation related issues on site.
6.20	Y	Dust management will be implemented on site.

Justification and alternative management measures:

6.1 – Blade up approach not always suitable. Blade up approach will be used when possible, however, some drainages and rough ground etc will need to be bladed to provide a safe access track for the drill rig.

Access tracks – please note access track clearing lengths have been determined as distance from existing tracks / roads. Access tracks shown on map and shape file starts from existing gazetted roads / homesteads.

6.7 Sumps not lined because the plastic liner is considered to be a much greater environmental hazard than the groundwater in the sump. All drilling additives used now are biodegradable. Liners are used in arid areas to conserve water, not protect the groundwater system. They subsequently need to be dug out prior to backfill of sump. This is a challenging exercise. In the tropics or where drilling water is plentiful or where there are natural barriers to sump seepage (e.g. clays), liners are not used.

Section 7 – Rehabilitation and Closure

By checking these shaded boxes, you are agreeing to implement the following minimum rehabilitation standards on the project area. Where boxes have been left unchecked, justification is required.

A refund of security related to completed rehabilitation on site requires the submission of a rehabilitation report including photographs, an updated security calculation and updated disturbance tracking spreadsheet to the Department.

7.1	Y	Drill holes will be plugged below ground level at a minimum depth of 0.4 metres and soil mounded to prevent subsidence, within 6 months of completion of drilling.
7.2	Y	Drill holes encountering multiple or confined aquifers will be grouted with concrete.
7.3	Y	Drill samples/spoil will be returned down drill holes, buried in sumps, or removed from site.
7.4	Y	All drill hole and access markers including flagging tape, wooden markers and star pickets will be removed from site.
7.5	Y	Cut and fill drill pads will be re-contoured to be consistent with the surrounding terrain.
7.6	N/A	Drill pads and compacted areas along the contour (on sloping ground) will be ripped/scarified of and tracks will be cross-ripped (zig-zag).
7.7	Y	Tracks will be rehabilitated, including pushing in all windrows, unless otherwise agreed in writing by the land holder or appropriate third party.
7.8	Y	Appropriate erosion and sediment controls will be installed where erosion is evident or likely to occur.
7.10	N/A	Access through watercourses will be removed and banks restored.
7.11	Y	All previously disturbed areas will be stable, with no evidence of active soil erosion.
7.12	Y	All excavations will be backfilled within 6 months of their completion.
7.13	Y	All water bores will be decommissioned unless otherwise agreed in writing by the land holder or appropriate third party.
7.14	Y	All rubbish and infrastructure will be removed from site.
7.15	Y	Topsoil will be replaced and vegetation re-established.
7.16	Y	Contaminated soils (e.g. hydrocarbon or hazardous chemicals) will be rehabilitated or removed from site.
7.17	Y	Monitoring will be undertaken following the wet season or a significant rainfall event.

Justification and alternative management measures:

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7.6 - Not applicable as access and drill pads are located on flat ground / terrain.

7.10 – Not applicable as all access that crosses water courses will be via existing station tracks.

South32 operates to environmental best practices. All remediation (rehabilitation) works will be completed by a competent operator within 6 months from completion of drilling. South32 are happy to provide examples of rehabilitated drill sites in similar environments.

Section 8 – Required Attachments

8.1	Y	Initial Application for Authorisation or variation of Authorisation (only if details on the form have subsequently changed).
8.2	Y	Nomination of Operator Form, where required
8.3	Y	Security Calculation Spreadsheet
8.4	Y	Evidence of Land Access Agreement if operating on an Exploration Licence (EL) on Pastoral Lease (e.g. two-ways exchange of email)
8.5	N/A	Disturbance tracking spreadsheet (for existing Authorisations)
8.6	Y	Spreadsheet with coordinates of proposed drill holes or polygons of target areas
8.7	Y	KML/shape files/track logs of proposed tracks, camp sites and proposed drill holes or polygons of target areas
8.8	Y	Map(s) of the work area(s) showing: <ol style="list-style-type: none"> 1. title boundaries and title numbers 2. current and proposed drill holes, or polygons of target areas 3. current and proposed tracks 4. rehabilitated areas 5. camp sites 6. heritage sites or significant environmental areas 7. environmental constraints
8.10	NA	Radiation Management Plan (if applicable)
8.12	Y	Document(s) being appended in relation to Section 2 (if any): - -