



OUT19/12069

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Dear Mr O'Donoghue

**Vickery Mine Extension (SSD-7480)
Response to Submissions**

I refer to your email of 3 September 2019 to the Department of Planning, Industry and Environment (DPIE) – Lands, Water and Department of Primary Industries (DPI) about the above matter.

Please see attached advice from DPIE –Water and the NSW Natural Resources Access Regulator (NRAR) regarding the Vickery Extension Project Submissions Report. DPIE – Crown Lands and DPIE – Primary Industries will respond separately to this matter.

A number of concerns in relation to the Vickery Mine Extension still remain including:

1. That the proponent needs to confirm that it has enough entitlement for the project including arranging for an impact assessment of the proposed bore field in Upper Namoi Zone 4, and
2. The risk of impact of the stockpile on the alluvium has not been adequately addressed and requires further assessment.

Please note the detailed advice provided in Attachment A.

Any further referrals to DPIE – Lands, Water and DPI can be sent by email to:
landuse.enquiries@dpi.nsw.gov.au.

Yours sincerely

A handwritten signature in blue ink that reads 'Jim Bentley'.

Jim Bentley
CEO Water (Deputy Secretary)
21 November 2019

Attachment A

Detailed advice to DPIE Planning & Assessment regarding the Vickery Mine Extension (SSD-7480) Response to Submissions

1.0 Licensing

It is important that the proponent clearly confirms that it has enough entitlement for the project. The proponent needs to:

- clearly explain which Water Access Licences (WALs) and in what proportion that will be used for this project,
- arrange assessment of the proposed bore field to ensure enough water is available, and
- ensure the proposed sediment dams do not require a licence or entitlement.

1.1 Explanation

The Response to Submissions (RTS) has reiterated that sufficient water access licences are held to account for groundwater and surface water take. However where WALs are currently being used for other projects the RTS remains unclear on the ability to use these for the current project. The proponent has still not clearly identified: all WALs held in each water source, the project(s) each WAL applies to, and where a WAL is being counted against multiple projects how much of the total is allocated to each project.

The proposed bore field in Upper Namoi Zone 4 will require assessment against the DPIE Water impact assessment criteria for groundwater dealings as described in the [Water resource plans Fact Sheet](#). This assessment is to ensure the proposed extraction is consistent with the rules of the relevant Water Sharing Plan. DPIE Water notes that the proponent has not adequately addressed this issue and has disregarded our earlier advice in response to the EIS (OUT18/14196). This should be addressed as a priority given there is no guarantee the bore field will be approved at the volume requested. This is a significant commercial risk for the project in terms of water availability.

The RTS notes that sediment dams will be sized in excess of standard practice. For sediment dams to be excluded from consideration for licensing requirements they need to be designed in accordance with best management practice. This is specified in Schedule 1(3) of the Water Management Regulation 2018. We recommend that the sediment dams be sized in accordance with best management practice (ie. Landcom (2004)) or the relevant licensing requirements need to be quantified and the ability to acquire the necessary entitlement needs to be demonstrated.

On the basis the proposed dewatering bores are in an approved SSD project they will not need a subsequent approval under the *Water Management Act 2000*. If it is not clear where the bores are to be located in the SSD (as applicable) they will need to be identified in the Water Management Plan (WMP) and assessed for impact to achieve this exclusion.

1.2 Recommendation – Prior to Determination

- The proponent is required to ensure it has adequate water supply prior to production.
- The proponent should confirm that the identified water entitlements are available for the project and will not be required to account for continuing take where nominated. We recommend that Table 6-1 (Appendix 6 of the EIS) is updated showing all WALs held in each water source, clearly detailing which project(s) each WAL applies to, and where a WAL is being counted against multiple projects how much of the total is allocated to each project. This is required to satisfy the Secretary's Assessment Requirement to demonstrate access to

sufficient water for all projects running concurrently. The Aquifer Interference Policy requires the proponent to hold sufficient water entitlement prior to approval.

- An impact assessment of the borefield is required against the DPIE Water groundwater dealing/new bore impact assessment criteria in consultation with DPIE Water.
- The proponent should review the size of their proposed sediment dams to ensure they satisfy an exclusion from holding water entitlement in the Harvestable Right Zone noting the exclusion in Schedule 1(3) of the Water Management Regulation 2018 requires dams to be designed consistent with best management practice.

1.3 Recommendation – Post Determination

- Relevant approvals and licences under the *Water Management Act 2000* must be obtained before commencing any works which intercept or extract groundwater or surface water, including incidental or induced take from adjacent groundwater sources.

2.0 Impacts to groundwater

The risk of impact of the stockpile on the alluvium has not been adequately addressed and requires further assessment.

2.1 Explanation

DPIE Water is concerned that the stockpile is a risk to aquifer compaction and groundwater contamination through generation of leachate. The proponent has stated the salinity of the alluvium in proximity to the mine is poor and therefore the stockpile is low risk to the alluvium. However compaction does not appear to have been addressed at all. It is not clear if the stockpile will include mitigation measures to protect the underlying or adjacent alluvium from leachate contamination.

The RTS indicates any dewatering bores would be located within the footprint of the open cut pit and they would have negligible drawdown impact in comparison to the impact of the pit. This is satisfactory on the basis any drawdown impacts from dewatering bores would be monitored and managed in accordance with the limits predicted for the open cut pit.

2.2 Recommendation – Prior to Determination

- With respect to the stockpile:
 - The proponent is required to map the proposed stockpile locations in relation to the alluvial boundaries. Figure 3 in the RTS must be updated with this information.
 - The proponent is required to address compaction of the alluvium in relation to extent and loss of storage.
 - The proponent is required to address water quality risks including baseline, lateral extends, duration, risk to receptors to the alluvium as a result of the emplacements that overlie or are adjacent to the alluvium.
 - The proponent is required to clarify any measure in place to mitigate the risk of the stockpile to the alluvium.

Further recommendations may be required depending on review of this information.

3.0 Surface water impacts

We require more information about potentially acid-forming waste rock. Other impacts to surface water can be adequately addressed through the WMP.

3.1 Explanation

As a diversion is no longer proposed for South Creek and a 40m vegetated buffer is to be applied between infrastructure and South Creek and Stratford Creek, our earlier issues have been addressed.

The RTS has confirmed the predicted impacts on flooding meet the requirements of the Carroll to Boggabri Floodplain Management Plan. This is considered adequate. DPI Water notes that an increase in erosion potential on the Namoi River is predicted. The proposal to implement erosion control measures to address this issue is supported.

The proponent has not adequately addressed the matter related to acid-forming waste rock. Other than a general discussion referencing “low acid generating capacity” and increased sulphur concentrations in Appendix M of the EIS, the analysis remains unsatisfactory.

A discussion of potential issues requires a quantitative basis and description of the detailed exposure pathways to enable the risk to be determined.

3.2 Recommendation – Pre Determination

- The proponent is required to identify the presence and volume of potentially acid-forming waste rock, fine-grained amorphous sulphide minerals and coal reject/tailings material and exposure pathways:
 - Present an acid-base mass balance, based on scheduled volumetric rock mixing, and kinetically effective acid-forming potential and acid neutralising capacity of rock materials.
 - Identify potential exposure pathways for acidity and trace metals.
 - Discuss conflicting analytical results with consideration of the effect of measurement error on interpretations

3.3 Recommendation – Post Determination

Note Section 4.0.

4.0 Management Plans

The development of the WMP with the incident response plan and monitoring will be key in addressing the majority of our concerns with the project. The proponent has mentioned the intention to develop the plan however little detail was provided regarding the recommendations on the WMP.

4.1 Explanation

The WMP is required to address risk of erosion, management of and risks to water supply and quality.

4.2 Recommendation – Post Determination

- As a condition of consent, develop a WMP in consultation with DPIE Water to include:
 - An incident response plan with triggers consistent with the National Water Quality Management Strategy (NWQMS) guidelines (ANZECC/ARMCANZ latest issue) and triggers linked to predicted (from modelling) water level impacts in all geological formations.
 - Identify hydrochemistry recharge/discharge processes and impact management required to manage impacts on water quality in the alluvial aquifers.
 - Ensure diversion channels and dams for other creeks are designed to convey the maximum discharge in a stable manner, and any downstream impacts are identified and mitigated



- A modelling plan section that confirms the adequacy of modelling predictions to confirm the ongoing licensing requirements and clarifies future model verification and schedule of model updates etc.
- The requirements / criteria as listed in Section 11.1 (Appendix B of the EIS). Adequate adaptive management measures and management responses.
- A monitoring plan that includes adequate surface and groundwater sampling (e.g., including routine and event based). This should include detailing the locations of any dewatering bores and the metering and management of any water extracted prior to their construction and use.
- A plan to address acid-forming waste rock if it is present.
- A monitoring plan to address overflows from sediment dams to ensure they will be properly monitored and if concentrations are in excess of Guidelines and appropriate action (including reporting) is taken.
- An erosion sediment control plan required prior to the start of construction
- An ongoing reporting schedule and WMP update schedule. Yearly reporting must include requirement to provide all data to the Department in electronic format such as excel.
- The proponent is required to consult with DPIE Water in the development of the rehabilitation planning and final landscape designs component of the Mine Operations Plan.

Assessing groundwater applications

The potential impact of groundwater extraction is managed through the assessment of all applications for groundwater dealings (trade) and water supply work approvals (bores). Either WaterNSW or the Natural Resource Access Regulator receives applications and then refers them, as required, to the NSW Department of Industry—Lands & Water for hydrogeological assessment. This fact sheet outlines the assessment process and the criteria applied.

Procedure for assessing a groundwater application

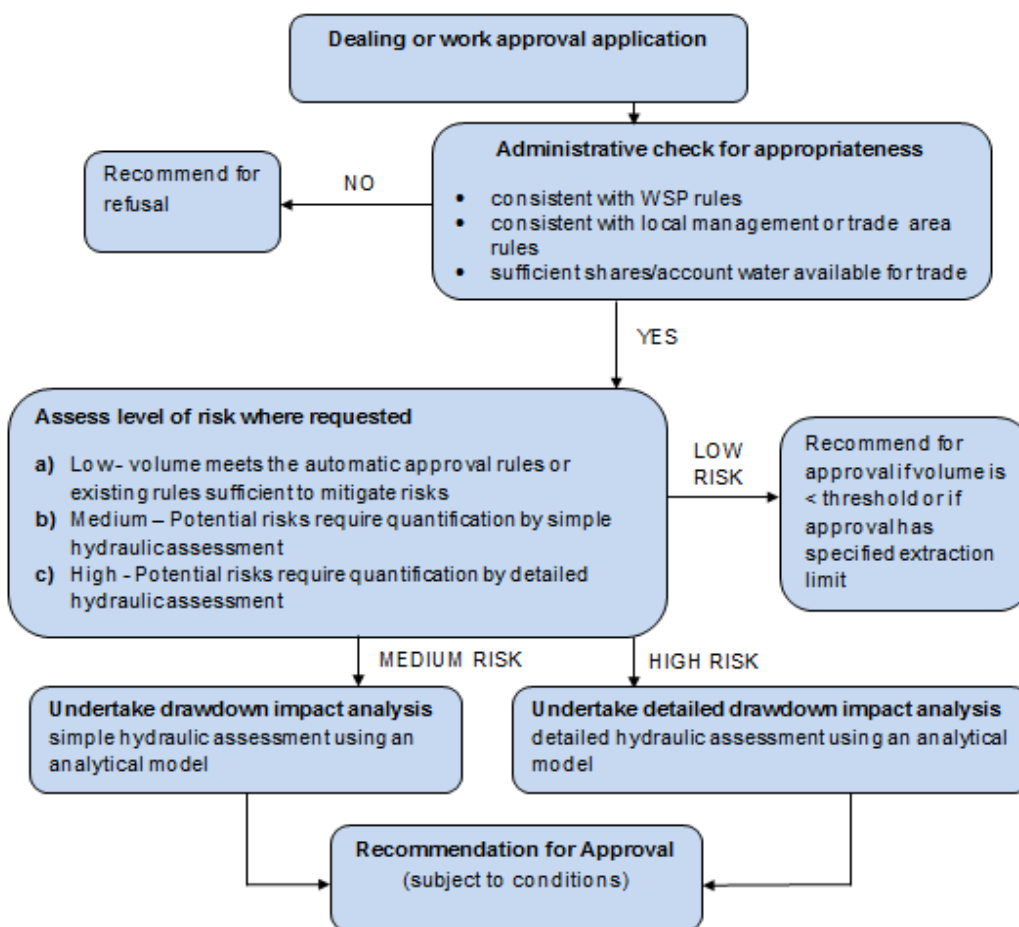


Figure 1. Procedure for assessing an application

Specific hydrogeological assessment

Once an application for a dealing or a water supply work approval has been checked and accepted, it is then prioritised for assessment. Prioritisation is based on the level of risk to the groundwater source and its dependent ecosystems. The risk categories are:

- low risk—no further impact assessment is carried out and the application is approved
- medium risk—a simple hydraulic assessment required (analytical model)
- high risk—a detailed hydraulic assessment required (analytical model).

The hydraulic assessment involves the analysis of expected drawdown impacts compared to the acceptable levels of impact specified for each groundwater source.

Applications that require hydrogeological assessment

Table 1. Types of applications requiring assessment

Water Management Act 2000 provision	Application type	Description
92	Water supply works approval	Approval to construct a new or additional groundwater work
71P	Subdivision and consolidation of access licences	Division of a licence into two or more licences (usually so a portion can be sold); combining of licences
71Q	Assignment of rights under access licence dealing	Reduction of the share component on a licence and the increase by the same amount on another (previously referred to as a permanent trade)
71R	Amendment of share component of access licence	Cancel an access licence and grant a new licence in another water source or management area
71S	Amendment of extraction component of access licence	Change the times or rates at which water can be extracted (not generally applicable to groundwater)
71T	Assignment of water allocations	Reduction of allocation in a licence account and increase by the same amount in another (previously known as a temporary transfer)
71U	Interstate transfer of access licences	Same as 71Q dealing except it is between two interstate access licences
71V	Interstate assignment of water allocations	Same as 71T dealing except it is between two interstate access licences
71W	Nomination of water supply works to access licence	Nomination of a works removed from or added to an access licence, irrespective of ownership and location.

Hydrogeological assessment criteria

Groundwater is managed to allow for some level of drawdown within the groundwater source. Determining the magnitude of this impact in order to set assessment criteria has been largely based on water resource management experience. Considerations when deciding the level of impact on the groundwater source and its dependent ecosystems include impacts on:

- connected surface water sources
- culturally significant sites
- neighbouring water supply bores
- groundwater quality.

Cumulative drawdown from existing authorised works and entitlements and the likely compaction of sediments within the groundwater source are also considered.

The assessment criteria applied for groundwater source and aquifer type are provided in Table 2.

For dealings, the same assessment criteria are applied to both assignment of allocation (temporary trade) and assignment of share component (permanent trade) however the impact period considered is different, being one year and ten years respectively.

Table 2. Groundwater criteria for acceptable level of impacts

Groundwater source	Impact on water table (unconfined aquifers)	Impact on groundwater pressure (confined/semi-confined aquifers)
<p>1. Alluvial groundwater sources</p> <p>These criteria apply to all alluvial groundwater sources except those listed at items 1.1 to 1.2</p>	<ol style="list-style-type: none"> 1. Less than 0.1 metre cumulative drawdown in the water table, 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater-dependent ecosystem, or b. high-priority, culturally significant site. 2. An additional drawdown of not more than 10% of the pre-development Total Available Drawdown (TAD) above the base of the water source to a maximum of 2 metres at any: <ol style="list-style-type: none"> a. 3rd or higher order surface water source measured at 40 metres from the high bank, or b. water supply works (excluding those on the same property) subject to negotiation with impacted parties. 3. A cumulative drawdown of not more than 10% of the pre-development TAD of the water source to a maximum of 2 metres at a distance of 200 metres from any water supply works (including the pumping bores) subject to negotiation with impacted parties. 	<ol style="list-style-type: none"> 1. A cumulative drawdown of not more than 40% of the pre-development TAD above the base of the water source at a distance of 200 metres from any water supply works including the pumping bores. 2. An additional drawdown of not more than 10% of the pre-development TAD above the base of the water source to a maximum of 3 metres at any water supply works (excluding those on the same property), subject to negotiation with impacted parties.
<p>1.1 Lower Murrumbidgee, deep groundwater source and Lower Murray groundwater source</p>	<p>Not applicable</p>	<ol style="list-style-type: none"> 1. A cumulative drawdown of not more than 70% of the pre-development TAD above the top of the productive aquifer at a distance of 200 metres from any water supply works including the pumping bores. 2. An additional drawdown of not more than 10% of the pre-development TAD above the top of the productive aquifer to a maximum of 3 metres at any water supply works (excluding those on the same property), subject to negotiation with impacted parties.

Groundwater source	Impact on water table (unconfined aquifers)	Impact on groundwater pressure (confined/semi-confined aquifers)
<p>1.2 Lower Gwydir and Lower Namoi groundwater sources</p>	<ol style="list-style-type: none"> 1. Less than 0.1 metre cumulative drawdown in the water table, 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater dependent ecosystem, or b. high-priority, culturally significant site. 2. An additional drawdown of not more than 10% of the pre-development TAD above the base of the water source to a maximum of 2 metres at any: <ol style="list-style-type: none"> a. 3rd or higher order surface water source measured at 40 metres from the high bank, or b. water supply works (excluding those on the same property) subject to negotiation with impacted parties. 3. A cumulative drawdown of not more than 10% of the pre-development TAD of the water source to a maximum of 2 metres at a distance of 200 metres from any water supply works (including the pumping bores) subject to negotiation with impacted parties. 	<ol style="list-style-type: none"> 1. A cumulative drawdown of not more than 40% of the pre-development TAD above the base of the water source at a distance of 200 metres from any water supply works including the pumping bores. 2. An additional drawdown of not more than 10% of the pre-development TAD above the base of the water source to a maximum of 2 metres at any water supply works (excluding those on the same property), subject to negotiation with impacted parties.

Groundwater source	Impact on water table (unconfined aquifers)	Impact on groundwater pressure (confined/semi-confined aquifers)
<p>2. Coastal sands groundwater sources</p>	<ol style="list-style-type: none"> 1. Less than 0.1 metre cumulative drawdown in the water table 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater-dependent ecosystem, or b. high-priority, culturally significant site. 2. An additional drawdown of not more than 10% of the pre-development TAD above the base of the water source to a maximum of 2 metres at any: <ol style="list-style-type: none"> a. 3rd or higher order surface water source measured at 40 metres from the high bank, or b. water supply works (excluding those on the same property) subject to negotiation with impacted parties. 3. Maintain a positive water table head of greater than or equal to 0.5 metres above mean sea level at 40 metres landward side from any: <ol style="list-style-type: none"> a. seawater body/saline water body b. tidal river or creek c. tidal wetland d. tidal estuary, or e. tidal drains. 4. A cumulative drawdown of no more than 10% of the pre-development TAD of the water source to a maximum of 2 metres at a distance of 200 metres from any water supply works including the pumping bores subject to negotiation with impacted parties 	<ol style="list-style-type: none"> 1. A pressure level decline of not more than 40% of the pre-development pressure level above the base of the water source at a distance of 200 metres from any water supply works including the pumping bores. 2. An additional drawdown of not more than 2 metres of at any water supply works (excluding those on the same property), subject to negotiation with impacted parties.

Groundwater source	Impact on water table (unconfined aquifers)	Impact on groundwater pressure (confined/semi-confined aquifers)
<p>3. Porous and fractured rock groundwater sources</p> <p>These criteria apply to all porous rock sources except those listed at items 3.1 to 3.2</p>	<ol style="list-style-type: none"> 1. Less than 0.1 metre cumulative drawdown in the water table 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater-dependent ecosystem, or b. high-priority, culturally significant site. 2. An additional drawdown of not more than 10% of the pre-development TAD to a maximum of 2 metres at any: <ol style="list-style-type: none"> a. 3rd or higher order surface water source measured at 40 metres from the high bank. b. water supply works (excluding those on the same property), subject to negotiation with impacted parties. 3. A cumulative drawdown of no more than 10% of the pre-development TAD of the unconfined aquifer at a distance of 200 metres from any water supply works including the pumping bores. 	<ol style="list-style-type: none"> 1. A cumulative drawdown of not more than 40% of the pre-development TAD at a distance of 200 metres from any water supply works including the pumping bores. 2. An additional drawdown of not more than 3 metres at any water supply works (excluding those on the same property) subject to negotiation with impacted parties.
<p>3.1. Great Artesian Basin (GAB)</p> <p>Eastern recharge groundwater source, and southern recharge groundwater source</p>	<ol style="list-style-type: none"> 1. Less than 0.1 metre cumulative drawdown in the water table relative to natural variation 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater-dependent ecosystem, or b. high-priority, culturally significant site. 2. An additional drawdown of not more than 10% of the pre-development TAD to a maximum of 2 m at any: <ol style="list-style-type: none"> a. 3rd or higher order surface water source measured at 40 metres from the high bank. b. water supply works (excluding those on the same property), subject to negotiation with impacted parties. 3. A cumulative drawdown of no more than 10% of the pre-development TAD of the unconfined aquifer at a distance of 200 metres from any water supply works including the pumping bores. 	<ol style="list-style-type: none"> 1. Less than 0.2 metre drawdown in the groundwater pressure relative to natural variation 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater dependent ecosystem, or b. high-priority, culturally significant site. 2. Pressure level decline should not: <ol style="list-style-type: none"> a. cause any flowing bore to cease to flow b. be no more than 1 metre at any flowing water supply work, or c. be no more than 2 metres at any non-flowing water supply work. 3. A pressure level decline of not more than 15 metres at a distance of 200 metres from any water supply works including the pumping bores. 4. The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW state border.

Groundwater source	Impact on water table (unconfined aquifers)	Impact on groundwater pressure (confined/semi-confined aquifers)
<p>3.2. Great Artesian Basin</p> <p>Surat, Warrego, and central groundwater sources</p>	<p>Not applicable</p>	<ol style="list-style-type: none"> 1. Less than 0.2 metres drawdown in the groundwater pressure relative to natural variation 40 metres from any: <ol style="list-style-type: none"> a. high-priority, groundwater-dependent ecosystem, or b. high-priority, culturally significant site. 2. Pressure level decline should: <ol style="list-style-type: none"> a. not cause any flowing bore to cease to flow b. be no more than 1 metre at any flowing water supply work, or c. be no more than 2 metres at any non-flowing water supply work. 3. A pressure level decline of not more than 30 metres at a distance of 200 m from any water supply works including the pumping bores. 4. The cumulative pressure level decline of no more than 10% of the 2008 pressure level above ground surface at the NSW state border.

More information

More information is provided in the following fact sheets at industry.nsw.gov.au/water-resource-plan-consultation:

- *Groundwater available water determinations*
- *Groundwater-dependent ecosystems*
- *Water resource plans in NSW*

Have your say

Community input is an important part of the development of each water resource plan. As part of the consultation process, stakeholders and the broader community will be able to make written submissions on the draft water resource plans. All submissions received will be used to inform each final plan.

Draft water resource plans will be placed on public exhibition and information sessions held at several locations throughout the plan area.

Draft plans will be available on the department's website, along with a range of supporting information, details of public exhibition points and stakeholder feedback.

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