

Published on DES Disclosure Log
RTI Act 2009

DES/OCG Kidston chat ~11:35am 15/01/19

Carlin Boyd, Renee Farkas, Melissa Williams,
Luke Croton, Steven Tarte, Rosemary Sherman.

MW: What is a mining activity discussion. Expand
Wises pit, Started consideration of project
+ mining tenure and DA approved by
Council. Luke - last advice was that it is
not a mining activity.

LC: In relation to the whole project.

ST: Main thing is that part of construction of Wises is to have the right capacity. Because the project is not a mining activity - we think it shouldn't trigger the MR Act and therefore, EP Act.

RF: Can we please wait for IFM.

ST: OK will park it. Have a revised IAR. Focusing on it internally.

MW: Links worked for you Caitlin?

CB: Yes and forwarded.

MW: I did not put a particular timeframe focusing on things that have changed

CB: May need to focus on somethings haven't changed that were strongly recommended

ST: Such as

CB: Total P and algal blooms.

ST: IOBP turn-around and conditions

11:40am

IFM and Dean Shape enter

ST: Started talking about mining activity

IFM: Moving WRD?

MW: Having discussions w Luke RG the project and mining activity. DA is the mechanism as a whole.

ST: Luke would you like to clarify

CC: We met with Genex and advised they needed a DA. MR Act provides an in use approval(?).

IFM: I don't disagree, but the proposal know, they don't want to use WR they want to rip up the cap and dump waste materials. I cannot see how that doesn't touch on FA. To me yes they don't need an approval, do need to have the liability covered to the State. Right mechanism is a new FA.

ST: ~~We look at~~ Don't disagree that there is an increase to state liability.

IFM: How would you do it, if not with FA.
 ST: Can use Conditions.
 IFM: You want to use FA and rehab in conditions.

ST: That is an option. I understand the DCS believe the activities should be regulated. Original discussion was to include an ERA.

IFM: ~~Ent~~ Options were not impose harm, this will, Option then is this process or include an ERA. There is some high level discussion around power generation. Proba Didn't get expedited. In terms of ripping up cap that then requires to be rehabbed to a standard. There are ongoing liability issues and GW issues in terms of the mining activity.

ST: Proponent has made their choice.

IFM: 500ML water?

DS: Will still result in exceedences.

IFM: Still exceeding at Ginasleigh?

yes.

MW: Will be looking at that as part of IAR.

ST: I wouldn't mind looking back at the ERA option, future regulate.

DS: Local authorities have gone in and use WR for roads they have required a DA. Always has been engagement b/n EA + DA holder. Similar to this with WR - Financial requirement.

ST: Other implications, I is excavation is a mining activity then PAct may not apply.

IFM: Wises claim is not the conversation.

ST: Where it is ending up.

IFM: The poOps will come in. Solution is

easy - give us FA or move it somewhere else.

DS: to give context WR at this site is nasty. WP is very poor. Opening WRD now is not a great idea. Rehab may not be as simple as they think.

IFM: Excavating is not an issue its the location the waste ends.

ST: Not an EA amendment?

IFM: Not that hard, but we are fighting internally over something simple will be a large (FA) amount as its a high risk structure.

ST: Can just impose conditions.

IFM: Thats saying that the WRD is now covered under the DA. Was that covered in the DA application I don't think it was. Disposal of high-risk

ST: rock.

ST: It was not.

IFM: Process is simpler via PoOps + FA.

I still don't understand the reluctance.
ST: Proponent concerns around simplicity of approval process.

DS: Biggest ticket issue is the O.S.G.L of poor quality water that will still exceed.

ST: Not expecting to authorise that, authorise something your comfortable with

DS: We will but proponent will have a hard time meeting them.

ST: For operations I thought the issue was Nitrogen

IFM: Nitrogen and Nitrate, pre-liminary review. Came to conclusion it didn't cover all the issues. Back to mining activity. Simplest option if moving

WRD is what they want to do is PoOps + FA.

ST: One question - breaking of the cap, is that captured under the EA.

IFM: EA only authorises disturbance area, regulates where it's going to

ST: Not from.

IFM: Wises is within the footprint, the Earthworks is not part of the mining activity. Bearing in mind that WRD is a large liability

ST: When you say existing WRD

IFM: North west.

ST: Currently seeping and re-directed

IFM: Yes, Kidston Gold mine has not been surrendered as it is not ready for surrender its active management, residual risk is too high for the state to take on.

DS: Other thing - what we decide here if it varies from what we do now it sets precedent.

~~ST: ERA would~~

IFM: Issue is two 'separate' entities, one in the same but if someone else operates. If GENEX take on the mine then yes one EA but the ERA won't be as simple as you think. May not be captured by the ERA unless they're the same entity.

ST: Around this issue CG is interested in engaging w the department. Will update him on your thoughts

IFM: For benefit, I don't think Luke or I's thoughts are contradictory. Do you agree in principle. Message we're getting is CG is not agreeing, political issue. If you still disagree we would like

to understand that.

ST: I can't speak for CG, I give my recommendation

IFM: But do you concur

ST: Starting to think yes - simplest option for regulation. Happy to brief. CG may go the opposite way. I'll brief on where proponent needs a PoOps amend and FA amend and outline what's required.

IFM: Alternative may not be... protects the state liability.

ST: I will let you know of any concerns

DS: Will you brief RE O.SGL.

ST: He knows but can brief again, not doubt there're issues around discharge. Happy to convey your concerns.

IFM: Generally, we don't condition if they can't comply

ST: We need to see what the IAR says first.

IFM: I have been getting some queries. Issue around water quality and how we work through is critical.

ST: Really about issues in IAR now, Caitlin you mentioned they haven't covered some.

IFM: Review and talk through issues or is 10 BD you want conditions.

ST: If they are key issues deal with sooner rather than later. Issues stepping conditions. Ideally conditions and review by 10 BD.

IFM: Late this week or early next week

DS: Late this week beneficial.

IFM leaves + LC leave. 12:20pm.

ST: later this week let us know availability time, Friday.

DS: Need to get to Sciences et al to make sure they have it, Caitlin is
 sch4p4(6) Personal Information we will manage

ST: OCG was telecon at 10am Friday,
 can push back.

DS: Friday morning please, before 11.

ST: let me know your availabilities.

DS: Pencil in 9:30-10:30 Friday morning.

RF: Clarify 10 BD.

DS: May have to be tailored RE IAR content. If content is there we will draft conditions that we can.

ST: Thank you, anything else Mel?

MW: Caitlin?

CB: No.

DS: Hoping sciences and Craig are around, will confirm if problematic.

ST: Thank you.

12:25pm

sch4p4(6) Personal Information

Kidston DES (MBC) + OCG Chat

18/01/19.
~9.30am.

Caitlin Booy, Dean Sharpe, IFM, Brian Benham, Mel Harris, Tanya Lavett, Rose Shearman, Steven Tarte, Emma Malone and Nicki Werynski.

MH: Some things addressed but not well

DS: Assertions that are scientifically flawed.

IFM: Problematic in WPO, the argument is N is not the limiting factor its total P, which is exceeding WPO.

DS: NSW - algal blooms lead to significant outcome.

MH: algal blooms = a million dead fish.

IFM: happy to work within mixing zone. but not Ginsaleigh gorge (~50km downstream). load is not acceptable. Its the cheapest but the load and [] are not accept

If we kill the refugia we kill everything. A large outstanding issue. There is an opportunity, an off-stream storage, which I think will be cheaper and provide long term benefits. I don't know why they want to do Poops + FA, they haven't thought of risk.

DS: Caitlin has done work. Storage option on site for ~1.5GL

IFM: Mind you we're not engineers.

ST: We can highlight, if that's not what they want.

IFM: But then we have to set conditions that we know they can't meet. Not sure how we would enforce them.

DS: CG would follow-up on breaches.

ST: Conditions from you but compliance around imposed conditions would be on us.

IFM: Who would collect evidence

MR: None, I've raised it.

ST: We would hope you would do the work but we would take actions needed.

IFM: Conditions we know they can't meet.

DS: What about amendments

ST: Similar to an EA amend. they lodge, PN dec, "you assess and CG makes a decision".

IFM: Enforcement, would CG would ask DES or expected?

ST: It would be asked

IFM: For which way it falls in this case I don't know. Comes back to if the continue

on what they propose we know they can't meet. Should (they) acknowledge there are other optimisation options.

ST: Lets just jump back to issues. Total N and Total. Anything else?

DS: Zn

ST: IFM: No matter how much we tweak, theres always contaminants. Talked to Reeven in the past, prevent, minimise then treat and release. Drought, they couldve gotten rid of a lot of water

ST: Around that, reduction of inventory now. Around nutrients and Zinc, which phase talking about.

IFM: Still issues at both stages, during operation if they need it that high than they need a balancing reservoir. Size may be diff bth operation + construct. Need to put their minds to it. They need a balancing res. Will have a balancing storage and an operation release.

ST: Balancing dam concept. Able to store extra water and use when needed.

IFM: That would be ideal.

DS: Mitigate discharge.

IFM: Minimise discharge and give conditions that they can meet.

IFM: Thats the cracker.

CB: Still unclear how much they need to discharge.

ST: Will talk to the proponents today.

IFM: Need to come back, legislation is PoOps + FA for the site

IFM: If they go through the new calculator that could be a problem

ST: That's on the website.

IFM: Be aware is FA will go to ERC, depending how quick they come in. This time late this quarter start ERC.

ST: Want to beat MERF Act?

IFM: Was set for 1st Quarter but not sure, working on 1 March. In Feb need it in an assumed.

Prelodgement would have to be early next week.

ST: I will give you a call after the meeting with the client.

~~contaminants~~

DS: To confirm in terms of conversation re mining activity everyone is on same page

MM: Yes.

ST: We will highlight concerns need some advice. We're trying to move towards a different option

IFM: This is final IAR no more info?

ST: Always flexible, up to CG making a decision. Will have a conversation with CG to see what he wants to do.

IFM: How would you like us to frame advice? This is x, y, z?

ST: I think yes, highlight concerns.

IFM: Highlight options. When by?

ST: Let me understand where CG wants to head.

IFM: We will aim early next week for written comments.

MH: Thankyou

IFm: If you need call on my mobile.
End at 10:05am

sch4p4(6) Personal Information

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Date : 23/01/2019 4:00:09 PM

From : "BOOY Caitlin"

To : "Melanie Harris"

Cc : "FARKAS Renee" , "SHARPE Dean" , "FOMIATTI MINNESMA Ingrid"

Subject : Preliminary review of IAR

Attachment : image001.png;image003.png;

Good afternoon Mel,

Following a preliminary review of the document, DES has identified the following:

- It is unclear whether a release during construction is required as the additional water storage volume from the waste rock dump relocation is stated as 2.5 GL which is greater than the predicted volume required to be discharged during construction (1.5 GL).
- The concentration of total nitrogen will exceed the WQO and the baseline water quality at Einasleigh, approximately 48km downstream. The impact assessment states that it is unlikely that the increased nitrogen concentration would lead to algal bloom/s, due to the limited availability of phosphorus. However, the concentration of total phosphorus in the pits is also greater than the WQO. There is therefore, a potential risk of algal blooms downstream of the release point, in particular in semi-permanent pools downstream.
- More detailed assessment of the proposal in relation to the potential for algal blooms should be provided. The proponents mention that there is no evidence of algae growth within Eldridge Pit to date, despite nitrate levels of 5 mg/L. The toxicity assessment revealed that 100% Eldridge water was non-toxic within an algae test, i.e. it did not inhibit growth. Hence an assessment is required regarding other important factors downstream including turbidity, metals entrainment/dilution and settling which promote algae growth.
- The concentration of dissolved zinc under the worst case scenario is greater than the WQO at all locations, including the release point and East Gilbert Creek in Table 65.
- Mixing zone modelling for the construction phase release has not been completed. Modelling is required to represent the greater concentrations for a release originating directly from Eldridge Pit (compared with the modelled operational scenario of 9 parts Eldridge to 1 part Wises Pit). In addition, construction phase modelling representing the proposed release outfall structure is required (compared with diffuser based scenarios presented for the operational scenario)
- Potential interactions of contaminants with sediments has been adequately addressed.
- Einasleigh Gorge downstream has been removed from the monitoring program.

Please note these represent preliminary comments only. We will endeavor to have further comments provided to you for review by 29 January.

Please feel free to contact me, should you have any further questions.

Kind regards

Caitlin



Caitlin Booy

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OCG, AECOM, Genex and MBC.
Nitrogen chat teleconference.

24/01/19
~3pm.

Attendees:

IFM: How much water has to be discharged.
400ML/day?

MH: Based on chat with Aaran.

IFM: Need to Clarify.

N: Exec. summary 409ML for constr.

~~IFM:~~

IFM: What are applying for? Approval for

XGL or XML/yr?

AM: Difficult to say because it depends on weather events.

RL: Worked with the data and the most likely case will depend on weather.

AM: IF there is no wet season we won't need to release.

IFM: IF we're looking at $\times$ dilution. There's 0 discharge if no rain. It's very hard, how to you expect conditions with a moving target.

RL: We've proposed a regime that discharges are controlled. In terms of conditions I thought it'd be based on the WPOs.

IFM: In that framework, you can't meet WPOs for everything which you can't.

N: Baseline [] in Copperfield is already above.

IFM: Even if you aim for 0.25 you're still exceeding. I take your point but regardless if you discharge at 7mg/L you'll have hard time meeting 0.25.

N: [] will only occur during a release but there's the post release flush.

IFM: Einasleigh Gorge is where you're still exceeding is a standing pool, it won't work for us to have exceedances

RLAM: We're only talking days

IFM: In the ephemeral ~~pool~~ areas that's fine but the gorge is permanent. We've always been very clear about that.

It has a higher residence time
it won't easily get flushed
through. Its a nutrient that
overtime will be problematic.

RL: we may take that away and
think that through.

IFM: ~~I don't know if theres any
other~~

AM: ~~It~~ Total is the problem and not
the individual

IFM: the nutrient issue needs to be
looked at more holistically. Algal
blooms have multiple factors. If
you fill the gorge with nutrients
and phosphorus there is a
potential for algal blooms.

AM: I think we go away and
have a further think, do you
have any suggestions?

IFM: Sciences people.

AM: IF we can demonstrate that
there won't be algal blooms.

IFM: We're talking about 48km.
Reducing the release to reduce
the dilution factor. TF

AM: Thanks for your feedback, we'll
go have another think. Are there
any issues other than nitrogen

MH: Comments ~~at~~ 10BD will be Tuesday

ST:

IFM: I think we need to meet face to
face.

ST: Shall we structure next weeks
meeting.

MH: I will set up the meeting,
close at 3.30pm

Date : 31/01/2019 5:02:31 PM

From : "FARKAS Renee"

To : "'Melanie Harris'"

Cc : "SHARPE Dean" , "BOOY Caitlin"

Subject : DES Comments on IAR

Attachment : Kidston IAR 2nd submission_20190131 - DES Combined.xlsx;image001.png;image003.png;

Hi Mel,

Please find attached the comments from DES in relation to the Kidston Pumped Hydro Storage Project IAR.

[Renee.](#)



Renee Farkas

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IAR Section		DES Comments on IAR first submission		DES comments on IAR second submission	
Heading / Topic		Review Comment	Recommendation	Review Comment	Recommendation
Executive Summary	Receiving Environment	No evidence is provided to confirm that Middle Spring is not hydraulically connected to the groundwater regime of the proposed release area.	Provide evidence to support the assertion that the Middle Spring is not hydraulically connected to the proposed release area groundwater regime. If this evidence is not available, connection between Middle Spring and local groundwater should be assumed.	DES has previously commented on the lack of evidence in the IAR to support the assertion that Middle Spring is not hydraulically connected to the groundwater regime of the proposed release area. In response, the proponent has agreed to assess potential connectivity as part of "water modelling refinement and design phase work", however, this information should be provided in the IAR.	Update the IAR to include evidence to support the assertion that the Middle Spring is not hydraulically connected to the proposed release area groundwater regime. In the absence of this evidence, hydraulic connection between Middle Spring and local groundwater should be assumed.
Executive Summary	Operational/Construction Releases	This section should state the likely volume of water that would need to be released during construction and continued operations.	State the volume of water that would be released during construction and continued operations.	No further comments	
Executive Summary				(new comment) The location of many features referred to in the Executive Summary is unclear in the absence of a map, for example Chinaman Creek.	Include a map in the Executive Summary or the front end of the document to clarify the location of features discussed in the Executive Summary.
Executive Summary	Construction Releases	Specific detail regarding the number of days per year over which releases may occur should be included, for example, the likely minimum and maximum number of release days.	At a minimum, include the minimum and maximum number of days over which water will be released during the construction period.	No further comments	
Executive Summary				(new comment) The IAR states that "In reality the actual assimilative capacity usage will be lower than 76.3% in most cases." The IAR should present a realistic summary of likely releases.	Amend the IAR to provide a realistic summary of construction releases.
Executive Summary	Hydraulics and Fluvial Geomorphology Impacts for Temporary Construction Releases	Visual inspections during construction releases are proposed to identify erosion and scouring at the release location. However, no information is provided to indicate what level of erosion or scour would be deemed unacceptable - noting that underwater scouring will not be visible. Furthermore, no mitigation measures are identified to limit the impacts of unacceptable levels of erosion and scouring - noting that once erosion or scour is identified it may be too late to intervene to ensure further erosion or scouring is limited or prevented.	The IAR should describe: 1) how unacceptable erosion or scouring will be defined 2) how underwater scouring would be identified 3) suitable mitigation measures that would be implemented to limit/prevent further scouring or erosion 4) whether water releases would cease or be slowed to limit the potential impacts of erosion or scouring.	No further comments	
				(new comment) The 4th dot point in this section discusses the sensitivity of the Copperfield River macroinvertebrates communities to environmental change, however, there is little discussion of why then these sensitive communities are not predicted to be impacted by operational water releases.	Include additional information detailing why sensitive macroinvertebrate communities will not be impacted by operational releases.
4.1.1	Construction Phase	HDPE liners may leak if damaged during or after installation. Suitable mitigation measures should be described that would minimise the likelihood of any damage and also limit potential environmental impacts should the HDPE liner be damaged and leak.	Include suitable mitigation measures to minimise the likelihood of damage to the HDPE liner and limit the potential impacts to environmental values should the HDPE liner be damaged and leak.	No further comments	
4.1.2	Release Infrastructure	Table 2 details that "releases will be from the Wises upper reservoir at the operational phase mixture of 9 parts Eldridge water to 1 part Wises". However, Table 81 only details releases to the river from Eldridge pit.	Provide details/clarity around when releases during construction will occur from a mixed scenario, and how a 9:1 mixture would be achieved prior to commissioning.	The previous comments are still valid	
4.1.2	Release Infrastructure	This section does not describe the rationale for the location of the release infrastructure.	This section should clearly describe why this release location was chosen. Describe how this location maximises the avoidance and mitigation of potential impacts to environmental values of the land and Copperfield River.	The previous comments are still valid	
4.2.2	Design Refinement and Assessment of Alternatives	Costs estimates for in-pit treatment or RO treatment and release have been undertaken on 17.5 and 12 gigalitres (GL), respectively (Table 4). Given the WQO risks identified in Chapter 7 from 1:25 discharge proposal, these costs should also be presented for the latest predicted construction volume (1.5-2 GL). Queensland Water Quality Guidelines state there is a need to justify that achieving water quality objectives (based on ANZECC toxicity guidelines) is economically or technically unacceptable before relaxation of the objectives (QWQGs Section 5.3).	Without a reliable assessment of the economics and feasibility of the various possible treatment options for the construction phase predicted volume (1.5-2 GL) the temporary alteration (3 years) of water quality objectives to <80% species protection for 50 kms of the Copperfield cannot be thoroughly assessed.	This has now been addressed in part as the new Design Option 5, proposes to increase the capacity of Wises Pit to minimise discharge volume during construction.	The IAR should detail all options that were considered, including for example irrigation, additional containment within expanded pit, construction of an additional storage facility.
4.2.2	Design Refinement and Assessment of Alternatives	Options for treatment or alternative disposal of the remaining 1.85 – 2.56GL of excess construction water are not proposed.	This section should include a discussion of options for addressing the 2.56GL. Disposal to waters should only be considered after other all alternative re-use, recycling and treatment options have been utilised.	Unclear in this section whether a release during construction is required as the additional water storage volume is 2.5 GL which is greater than the predicted volume to be discharged during construction.	Clarify construction release requirements in this section.
4.2.3				Table 5-Step 2, Waste Prevention. The first paragraph of this column is misleading as it infers that the volume of water to be released has been reduced to zero. This is in fact not that case.	Amend this section to refer to the volume of water requiring release during construction and operations.
4.7.2	Release Event Type 2 – Pass-Through Discharge	This section states that the "rapidity of any potential mixing has not been estimated as it is likely that the incident rainfall will remain at least partially separated from the higher density pit water during a pass through discharge event." Nonetheless, the quality of water to be released during a Type 2 release is not adequately described. A quantitative assessment of the impact of this type of release must be included in the IAR to allow for a full assessment of its potential impact and acceptability.	Include a full and detailed description of the likely quality of water that would be released during a Type 2 release. Include a comprehensive detailed quantitative assessment of the likely impacts of this type of release on water quality and environmental values downstream of the release location.	No further comments	
4.7.2	Release Event Type 2 – Pass-Through Discharge	Type 2 pass-through discharges have not been assessed for causality, frequency, discharge volume or quality.	If approval is sought relating to a pass through discharge, a quantitative assessment needs to be undertaken	No further comments	
5.11.12		This section describes potential for changes in groundwater levels to occur in the vicinity of potential GDEs and the need for additional work to determine if these changes will negatively impact vegetation communities. This described additional work should be included in the IAR.	Include in the IAR an assessment of the potential impacts of changes in groundwater levels on GDEs and vegetation on site and downstream of the project.	No further comments	
5.6.3	Sulfate	Sulfate is considered 'high risk' given its historical exceedances of the default WQO for recreation. In risk assessment as "Hydrogeochemical modelling of the predicted water quality at the Gorge suggests, however, that mineral precipitation is not expected beyond that already associated with the (pre-release) Copperfield River."	Mentioned twice in risk assessment (Table 107), but not further described. IAR needs to discuss why sulfate is considered high risk in detail.	No further comments	

6.1.1.2	Dilution Ratio for Adoption	This section describes the use of up to 69% of the receiving environment's assimilative capacity during operational releases. It is expected that during the wet season some assimilative capacity may already be taken up by overtopping of the Kidston tailing dams and other inputs of runoff from the Kidston site. The assimilative capacity of the receiving environment used by the current development, excluding the proposed water releases, should be described in full in this section. The cumulative impact of all inputs (including the proposed construction and operational releases) from the project into the Copperfield River must also be more concisely discussed.	This section should include a comprehensive analysis of the assimilative capacity of the receiving environment already used by the current Kidston Development, including stormwater runoff and tailing dams overtopping during the wet season. It should also include a more detailed quantitative analysis of the potential cumulative impacts of all inputs from the site into the Copperfield River (including the proposed construction and operational releases).	The previous comments are still valid	
6.2	Water Quality Impact Assessment	The proposed risk assessment for operational phase-controlled discharges predicts that environmental values are unlikely to be adversely impacted by the modelled minimum 1:200 dilution. It is important to highlight that while the impacts assessment was undertaken using a 1:200 dilution design approach, for the purposes of regulation, the operational phase CG approval conditions will require end of pipe limits for the identified important physico-chemical indicators and toxicants, and conditioning around the minimum stream flow and discharge quantities (as well as monitoring frequencies defined). Maximum EOP limits for toxicants need to be derived from the assumptions around inputs used in the impact assessment predictions. Increasing the EOP limits well above the numbers used within modelling represents a higher risk prospect.		No further comments	
6.2.1	Near Field Mixing Zone Assessment (CORMIX)	The near field mixing assessment has returned a result suggesting that the mixing zone where WQOs are not met will be mostly less than 135 m distance downstream (worst case 623 m, in 2% natural flow conditions), and at the minimum release flow trigger the mixing zone is estimated as 51 m distance downstream and a stream width 32 m. While the physical dimensions of the mixing zone based on minimum DTA dilutions has not been assessed specifically, this is anticipated to be a much smaller distance than based on WQOs. However, the dilutions identified in both DTAs do not represent worse case given the water quality assessed was based on composite samples, rather than 100% Eldridge pit. The near field mixing assessment for the operational phase is acceptable.		There is a potential risk of algal blooms within the mixing zone. With the concentration of total nitrogen in the release water 43 times, nitrate 7 times and total phosphorus 3 times the WQO. The nutrient load to the system will also be increased due to the release.	Assess the potential for algal blooms within near field mixing zone.
6.2.2.5				The conclusion in the Section 6.2.2.5 does not appear to be entirely correct. The concentration of dissolved zinc under the worst case scenario is greater than the WQO at all locations, including the release point and East Gilbert Creek in Table 65.	
6.2.3	Assessment of Water Quality Impacts to Environmental Values	Parameters relevant to the aquatic ecosystem EV are below the WQO at all locations, with the exception of total nitrogen and dissolved zinc.	The document needs to detail what the exceedance may cause – i.e. it currently does not discuss/explore the possibility of increased turbidity/residence time in the creek/Enasleigh Gorge etc. – for neither the construction phase or operations phase Needs to discuss the potential increase in releases from rest of Kidston Mine Site in high rainfall events, which has historically resulting in WQO exceedances	The concentration of total nitrogen will exceed the WQO and the baseline water quality at Enasleigh, 48.3 km downstream. The impact assessment states that it is unlikely that the increased nitrogen concentration would lead to algal bloom, due to the limited availability of phosphorus. However, the concentration of total phosphorus in the pits is also greater than the WQO. There is therefore, a potential risk of algal blooms downstream of the release point, in particular in semi-permanent pools downstream.	Include release of Total P from the pits as a source of phosphorus.
6.2.3				(new comment) The impact assessment makes mention of photographic monitoring of the release point to monitor erosion or deposition, but does not mention potential mitigation measures to avoid or minimise erosion or deposition.	Include mitigation measures to assist in the avoidance and minimisation of erosion or deposition at the release point.
6.2.1.5				(new comment) This section mentions "other modelled scenarios". Verify that this modelling is also included in the IAR. If it is not currently included, it should be.	Confirm "other modelled scenarios" are included in the IAR. If not, amend the IAR to include these other scenarios.
6.2.4	Conclusions of Water Quality Impact Assessment	Approval conditions will need to ensure that operational and construction discharge conditions are mutually exclusive and do not co-occur, given that no section of the IAR has assessed the potential for concurrent discharges. In addition, regulatory receiving environment triggers are most likely required, rather than simply being part of a non-specific REMP condition. Triggers and sampling location should reflect modelling output predictions.		No further comments	
6.2.4	Conclusion of Water Quality Impact Assessment	The second dot point in this section describes mixing within 625m as "rapid". The department does not agree with statement - mixing over this distance should not be described as rapid.	Reword the description of mixing within 625m as "rapid mixing".	No further comments	
6.2.4	Conclusion of Water Quality Impact Assessment	An estimated 625m mixing zone is larger than most approved mine water release mixing zones. Additional measures should be examined to reduce the length of the mixing zone.	Describe additional measures to reduce the release mixing zone.	No further comments	
				(new comment) Potential entrainment and contamination of sediments in the mixing zone has not been addressed.	Include potential for sediment contamination in risk assessment.
7.2				(new comment) It is unclear in Section 7 what the required discharge volume during construction will be based on the new design option 5. Section 7 only states that there will be a significant reduction in the excess construction water volume. The additional water storage volume under option 5 of 2.5 GL is greater than the previous predicted volume to be discharged during construction of 1.5 GL. It is therefore, unclear why discharge is still required during construction. No justification has been given to why the same conditions that are proposed for the operational phase have been applied to construction. Of note is that the concentration of dissolved zinc, nitrate and total nitrogen is greater in Eldridge Pit than the mix of water to the discharged during operation (9 parts Eldridge to 1 part Wises Pit).	Further detail is required in the last paragraph in Section 7.2.1.2 on page 235 regarding the proposed volume of water to be discharged during construction and the proposed construction conditions.
7.2.1.2	Construction Stages and Model Objective Functions	While this section indicates that a release of waters would not be required until Construction Phase 3 (188 days), any proposed construction release should be optimised to take advantage of high river flow scenarios across the three year construction phase.	Please provide clarity on the proposed duration of the construction releases (i.e. first and last date of potential release, integrated with the construction schedule)	It remains unclear in this section what is maximum volume of release required during the construction phase, and the source (Eldridge/Wises/Mix) of any proposed release releases at different times during the construction period.	The maximum volume (worst case scenario) which may be required to be released during construction should be providing, including the source (Eldridge/Wises/Mix) of any proposed release releases at different times during the construction period.

7.3	Water Quality Impact Assessment	Scouring near the temporary outfall is noted. However, the area over which scouring may occur is not adequately described. There is no description of potential impacts to flora and fauna values within the area that may experience scouring. No assessment is provided of potential indirect impacts on downstream environmental values from increased sedimentation and turbidity from scouring.	Describe the area that may experience scouring including any potential direct and indirect impacts to flora and fauna values.	No further comments	
7.3.1	Near Field Mixing Zone Assessment	Construction phase discharges of toxic wastewater proposed via pontoon mounted submersible pumps and HDPE pipes is proposed for a significant yet undefined duration of time (>1.5 years). Water Sciences does not support a large toxicity mixing zone where it is not consistent with the Australian Water Quality Guidelines and has the potential to cause environmental harm. In such cases, a diffuser to promote near-field mixing of the release would normally be required to minimise impacts. No dispersion assessment (CORMIX) is presented in the IAR for the construction discharge proposal (Chapter 7.2 Preliminary Construction Phase Assessment, Section 7.3.1 Near Field Mixing Zone Assessment).	Further consideration and modelling of mixing zones for the proposed construction discharges via the "temporary outfall structure" and via the "diffuser" is required as part of the IAR. Refer to page 13 of the Technical guideline: Wastewater release to Queensland waters for further guidance (https://environment.des.qld.gov.au/assets/documents/regulation/pr-gi-wastewater-to-waters.pdf). Define the physical dimensions of the initial mixing zone where relevant WQOs and DTA thresholds are reached (see further comments in relation to appropriate safety factors and considerations for the application of DTA data) via 1) the "temporary outfall structure" and 2) the "diffuser" (for construction phase proposal).	No new near field mixing zone modelling has been done for the proposed construction phase release. The reason provided for this is that the same release conditions as the operational phase will be used. However, as outlined above, the concentration of dissolved zinc, nitrate and total nitrogen is greater in Eldridge Pit than the mix of water to the discharged during operation (9 parts Eldridge to 1 part Wises Pit). Therefore, the worst case scenario has not been modelled for these parameters. It is also suggested that the outfall structure may not be complete and that initial releases during the construction phase may be via a simple outfall structure. Mixing zone modelling for operation included two different conceptual diffuser configurations. Therefore, as per previous comments, the modelling for the operational phase does not provide the worst case scenario of a simple/temporary outfall structure. Mixing zone impacts of entrained metals in sediments should also be addressed.	Provide mixing zone modelling representing the construction release conditions (source water, maximum release volume, outfall structure).
7.3.2	Far Field Assessment of Sustainable Load (Mass Balance)	An incomplete impact assessment is presented for the mid-field locations within the Copperfield River. Limited detail is presented regarding the anticipated concentrations of toxicants and duration of likely exposures within the identified semi-permanent pools downstream of the proposed wastewater discharge.	If the majority of release opportunities within the construction phases are utilised in succession (over a wet season for example), what are the predictions regarding aquatic ecosystem impacts within these important refugia.	There is a potential risk of algal blooms within the mixing zone and the semi-permanent pools downstream. With the concentration of total nitrogen in the release water 47 times, nitrate 8 times and total phosphorus 2.5 times the WQO. Efficacy of proposed flushing (i.e. cease release at <400ML/d) in downstream water bodies (ie Copperfield Gorge) is inadequately discussed.	
7.3.4	Assessment of Water Quality Impacts to Environmental Values	The concentrations represented by the mass balance will only be present whilst the release is occurring. However, the section does not provide examples of how long the system takes to return to < WQOs, how long the water takes to move from Kidston to Einasleigh, etc.	The IAR needs to detail, how long the system takes to return to < WQOs in scenarios where they are being exceeded for large periods downstream, how long the water takes to move from Kidston to Einasleigh (i.e. days/weeks), how long will elevated concentrations be present at that location; and the proportion of days per year where there is 'unimpacted' water present in the system, compared to release impacted days.	This comment is still valid	
7.3.4	Assessment of Water Quality Impacts to Environmental Values	Many indicators are predicted to exceed WQOs up to and over 50 km downstream from proposed construction release. The impact assessment has also assessed the anticipated resultant water quality against less stringent toxicity guidelines due to the temporary nature of this discharge (80% species protection). Again, exceedances are modelled to occur downstream up to 50 km. If this is correct, this places this application within a high-risk category in terms of potential aquatic ecosystem and drinking water impacts. Wastewater discharge assessments typically attempt to achieve relevant WQOs within 300m (or 3 stream widths if less) rather than 50 km (page 14 of Technical guideline: Wastewater release to Queensland waters).		This section has been updated based on the design option 5. As outlined above (Section 6.2.3), the concentration of total nitrogen will exceed the WQO and the baseline water quality at Einasleigh, 48.3 km downstream. The impact assessment states that it is unlikely that the increased nitrogen concentration would lead to algal bloom, due to the limited availability of phosphorus. However, the concentration of total phosphorus in the pits is also greater than the WQO. There is therefore, a potential risk of algal blooms downstream of the release point, in particular semi-permanent pools downstream.	
7.3.4	Assessment of Water Quality Impact to Environmental Values	Construction releases are predicted to exceed the available assimilative capacity of the receiving environment (Copperfield River) and would result	The IAR should provide a comprehensive and detailed quantitative assessment of the project's potential impacts on environmental values.	This section has been updated based on the design option 5. As outlined above (Section 6.2.3), the concentration of total nitrogen will exceed the WQO and the baseline water quality at Einasleigh, 48.3 km downstream. The impact assessment states that it is unlikely that the increased nitrogen concentration would lead to algal bloom, due to the limited availability of phosphorus. However, the concentration of total phosphorus in the pits is also greater than the WQO. There is therefore, a potential risk of algal blooms downstream of the release point, in particular semi-permanent pools downstream.	A more detailed assessment of the proposal in relation to the potential for algal blooms should be provided
7.3.4	Assessment of Water Quality Impact to Environmental Values	The information provided in Table 92 is not sufficient to support the statement that impacts from construction releases will be transitory and reversible. For example, an exceedance of the WQO for 95% species protection 48km downstream of the release for up to 41 days per year for three years has the potential to significantly impact environmental values yet potential impacts are discussed in a cursory manner in the IAR.	Further evidence, including a detailed impact assessment based on reasoned discussion should be provided to support the assertion that potential impacts of construction releases will be transitory and reversible.		
7.3.4	Assessment of Water Quality Impact to Environmental Values	Post-release flushing from the Copperfield Dam is proposed to aid in the dilution of releases from the project site. However, a quantitative assessment of the impact of this flushing on water quality is not provided in the IAR. If post-release flushing from the Copperfield Dam is proposed	The IAR should include a quantitative assessment of the impacts of post-release flushing on water quality to support the implementation of this measure to improve water quality after a water release.		
7.3.4	Assessment of Water Quality Impact to Environmental Values	The impact assessment does not include a risk matrix assessing the likelihood and severity of potential impacts arising from the proposed operational and construction water releases. The risk matrix should detail how proposed mitigation measures would reduce the likelihood or	Include a risk matrix assessing the likelihood and severity of potential impacts of the proposed project, including the likely effectiveness of mitigation measures in reducing the likelihood or severity of impacts.		
7.3.4	Assessment of Water Quality Impact to Environmental Values	Based on worst case maximum values during the later stages of construction - WQO for drinking water are predicted to be exceeded at downstream locations at which water may be used for drinking. Given the potential for impacts to human health, the precautionary approach must be applied so that no water from the Copperfield River is consumed, and potable water provided, at any stage during operations and construction when WQO for drinking water may be exceeded.	Revise this IAR section to clarify that no river water will be used for potable uses at any stage during operations and construction when WQO for drinking water may be exceeded.		
7.3.4	Assessment of Water Quality Impact to Environmental Values	Water quality should be monitored at the Oaks homestead to validate modelling results and confirm that water quality objectives for potable water are achieved before potable usage of water at this location recommences following a release.	Include the monitoring of water quality at the Oaks homestead and triggers for the cessation and recommencement of the use of water from the Copperfield River for potable uses at this location. Provide details on how the proponent would communicate with the Oaks homestead to ensure river water is not in used during releases when WQO for drinking water may be exceeded. It is recommended that Queensland Health be consulted regarding the appropriateness of this WQO exceedance and any proposed mitigation measure(s).		
7.3.4	Assessment of Water Quality Impact to Environmental Values	Mitigation measures are not proposed to improve the quality and quantity of pit water prior to release - despite the exceedance of WQO during construction releases.	Describe and fully assess suitable mitigation measures to limit WQO exceedances during construction releases, including mitigation measures to improve the quality and reduce the quantity of pit water prior to any release.		

7.3.5	Conclusions of Water Quality Impact Assessment	<p>Justification regarding proceeding with 1:25 approach are based on the:</p> <p>1) DTA biological effects data, and;</p> <p>2) Temporary nature of the construction phase discharges (3 years) for the proposal being satisfactory in terms of adverse impacts.</p> <p>The water quality of the DTA Composite 2 is a better quality than observed from historical sampling. The following table presents a comparison between the DTA sample and statistical information in terms of historical water quality from Eldridge Pit:</p> <p>Constituent concentration in composite sample submitted for DTA 2 90% Eldridge:10% Wises Corresponding closest percentile from Eldridge Pit historical data in Appendix B (maximum recorded)</p> <p>Dissolved Zinc (1.09 mg/L) 80th percentile (max 1.75 mg/L)</p> <p>Dissolved Cadmium (0.0221 mg/L) 75th percentile (max 0.0321 mg/L)</p> <p>Dissolved Cobalt (0.004 mg/L) 20th percentile (max 0.029 mg/L)</p> <p>Electrical Conductivity (3210 µS/cm) 75th percentile (max 4790 mg/L)</p> <p>Sulphate (1720 mg/L) 25th percentile (max 2500 mg/L)</p> <p>The above table presents a selection of certain relevant indicators, and is not a comprehensive comparison. It does highlight, however, that the water quality tested for biological impacts (using DTA) was generally better quality than historical worse-case findings. What is clear from much of the information presented in the construction IAR is firstly, that the 1:25 discharge proposal represents a high risk to downstream environmental values and secondly, that water quality in the proposed discharge will change over time and is not static.</p>	<p>If the DTA is proposed to be used as the primary justification of low risk, then the end of pipe limit maximums will need to be set according to the water quality measured within the DTA composite (and adjusted by agreed safety factors for hardness modification and to lowest NOEC (x 10)). The hardness in the lowest DTA dilution is still very high and predictions regarding the toxicity ameliorating effects at this range may be less predictable.</p> <p>According to the ANZECC guidelines where mixture toxicity is observed, the next step in the assessment is toxicity identification and evaluation (TIE) techniques, which assist in identifying the main toxicants of concern for that particular mixture (see page 3.4-16 ANZECC). This could be considered further although is time consuming. The DTA did not actually investigate a dilution factor relevant to the proposed discharge dilution (lowest in the DTA is 6.25%, while the discharge proposal is 4%). This presents more uncertainty with the DTA and a discussion should be presented about whether application of a safety factor on top of the lowest NOEC may be appropriate, i.e. build in a safety factor to lowest NOEC (x 10).</p> <p>Further discussion is required in the IAR regarding the anticipated long term impacts to aquatic ecosystems from potential toxicity experienced intermittently over three years (as per the IAR states). The life-cycles of relevant species should be outlined and three years of possible population impacts discussed, including how this timeframe may negatively influence the possibilities of recovery. Three years is a relatively long duration for impacts without further assessment, especially given species lifecycles may range from 2 years or significantly less.</p> <p>Where a pre-approval risk assessment highlights a potential for high risk from discharges, there is the possibility that post-approval DTAs can be conditioned and utilised for compliance/ongoing risk assessment and feedback into tiered approval conditions. This would involve a suitable frequency and sampling locations for DTA samples collected directly from receiving water during the influence of discharges and should relate back to the dilutions allowed as part of the approval and original assessment.</p> <p>A more detailed assessment of the proposal in relation to the potential for algae blooms should be provided. The proponents mention that there is no evidence of algae growth within Eldridge Pit to date, despite nitrate levels of 5 mg/L. The toxicity assessment revealed that 100% Eldridge water was non-toxic within an algae test, i.e. it did not inhibit growth. Hence an assessment is required regarding other important factors downstream including turbidity and settling which may inhibit or promote algal growth.</p>	<p>This section has been updated based on the design option 5. Therefore, most comments are no longer valid. However, the comment regarding a detailed assessment of the potential for algal blooms is still required. This is relevant for operation and construction releases. A more detailed assessment of the proposal in relation to the potential for algae blooms should be provided. The proponents mention that there is no evidence of algae growth within Eldridge Pit to date, despite nitrate levels of 5 mg/L. The toxicity assessment revealed that 100% Eldridge water was non-toxic within an algae test, i.e. it did not inhibit growth. Hence an assessment is required regarding other important factors downstream including turbidity and settling which may inhibit or promote algal growth.</p>	<p>A more detailed assessment of the proposal in relation to the potential for algae blooms should be provided. The proponents mention that there is no evidence of algae growth within Eldridge Pit to date, despite nitrate levels of 5 mg/L. The toxicity assessment revealed that 100% Eldridge water was non-toxic within an algae test, i.e. it did not inhibit growth. Hence an assessment is required regarding other important factors downstream including turbidity and settling which may inhibit or promote algal growth.</p>
7.3.5	Conclusion of Water Quality Impact Assessment	The assumption that the river will not be used for recreation in high flow conditions is not an acceptable measure to avoid the impacts of the exceedance of recreation WQO for Manganese.	Explore and fully describe suitable additional mitigation measures to further limit the exceedance of WQO.		
7.5.1	Water Quality	The sensitivity of macroinvertebrates downstream from the release location is stated in this section, including the "adoption and application of appropriate release management strategies" to reduce the level of residual risk to aquatic downstream aquatic values. These potential management strategies and mitigation measures not detailed in the IAR, nor is their potential efficacy adequately assessed. Monitoring outlined in Table 5 of the REMP is not of a sufficient frequency to enable the effective management of water releases to limit impacts to flora and fauna values.	The IAR should provide detailed management and mitigation measures to further reduce the risk of construction water release impacts to aquatic flora and fauna values. The IAR should adequately assess and provide evidence of the likely efficacy of any proposed mitigation measures.	No further comments	
7.5.1	Water Quality	The IAR suggests macroinvertebrate communities as an ideal biological indicator for the future project REMP. However, no detail is provided as to how macroinvertebrate sensitivities would be used to monitor potential impacts of the proposed project, or how the proposed project may be modified if impacts to macroinvertebrates are detected. Note - frequent monitoring would be required to ensure any impacts are detected and can be responded to within a timeframe likely to limit those impacts.	The IAR should detail how macroinvertebrate monitoring would be undertaken to enable project modification in response to the detection of impacts on macroinvertebrates. The proponent should consider increasing the frequency of sampling of flora and fauna values to allow modification of releases in response to any monitoring results.	No further comments	
7.5.2	Hydrology	Noting that changes in hydrology and increased flows and water permanency may suit some species, it is also likely to negatively impacts other species. This should be assessed the IAR.	The IAR should detail and discuss which species are likely to benefit or suffer under a regime with increased water flow rates and increased water permanency.	No further comments	
7.5.3	Erosion and Sedimentation	This section does not adequately describe the impact/potential impact regarding the accumulation of contaminants in sediment.	The IAR needs to further assess the actual/potential impacts that accumulation of sediment will have on the receiving environment that provides scientific justification that these impacts are 'low'.	No further comments	

9.1	Summary of Proposed Release Criteria	<p>Release conditions should include contaminant end of pipe triggers and limits for the relevant parameters, in addition to conditions regarding flow triggers and minimum dilutions. The impact assessment has been undertaken on the basis of assessing the risk of 1:25 or 1:200 assuming water quality from historical information (and based on the site water balance predictions of what will be required in terms of discharges).</p> <p>Licensing processes utilise information from the impact assessment to then consider the appropriate conditions. EOP and within the receiving environment. Assumptions cannot be reliably made to assert that water quality within the pit will not alter (or deteriorate) over the operation lifetime. This is especially important, given the likely increased ingress of groundwater once the current water levels in Eldridge Pit are dropped. There is also an identified potential for oxidation of the sulphides and liberation of cadmium, zinc, copper and arsenic from pit walls.</p>	<p>If the maximum release rate is proposed to be adjusted on real time data from upstream gauge, then the minimum flow triggers should also be managed on a real time or short term basis (i.e. cubic metres/second, rather than ML/Day). Any request to use variable release ratios (volumes) based on real time dilution factor with the receiving water flows presents additional complications in regards to the onsite management and compliance assessment. A discussion of how the onsite management would be designed to enable rapid alterations of discharge volumes to fluctuating natural stream flows should be detailed within the IAR.</p> <p>Some early attempts to develop an EOP limits appear to have been presented for dissolved zinc for operational discharges, but nothing has been presented for the construction phase limits. If modelling has assessed EOP maximum of 1.58-1.75 for dissolved zinc then this will more closely reflect the EOP limit, which should then be applied. Doubling the end of pipe limit would require impact assessments and modelling using the requested limit, and this has not been undertaken.</p> <p>The release ratio during the construction phase of 4.2% listed in Table 108 does not equate to 25:1. The release ratio should read 4%. This error needs to be corrected throughout the documents.</p>	<p>The previous comments are still valid, except those related to the 1:25 dilution for construction.</p>	
9.2	Monitoring	<p>Increased water quality and aquatic ecosystem health risks from construction phase proposal would require, if approved, a more comprehensive and responsive monitoring regime. Within the "Overview of Receiving Environment Monitoring Program" Table 109, the upstream and downstream water quality monitoring frequency during releases stipulates a sample is to be taken within the first 24 hours, and then every three days thereafter until one week after the release ceases. Given that Type 1 discharges will not occur at flows less than 400 ML/day, an estimate of how long the minimum flow (plus discharge volume for construction phase 16 ML/day) would take to reach the last downstream monitoring site EG1 is necessary. The proposed monitoring timing/frequency should capture sampling for declining water quality and impacts in relation to the predicted timing of impacts.</p>	<p>The approval will need to nominate the relevant indicators, conditions and monitoring points/frequency. Currently this information sits within the REMP document.</p> <p>The nominated site D51 is listed as immediately downstream of the mixing zone, however, no clarification of which mixing zone is relevant for this site location has been presented. Further downstream, monitoring is also required with the semi-permanent waterholes Pond 4, Pond 5, and W3 during the construction phase.</p>	<p>The previous comments are still valid.</p> <p>Pond 4 and the Einasleigh gorge downstream have been removed from the monitoring program in the new IAR.</p> <p>Copperfield gorge has been added, is this site equivalent to the Einasleigh gorge site?</p> <p>Potentially groundwater quality monitoring should be included in the monitoring program.</p>	
Appendix B	Water Quality Statistics Table	<p>Appendix B appears to exclude the information more recently obtained from depth profiling within the Eldridge Pit.</p>		<p>The previous comments are still valid</p>	
Appendix G	DTA - June 2018	<p>The most diluted wastewater Rainbow fish embryo hatching assessment (for both DTA 1 and DTA 2) shows a trend (although not statistically significant) of more toxicity and much higher variability than less diluted tests. The possible influence of hardness within the DTA dilutions is lacking from the IAR. A written discussion and explanation from Ecotox Pty Ltd in regards to the possibility of a multiple phase dose response should be included in the IAR. The possibility of higher toxicity in more dilute mixtures should be addressed given the well-established influence of water hardness on toxicity. Can the results of the DTA be relied upon to assure that no acute and/or chronic toxicity impacts are posed by the proposal (over a 3 year period of repeated event-based discharges)?</p>		<p>The previous comments are still valid</p>	
Draft REMP					
1.0	Aims and objectives	<p>Note - An objective of the REMP is also to outline mitigation and measurement measures that would be implemented to further limit potential impacts of the water releases, as suggested in section 7.5.1.</p>	<p>The IAR should include potential mitigation and management measures that may be implemented in response to monitoring undertaken as part of the REMP to limit impacts of water releases. It should include triggers for the implementation of each mitigation measure.</p>	<p>The previous comments are still valid</p>	
4.1	Figure 3, Water monitoring location map	<p>Figure 3 is not included in the draft REMP.</p>	<p>Include Figure 3 to clarify proposed water quality monitoring locations.</p>	<p>The previous comments are still valid</p>	
4.4.2	Assessment Method	<p>The methodology for assessing aquatic flora and fauna communities is not provided.</p>	<p>Detail the methodology for assessing aquatic flora and fauna communities.</p>	<p>The previous comments are still valid</p>	
6.0	Reporting	<p>The placeholder in this section indicates that reporting will be completed "as per conditions of EA." Note - the proposed project will not have an EA as it is not an environmentally relevant activity requiring an EA.</p>	<p>Clearly state here and in other sections of the IAR that no EA approval would be issued for the proposed project as the activity is not an ERA. Any approval conditions would sit as imposed conditions in the Coordinator-General's Evaluation Report for the proposed project. Compliance with any imposed conditions would be the responsibility of the Office of the Coordinator-General.</p>	<p>The previous comments are still valid</p>	

Date : 14/02/2019 3:23:30 PM

From : "FARKAS Renee"

To : "Melanie Harris"

Cc : "SHARPE Dean" , "BOOY Caitlin"

Subject : Kidston Pumped Storage Hydro Project - DES comments AECOM Algal Bloom Risk draft Memo

Attachment : image001.png;image003.png;

Hi Mel,

DES has the following comments in relation to the draft Memo provided 6 February 2019 regarding the Algal Bloom risk within Copperfield River.

- It is agreed that the WQO for total nitrogen (TN) based on ANZECC/ARMCANZ 2000 default WQOs for upland rivers in Tropical Australia may not be appropriate for the location based the background WQ data at WB presented in the impact assessment report (IAR). However, a number of comments regarding the information provided in the memo are below.
- Although, it is agreed that Nitrate as N contributes towards the TN value, the intent of the nitrate and TN WQOs is different. The Nitrate WQO is based on toxicity to aquatic organisms and the TN WQO is based on an indirect affect to the ecosystem, such as algal blooms. Therefore, the potential risk of algal blooms from the release was important to assess in the receiving environment.
- Nitrate data was presented in the memo from DNRME gauges throughout the catchment. This data was not presented in the IAR. However, based on the background data at WB the WQO for nitrate (0.7 mg/L) is appropriate.
- Information has been presented in the memo regarding the authorised nutrient releases from wastewater treatment plants. The argument presented is not relevant to the discussion regarding the impact to the receiving environment downstream of the Kidston release point. The receiving environment downstream of the Kidston release point is an ephemeral river and the receiving environment for the Mt St John, Picnic Bay and Horseshoe Bay STPs are not comparable.
- It is suggested that the risk of algal blooms in the receiving environment is low and that the receiving environment WQO for TN in Table E5 could be 0.3 mg/L. However, there is limited nutrient data available and it is suggested that additional data be collected before the WQO for TN of 0.3 mg/L is applied.

Kind regards,
Renee.



Renee Farkas

Team Leader

Minerals Assessment Centre | Environmental Services and Regulation
Department of Environment and Science

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Level 3, 5B Sheridan Street, Cairns QLD 4870

PO Box 7230, Cairns QLD 4870

Working part time – Wednesday to Friday

Date : 20/02/2019 12:48:37 PM

From : "FARKAS Renee"

To : "Melanie Harris" , "BOOY Caitlin"

Cc : "Rosemary Shearman" , "SHARPE Dean"

Subject : RE: Email to AECOM - Clarification of information

Attachment : image001.png;image002.jpg;image003.jpg;image004.jpg;image005.png;image006.png;image007.png;image008.jpg;

Hi Mel,

some suggested changes, below.

Thanks, Renee.

From: Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>

Sent: Monday, 18 February 2019 3:45 PM

To: BOOY Caitlin; FARKAS Renee

Cc: Rosemary Shearman

Subject: FW: Email to AECOM - Clarification of information

Hi Renee and Caitlin,

I am proposing to send the information below to Genex and AECOM and request clarification. Is there anything you would like to add? I would like to send this out on Thursday morning if possible.

Cheers Mel

In reviewing the various iterations of the IAR, including the document submitted on 11 January 2019, OCG and DES have noted that there are a variety of different figures throughout the document. We are seeking clarification on the following information:

- the capacity of the Eldridge and Wises Pits
 - e.g. page 16 of the IAR (11/1) states that Wises Pit can hold approximately 10 GL, but this page also states that the Wises Pit holds 8.5 GL. In Appendix K it states the Wises Pit will have a volume of 8.38 GL following the pumping of water from the Eldridge Pit. Similarly numbers vary throughout the document for the Eldridge Pit volumes.
- the estimated volume of water to be released to the Copperfield River from the Eldridge Pit for **initial dewatering-construction** phase under different rainfall accumulation scenarios
- whether or not any other water may be required to be released during construction – and if yes, what is the source of that water (i.e. Eldridge Pit only or Eldridge + Wises at a dilution ration of 9:1);
- confirm the distance from the project site (**proposed release point**) to the **start of the** Copperfield Gorge at Einasleigh – it varies between 44.25, 44.98 and 50 km downstream (**measured as "adopted middle thread distance" of the watercourse**)
- clarify the current volumes of Wises and Eldridge pits following the recent rain events (and any subsequent changes to the construction phase release proposal)
- that the gorge at Einasleigh is called the Copperfield Gorge and the dam upstream of the project site is called Copperfield Dam – the names still vary within the document
- confirm quantity of waste rock/virgin rock and total extraction for the construction of Wises Pit (section 4.1.1 states 1.6m³ and 4.2.2.5 states 1.5m³). Confirm the location/use of the quantities e.g. for dam construction, relocation to existing WRD
- table 3 identifies construction phase from 2019-2022. Confirm timing for all construction activities in months/years.
- confirm capex for K2H project (originally being \$330 million).



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Date : 20/02/2019 12:48:35 PM

From : "FARKAS Renee"

To : "'Melanie Harris'", "BOOY Caitlin"

Cc : "Rosemary Shearman", "SHARPE Dean"

Subject : RE: Email to AECOM - Clarification of information

Attachment : image001.png;image002.jpg;image003.jpg;image004.jpg;image005.png;image006.png;image007.png;image008.jpg;

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From: Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>

Sent: Monday, 18 February 2019 3:45 PM

To: BOOY Caitlin; FARKAS Renee

Cc: Rosemary Shearman

Subject: FW: Email to AECOM - Clarification of information

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- the estimated volume of water to be released to the Copperfield River from the Eldridge Pit for **initial dewatering-construction** phase under different rainfall accumulation scenarios
- whether or not any other water may be required to be released during construction – and if yes, what is the source of that water (i.e. Eldridge Pit only or Eldridge + Wises at a dilution ratio of 9:1);
- confirm the distance from the project site (**proposed release point**) to the **start of the** Copperfield Gorge at Einasleigh – it varies between 44.25, 44.98 and 50 km downstream (**measured as "adopted middle thread distance" of the watercourse**)
- clarify the current volumes of Wises and Eldridge pits following the recent rain events (and any subsequent changes to the construction phase release proposal)
- that the gorge at Einasleigh is called the Copperfield Gorge and the dam upstream of the project site is called Copperfield Dam – the names still vary within the document
- confirm quantity of waste rock/virgin rock and total extraction for the construction of Wises Pit (section 4.1.1 states 1.6m³ and 4.2.2.5 states 1.5m³). Confirm the location/use of the quantities e.g. for dam construction, relocation to existing WRD
- table 3 identifies construction phase from 2019-2022. Confirm timing for all construction activities in months/years.
- confirm capex for K2H project (originally being \$330 million).



Melanie Harris
Project Manager
Coordinated Project Delivery
Office of the Coordinator-General
Department of State Development,
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Date : 22/02/2019 9:37:36 AM

From : "FARKAS Renee"

To : "Rosemary Shearman"

Cc : "Melanie Harris" , "SHARPE Dean" , "Steven Tarte" , "BOOY Caitlin" , "PAGE Cathie"

Subject : Kidston - DES confirmation

Attachment : image001.png;image002.png;image003.png;image006.png;

Good morning Rosemary,

DES consider that the key matters that must be further addressed in the supplementary IAR have been communicated to Genex and are predominantly captured in the Excel comments table and subsequent emails.

There remains some areas of disagreement between DES/Genex in the Excel comments table and, in addition, DES consider there are drafting issues throughout the IAR, including inconsistencies and insufficiently supported conclusions. However, these have been identified previously and, with the exception of those items already required to be addressed in the Supplementary IAR, we do not consider the drafting issues are material to our assessment and conditioning of the proposed release.

As such, we will await submission of the supplementary IAR and, on receipt of sufficient information, will proceed to provide OCG with draft conditions for the release.

Please let me know if you require anything further.

Kind regards,
Renee.



Renee Farkas
Team Leader

Minerals Business Centre | Environmental Services and Regulation
Department of Environment and Science

P 07 4222 5578
Level 3, 5B Sheridan Street, Cairns QLD 4870
PO Box 7230, Cairns QLD 4870

Working part time – Wednesday to Friday

From: Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>

Sent: Thursday, 21 February 2019 2:55 PM

To: FARKAS Renee

Cc: Steven Tarte; Melanie Harris; BOOY Caitlin

Subject: Kidston - DES confirmation

Hi Renee

Following last week's discussion, could you please confirm if DES are providing confirmation of their position in regards to Genex's responses to address the outstanding issues on the draft IAR.

For reference, please see attached spreadsheet containing comments/responses.

Kind regards,
Rosemary



Rosemary Shearman
A/Senior Project Officer
Office of the Coordinator-General
Department of State Development,
Manufacturing, Infrastructure and Planning

P 07 3452 7476
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Date : 4/03/2019 5:12:31 PM

From : "BOOY Caitlin"

To : "Melanie Harris"

Cc : "FARKAS Renee" , "FOMIATTI MINNESMA Ingrid" , "SHARPE Dean" , "Steven Tarte" , "TRELOAR Kirstie"

Subject : Kidston draft conditions

Attachment : KPH Draft Conditions 4 March 2019.docx;image001.png;image003.png;

Hi Mel,

Apologies for the delay, please see attached draft conditions for the KPH project.

Please note that these conditions are a work in progress and are being updated regularly. Additionally, all numbers provided are preliminary and are subject to changes following review of the additional information received last Friday (1 March 2019).

Should you have any further questions in relation to this, please contact me and I will be happy to assist.

Kind regards,
Caitlin



Caitlin Booy

Environmental Officer (Minerals)

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☐ Please consider the environment before printing this email.

Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	<p>The holder of this evaluation report must:</p> <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by <<Insert date 3 months from date of issue>>
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report.
A6	<p>Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following:</p> <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction , undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>Where a condition of this evaluation report requires compliance with a standard, policy or guideline published externally to this evaluation report and the standard is amended or changed subsequent to the issue of this evaluation report, the holder of this evaluation report must:</p> <ul style="list-style-type: none"> a. comply with the amended or changed standard, policy or guideline within two years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation; and b. until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under these conditions.
B2	The release of contaminants to waters must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the evaluation report holder must measure and record the receiving waters stream discharge and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the evaluation report holder must measure and record the receiving waters stream discharge and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a contaminant limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in such waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)		Streamflow	Release Discharge
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.90	144.16	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow at WB is greater than (>) 5 m³/sec. Once the stream discharge is lower than (<) 5 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	TBA¹	TBA¹	Continuously during release events (minimum hourly) (m³/sec)	N/A	Contaminated water may only be released at KPH1 when stream discharge in the Copperfield River measured at WB is 200 times greater than the rate of release at KPH1 (m³/sec). Release rate must be calculated in real time. When the release occurs during minimum stream discharge in the Copperfield River (5 m³/sec), the maximum release rate is 0.18 m³/sec.

¹ Coordinates must be provided to the entity with jurisdiction prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Commented [BC1]: Precise co-ordinates to be provided.

Table 2 – Contaminant release limits (End of Pipe) *(all numbers preliminary, and are subject to changes)*

Contaminant ¹	Release Limit ² (for metals (µg/L) based on filtered samples)	Release Limit ² (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,400 ¹		Every fifteen (15) minutes during release and daily for one week following cessation of release.
pH (pH Unit)	6 - 8.5		
Dissolved oxygen (% sat)	>85 ²		
Sulfate (SO ₄ ²⁻) (mg/L)	2700 ¹		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ²		
Fluoride (mg/L)	3 ¹		
Aluminum	55 ³	240 ¹	
Arsenic	170 ¹	370 ¹	
Cadmium	30 ¹	50 ¹	
Chromium	1 ³	50 ⁵	
Cobalt	30 ¹	3600 ¹	
Copper	5 ¹	60 ¹	
Iron	300	310 ¹	
Lead	3.4 ³	180 ¹	
Manganese	2600 ¹	3700 ¹	
Mercury	0.06 ³	1 ⁵	
Molybdenum	65 ¹	130 ¹	
Nickel	40 ¹	51 ¹	
Selenium	5 ³	10 ⁵	
Uranium	0.5 ³	17 ⁵	
Vanadium	6 ³	10	
Zinc	1600 ¹	2400 ¹	
Cyanide as unionized HCN	7 ³		
Ammonia as N (mg/L)	0.9 ³		
Nitrate as N (mg/L)	5.5 ¹		
Total N (mg/L)	7 ¹		
Total P (mg/L)	0.03 ¹		
Major ions	For interpretation purposes and hardness modification of relevant toxicity triggers.		
Hardness			

Notes:

1 – Maximum of historical data used in the risk assessment process (Genex Intergrated Assessment Report; Table 13)

2 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 – ANZECC (2000) trigger value for 95% aquatic species protection – Table 3.4.1

4 – Hardness modified.

5 – Australian drinking water guideline.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters quality objectives .
B13	Water quality objectives specified in Table 4 - Receiving waters quality objectives must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	
KPH2	Copperfield River, (approx.) 1.9 km downstream of KPH1	- 18.87 (TBC)	44.17 (TBC)	<ul style="list-style-type: none"> Daily during release (the first sample must be taken within 2 hours of commencement of release); and Daily for one week following cessation of release.

Commented [BC2]: Precise co-ordinates to be provided.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters quality objectives *(all numbers preliminary, and are subject to changes)*

Contaminant	Water quality objectives
Electrical conductivity (µS/cm)	300 ¹
pH (pH Unit)	6-7.5 ²
Sulfate (SO ₄ ²⁻) (mg/L)	250 ³
Fluoride (mg/L)	1.5 ⁵
Chlorophyll a (cells/100ml)	5 ²
Major ions	For interpretation purposes
Hardness ⁹	
Turbidity (NTU)	For interpretation and general monitoring purposes
Dissolved Oxygen	
Total Ammonia N (mg/L)	0.9 ³
Nitrate as N (mg/L)	2.1
Total N (mg/L)	0.2 ²
Total P (mg/L)	0.01 ²
Cyanide as unionized HCN (µg/L)	7

Contaminant	Water quality objectives	
	Water quality objectives (Dissolved)	Water quality objectives (Total)
Aluminum (µg/L)	2900 ¹	4000 ¹
Arsenic (µg/L)	13 ³	13
Cadmium (µg/L)	0.2 ³	2 ⁵
Chromium (µg/L)	1.0 ³	50 ⁵
Cobalt (µg/L)	1.4 ⁴	25 ¹
Copper (µg/L)	5 ¹	9 ¹
Iron (µg/L)	300	750 ¹
Lead (µg/L)	3.4 ³	10 ⁵
Manganese (µg/L)	1900 ³	1900
Mercury (µg/L)	0.06 ^b	1 ⁵
Molybdenum (µg/L)	34 ⁴	34
Nickel (µg/L)	11 ³	20 ⁵
Selenium (µg/L)	5 ³	10 ⁵
Uranium (µg/L)	0.5 ³	17 ⁵
Vanadium (µg/L)	6 ³	100 ⁶
Zinc (µg/L)	8 ³	30 ¹

Notes:

1 – Site specific trigger value – 95th percentile of WB full dataset

2 – ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 – ANZECC (2000) trigger value for 95% aquatic species protection – Table 3.4.1

4 – Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)

5 – Australian drinking water guideline.

6 – Long term irrigation.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 4 - Receiving waters quality objectives .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .

B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the water quality objectives listed in Table 4 - Receiving waters quality objectives, the evaluation report holder must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ul style="list-style-type: none"> a) If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or b) If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ul style="list-style-type: none"> i. Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and ii. Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 4 - Receiving waters quality objectives; and iii. Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and iv. Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a water quality objective exceedance has occurred and is under investigation in accordance with B15(b)(iii) and B15(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B15(b)(iii).</p>
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Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	Receiving waters
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.90	144.16	Once within 24 hours prior to commencement of release; and
KPH 3	Copperfield River, upstream of East Creek confluence	TBC -	TBC -	Daily during release; and
		-18.51	144.11	Once every two days for 6 days following cessation of release; and
				Monthly during stream flow.
Downstream site				
W2	Copperfield River, 1.1 km downstream of KPH1	-18.87	144.17	Once within 24 hours prior to commencement of release; and
KPH4	Copperfield River, 4.3 km downstream of KPH1	TBC -	TBC -	Daily during release; and
		-18.51	144.10	Once every two days for 6 days following cessation of release; and
W3	Copperfield River, 7.4 km downstream of KPH1	-18.82	144.17	Monthly during stream flow.
Pond 5	Copperfield River, 5.8 km downstream of KPH1	-18.83	144.17	
Copperfield Gorge	Approx. 50 km downstream of KPH1	TBC -	TBC -	

Commented [BC3]: Precise co-ordinates to be provided.

Commented [BC4]: Precise co-ordinates to be provided.

Commented [BC5]: Precise co-ordinates to be provided.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 6 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 7 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 6 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 6 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 7 - Sediment contaminant default guideline values, the evaluation report holder must compare this result to monitoring results collected from a relevant control site; and</p> <ul style="list-style-type: none"> a) If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or b) If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ul style="list-style-type: none"> i. Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and ii. Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 7 - Sediment contaminant default guideline values; and iii. Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and iv. Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B18(b)(iii) and B18(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B18(b)(iii).</p>

Table 6 - Sediment monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.90	144.16	• Once every three months
KPH 3	Copperfield River, upstream of East Creek confluence	TBC - -18.51	TBC - 144.11	
Downstream sites				
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	- 18.87 (TBC)	44.17 (TBC)	• Once every three months
W2	Copperfield River, 1.1 km downstream of KPH1	-18.8779	144.17	
KPH4	Copperfield River, 4.3 km downstream of KPH1	TBC - -18.51	TBC - 144.10	
W3	Copperfield River, 7.4 km downstream of KPH1	-18.82	144.17	
Pond 5	Copperfield River, 5.8 km downstream of KPH1	-18.83	144.17	
Copperfield Gorge	Approx. 50 km downstream of KPH1	TBC -	TBC -	

Commented [BC6]: Precise co-ordinates to be provided.

Commented [BC7]: Precise co-ordinates to be provided.

Commented [BC8]: Precise co-ordinates to be provided.

Commented [BC9]: Precise co-ordinates to be provided.

Table 7 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines
2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The evaluation report holder must develop and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is all underlying ground waters and the waters of Copperfield River, East Creek, Semi-permanent pools and the Copperfield Gorge. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <ul style="list-style-type: none"> Quarterly monitoring for: <ul style="list-style-type: none"> a) Surface water quality for contaminants listed in Table 4 - Receiving waters quality objectives; b) Sediment quality for contaminants listed in Table 7 - Default guideline values for sediment quality; c) Habitat assessment undertaken in accordance with the AusRivas methodology (DNRM, 2001); and d) Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. e) Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. f) Groundwater monitoring at the locations specified in Table 8 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River.
B24	A document that details the content of the REMP that addresses the requirements of conditions B22 and B23 must be prepared and provided to the entity with jurisdiction by 1 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ul style="list-style-type: none"> a) Potential impacts of the releases on the receiving environment, including downstream environmental values; b) The suitability of existing release limits to protect downstream environmental values; and, c) Any groundwater linkages and potential impacts on downstream environmental values.

Table 8 – Groundwater bore locations

Groundwater Bore	Location	
	Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)
BA06	TBC	TBC
BA07	TBC	TBC

Water monitoring reporting	
B26	<p>The following information must be recorded in relation to all water monitoring required under the conditions of this evaluation report and submitted to the entity with jurisdiction on request:</p> <ul style="list-style-type: none"> a) The date on which the sample was taken; b) The time at which the sample was taken; c) The monitoring point at which the sample was taken; d) The measured or estimated daily quantity of contaminated water released from the release point; e) The release volume at the time of sampling for the release point; and f) The results of all monitoring and details of any exceedances of the conditions of this evaluation report.
Notification of release event	
B27	<p>The entity with jurisdiction must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in Table 1 – Contaminated water release criteria at least 48 hours prior to a release commencing.</p>
B28	<p>The entity with jurisdiction must be notified by telephone and email of any release from the release point specified Table 1 – Contaminated water release criteria within 2 hours after the release has ceased.</p>
B29	<p>The entity with jurisdiction must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in Table 1 – Contaminated water release criteria. Notification must include the submission of written advice to the entity with jurisdiction of the following information:</p> <ul style="list-style-type: none"> a) Release commencement date/time; b) Details regarding the compliance of the release with the conditions of this evaluation report; c) Release volume and receiving water flow volume measured in accordance with Table 1 – Contaminated water release criteria. d) Release electrical conductivity, DO, temperature and pH.
B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.

Date : 4/03/2019 5:12:31 PM

From : "BOOY Caitlin"

To : "Melanie Harris"

Cc : "FARKAS Renee" , "FOMIATTI MINNESMA Ingrid" , "SHARPE Dean" , "Steven Tarte" , "TRELOAR Kirstie"

Subject : Kidston draft conditions

Attachment : KPH Draft Conditions 4 March 2019.docx;image001.png;image003.png;

Hi Mel,

Apologies for the delay, please see attached draft conditions for the KPH project.

Please note that these conditions are a work in progress and are being updated regularly. Additionally, all numbers provided are preliminary and are subject to changes following review of the additional information received last Friday (1 March 2019).

Should you have any further questions in relation to this, please contact me and I will be happy to assist.

Kind regards,
Caitlin



Caitlin Booy

Environmental Officer (Minerals)

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Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	<p>The holder of this evaluation report must:</p> <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by <<Insert date 3 months from date of issue>>
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report.
A6	<p>Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following:</p> <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction , undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>Where a condition of this evaluation report requires compliance with a standard, policy or guideline published externally to this evaluation report and the standard is amended or changed subsequent to the issue of this evaluation report, the holder of this evaluation report must:</p> <ul style="list-style-type: none"> a. comply with the amended or changed standard, policy or guideline within two years of the amendment or change being made, unless a different period is specified in the amended standard or relevant legislation; and b. until compliance with the amended or changed standard, policy or guideline is achieved, continue to remain in compliance with the corresponding provision that was current immediately prior to the relevant amendment or change.

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under these conditions.
B2	The release of contaminants to waters must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the evaluation report holder must measure and record the receiving waters stream discharge and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the evaluation report holder must measure and record the receiving waters stream discharge and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a contaminant limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in such waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)		Streamflow	Release Discharge
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.90	144.16	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow at WB is greater than (>) 5 m³/sec. Once the stream discharge is lower than (<) 5 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	TBA¹	TBA¹	Continuously during release events (minimum hourly) (m³/sec)	N/A	Contaminated water may only be released at KPH1 when stream discharge in the Copperfield River measured at WB is 200 times greater than the rate of release at KPH1 (m³/sec). Release rate must be calculated in real time. When the release occurs during minimum stream discharge in the Copperfield River (5 m³/sec), the maximum release rate is 0.18 m³/sec.

¹ Coordinates must be provided to the entity with jurisdiction prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Commented [BC1]: Precise co-ordinates to be provided.

Table 2 – Contaminant release limits (End of Pipe) *(all numbers preliminary, and are subject to changes)*

Contaminant ¹	Release Limit ² (for metals (µg/L) based on filtered samples)	Release Limit ² (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,400 ¹		Every fifteen (15) minutes during release and daily for one week following cessation of release.
pH (pH Unit)	6 - 8.5		
Dissolved oxygen (% sat)	>85 ²		
Sulfate (SO ₄ ²⁻) (mg/L)	2700 ¹		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ²		
Fluoride (mg/L)	3 ¹		
Aluminum	55 ³	240 ¹	
Arsenic	170 ¹	370 ¹	
Cadmium	30 ¹	50 ¹	
Chromium	1 ³	50 ⁵	
Cobalt	30 ¹	3600 ¹	
Copper	5 ¹	60 ¹	
Iron	300	310 ¹	
Lead	3.4 ³	180 ¹	
Manganese	2600 ¹	3700 ¹	
Mercury	0.06 ³	1 ⁵	
Molybdenum	65 ¹	130 ¹	
Nickel	40 ¹	51 ¹	
Selenium	5 ³	10 ⁵	
Uranium	0.5 ³	17 ⁵	
Vanadium	6 ³	10	
Zinc	1600 ¹	2400 ¹	
Cyanide as unionized HCN	7 ³		
Ammonia as N (mg/L)	0.9 ³		
Nitrate as N (mg/L)	5.5 ¹		
Total N (mg/L)	7 ¹		
Total P (mg/L)	0.03 ¹		
Major ions	For interpretation purposes and hardness modification of relevant toxicity triggers.		
Hardness			

Notes:

1 – Maximum of historical data used in the risk assessment process (Genex Intergrated Assessment Report; Table 13)

2 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 – ANZECC (2000) trigger value for 95% aquatic species protection – Table 3.4.1

4 – Hardness modified.

5 – Australian drinking water guideline.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters quality objectives .
B13	Water quality objectives specified in Table 4 - Receiving waters quality objectives must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	
KPH2	Copperfield River, (approx.) 1.9 km downstream of KPH1	- 18.87 (TBC)	44.17 (TBC)	<ul style="list-style-type: none"> Daily during release (the first sample must be taken within 2 hours of commencement of release); and Daily for one week following cessation of release.

Commented [BC2]: Precise co-ordinates to be provided.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters quality objectives *(all numbers preliminary, and are subject to changes)*

Contaminant	Water quality objectives
Electrical conductivity (µS/cm)	300 ¹
pH (pH Unit)	6-7.5 ²
Sulfate (SO ₄ ²⁻) (mg/L)	250 ³
Fluoride (mg/L)	1.5 ⁵
Chlorophyll a (cells/100ml)	5 ²
Major ions	For interpretation purposes
Hardness ⁹	
Turbidity (NTU)	For interpretation and general monitoring purposes
Dissolved Oxygen	
Total Ammonia N (mg/L)	0.9 ³
Nitrate as N (mg/L)	2.1
Total N (mg/L)	0.2 ²
Total P (mg/L)	0.01 ²
Cyanide as unionized HCN (µg/L)	7

Contaminant	Water quality objectives	
	Water quality objectives (Dissolved)	Water quality objectives (Total)
Aluminum (µg/L)	2900 ¹	4000 ¹
Arsenic (µg/L)	13 ³	13
Cadmium (µg/L)	0.2 ³	2 ⁵
Chromium (µg/L)	1.0 ³	50 ⁵
Cobalt (µg/L)	1.4 ⁴	25 ¹
Copper (µg/L)	5 ¹	9 ¹
Iron (µg/L)	300	750 ¹
Lead (µg/L)	3.4 ³	10 ⁵
Manganese (µg/L)	1900 ³	1900
Mercury (µg/L)	0.06 ^b	1 ⁵
Molybdenum (µg/L)	34 ⁴	34
Nickel (µg/L)	11 ³	20 ⁵
Selenium (µg/L)	5 ³	10 ⁵
Uranium (µg/L)	0.5 ³	17 ⁵
Vanadium (µg/L)	6 ³	100 ⁶
Zinc (µg/L)	8 ³	30 ¹

Notes:

1 – Site specific trigger value – 95th percentile of WB full dataset

2 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 - ANZECC (2000) trigger value for 95% aquatic species protection – Table 3.4.1

4 – Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)

5 – Australian drinking water guideline.

6 – Long term irrigation.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 4 - Receiving waters quality objectives .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .

B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the water quality objectives listed in Table 4 - Receiving waters quality objectives, the evaluation report holder must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ul style="list-style-type: none"> a) If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or b) If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ul style="list-style-type: none"> i. Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and ii. Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 4 - Receiving waters quality objectives; and iii. Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and iv. Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a water quality objective exceedance has occurred and is under investigation in accordance with B15(b)(iii) and B15(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B15(b)(iii).</p>
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Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	Receiving waters
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.90	144.16	Once within 24 hours prior to commencement of release; and
KPH 3	Copperfield River, upstream of East Creek confluence	TBC - -18.51	TBC - 144.11	Daily during release; and Once every two days for 6 days following cessation of release; and Monthly during stream flow.
Downstream site				
W2	Copperfield River, 1.1 km downstream of KPH1	-18.87	144.17	Once within 24 hours prior to commencement of release; and
KPH4	Copperfield River, 4.3 km downstream of KPH1	TBC - -18.51	TBC - 144.10	Daily during release; and Once every two days for 6 days following cessation of release; and
W3	Copperfield River, 7.4 km downstream of KPH1	-18.82	144.17	Monthly during stream flow.
Pond 5	Copperfield River, 5.8 km downstream of KPH1	-18.83	144.17	
Copperfield Gorge	Approx. 50 km downstream of KPH1	TBC -	TBC -	

Commented [BC3]: Precise co-ordinates to be provided.

Commented [BC4]: Precise co-ordinates to be provided.

Commented [BC5]: Precise co-ordinates to be provided.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 6 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 7 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 6 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 6 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 7 - Sediment contaminant default guideline values, the evaluation report holder must compare this result to monitoring results collected from a relevant control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 7 - Sediment contaminant default guideline values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B18(b)(iii) and B18(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B18(b)(iii).</p>

Table 6 - Sediment monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.90	144.16	• Once every three months
KPH 3	Copperfield River, upstream of East Creek confluence	TBC - -18.51	TBC - 144.11	
Downstream sites				
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	- 18.87 (TBC)	44.17 (TBC)	• Once every three months
W2	Copperfield River, 1.1 km downstream of KPH1	-18.8779	144.17	
KPH4	Copperfield River, 4.3 km downstream of KPH1	TBC - -18.51	TBC - 144.10	
W3	Copperfield River, 7.4 km downstream of KPH1	-18.82	144.17	
Pond 5	Copperfield River, 5.8 km downstream of KPH1	-18.83	144.17	
Copperfield Gorge	Approx. 50 km downstream of KPH1	TBC -	TBC -	

Commented [BC6]: Precise co-ordinates to be provided.

Commented [BC7]: Precise co-ordinates to be provided.

Commented [BC8]: Precise co-ordinates to be provided.

Commented [BC9]: Precise co-ordinates to be provided.

Table 7 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines
2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The evaluation report holder must develop and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is all underlying ground waters and the waters of Copperfield River, East Creek, Semi-permanent pools and the Copperfield Gorge. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <ul style="list-style-type: none"> Quarterly monitoring for: <ul style="list-style-type: none"> a) Surface water quality for contaminants listed in Table 4 - Receiving waters quality objectives; b) Sediment quality for contaminants listed in Table 7 - Default guideline values for sediment quality; c) Habitat assessment undertaken in accordance with the AusRivas methodology (DNRM, 2001); and d) Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. e) Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. f) Groundwater monitoring at the locations specified in Table 8 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River.
B24	A document that details the content of the REMP that addresses the requirements of conditions B22 and B23 must be prepared and provided to the entity with jurisdiction by 1 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ul style="list-style-type: none"> a) Potential impacts of the releases on the receiving environment, including downstream environmental values; b) The suitability of existing release limits to protect downstream environmental values; and, c) Any groundwater linkages and potential impacts on downstream environmental values.

Table 8 – Groundwater bore locations

Groundwater Bore	Location	
	Latitude (GDA94 MGA z55)	Longitude (GDA94 MGA z55)
BA06	TBC	TBC
BA07	TBC	TBC

Water monitoring reporting	
B26	<p>The following information must be recorded in relation to all water monitoring required under the conditions of this evaluation report and submitted to the entity with jurisdiction on request:</p> <ul style="list-style-type: none"> a) The date on which the sample was taken; b) The time at which the sample was taken; c) The monitoring point at which the sample was taken; d) The measured or estimated daily quantity of contaminated water released from the release point; e) The release volume at the time of sampling for the release point; and f) The results of all monitoring and details of any exceedances of the conditions of this evaluation report.
Notification of release event	
B27	<p>The entity with jurisdiction must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in Table 1 – Contaminated water release criteria at least 48 hours prior to a release commencing.</p>
B28	<p>The entity with jurisdiction must be notified by telephone and email of any release from the release point specified Table 1 – Contaminated water release criteria within 2 hours after the release has ceased.</p>
B29	<p>The entity with jurisdiction must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in Table 1 – Contaminated water release criteria. Notification must include the submission of written advice to the entity with jurisdiction of the following information:</p> <ul style="list-style-type: none"> a) Release commencement date/time; b) Details regarding the compliance of the release with the conditions of this evaluation report; c) Release volume and receiving water flow volume measured in accordance with Table 1 – Contaminated water release criteria. d) Release electrical conductivity, DO, temperature and pH.
B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.

Date : 12/03/2019 1:18:57 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Steven Tarte"

Cc : "SHARPE Dean" , "FARKAS Renee" , "BOOY Caitlin" , "Melanie Harris"

Subject : RE: Confirming supplementary material requirements

Attachment : image004.png;image008.png;image009.png;image011.png;image001.png;image002.jpg;image003.png;

Dear Steven,

I can confirm that sufficient information has been provided to set conditions for the Kidston Pumped Storage Hydro Project.

Additionally, DES proposes a workshop meeting date of 27 March 2019. This will ensure that there is sufficient time for AECOM to provide written comments by 18 March 2019 and DES to review comments prior to the workshop. Further ensuring that the conversation in the workshop are meaningful and productive and can lead to a finalised set of conditions.

Kind regards

Ingrid



Ingrid Fomiatti Minnesma

Director Minerals

Minerals & North Queensland Compliance | Environmental Services & Regulation

Department of Environment and Science

P 07 4222 5337 Facsimile: 07 4222 5070 Mobile: **Personal In**

Email: ingrid.fomiattiminnesma@des.qld.gov.au

5b Sheridan Street Cairns Q 4870

Postal address: PO Box 7230 Cairns Q 4870.



From: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Sent: Tuesday, 12 March 2019 10:25 AM

To: FOMIATTI MINNESMA Ingrid

Cc: SHARPE Dean; FARKAS Renee; BOOY Caitlin; Melanie Harris

Subject: FW: Confirming supplementary material requirements

Hi Ingrid,

Further to the email below, could you please confirm if DES has sufficient information to complete the draft set of conditions to regulate the proposed water releasees for the Kidston Pumped Storage Hydro project.

Your advice will inform the Coordinator-General's decision to accept the draft impact assessment report (including the supplementary material attached to this email) as the final impact assessment report. This means that no further substantial information is required to complete the evaluation of the project. Completion of the evaluation report would follow this decision.

Subject to your advice, we intend to provide briefing material to the Coordinator-General by Friday this week.

Please call if you wish to discuss.

Regards,



Steven Tarte

A/Director

Office of the Coordinator-General

Department of State Development,
Manufacturing, Infrastructure and Planning

P 07 3452 7455 M **Personal In**

Level 17, 1 William Street, Brisbane QLD 4000

PO Box 15009, City East QLD 4002

www.dsdmip.qld.gov.au

From: Melanie Harris

Sent: Friday, 1 March 2019 4:46 PM

To: FARKAS Renee <Renee.Farkas@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>
Cc: FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>; SHARPE Dean <Dean.Sharpe@des.qld.gov.au>; Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>; Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>; Emma Malone <Emma.Malone@coordinatorgeneral.qld.gov.au>; Tanya Lavett <Tanya.Lavett@coordinatorgeneral.qld.gov.au>
Subject: Fwd: Confirming supplementary material requirements

Good afternoon Renee and Caitlin

Attached is the supplementary material from Genex.

I will discuss timeframes etc with you early next week.

Kind regards

Melanie

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From: Lau, Rouven <rouven.lau@aecom.com>
Sent: Friday, March 1, 2019 4:18 pm
To: Steven Tarte; Melanie Harris
Cc: Arran McGhie; Craig Francis; Lee, Nicky
Subject: RE: Confirming supplementary material requirements

Good afternoon Steven and Mel,

Please find attached the IAR supplementary Information to address DES comments as well as clarifications on the queries raised in your email dated 22 February 2019.

We have also included the raw water quality data as requested.

If you have any question, please feel free to give me a call, otherwise I look forward to speaking on Tuesday.

Regards,

Rouven

Rouven Lau
Associate Director - Environment
D +61 7 4720 1583 M + (6) Personal Info
Rouven.Lau@aecom.com

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Please consider the environment before printing this email.

From: Steven Tarte [<mailto:Steven.Tarte@coordinatorgeneral.qld.gov.au>]
Sent: Friday, 22 February 2019 5:35 PM
To: Craig Francis; Lau, Rouven
Cc: Arran McGhie; Melanie Harris
Subject: Confirming supplementary material requirements

Hi Craig, Rouven,

Apologies for sending this through later than indicated.

OCG and DES have noted that there are a variety of different figures and some inconsistencies throughout the draft IAR (dated 11 January 2019). We are seeking clarification on the following information as supplementary information to the draft IAR:

- the capacity of the Eldridge and Wises Pits
 - e.g. page 16 of the IAR (11/1) states that Wises Pit can hold approximately 10 GL, but this page also states that the Wises Pit holds 8.5 GL. In Appendix K it states the Wises Pit will have a volume of 8.38 GL following the pumping of water from the Eldridge Pit. Similarly numbers vary throughout the document for the Eldridge Pit volumes.
- the estimated volume of water to be released to the Copperfield River from the Eldridge Pit for construction phase under different rainfall accumulation scenarios
- whether or not any other water may be required to be released during construction – and if yes, what is the source of that water (i.e. Eldridge Pit only or Eldridge + Wises at a dilution ration of 9:1);
- confirm the distance from the project site (proposed release point release point) to the start of the Copperfield Gorge at Einasleigh – it varies between 44.25, 44.98 and 50 km downstream (measured as “adopted middle thread distance” of the watercourse)

- clarify the current volumes of Wises and Eldridge pits following the recent rain events (and any subsequent changes to the construction phase release proposal)
- that the gorge at Einasleigh is called the Copperfield Gorge and the dam upstream of the project site is called Copperfield Dam – the names still vary within the document
- confirm quantity of waste rock/virgin rock and total extraction for the construction of Wises Pit (section 4.1.1 states 1.6m3 and 4.2.2.5 states 1.5m3). Confirm the location/use of the quantities e.g. for dam construction, relocation to existing WRD
- table 3 identifies construction phase from 2019-2022. Confirm timing for all construction activities in months/years.
- confirm capex for K2H project (originally being \$330 million).

To confirm, the above matters and each item that you have indicated in the attached spreadsheet as supplementary information, should form the 'supplementary material' to support the draft IAR.

DES have not identified any further information requirements to that which is set out above.

I look forward to receiving the supplementary material on 1 March 2019. Please send through any preliminary results to the water quality sampling for information.

Please call if you wish to discuss.

Regards,

Steven



Steven Tarte
A/Executive Director
Office of the Coordinator-General
Department of State Development,
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Date : 12/03/2019 1:18:57 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Steven Tarte"

Cc : "SHARPE Dean" , "FARKAS Renee" , "BOOY Caitlin" , "Melanie Harris"

Subject : RE: Confirming supplementary material requirements

Attachment : image004.png;image008.png;image009.png;image011.png;image001.png;image002.jpg;image003.png;

Dear Steven,

I can confirm that sufficient information has been provided to set conditions for the Kidston Pumped Storage Hydro Project.

Additionally, DES proposes a workshop meeting date of 27 March 2019. This will ensure that there is sufficient time for AECOM to provide written comments by 18 March 2019 and DES to review comments prior to the workshop. Further ensuring that the conversation in the workshop are meaningful and productive and can lead to a finalised set of conditions.

Kind regards

Ingrid



Ingrid Fomiatti Minnesma

Director Minerals

Minerals & North Queensland Compliance | Environmental Services & Regulation

Department of Environment and Science

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Email: ingrid.fomiattiminnesma@des.qld.gov.au

5b Sheridan Street Cairns Q 4870

Postal address: PO Box 7230 Cairns Q 4870.



From: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Sent: Tuesday, 12 March 2019 10:25 AM

To: FOMIATTI MINNESMA Ingrid

Cc: SHARPE Dean; FARKAS Renee; BOOY Caitlin; Melanie Harris

Subject: FW: Confirming supplementary material requirements

Hi Ingrid,

Further to the email below, could you please confirm if DES has sufficient information to complete the draft set of conditions to regulate the proposed water releasees for the Kidston Pumped Storage Hydro project.

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Subject to your advice, we intend to provide briefing material to the Coordinator-General by Friday this week.

Please call if you wish to discuss.

Regards,



Steven Tarte

A/Director

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From: Melanie Harris

Sent: Friday, 1 March 2019 4:46 PM

To: FARKAS Renee <Renee.Farkas@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>
Cc: FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>; SHARPE Dean <Dean.Sharpe@des.qld.gov.au>; Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>; Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>; Emma Malone <Emma.Malone@coordinatorgeneral.qld.gov.au>; Tanya Lavett <Tanya.Lavett@coordinatorgeneral.qld.gov.au>
Subject: Fwd: Confirming supplementary material requirements

Good afternoon Renee and Caitlin

Attached is the supplementary material from Genex.

I will discuss timeframes etc with you early next week.

Kind regards

Melanie

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From: Lau, Rouven <rouven.lau@aecom.com>
Sent: Friday, March 1, 2019 4:18 pm
To: Steven Tarte; Melanie Harris
Cc: Arran McGhie; Craig Francis; Lee, Nicky
Subject: RE: Confirming supplementary material requirements

Good afternoon Steven and Mel,

Please find attached the IAR supplementary Information to address DES comments as well as clarifications on the queries raised in your email dated 22 February 2019.

We have also included the raw water quality data as requested.

If you have any question, please feel free to give me a call, otherwise I look forward to speaking on Tuesday.

Regards,

Rouven

Rouven Lau
Associate Director - Environment
D +61 7 4720 1583 M (6) Personal Info
Rouven.Lau@aecom.com

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Please consider the environment before printing this email.

From: Steven Tarte [<mailto:Steven.Tarte@coordinatorgeneral.qld.gov.au>]
Sent: Friday, 22 February 2019 5:35 PM
To: Craig Francis; Lau, Rouven
Cc: Arran McGhie; Melanie Harris
Subject: Confirming supplementary material requirements

Hi Craig, Rouven,

Apologies for sending this through later than indicated.

OCG and DES have noted that there are a variety of different figures and some inconsistencies throughout the draft IAR (dated 11 January 2019). We are seeking clarification on the following information as supplementary information to the draft IAR:

- the capacity of the Eldridge and Wises Pits
 - e.g. page 16 of the IAR (11/1) states that Wises Pit can hold approximately 10 GL, but this page also states that the Wises Pit holds 8.5 GL. In Appendix K it states the Wises Pit will have a volume of 8.38 GL following the pumping of water from the Eldridge Pit. Similarly numbers vary throughout the document for the Eldridge Pit volumes.
- the estimated volume of water to be released to the Copperfield River from the Eldridge Pit for construction phase under different rainfall accumulation scenarios
- whether or not any other water may be required to be released during construction – and if yes, what is the source of that water (i.e. Eldridge Pit only or Eldridge + Wises at a dilution ration of 9:1);
- confirm the distance from the project site (proposed release point release point) to the start of the Copperfield Gorge at Einasleigh – it varies between 44.25, 44.98 and 50 km downstream (measured as “adopted middle thread distance” of the watercourse)

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- that the gorge at Einasleigh is called the Copperfield Gorge and the dam upstream of the project site is called Copperfield Dam – the names still vary within the document
- confirm quantity of waste rock/virgin rock and total extraction for the construction of Wises Pit (section 4.1.1 states 1.6m3 and 4.2.2.5 states 1.5m3). Confirm the location/use of the quantities e.g. for dam construction, relocation to existing WRD
- table 3 identifies construction phase from 2019-2022. Confirm timing for all construction activities in months/years.
- confirm capex for K2H project (originally being \$330 million).

To confirm, the above matters and each item that you have indicated in the attached spreadsheet as supplementary information, should form the 'supplementary material' to support the draft IAR.

DES have not identified any further information requirements to that which is set out above.

I look forward to receiving the supplementary material on 1 March 2019. Please send through any preliminary results to the water quality sampling for information.

Please call if you wish to discuss.

Regards,

Steven



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Date : 12/03/2019 3:58:43 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Steven Tarte"

Cc : "SHARPE Dean" , "FARKAS Renee" , "BOOY Caitlin" , "Melanie Harris"

Subject : RE: Confirming supplementary material requirements

Attachment :

image006.png;image010.png;image011.png;image018.png;image007.png;image009.jpg;image012.png;image013.png;image016.jpg;image017.png;

Thank you

I only see the value in meeting if we have written comments from the company by midday on Monday 18/3. I think we may need to meet on 20/3 by phone to explore any issues and consider any solutions before we meet and finalise any conditions. The aim of the final workshop would be to walk away with finalised and agreed conditions – so all decisions makers would need to be in the room.

It may be that we find that all conditions are agreeable on 20/3 and without a meeting in person on 27/3 which would be great. However that is generally not my experience.

Maybe we can have a conversation around the process from here?

Kind regards

Ingrid



Ingrid Fomiatti Minnesma

Director Minerals

Minerals & North Queensland Compliance | Environmental Services & Regulation
Department of Environment and Science

P 07 4222 5337 Facsimile: 07 4222 5070 Mobile: 5) Personal Inf

Email: ingrid.fomiattiminnesma@des.qld.gov.au

5b Sheridan Street Cairns Q 4870 Postal address: PO Box 7230 Cairns Q 4870.



From: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Sent: Tuesday, 12 March 2019 3:28 PM

To: FOMIATTI MINNESMA Ingrid

Cc: SHARPE Dean; FARKAS Renee; BOOY Caitlin; Melanie Harris

Subject: RE: Confirming supplementary material requirements

Thank you for confirming Ingrid, much appreciated.

Can I propose a slight alternative to the meeting arrangements. I would prefer to lock in the meeting for 20 March with the ability to move it to 27 March. The factor that would push the meeting to 27 March would be significant concern from the proponent (or many issues raised) that would require more time to consider before coming to a final position. We would check in with the proponent early on Monday to confirm and decide on the appropriate meeting date (in consultation with yourself).

Genex confirmed today that review and comments on the draft conditions would be their key priority.

Would you be OK with this approach?

Happy to discuss.

Steven



Steven Tarte

A/Director

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From: FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>

Sent: Tuesday, 12 March 2019 1:19 PM

File A

Page 61 of 161

To: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Cc: SHARPE Dean <Dean.Sharpe@des.qld.gov.au>; FARKAS Renee <Renee.Farkas@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>

Subject: RE: Confirming supplementary material requirements

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Email: ingrid.fomiattiminnesma@des.qld.gov.au

5b Sheridan Street Cairns Q 4870 Postal address: PO Box 7230 Cairns Q 4870.



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Sent: Tuesday, 12 March 2019 10:25 AM

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Cc: SHARPE Dean; FARKAS Renee; BOOY Caitlin; Melanie Harris

Subject: FW: Confirming supplementary material requirements

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Date : 15/03/2019 4:25:04 PM
From : "FARKAS Renee"
To : "FOMIATTI MINNESMA Ingrid"
Subject : Draft Conditions for Kidston Pumped Storage Hydro project
Attachment : KPH_draft conditions (DES 15March19).docx;

To: Steven.Tarte@coordinatorgeneral.qld.gov.au

Cc: Melanie.Harris@coordinatorgeneral.qld.gov.au; renee.farkas@des.qld.gov.au; dean.sharpe@des.qld.gov.au

Good afternoon Steven,

Please find attached the draft approval conditions which are recommended by DES for inclusion in the Evaluation Report for Kidston Pumped Storage Hydro project.

Kind regards,

Ingrid.

Published on DES Disclosure Log
RTI Act 2009

Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	The holder of this evaluation report must: <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by 1 May 2019.
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report .
A6	Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following: <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>All determinations of water and sediment quality, and biological monitoring must be performed by an appropriately qualified person.</p>

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under conditions of this evaluation report .
B2	The release of contaminated water must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a release limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	(GDA94 MGA z55)			Streamflow rate	Release Discharge
	Latitude	Longitude			
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.9051	144.1625	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow rate at WB is greater than (>) 5 m³/sec. Once the streamflow rate is less than (<) 5 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	-18.8870	144.1654	Hourly during release events (m³/sec)	N/A	Contaminated water may only be released at KPH1 when streamflow rate in the Copperfield River measured at WB is 200 times greater than the release discharge rate at KPH1 (m³/sec). When the release occurs during minimum streamflow in the Copperfield River (5 m³/sec), the maximum release discharge rate is 0.025 m³/sec. Release discharge rate must be calculated in real time.

¹ Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 2 – Contaminant release limits (End of Pipe)¹

Contaminant	Release Limit (for metals (µg/L) based on filtered ⁷ samples)	Release Limit (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,320 ²		Every fifteen (15) minutes during release
pH (pH Unit)	6 - 7.5 ²		
Dissolved oxygen (% sat)	>85 ¹		
Sulfate (SO ₄ ²⁻) (mg/L)	2690 ²		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ³		
Fluoride (mg/L)	3 ²		
Major ions	No limit - For interpretation purposes		
Hardness			
Ammonia as N (mg/L)	0.5 ⁴		
Nitrate as N (mg/L)	5.5 ²		
Total N (mg/L)	7 ²		
Total P (mg/L)	0.03 ²		
Cyanide as unionized HCN	7 ⁴		
Aluminium	55 ⁴	240 ²	
Arsenic	170 ²	370 ²	
Cadmium	30 ²	46 ²	
Chromium	1 ⁴	50 ⁵	
Cobalt	30 ²	3840 ²	
Copper	5 ²	200 ⁶	
Iron	300 ⁴	310 ²	
Lead	3.4 ⁴	190 ²	
Manganese	2860 ²	3770 ²	
Mercury	0.06 ⁴	1 ⁵	
Molybdenum	63 ²	125 ²	
Nickel	38 ²	51 ²	
Selenium	5 ⁴	10 ⁵	
Uranium	0.5 ⁴	17 ⁵	
Vanadium	6 ⁴	10 ²	
Zinc	1750 ²	2350 ²	

Notes:

1 – Notwithstanding the release limits stated in this table, receiving waters compliance limits stated in Table 4 must be met at the downstream compliance monitoring site.

2 - Maximum of historical data used in the risk assessment process (Genex Integrated Assessment Report; Table 13)

3 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4 – ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

5 – NWQMS (2011) Australian Drinking Water Guidelines

6 - ANZECC (2000) Long term irrigation

7. Samples that have been filtered through a 0.45µm filter.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters compliance limits .
B13	Receiving waters compliance limits specified in Table 4 - Receiving waters compliance limits must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	<ul style="list-style-type: none">• Daily during release (the first sample must be taken within 2 hours of commencement of each release); and• Daily for one week following cessation of each release.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters compliance limits

Contaminant	Receiving Waters Compliance Limit	
	for metals (µg/L), based on filtered ⁹ samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	300 ¹	
pH (pH Unit)	6.5 - 8.75 ²	
Sulfate (SO ₄ ²⁻) (mg/L)	250 ⁵	
Fluoride (mg/L)	1 ⁵	
Chlorophyll a (cells/100ml)	5 ²	
Major ions	No limit - For interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁶	
Nitrate as N (mg/L)	0.7 ³	
Total N (mg/L)	0.15 ²	
Total P (mg/L)	0.01 ²	
Cyanide as unionized HCN (µg/L)	7 ³	
Aluminum (µg/L)	2870 ¹	3950 ¹
Arsenic (µg/L)	13 ³	13 ⁸
Cadmium (µg/L)	0.2 ^{3,4}	2 ⁶
Chromium (µg/L)	1 ³	50 ⁶
Cobalt (µg/L)	2.8 ⁵	50 ⁷
Copper (µg/L)	5 ¹	200 ⁷
Iron (µg/L)	300 ³	750 ¹
Lead (µg/L)	3.4 ^{3,4}	10 ⁷
Manganese (µg/L)	1900 ³	1900 ⁸
Mercury (µg/L)	0.05 ³	1 ³
Molybdenum (µg/L)	34 ⁵	34 ⁸
Nickel (µg/L)	11 ^{3,4}	25 ¹
Selenium (µg/L)	5 ³	10 ⁶
Uranium (µg/L)	0.5 ³	17 ⁶
Vanadium (µg/L)	6 ³	100 ⁷
Zinc (µg/L)	8 ^{3,4}	2000 ⁷

Notes:

1 – Site specific value – 95th percentile of WB full dataset (Genex Intergrated Assessment Report; Table 20)

2 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 - ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

4- Hardness modification may be applied to the Compliance Limit for this toxicant based on analytical results of the collected sample.

5 – Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)

6 – Australian drinking water guideline.

7 – Long term irrigation.

8 – Where the filtered compliance limit is higher than the lowest applicable Receiving Waters Limit for total metals, the filtered number is applied.

9. Samples that have been filtered through a 0.45µm filter.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 6 - Receiving waters trigger values .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .
B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the trigger values listed in Table 6 - Receiving waters trigger values, the holder of this evaluation report must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 6 - Receiving waters trigger values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a Trigger Value exceedance has occurred and is under investigation in accordance with B17(b)(iii) and B17(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B17(b)(iii).</p>

Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		Receiving waters
		Latitude	Longitude	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.9051	144.1625	Once within 24 hours prior to commencement of release; and
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
Downstream site				
W2	Copperfield River, approx. 1.1 km downstream of KPH1	-18.8779	144.1702	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
KPH4	Copperfield River, approx. 4.3 km downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, approx. 7.4 km downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, approx. 5.8 km downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, approx. 48 km downstream of KPH1	-18.5082	144.1009	

Table 6 - Receiving waters trigger values

Contaminant	Trigger values	
	for metals (µg/L), based on filtered samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	200 ¹	
pH (pH Unit)	6.5 - 8.75 ¹	
Sulfate (SO ₄ ²⁻) (mg/L)	4 ¹	
Fluoride (mg/L)	1 ²	
Chlorophyll a (cells/100ml)	5 ³	
Major ions	No trigger value - for interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁴	
Nitrate as N (mg/L)	0.7 ⁵	
Total N (mg/L)	0.15 ³	
Total P (mg/L)	0.01 ³	
Cyanide as unionized HCN (µg/L)	7 ⁵	
Aluminum (µg/L)	570 ¹	1530 ¹
Arsenic (µg/L)	1 ¹	2 ¹
Cadmium (µg/L)	0.1 ¹	0.1 ¹
Chromium (µg/L)	1 ¹	1 ¹
Cobalt (µg/L)	1 ¹	2.5 ¹
Copper (µg/L)	3 ¹	5 ¹
Iron (µg/L)	210 ¹	435 ¹
Lead (µg/L)	1 ¹	1 ¹
Manganese (µg/L)	48	83 ¹
Mercury (µg/L)	0.05 ⁵	1 ⁴
Molybdenum (µg/L)	0.5 ¹	2.5 ¹
Nickel (µg/L)	0.5 ¹	3 ¹
Selenium (µg/L)	5 ¹	5 ¹
Uranium (µg/L)	0.5 ⁵	17 ⁴
Vanadium (µg/L)	6 ⁵	100 ²
Zinc (µg/L)	6 ¹	13 ¹

Notes:

1 – Site specific value – 80th percentile of WB full dataset (Genex Integrated Assessment Report; Table 20); or the laboratory limit of detection where the calculated 80th percentile is less than the limit of detection.

2 – ANZECC (2000) Long term irrigation

3- ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4- Australian drinking water guideline.

5- ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

6. Samples that have been filtered through a 0.45µm filter.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 7 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 8 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 7 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 7 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 8 - Sediment contaminant default guideline values, the holder of this evaluation report must compare this result to monitoring results collected from a relevant control site; and</p> <ul style="list-style-type: none"> a) If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or b) If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ul style="list-style-type: none"> i. Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and ii. Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 8 - Sediment contaminant default guideline values; and iii. Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and iv. Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B21(b)(iii) and B21(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B21(b)(iii).</p>

Table 7 - Sediment monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.9051	144.1625	• Once every three months
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	
Downstream sites				
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	• Once every three months
W2	Copperfield River, approx. 1.1 km downstream of KPH1	-18.8779	144.1702	
KPH4	Copperfield River, approx. 4.3 km downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, approx. 7.4 km downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, approx. 5.8 km downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, approx. 48 km downstream of KPH1	-18.5082	144.1009	

Table 8 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine water. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The holder of this evaluation report must develop, maintain, and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is the waters, including underlying groundwaters in alluvial and colluvium deposits, of the Copperfield River, East Creek, semi-permanent pools and the Copperfield Gorge at Einasleigh. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <p>Monthly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites:</p> <ul style="list-style-type: none"> a) Water quality for contaminants listed in Table 4 - Receiving waters compliance limits; b) Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. <p>Quarterly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites:</p> <ul style="list-style-type: none"> c) Sediment quality for contaminants listed in Table 8 - Sediment contaminant default guideline values; d) Habitat assessment undertaken in accordance with the AusRivas methodology (DNRM, 2001); and e) Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. f) Groundwater monitoring at the locations specified in Table 9 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River.
B24	A document that details the content of the REMP that addresses the requirements of conditions this evaluation report must be prepared and provided to the entity with jurisdiction by 1 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ul style="list-style-type: none"> a) Potential impacts of the releases on the receiving environment, including downstream environmental values; b) The suitability of existing release limits to protect downstream environmental values; and, c) Any groundwater linkages and potential impacts on downstream environmental values.

Table 9 – Groundwater bore locations

Groundwater Bore	Location	
	(GDA94 MGA z55)	
	Latitude	Longitude
BA06	-18.8880	144.1625
BA07	-18.8781	144.1677

Water monitoring reporting	
B26	<p>The following information must be recorded in relation to all water monitoring required under the conditions of this evaluation report and submitted to the entity with jurisdiction on request:</p> <ul style="list-style-type: none"> a) The date on which the sample was taken; b) The time at which the sample was taken; c) The monitoring point at which the sample was taken; d) The measured or estimated daily quantity of contaminated water released from the release point; e) The release volume at the time of sampling for the release point; and f) The results of all monitoring and details of any exceedances of the conditions of this evaluation report.
Notification of release event	
B27	<p>The entity with jurisdiction must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in Table 1 – Contaminated water release criteria at least 48 hours prior to a release commencing.</p>
B28	<p>The entity with jurisdiction must be notified by telephone and email of any release from the release point specified Table 1 – Contaminated water release criteria within 2 hours after the release has ceased.</p>
B29	<p>The entity with jurisdiction must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in Table 1 – Contaminated water release criteria. Notification must include the submission of written advice to the entity with jurisdiction of the following information, collected in accordance with the conditions of this evaluation report:</p> <ul style="list-style-type: none"> a) Release commencement date/time; b) Details regarding the compliance of the release with the conditions of this evaluation report; c) Release volume and receiving water flow volume measured in accordance with Table 1 – Contaminated water release criteria. d) Release electrical conductivity, DO, temperature and pH.

B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information, collected in accordance with the conditions of this evaluation report, to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.
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Schedule C - Definitions

‘contaminated water’ is water sourced from Eldridge Pit (during construction phase) or mixed water from both Eldridge and Wises Pit sourced from Wise Pit (during construction and operations).

‘evaluation report’ (OGC please insert definition)

‘entity with jurisdiction’ (OGC please insert definition) is the agency appointed by DSDIP that administers the evaluation report provisions under the *State Development and Public Works Organisation Act 1971*.

‘streamflow’ is the water flowing in the Copperfield River, arising from precipitation in the catchment of the Copperfield River, or from a release from the Copperfield Dam.

‘appropriately qualified person’ means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

‘EC’ means electrical conductivity

‘µS/cm’ means micro siemens per centimetre.

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Date : 15/03/2019 4:41:46 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Steven.Tarte@coordinatorgeneral.qld.gov.au" , "Melanie Harris" , "FARKAS Renee" , "SHARPE Dean" , "BOOY Caitlin"

Subject : Draft Conditions for Kidston Pumped Storage Hydro project

Attachment : KPH_draft conditions (DES 15March19).docx;image001.png;image005.png;image006.png;image007.jpg;

Good afternoon Steven,

Please find attached for your consideration, the draft approval conditions which are recommended by DES for inclusion in the Evaluation Report for Kidston Pumped Storage Hydro project.

Kind regards,

Ingrid



Ingrid Fomiatti Minnesma

Director Minerals

Minerals & North Queensland Compliance | Environmental Services & Regulation

Department of Environment and Science

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Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	The holder of this evaluation report must: <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by 1 May 2019.
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report .
A6	Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following: <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>All determinations of water and sediment quality, and biological monitoring must be performed by an appropriately qualified person.</p>

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under conditions of this evaluation report .
B2	The release of contaminated water must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a release limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	(GDA94 MGA z55)			Streamflow rate	Release Discharge
	Latitude	Longitude			
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.9051	144.1625	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow rate at WB is greater than (>) 5 m³/sec. Once the streamflow rate is less than (<) 5 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	-18.8870	144.1654	Hourly during release events (m³/sec)	N/A	Contaminated water may only be released at KPH1 when streamflow rate in the Copperfield River measured at WB is 200 times greater than the release discharge rate at KPH1 (m³/sec). When the release occurs during minimum streamflow in the Copperfield River (5 m³/sec), the maximum release discharge rate is 0.025 m³/sec. Release discharge rate must be calculated in real time.

¹ Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 2 – Contaminant release limits (End of Pipe)¹

Contaminant	Release Limit (for metals (µg/L) based on filtered ⁷ samples)	Release Limit (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,320 ²		Every fifteen (15) minutes during release
pH (pH Unit)	6 - 7.5 ²		
Dissolved oxygen (% sat)	>85 ¹		
Sulfate (SO ₄ ²⁻) (mg/L)	2690 ²		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ³		
Fluoride (mg/L)	3 ²		
Major ions	No limit - For interpretation purposes		
Hardness			
Ammonia as N (mg/L)	0.5 ⁴		
Nitrate as N (mg/L)	5.5 ²		
Total N (mg/L)	7 ²		
Total P (mg/L)	0.03 ²		
Cyanide as unionized HCN	7 ⁴		
Aluminium	55 ⁴	240 ²	
Arsenic	170 ²	370 ²	
Cadmium	30 ²	46 ²	
Chromium	1 ⁴	50 ⁵	
Cobalt	30 ²	3840 ²	
Copper	5 ²	200 ⁶	
Iron	300 ⁴	310 ²	
Lead	3.4 ⁴	190 ²	
Manganese	2860 ²	3770 ²	
Mercury	0.06 ⁴	1 ⁵	
Molybdenum	63 ²	125 ²	
Nickel	38 ²	51 ²	
Selenium	5 ⁴	10 ⁵	
Uranium	0.5 ⁴	17 ⁵	
Vanadium	6 ⁴	10 ²	
Zinc	1750 ²	2350 ²	

Notes:

1 – Notwithstanding the release limits stated in this table, receiving waters compliance limits stated in Table 4 must be met at the downstream compliance monitoring site.

2 - Maximum of historical data used in the risk assessment process (Genex Integrated Assessment Report; Table 13)

3 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4 – ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

5 – NWQMS (2011) Australian Drinking Water Guidelines

6 - ANZECC (2000) Long term irrigation

7. Samples that have been filtered through a 0.45µm filter.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters compliance limits .
B13	Receiving waters compliance limits specified in Table 4 - Receiving waters compliance limits must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	<ul style="list-style-type: none">• Daily during release (the first sample must be taken within 2 hours of commencement of each release); and• Daily for one week following cessation of each release.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters compliance limits

Contaminant	Receiving Waters Compliance Limit	
	for metals (µg/L), based on filtered ⁹ samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	300 ¹	
pH (pH Unit)	6.5 - 8.75 ²	
Sulfate (SO ₄ ²⁻) (mg/L)	250 ⁵	
Fluoride (mg/L)	1 ⁵	
Chlorophyll a (cells/100ml)	5 ²	
Major ions	No limit - For interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁶	
Nitrate as N (mg/L)	0.7 ³	
Total N (mg/L)	0.15 ²	
Total P (mg/L)	0.01 ²	
Cyanide as unionized HCN (µg/L)	7 ³	
Aluminum (µg/L)	2870 ¹	3950 ¹
Arsenic (µg/L)	13 ³	13 ⁸
Cadmium (µg/L)	0.2 ^{3,4}	2 ⁶
Chromium (µg/L)	1 ³	50 ⁶
Cobalt (µg/L)	2.8 ⁵	50 ⁷
Copper (µg/L)	5 ¹	200 ⁷
Iron (µg/L)	300 ³	750 ¹
Lead (µg/L)	3.4 ^{3,4}	10 ⁷
Manganese (µg/L)	1900 ³	1900 ⁸
Mercury (µg/L)	0.05 ³	1 ³
Molybdenum (µg/L)	34 ⁵	34 ⁸
Nickel (µg/L)	11 ^{3,4}	25 ¹
Selenium (µg/L)	5 ³	10 ⁶
Uranium (µg/L)	0.5 ³	17 ⁶
Vanadium (µg/L)	6 ³	100 ⁷
Zinc (µg/L)	8 ^{3,4}	2000 ⁷

Notes:

1 – Site specific value – 95th percentile of WB full dataset (Genex Intergrated Assessment Report; Table 20)

2 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

3 - ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

4- Hardness modification may be applied to the Compliance Limit for this toxicant based on analytical results of the collected sample.

5 – Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)

6 – Australian drinking water guideline.

7 – Long term irrigation.

8 – Where the filtered compliance limit is higher than the lowest applicable Receiving Waters Limit for total metals, the filtered number is applied.

9. Samples that have been filtered through a 0.45µm filter.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 6 - Receiving waters trigger values .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .
B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the trigger values listed in Table 6 - Receiving waters trigger values, the holder of this evaluation report must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 6 - Receiving waters trigger values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a Trigger Value exceedance has occurred and is under investigation in accordance with B17(b)(iii) and B17(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B17(b)(iii).</p>

Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		Receiving waters
		Latitude	Longitude	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.9051	144.1625	Once within 24 hours prior to commencement of release; and
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
Downstream site				
W2	Copperfield River, approx. 1.1 km downstream of KPH1	-18.8779	144.1702	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
KPH4	Copperfield River, approx. 4.3 km downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, approx. 7.4 km downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, approx. 5.8 km downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, approx. 48 km downstream of KPH1	-18.5082	144.1009	

Table 6 - Receiving waters trigger values

Contaminant	Trigger values	
	for metals (µg/L), based on filtered samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	200 ¹	
pH (pH Unit)	6.5 - 8.75 ¹	
Sulfate (SO ₄ ²⁻) (mg/L)	4 ¹	
Fluoride (mg/L)	1 ²	
Chlorophyll a (cells/100ml)	5 ³	
Major ions	No trigger value - for interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁴	
Nitrate as N (mg/L)	0.7 ⁵	
Total N (mg/L)	0.15 ³	
Total P (mg/L)	0.01 ³	
Cyanide as unionized HCN (µg/L)	7 ⁵	
Aluminum (µg/L)	570 ¹	1530 ¹
Arsenic (µg/L)	1 ¹	2 ¹
Cadmium (µg/L)	0.1 ¹	0.1 ¹
Chromium (µg/L)	1 ¹	1 ¹
Cobalt (µg/L)	1 ¹	2.5 ¹
Copper (µg/L)	3 ¹	5 ¹
Iron (µg/L)	210 ¹	435 ¹
Lead (µg/L)	1 ¹	1 ¹
Manganese (µg/L)	48	83 ¹
Mercury (µg/L)	0.05 ⁵	1 ⁴
Molybdenum (µg/L)	0.5 ¹	2.5 ¹
Nickel (µg/L)	0.5 ¹	3 ¹
Selenium (µg/L)	5 ¹	5 ¹
Uranium (µg/L)	0.5 ⁵	17 ⁴
Vanadium (µg/L)	6 ⁵	100 ²
Zinc (µg/L)	6 ¹	13 ¹

Notes:

1 – Site specific value – 80th percentile of WB full dataset (Genex Integrated Assessment Report; Table 20); or the laboratory limit of detection where the calculated 80th percentile is less than the limit of detection.

2 – ANZECC (2000) Long term irrigation

3- ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4- Australian drinking water guideline.

5- ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

6. Samples that have been filtered through a 0.45µm filter.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 7 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 8 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 7 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 7 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 8 - Sediment contaminant default guideline values, the holder of this evaluation report must compare this result to monitoring results collected from a relevant control site; and</p> <ul style="list-style-type: none"> a) If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or b) If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ul style="list-style-type: none"> i. Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and ii. Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 8 - Sediment contaminant default guideline values; and iii. Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and iv. Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B21(b)(iii) and B21(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B21(b)(iii).</p>

Table 7 - Sediment monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
Control sites ¹				
WB	Copperfield River, 2 km upstream of KPH1	-18.9051	144.1625	• Once every three months
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	
Downstream sites				
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	• Once every three months
W2	Copperfield River, approx. 1.1 km downstream of KPH1	-18.8779	144.1702	
KPH4	Copperfield River, approx. 4.3 km downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, approx. 7.4 km downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, approx. 5.8 km downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, approx. 48 km downstream of KPH1	-18.5082	144.1009	

Table 8 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine water. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The holder of this evaluation report must develop, maintain, and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is the waters, including underlying groundwaters in alluvial and colluvium deposits, of the Copperfield River, East Creek, semi-permanent pools and the Copperfield Gorge at Einasleigh. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <p>Monthly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites:</p> <ol style="list-style-type: none"> Water quality for contaminants listed in Table 4 - Receiving waters compliance limits; Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. <p>Quarterly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites:</p> <ol style="list-style-type: none"> Sediment quality for contaminants listed in Table 8 - Sediment contaminant default guideline values; Habitat assessment undertaken in accordance with the AusRivas methodology (DNRM, 2001); and Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. Groundwater monitoring at the locations specified in Table 9 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River.
B24	A document that details the content of the REMP that addresses the requirements of conditions this evaluation report must be prepared and provided to the entity with jurisdiction by 1 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ol style="list-style-type: none"> Potential impacts of the releases on the receiving environment, including downstream environmental values; The suitability of existing release limits to protect downstream environmental values; and, Any groundwater linkages and potential impacts on downstream environmental values.

Table 9 – Groundwater bore locations

Groundwater Bore	Location	
	(GDA94 MGA z55)	
	Latitude	Longitude
BA06	-18.8880	144.1625
BA07	-18.8781	144.1677

Water monitoring reporting	
B26	<p>The following information must be recorded in relation to all water monitoring required under the conditions of this evaluation report and submitted to the entity with jurisdiction on request:</p> <ul style="list-style-type: none"> a) The date on which the sample was taken; b) The time at which the sample was taken; c) The monitoring point at which the sample was taken; d) The measured or estimated daily quantity of contaminated water released from the release point; e) The release volume at the time of sampling for the release point; and f) The results of all monitoring and details of any exceedances of the conditions of this evaluation report.
Notification of release event	
B27	<p>The entity with jurisdiction must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in Table 1 – Contaminated water release criteria at least 48 hours prior to a release commencing.</p>
B28	<p>The entity with jurisdiction must be notified by telephone and email of any release from the release point specified Table 1 – Contaminated water release criteria within 2 hours after the release has ceased.</p>
B29	<p>The entity with jurisdiction must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in Table 1 – Contaminated water release criteria. Notification must include the submission of written advice to the entity with jurisdiction of the following information, collected in accordance with the conditions of this evaluation report:</p> <ul style="list-style-type: none"> a) Release commencement date/time; b) Details regarding the compliance of the release with the conditions of this evaluation report; c) Release volume and receiving water flow volume measured in accordance with Table 1 – Contaminated water release criteria. d) Release electrical conductivity, DO, temperature and pH.

B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information, collected in accordance with the conditions of this evaluation report, to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.
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Schedule C - Definitions

'contaminated water' is water sourced from Eldridge Pit (during construction phase) or mixed water from both Eldridge and Wises Pit sourced from Wise Pit (during construction and operations).

'evaluation report' (OGC please insert definition)

'entity with jurisdiction' (OGC please insert definition) is the agency appointed by DSDIP that administers the evaluation report provisions under the *State Development and Public Works Organisation Act 1971*.

'streamflow' is the water flowing in the Copperfield River, arising from precipitation in the catchment of the Copperfield River, or from a release from the Copperfield Dam.

'appropriately qualified person' means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

'EC' means electrical conductivity

'µS/cm' means micro siemens per centimetre.

Published on DES Disclosure Log
RTI Act 2009

Kidston meeting w Client + OCG 20/03/19
IFM, Caitlin Boyd, Dean Sharpe, ~ 2.30pm
Kirstie Treleear, Phil Harris, Steven Tarte,

James
Harding
also in
attendance

-Confirmed
by OCG.
28/03/19
Caitlin

Rouven Lau, Arran McGhie, Craig Francis,
Rosemary Shearman, Emma Matone, Tanya
~~Lavett~~, Cathie Page, Nicky Lee, Reece
Fraser, Sonia Claus (3pm).

NL: (Aecom).

• WB VS W2.

↳ TSF, butchers crk, contaminants
impacting on W2.

↳ W/o releases there will be exceed-
ances at W2.

↳ Best baseline data W2.

IFM: W2 data in context in 1:200 dilution
Are you looking at when there are
releases. ~~Wait~~ No releasing and still
exceeding but can't do anything.

NL: Exercise done was on W2.

IFM: W2 during flow is different.

NL: 1:200 dilution based on W2.

IFM: Need to take on notice, we think
all work is based on WB.

NL: Not the case.

IFM: Table 92 + 93 in IAR. based on
~~W2~~ W2?

NL: Yes.

IFM: If we go down W2, it won't change
numbers in table, what does it change?

NL: As conditions stand we can't meet
them.

IFM: KPH2 is agreed on based on 1:200.
Are some of the numbers too low?

NL: Some of them.

IFM: So you're saying you want to
meet back to W2. Your issue is
you want to compare to W2 not
WB.

NL: When contaminant limits have been
calculated with WB. Limits in
Table 4 + 6 have been calculated

with WB.

IFM: You're saying 95th for W2.

NL: We're looking at 99th for W2.

IFM: If W2 is impacted you don't want to cause any more time. WP during flow events, ~~it~~ does W2 data show that.

NL: Reece? W2 during flow.

RF: NO real link between contaminants and flow

IFM: Not sure we will conclude today, may need Sonia. I see what you're pointing out, I'm not convinced that's the way to go.

X: We've assessed based on W2.

IFM: We've conditioned based on a non-impacted site, because combined impacts should be considered.

NL: We can't possibly meet that.

IFM: the WPO of using W2 quality meeting W2 downstream - so you won't have an impact.

NL: Eg. A1 contaminant limit set at WB, there's a WPO that's been identified(?) i.e. s-spec.

IFM: WPO for A1 is low, I don't think. A1 is a good example. What I'm hearing is we want to maintain [W2].

NL: Yes

DS: Is there clarity in terms of the site at W2 based on the site and flow. [W2]

X: The only time we sample W2 is during flows.

DS: That's what I'm asking

IFM: How appropriate is that.

DS: That's mine affected water.

NL: Yes.

IFM: What you're asking is that after is been affected by mine affected water and you want to ~~pollute~~ pollute to that.

AM: Not impacting those WQOs.

IFM: I think we can't come to an agreement today.

DS: You're happy with compliance limits though?

NL: For most.

IFM: We need more justification, I get some of it but not all, an email or explanatory notes.

DS: Need a bit more.

NL: I agree

IFM: If we can get that by Friday

NL: Lets move on. Location of KPH₁ will need to be changed and KPH₂ needs to be moved.

IFM: Happy to move KPH₁, but CORMIX modelling shows a mixing zone of ~700m. ~~and~~ we gave a bit extra (~2km). Not prepared to move KPH₂

NL: we will take that on board.

? : Can you please explain that a bit more.

IFM: If mixing zone is ~700m we put one at 700m downstream. We settled on KPH₂ because of accessibility. As long as distance between KPH₁ and KPH₂ is > 700m I don't think we will move.

AM

*: OK thank you.

Sonia dials in ~3pm.

ST.

AMT: I understood from the start that it was made clear that we would use W2 as the baseline

SC: My understanding was that WQOs were used on WB but dilution was based on W2.

NL: Were we proposed site-spec were W2

RF: No we used WB but we used W2 for assimilative capacity

SC: What that means is that EOP is mixed with W2 what dilution is required to meet WB or ANZECC. That's why we asked for all the additional information.

NL: We're not disputing that.

SC: No but you're using the assimilative capacity and W2. WQOs are based on WB.

RF: In the circumstance where we will exceed at W2 without releases.

SC: Your modelling suggests that you should meet WQOs.

NL: A lot of them are defaults

IFM: Do we all agree that table 92 + 93 WQO that we're aiming for is based on WB or ANZECC. Your modelling shows W2(1):200 mix will meet WQOs. If table 92 and 93 are correct then we don't have a problem.

NL: We will consider and come back to you.

IFM: We need to decide if the WQOs agreed on previously than the modelling needs to be redone.

SC: Table 92 + 93 didn't have all the indicators in it. ~~The~~ The indicators you're proposing to change required less dilution than zinc (eg).

IFM: Task 1 - look at table 92 + 93
to are we happy.

Task 2 - go back to these indicators and confirm they need less dilution than zinc. Can you confirm by end of the week.

NL: I guess should be fine.

IFM: If we do want to meet on Wednesday we need to fundamentally agree.

NL: Move onto monitoring locations.

RF: Talked about moving release point. Set points for compliance downstream except W2. (trigger values). All we're asking is to remove W2 from trigger values.

IFM: Intent of including that point was to be a trigger, is the dilution working. If you don't meet at W2, we won't "hit over the head" just an ~~indicator~~ indicator that you won't meet.

SC: Intent of W2 was to identify if you will meet WQOs at KPH2.

IFM: We may need to reframe. We want to keep ~~it~~ it in. ~~but~~ We will take on board.

RF: With trigger values, compare d-stream to u-stream, ~~do~~ if D > U then investigate. Would be better if we compare to a point

immediately upstream of the RP.
SC: What do you mean by upstream.

RF: further down than WB but before RPH.

IFM: Need to go back to modelling again, we're aiming for WBS based on WB.

SC: What you're saying is that background would be impacted.

IFM: All comes back to if table 92+93 RL are correct.

AM: For triggers - how do you expect the proponent to understand other influences.

IFM: Modelling does that already. If we all still agree on the tables. If it stands that it will all be fine.

RL/SR: If there is an exceedance downstream who will be responsible. Genex or Genex and energy.

IFM: You are at liberty to prove that might be part of the investigation if D~~S~~WB than no further ~~investi~~ action. If D~~S~~WB than you propose who.

RL: RF: Next point is about frequency. B23. Biological monitoring, we want to get rid of biological monitoring. It's an ephemeral system. If it's possible to get in at end of wet season.

IFM: If we say qtrly / monthly. There's a difference between biological monitoring. I think we're looking at refugia monitoring. Certainly not looking for once a year.

RF: I think we have that in the REMP.

IFM: let us have a look if you wouldn't mind.

RF: I think that's all.

IFM: If table 92 + 93 stand then I think we're very close and may not need to meet. If they don't then we have a problem.

ST: Please let me know how long it would take to look at that.

AM: tomorrow.

IFM: On face value if 92 + 93 are correct then we won't need to meet. I don't think the other issues are too hard to fix. Probably don't need to meet.

ST: Sounds good, happy Arran?

AM: Yes

sch4p4(6) Personal Information

Close at 3:30

Date : 26/03/2019 2:01:56 PM
From : "FOMIATTI MINNESMA Ingrid"
To : "Steven Tarte"
Cc : "Fraser, Reece", "Lee, Nicky", "Melanie Harris", "Arran McGhie", "SHARPE Dean", "James Harding", "BOOY Caitlin", "BOOY Caitlin", "TRELOAR Kirstie", "Rosemary Shearman", "Tanya Lavett", "Emma Malone", "Lau, Rouven"
Subject : Actions from draft conditions discussion for K2H project
Attachment : KPH_draft conditions (DES 25 March 19).docx;image009.png;image011.png;image012.jpg;image013.jpg;image014.jpg;image015.png;image016.png;image017.png;image018.jpg;image001.png;image006.png;image002.png;image008.jpg;image010.png;
Dear Steven,

Please see attached revised conditions for the Kidston Hydro Project.

The suggested amendments that AECOM sent through on Friday are not supported. This is specifically in relation to **Table 1, Table 4 and Table 6**.

The changes to the release criteria in **Table 1** are not supported for the following reasons;

- KPH1 is the only authorised release point for the project, as such it is not appropriate to remove this from the release discharge criteria;
- To account for uncertainty in the calculation of volumetric flow, the minimum flow rate has been increased to 5m³/sec from 4.63m³/sec;
- Stream flow rate and discharge release rate has been defined in m³/sec rather than ML/day to ensure that the minimum dilution ratio is met every hour not averaged over the day.

The limits and triggers that they have proposed in **Table 4 and Table 6** are, in most cases, lower than ANZECC toxicant trigger values and what was proposed by DES. This is different to what was proposed and assessed in the IAR and it is unclear whether Genex would be able to meet these trigger values.

The TN and TP limits proposed in Table 4 are not supported. DES would be amenable to revising the compliance limit for TN of 0.35 mg/L and 0.04 mg/L for TP, based on Table 92 and Table 93 of the IAR, Table 2 in the Algae memo and Table 8 in the Supplementary IAR. DES is accepting of these as proposed interim limits, with a requirement to provide site-specific limits for these parameters by **1 September 2020**.

Furthermore, values for total concentrations of Arsenic, Manganese and Molybdenum in **Table 4 and Table 6** and Iron in **Table 6** are lower than the dissolved fraction. This should never be the case.

All remaining issues raised by AECOM can be accepted, specifically the removal of W2 from the downstream trigger sites, and the frequency of biological monitoring. W2 is now included as an 'interpretation site' and no investigation will be required should a trigger value be exceeded. Macroinvertebrate frequency has been amended as per our discussions last Wednesday.

Regards,



Ingrid Fomiatti Minnesma
Director Minerals
Minerals & North Queensland Compliance | Environmental Services & Regulation
Department of Environment and Science
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5b Sheridan Street Cairns Q 4870 Postal address: PO Box 7230 Cairns Q 4870.



From: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>
Sent: Friday, March 22, 2019 3:26 PM
To: Lau, Rouven
Cc: Fraser, Reece; Lee, Nicky; Melanie Harris; FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone
Subject: RE: Actions from draft conditions discussion for K2H project

Hi Rouven,

Thank you for sending through the updated comments on the draft conditions.

DES are currently reviewing your proposed changes and intend to provide a response on Monday. If needed, we can then reconvene by teleconference on Wednesday as scheduled.

If you have any questions, please don't hesitate to call.

Regards,

Steven



Steven Tarte
A/Director
Office of the Coordinator-General
Department of State Development,
Manufacturing, Infrastructure and Planning
P 07 3452 7455 M **Personal**
Level 17, 1 William Street QLD 4000
PO Box 15009, City East QLD 4002
www.dsdmip.qld.gov.au

From: Lau, Rouven <Rouven.Lau@aecom.com>
Sent: Thursday, 21 March 2019 7:17 PM
To: Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>; FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>; Arran McGhie <am@genexpower.com.au>; SHARPE Dean <Dean.Sharpe@des.qld.gov.au>; James Harding <jh@genexpower.com.au>; Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; TRELOAR Kirstie <Kirstie.Treloar@des.qld.gov.au>; Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>; Emma Malone <Emma.Malone@coordinatorgeneral.qld.gov.au>; Tanya Lavett <Tanya.Lavett@coordinatorgeneral.qld.gov.au>
Cc: Fraser, Reece <Reece.Fraser@aecom.com>; Lee, Nicky <nicky.lee@aecom.com>
Subject: RE: Actions from draft conditions discussion for K2H project

Good afternoon everyone,

We have undertaken the review of Tables 92 and 93 in the IAR and confirm that WQOs and figures remain unchanged.

Please find attached the updated comments to the draft conditions, including the proposed updates to Table 4 and Table 6 as follows:

1. For the compliance limits set out in Table 4 of the conditions, we have applied the WQOs, as used in the impact assessment (refer to the **attached** WQO Summary Table which lists the WQO for each parameter, the source and the reference within the IAR document). These WQOs are a combination of default values from various guideline values and where appropriate, site-specific values derived as part of the assessment of baseline water quality in the Copperfield River. The only new values proposed (i.e. not presented in the IAR) are interim values for Total Nitrogen (TN) and Total Phosphorus (TP). As established in communications between AECOM and DES in February 2019, the default WQO for TN (0.15 mg/L) is not suitable for the Copperfield River catchment. Similarly, baseline TP values are also elevated across the catchment. Interim site-specific WQOs have been assessed as 0.648 mg/L for TN and 0.054 mg/L for TP, based on the results of extensive additional monitoring undertaken in February 2019 (refer to Section 3.0 of the Supplementary IAR Information Report). It is proposed that these values be finalised following additional baseline monitoring.
2. For the trigger values set out in Table 6 of the conditions, we have applied a value which is set at 80% of the WQOs listed in Table 4. This approach is considered to provide early warning of a parameter approaching the WQO, and therefore requiring further investigation.

I will provide estimated coordinates for the release point tomorrow, noting that these may need to be refined during the detailed design period.

As always, any questions please feel free to give me a call.

Regards,

Rouven

Rouven Lau
Associate Director - En
D +61 7 4720 1583 M **Personal I**
Rouven.Lau@aecom.com

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From: Melanie Harris [<mailto:Melanie.Harris@coordinatorgeneral.qld.gov.au>]
Sent: Thursday, 21 March 2019 10:08 AM
To: FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; Steven Tarte; BOOY Caitlin; Lau, Rouven; Lee, Nicky; Fraser, Reece; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Emma Malone; Tanya Lavett
Subject: Actions from draft conditions discussion for K2H project

Good morning everyone,

Please find the actions from yesterday's discussion below.

- The proponent to review Tables 92 and 93 in the IAR to confirm that WQOs and figures are appropriate (i.e. based on ANZECC and WB as previously discussed). Response to be provided to DES/OCG by Friday 22 March 2019. The proponent has since confirmed that a response will be provided today.
- Proponent to provide coordinates for the release point.
- DES to review/amend conditions to ensure that it is clear that W2 is to be used for an early warning monitoring point upstream of the receiving environment compliance limits.
- DES to review/amend the wording for biological modelling to ensure the requirements better reflect an ephemeral stream (i.e. six weeks following a major flow event).

Kind regards,

Mel

 Melanie Harris
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Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	The holder of this evaluation report must: <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by 1 May 2019.
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report .
A6	Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following: <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>All determinations of water and sediment quality, and biological monitoring must be performed by an appropriately qualified person.</p>

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under conditions of this evaluation report .
B2	The release of contaminated water must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a release limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	(GDA94 MGA z55)			Streamflow rate	Release Discharge
	Latitude	Longitude			
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.9051	144.1625	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow rate at WB is greater than (>) 5 m³/sec. Once the streamflow rate is less than (<) 5 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	TBA¹	TBA¹	Hourly during release events (m³/sec)	N/A	Contaminated water may only be released at KPH1 when streamflow rate in the Copperfield River measured at WB is 200 times greater than the release discharge rate at KPH1 (m³/sec). When the release occurs during minimum streamflow in the Copperfield River (5 m³/sec), the maximum release discharge rate is 0.025 m³/sec. Release discharge rate must be calculated in real time.

¹ Coordinates must be provided to the **entity with jurisdiction** by 1 May 2019.

Table 2 – Contaminant release limits (End of Pipe)¹

Contaminant	Release Limit (for metals (µg/L) based on filtered ⁷ samples)	Release Limit (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,320 ²		Every fifteen (15) minutes during release
pH (pH Unit)	6 - 7.5 ²		
Dissolved oxygen (% sat)	>85 ¹		
Sulfate (SO ₄ ²⁻) (mg/L)	2690 ²		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ³		
Fluoride (mg/L)	3 ²		
Major ions	No limit - For interpretation purposes		
Hardness			
Ammonia as N (mg/L)	0.5 ⁴		
Nitrate as N (mg/L)	5.5 ²		
Total N (mg/L)	7 ²		
Total P (mg/L)	0.03 ²		
Cyanide as unionized HCN	7 ⁴		
Aluminium	55 ⁴	240 ²	
Arsenic	170 ²	370 ²	
Cadmium	30 ²	46 ²	
Chromium	1 ⁴	50 ⁵	
Cobalt	30 ²	3840 ²	
Copper	5 ²	200 ⁶	
Iron	300 ⁴	310 ²	
Lead	3.4 ⁴	190 ²	
Manganese	2860 ²	3770 ²	
Mercury	0.06 ⁴	1 ⁵	
Molybdenum	63 ²	125 ²	
Nickel	38 ²	51 ²	
Selenium	5 ⁴	10 ⁵	
Uranium	0.5 ⁴	17 ⁵	
Vanadium	6 ⁴	10 ²	
Zinc	1750 ²	2350 ²	

Notes:

1 – Notwithstanding the release limits stated in this table, receiving waters compliance limits stated in Table 4 must be met at the downstream compliance monitoring site.

2 - Maximum of historical data used in the risk assessment process (Genex Impact Assessment Report; Table 13)

3 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4 – ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

5 – NWQMS (2011) Australian Drinking Water Guidelines

6 - ANZECC (2000) Long term irrigation

7. Samples that have been filtered through a 0.45µm filter.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters compliance limits .
B13	Receiving waters compliance limits specified in Table 4 - Receiving waters compliance limits must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	<ul style="list-style-type: none">• Daily during release (the first sample must be taken within 2 hours of commencement of each release); and• Daily for one week following cessation of each release.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters compliance limits

Contaminant	Receiving Waters Compliance Limit	
	for metals (µg/L), based on filtered ⁹ samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	300 ¹	
pH (pH Unit)	6.5 - 8.75 ²	
Sulfate (SO ₄ ²⁻) (mg/L)	250 ⁵	
Fluoride (mg/L)	1 ⁵	
Chlorophyll a (cells/100ml)	5 ²	
Major ions	No limit - For interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁶	
Nitrate as N (mg/L)	0.7 ³	
Total N (mg/L)	0.35 ¹⁰	
Total P (mg/L)	0.04 ¹⁰	
Cyanide as unionized HCN (µg/L)	7 ³	
Aluminum (µg/L)	2870 ¹	3950 ¹
Arsenic (µg/L)	13 ³	13 ⁸
Cadmium (µg/L)	0.2 ^{3,4}	2 ⁶
Chromium (µg/L)	1 ³	50 ⁶
Cobalt (µg/L)	2.8 ⁵	50 ⁷
Copper (µg/L)	5 ¹	200 ⁷
Iron (µg/L)	300 ³	750 ¹
Lead (µg/L)	3.4 ^{3,4}	10 ⁷
Manganese (µg/L)	1900 ³	1900 ⁸
Mercury (µg/L)	0.05 ³	1 ³
Molybdenum (µg/L)	34 ⁵	34 ⁸
Nickel (µg/L)	11 ^{3,4}	25 ¹
Selenium (µg/L)	5 ³	10 ⁶
Uranium (µg/L)	0.5 ³	17 ⁶
Vanadium (µg/L)	6 ³	100 ⁷
Zinc (µg/L)	8 ^{3,4}	2000 ⁷

Notes:

1. Site specific value – 95th percentile of WB full dataset (Genex Impact Assessment Report; Table 20)
2. ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4
3. ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.
4. Hardness modification may be applied to the Compliance Limit for this toxicant based on analytical results of the collected sample.
5. Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)
6. Australian drinking water guideline.
7. Long term irrigation.
8. Where the filtered compliance limit is higher than the lowest applicable Receiving Waters Limit for total metals, the filtered number is applied.
9. Samples that have been filtered through a 0.45µm filter.
10. Interim value – 80th percentile of W2 full data set (Genex Supplementary Material; Table 8, 1 March 2019). A site-specific value must be provided to the **entity with jurisdiction** by 1 September 2020.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 6 - Receiving waters trigger values .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .
B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the trigger values listed in Table 6 - Receiving waters trigger values, the holder of this evaluation report must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 6 - Receiving waters trigger values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a Trigger Value exceedance has occurred and is under investigation in accordance with B17(b)(iii) and B17(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B17(b)(iii).</p>

Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		Receiving waters
		Latitude	Longitude	
Control sites				
WB	Copperfield River, upstream of KPH1	-18.9051	144.1625	Once within 24 hours prior to commencement of release; and Daily during release; and
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	Once every two days for 6 days following cessation of release; and Once per month thereafter.
Interpretation site				
W2	Copperfield River, downstream of KPH1	-18.8779	144.1702	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
Downstream site				
KPH4	Copperfield River, downstream of KPH1	-18.8549	144.1808	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.

W3	Copperfield River, downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, downstream of KPH1	-18.5082	144.1009	

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Table 6 - Receiving waters trigger values

Contaminant	Trigger values	
	for metals (µg/L), based on filtered samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	200 ¹	
pH (pH Unit)	6.5 - 8.75 ¹	
Sulfate (SO ₄ ²⁻) (mg/L)	4 ¹	
Fluoride (mg/L)	1 ²	
Chlorophyll a (cells/100ml)	5 ³	
Major ions	No trigger value - for interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁴	
Nitrate as N (mg/L)	0.7 ⁵	
Total N (mg/L)	0.15 ³	
Total P (mg/L)	0.01 ³	
Cyanide as unionized HCN (µg/L)	7 ⁵	
Aluminum (µg/L)	570 ¹	1530 ¹
Arsenic (µg/L)	1 ¹	2 ¹
Cadmium (µg/L)	0.1 ¹	0.1 ¹
Chromium (µg/L)	1 ¹	1 ¹
Cobalt (µg/L)	1 ¹	2.5 ¹
Copper (µg/L)	3 ¹	5 ¹
Iron (µg/L)	210 ¹	435 ¹
Lead (µg/L)	1 ¹	1 ¹
Manganese (µg/L)	48	83 ¹
Mercury (µg/L)	0.05 ⁵	1 ⁴
Molybdenum (µg/L)	0.5 ¹	2.5 ¹
Nickel (µg/L)	0.5 ¹	3 ¹
Selenium (µg/L)	5 ¹	5 ¹
Uranium (µg/L)	0.5 ⁵	17 ⁴
Vanadium (µg/L)	6 ⁵	100 ²
Zinc (µg/L)	6 ¹	13 ¹

Notes:

1. Site specific value – 80th percentile of WB full dataset (Genex Impact Assessment Report; Table 20); or the laboratory limit of detection where the calculated 80th percentile is less than the limit of detection.
2. ANZECC (2000) Long term irrigation
3. ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4
4. Australian drinking water guideline.
5. ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.
6. Samples that have been filtered through a 0.45µm filter.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 7 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 8 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 7 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 7 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 8 - Sediment contaminant default guideline values, the holder of this evaluation report must compare this result to monitoring results collected from a relevant control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 8 - Sediment contaminant default guideline values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B21(b)(iii) and B21(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B21(b)(iii).</p>

Table 7 - Sediment monitoring sites

Table 1. Sediment monitoring sites				
Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
Control sites				
WB	Copperfield River, upstream of KPH1	-18.9051	144.1625	• Once every three months
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	
Downstream sites				
KPH2	Copperfield River, downstream of KPH1	-18.8719	144.1740	• Once every three months
W2	Copperfield River, downstream of KPH1	-18.8779	144.1702	
KPH4	Copperfield River, downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, downstream of KPH1	-18.5082	144.1009	

Table 8 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine o. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines
2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The holder of this evaluation report must develop, maintain, and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is the waters, including underlying groundwaters in alluvial and colluvium deposits, of the Copperfield River, East Creek, semi-permanent pools and the Copperfield Gorge at Einasleigh. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <ul style="list-style-type: none"> • Monthly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites: <ul style="list-style-type: none"> a) Water quality for contaminants listed in Table 4 - Receiving waters compliance limits; and, b) Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. • Quarterly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites: <ul style="list-style-type: none"> c) Sediment quality for contaminants listed in Table 8 - Sediment contaminant default guideline values; and, d) Groundwater monitoring at the locations specified in Table 9 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River; and, • Biological monitoring for the following parameters in spring and autumn each year: <ul style="list-style-type: none"> e) Habitat assessment undertaken in accordance with the AusRivAS methodology (DNRM, 2001); f) Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. <p>Note: timing of the macroinvertebrates in accordance with accepted methodologies for ephemeral streams.</p>
B24	A document that details the content of the REMP that addresses the requirements of conditions this evaluation report must be prepared and provided to the entity with jurisdiction by 1 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ul style="list-style-type: none"> a) Potential impacts of the releases on the receiving environment, including downstream environmental values; b) The suitability of existing release limits to protect downstream environmental values; and, c) Any groundwater linkages and potential impacts on downstream environmental values.

Table 9 – Groundwater bore locations

Groundwater Bore	Location	
	(GDA94 MGA z55)	
	Latitude	Longitude
BA06	-18.8880	144.1625
BA07	-18.8781	144.1677

Water monitoring reporting

B26

The following information must be recorded in relation to all water monitoring required under the conditions of this **evaluation report** and submitted to the **entity with jurisdiction** on request:

- The date on which the sample was taken;
- The time at which the sample was taken;
- The monitoring point at which the sample was taken;
- The measured or estimated daily quantity of **contaminated water** released from the release point;
- The release volume at the time of sampling for the release point; and
- The results of all monitoring and details of any exceedances of the conditions of this **evaluation report**.

Notification of release event

B27

The **entity with jurisdiction** must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in **Table 1 – Contaminated water release criteria** at least 48 hours prior to a release commencing.

B28

The **entity with jurisdiction** must be notified by telephone and email of any release from the release point specified **Table 1 – Contaminated water release criteria** within 2 hours after the release has ceased.

B29

The **entity with jurisdiction** must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in **Table 1 – Contaminated water release criteria**. Notification must include the submission of written advice to the **entity with jurisdiction** of the following information, collected in accordance with the conditions of this **evaluation report**:

- Release commencement date/time;
- Details regarding the compliance of the release with the conditions of this **evaluation report**;
- Release volume and receiving water flow volume measured in accordance with **Table 1 – Contaminated water release criteria**.
- Release electrical conductivity, DO, temperature and pH.

B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information, collected in accordance with the conditions of this evaluation report, to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.
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Schedule C - Definitions

‘Autumn’ means the late wet season, when flow has declined to a level able to be sampled, without significant flood peaks

‘contaminated water’ is water sourced from Eldridge Pit (during construction phase) or mixed water from both Eldridge and Wises Pit sourced from Wise Pit (during construction and operations).

‘evaluation report’ (OGC please insert definition)

‘entity with jurisdiction’ (OGC please insert definition) is the agency appointed by DSDIP that administers the evaluation report provisions under the *State Development and Public Works Organisation Act 1971*.

‘Spring’ means the early wet season, when flow has been established for at least four weeks

‘streamflow’ is the water flowing in the Copperfield River, arising from precipitation in the catchment of the Copperfield River, or from a release from the Copperfield Dam.

‘appropriately qualified person’ means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

‘EC’ means electrical conductivity

‘µS/cm’ means micro siemens per centimetre.

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Kidston client workshop. 12pm 27/03/11
Caitlin Booy, IFM, Dean Sharpe, Mel Harris,
Steven Tarte, Cathie Page, Sonia Claus,
Rouven Lau, Nicky Lee, Reece Fraser,
Craig Francis, Arran McGhie.

IFM: The way we've addressed W2 and
monitoring acceptable.

RL: There are a few more but we
will cover at the end.

IFM: So the main issues are still
table 4 and 6.

RL: Yes, there are a few other issues.
First point is KPM happy to leave
as you've stated it. Second point

suggestion to raise $4.63 \text{ m}^3/\text{s}$ to $5 \text{ m}^3/\text{s}$.
we don't see the increase as necessary.

IFM: Are you happy to measure to $0.01 \text{ m}^3/\text{s}$ with no margin of error.

RL: All our work done has been done on that data.

SC: The issue is about measuring in the field. If you can measure to 4.63 than there's no problem.

RF: Its the same with 5.00

IFM: If you're happy with it

RL: we're happy with it.

DS: 4.64 would be a non-comp.

IF

IFM: Reee you're saying you'll manage that in terms of the trigger.

RL: We accept point 3. Moving to Table 4. Ingot A couple of parameters, we're happy with most of table 4. Key issue is around EC, that's sitting at 300 we would like to see that go to 500 , it gives us a more realistic compliance.

RF: That's what was proposed in IAR.

SC: But in terms of Table 92+93. you're always below 200 .

RF: We had designed everything for WQOs which was 500 for EC.

RL: Not sure why that's the case asking DES to reconsider.

SC: 300 was based off site specific data for WB.

RL: I thought it was if the default was higher we choose default

IFM: We need to check that.

NL: Its for Gulf Rivers.

RF: 500 is ~~95~~⁷⁵ based on default for Gulf catchment.

IFM: We'll take that on notice I

AM: think its 425 not 500.

RL: We hear what you're saying but the in principle was default

IFM: Its not a default.

AM: No but its what was agreed upon based on QCD WQG.

ST: Hey Arman, when you check that can you check that point Sonia made.

IFM: Default is 250, sitespec is 300

AM: I thought the stance was only vary if the site spec was higher.

SC: That's not entirely correct. If we think site-specific number is more appropriate than we apply it. If you have national higher than yes, but the theory is to apply site-specific over national / regional values.

AM: At the end of the day we proposed 500.

SC: I need to go back and see if we questioned it.

IFM: All data shows that you can meet 300 so what I'm hearing is an in principle argument.

AM: If you check 425 or 500

IFM: I'm 95% sure its 425. doesn't negate the issue based on modelling may have to

agree to disagree

RL: I notice TN and TP were based on W2 and want an understanding of this comes back to theory.

For metals WB is lower which represents the receiving environment.

For nutrients W2 is actually lower. The memo wasn't updated with the supplementary IAR. Assumption is that there is dilution, we've applied W2 based on the new supplementary data. Theory is to protect the downstream receiving environment. Used W2 because nutrients

RF: WB is before any mining activities.

SC: We made assumptions that WB was not impacted. The assumption that WB is reflective of all parameters in the receiving environment was incorrect. If you want to provide more data that says something else than that, a different story.

RL: Is that based on all data from 2011.

SC: Table 8.

RL: That's correct, was a question happy with that.

IFM: All I'm hearing is 500. Is that able to be labeled on 300 Vs 425

AM: Based on assessment being done on 500, I would like to

IFM: go check. Happy to do further checking but I think 300 is solid.]

AM: Tried to come up with a flexible approach, the EA is 1000.

IFM: Wasn't the agreement was to

Impact assimilative capacity.

RL: In terms of Table 6 it seems Table 6 is not happy?

SC: We don't ~~usually~~ usually apply this, if it's based on the 80th percentile it means you exceed 20% of the time.

AM: ~~You~~ With the limit you're suggesting for sulphate that will trigger an investigation every time, administrative burden is high.

SC: Sulphate is different, let's take that out, for all other numbers will you be able to meet all the numbers you've proposed.

RFE: What we're trying to do was link Table 6 to Table 4.

SC: Comes back to how we condition an EA. This is not normally how we condition. They're triggers for you to do an investigation. There's a balance b/n administrative for us and how you're activities will impact. The numbers we've proposed than you should not need to investigate. I think changing the approach is not appropriate. All the work was done to ensure you won't exceed. Table 92 + 93 don't have all the parameters so if you need more dilution ~~for~~ ^{File A} than we need to discuss those. Page 129 of 161

- AM: Broadly I think we're happy but there are exceptions.
- RL: first is sulphate, Sonia
- SC: Sulphate comes back to the workshop and IFMs concerns.
- IFM: My position has not changed has modelling shows that you will not meet.
- RF: sulphate will be way above 4.
- IFM: Is that post mixing zone
- SC: trigger values are downstream 4. 8km downstream is where these values apply
- RF: Intent of triggers - modelling shows by East Creek it should be 15 or 20.
- SC: You expect 15.
- IFM: Worst case is 20 ~~and worst~~
- RF: Yes. Table 93 Worst case is (6.9km downstream) 20.8 on that I'd like to have sulphate at 21.
- IFM: I'm struggling. This is a trigger value for investigation. Happy to look at 4 vs another number but just picking a number is not ok.
- RL: We would investigate if modelling has not shown what it is. We're just trying to come up with something.
- IFM: I'm happy to pick another number. This is a trigger value. Based on an argument that x is appropriate. 1/5 about assimilative capacity. Don't want salting downstream.

IFM: Happy for you to do your releases and show that you have no impact and come back, but cannot pluck numbers.

RF: On our side 'sulphate is bad' is not appropriate, comparing apples with apples.

IFM: I'm sure it's not apples with apples

SC: I think max at WB is maybe 10.

IFM: 4 is 80th percentile WB.

CB: 4.3km downstream 4 apples.

IFM: As Reece pointed out situation is different. Not happy with
 a) picking a number,
 b) not having justification.
 I'm not understanding how material.

AM: I agree with what you're saying. Modelling shows ~~no~~ at the gorge median is 15.

CF: East creek is proxy for KPM4, median for releases is 15. I imagine we will exceed.

IFM: We've given a fair bit of flexibility. One way of dealing is by investigating the other is we condition that you must do the equivalent of an Enviro. Invest.

RF: Its practicality. We will always exceed.

IFM: We haven't answered to question you're increasing 200%. I thought the invest was an appropriate approach. I get the point you're

making.

RL: We want to come up with something that is achievable.

IFM: Uncertainty in the change b/n 4 and 15.

SC: Issue w/ sulphate there is no value. Normally we do a site spec which is 4.

IFM: We've given you 250 when it should be 4.

AM: Compliance is still 250.

IFM: Need to demonstrate that between 4 and 250 is ok.

RC: Next is EC but I think we have that discussion in parallel to table 4 discussions.

IFM: I think we've done that its 80% of site-spec data. & if in a yrs time we need to reconsider we can.

ST: You have an ability to make a change application.

RL: LOR is in table 6; Nickel, molybdenum and uranium LOR is 1ug/L

RF: trigger values are ~~2~~ LOR.

IFM: [Note 1] is meant to deal with that, I'm fine to change to 1. If we do that make it 1, 1+1.

RE: TN + TP we're looking at raising. Trigger values would trigger every time. Even if its an iterim. looked at WB 50% ~~to~~ We want to come up with a number that wouldn't trigger every time

TN: 0.34 TP 0.04.

RL: We'll provide coordinates

IFM: Is the date not appropriate.

RE: looking at early mid June.

AM

AM: I think we nominate rough co-ordinates and update

IFM: So we can update the footnote

AM: Yeah.

RL: Sediment monitoring frequency. We're proposing to change slightly. Why was changed

IFM: Wanted to change 2 a year

NL: Every 3 months for 2 years and 2 a year thereafter.

IFM: We have some apprehension, keep at qly and then based on data change it. Whether 2 years is enough data. Will have to do a loop around

AM at some point

RL: can we make it subject to

IFM: After 2, 3, 4, 5 years do an evaluation report

AM: Can you're right Ingrid if we're way off we can come back.

IFM: It leaves you with the power.

RL: Around Spring and Autumn. can we say twice per wet season.

IFM: It's as clear as we can be twice a wet season can be a week apart.

RL: Date in the REMP to 30 May.

IFM: OK. Can we have an in principle agreement that conditions are ok.

RL: we haven't had a good final read.

IFM: As it relates to the issues to fix that's fine. Do we need to meet

again.

ST: Can we agree that we're happy ^{with actions}

CP: Do you have a timeframe for AR.

ST: Next Friday

IFM: So we should meet Friday.

ST: Can we go through actions

1) EC Table 4 (both, DES preference is 300).

2) Sulphate Table 6 (Genex to propose a reasoned argument for a new number).

3) DES to look at TN+TP Table 4.6

4) Moly, Uranium and Nickel to be LOR.

5) B24 - 30 May, 2019.

ST: Any new issue must be substantial to warrant review.

End at 1:30pm

sch4p4(6) Personal Information

Date : 27/03/2019 1:42:46 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Steven Tarte"

Cc : "Fraser, Reece", "Lee, Nicky", "Melanie Harris", "Arran McGhie", "SHARPE Dean", "James Harding", "BOOY Caitlin", "BOOY Caitlin", "TRELOAR Kirstie", "Rosemary Shearman", "Tanya Lavett", "Emma Malone", "Lau, Rouven"

Subject : RE: Actions from draft conditions discussion for K2H project

Attachment : KPH_draft

conditions_27_March_2019.docx;image001.png;image006.png;image020.png;image022.png;image023.jpg;image024.jpg;image025.jpg;image026.png;image027.png;image028.png;image029.jpg;image002.png;image00

Dear Steven

Please find attached the amended conditions as a results of today's meeting

DES believes this is a near final product. DES will provide further clarity around the EC and Sulphate numbers, however would like to highlight this is the position arrived at taking into consideration all data and submissions as part of the IAR. DES believes that the proposed values ensure that there is an appropriate level of protection and assessment of impacts for the receiving environment to ensure that commitments made by the proponent to minimise and mitigate impacts are achieved.

Kind regards
Ingrid



Ingrid Fomiatti Minnesma
Director Minerals
Minerals & North Queensland Compliance | Environmental Services & Regulation
Department of Environment and Science
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5b Sheridan Street Cairns Q 4870 Postal address: PO Box 7230 Cairns Q 4870.



From: FOMIATTI MINNESMA Ingrid

Sent: Tuesday, 26 March 2019 2:02 PM

To: Steven Tarte

Cc: Fraser, Reece; Lee, Nicky; Melanie Harris; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone; Lau, Rouven

Subject: Actions from draft conditions discussion for K2H project

Dear Steven,

Please see attached revised conditions for the Kidston Hydro Project.

The suggested amendments that AECOM sent through on Friday are not supported. This is specifically in relation to Table 1, Table 4 and Table 6.

The changes to the release criteria in Table 1 are not supported for the following reasons;

- KPH1 is the only authorised release point for the project, as such it is not appropriate to remove this from the release discharge criteria;
- To account for uncertainty in the calculation of volumetric flow, the minimum flow rate has been increased to 5m³/sec from 4.63m³/sec;
- Stream flow rate and discharge release rate has been defined in m³/sec rather than ML/day to ensure that the minimum dilution ratio is met every hour not averaged over the day.

The limits and triggers that they have proposed in Table 4 and Table 6 are, in most cases, lower than ANZECC toxicant trigger values and what was proposed by DES. This is different to what was proposed and assessed in the IAR and it is unclear whether Genex would be able to meet these trigger values.

The TN and TP limits proposed in Table 4 are not supported. DES would be amenable to revising the compliance limit for TN of 0.35 mg/L and 0.04 mg/L for TP, based on Table 92 and Table 93 of the IAR, Table 2 in the Algae memo and Table 8 in the Supplementary IAR. DES is accepting of these as proposed Interim limits, with a requirement to provide site-specific limits for these parameters by 1 September 2020.

Furthermore, values for total concentrations of Arsenic, Manganese and Molybdenum in Table 4 and Table 6 and Iron in Table 6 are lower than the dissolved fraction. This should never be the case.

All remaining issues raised by AECOM can be accepted, specifically the removal of W2 from the downstream trigger sites, and the frequency of biological monitoring. W2 is now included as an 'interpretation site' and no investigation will be required should a trigger value be exceeded. Macroinvertebrate frequency has been amended as per our discussions last Wednesday.

Regards,



Ingrid Fomiatti Minnesma
Director Minerals
Minerals & North Queensland Compliance | Environmental Services & Regulation
Department of Environment and Science
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From: Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Sent: Friday, March 22, 2019 3:26 PM

To: Lau, Rouven

Cc: Fraser, Reece; Lee, Nicky; Melanie Harris; FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone

Subject: RE: Actions from draft conditions discussion for K2H project

Hi Rouven,

Thank you for sending through the updated comments on the draft conditions.

DES are currently reviewing your proposed changes and intend to provide a response on Monday. If needed, we can then reconvene by teleconference on Wednesday as scheduled.

If you have any questions, please don't hesitate to call.

Regards,

Steven

Steven Tarte
A/Director



Office of the Coordinator-General
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PO Box 15009, City East QLD 4002
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From: Lau, Rouven <Rouven.Lau@aecom.com>

Sent: Thursday, 21 March 2019 7:17 PM

To: Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>; FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>; Arran McGhie <am@genexpower.com.au>; SHARPE Dean <Dean.Sharpe@des.qld.gov.au>; James Harding <jh@genexpower.com.au>; Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; TRELOAR Kirstie <Kirstie.Treloar@des.qld.gov.au>; Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>; Emma Malone <Emma.Malone@coordinatorgeneral.qld.gov.au>; Tanya Lavett <Tanya.Lavett@coordinatorgeneral.qld.gov.au>

Cc: Fraser, Reece <Reece.Fraser@aecom.com>; Lee, Nicky <nicky.lee@aecom.com>

Subject: RE: Actions from draft conditions discussion for K2H project

Good afternoon everyone,

We have undertaken the review of Tables 92 and 93 in the IAR and confirm that WQOs and figures remain unchanged.

Please find attached the updated comments to the draft conditions, including the proposed updates to Table 4 and Table 6 as follows:

1. For the compliance limits set out in Table 4 of the conditions, we have applied the WQOs, as used in the impact assessment (refer to the attached WQO Summary Table which lists the WQO for each parameter, the source and the reference within the IAR document). These WQOs are a combination of default values from various guideline values and where appropriate, site-specific values derived as part of the assessment of baseline water quality in the Copperfield River. The only new values proposed (i.e. not presented in the IAR) are interim values for Total Nitrogen (TN) and Total Phosphorus (TP). As established in communications between AECOM and DES in February 2019, the default WQO for TN (0.15 mg/L) is not suitable for the Copperfield River catchment. Similarly, baseline TP values are also elevated across the catchment. Interim site-specific WQOs have been assessed as 0.648 mg/L for TN and 0.054 mg/L for TP, based on the results of extensive additional monitoring undertaken in February 2019 (refer to Section 3.0 of the Supplementary IAR Information Report). It is proposed that these values be finalised following additional baseline monitoring.
2. For the trigger values set out in Table 6 of the conditions, we have applied a value which is set at 80% of the WQOs listed in Table 4. This approach is considered to provide early warning of a parameter approaching the WQO, and therefore requiring further investigation.

I will provide estimated coordinates for the release point tomorrow, noting that these may need to be refined during the detailed design period.

As always, any questions please feel free to give me a call.

Regards,

Rouven

Rouven Lau

Associate Director - Environment

Personal **Personal**
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Please consider the environment before printing this email.

From: Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>

Sent: Thursday, 21 March 2019 10:08 AM

To: FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; Steven Tarte; BOOY Caitlin; Lau, Rouven; Lee, Nicky; Fraser, Reece; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Emma Malone; Tanya Lavett

Subject: Actions from draft conditions discussion for K2H project

Good morning everyone,

Please find the actions from yesterday's discussion below.

- The proponent to review Tables 92 and 93 in the IAR to confirm that WQOs and figures are appropriate (i.e. based on ANZECC and WB as previously discussed). Response to be provided to DES/OOG by Friday 22 March 2019. The proponent has since confirmed that a response will be provided today.
- Proponent to provide coordinates for the release point.
- DES to review/amend conditions to ensure that it is clear that W2 is to be used for an early warning monitoring point upstream of the receiving environment compliance limits.
- DES to review/amend the wording for biological modelling to ensure the requirements better reflect an ephemeral stream (i.e. six weeks following a major flow event).

Kind regards,

Mel



Melanie Harris
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Schedule A – General

A1	This evaluation report authorises environmental harm referred to in the conditions. Where there is no condition or this evaluation report is silent on a matter, the lack of a condition or silence does not authorise environmental harm.
A2	The holder of this evaluation report must: <ul style="list-style-type: none"> a. install all measures, plant and equipment necessary to ensure compliance with the conditions of this environmental authority; b. maintain such measures, plant and equipment in a proper and efficient condition; c. operate such measures, plant and equipment in a proper and efficient manner; and d. ensure all instruments and devices used for the measurement or monitoring of any parameter under any condition of this evaluation report are properly calibrated.
A3	All monitoring records or reports required by this evaluation report must be kept for a period of not less than five years.
A4	The holder of this evaluation report must develop and implement a risk management system for the activity which meets the content requirement of the Standard for Risk Management (ISO31000:2009), or the latest edition of an Australian standard for risk management, by 1 May 2019.
A5	The holder of this evaluation report must notify the entity with jurisdiction by written notification within 24 hours, after becoming aware of any emergency or incident which results in the release of contaminants not in accordance, or reasonably expected to be not in accordance with, the conditions of this evaluation report .
A6	Within 10 business days following the initial notification of an emergency or incident, or receipt of monitoring results, whichever is the latter, further written advice must be provided to the entity with jurisdiction , including the following: <ul style="list-style-type: none"> a. Results and interpretation of any samples taken and analysed; b. Outcomes of actions taken at the time to prevent or minimise unlawful environmental harm; and c. Proposed actions to prevent a recurrence of the emergency or incident.

A7	<p>The holder of this evaluation report must record all environmental complaints received about the authorised activities including:</p> <ul style="list-style-type: none"> a. name, address and contact number for of the complainant b. time and date of complaint c. reasons for the complaint d. investigations undertaken e. conclusions formed f. actions taken to resolve the complaint g. any abatement measures implemented h. person responsible for resolving the complaint.
A8	<p>The holder of this evaluation report must, when requested by the entity with jurisdiction, undertake relevant specified monitoring within a reasonable timeframe nominated or agreed to by the entity with jurisdiction to investigate any complaint of environmental harm. The results of the investigation (including an analysis and interpretation of the monitoring results) and abatement measures, where implemented, must be provided to the entity with jurisdiction within 10 business days of completion of the investigation, or no later than 10 business days after the end of the timeframe nominated by the entity with jurisdiction to undertake the investigation.</p>
A9	<p>All determinations of water and sediment quality, and biological monitoring must be performed by an appropriately qualified person.</p>

Schedule B - Water

Contaminant Release	
B1	Contaminants that will, or have the potential to cause environmental harm must not be released directly or indirectly to any waters, except as permitted under conditions of this evaluation report .
B2	The release of contaminated water must only occur in accordance with Table 1 – Contaminated water release criteria .
B3	The release of contaminated water must only occur from the release point specified in Table 1 – Contaminated water release criteria
B4	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the gauging station location specified in Table 1 – Contaminated water release criteria .
B5	During the release of contaminated water from the specified release point, the holder of this evaluation report must measure and record the receiving waters streamflow rate and the contaminant release discharge rate at the recording frequency specified in Table 1 – Contaminated water release criteria .
B6	Contaminated water released to surface waters must be monitored for each contaminant specified in Table 2 – Contaminant release limits (End of Pipe) .
B7	Contaminated water released to surface waters must be monitored at the frequency specified in Table 2 – Contaminant release limits (End of Pipe) .
B8	Contaminated water released to surface waters must not exceed a release limit specified in Table 2 – Contaminant release limits (End of Pipe) .
B9	The release of contaminated water to surface waters must not cause erosion of the bed and banks of the receiving waters, or a material build-up of sediment in waters.

Table 1 – Contaminated water release criteria

Monitoring Point	Gauging station		Recording Frequency	Criteria for release	
	(GDA94 MGA z55)			Streamflow rate	Release Discharge
	Latitude	Longitude			
Receiving waters stream discharge					
WB Copperfield River (Upstream of release point)	-18.9051	144.1625	Hourly during release events (m³/sec)	Contaminated water may only be released when the streamflow rate at WB is greater than (>) 4.63 m³/sec. Once the streamflow rate is less than (<) 4.63 m³/sec, the release must cease.	N/A
Contaminated water release					
KPH1 Release point (in pipe)	TBA¹	TBA¹	Hourly during release events (m³/sec)	N/A	Contaminated water may only be released at KPH1 when streamflow rate in the Copperfield River measured at WB is 200 times greater than the release discharge rate at KPH1 (m³/sec). When the release occurs during minimum streamflow in the Copperfield River (4.63 m³/sec), the maximum release discharge rate is 0.025 m³/sec. Release discharge rate must be calculated in real time.

¹ Coordinates must be provided to the **entity with jurisdiction** by 1 May 2019.

Table 2 – Contaminant release limits (End of Pipe)¹

Contaminant	Release Limit (for metals (µg/L) based on filtered ⁷ samples)	Release Limit (for metals (µg/L) based on total samples)	Monitoring Frequency
Electrical conductivity (µS/cm)	5,320 ²		Every fifteen (15) minutes during release
pH (pH Unit)	6 - 7.5 ²		
Dissolved oxygen (% sat)	>85 ¹		
Sulfate (SO ₄ ²⁻) (mg/L)	2690 ²		Daily during release (the first sample must be taken within 2 hours of commencement of release).
Turbidity (NTU)	15 ³		
Fluoride (mg/L)	3 ²		
Major ions	No limit - For interpretation purposes		
Hardness			
Ammonia as N (mg/L)	0.5 ⁴		
Nitrate as N (mg/L)	5.5 ²		
Total N (mg/L)	7 ²		
Total P (mg/L)	0.03 ²		
Cyanide as unionized HCN	7 ⁴		
Aluminium	55 ⁴	240 ²	
Arsenic	170 ²	370 ²	
Cadmium	30 ²	46 ²	
Chromium	1 ⁴	50 ⁵	
Cobalt	30 ²	3840 ²	
Copper	5 ²	200 ⁶	
Iron	300 ⁴	310 ²	
Lead	3.4 ⁴	190 ²	
Manganese	2860 ²	3770 ²	
Mercury	0.06 ⁴	1 ⁵	
Molybdenum	63 ²	125 ²	
Nickel	38 ²	51 ²	
Selenium	5 ⁴	10 ⁵	
Uranium	0.5 ⁴	17 ⁵	
Vanadium	6 ⁴	10 ²	
Zinc	1750 ²	2350 ²	

Notes:

1 – Notwithstanding the release limits stated in this table, receiving waters compliance limits stated in Table 4 must be met at the downstream compliance monitoring site.

2 - Maximum of historical data used in the risk assessment process (Genex Impact Assessment Report; Table 13)

3 - ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4

4 – ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.

5 – NWQMS (2011) Australian Drinking Water Guidelines

6 - ANZECC (2000) Long term irrigation

7. Samples that have been filtered through a 0.45µm filter.

Receiving waters compliance	
B10	Receiving waters must be monitored at the location specified in Table 3 - Downstream compliance monitoring site and frequency .
B11	Receiving waters must be monitored at the frequency specified in Table 3 - Downstream compliance monitoring site and frequency .
B12	Receiving waters must be monitored for the contaminants listed in Table 4 - Receiving waters compliance limits .
B13	Receiving waters compliance limits specified in Table 4 - Receiving waters compliance limits must not be exceeded at the location specified in Table 3 - Downstream compliance point and monitoring frequency .

Table 3 - Downstream compliance monitoring site and frequency

Monitoring sites	Receiving waters description	Location ¹		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
KPH2	Copperfield River, (approx.)1.9 km downstream of KPH1	-18.8719	144.1740	<ul style="list-style-type: none">• Daily during release (the first sample must be taken within 2 hours of commencement of each release); and• Daily for one week following cessation of each release.

1. Coordinates must be provided to the **entity with jurisdiction** prior to activities commencing at the Kidston Pumped Storage Hydro Project.

Table 4 - Receiving waters compliance limits

Contaminant	Receiving Waters Compliance Limit	
	for metals (µg/L), based on filtered ⁹ samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	300 ¹	
pH (pH Unit)	6.5 - 8.75 ²	
Sulfate (SO ₄ ²⁻) (mg/L)	250 ⁵	
Fluoride (mg/L)	1 ⁵	
Chlorophyll a (cells/100ml)	5 ²	
Major ions	No limit - For interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁶	
Nitrate as N (mg/L)	0.7 ³	
Total N (mg/L)	0.35 ¹⁰	
Total P (mg/L)	0.04 ¹⁰	
Cyanide as unionized HCN (µg/L)	7 ³	
Aluminum (µg/L)	2870 ¹	3950 ¹
Arsenic (µg/L)	13 ³	13 ⁸
Cadmium (µg/L)	0.2 ^{3,4}	2 ⁶
Chromium (µg/L)	1 ³	50 ⁶
Cobalt (µg/L)	2.8 ⁵	50 ⁷
Copper (µg/L)	5 ¹	200 ⁷
Iron (µg/L)	300 ³	750 ¹
Lead (µg/L)	3.4 ^{3,4}	10 ⁷
Manganese (µg/L)	1900 ³	1900 ⁸
Mercury (µg/L)	0.05 ³	1 ³
Molybdenum (µg/L)	34 ⁵	34 ⁸
Nickel (µg/L)	11 ^{3,4}	25 ¹
Selenium (µg/L)	5 ³	10 ⁶
Uranium (µg/L)	0.5 ³	17 ⁶
Vanadium (µg/L)	6 ³	100 ⁷
Zinc (µg/L)	8 ^{3,4}	2000 ⁷

Notes:

1. Site specific value – 95th percentile of WB full dataset (Genex Impact Assessment Report; Table 20)
2. ANZECC (2000) Aquatic Ecosystem Guidelines for Lowland Rivers for Tropical Australia – Table 3.3.4
3. ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.
4. Hardness modification may be applied to the Compliance Limit for this toxicant based on analytical results of the collected sample.
5. Low reliability freshwater trigger (Section 8.3.7 Detailed description of chemicals, ANZECC guidelines 2000)
6. Australian drinking water guideline.
7. Long term irrigation.
8. Where the filtered compliance limit is higher than the lowest applicable Receiving Waters Limit for total metals, the filtered number is applied.
9. Samples that have been filtered through a 0.45µm filter.
10. Interim value – 80th percentile of W2 full data set (Genex Supplementary Material; Table 8, 1 March 2019). A site-specific value must be provided to the **entity with jurisdiction** by 1 September 2020.

Receiving environment monitoring – Surface waters	
B14	Receiving waters must be monitored at the locations specified in Table 5 - Receiving waters monitoring sites .
B15	Receiving waters must be monitored for each contaminant specified in Table 6 - Receiving waters trigger values .
B16	Receiving waters must be monitored at the frequency specified in Table 5 - Receiving waters monitoring sites .
B17	<p>If a contaminant concentration measured at a downstream site specified in Table 5 - Receiving waters monitoring sites exceeds any of the trigger values listed in Table 6 - Receiving waters trigger values, the holder of this evaluation report must compare this result to monitoring results collected from the relevant upstream control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the receiving waters monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the receiving waters monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted receiving waters for all contaminants specified in Table 6 - Receiving waters trigger values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a Trigger Value exceedance has occurred and is under investigation in accordance with B17(b)(iii) and B17(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B17(b)(iii).</p>

Table 5 - Receiving waters monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		Receiving waters
		Latitude	Longitude	
Control sites				
WB	Copperfield River, upstream of KPH1	-18.9051	144.1625	Once within 24 hours prior to commencement of release; and Daily during release; and
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	Once every two days for 6 days following cessation of release; and Once per month thereafter.
Interpretation site				
W2	Copperfield River, downstream of KPH1	-18.8779	144.1702	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.
Downstream site				
KPH4	Copperfield River, downstream of KPH1	-18.8549	144.1808	Once within 24 hours prior to commencement of release; and Daily during release; and Once every two days for 6 days following cessation of release; and Once per month thereafter.

W3	Copperfield River, downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, downstream of KPH1	-18.5082	144.1009	

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Table 6 - Receiving waters trigger values

Contaminant	Trigger values	
	for metals (µg/L), based on filtered samples	for metals (µg/L), based on total samples
Electrical conductivity (µS/cm)	200 ¹	
pH (pH Unit)	6.5 - 8.75 ¹	
Sulfate (SO ₄ ²⁻) (mg/L)	4 ¹	
Fluoride (mg/L)	1 ²	
Chlorophyll a (cells/100ml)	5 ³	
Major ions	No trigger value - for interpretation purposes	
Hardness		
Turbidity (NTU)		
Dissolved Oxygen		
Total Ammonia N (mg/L)	0.5 ⁴	
Nitrate as N (mg/L)	0.7 ⁵	
Total N (mg/L)	0.30 ³	
Total P (mg/L)	0.04 ³	
Cyanide as unionized HCN (µg/L)	7 ⁵	
Aluminum (µg/L)	570 ¹	1530 ¹
Arsenic (µg/L)	1 ¹	2 ¹
Cadmium (µg/L)	0.1 ¹	0.1 ¹
Chromium (µg/L)	1 ¹	1 ¹
Cobalt (µg/L)	1 ¹	2.5 ¹
Copper (µg/L)	3 ¹	5 ¹
Iron (µg/L)	210 ¹	435 ¹
Lead (µg/L)	1 ¹	1 ¹
Manganese (µg/L)	48	83 ¹
Mercury (µg/L)	0.05 ⁵	1 ⁴
Molybdenum (µg/L)	1 ⁷	2.5 ¹
Nickel (µg/L)	1 ⁷	3 ¹
Selenium (µg/L)	5 ¹	5 ¹
Uranium (µg/L)	1 ⁷	17 ⁴
Vanadium (µg/L)	6 ⁵	100 ²
Zinc (µg/L)	6 ¹	13 ¹

Notes:

1. Site specific value – 80th percentile of WB full dataset (Genex Impact Assessment Report; Table 20); or the laboratory limit of detection where the calculated 80th percentile is less than the limit of detection.
2. ANZECC (2000) Long term irrigation
3. Site specific value – 50th percentile of W2 – full dataset
4. Australian drinking water guideline.
5. ANZECC (2000) Table 3.4.1 Trigger values for aquatic ecosystem protection, applicable to slightly–moderately disturbed systems.
6. Samples that have been filtered through a 0.45µm filter.
7. The laboratory limit of detection where the calculated 80th percentile is less than the limit of detection.

Receiving environment monitoring – sediments	
B18	Sediment must be monitored at the locations specified in Table 7 - Sediment monitoring sites .
B19	Sediment must be monitored for each contaminant specified in Table 8 - Sediment contaminant default guideline values .
B20	Sediment must be monitored at the frequency specified in Table 7 - Sediment monitoring sites .
B21	<p>If a contaminant concentration measured at a downstream site specified in Table 7 - Sediment monitoring sites exceeds any of the default guideline values listed in Table 8 - Sediment contaminant default guideline values, the holder of this evaluation report must compare this result to monitoring results collected from a relevant control site; and</p> <ol style="list-style-type: none"> If the contaminant concentration measured at the downstream sediment monitoring site is equal to or less than the contaminant concentration measured at the relevant control sites, no further action is required; or If the contaminant concentration measured at the downstream sediment monitoring site is greater than the contaminant concentration measured at the relevant control sites: <ol style="list-style-type: none"> Notify the entity with jurisdiction within 24 hours of becoming aware of the exceedance; and Undertake further sampling of potentially impacted sediment for all contaminants specified in Table 8 - Sediment contaminant default guideline values; and Complete an investigation into the potential for environmental harm to occur in accordance with ANZECC (2000) methodology, within three months of identifying this exceedance or the alternative timeframe specified by the entity with jurisdiction; and Within one week of completing the investigation, provide a written report to the entity with jurisdiction detailing all pertinent aspects of the investigation (such as objectives, applied methodology, investigation outcomes, assumptions relied upon and justification for any assertions made) and any actions undertaken and/or proposed to prevent or minimise environmental harm. <p>Note: Where a contaminant trigger level exceedance has occurred and is under investigation in accordance with B21(b)(iii) and B21(b)(iv), no further reporting is required for subsequent exceedance events of that contaminant during the course of the investigation required under B21(b)(iii).</p>

Table 7 - Sediment monitoring sites

Monitoring sites	Receiving waters description	Location		Monitoring frequency
		(GDA94 MGA z55)		
		Latitude	Longitude	
Control sites				
WB	Copperfield River, upstream of KPH1	-18.9051	144.1625	• Once every three months
KPH3	Copperfield River, upstream of East Creek confluence	-18.8614	144.1885	
Downstream sites				
KPH2	Copperfield River, downstream of KPH1	-18.8719	144.1740	• Once every three months
W2	Copperfield River, downstream of KPH1	-18.8779	144.1702	
KPH4	Copperfield River, downstream of KPH1	-18.8549	144.1808	
W3	Copperfield River, downstream of KPH1	-18.8268	144.1788	
Pond 5	Copperfield River, downstream of KPH1	-18.8383	144.1770	
Copperfield Gorge (at Einasleigh)	Copperfield River, downstream of KPH1	-18.5082	144.1009	

Table 8 - Sediment contaminant default guideline values

Contaminant (mg/kg dry weight)	Default Guideline Values (DGV)
Arsenic	20 ¹
Cadmium	1.5 ¹
Chromium	80 ¹
Copper	65 ¹
Lead	50 ¹
Mercury	0.15 ¹
Nickel	21 ¹
Zinc	200 ¹

1. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine o. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

2. Measured data for toxicants in sediment should be normalised to the silt fraction (< 63 µm) for comparison with the DGV.

Receiving Environment Monitoring Program	
B22	The holder of this evaluation report must develop, maintain, and implement a Receiving Environment Monitoring Program (REMP) for all stages of the activity to monitor, identify and describe any adverse impacts to receiving water environmental values, water and sediment quality and flows due to the Project. This must include monitoring the effects of the Project on the receiving environment periodically (under natural flow conditions) and while contaminants are being discharged from the site. For the purposes of the REMP, the receiving environment is the waters, including underlying groundwaters in alluvial and colluvium deposits, of the Copperfield River, East Creek, semi-permanent pools and the Copperfield Gorge at Einasleigh. The REMP should encompass any sensitive receiving waters or environmental values downstream of the authorised activity that will potentially be directly affected by an authorised release of contaminants.
B23	<p>The REMP must include at a minimum:</p> <ul style="list-style-type: none"> • Monthly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites: <ul style="list-style-type: none"> a) Water quality for contaminants listed in Table 4 - Receiving waters compliance limits; and, b) Stream flow and <i>in situ</i> parameters including temperature, pH, EC and DO continuously (15 min intervals) at the locations listed in Table 1 – Contaminated water release criteria. • Quarterly monitoring for all sites listed in Table 5 - Receiving waters monitoring sites: <ul style="list-style-type: none"> c) Sediment quality for contaminants listed in Table 8 - Sediment contaminant default guideline values; and, d) Groundwater monitoring at the locations specified in Table 9 – Groundwater bore locations to quantify any linkages between the Eldridge Pit, Wises Pit and the Copperfield River; and, • Biological monitoring for the following parameters in spring and autumn each year: <ul style="list-style-type: none"> e) Habitat assessment undertaken in accordance with the AusRivAS methodology (DNRM, 2001); f) Macroinvertebrates, including taxonomic richness, PET Taxa richness and SIGNAL 2 Index. <p>Note: timing of the macroinvertebrates in accordance with accepted methodologies for ephemeral streams.</p>
B24	A document that details the content of the REMP that addresses the requirements of conditions this evaluation report must be prepared and provided to the entity with jurisdiction by 30 May 2019.
B25	<p>A report outlining the findings of the REMP, including all monitoring results and interpretations must be prepared annually and made available on request to the entity with jurisdiction. This must identify:</p> <ul style="list-style-type: none"> a) Potential impacts of the releases on the receiving environment, including downstream environmental values; b) The suitability of existing release limits to protect downstream environmental values; and, c) Any groundwater linkages and potential impacts on downstream environmental values.

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Table 9 – Groundwater bore locations

Groundwater Bore	Location	
	(GDA94 MGA z55)	
	Latitude	Longitude
BA06	-18.8880	144.1625
BA07	-18.8781	144.1677

Water monitoring reporting	
B26	<p>The following information must be recorded in relation to all water monitoring required under the conditions of this evaluation report and submitted to the entity with jurisdiction on request:</p> <ul style="list-style-type: none"> a) The date on which the sample was taken; b) The time at which the sample was taken; c) The monitoring point at which the sample was taken; d) The measured or estimated daily quantity of contaminated water released from the release point; e) The release volume at the time of sampling for the release point; and f) The results of all monitoring and details of any exceedances of the conditions of this evaluation report.
Notification of release event	
B27	<p>The entity with jurisdiction must be notified by telephone and email of the expected date and time of any proposed release from the release point specified in Table 1 – Contaminated water release criteria at least 48 hours prior to a release commencing.</p>
B28	<p>The entity with jurisdiction must be notified by telephone and email of any release from the release point specified Table 1 – Contaminated water release criteria within 2 hours after the release has ceased.</p>
B29	<p>The entity with jurisdiction must be notified by telephone and email no later than 24 hours after commencing a release from the release point specified in Table 1 – Contaminated water release criteria. Notification must include the submission of written advice to the entity with jurisdiction of the following information, collected in accordance with the conditions of this evaluation report:</p> <ul style="list-style-type: none"> a) Release commencement date/time; b) Details regarding the compliance of the release with the conditions of this evaluation report; c) Release volume and receiving water flow volume measured in accordance with Table 1 – Contaminated water release criteria. d) Release electrical conductivity, DO, temperature and pH.

B30	<p>Following cessation of the release from the release point specified in Table 1 – Contaminated water release criteria and within 20 business days provide the following information, collected in accordance with the conditions of this evaluation report, to the entity with jurisdiction in writing:</p> <ul style="list-style-type: none"> a) Release cessation date/time; b) Flow rates in receiving water; c) Release rates; d) Volume of water released (total and per day); e) Details regarding the compliance of the release with the conditions of this evaluation report (i.e. contaminant limits, natural flow, discharge volume); f) All in-situ water quality monitoring results, including pH, EC, DO and temperature; and g) Any other matters pertinent to the water release event.
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Schedule C - Definitions

‘Autumn’ means the late wet season, when flow has declined to a level able to be sampled, without significant flood peaks

‘contaminated water’ is water sourced from Eldridge Pit (during construction phase) or mixed water from both Eldridge and Wises Pit sourced from Wise Pit (during construction and operations).

‘evaluation report’ (OGC please insert definition)

‘entity with jurisdiction’ (OGC please insert definition) is the agency appointed by DSDIP that administers the evaluation report provisions under the *State Development and Public Works Organisation Act 1971*.

‘Spring’ means the early wet season, when flow has been established for at least four weeks

‘streamflow’ is the water flowing in the Copperfield River, arising from precipitation in the catchment of the Copperfield River, or from a release from the Copperfield Dam.

‘appropriately qualified person’ means a person who has professional qualifications, training, skills or experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis on performance relating to the subject matter using the relevant protocols, standards, methods or literature.

‘EC’ means electrical conductivity

‘µS/cm’ means micro siemens per centimetre.

Date : 27/03/2019 3:38:54 PM
From : "FOMIATTI MINNESMA Ingrid"
To : "Steven Tarte"
Cc : "Fraser, Reece", "Lee, Nicky", "Melanie Harris", "Arran McGhie", "SHARPE Dean", "James Harding", "BOOY Caitlin", "BOOY Caitlin", "TRELOAR Kirstie", "Rosemary Shearman", "Tanya Lavett", "Emma Malone", "Lau, Rouven"
Subject : RE: Actions from draft conditions discussion for K2H project
Attachment :
image001.png;image006.png;image016.png;image018.png;image019.jpg;image020.jpg;image021.jpg;image022.png;image023.png;image024.png;image025.jpg;image002.png;image010.jpg;image011.png;image012.jpg
Hi

Further to my email below:

- The proposed trigger and limit for EC are based on the water quality within the receiving environment. The receiving environment data presented in Table 8 of the Supplementary IAR shows that EC is less than 200 μ S/cm for all sites, except W2.
- The full dataset provided in Table 20 of the IAR, has the 95th percentile of WB for EC as 274 μ S/cm and the 80th percentile of 190 μ S/cm. Therefore, a limit of 300 μ S/cm and a trigger of 200 μ S/cm was proposed.
- Table 92 and 93 also show that post mixing EC is modelled to be < 300 μ S/cm at all sites downstream under worst case scenario.

Kind regards

Ingrid



,146 | FOMIATTI MINNESMA Ingrid
Cran| Wednesday, 27 March 2019 1:43 PM
v4 | Steven Tarte
sN | Fraser, Reece; Lee, Nicky; Melanie Harris; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone; Lau, Rouven
CMES | RE: Actions from draft conditions discussion for K2H project

Dear Steven

Please find attached the amended conditions as a results of today's meeting

DES believes this is a near final product. DES will provide further clarity around the EC and Sulphate numbers, however would like to highlight this is the position arrived at taking into consideration all data and submissions as part of the IAR. DES believes that the proposed values ensure that there is an appropriate level of protection and assessment of impacts for the receiving environment to ensure that commitments made by the proponent to minimise and mitigate impacts are achieved.

Kind regards

Ingrid



,146 | FOMIATTI MINNESMA Ingrid
Cran| Tuesday, 26 March 2019 2:02 PM
v4 | Steven Tarte
sN | Fraser, Reece; Lee, Nicky; Melanie Harris; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone; Lau, Rouven
CMES | RE: Actions from draft conditions discussion for K2H project

Dear Steven,

Please see attached revised conditions for the Kidston Hydro Project.

The suggested amendments that AECOM sent through on Friday are not supported. This is specifically in relation to **vi Ed 3** and **vi Ed 4**.

The changes to the release criteria in **vi Ed 3** are not supported for the following reasons;

- KPH1 is the only authorised release point for the project, as such it is not appropriate to remove this from the release discharge criteria;
- To account for uncertainty in the calculation of volumetric flow, the minimum flow rate has been increased to 5m³/sec from 4.63m³/sec;
- Stream flow rate and discharge release rate has been defined in m³/sec rather than ML/day to ensure that the minimum dilution ratio is met every hour not averaged over the day.

The limits and triggers that they have proposed in **vi Ed 1** and **vi Ed 3** are, in most cases, lower than ANZECC toxicant trigger values and what was proposed by DES. This is different to what was proposed and assessed in the IAR and it is unclear whether Genex would be able to meet these trigger values.

The TN and TP limits proposed in Table 4 are not supported. DES would be amenable to revising the compliance limit for TN of 0.35 mg/L and 0.04 mg/L for TP, based on Table 92 and Table 93 of the IAR, Table 2 in the Algae memo and Table 8 in the Supplementary IAR. DES is accepting of these as proposed interim limits, with a requirement to provide site-specific limits for these parameters by 1 September 2020.

Furthermore, values for total concentrations of Arsenic, Manganese and Molybdenum in **vi Ed 1** and **vi Ed 3** and Iron in **vi Ed 3** are lower than the dissolved fraction. This should never be the case.

All remaining issues raised by AECOM can be accepted, specifically the removal of W2 from the downstream trigger sites, and the frequency of biological monitoring. W2 is now included as an 'interpretation site' and no investigation will be required should a trigger value be exceeded. Macroinvertebrate frequency has been amended as per our discussions last Wednesday.

Regards,



Table 146 d mēg mārī 6 i

Director Minerals

g mārī d f b 41 mē m r a i d a 3 46 8 d i a n h 2 p u d 4 a 6 r a n d c r i u d n i f p r b m i n e s m a
Department of Environment and Science

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f 07 4222 5070 i t e 4 e d

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Personal



, 146 | Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>

Crn Friday, March 22, 2019 3:26 PM

v4 | Lau, Rouven

sM Fraser, Reece; Lee, Nicky; Melanie Harris; FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; BOOY Caitlin; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Tanya Lavett; Emma Malone

CMES NHRE: Actions from draft conditions discussion for K2H project

Hi Rouven,

Thank you for sending through the updated comments on the draft conditions.

DES are currently reviewing your proposed changes and intend to provide a response on Monday. If needed, we can then reconvene by teleconference on Wednesday as scheduled.

If you have any questions, please don't hesitate to call.

Regards,

Steven



Steven Tarte

A/Director

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, 146 | Lau, Rouven <Rouven.Lau@aecom.com>

Crn Thursday, 21 March 2019 7:17 PM

v4 | Melanie Harris <Melanie.Harris@coordinatorgeneral.qld.gov.au>; FOMIATTI MINNESMA Ingrid <Ingrid.FomiattiMinnesma@des.qld.gov.au>; Arran McGhie <am@genexpower.com.au>; SHARPE Dean

<Dean.Sharpe@des.qld.gov.au>; James Harding <jh@genexpower.com.au>; Steven Tarte <Steven.Tarte@coordinatorgeneral.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>; BOOY Caitlin <caitlin.booy@des.qld.gov.au>;

TRELOAR Kirstie <Kirstie.Treloar@des.qld.gov.au>; Rosemary Shearman <Rosemary.Shearman@coordinatorgeneral.qld.gov.au>; Emma Malone <Emma.Malone@coordinatorgeneral.qld.gov.au>; Tanya Lavett

<Tanya.Lavett@coordinatorgeneral.qld.gov.au>

sM Fraser, Reece <Reece.Fraser@aecom.com>; Lee, Nicky <nicky.lee@aecom.com>

CMES NHRE: Actions from draft conditions discussion for K2H project

Good afternoon everyone,

We have undertaken the review of Tables 92 and 93 in the IAR and confirm that WQOs and figures remain unchanged.

Please find attached the updated comments to the draft conditions, including the proposed updates to Table 4 and Table 6 as follows:

- For the compliance limits set out in Table 4 of the conditions, we have applied the WQOs, as used in the impact assessment (refer to the attached WQO Summary Table which lists the WQO for each parameter, the source and the reference within the IAR document). These WQOs are a combination of default values from various guideline values and where appropriate, site-specific values derived as part of the assessment of baseline water quality in the Copperfield River. The only new values proposed (i.e. not presented in the IAR) are interim values for Total Nitrogen (TN) and Total Phosphorus (TP). As established in communications between AECOM and DES in February 2019, the default WQO for TN (0.15 mg/L) is not suitable for the Copperfield River catchment. Similarly, baseline TP values are also elevated across the catchment. Interim site-specific WQOs have been assessed as 0.648 mg/L for TN and 0.054 mg/L for TP, based on the results of extensive additional monitoring undertaken in February 2019 (refer to Section 3.0 of the Supplementary IAR Information Report). It is proposed that these values be finalised following additional baseline monitoring.
- For the trigger values set out in Table 6 of the conditions, we have applied a value which is set at 80% of the WQOs listed in Table 4. This approach is considered to provide early warning of a parameter approaching the WQO, and therefore requiring further investigation.

I will provide estimated coordinates for the release point tomorrow, noting that these may need to be refined during the detailed design period.

As always, any questions please feel free to give me a call.

Regards,

Rouven

Rouven Lau

Associate Director - Environment

D +61 7 4720 1583 M

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Personal

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Please consider the environment before printing this email.

From: Melanie Harris <<mailto:Melanie.Harris@coordinatorgeneral.qld.gov.au>>

Sent: Thursday, 21 March 2019 10:08 AM

To: FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; James Harding; Steven Tarte; BOOY Caitlin; Lau, Rouven; Lee, Nicky; Fraser, Reece; BOOY Caitlin; TRELOAR Kirstie; Rosemary Shearman; Emma Malone; Tanya Lavett

Subject: Actions from draft conditions discussion for K2H project

Good morning everyone,

Please find the actions from yesterday's discussion below.

- The proponent to review Tables 92 and 93 in the IAR to confirm that WQOs and figures are appropriate (i.e. based on ANZECC and WB as previously discussed). Response to be provided to DES/OCG by Friday 22 March 2019. The proponent has since confirmed that a response will be provided today.
- Proponent to provide coordinates for the release point.
- DES to review/amend conditions to ensure that it is clear that W2 is to be used for an early warning monitoring point upstream of the receiving environment compliance limits.
- DES to review/amend the wording for biological modelling to ensure the requirements better reflect an ephemeral stream (i.e. six weeks following a major flow event).

Kind regards,

Mel



Melanie Harris

Project Manager

s 441 m l r 3 143 N d r d u r l y

Office 313m 3 441 m n l - G r a r i d

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Date : 29/03/2019 12:48:32 PM

From : "FOMIATTI MINNESMA Ingrid"

To : "Lau, Rouven" , "Melanie Harris" , "SHARPE Dean" , "Steven Tarte" , "BOOY Caitlin" , "PAGE Cathie" , "CLAUS Sonia" , "Tanya Lavett" , "Rosemary Shearman" , "Emma Malone"

Cc : "Craig Francis" , "Arran McGhie" , "Fraser, Reece" , "Lee, Nicky"

Subject : RE: Action items from conditions discussion

Attachment :

image009.jpg;image010.png;image014.png;image015.png;image016.jpg;image017.jpg;image018.jpg;image019.png;image020.png;image021.png;image022.jpg;image001.png;image002.jpg;

Dear Rouven

DES has considered the memo and the representations made I offer the following considerations.

The risk associated with an increase in sulfate within the receiving environment downstream of the release has not been adequately assessed in the IAR or the memo provided 28th March 2019. There is a risk to aquatic ecosystems by using the proposed 18 mg/L, the drinking water or stock watering guidelines as a trigger value to protect the aquatic ecosystems in the Copperfield River and the broader Gilbert River Basin. Additionally, the comparison of sulfate concentrations from other river basins is not appropriate, as the concentration of sulfate can vary considerably across the state. In a study in 2013 by TropWater, the concentration of sulfate in waterholes within the Gilbert River Basin was found to be less than 10 mg/L (see Table below) and less than 2 mg/L at G3, G4 and G5 which are on the Einasleigh River, these concentrations are similar to those that were measured at WB.

The National and Queensland Water Quality Guidelines emphasize the need to develop locally relevant guidelines, therefore it is more appropriate to apply a trigger value that is based on background data at WB. Therefore, a trigger value of 4 mg/L is proposed by DES in Table 6 of the draft EA, based on the 80th percentile of WB, to protect the downstream receiving environment. If in the future, information can be provided that an increase in the sulfate concentration to the proposed 18 mg/L is a low risk and does not impact on the aquatic ecosystems downstream, then the EA trigger value may be amended.

This would require an adequately designed study – which DES is happy to engage on. However in the current circumstance I believe there is no time to do this before we proceed to conditions and hence the most pragmatic solution is to continue with the trigger value as it stands and allow the project to proceed while this study is undertaken. I note that this issue was discussed at length during our various conversations early during the project and this possible solution was flagged. In lieu of appropriate scientific evidence to support the proposition to increase sulfate levels in the receiving environment by over 300%, DES maintains its position.

Kind regards Ingrid

Gilbert catchment water quality laboratory analysis results: major ions

WATERHOLE	DATE	TIME	ACa mg/L	AMg mg/L	ANa mg/L	AK mg/L	ACl mg/L	ASO4 mg/L	Ca mg/L	Mg mg/L	Na mg/L	K mg/L	Cl mg/L	SO4 mg/L
G01	01/12/2012	16:30	19	28	31	8	10	1	0.948	2.304	1.349	0.205	0.282	0.021
	20/01/2013	10:00	25	30	31	6	8	-	1.248	2.469	1.349	0.153	0.226	-
G02	01/12/2012	13:00	17	8	28	5	25	1	0.848	0.658	1.218	0.128	0.705	0.021
	20/01/2013	12:00	24	11	34	5	26	-	1.198	0.905	1.479	0.128	0.733	-
G03	28/11/2012	13:00	10	20	48	6	30	2	0.499	1.646	2.088	0.153	0.846	0.042
	18/01/2013	10:00	12	15	44	4	27	-	0.599	1.234	1.914	0.102	0.762	-
	19/02/2013	13:00	17	10	20	3	10	<1	0.848	0.823	0.870	0.077	0.282	0.010
G04	28/11/2012	9:00	10	22	81	8	63	1.0	0.499	1.810	3.524	0.205	1.777	0.021
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G06	27/11/2012	7:00	34	54	33	5	12	1.0	1.697	4.444	1.436	0.128	0.339	0.021
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	19/01/2013	14:00	3	2	6	3	4	8.0	0.150	0.165	0.261	0.077	0.113	0.167
	20/02/2013	12:45	3	2	6	2	3	6.0	0.150	0.165	0.261	0.051	0.085	0.125
G09	30/11/2012	8:00	7	5	31	9	16	1.0	0.349	0.411	1.349	0.230	0.451	0.021
	19/01/2013	10:30	4	2	5	3	4	<1	0.200	0.165	0.218	0.077	0.113	0.010
	20/02/2013	13:00	<1	1	2	2	2	<1	0.025	0.082	0.087	0.051	0.056	0.010
G10	29/11/2012	17:00	9	6	22	4	11	5	0.449	0.494	0.957	0.102	0.310	0.104
	19/01/2013	8:45	7	3	9	2	6	4	0.349	0.247	0.392	0.051	0.169	0.083
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ASO4 - Aqueous sulfate

Source: Wallace, Jim & Burrows, Damien & Brodie, Jon & Thomas, Colette & Butler, Barry & James, Cassandra & Waltham, Nathan. (2013). Waterhole ecology in the Flinders and Gilbert catchments. 408.

https://www.researchgate.net/publication/260599789_Waterhole_ecology_in_the_Flinders_and_Gilbert_catchments



Ingrid Fomiatti Minnesma

Director Minerals

Minerals & North Queensland Compliance | Environmental Services & Regulation

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Employee Resource Group



From: Lau, Rouven <Rouven.Lau@aecom.com>

Sent: Thursday, 28 March 2019 9:21 PM

To: Melanie Harris; FOMIATTI MINNESMA Ingrid; SHARPE Dean; Steven Tarte; BOOY Caitlin; PAGE Cathie; CLAUS Sonia; Tanya Lavett; Rosemary Shearman; Emma Malone

Cc: Craig Francis; Arran McGhie; Fraser, Reece; Lee, Nicky

File A

Page 157 of 161

Subject: RE: Action items from conditions discussion

Good evening,

In response to action items 1 and 2 below:

1. **Table 4 EC value of 300 S/cm** – After a review of available data, correspondence from DES yesterday, Queensland Water Quality Guidelines, and modelling in the IAR, Genex are prepared to accept the 300 S/cm contaminant limit in Table 4 and the 200 S/cm trigger value in Table 6 of the draft licence conditions.
2. **Table 6 Sulfate value of 4mg/L** – We maintain our position of seeking a more practical trigger value that does not impose an unnecessary administrative burden to Genex and the OCG / DES. We acknowledge the concerns that were raised by DES at our meeting yesterday regarding the uncertainties relating to potential impacts of sulphate. In response we have undertaken further assessments to better understand the thresholds for environmental impacts of sulphate, including geochemical modelling and a literature review of other specific impact assessments undertaken for sulphate in other catchments. As a result of these considerations, we propose a trigger value of 18mg/L for sulphate in the downstream receiving environment. We have attached the outcome of the additional investigation in support of this revised trigger value.

Subject to agreeing on the revised sulphate trigger value Genex are prepared to conclude the licence negotiations.

Regards,

Rouven

Rouven Lau

Associate Director - Environmental
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Please consider the environment before printing this email.

From: Melanie Harris [<mailto:Melanie.Harris@coordinatorgeneral.qld.gov.au>]

Sent: Wednesday, 27 March 2019 1:54 PM

To: FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; Craig Francis; Steven Tarte; Lau, Rouven; BOOY Caitlin; PAGE Cathie; CLAUS Sonia; Fraser, Reece; Lee, Nicky

Cc: Emma Malone; Rosemary Shearman; Tanya Lavett

Subject: Action items from conditions discussion

Good afternoon everyone – please find action items from our discussion below:

1. Table 4 – EC currently set at 300. AECOM to provide justification as to why 500 is more appropriate, noting that DES consider Genex can meet 300 which is based on WB data.
2. Table 6 - Sulfate – Genex to provide a different argument for a new trigger level which DES will consider
3. Table 6 - TN and TP – DES will review proposed trigger values based on data (note: amended as per DES email of 1:46 pm)
4. Table 6 - Molybdenum, Nickel and Uranium figures to change to 1 due to LOR issues (note: amended as per DES email of 1:46 pm).
5. B24 to be changed to 30 May (note: amended as per DES email of 1:46 pm)).

DES have re-issued conditions. To enable closing out of assessment in a timely manner, all matters to be finalised by 29/3.

If new issues are raised, they will need to be substantial to warrant further consideration.

If there are any questions, please don't hesitate to call.

Kind regards,

Mel



Melanie Harris
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Date : 1/04/2019 10:34:22 AM

From : "FOMIATTI MINNESMA Ingrid"

To : "Lau, Rouven", "Melanie Harris", "SHARPE Dean", "Steven Tarte", "BOOY Caitlin", "PAGE Cathie", "CLAUS Sonia", "Tanya Lavett", "Rosemary Shearman", "Emma Malone"

Cc : "Craig Francis", "Arran McGhie", "Fraser, Reece", "Lee, Nicky"

Subject : RE: Action items from conditions discussion

Attachment :

image001.png;image008.png;image017.jpg;image019.jpg;image020.png;image021.jpg;image022.jpg;image023.jpg;image024.png;image025.png;image026.png;image027.jpg;image003.png;image005.jpg;image007.png;

Dear Rouven

The DTA2 results were reviewed by DES and a response provided in July 2018 (WRN8 2016) and further concerns regarding the use of DTA2 were raised in subsequent reviews and at our meetings. Issues were raised regarding the limitations and minimum requirements if the DTA was to be used to derive effluent-, chemical- and/or site- specific WQOs.

An important concern regarding the DTA was that the species used did not meet the minimum data requirement of the Species Sensitivity Distribution (SSD) method and that the use of locally relevant wild-caught species, acclimatized for local conditions, rather than readily available species at standard laboratory conditions was recommended.

The use of locally relevant wild-caught species is particularly relevant with regard to the naturally low sulfate concentrations in the Copperfield River, as locally relevant wild-caught species may be more sensitive to an increase in sulfate than species at standard laboratory conditions.

In addition it should be noted that the sulfate issue is broader than DTA and direct toxicity matters raised as the duration of concentrations greater than 4 mg/L should be considered and the risk of a long term increase in sulfate to the aquatic ecology within the local receiving environment downstream of the release point is still unknown and requires further investigation.

DES is amenable to the client conducting further studies to firm up the science around this – and is available to discuss the scope.

However it was my understanding this was an urgent matter, hence based on the current uncertainty and in line with all previous conversations going back over 9 months now, DES provided a solution whereby the project can commence and some of this work can be completed post approval. In itself this means that all parties take on some risk. However if this is not acceptable to the client then we will require the further work to be completed.

This is DES's final position on this matter and DES will finalise its response to OCG today.

Kind regards

Ingrid



Ingrid Fomiatti Minnesma

Director Minerals

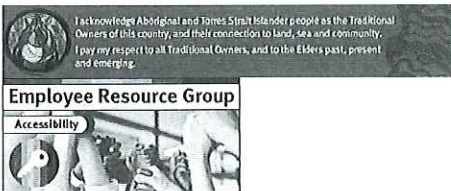
Minerals & North Queensland Compliance | Environmental Services & Regulation

Department of Environment and Science

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Email: ingrid.fomiatti@minnesma.qld.gov.au

5b Sheridan Street Cairns Q 4870 Postal address: PO Box 7230 Cairns Q 4870.



From: Lau, Rouven <Rouven.Lau@aecom.com>

Sent: Friday, 29 March 2019 4:55 PM

To: FOMIATTI MINNESMA Ingrid; Melanie Harris; SHARPE Dean; Steven Tarte; BOOY Caitlin; PAGE Cathie; CLAUS Sonia; Tanya Lavett; Rosemary Shearman; Emma Malone

Cc: Craig Francis; Arran McGhie; Fraser, Reece; Lee, Nicky

Subject: RE: Action items from conditions discussion

Hi Ingrid and Steven,

We have assessed the risk of sulphate in the receiving environment from an ecotoxicological, a precipitation and a mass balance standpoint.

In terms of specifying site-specific guideline values, the Direct Toxicity Assessments were undertaken for the mixture of the receiving environment and release water compositions, in accordance with ANZECC (2000) guideline methodology. This was a site-specific measurement, based on the composition of water in the Copperfield River, mixed with varying concentrations of release water, to determine what ratio between the two waters would achieve a 95% species protection level based on ecotoxicological response.

DTA2 (June 2018) showed that dilution of the release water (composite samples) to a value of 1 part release water to 1.1 parts receiving water would achieve a 95% species protection level. At this mixing ratio the concentration of sulphate would be approximately 820mg/L. We present these values as locally relevant guidelines derived using ANZECC (2000) methodology. It is worth emphasising that the results from DTA2 are representative of the receiving environment after releases, if releases were to occur at 1 part release water to 9 parts receiving environment water. As outlined throughout the IAR process, and conditioned in the draft licence, we will release at 1 part of release water to 200 parts of receiving environment water. At this release ratio, we achieve a concentration in the downstream environment of between 15-20mg/L as outlined in the IAR and the memo. This release ratio is well below of what the DTA outlines will achieve a 95% species protection level.

Acknowledging and having regard toward DES' ongoing concern, but also considering the above, we request that a smaller increase in sulphate trigger value to 9mg/L be considered. This will provide consistency between the Project and current mine EA trigger value, whilst considering DES's concerns about the larger value of 18 mg/L.

I hope that we can move forward on this basis.

Regards,

Rouven

Rouven Lau

Associate Director - Environment

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Please consider the environment before printing this email.

From: FOMIATTI MINNESMA Ingrid (<mailto:ingrid.fomiatti@minnesma.qld.gov.au>)

Sent: Friday, 29 March 2019 12:49 PM

To: Lau, Rouven; Melanie Harris; SHARPE Dean; Steven Tarte; BOOY Caitlin; PAGE Cathie; CLAUS Sonia; Tanya Lavett; Rosemary Shearman; Emma Malone

Cc: Craig Francis; Arran McGhie; Fraser, Reece; Lee, Nicky

Subject: RE: Action items from conditions discussion

Dear Rouven

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The National and Queensland Water Quality Guidelines emphasis the need to develop locally relevant guidelines, therefore it is more appropriate to apply a trigger value that is based on background data at WB. Therefore, a trigger value of 4 mg/L is proposed by DES in Table 6 of the draft EA, based on the 80th percentile of WB, to protect the downstream receiving environment. If in the future, information can be provided that an increase in the sulfate concentration to the proposed 18 mg/L is a low risk and does not impact on the aquatic ecosystems downstream, then the EA trigger value may be amended.

This would require an adequately designed study – which DES is happy to engage on. However in the current circumstance I believe there is no time to do this before we proceed to conditions and hence the most pragmatic solution is to continue with the trigger value as it stands and allow the project to proceed while this study is undertaken. I note that this issue was discussed at length during our various conversations early during the project and this possible solution was flagged. In lieu of appropriate scientific evidence to support the proposition to increase sulfate levels in the receiving environment by over 300%, DES maintains its position.

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Gilbert catchment water quality laboratory analysis results: major ions

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ASO4 - Aqueous sulfate

Source: Wallace, Jim & Burrows, Damien & Brodie, Jon & Thomas, Colette & Butler, Barry & James, Cassandra & Waltham, Nathan. (2013). Waterhole ecology in the Flinders and Gilbert catchments. 408. https://www.researchgate.net/publication/260599789_Waterhole_ecology_in_the_Flinders_and_Gilbert_catchments



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Sent: Thursday, 28 March 2019 9:21 PM

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Cc: Craig Francis; Arran McGhie; Fraser, Reece; Lee, Nicky

Subject: RE: Action items from conditions discussion

Good evening,

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Subject to agreeing on the revised sulphate trigger value Genex are prepared to conclude the licence negotiations.

Regards,

Rouven

Rouven Lau

Associate Director - Environment

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From: Melanie Harris [<mailto:melanie.harris@coordinatorgeneral.qld.gov.au>]

Sent: Wednesday, 27 March 2019 1:54 PM

To: FOMIATTI MINNESMA Ingrid; Arran McGhie; SHARPE Dean; Craig Francis; Steven Tarte; Lau, Rouven; BOOY Caitlin; PAGE Cathie; CLAUS Sonia; Fraser, Reece; Lee, Nicky

Cc: Emma Malone; Rosemary Shearman; Tanya Lavett

Subject: Action items from conditions discussion

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DES have re-issued conditions. To enable closing out of assessment in a timely manner, all matters to be finalised by 29/3.

If new issues are raised, they will need to be substantial to warrant further consideration.

If there are any questions, please don't hesitate to call.

Kind regards,

Mel



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