

Ref: C-EA-100585504. Summary of responses and amendments to application material

Item	Information Requested	Senex Response
1	<p>Issue 1: The application does not provide sufficient information to describe the proposed amendment. The following information is missing from the amendment application:</p> <p>1) The application does not meet the key requirements of the guideline “Structures which are dams or levees constructed as part of environmentally relevant activities” (ESR/2016/1934), which are required to be provided to the administering authority to assess the proposed regulated structures. These requirements include but are not limited to:</p> <ul style="list-style-type: none"> ● ‘design plan’ which identifies how consequence scenarios are addressed in the planned design and operation of a regulated structure, which includes: <ul style="list-style-type: none"> ○ the physical dimensions of the regulated structure; ○ the materials and standards to be used for construction; and ○ the criteria to be used for operating the regulated structure ○ design storage allowance (DSA) ○ the consequence scenarios that have been used in undertaking a consequence assessment. ○ the application also does not identify if the proposed ‘regulated structures’ that are not classified as “low consequence” are considered to be high or significant consequence. ○ the hydrology/hydraulics used to estimate and deal with flood events, internal and external to the regulated structure, at probabilities appropriate to address identified consequence scenarios, including containment of contaminants ○ seepage and stability issues (including containment of contaminants) and ○ any assumptions relating to the design and safety of the regulated structure. ○ certification from a suitably qualified person be obtained, accompanied by a statement of reasons setting out how facts documented in the design plan support the conclusion that the regulated structure is capable of providing the specific performance required of that structure. ● the application also does not identify if the proposed ‘regulated structures’ that are not classified as “low consequence” are considered to be high or significant consequence. ● the environmental objectives specified in Section 4.1 and 4.2 of the guideline that must be demonstrated by the applicant as part of any application for an activity with a regulated structure. <p>2) The application does not address if the structures will be designed to facilitate a release to the environment.</p> <p>3) The application also identifies five proposed structures as “Low Consequence Structures” – in order to meet this requirement a structure is required to demonstrate that it meets the ‘low’ criteria identified in Table 1 - Consequence Category Assessment of the manual “Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/19332)”.</p> <p>4) The application does not include any information about ancillary linear infrastructure. This infrastructure is likely to be required to move water between the 8 proposed regulated structures as well as to receive water from other tenures held by the applicant.</p>	
	<p>Required actions:</p> <ol style="list-style-type: none"> 1) Describe the location of the proposed regulated structures, including a map showing the locations. 2) Provide the information required by the guideline, “Structures which are dams or levees constructed as part of environmentally relevant activities” (ESR/2016/1934), including information specified in subpoint 1 under Issue 1 of this notice. 3) If the proposed regulated structures will be designed to facilitate a release to the environment, provide the following information: <ol style="list-style-type: none"> a. Provide the location of the release point (Latitude and Longitude GDA 2020 and zone); b. Identify the receiving waterway; c. Establish a baseline for the water quality in the receiving waters. This should include empirical data obtained of the receiving waters that demonstrates any expected changes due to seasonal and meteorological changes. The information should also include the seasonal changes to the flow rate of the receiving waters; d. Identify the expected frequency and volume of the discharge; e. Identify any potential downstream sensitive receptors. This include any ecological areas that would be negatively affected by the release of contaminants as well as any other land-users that may rely on the surface water for agricultural purposes or consumption; f. Identify the expected contaminants; g. Provide proposed discharge limits; h. Identify the background water quality and flow rate of the receiving waters; i. Demonstrate that the proposed discharge limits will not result in environmental harm (including nuisance) to the receiving waterway, making reference to the relevant water quality objectives identified under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 as well as the determined baseline water quality as per subpoint 3) c above. 	<ol style="list-style-type: none"> 1) Please refer to Figure 4-2 and Appendix A of the updated supporting information report 2) Please refer to Tables 4-8 to 4-11 and Appendices H of the updated supporting information report. 3) N/A - regulated and low consequence structures are designed to be no-release structures. The design requirement for a spillway on a regulated structure is a de-escalation point to allow overtopping in a controlled manner and prevent a dam break scenario. However, there are multiple levels of controls specifically designed to prevent releases via the spillway as detailed in sections 4 and 5 of the updated supporting information report.

	<p>4) If the proposed regulated structures will be designed to contain and will not release any contaminants to the environment, provide the following information:</p> <p>a. Identify the Annual Exceedance Probability (AEP) and Annual Recurrence Interval (ARI) that the structures will be designed to contain.</p> <p>b. Provide sufficient justification as to the AEP and ARI selected.</p> <p>5) For structures identified as “low consequence”, demonstrate how they meet the ‘low’ criteria identified in Table 1 - Consequence Category Assessment of the manual “Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/19332)”.</p> <p>6) Confirm if any ancillary linear infrastructure is likely to be required to move water between the 8 proposed regulated structures as well as to receive water from other tenures held by the applicant. If yes, provide details of this infrastructure, including their locations.</p>	<p>4) Please refer to Section 4 and section 5, Tables 4-8 to 4-11 and Appendices H of the updated supporting information report</p> <p>5) Low consequence dams will be <100ML, will be for produced water only and will not trigger any high or significant criteria listed in Table 1 in the Manual for assessing consequence categories and hydraulic performance of structures.</p> <p>6) No ancillary water management infrastructure is part of this application. Should any be required in future it will be subject to a separate EA amendment process if required.</p>
2	<p>Issue 2: The application does not sufficiently describe the land that will be affected by the proposed amendment and specifically:</p> <p>1) The application does not identify where within PL209 and PL445 the proposed regulated structures will be constructed and operated.</p> <p>2) The application mentions that certain areas have been identified as ‘no go’ areas as part of the constraints area protocol, shown in Figure 3-2 of the supporting information report. The application indicates that in these areas regulated structures will not be located. However mapping provided for these areas suggests they are small and may not accommodate the proposed dams.</p> <p>Required actions:</p> <p>1) Describe the location of the proposed regulated structures, including the land likely to be affected by the these structures and a map showing their locations with GPS coordinates in GDA 2020 datum.</p> <p>2) Explain how the location of the proposed regulated structures will fit in with the ‘no go’ areas presented in Figure 3-2 of the supporting information report.</p>	<p>1) Please refer to Figure 4-2, Appendix A and Appendix J of the updated supporting information report</p> <p>2) 'No go areas' are just that, no infrastructure will be located within a no-go area.</p>
3	<p>Issue 3: The application has identified the relevant environmental values for the area at large. However, the specific environmental values that may be affected by the proposed amendment have not been described due to the lack of information on the actual location of the proposed regulated structures.</p> <p>Required action: Describe the environmental values likely to be affected by the proposed regulated structures which are specific to their location.</p>	<p>1) Please refer to Section 8 and specifically Figure 8-1 and Table 8-1 for details of environmental values in proximity to potential dam locations. Further details on potential impacts to environmental values and an impact assessment are provided in sections 9 - 13 of the supporting information report.</p>
4	<p>Issue 4: The application primarily addresses emissions and releases associated with the construction of the activities (i.e. erosion and sediment controls and noise). However, the application does not appear to consider emissions and releases that may occur during the operational phase of the activity. This includes releases from the dams that may occur during extreme weather events.</p> <p>Required Action:</p> <p>1) Include in the application details of emissions and releases associated with the operational phase of the activity and particularly any releases from the dams that may occur during extreme weather events.</p>	<p>1) Regulated dams are designed as no-release structures. The Model Dam conditions and the Dam Design Manual allow for this through the requirements for MOL, DSA (and MRL) and ESS.</p> <p>Where a structure is classified as significant or high consequence (aka a regulated structure), the dam manual requires that it be constructed to include both a design storage allowance which must be available within the dam from 1 November every year to allow for expected wet season rains, and an Extreme Storm Storage volume to provide additional capacity in the event of an extreme weather event. DSA and ESS volumes are calculated in accordance with the parameters and criteria contained within the dam manual. Should a weather event be so extreme as to create a scenario where overtopping is likely to occur, flow paths through the operation of gravity will be into the water catchment, where it is expected that water volumes will already be sufficiently high from the same extreme weather event that dilution will occur and residence times will be minimal (i.e. local creeks and rivers in flood). The risks of such scenarios have been assessed in both the CCA and the Bow-Tie risk assessments provided as Appendix G and Appendix I and summarised in Section 4.3 of the updated supporting information report.</p> <p>Further information on potential impacts to environmental values from seepage, overtopping or dam break are included in sections 9 to 13 of the updated supporting information report.</p>

5	<p>Issue 5: In the absence of a specified location for the proposed regulated structures, the application does not sufficiently describe site specific risk and likely magnitude of the impacts on the environmental values resulting from the construction and operation of the proposed regulated structures.</p> <p>There are information gaps in the description of risk and likely magnitude of impacts on the environmental values which include but are not limited to the following items:</p> <ol style="list-style-type: none"> 1) The impacts associated with a potential dam failure have not been described and assessed. 2) The impacts associated with stormwater management, including a potential discharge into waterways or surrounding land have not been described and assessed. Given that the proposed dams may hold a large volume of water and the water quality may include EC of 15,500us/cm any such release has the potential to cause significant environmental harm. 3) The impacts resulting from the storage of brine in the proposed dams from the Reverse Osmosis water treatment plant located offsite have not been described and assessed. The application refers to the need to accommodate additional brine generated as part of the Reverse Osmosis water treatment plant (approx. 300 ML). Brine storage in any of the proposed regulated structures is likely to pose a significantly greater risk and impact on environmental values if brine is released to the environment. 4) The impacts associated with the associated linear infrastructure are not described and assessed. This impact assessment is particularly important given the high density of waterways and other matters of environmental significance (such as for example Matters of State Environmental Significance (MSES) and Environmentally Sensitive Areas (ESAs) located within the relevant tenures, which would likely result in the linear infrastructure causing disturbance to these areas. 5) The application states in section 8.3.6.1 of the supporting information report that diversion of first order streams will be required to facilitate the construction of some of the regulated structures. However, the impacts associated with the proposed diversion have not been described and assessed. 	
	<p>Required actions:</p> <ol style="list-style-type: none"> 1) Describe the risk and likely magnitude of impacts on the environmental values resulting from a potential dam failure. 2) Describe the risk and likely magnitude of impacts on the environmental values associated with stormwater management, including a potential discharge into waterways or surrounding land due to for example an extreme weather event. 3) Describe the risk and likely magnitude of impacts on the environmental values resulting from the storage of brine in the proposed dams from the Reverse Osmosis water treatment plant located offsite. 4) Describe the risk and likely magnitude of impacts on the environmental values associated with the construction and operation of any ancillary linear infrastructure. 5) Describe the risk and likely magnitude of impacts on the environmental values associated with the planned diversion of the first order streams to facilitate the construction of some of the regulated structures. 	<ol style="list-style-type: none"> 1) Please refer to section 4 (CCA) and section 8 (Environmental Values) of the updated supporting information report. 2) Low consequence dams and regulated structures are not designed to have an external catchment, and are designed as no-release structures. Stormwater management will predominantly consist of diversion drains to channel overland flow around dam embankments and safely discharge it at an appropriate velocity into the natural drainage system. Regulated structures are also designed to include storage for expected seasonal rainfall and extreme weather events (refer to the response to issue 4 above for further information). 3) Please note that while water treatment is mentioned in the application as the destination for produced water, the application does not seek authorisation for such infrastructure. Similarly, the application does not seek authorisation for any ancillary infrastructure associated with transfer of water or brine across tenures. Should either water treatment or water transfer infrastructure be required in future, it will be subject to a separate EA amendment application. For a discussion of the risks and likely magnitude of impacts associated with the storage of Brine, please refer to section 4 and section 8 of the updated supporting information report. 4) As noted above in the response to 3) above, ancillary linear infrastructure does not form part of the application and should it be required in future will be the subject of a separate EA amendment application. 5) Please refer to section 4 and section 10.1.1 of the updated supporting information application.
6	<p>Issue 6: Section 4 of the application discusses existing management practices and include:</p> <ul style="list-style-type: none"> • erosion and sediment control (during construction) • decommissioning • rehabilitation (including transitional rehabilitation and final rehabilitation) • waste management <p>However, these management practices do not appear to address all potential adverse impacts resulting from the proposed activity, which are listed in subpoints 1 - 5 under Issue 5.</p> <p>Required action: Provide details of the management practices proposed to be implemented to prevent or minimise adverse impacts resulting from the proposed activity which are listed in subpoints 1 - 5 under Issue 5.</p>	<ol style="list-style-type: none"> 1) Please refer to section 5 of the updated supporting information report.
7	<p>Issue 7: The application does not identify the volume of water proposed to be stored in the proposed regulated structures. The application refers only to the surface area of the dams and does not provide the depth or other means of determining the volumes of water proposed to be stored. The application does not provide measurable criteria for the quantity of water used, treated, stored or disposed of with reference to the proposed regulated structures.</p> <p>Required action: Provide information on the quantity of water proposed to be stored in the proposed regulated structures and the measurable criteria for the quantity of water proposed to be stored in the proposed regulated structures.</p>	<ol style="list-style-type: none"> 1) Please refer to Table 4-3 of the updated supporting information report for proposed maximum storage volumes for regulated structures. Measurable criteria (management criteria) are detailed in section 6.4 and potential corrective actions are listed in Table 6-5 of the updated supporting information report.

8	<p>Issue 8: As the application does not identify the location of the proposed regulated structures, the relevant environmental values have not been adequately identified. Therefore, proposed measurable criteria for the protection of the environmental values are not sufficient or suitable.</p> <p>Required action: Provide the measurable criteria for the protection of the environmental values affected by the proposed CSG activity based on the specific location of environmental values.</p>	<p>1) please refer to section 6-4 and specifically Table 6-4 and 6-5 for details of the measurable criteria (referred to as management criteria in the Supporting Information Report) and potential corrective actions.</p>
9	<p>Issue 9: The application's response to these criteria is said to be presented in Table 2-2, section 6 of the supporting information report. However, there is no corresponding information that addresses this matter in section 6, or elsewhere in the supporting information report.</p> <p>Required action: Provide information on the actions that are to be taken if any of the management criteria are not complied with to ensure that the criteria will be able to be complied with in the future.</p>	<p>1) please refer to section 6-4 and specifically Table 6-4 and 6-5 for details of the measurable criteria (referred to as management criteria in the Supporting Information Report) and potential corrective actions.</p>
10	<p>Issue 10: The application does not include consideration of any feasible alternatives to CSG evaporation dams for managing CSG water.</p> <p>Required action: Provide an evaluation showing there is no feasible alternative to a CSG evaporation dam for managing the CSG water.</p>	<p>1) The application does not propose any evaporation dams. Evaporation dams have not been authorised since 2012 when the CSG water management hierarchy was implemented.</p>