

Item	Information Requested	Senex Response
Part 1		
1	<p><u>Issue</u></p> <p>The supporting Basis of Design Document and the preliminary Consequence Category Assessment (CCA) documents both refer to a 300ML brine dam and a 700ML process water dam, while Section 4.1 of the Louisiana EA Amendment Supporting Information Report (the Report) states, “Engeny (2024) completed a preliminary CCA covering all 25 potential 300 – 1000ML dam locations across the Louisiana area in accordance with the Dam Manual (Appendix G). This CCA is based on the parameters identified in Table 4-3.” (comprising of 700ML of produced water and 300ML of concentrated brine storage as described in Appendix G – Preliminary Consequence Category Assessment (CCA))</p> <p>The forecast water production described in section 6.1 of the report in figure 6.1 (refer below) suggests that the volume of water being produced per year (4.5ML/day x 365 = 1,642.5ML), may exceed the proposed capacity of these dams. The cumulative volume of water extracted over the projected life of the project, also appears significantly greater than the capacity provided by these dams (peaking at approx. 6,800ML).</p> <p>While it is understood that a certain volume of water being produced will be treated prior to release and that there will be losses such as via evaporation, it is also understood that additional capacity provided by these dams is being sought to provide storage capacity for waters produced by the larger Atlas project area (regulated across multiple environmental authorities).</p> <p><u>Requested Information</u></p> <p>Provide further detail regarding:</p> <ol style="list-style-type: none"> The design and capacity of each structure including: <ul style="list-style-type: none"> The surface area and volume of each structure at each location identified; and The maximum depth of each structure at each location identified; and The total designed volume of storage for each water type (brine, produced water etc); and Information is also required about whether other deeper dams have been considered which may reduce the overall number of dams required and reduce the number/footprint of the individual dams required. Why were these determined to be not appropriate? The annual volume of produced waters <ul style="list-style-type: none"> produced within Louisiana the project area that will be directed into the project area from outside of the Louisiana project area. Provide further information regarding other types of waters that will be directed to the Louisiana project area including <ul style="list-style-type: none"> the type and quality and quantity of waters (i.e. Reverse Osmosis permeate or other waters) directed to the Louisiana Dams from outside of the Louisiana project area. 	<p>1. & 2. Section 3.2 of the Louisiana EA amendment Supporting Information Report submitted 31/05/2024 (hereafter the Supporting Information Report) proposes three regulated structures with a combined area limit of 75ha. Separately to this, Section 4.1, Table 4-3 Details of Proposed Structures provides a maximum volumetric limit for produced water dams and brine dams of 700ML and 300ML respectively. The 1,000ML referenced in section 4.1 refers to a potential two cell regulated structure scenario. This represents an 'absolute maximum' for the project and is what the generic CCA and Preliminary Basis of Design (submitted as Appendix G and H to the Supporting Information Report) account for.</p> <p>Final dam depth will be determined by a Suitably Qualified Person in accordance with the Manual for assessing consequence categories and hydraulic performance of structures ESR/2016/1933 (the Manual) with considerations including (but not limited to) required storage volume, site topography and site geotechnical information. The preliminary basis of design provided with the application will be refined once a final location is selected. The final dam design plan will incorporate any relevant consideration of depth, so that where possible the footprint of the dam may be reduced as far as is reasonably practicable.</p> <p>3. & 4. The forecast annual produced water volume for the Louisiana tenures (PL209 and PL 445) is specified in Appendix B of the Supporting Information Report with peak production forecast to be approximately 3.5 ML/d (Appendix B of the Supporting Information Report). This does not easily extrapolate to an annual forecast due to the short duration of peak water production and the steep decline in water production once the peak has been passed (see Figure 3.1 of Appendix B to the Supporting Information Report). Water forecasts provided in Appendix B of the Supporting information Report show an estimated 6,800 ML of water will be produced over the planned 30yr life of the project. Senex’s planned infrastructure will have sufficient capacity to safely store forecast water volumes over the life of the project.</p> <p>Section 6.2 (Tables 6-1 and 6-2) of the Supporting Information Report details the expected produced water quality and expected brine quality for the project area. Produced water flows may be balanced across Senex greater Atlas tenures (PL 1037, PL 1127, PL 445 and PL 209) and the water quality data information provided in section 6.2 of the supporting information report encompasses these tenures. Brine quality data is also considered representative of actual quality, being based on the brine stored on Senex's PL 1037.</p> <p>As stated in section 3 of the Supporting Information Report '... it should be noted, that while this EA amendment application includes brine storage as an option, it does not propose any amendments to construct or operate water treatment plants (WTPs) or associated pipelines. Should these activities be required, then they will be subject to the outcome of a separate and future EA amendment application'</p> <p>Senex has no plans to transfer brine from other tenures to the area covered by this EA.</p>
2	<p><u>Issue</u></p> <p>The supporting information states that following completion of the activity, rehabilitation of these structures will involve the removal of any accumulated brine slurry which will be collected and transferred to a regulated waste facility that is authorised to receive such waste.</p> <p>Given the expected water quality data included in Table 2 of the Preliminary Consequence Category Assessment (see below) the administering authority requires further information regarding the management and disposal of the brine.</p> <p>Additionally, given the expected EC of the waters involved it is expected that regular removal of salt slurry would be required to ensure capacity remains available within the dam structures. It is noted that Appendix E- Waste Management Procedure document does not specifically address brine management.</p>	

	<p><u>Requested Information</u> Provide the following information:</p> <ol style="list-style-type: none"> 1. The volume of brine slurry expected to accumulate in each structure in a year; and 2. The total estimated volume of the brine material that will be required to be removed from the dam structures to retain a sufficient operational capacity and how often this is expected to occur; and 3. Identify which waste facilities will be utilised to dispose of the brine waste. 	<p>As noted in section 3 of the Supporting Information Report 'while this EA amendment application includes brine storage as an option, it does not propose any amendments to construct or operate water treatment plants (WTPs) or associated pipelines. Should these activities be required, then they will be subject to the outcome of a separate and future EA amendment application.'</p> <p>Senex designs its brine storage structures to incorporate both water balance modelling (i.e. capacity required) and also brine slurry accumulation. To achieve this, Senex balances inflows and forecast evaporation rates to ensure that the projected capacity of a brine storage structure will not be exceeded over the life of the planned development. Therefore, it is not necessary to remove brine material from structure in order to maintain capacity.</p> <p>At the end of project life, brine will be disposed of or stored in accordance with the legislative framework of the day, including the relevant EA conditions and the Department's Coal Seam gas brine management action plan 2023-2033.</p>
3	<p><u>Issue</u> The application provides an overview of the impacts expected of the proposed Schedule 3 activity: regulated structures, based primarily on the applicant successfully avoiding any areas identified as containing matters of state environmental significance (MSES) as per the existing Atlas Constraints Protocol. A site-specific analyses of each location and the anticipated impacts on receiving environmental values was not provided.</p> <p>The information requested under this part is required for each of the 25 proposed locations for the regulated structures. This information is required for DESI to complete a site-specific environmental value assessment of each proposed location.</p> <p><u>Requested Information</u> At each proposed location:</p> <ol style="list-style-type: none"> 1. Identify if any of the following environmentally sensitive areas (ESAs) are present: <ol style="list-style-type: none"> a. MSES; b. Essential habitat at each proposed location; c. Defining distance to watercourse; d. Prescribed environmental matters (PEMs). <p>If the primary protection zones, or secondary protection zones of ESAs are impacted at the proposed location, identify the extent of the disturbance in hectares and provide associated spatial data for this disturbance. This must include consideration of potential indirect impacts such as changes to surface water flow regimes etc.</p> <p>If required, provide an updated draft Table 2 (from condition E7 of the EA), Authorised activities in ESAs.</p> <ol style="list-style-type: none"> 2. Determine if a significant residual impact (SRI) for the location or any other area that may be directly or indirectly impacted by the construction of the structure may occur; and 3. Identify the methodology that will be used to ensure compliance with the current rehabilitation conditions present within the EA. This must include the disposal of any waste material and reestablishing the existing land use. Where the land use involves cropping or grazing, describe how these areas will be returned to the pre-disturbance carrying capacity or other means of determining productivity. 	<ol style="list-style-type: none"> 1. Following additional ecological survey work completed after Senex's application, two indicative conceptual dam locations have been ruled out due to new no-go zones being identified. However, no other information has changed in regard to the assessment of proximity to environmental values provided in Figure 8-1, Figure 8-2 and Table 8-1 of the Supporting Information Report. Section 8 of the Supporting Information Report details: <ol style="list-style-type: none"> a) all indicative conceptual dam locations; b) the position of environmental constraints and no-go zones (including Environmentally Sensitive Area (ESA) protection zones); and c) the distance from each indicative conceptual dam location to identified environmental constraints <p>In addition, commitments made throughout the supporting information report clearly state:</p> <ul style="list-style-type: none"> • No ESAs or Prescribed Environmental Matters (PEMS) will be cleared. • As non-essential petroleum activities, the proposed regulated and low-consequence structures will not be located within the primary protection zones of ESAs. • No Regional Ecosystems will be cleared • No remnant or regrowth vegetation with habitat value for NC Act threatened species (CE, E, V and NT) will be cleared. <p>An updated map (MAA-1105 -1 Indicative Conceptual Dam Locations EV Assessment Rev 0 IFU) provided with this response also illustrates the full extent of areas deemed to be unconstrained from an environmental perspective. Should circumstances mean that a regulated structure cannot be constructed at one of the identified indicative conceptual dam locations it could be constructed within the unconstrained area and still meet all of the commitments made in this application.</p> 2. As per Section 9 of the Supporting Information Report, no significant residual impact (SRI) to a PEM has been identified as a result of construction and/or operational activities at any of the identified indicative conceptual dam locations. Some impact to koala dispersal habitat and echidna habitat may occur. However, the assessment undertaken identified no SRI. <p>Section 10.1.2 of the Supporting Information Report identifies that the controls that form an integral part of dam construction and operation reduce the risk of direct and indirect impact to surface waters to As Low As Reasonably Practicable (ALARP). It also notes that regulated structures must be designed, constructed and operated to be no release structures.</p> <p>Section 11.6 of the Supporting Information Report summarises the impact assessment for groundwater and notes 'With the implementation of the above construction and operational controls, impacts to shallow groundwater, or groundwater users as a result of the proposed activities are not expected.' this assessment is inclusive of Aquatic, Terrestrial and Subterranean Groundwater Dependent Ecosystems (GDEs).</p> <ol style="list-style-type: none"> 3. Please refer to Appendix F of the Supporting Information Report for the Senex Rehabilitation Plan
4	<p><u>Issue</u> To assist in the assessment of the application, spatial data is required for each of the proposed locations.</p> <p><u>Requested information</u> Provide spatial data, in shapefile format, for:</p> <ol style="list-style-type: none"> 1. the proposed disturbance and ancillary infrastructure footprint; 2. all existing disturbance already carried out (if applicable); 3. all relevant ESA mapping layers; and 4. all MSES and matters of national environmental significance (MNES) that would be impacted by the proposal, notwithstanding whether this impact triggers an SRI. 	<p>All requested data has been provided in map form as part of the Supporting Information Report.</p>

5	<p><u>Issue</u></p> <p>A considerable number of the proposed locations either include or are in close proximity to existing watercourses. The application states that in these instances the existing waterways may be diverted to allow for the construction of the proposed structures. The proposed structures may also affect the movement of surface flows of water, impacting the volume and quality of waters that would normally be received downstream, impacting aquatic ecosystems and other ecosystems that may be dependent on the presence of these waters.</p> <p>The application material provided does not include an assessment of the potential impact as a result of the diversion of waters on aquatic life, water quality or receiving land environmental values.</p>	
	<p><u>Requested Information</u></p> <p>For each proposed location where waters may be diverted or otherwise interfered with, provide a site-specific assessment of impacts to:</p> <ol style="list-style-type: none"> 1. aquatic life; and 2. water quality; and 3. receiving water environmental values; and 4. receiving land environmental values; and 5. identify the frequency of the expected flooding of the site; and 6. any corresponding change to expected flood levels resulting from the construction of the structures in waters and the impacts the diversions will have on the behaviour of floodwaters. 	<p>1. - 4. As per section 10.1.1.1 of the Supporting Information Report, any diversions required as a result of dam construction would be limited to drainage lines and stream order 1 watercourses.</p> <p>No PEMS will be impacted by dam construction. The tenure area has been highly modified and degraded by existing pastoral activities (cattle grazing) and outside of limited vegetated areas holds negligible environmental value. Similarly, section 10.1.1.1 notes that <i>'the location of dams is high in the catchment, with these areas mapped in the flood modelling being highly ephemeral, shallow drainage channels which only flow in periods of intense rainfall and have limited ecological and environmental value. With the construction of a dam, the site would be re-profiled and drains installed to divert stormwater away from the toe of the embankments and into more defined watercourses via any appropriate Erosion and Sediment Control (ESC) measures. Environmental impacts as a result of the installation of diversion drains are expected to have negligible impact to Environmental Values and would function as a key safety measure in maintaining the integrity of dam embankments.'</i></p> <p>5. As per the Manual for assessing consequence categories and hydraulic performance of structures (ESR/2016/1933, Version 5.03) (Dam Design Manual) the 1:100 year annual exceedance probability (1:100 year flood modelling) has been used within the CCA provided to date.</p> <p>6. As noted in the response to 1.- 4. above, Section 10 of the Supporting Information Report details the surface waters of the project area and notes that higher order watercourses (stream order 2 and above) in the tenure area are highly ephemeral. Therefore, the diversion of any drainage lines or stream order 1 watercourses is expected to have negligible impact on flow and flood regimes across or beyond the tenure.</p>
6	<p><u>Issue:</u></p> <p>The area is mapped as containing the following types of groundwater dependent ecosystems (GDE).</p> <ul style="list-style-type: none"> - Potential GDE aquifers - Terrestrial GDE areas - Surface GDE areas - Surface expression GDE - Surface GDE lines <p>There is the potential that depending on the choice of location for the regulated structures, there is a risk that groundwater may be intercepted, which may require additional management measures to be put in place to prevent connectivity between the stored process water and groundwater. Depending on the location of the structures and the proximity to these formations, there is the potential to impact surface expression GDEs by disrupting flows to surface waters which may in-turn affect near surface groundwaters (i.e. recharge) or by the stored process waters coming into contact with these waters which may cause a release of contaminants.</p>	

	<p>Requested Information:</p> <ol style="list-style-type: none"> 1. For each proposed location identify the relevant groundwater dependant ecosystem and provide a site-specific assessment of impacts. 2. Identify what measures will be undertaken to monitor the health of each identified GDE and how the impacts will be identified and avoided. 3. Identify what measures will be in place to rehabilitate or remediate the identified GDES should it be determined that the activity is impacting on those areas. 	<p>1. Section 11.6 of the Supporting Information Report summarises the impact assessment for groundwater and notes 'With the implementation of the above construction and operational controls, impacts to shallow groundwater, or groundwater users as a result of the proposed activities are not expected.' this assessment is inclusive of Aquatic, Terrestrial and Subterranean GDEs.</p> <p>For general hydrogeological context, groundwater in consolidated aquifers is present at depth, with limited interaction between the alluvium and the underlying Surat Basin geological units Atlas 3 EPBC water monitoring and management plan (WMMP) (https://senexenergy.com.au/wp-content/uploads/2024/05/Attachment-I-Water-Monitoring-and-Management-Plan.pdf). Further, any alluvium present in the project area is limited in extent and generally in the immediate vicinity of higher stream order watercourses. Indicative conceptual dam locations are all located close to the crests of rises and away from higher order watercourses. Therefore, dam construction and operation is highly unlikely to impact on shallow groundwater within the alluvium.</p> <p>In addition to the above, prescribed controls for regulated structures include:</p> <ol style="list-style-type: none"> a) Leakage detection via monitoring water level in collection sump/s or flow rate through leakage recirculation pipes. b) Seepage detection via monitoring water level and chemical properties in shallow and deep groundwater bores surrounding the regulated structure. <p>The certified Dam Design Plan is required to also contain a Dam Operating Plan, which as well specifying required monitoring, also must include action plans which specify emergency triggers and required actions. These are detailed in section 5.3.4 of the Supporting Information Report. Both leakage detection and seepage monitoring function to detect a failure to contain the wetting front in close proximity to the dam to enable remediation actions to be taken prior to a seepage plume reaching a sensitive receptor – minimising the likelihood of any impact to such receptors.</p> <p>The application of prescribed construction and operational controls mandated in the Dam Design Manual (ESR/2016/1933) and the Model Dam Conditions (ESR/2016/1934)(e.g. those identified above), minimise the risk of direct and indirect impact to surface waters (including aquatic and terrestrial GDEs). These controls act either to introduce additional contingency to the design, or to create early warning systems to allow remedial action before environmental harm occurs. Therefore, adverse impacts to GDEs as a result of dam construction and operation are considered to be remote.</p> <p>2. and 3. Sections 4.3.3 and 4.3.4 of the Atlas Stage 3 WMMP (https://senexenergy.com.au/wp-content/uploads/2024/05/Attachment-I-Water-Monitoring-and-Management-Plan.pdf) detail the ongoing monitoring and assessment required to comply with the Joint Industry Framework (JIF) and specifically addresses impacts to GDEs.</p>
7	<p><u>Issue:</u></p> <p>Major variabilities of soil types and subsurface conditions are anticipated across the proposed locations. While variations in surface features have been considered (i.e. the positioning of the 25 sites away from ESAs), there does not appear to be any equivalent site specific consideration of the variations in subsurface conditions and soil types.</p> <p>These variations would affect a range of scenarios, potentially changing the determined consequence category.</p> <p>The risk to nearby groundwater resources in a sandy soil environment, for example, would be many times greater than the risk in an area with deep clay soil profiles and applies to both generic CCAs, for the Produced Water Dam Consequence Category for Failure to Contain – Seepage, and the Brine Concentrate Dam Consequence Category for Failure to Contain – Seepage.</p> <p>Engeny has also provided a generic Basis of Design in Appendix H for HDPE single lined storages for produced water, and HDPE double lined storages for Reverse Osmosis (RO) brine concentrate. While Appendix H contains information regarding the design elements for design for these structures it does not provide detail about the liners and any necessary subbase layers and foundations that may be required for the HDPE lined storages. It is anticipated that foundation preparation will vary from location to location depending on the in-situ conditions, physical properties and permeabilities of the foundation material.</p> <p>If the purpose of the storage and liner design is to achieve the 'No Release' outcomes identified by the application, and which are required by the existing conditions in the EA and acknowledged in the Supporting Information Report, this must be addressed in the supporting information. This is considered to be of significant importance to determining the risk associated with each of the proposed structure and should be included in the supporting information.</p>	
	<p><u>Requested Information:</u></p> <ol style="list-style-type: none"> 1. Provide further information regarding the suitability of soil types at each of the proposed locations. 2. Provide updated CCA Assessments that identify the soil types and other subsurface conditions present at each of the 25 proposed locations. Areas where the soil types are unsuitable due to issues with potential to contain the wetting front or are inherently unstable, must be eliminated. 3. The CCA Assessment must also identify each soil type expected to be present and include the particular issues posed by that soil type and other subsurface conditions and how these matters may affect the proposed structures. 4. Based on the above-mentioned assessment, identify those proposed locations that are not suitable for the proposed activity due to issues that; (1) may affect the stability of the underlying foundations of the dam structures and (2) pose issues with regard to containing any wetting front that may have the potential to affect the structures ability to ensure compliance with the 'no release' condition of the EA. 	<p>A map showing the high-level soils units present across the project area is provided with this response (MAA-1273 Soil Units Map Rev 0 IFU). Detailed geotechnical works will be undertaken during the dam design phase, with the findings to inform the design and construction measures in the certified Dam Design Plan. As detailed in the response to Part 2 of this Information Request and pursuant to Senex' existing Environmental Authority conditions plus the Department's guideline (ESR/2016/1934), the certified Dam Design Plan will be provided post-approval.</p>
8	<p><u>Issue:</u></p>	

	<p><u>Requested Information</u> 1. Confirm which of the proposed structures will be located within Strategic Cropping Land.</p>	<p>Please refer to the attached Map (MAA-1281 SCL and Indicative Conceptual Dam Locations Map Rev 0 IFU)</p>
<p>9</p>	<p><u>Issue:</u> In relation to the cultural and spiritual values under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019, large areas of the project area are subject to the following Native Title claims and determinations.</p> <p>Native Title Determination: • Imam People #2 – Tribunal No QCD2016/005 (Fed Court QUD6162/1998 (Determined 23 June 2016) (noted to include parts of Woleebee Creek) Native Title Claim: • Imam People #4 – Tribunal No QC2017/008 (Fed Court QUD413/2017 (Active – lodged 21 August 2017) Given the presence of native title claims and native title determinations within the project area, consideration of the cultural and spiritual environmental values for waters is required.</p> <p>Native title is only referenced once in the Atlas constraints plan as an item used to produce the constraints maps – however the extent of how it is employed to determine the proposed locations of the regulated structures is not explained.</p>	
	<p><u>Requested Information</u> 1. Provide further information as to how the cultural and spiritual values identified for the receiving waters in the project area are identified and protected. This includes matters of significance to the present, past or future generations and may include: • Custodial, spiritual and traditional heritage, hunting, gathering and ritual responsibilities • Symbols, landmarks and icons (such as waterways, turtles and frogs) • Lifestyles (such as agriculture and fishing) 2. Identify what engagement and ideally agreements have been reached with the relevant first nations people for the waters affected by the proposed locations.</p>	<p>1.The following response has been provided by KCB, the author of The Atlas 3 EPBC Water Resource Impact Assessment Report (EPBC 2022/09410)</p> <p>The watercourses through the project area are ephemeral and dry for the majority of the year. There is flowing water in the system only after periods of heavy rainfall. Due to the nature of these ephemeral systems it is unlikely that the creeks are used for recreation; or cultural and spiritual uses through these upper reaches. These uses were taken into consideration during the Atlas Stage 3 EPBC Groundwater Assessment and no impact is predicted.</p> <p>2.Please refer to response to Issue 10 below.</p>
<p>10</p>	<p><u>Issue:</u> The administering authority is required to consider potential impacts to the human rights of affected indigenous peoples as per sections 27 and 29 of the Human Rights Act 2019 (HR Act).</p> <p><u>Requested Information</u> 1. Provide information as to how, in determining the locations of the proposed structures, the rights of any affected peoples have been protected. 2. What engagement and ideally agreements have been reached with the relevant peoples in the area, including peoples who don't identify as indigenous that ensure that the rights defined under the HR Act are preserved. 3. Given that Australia is a signatory to the UN Declaration of the Rights of Indigenous People, the administering authority has a duty to ensure that agreements reached are free, prior and included informed consent where: • 'free' implies no coercion, intimidation or manipulation • 'prior' implies that consent is obtained in advance of the activity associated with the decision being made, and includes the time necessary to allow Indigenous people to undertake their own decision-making processes • 'informed' implies that Indigenous peoples have been provided all information relating to the activity and that that information is objective, accurate and presented in a manner and form understandable to Indigenous people • 'consent' implies that Indigenous people have agreed to the activity that is the subject of the relevant decision, which may also be subject to conditions.</p> <p>How has the applicant ensured that any agreement reached has been made with free, prior and informed consent.</p>	<p>Senex works to hold respectful, trusted and mutually beneficial relationships with Indigenous stakeholders. Senex has several policies and procedures in place, including an Indigenous Engagement Policy supported by a Cultural Heritage and Native Title Management Procedure, formalising approaches, principles, and consultation processes with Indigenous Stakeholders.</p> <p>Within the Project Area, land subject to Native Title has either been:</p> <ul style="list-style-type: none"> • Excluded from the tenement; • Subject to an ancillary agreement with the claimant extinguishing native title rights; or • Where Native Title land was previously excluded from the tenement, following the right to negotiate process no claimant came forward or identified, and the excluded land was able to be re-included in the tenement. <p>Therefore, there is no land subject to Native Title within the project area.</p> <p>In regard to Cultural Heritage, Senex entered into a joint Cultural Heritage Management Agreement (CHMA) with the Indigenous Stakeholders in February 2018. This CHMA allows access to undertake survey ahead of disturbance activities on land within the Project Area. This CHMA has not been made publicly available due to commercial and cultural sensitivity reasons. The Indigenous Stakeholders have undertaken ongoing blocks of survey work and Cultural Heritage clearances as part of working with Senex under this CHMA and Senex will continue to act with respect to all Aboriginal Parties and heritage protection. Under the CHMA, Senex has also committed to building employee, contractor and sub-contractor cultural awareness through induction sessions conducted by the Indigenous Stakeholders on a regular basis.</p> <p>Senex is also committed to holding annual meetings with the Indigenous Stakeholders in accordance with the CHMA commitments. At the most recent meeting, Senex advised of the PLs 209 and 445 acquisition from APLNG and were able to confirm with the Indigenous Stakeholders that the existing CHMA could be extended to include the new tenements. This outcome is an example of both an effective legal framework, but also of the collaborative relationship between Senex and the Indigenous Stakeholders.</p> <p>Senex supports Indigenous training, education, and business participation programs and strongly emphasises cultural awareness training and heritage protection. Senex provide training to ensure employees, contractors and visitors are aware of the cultural heritage in our operating areas and of their responsibilities and obligations to respect and protect it.</p>

<p>Part 2</p>		<p>Senex refers to the following DESI guidelines relating to regulated structures forms the basis of the conditioning approach applied to regulated structures across the industry in Queensland:</p> <ul style="list-style-type: none"> •The Streamlined Model Conditions for Petroleum Activities (ESR/2016/1989, version 2.04). This guideline states: Please refer to the guideline (ESR/2016/1934) for model conditions for regulated structures and the manual (ESR/2016/1933) for the consequence assessment.’ •Guideline (ESR/2016/1934) Structures which are dams or levees constructed as part of environmentally relevant activities (streamlined model conditions for dams) <p>Existing conditions in Schedule J of P-EA-100112777 closely align with those in ESR/2016/1934 and a comparison is provided as Attachment 1 to this response.</p> <p>Application of the streamlined model conditions for dams (ESR/2016/1934) and Senex’s existing EA conditions will require Consequence Category Assessments (CCA) and Dam Design Plans to be certified by a Registered Professional Engineer of Queensland (RPEQ) as meeting the key design criteria listed in the Manual for Assessing the Consequence Category for Dams (ESR/2016/1933). In other words an RPEQ stakes their professional reputation on the design, construction and ongoing performance of the dam to the required standards, and a proponent stakes their reputation and social license to operate on their ability to operate and maintain the dam as per the dam design plan to ensure those standards are met throughout the lifespan of the dam.</p> <p>The requirement to have the CCA and the dam design plan certified is a critical safeguard in the authorisation of regulated structures and will ensure compliance with the mandated design, construction and operational criteria as set by the regulator, and effectively mitigates potential environmental harm resulting from identified failure scenarios identified in the manual (ESR/2016/1933).</p> <p>Consistent with the existing regulatory framework and guidelines, Senex will provide the certified CCA and Dam Design Plans, and the information requested by DESI in Part 2 of the Information Request after approval once final locations for the dams are agreed with landholders, as only at this point is there enough certainty to justify the resources required for these specific activities.</p>
		<p>Information provided with the Supporting Information Report includes a preliminary CCA and a preliminary Basis of Design (Appendix G and H respectively). The information requested by DESI in Part 2 of the Information Request will be provided post-approval by Senex as part of any certified CCA and certified Dam Design Plan on a site-specific basis.</p> <p>This is necessary as infrastructure layouts (including final locations for regulated structures) are unable to be finalised until an approval is granted and a Conduct and Compensation Agreement is negotiated with the relevant landholders. A pre-requisite to the Conduct and Compensation Agreement is that the proponent holds the tenure necessary to support the proposed activities. In the case of this application, Senex must first obtain the pre-requisite EA conditions to support development plans, before discussions can commence with landholders. Nevertheless, Senex confirms that the prescribed standards and criteria for Low Consequence and Regulated Structures will be met and that this will be demonstrated through the required preparation and submission of certified Consequence Category Assessments and Dam Design Plans.</p>
<p>Failure to contain - Seepage</p>		
<p>1</p>	<p><u>Issue: Low Consequence Structures</u> The “ Low Consequence Structures”, (up to 100 Megalitre capacity), that also form part of this EA Application, have been deemed to be low CCAs without providing any form of substantiation.</p>	
	<p><u>Requested Information</u> 1. Provide the CCA assessment for each of the proposed structures that demonstrates it complies with “Low Consequence Structure” requirements. 2. As each structure has been determined to meet the “Low Consequence Structure” RPEQ certification of the design must be provided for each structure determined to be low consequence. 3. Confirm that the CCA assessment addresses those issues identified with the Failure to contain – Seepage assessment of the generic CCAs.</p>	<p>The preliminary Consequence Category Assessment (CCA) provided as Appendix G to the Supporting Information report identified the following consequence categories for a 700ML produced water storage:</p> <ol style="list-style-type: none"> 1. Failure to contain (seepage) - Low (harm to humans); Low (general environmental harm), Low (general economic loss or property damage) 2. Failure to Contain (Overtopping) - Low (harm to humans); Low (general environmental harm), Low (general economic loss or property damage) 3. Failure to Contain (Dam Break) - Low (harm to humans); significant (general environmental harm), significant (general economic loss or property damage) <p>Given that the proposed low consequence dams will only store produced water, the above consequence categories can be applied for the failure to contain (seepage) and failure to contain (overtopping) scenarios. In regard to the failure to contain (dam break) scenario, the proposed maximum volume of the low consequence dams is seven times less than that of the proposed regulated structure (100ML vs 700ML). This reduced volume significantly reduces any flood height and downstream propagation distance meaning that the likely impact in terms of general environmental harm and general economic loss or property damage would not meet the minimum thresholds specified for the significant consequence category for adverse effects.</p> <p>The preliminary CCA provided with the Supporting Information Report is therefore considered to adequately address the consequence category assessment for a low consequence structure. Senex's existing EA conditions ((J1) and (J6)) require that a certified CCA be provided for low consequence dams. This certified document will be provided once final location/s are selected, and as previously noted would ensure that the dam is designed, constructed and operated in accordance with the relevant prescribed standards and regulatory criteria.</p>

2	<p><u>Issue: Harm to Humans</u></p> <p>It is noted that the environmental values for the area provided as part of the CCA Assessment include Human Consumption and Farm supply/use. Aerial photography available for the area also indicates the presence of residential premises both within and adjacent to the tenure. It is also noted that there is a high concentration of registered bores within the tenure.</p> <p>This appears to contradict the advice in the harm to humans assessment that states that groundwater in the vicinity of the project area is not utilised for human consumption (referenced in the Habitable Dwellings and Third-Party infrastructure section of the CCA). It is unclear how it has been determined that all proposed locations will comply with the low consequence category.</p>	
	<p><u>Requested Information</u></p> <p>1. For each of the proposed locations provide further information regarding the potential for any seepage to contaminate surface and groundwaters that may be used for human consumption and farm use.</p>	Please refer to the overarching response to Part 2 above
3	<p><u>Issue: General Environmental Harm</u></p> <p>It is noted that the CCA assessment considered that the seepage from the dams may impact endangered and of concern regional ecosystem, regulated vegetation and GDEs if expressed within Woleebee Creek. It is unclear if other watercourses within the project area have been considered.</p> <p>The CCA assessment also states that seepage to groundwater and surface waters is expected to be slow moving and of relatively small magnitude. It is unclear how this has been determined as the assessment does not appear to include an assessment or consideration of the soil types.</p>	
	<p><u>Requested Information</u></p> <p>1. Confirm if the CCA assessment has considered other watercourses within the project area. For the purposes of determining a watercourse the definition of waters as described within the EA must be used.</p> <p>2. Provide further information as to how the expected seepage of groundwater and surface waters have been determined in the absence of any included consideration of the soil types and subsurface structures included with the supporting information.</p> <p>3. Depending on the location there is the potential for a release to enter areas identified as containing significant values (i.e. areas of MSES), either directly or indirectly (i.e. releases being washed downstream), potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p> <p>4. It is unclear if there has been consideration of the likely costs associated and the time required to remediate any such release, potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p>	Please refer to the overarching response to Part 2 above
4	<p><u>Issue: General Economic Loss or Property Damage</u></p> <p>The assessment has identified the outcome for General Economic Loss or Property Damage for the Produced Water Dam and Brine Dam as low. Based on the water quality expected in each of the dams, it is expected to exceed the relevant stock watering and irrigation levels. Should this material come into contact with soils or groundwaters, there is the potential for serious environmental harm to occur.</p> <p>The CCA assessments states that seepage from the dam will impact third party farming operations if it contaminates groundwater or is expressed in Woleebee Creek. The assessment also states that seepage is considered unlikely from either the produced water or brine dams. However, it is unclear how this has been determined. The soil type and subsurface structures do not appear to be considered and it is unclear if the instruction on P7 in the CCA Manual "The consequence category for a failure event scenario cannot be changed by adding a design element," has been followed.</p> <p>It is also noted that that the project area includes areas identified as agricultural land including areas mapped as strategic cropping land. This does not appear to have been addressed as part of the potential economic impacts as part of the CCA provided. Should agricultural land be affected by any releases associated with this activity, there is the potential that rehabilitation, compensation and repair costs may exceed the thresholds identified in the manual for significant consequences. It is also noted that given the nature of the materials being stored in the dam, remediation methods are likely to be associated with removal and replacement of affected soils, significantly increasing costs. The material removed will be considered a regulated waste and require disposal in appropriate facilities further adding to costs.</p>	
	<p><u>Requested Information</u></p> <p>1. Provide further information as to how the 'low' outcome was determined.</p> <p>2. Depending on the location there is the potential for a release to enter areas identified as being used for agriculture and areas identified as strategic cropping land, either directly or indirectly (i.e. releases being washed downstream), affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p> <p>3. It is also unclear if there has been consideration of the likely costs associated and the time required to remediate any such release, potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p>	Please refer to the overarching response to Part 2 above

Failure to contain - Overtopping	
5	<p><u>Issue: Harm to Humans</u></p> <p>The CCA assessment considers the potential to impacts to the Glebe Weir located on the Dawson River (approx. 90km) downstream of the project area used to supply catchment to urban areas within Central Queensland. It appears to consider the potential catchment of the individual dams and the expected short duration of any catchment. The assessment then considers the potential impact of these releases in relation to the catchment of waters in relation to the Glebe Weir. The application identifies the considerable dilution likely to occur between the project area and the Weir reducing the concentration of any contaminant below acceptable lows.</p> <p>The administering authority holds concerns regarding any potential impacts that may occur within the immediate vicinity of any release prior to any significant dilution occurring. As mentioned previously environmental values for surface waters in the area include human consumption and farm use.</p> <p>While the catchment area may be minimal for each structure, the expected quality of the waters is such that any release has the potential to cause environmental harm. This small catchment may result in insufficient dilution of contaminants, resulting in greater harm in the immediate vicinity of any release.</p>
	<p><u>Requested Information</u></p> <ol style="list-style-type: none"> 1. Provide further information regarding the potential for overtopping to contaminate surface and groundwaters that may be used for human consumption and farm use. 2. Provide further information as to the expected frequency of overtopping. 3. It is also noted that some of the proposed locations will involve the diversion of mapped waterways to direct surface waters away from the dam. Confirm if the determination of the potential risk has followed the CCA Manual's instructions regarding the determination of the consequence category for a failure event scenario by adding a design element. 4. Depending on the location there is the potential for a release to enter areas identified as containing significant values (i.e. areas of MSES), either directly or indirectly (i.e. releases being washed downstream), potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location. 5. It is also unclear if there has been consideration of the likely costs associated and the time required to remediate any such release, potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location.
6	<p><u>Issue: General Environmental Harm.</u></p> <p>Similarly to the concerns regarding human health, the smaller catchment, combined with the expected quality of waters, would mean that any overtopping event is likely to involve high concentrations of contaminants. Any release of such contaminants is likely to have significant impacts on the immediate area.</p>
	<p><u>Requested Information</u></p> <ol style="list-style-type: none"> 1. Provide further information regarding the potential for overtopping to contaminate surface and groundwaters as well as any releases to land and the likely harm that may occur. This must take into consideration the specific receiving area for each location and include the relevant values such as MSES. 2. Provide further information as to the expected frequency of overtopping. 3. It is also noted that some of the proposed locations will involve the diversion of mapped waterways to direct surface waters away from the dam. Confirm if the determination of the potential risk has followed the Manuals instructions regarding the determination of the consequence category for a failure event scenario by adding a design element. 4. Depending on the location there is the potential for a release to enter identified as containing significant values (i.e. areas of MSES), either directly or indirectly (i.e. releases being washed downstream), potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location. 5. It is also unclear if there has been consideration of the likely costs associated and the time required to remediate any such release, potentially affecting the relevant consequence category. Confirm that the determined consequence category has taken this into consideration for each proposed location. 6. This must be undertaken for each of the proposed locations.
7	<p><u>Issue: General Economic Loss or Property Damage</u></p> <p>Similarly to the concerns regarding human health and general environmental harm, the smaller catchment, combined with the expected quality of waters, would mean that any overtopping event is likely to involve high concentrations of contaminants. Any release of these contaminants is likely to have significant impacts on the immediate area.</p>

Please refer to the overarching response to Part 2 above

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<p><u>Requested Information</u></p> <p>1. Provide further information regarding the potential for overtopping to contaminate surface and groundwaters and releases to surface where any economic loss or property damage may occur. This should identify the relevant potential impacts to each area, (i.e. impacts to soils used for grazing or cropping including reduced crop yield for the duration of the impact (time taken for any impacted area to return to the yield available prior to any release).</p> <p>2. Provide further information as to the expected frequency of overtopping.</p> <p>3. It is also noted that some of the proposed locations will involve the diversion of mapped waterways to direct surface waters away from the dam. Confirm if the determination of the potential risk has followed the Manuals instructions regarding the determination of the consequence category for a failure event scenario by adding a design element.</p> <p>4. This must be undertaken for each of the proposed locations.</p>	<p>Please refer to the overarching response to Part 2 above</p>
Failure to contain – Dam Break	
<p>8 <u>Issue: Harm to Humans</u></p> <p>It is noted that the response to this section identifies the impact zone for the failure of the dams to approximately 10-15km downstream based on the requirements of table 5 of the Guideline for failure impact assessment of Water Dams (Nov 2018) published by the predecessor of the current Department of Resources. The following diagram includes a circle with a radius of approximately 15km to provide an indication of scale relative to the tenures.</p> <p>Considering the potential propagation area, the administering authority holds concerns regarding the prediction that less than 10 persons are expected to be affected, as per the determined low consequence. The project area includes several residential properties that have the potential to include several persons at each location.</p> <p>Additionally if the dam were to break, there is the potential that a large volume of water may suddenly be introduced into the waterway – effectively causing a flash flood. This may pose a risk to any vehicles crossing waterways.</p> <p>There is also the risk of any such release contaminating surface waters (and to a lesser degree shallow groundwaters) used as potable water supplies for humans and cattle and water supplies for irrigation – further impacting on humans ability to sustain their lifestyles at these locations.</p>	
<p><u>Requested Information</u></p> <p>1. Confirm the number of persons predicted to be affected in the event of a dam break.</p> <p>2. Confirm if any assessment of impacts to traffic in the area have been considered and that persons that may be present on these road crossings have been considered.</p> <p>3. Also confirm if the assessment has considered impacts to water quality in any waters (including groundwaters) within each expected receiving area.</p>	<p>Please refer to the overarching response to Part 2 above</p>
<p>9 <u>Issue: General Environmental Harm.</u></p> <p>Given the nature of the contaminants contained, the size of the expected area, the impacts caused by any release as a result of a dam break are expected to be significant. Depending on the location there is the potential for a release to enter areas identified as containing significant values (i.e. areas of MSES), either directly or indirectly (i.e. releases being washed downstream), potentially affecting the relevant consequence category. It is also unclear if there has been consideration of the likely costs associated and the time required to remediate any such release, potentially affecting the relevant consequence category</p>	
<p><u>Requested Information</u></p> <p>1. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p> <p>2. Confirm that the determined consequence category has taken this into consideration for each proposed location.</p>	<p>Please refer to the overarching response to Part 2 above</p>
RPEQ Certification	
<p>10 The current approval process for Regulated Dams requires that an RPEQ engineer undertake a Consequence Category Assessment (CCA) on any proposed structure at any site where Regulated Dam conditions have been imposed in the Environmental Authority. A certified copy of this assessment must be provided to the administering authority.</p>	

<p>1. Further detail is required to be provided as part of the CCA for each of the locations.</p> <p>2. The CCA must address the requirements of the design plan as described in the document, "Structures which are dams or levees constructed as part of the environmentally relevant activities" (ESR/2016/1934) including:</p> <p>a) The design plan must describe the physical dimensions of the regulated structure, the materials and standards to be used for construction of the regulated structure, and the criteria to be used for operating the regulated structure.</p> <p>b) A design plan for a regulated structure should address a range of issues including:</p> <ul style="list-style-type: none">i. the consequence scenarios that have been used in undertaking a consequence assessment;ii. 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, includingiii. containment of contaminants;iv. seepage and stability issues, including containment of contaminants; andv. any assumptions relating to the design and safety of the regulated structure <p>c) If this information is not available, a suitable explanation must be provided as to why this information is not available at this time.</p> <p>d) Certification is required in the form set out in the Manual, from a suitably qualified and experienced person. The certification must be accompanied by a statement of reasons setting out how the facts documented in the design plan support the conclusion that the regulated structure is capable of providing the specific performance required of that structure.</p> <p>e) The certification must also take into consideration the matters raised as part of this information request.</p> <p>f) Where issues exist for a location that may prevent certification, these must be identified, and the measures required to address these issues included.</p>	<p>Please refer to the overarching response to Part 2 above</p>
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