12 April 2017

Planning Services
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Attention: Executive Director – Resource Assessments and Business Systems

Dear Sir/Madam,

RE: North West Local Land Services' Comments on Santos Environmental Impact Statement (Narrabri Gas Project) – Application No. SSD 6456

Thank you for the opportunity to comment on the Santos Environmental Impact Statement (Narrabri Gas Project) Application No. SSD 6456.

North West Local Land Services (NWLLS) has assessed the Santos Environmental Impact Statement (EIS) in relation to the NWLLS Transitional Regional Natural Resource Management (NRM) Plan and potential impacts on Travelling Stock Reserves which NWLLS manage.

It is understood that Santos proposes to develop a major coal seam gas project (known as the "Narrabri Gas Project") near Narrabri over a 20 year period. The project will involve the progressive development of a coal seam gas field comprising up to 850 gas wells on up to 425 well pads and the construction and operation of gas processing and water treatment facilities. The project area covers approximately 95 000 hectares and the project footprint is proposed to directly impact about 1% of that area or approximately 1170 Hectares (Ha) of native vegetation. The current land uses are mainly forestry and agriculture.

The Pilliga represents the largest block of remnant vegetation in NSW, west of the Great Dividing Range. While it is acknowledged that the *Brigalow and Nandewar Community Conservation Area Act 2005* zoned parts of the project area on state land as "forestry, recreation and mineral extraction", this area of the Pilliga Forest is recognised as containing a wide range of significant ecological values. This is evident in the results of the various ecological reports included within the EIS.

COMMENTS ON EIS

Please find below the following comments from NWLLS.

Travelling Stock Reserves (TSR)

It is key that the EIS be able to articulate the actual works and operations that will occur specifically on TSR to enable NWLLS to exercise its due diligence of assessing impacts appropriately. This detail has not been provided and is major information gap in the EIS. Consequently, NWLLS is unable to appropriately assess impacts to TSR that would satisfy reasonable levels of accountability and stewardship.

NWLLS manages approximately 583Ha of TSR within the project area. The main TSR is along the Newell Highway. This TSR contains important water infrastructure for stock and is identified by NWLLS as a high conservation value TSR. A small TSR is located near Yarrie Lake, also a high conservation value TSR. De-watering, degassing and contamination of aquifers are the biggest risks for NWLLS TSR. The contamination of groundwater aquifers would render TSR water point assets worthless and the TSR network within the project area unusable.

The NSW Travelling Stock Reserves State Planning Framework 2016–21 provides the overarching principles for Local Land Services' management of travelling stock reserves (TSR). NWLLS recommends the proponent specifically address in the EIS how the development proposal aligns with the 'guiding principles' for TSR land use.

The construction and operation of gas related infrastructure within TSR has the potential to impact on significant ecological values and land use activities. To minimise impacts to TSR infrastructure, use and conservation values, it is recommended that gas related infrastructure be located along existing infrastructure alignments and planning of location of infrastructure be undertaken in consultation with NWLLS TSR and biodiversity staff.

The project must demonstrate that it can meet Biodiversity Target 4 (see below) of the NWLLS Transitional Regional NRM Plan and incorporate measures into weed management planning for the entirety of the project. This includes the proponent ensuring that all legislative biosecurity requirements particularly relating to weed management are incorporated into weed management strategies and site based weed management plans where they are located on TSR or where there may be an impact to TSR.

NWLLS Transitional Regional NRM Plan

The NWLLS Transitional Regional NRM Plan identifies NRM priorities for the NWLLS region. The proposed development is within the "Plains" subregion of the NWLLS Transitional Regional NRM Plan where the following Goal: *"Resilient communities and landscapes for the future"* is relevant and the following Targets are applicable:

Biodiversity 1: By 2020, there is an increase in native vegetation extent and vegetation does not decrease to less than 70% in less cleared sub-catchments and 30% in over cleared catchments, and no further regional vegetation community decreases to less than 30% extent, as identified by 2010 baseline.

Biodiversity 2: By 2020, maintain sustainable populations of a range of native fauna species by ensuring that no further regional vegetation community decreases to less than 30% extent, as identified by 2010 baseline.

Biodiversity 3: By 2020, contribute to the recovery of priority viable threatened species, populations and communities.

Biodiversity 4: By 2020, no new invasive species are established in the catchment and the spread of key emerging invasive plants and animals is limited.

Water 1: By 2020, there is an improvement in the condition of those riverine ecosystems that have not crossed defined geomorphic thresholds as at the 2010 baseline.

Water 2: By 2020, there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.

Water 3: By 2020, there is an improvement in the condition of regionally significant wetlands and the extent of those wetlands is maintained.

People 1. Natural resource management decisions contribute to social wellbeing.

People 2. There is an increase in the adaptive capacity of the catchment community.

While it is recognised that the NWLLS Transitional Regional NRM Plan's Targets refer to a 2020 timeframe, the intent of the Targets after this date are still applicable until the Plan is updated. In assessing the EIS, it is determined that little assessment has been made in relation to the NWLLS Transitional Regional NRM Plan's Targets. Further details are required to demonstrate that the project can meet these Targets.

The following comments are in relation to the relevant Targets of the NWLLS Transitional Regional NRM Plan.

NWLLS Transitional Regional NRM Plan - Biodiversity Targets (1-4)
In reviewing the EIS, NWLLS is concerned in regards to the following:

- Cumulative impacts on the area's significant ecological values mainly in terms of impact on threatened species and ecological communities, habitat loss, fragmentation of the landscape plus indirect impacts from noise and light over 20-30 years. While the proposed development differs from other extractive activities such as mines where impacts are largely confined to one defined area, impacts associated with coal seam gas activities are more numerous, cumulative and fragmented in location and scattered over a larger and currently undefined area.
- The EIS has not clearly demonstrated that Biodiversity Targets 1-4 and Water Target 3 will be meet through the identification, avoidance, mitigation and offset measures currently proposed for the project.
- Lack of demonstration within the proposed Biodiversity Offsets Strategy for the project to provide meaningful offsets including a net gain (through revegetation works) in vegetation extent and ecological values
- Lack of assessment of potential impacts on NWLLS on-ground natural resource management programs. NWLLS is currently investing in a range of threatened species programs guided by the NWLLS Transitional Regional NRM Plan in and adjacent to the

project area as part of the NSW Saving our Species Program. On-ground natural resource management investment has also been undertaken within the area over the years. There is concern that the project may detrimentally impact on these programs. An assessment of potential impacts on these programs is required.

Specific Comments in relation to Targets

1. Identification of Ecological Values

- NWLLS acknowledges that Santos has prepared an extensive EIS including an indepth assessment of ecological values of the project area, impacts, mitigation measures and a proposed biodiversity offsets strategy. Recommendations for additional ecological information to demonstrate that the project can meet the Targets of the NWLLS Transitional Regional NRM Plan are outlined in the relevant sections below and within the Recommendation Section at the end of this submission.

2. Threatened Species and Ecological Communities

- As identified in the EIS, the area subject to the proposed development contains a large number of significant ecological values. The report specifically identifies that 13 threatened species and four threatened ecological communities would be directly and indirectly impacted by the development. A large number of other threatened species also occur in the area and have the potential to be impacted upon. The EIS has not clearly addressed Biodiversity Target 3 in relation to how the project will contribute to the recovery of priority viable threatened species, population and communities. The project needs to further demonstrate how it will avoid upfront impact on these values (e.g. reduce the need for upfront clearing of 1Ha for each gas well pad). Further details within the biodiversity offset strategy to meet this Target are required.
- The report has not identified the potential use of strategic threatened species recovery planning measures within the subject area including the suitability of salvage translocation of affected species.
- The report is also not clear on whether an appropriate assessment for koalas has been undertaken in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) requirements.
- The NSW Endangered Ecological Community*; Pilliga Outwash Ephemeral Wetlands in the Brigalow Belt South Bioregion* have been identified to occur in the Pilliga area including within the Pilliga State Conservation Area. The EIS has not undertaken an assessment to determine whether this EEC occurs within the Project area and potential impacts that the proposed development may have on this ecosystem if they do occur. If the EEC is located within the project area an impact assessment must be undertaken and avoidance, mitigation and offset requirements addressed.

3. Site Plan

- While a Conceptual Layout Indicative Sketch Plan has been provided in the EIS (Figure 6-16), none of the EIS reports refer to this sketch plan to address potential impacts on ecological values. As no detailed infrastructure design plan including more specific locations of gas well pads and associated infrastructure has been provided in the EIS, it is very difficult to determine whether the EIS adequately assesses potential impacts on the ecological values within the project area.
- The project is proposing 425 well pads plus associated infrastructure. This is a very large number of well pads resulting in at least 1170 Ha of direct and indirect impacts on ecological values. The EIS needs to clearly demonstrate why 425 gas well pads are

required for the project and that other alternatives including a reduced number of gas well pads have been analysed and evaluated to reduce ecological impacts.

4. Clearing

5. The EIS states that each gas well pad requires 1Ha of clearing followed by immediate rehabilitation of approximately half to two thirds of this area (depending on required infrastructure) following construction (6 months after clearing). The EIS has not demonstrated why an automatic upfront 1Ha of clearing is required for every gas well pad. If it is proposed to immediately rehabilitate nearly half of the 1Ha after construction and finalisation of required gas well infrastructure it is recommended that the Field Development Protocol and micro-siting process be undertaken upfront to reduce the need to clear unnecessary ecological values and limit lag times for ecological restoration.

- The location of new infrastructure where possible be along existing infrastructure, roads, tracks and disturbance corridors and other cleared areas to limit impacts. Opportunities for direct drilling to avoid significant ecological values needs to be included in clearing proposals.
- Any additional clearing that may potentially be required as part of decommissioning works also needs to be identified upfront and incorporated into offset strategies.
- The proposed Field Development Protocol identifies that disturbance to the high ecological sensitivity class is limited to 0.5% of total class area. NWLLS recommends that as only 4 or 5% of the high ecological sensitivity class exists, areas identified as high ecological sensitivity class be avoided (no go areas) for the location of gas well pads and associated infrastructure.
- The EIS does not identify whether there will be salvage translocation of threatened species that will be impacted upon by the clearing works.
- Removal of a maximum of 10 143 hollows (potential to be reduced through the ecological scouting procedure) is proposed as part of construction activities. Mitigation measures only address hollows above 300mm diameter on a replacement ratio of 1:1. Details on how they are going to provide a 1:1 replacement have yet to be identified and it needs to be defined clearly particularly in the Rehabilitation Plan. The impact to fauna that use hollows smaller than this size for roosting, shelter and nesting has not been addressed in the EIS.

6. Bushfire Management

- Limited information has been provided in regards to the management of bushfire hazard in the EIS apart from referral that a Bushfire Management Plan will be developed. As the EIS proposes to rehabilitate areas that were cleared as part of construction, it is not clear whether these areas will be also required to provide asset protection functions as part of bushfire management for each gas well pad (and major infrastructure locations such as Leewood). At this stage, it is interpreted that rehabilitation will occur directly adjacent to each well pad infrastructure with no buffer provided. Further clarification is required to determine any requirements for asset protection zones around gas well pads and consequences to impacts and offset calculations.

7. Indirect Impacts

- The EIS attempts to provide an explanation (consisting of a formula) of how indirect impacts were quantified, however, the explanation provided is not clear and only seems to relate to noise impacts. The EIS states that there will be indirect impacts

from noise as the gas wells are quite noisy in operation (e.g. noise from a well pad in calm conditions with a 45dB(A) can be heard 48m from the source and 55m in adverse conditions. In addition, pilot flare noise can be heard up to 437m away in adverse conditions. Impacts from noise on nesting birds, owls, birds of prey and bats that listen for their prey maybe susceptible to disturbance from noise and could impact on their behaviours and potentially their ability to feed and reproduce. The impacts on these species have not been clearly identified. In addition, the proposed mitigation measures to reduce noise impacts on fauna are not identified and the proposed buffer widths for indirect impact extent need to be justified.

- The increased amount of traffic that will result as part of the project particularly within the first 3-4 years during the construction phase has the potential to dramatically increase wildlife vehicle strikes. Little information has been provided in the EIS except for the mention of reduced speed limits on how the project will address avoid, mitigate impacts to wildlife for all areas of the project and for the life of the project. A wildlife movement solutions strategy is required to address fauna impacts.

8. Rehabilitation Strategy

The proposed rehabilitation strategy largely focuses on rehabilitation measures at the decommissioning stage. Little focus is provided in regards to the proposed commencement of rehabilitation activities which start approximately six months after gas well pad construction. It is recommended that further details are provided in regards to this stage of rehabilitation activities and include seed sourcing and fauna habitat reinstatement components which at this stage are only addressed at decommissioning stage.

- The rehabilitation strategy needs to include threatened flora species re-introduction which may be addressed through specific species management/recovery plans. The rehabilitation strategy should also address habitat restoration for threatened fauna species.
- It is recommended that the rehabilitation strategy include a specific top soil management strategy that addresses location and storage methodology that promotes seed bank viability.

9. Weeds and Biosecurity

- Field surveys conducted between 2010 and 2014 have identified 116 introduced plant species within the project area. However, the distribution and density data of these weed species has not been provided in the EIS.
- The EIS has identified that weed invasion will impact on biodiversity values including reduced habitat quality and detrimental impacts on native plant communities under the NSW *Threatened Species Conservation Act* by exotic grasses. The EIS fails to identify aggressive species such as tiger pear (known to occur in the project area) and its impact on koalas or other fauna.
- Weed invasion and seed / propagule dispersal has been identified as a key threat with vehicles, equipment and workers as main vectors. Increased traffic flow is indicated to occur throughout all phases of the proposal highlighting the potential for weeds to increase particularly adjacent to roads, both existing and proposed. However, vehicle and contractor hygiene management strategies have not been taken into consideration in the EIS or how the proponent intends to fulfil their obligations in relation to this issue.
- Reference has been made in the EIS for pest and weeds (e.g. noxious weeds) being managed in accordance with Pest, Plant and Animal Control Plans. However, there is

no clear evidence, reference or linkage to the NSW *Biosecurity Act 2015* and *Regulation 2016* (including discharge of General Biosecurity Duty for all weeds), NWLLS Transitional Regional NRM Plan Targets (Biodiversity Target 4) and Draft North West Regional Strategic Weed Management Plan (2017-2022) in regards to the management of weeds within or adjacent to the project area.

- The proponent needs to provide further details on what measures they propose in order to mitigate the threat from invasive weeds impacting the immediate and surrounding environment. This includes ensuring no new invasive species are established and widespread weeds are controlled in line with the NSW *Biosecurity Act 2015* and subsequent regulations.

10. Proposed Biodiversity Offsets Strategy

- NWLLS recommends a proposed Biodiversity Offset Strategy that meets the requirements of the NSW Biodiversity Offsets Policy for Major Projects and required Commonwealth Government offsets under the EPBCA. An offset strategy has been developed to address direct impacts of 988.8Ha, an indirect impact of 181.1Ha and cumulative impacts of 84.8Ha. It considers the contribution that undertaking immediate rehabilitation post construction (586.6Ha) makes to reducing the overall offset liability. With this scenario the proposed offset for ecosystem credits as identified in the EIS is 1245.7Ha (or a direct impact ratio of 6034Ha). Species credits have been calculated based on worst case scenario but specific land areas have not been identified in the Strategy (species credits vary from 42 to 144,326 credits across 13 species).
- There is a lack of demonstration within the proposed Biodiversity Offsets Strategy for the project to provide meaningful offsets including a net gain (through revegetation works) in vegetation extent and ecological values to meet Biodiversity Targets particularly Targets 1-3
- It is acknowledged that the Strategy states that availability and suitability of potential offset sites will be investigated post submission of the EIS. However, further upfront clarification is required to demonstrate how the offset requirements will be met (e.g. how will ecosystems credits and species credits be provided for through offset mechanisms).
- NWLLS recommends a strategic approach to providing “like for like” land offsets (acquisition or biobanking agreements) proposed under the strategy as well as provision of any land offsets through the Biodiversity Conservation Fund. Proposed offsets should focus on locations adjacent to the current protected area estate within/adjacent the Pilliga Forest as a priority and then within the Pilliga area in general due to the significance of the area for threatened ecological values. NWLLS recommends consultation with key organisations including National Parks and Wildlife Service, Office of Environment and Heritage to identify potential target areas for land based offsets.
- Due to the dramatic decline in koalas within the Pilliga area as identified in the EIS, NWLLS recommends the proposed koala research program to identify location and sizes of koala populations in the broader Pilliga region as a compensatory offset measure (10%). NWLLS suggests the use of this information will be key to a range of conservation measures aiming at the long-term protection of the species, key populations and habitat within the Pilliga area.
- A nil-tenure feral animal control program is proposed to meet a third of the project’s offset liability (amount unknown). It has been proposed as a supplementary measure

under the NSW Biodiversity Offsets Policy for Major Projects. NWLLS does not endorse this offset program due to the following reasons:

- The proposed Biodiversity Offsets Strategy has not demonstrated that "like for like" offset sites as required under the NSW Biodiversity Offsets Policy for Major Projects cannot be found. Before considering the use of supplementary measures the Policy states, a proponent must demonstrate that all reasonable steps have been undertaken to locate appropriate offsets.
- Feral animal control is currently a legislative requirement for landholders to undertake over the area where the program is proposed (e.g. Forestry, private landholders). It is the responsibility of these landholders to meet their legislative requirements. The benefits of a landscape approach is recognised but should be undertaken outside of the biodiversity offset requirements.
- The proposed program only lasts for 20 years and is not an offset that is in perpetuity that a 'like for like' land offset would provide. Therefore there is a lack of long term benefits.
- Technological and scientific advances in the future may result in improvements to feral animal control programs which may reduce the reliance on manual control programs over a time (including within the program's 20 year timeframe).

NWLLS Transitional Regional NRM Plan - Biodiversity Targets (3-4) and Water Targets (1-3)

11. Aquatic Ecology

- The project area contains 717 km of mapped watercourses plus potentially three threatened species under State or Commonwealth legislation. However the main aquatic ecological focus has been on Bohena Creek due to the proposed managed release of waste water. An aquatic ecological impact assessment for the remainder of the project area has not been adequately provided. An aquatic ecological impact assessment will be required to determine any impacts of the project on the aquatic values of the entire project area and downstream catchment values.
- The EIS has not clearly demonstrated that a managed release into Bohena Ck (even on an infrequent basis) is a critical part of the project's overall water management program. Removal of this water management option particularly as part of its prolonged wet weather management option will remove any potential impacts on aquatic ecological values and water quality and quantity impacts that may arise from release of waste water in Bohena Creek and the Namoi River system.
- The EIS identifies nine groundwater dependent ecosystems within the project area. The EIS identifies that there will be "likely":
  - water quantity impacts (alteration to the water table levels in the Pilliga Sandstone aquifers) for six of these ecosystems
  - Water quantity impacts (possible changes to the artesian pressure at wetlands sourced from artesian bores) for three ecosystems
  - Water quality impacts (potential impact at Teds Hole from the managed release scheme on Bohena Creek) in regards to the alteration to the natural groundwater chemistry and/or chemical gradients or salinity levels.

In relation to the "likely" impacts identified above, the EIS does not demonstrate how the project will meet *Water 2 Target: by 2020, there is an improvement in the ability of*

groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.

12. Stygofauna

Due to previous reports that Stygofauna have been identified within the Pilliga area, additional Stygofauna surveys should be undertaken across the project area and surrounding catchment areas not just on Bohena Creek and Mollee Creek. Impacts and mitigation measures need to be identified if stygofauna are identified in groundwater systems.

13. Water quality and quantity monitoring

The development and implementation of a water quality and quantity monitoring program for both surface and groundwater that includes appropriate baseline data and ongoing monitoring across the entire project area and surrounding catchments is important. This will assist with identifying potential issues that may impact on the management of water quality and quality on Travelling Stock Reserves. Water monitoring and aquatic surveys are largely focused on the managed release of water into Bohena Creek and as such mainly occur along Bohena Creek and Namoi River/Narrabri Creek systems. It is recommended that a comprehensive water monitoring program be developed (including adequate baseline data) across all of the project area and surrounding catchments.

NWLLS Transitional Regional NRM Plan (People Targets 1 and 2)

It is recognised that the EIS includes a Social Impact Assessment. It is not clear however from the Social Impact Assessment, how the project's natural resource management decisions will contribute to social wellbeing and adaptive capacity of the local and regional community. It is well known that there are a wide range of community perceptions of the proposed project within the region's community. The EIS does not however, provide an analysis of these perceptions and how the project will address perceptions particularly those that are negative. Demonstration that the project will meet the NWLLS Transitional Regional NRM Plan (People Targets 1 and 2) is required to be provided by the proponent.

RECOMMENDATIONS:

To ensure the long term protection, management and enhancement of ecological values within the Pilliga area and to meet the NWLLS Transitional Regional NRM Plan's Targets and protect and maintain TSR functions and assets, NWLLS recommends the following be addressed:

TSR

1. It is key that the EIS be able to articulate the actual works and operations that will occur specifically on TSR to enable NWLLS to exercise its due diligence of assessing impacts appropriately. This detail has not been provided and is major information gap in the EIS. Consequently, NWLLS is unable to appropriately assess impacts to TSR that would satisfy reasonable levels of accountability and stewardship. It is recommended that the proponent identify specific impacts on TSR from the project, inclusive of any impacts that may occur outside the project area, and identify avoidance, mitigation and offset measures to minimise impacts.

2. The proponent specifically address in the EIS how the development proposal aligns with the 'guiding principles' for TSR land use under The NSW Travelling Stock Reserves State Planning Framework 2016–21.

NWLLS Natural Resource Management programs

3. Identify specific impacts on NWLLS natural resource management programs from the project, inclusive of any impacts that may occur outside the project area, and identify avoidance, mitigation and offset measures to minimise impacts.

NWLLS Transitional Regional NRM Plan – General

4. Provide an assessment against the NWLLS Transitional Regional NRM Plan to demonstrate compliance with Targets and critical thresholds identified in the Plan.

5. Demonstrate that cumulative impacts do not result in the long-term loss of ecological values and processes in the Pilliga area.

NWLLS Transitional Regional NRM Plan- Biodiversity Targets

6. Provide further information to demonstrate an appropriate assessment for koalas has been undertaken in accordance with the EPBCA and not just NSW State Environmental Planning Policy 44.

7. Investigate use of strategic threatened species recovery planning mechanisms and salvage translocation of impacted species as part of mitigation measures.

8. Provide a conceptual infrastructure design plan that includes indicative locations of gas well pads and associated infrastructure to assess whether the EIS has adequately addressed impacts to significant ecological values.

9. Demonstrate the need for 425 gas well pads and that other alternatives including reduced number of gas well pads have been investigated to reduce the ecological impact footprint of the project.

10. Provide a clear explanation why 1Ha is automatically cleared for each gas well pad. It is recommended that the Field Development Protocol and micro-siting of gas well infrastructure be used upfront to reduce the automatic upfront clearing amount of 1Ha.

11. Identify additional “no-go areas” where vegetation removal is prohibited including areas identified as a high ecological sensitivity class within the ecological sensitivity class mapping for the project area.

12. Identify potential additional clearing as a result of the decommissioning stage and include in offset calculations.

13. Provide further details to demonstrate that potential indirect impacts from noise and light from the project have been appropriately measured and provide details on proposed mitigation measures to reduce impacts on surrounding ecological values and processes.

14. Provide details for mitigation measures to address the removal of hollows less than 300mm diameter and for hollows over 300mm diameter.

15. Provide further details in regards to the density and distribution of weed species identified within the project area and identify aggressive species such as tiger pear that are known to occur in the project area.

16. Demonstrate how the project will meet the NSW *Biosecurity Act 2015* and *Regulation 2016* (including discharge of General Biosecurity Duty for all weeds), NWLLS Transitional Regional NRM Plan Targets (Biodiversity Target 4) and Draft North West Regional Strategic Weed Management Plan (2017-2022) in regards to the management of weeds within or adjacent to the project area over the life of the project.

17. It is recommended that a specific vehicle and equipment hygiene weed management strategy be developed to minimise risk associated with potential weed/seed/propagule spread throughout the project area.

18. The proposed rehabilitation strategy largely focuses on rehabilitation measures at the decommissioning stage. Amend the strategy to include further details of proposed rehabilitation measures which commence approximately six months after gas well pad construction. Provide further information whether the rehabilitation works will include threatened species management.

19. Determine whether the NSW Endangered Ecological Community; *Pilliga Outwash Ephemeral Wetlands in the Brigalow Belt South Bioregion* occurs within the project area. If the EEC does occur within the project area, an impact assessment must be undertaken and avoidance, mitigation and offset requirements addressed.

20. Further clarification is required to determine any requirements for bushfire asset protection zones around gas well pads and consequences to impacts and offset calculations if buffers are required in lieu of rehabilitation of impacted ecological values.

21. Provide an amended Biodiversity Offsets Strategy that provides a net biodiversity gain and demonstrate compliance with Biodiversity Targets of the NWLLS Transitional Regional NRM Plan.

22. Provide an amended Biodiversity Offsets Strategy that clearly demonstrates how the proposal will meet biodiversity offset requirements for both identified ecosystem and species credits.

23. Remove the proposed nil-tenure feral animal control program as part of the biodiversity offset commitments and replace this offset measure with a “like for like” land offset or contribution to the Biodiversity Conservation Fund which will result in biodiversity conservation measures in perpetuity rather than a 20 year timeframe.

24. Provide a strategic approach to provide “like for like” biodiversity offsets within the Pilliga area. It is recommended that Santos consult with key organisations such as National Parks and Wildlife Services and Office of Environment and Heritage to identify potential offset sites.

25. Provide a Wildlife Movement Solutions Strategy to address impacts from fauna as result of the project.

26. To address impacts to wildlife from increased traffic, NWLLS recommends the project financially assist a local wildlife rescue group (e.g. WIRES) to assist with the cost associated with the rescue and rehabilitation of injured wildlife particularly those impacted on by the project. WIRES resources currently within the region may not be able to accommodate additional injured wildlife that may arise as part of the project. It is recognised that this action may not be suitable as part of the biodiversity offset strategy and maybe more appropriately situated as part of the proposed Gas Community Benefit Fund.

NWLLS Transitional Regional NRM Plan – Water Targets

27. Provide a comprehensive aquatic ecological impact assessment to determine potential impacts of the project (not just in relation to the managed release of waste water) on the aquatic values of the entire area and downstream values.

28. Demonstrate that a managed release of waste water into Bohena Creek is a critical part of the project's overall water management program and that all other options to manage waste water have been exhausted.

29. The EIS identifies likely water quality and quantity impacts to a number of groundwater dependent ecosystems in the project area. Demonstrate how the project will avoid or mitigate the following impacts:
    a. alteration to the water table levels in the Pilliga Sandstone Great Artesian Basin aquifer for six identified ecosystems;
    b. possible changes to the artesian pressure at wetlands sourced from artesian bores for three identified ecosystems; and
    c. potential impact at Teds Hole from the managed release scheme on Bohena Creek in regards to the alteration to the natural groundwater chemistry and/or chemical gradients or salinity levels

30. Provide further information to demonstrate that the project meets the NWLLS Transitional Regional Natural Resource Management (NRM) Plan Water 2 Target: *By 2020, there is an improvement in the ability of groundwater systems to support groundwater dependent ecosystems and designated beneficial uses.*

31. Undertake additional aquatic groundwater surveys across the project area in addition to existing survey areas of Bohena and Mollee Creek to determine the presence/absence of stygofauna and potential impacts and mitigation measures that the project may have on stygofauna populations within project area and offsite.

32. Develop a comprehensive water monitoring program (groundwater and surface) including baseline data for the project.

NWLLS Transitional Regional NRM Plan - People Targets

33. Demonstrate that the project will meet the NWLLS Transitional Regional NRM Plan (People Targets 1 and 2).

If you have any questions or require clarification, please contact Frances Wright, Senior Land Services Officer on 02 6764 9202.

Sincerely,

James Hutchinson-Smith
General Manager
North West Local Land Services