Ref.	Author	EIS Ref	Topic	Comment / Question	Response
1	Rob Law Environment Centre NT Policy Officer		Changes in project since NOI	We note that the EIS appears to no longer make reference to the limestone quarry (approx.150m x 150m at approx.25m depth) and access road 20km west of the Mt Todd mine site. We therefore make the assumption that this quarry is no longer required. However, if the quarry is still intended it would be inappropriate to seek a separate environmental assessment for the quarry and this should have been included in the entire projects EIS for proper consideration.	We have conducted further investigations into the availability of clay in the local area and concluded that there are numerous sources between Pine Creek and Katherine. It is possible that the activity of quarrying clay and delivering it to the mine will be subcontracted to a local contractor. We will however ensure that the standard that this is to be done to complies with both Vista Gold's and the NT Governments guidelines. It is recognised that this activity will form part of a separate approval process outside this EIS.
12	Rob Law Environment Centre NT Policy Officer		Concluding remarks	In its current form we believe the Mt Todd gold mine proposal poses more serious environmental and social risks than the benefits it identifies. The project will create significant amounts of waste; threaten Gouldian finch populations, and poses significant residual risks of contamination of the Edith River. The following is a summary of our concerns to be addressed in a supplement to the draft EIS and for consideration by the approving ministers.	As with any extraction of minerals there is some impact to the environment and community. It is our opinion that we have demonstrated a comprehensive working knowledge of the risks and detailed appropriate mitigation strategies that provide acceptable residual risk(s).
13	Rob Law Environment Centre NT Policy Officer		Summary of key concerns and suggestions:	• Rehabilitation and mine closure risks for the project remain high and stronger commitments should be made by the proponent to reduce these risks • Unacceptable that the WRD is to remain as a feature in the landscape, and should be backfilled in to the batman pit. • Renewable energy sources for the mine should be properly investigated as there are technically and economically feasible options for meeting energy supply with renewable technologies • Offsets need to be addressed in a	As this part of the proponents response is provided as background and summary comments no response from Vista Gold has been offered.

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				supplement to the EIS and include commitments for biodiversity offsets and locally sourced greenhouse gas offsets • Climate change risks of flash flooding should be better integrated into risk models • Mine design should be based on preventing overflows and AMD contamination from high intensity rainfall events and not just normal operating conditions • The impact on Gouldian finch habitat remains high and approval would not reflect the function and purpose of the EPBC act. • The size of the mine will create potential legacy issues orders of magnitude greater than existing issues • Gold price volatility should not compromise commitments for rehabilitation and mine closure • A 30,000/33,000 tpd scenario is recommended if approval is granted as is likely to generate less waste and have a lesser environmental impact A preliminary rehabilitation completion criteria should be developed with stakeholders in the early stages of the mine to ensure Vista Gold is properly held to account No water should be released from the mine site into the Edith River that is not properly treated by best practice Australian standards	

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				A water treatment plant that can process greater volumes should be invested in The residual risks posed by the increased capacity of the TSF1 and the new TSF2, and the WRD remain medium to high and this is unacceptable and should be revised with engineering solutions to reduce risk	
14	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.			While there are a number of very significant environmental impacts to be considered in the assessment of this project proposal, AFANT will confine its comments to those issues with potential to impact fish and fishing in the Edith/Daly River area. The matters that are of greatest concern to AFANT and recreational fishers are: • The acknowledgment in the Draft Environmental Impact Statement (EIS) that toxic water will impact on shallow ground water systems as a result of the mine operations • The acknowledgment in the Draft Environmental Impact Statement (EIS) that toxic water will impact on shallow ground water systems as a result of the mine operations • That no plan has been outlined in the EIS to remove the necessity to discharge untreated water from retention ponds RP1, RP2 and RP5 • The increased volume and accumulation of large amounts of potential acid mine water in the Batman pit and impacts of this water on the environment	As this part of the proponents response is provided as background and summary comments no response from Vista Gold has been offered.

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				• The structural integrity, size, siting and potential impact of the tailing storage facilities TSF1 and TSF2 • Adequacy of the closure strategy, particularly the capacity of the proposed wetland system to protect water quality • The substantial and real environmental risk of in the event of emergency mine site shut down	
15	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.		Background	AFANT has taken a strong interest in the Mt Todd mine due to significant legacy issues at the mine site and the acid mine drainage issues that have affected the Edith River downstream. The existing Mt Todd mine which was operational from 1993 until it was abandoned in 2000 is an extremely large open cut gold mine. The Mt Todd mine is arguably the Northern Territory's largest and worst legacy mine site and has for over a decade caused significant toxic water to flow into the Edith River which flows into the iconic Daly River. One of AFANT's major concerns with the proposal as outlined in the EIS is that while significant risk, threats and issues have and still are evident at the Mt Todd site, the proposed expansion will dwarf the current site infrastructure. AFANT has significant concerns that while the entire mine operation infrastructure has been supersized, the assets required to manage potential environmental risks, which are already not	As this part of the proponents response is provided as background and summary comments no response from Vista Gold has been offered.

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				sufficient to manage the risk of rain events and water discharges at the site, seem to have been maintained at the same dimensions. All operational water bodies on the site are substantially being raised and enlarged with the exception of those required to retain contaminated water on site. While there is a statement that RP1 will be deepened, it is unclear if this will be sufficient to substantially reduce the impact of untreated water discharge from the site. AFANT has an extremely strong interest to ensure that the proposed mining operations and post closure rehabilitation of the site can be conducted in a manner that removes the current and future water and pollution risks at Mt Todd and the Edith River. What we definitely do not want is to have a large problem, as it currently exists, to develop into an even larger problem due to the scale of the proposed expansion. The current Mt Todd site layout has a myriad of problems and highlights what can go wrong when poor mine design and approvals are allowed to proceed by Government. It is essential that these issues are addressed and fixed through the EIS. One of the most important considerations for AFANT in this project is to ensure the spectacular recreational fishing experiences in the Daly River system are not put at risk.	
18	Amateur Fishermen's		Batman Pit	AFANT is concerned with the closure of the Batman pit and the expectation that an	A pit lake study is yet to be undertaken. An evaluation of the pit lake model will be undertaken following the completion of the groundwater model during

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	Association of the NT Inc. Craig Ingram AFANT Executive Officer.			enormous volume of water will accumulate within the pit over time. The EIS documentation is also unclear on the expected water quality of water that will accumulate within the pit but it appears from the drill samples that most of the lower sections of the Batman pit have rock which is potentially acid forming. A number of inconsistent comments appear to be made regarding the potential or otherwise of interaction with shallow ground water systems from water within the pit. It is acknowledged that under current water levels (Vol 1, 12-2) that ground water contamination is occurring from the Batman pit water, but inconstancies exist on any ground water impact post mine closure AFANT is extremely concerned with the potential for long term contamination of ground water systems. We are also concerned regarding the drawdown of local ground water and the risk of altering regional ground water flows both during and for an extended period after mine closure. AFANT also have a concern that the presence of a large pool of ARD/ML water in the Batman pit could have the potential threat to local fauna. AFANT is also concerned regarding apparent contradictory comments in Vol 1/ 5-34 which state that the provision will be made to overflow into water treatment wetlands while other comments indicate low level accumulation and long term equilibrium or	the Detailed Feasibility Study. The water modelling does not predict that the pit fills to overflow. It is most likely that the source of AMD will scale over and "shutdown" as a source. Under the water surface there is not enough oxygen for the natural AMD process to occur.

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				stabilisation of water levels within the Batman pit. Water accumulation equilibrium will be reached at 15 meters above chart datum or approximately 400 meters deep of water will accumulate in the pit over time. This could equate to over 400,000 megalitres of contaminated water stored at the site.	
21	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.		Equalisation pond	The equalisation pond is mentioned in a number of places in the EIS document but it is not clear on its location nor is it included on maps or the site plan.	The equalization pond is sized to hold 5 days of the WTP flow rate (500 m3/hr.). It is located directly adjacent to the water treatment plant. A GFA figure will be produced as part of the DFS.
22	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.		Passive treatment wetlands	The provision of three passive treatment wetlands is mentioned as the solution to the Mt Todd water quality rehabilitation and closure in the EIS document. The EIS documents are not consistent on the matter and it is unclear on the precise location of these facilities or the justification of the size of the facilities; 10ha (Vol 1 2-2). Nor is the location included on maps or the site plan. The EIS documents do not adequately justify or explain the adequacy of the three passive treatment wetlands (in total 10ha) to treat the water on site in the closure and rehabilitation phase. The size of the treatment ponds is dwarfed by the sheer volume and potential of ARD/ML water and run off from the site. Even if the retention ponds, other infrastructure tailings and waste rock dumps are adequately closed and capped, AFANT would like greater explanation on the	Two passive treatment systems will be required after the cessation of mining: one each for the waste rock dump and TSF-1. Seepage analysis indicates that <35m3/day will originate from the waste rock dump within two years of the cessation of mining (Attachment A). Seepage from TSF-1 will be modelled during the Detailed Feasibility. Geochemically, the metals and sulphate concentrations support treatment within a passive system. A design will be prepared during the Detailed Feasibility Study. The water treatment plant is intended to remain on site during the closure period of four years. An assessment will be made to remove this facility after it is known not to be required.

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				purpose and adequacy of the passive water treatment process and where they will be placed in relation to mine infrastructure It is AFANT's view that the passive wetland system may have a role during mine operation to prove that it is a suitable long term solution to water management on site. AFANT also notes that the proposal is to discharge treated waste water in excess of requirements into the Batman Creek/Edith River throughout the year (Vol 1, 10-16). AFANT sees that this could be a risk to the natural flow requirements of these systems and will need to be managed using best scientific advice on any potential impact on dry season flows in the Edith River.	
24	Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.		Conclusion	AFANT believes that significant questions still need to be answered on the future site water management, both during operation and after closure to ensure the adequate protection of the rivers downstream of the mine site.	As this part of the proponents response is provided as background and summary comments no response from Vista Gold has been offered beyond that Vista has a very sophisticated understanding of the risks. The protection of the rivers downstream of the mine will be varied for season to season by the maintenance of the WDL. This will ensure it remains current and that the 80% species protection regime is complied with.
27	Mt Todd, Vista Gold EIS – Ian Hollingsworth		Summarize existing surface water knowledge and how multiple lines of evidence will be used to assess the condition of surface water ecosystems, including water quality data, rapid biological assessment data	**Detailed Comment** The assessment of condition does not include an interpretation of general and major ion water chemistry data. Concentration on metal contaminants that are not conservative in stream water and biological assessment data with low statistical power obscures impact from the mine site. Use of the 80% species protection level from generic ANZECC water quality guidelines is inappropriate. Impact assessment and management needs to refer to site based trigger levels, and without community	The 80% species protection level as specified in the current WDL has been derived from a direct toxicity assessment of the water to be discharged from the site. A direct toxicity assessment provides an integrated measure of the impacts off all constituents in the mine water and follows the recommendations and methods of ANZECC & ARMCANZ (2000) for site specific DTA. The application of the 80% species protection level has been selected to aid in dewatering the site while protecting downstream ecosystems. It must be noted that the quality of the water to be discharged in the 2013/2014 wet season will be of higher quality than that discharged in the past. Further, the 80% species protection level is to be met at monitoring point SW4 which is on the mine lease. Monitoring for 2012/2013 discharges show that the 95% species protection trigger values for cadmium, nickel and zinc were met at the sampling point SW10, downstream of the site. (copper was elevated at SW10 due to the train derailment in December 2011)

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			and existing land use data	consent, 95% levels of protection are recommended in the ANZECC guideline. **Vista Gold Action** Include a thorough analysis and interpretation of perturbation to background general water quality parameters (including major ions) as a result of mining activities; rather than basing the impact assessment and dilution strategy on biological and Eco toxicological evidence. Make sure that the extent of water quality impact on the river system is clearly identified and that dilution conditions are specified relative to the 95 percentile of measured background range.	
29	Mt Todd, Vista Gold EIS – Ian Hollingsworth			Vista Gold Action Considering the AMD liabilities at Mt Todd, and similar geologies in the Pine Creek Inlier, and the high regional rainfall environment open cut mining operations are likely to be untenable. The Department of Resources need to clearly specify what constitutes an acceptable mine plan in this operating environment and elsewhere in the Top End. Underground mining operations and progressive backfilling and closure of the existing pits that represent an enduring liability at Mt Todd may be practicable, but the proposed plan is not.	It is anticipated that during operations, water management and any potential associated issues will be entirely different to the current situation where an excessive water inventory is present on site. Vista is committed to operating and managing water according to the regulatory requirements that will apply during operations. Further surface water modelling refinements will be undertaken during the Feasibility Study stage of the Project with the results incorporated into detailed design and the Mine Management Plan and relevant Environmental Management Plans that will be subject to DME approval. It is not anticipated that there will be any significant change to the model. However if there is a significant change the DME may require Vista Gold to submit another EIS.
30	Dept. Primary Industry and Fisheries Christine Long (CEO)			The actions proposed in the Draft EIS, intended to reduce the flow of water onto the site and minimise erosion, pollution and sediment movement off-site into the waterways will help minimise any potential risk of adverse impact on the Edith Rover, Horseshoe and Stow Creeks. This department	Vista Gold has an Emergency Response Plan that has management processes to deal with emergencies that may, or have the potential to adversely impact on the environment. This plan includes spills, fire and accidents. A fish kill caused by a dry weather spill would be covered in this Plan. Further, a surge pond will be established for the water treatment plant which will catch dry season accidental flows. The likelihood of water leaving the site during the dry season is low. Sediments and macro invertebrates are monitored on an annual

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				also recommends inclusion of a protocol to address any dry season flow events resulting in fish kills and with an associated post-event monitoring program. Consistent with the recommendation made in 2010 (by Michael Welch Authorisations and Evaluations Division to the Mt Todd Reference Groups: MT Todd Fish Surveys 2008 and s009 Mine Evaluations) this department recommends that monitoring be conducted on a biennial (as a minimum) basis, both upstream and downstream of the site, and including water quality, sediment samples, macro invertebrates, macrophytes and fish is recommended covering both we and dry seasons. Development of the IMP would benefit from involvement and input from local community rangers, the Parks and Wildlife Commission of the NT, the NT EPA and this department.	basis according to Lamche, G. (2007). The Darwin-Daly Regional AUSRIVAS Models –Northern Territory: User Manual. Aquatic Health Unit –Department of Natural Resources, Environment and the Arts. Report 06/2007D. Water quality is sampled upstream and downstream on a daily basis during discharge and on a monthly basis when no discharge is occurring as per WDL requirements. Vista Gold also monitors additional sites for water quality management on-site. Vista gold will continue to conduct annual monitoring according to the Macro invertebrate Monitoring Program, however, if an impact or issue is detected then dry season monitoring will be considered.
33	Dr Anne Walters Strategic Projects Officer The Parks and Wildlife Commission of the Northern Territory			The health of the Edith River and other waterways is a key concern. The main issues in this regard are discharge of contaminated water and the leaching of contaminates from the WRD and tailings areas. We believe that monitoring of the site and surrounds at Mt Todd should be rigid and independent.	Monitoring of site and the surrounds of Mt Todd is currently undertaken in accordance with the requirements of the Waste Discharge Licence issue by the NT Government. Additional monitoring of surface and ground waters is undertaken according to a regime specified within the site's Water Management Plan which is part of the site's DME approved Mine Management Plan. All sampling is undertaken according to relevant Australian Standards and all analyses are performed by an independent NATA accredited laboratory. Additional independent sampling is performed by the NT EPA and the DME's EMU. Vista is committed to continue monitoring according to any regulatory requirements that may be relevant at the time the site resumes operations.
41	Xavier Schobben Director Environmental Health Branch Dept. of Health		Werenbun Community	Executive Summary (Table 17-6): Werenbun community is listed as being 6.5 kin from site (air quality) and 8 kin from site (noise). This location reference needs amendment to ensure consistency of information.	The disparity is due to standard practices. 6.5lm is from the boundary of the mining lease and 8km is from the centre of the processing plant.
47	James Pratt Department Of		Erosion and Sediment Control	The Draft EIS recognises that the most significant potential risk to biodiversity values	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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	Land Resource Management		Plan (ESCP)	and particularly Matters of National Environmental Significance (MNES) is to the Gouldian Finch. The Yinberrie Hills provide habitat for the largest known population of Gouldian Finches and it is persistently used for breeding. Potential risks identified in the Draft EIS include dust, habitat clearing, predation by (or other interactions with) introduced animals, noise, poisoning by drinking from tailings darns, and habitat loss due to changed hydrology or artificial light. The treatment of Gouldian Finch issues within the EIS would have benefited from a more comprehensive review of the large amount of existing data from this area. Additionally, the approach in the EIS is inconsistent with the use of the Yinberrie Hills SOCS (Site of Conservation Significance) boundary as an indication of the extent of the important habitat area for this population. The SOCS boundary was drawn to encompass a number of values and, while much of the SOCS extent contains E. tintihnans woodlands, the majority of Gouldian Finch records are in the western half of the SOCS area (as shown in Fig 6.1 of Appendix N). Almost all regional Gouldian Finch breeding records are concentrated in the Yinberrie Hills to the immediate west and northwest of the mine site. Consequently, the EIS underestimates the potential risk to the Gouldian Finch population, both as a result of direct habitat damage and indirect impacts particularly through dust The EIS identifies that a total of 296 ha of potential Gouldian finch breeding habitat (E. tintinnans-dominated woodland) is proposed	

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				to be cleared, as well as an additional 1202 ha of other eucalypt woodland (potential foreging habitat). The calculation of 0.85% (i. e. <1%) of Gouldian finch breeding cleared is likely to be significantly underestimated This emphasises the importance of considering all possible alternative impact footprints that minimise clearing of breeding habitat - such as by relocating the proposed low grade ore stockpile away from such habitat. As identified in the EIS, increased production of dust may have a high risk of significantly impacting on the Gouldian finch population. Levels of dust of concern for humans (>50 119. in-3) are expected to cover at least 7,162 ha of Gouldian finch breeding habitat in the Yinberrie Hills SOCS. The Yinberrie Hills area to the west of the Batman Pit (the main breeding habitat) is predicted to have the highest concentrations of dust, with the potential to be exposed to predicted maximum 24-hour ground level concentrations of PMIO of greater than 200 119. in-3. The same area is predicted to have the highest deposition rates of dust, due to the prevailing southeasttrade winds. There is limited discussion in the EIS about appropriate thresholds of concern for dust levels in relation to fauna. The levels of dust that are of concern for Gouldian Finches specifically are unknown however, on the basis of the much higher respiratory rate of small birds are expected to be much lower than that for humans. Therefore the area of concern for dust impact on breeding (and foreging) habitat for Gouldian Finch is likely	

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				to cover a much larger area than modelled using the >50 119. in-3 threshold, and the threshold of concern to be exceeded more often. The EIS proposes standard mitigation and management procedures to prevent excessive dust and keep it at levels safe for humans. On this basis, the EIS assesses residual risks of increased dust production to various aspects of the Gouldian Finch population as High (Chapter a FAOl, FAO2, FAO3, FAO8). This suggests that further mitigation measures are warranted, particularly given the national significance of the Yinberrie Hills population. Although no additional mitigation measures are described, the EIS proposes three monitoring programs (referred to as mitigation measures) to assess the impacts of dust on Gouldian finches: 1. A dust monitoring program to assess dust levels and impacts at different distances from the mine; 2. Monitoring nesting frequency and success using large numbers of artificial nest boxes in high dust areas, and; 3. Continuation and expansion of the Department's Gouldian Finch monitoring program in the Yinberrie Hills Programs I and 2 are supported, although the success of (2) is dependent on the uptake and use of nesting boxes by Gouldian Finches, and this would require validation early in the program. The Department's Gouldian Finch monitoring program, as	

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				currently implemented, is a low intensity program based on waterhole counts late in the dry season While it has power to track regional population trends over long periods, it is not designed as a reactive monitoring program to determine the effects of a specific disturbance regime, and would need to be significantly redesigned and resourced to address this goal Experience has shown that the design of a monitoring program with the power to determine statistically significant trends in such a mobile and seasonally variable species is quite complex, and appropriate ecological and statistical expertise will need to be sought in developing such a program No information is given in the EIS about a potential management response if monitoring indicates a significant adverse impact on Gouldian Finch populations and/or nesting success. Given that increased dust levels may reduce habitat quality within the Yinberrie Hills, management actions that improve other aspects of habitat quality deserve attention as potential offsets for residual impact from the proposed development. Improvements in habitat quality are most likely to be achieved through landscape-scale fire management, particularly aimed at increasing the availability of important food grasses for Gouldian Finch. This may be informed by the decision support system for conservation management of the Gouldian Finch developed using Yinberrie Hills as a model. Recommendations	

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				• A comprehensive review of the large volume of existing information about Gouldian Finches in the Yinberrie Hills area would inform a more adequate treatment in the EIS of the risks to this species, particularly the delineation of the core breeding habitat for this population; • The appropriate threshold for concern in relation to the potential impact of raised dust levels on finches is uncertain, and this issue warrants further assessment by an independent expert; • On the basis that the residual risk to the Gouldian Finch population from raised dust levels is correctly assessed as High, then additional mitigation measures should be explored and implemented; • A monitoring program for Gouldian Finch in the Yinberrie Hills area that can statistically determine trends in the population size and breeding success should be designed and implemented, within timeframes that allow an appropriate management response; • Any potential to further minimise the clearing of Gouldian Finch habitat should be explored, such as by relocating the Low Grade Ore Storage Facility; • Mitigation of other impacts on habitat quality or population viability for Gouldian Finch should be rigorously implemented, including monitoring for, and eradication of, feral cats, feral rats and exotic grasses; • Other management actions that may improve habitat quality for the regional Gouldian Finch population should be supported.	
47A	James Pratt Department Of Land Resource		Erosion and Sediment Control Plan (ESCP)	The Department recommends that an Erosion and Sediment Control Plan (ESCP) be required as part of the Mine Management	Vista Gold commits to a detailed Erosion and Sediment Control Plan (ESCP) as part of the Mine Management Plan (MMP). The ESP will be prepared by a suitable qualified person. It is intended that the ESCP will highlight areas and

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	Management			Plan. The ESCP should be developed by a suitably qualified and experienced professional in erosion and sediment control planning, approved by the authority prior to the commencement of works, and subsequently implemented to the satisfaction of the consenting authority, to ensure sediment runoff does not leave the development during both the construction and operational phases. The International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control booklets or higher standard should be referenced as a guide to the type of information and detail required in the ESCP. Further information can be found at www.nt.gov.au/soil/management	circumstances of elevated erosion risk and provide mitigation options for designers, constructors, estimators, and decision makers to consider. The plan in addition will also discuss regular monitoring and maintenance program to ensure that the erosion control measures implemented are effective. A monitoring programme will be put in place that includes both short and long-term inspections during the construction phase.
48	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Executive Summary	Page viii: states that additional site water balance modelling will be undertaken to ensure that drainage and storage ponds can accommodate extreme rainfall events. • When will this additional modelling occur? • Will additional modelling incorporate proposed management measures not previously used in the Goldsim model (e. g. transfers to Tailings Storage Facilities; increased pumping capacity)? Refer to comments further in this document regarding accommodating "extreme rainfall events".	The water balance is currently allowed to pass a storm equal to the Boxing Day event. However, the model is not currently set up to allow pre-emptive actions such as transfers to the TSF during pre-production. Goldsim has the capability to perform short-term forecasts (with uncertainty), in the event one or more of the RPs may overtop. The model would first test each RP to determine if overtopping may occur, it then enters a subroutine that runs a weather forecast. The results of the forecast are exported to the parent model and if an overtopping event is imminent, water is sent from the RP to the TSF. The DFS level model may be refined to include such forecasting for the pre-production phase. Existing modelling has determined that standard size pumps and pipeline will be more than adequate to manage the flows around the site. Detailed work carried out during the DFS stage will finalise the sizing's. We have made provision in the economic model for the cost of this infrastructure. As to the question of when this will be done we can only state that it will be done as part of the DFS. As we have stated recently the DFS timing is dependent on market conditions which largely are beholding to the spot price of gold. That is to say as we are unable to determine when the spot price will improve therefore unable to provide a date for the DFS to be finished.

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					We have established to date that there is enough area and the natural topography is suitable for the drainage and storage ponds. The modelling yet to be completed will be an iterative process of refinement only.
50	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Waste rock dump stormwater	The draft EIS indicates that "Clean" stormwater from the waste rock dump (WRD) will be collected at the toe and diverted to West Creek. The Supplement should include a discussion on: • the monitoring that is proposed for this drainage to ensure it is 'clean' • before it is discharged; and • the mitigation measures that will be in place if the water is determined to be contaminated.	Until closure, RP1 sends to the water treatment plant. Upon closure, a passive wetlands treatment is proposed. Success of the passive treatment must be demonstrated prior to removal of the WTP from operation. We also note that as part of the operations and closure activities the source of AMD is encapsulated and as a product these measures are a contingency only. The design of drainage from the WRD has not been done to the detail that allows us to answer this question with specifics. However we can state that a sampling program will be established to collect a statistically large enough dataset to determine if ongoing sampling is required. This is one of the many monitoring activities that will be employed to ensure that the GCL layer is effective. We have completed a large number of tests on the NAF material to determine that there is no potential for this material to become PAF over time, Appendix L. As a product of the current site layout a diversion channel can be established to separate any mine affected water into RP1 (downstream). This is a contingency only and is not anticipated to be constructed / required.
51	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Pre-production equalisation pond	Provide more detail on the capacity of this pond and how the '~ 3 day storage' capacity was obtained, pump capacity and pump line infrastructure and discharge location(s). The draft EIS notes a spillway for overflows but no receiving watercourse is given. Please clarify.	The equalization pond is sized to hold 5 days of the WTP flow rate (500 m3/hr.), based on water balance modelling using Goldsim. The exact location of the discharge point and the pump line infrastructure will be determined at the DFS level. The WTP will treat to within permitted discharge standards and the ultimate receiving body will be the Edith River. However, during normal processes, all WTP effluent will be recycled back into process.
52	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Lined sludge disposal cell	The draft EIS on page 2-42 indicates that a lined sludge disposal cell will be constructed for permanent disposal of water treatment sludge. More information is required on the location of this cell, its footprint, capacity and any specific inaria ement considerations.	We have completed additional engineering and there is now no requirement for the Sludge Disposal Cell. Sludge is continuously recycled back to the reactor turbines, and periodically discharged, and pumped to the TSF from the high pH clarifier. Four (4) progressive cavity pumps are recommended for removal of the sludge from the WTP.

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					All of the details of the Water Treatment Plant requirements are attached in "Attachment F - PFS VOL VIII Appendix N Water Treatment Plant FINAL"
53	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Communition	Page 2-19 of the draft EIS states that ore contained within the existing Low Grade Ore (LGO) stockpile and scats from the scats stockpile may also be reprocessed, depending on the economics of the day. Discuss the fate of the ore in the LGO stock pile and scats if the economics do not support reprocessing.	If the existing LGO is uneconomic it will form part of the encapsulated PAF material in the WRD. The scats will remain encapsulated in TSF1, where they currently are today.
55	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Outline the economic costs versus the environmental benefits of backfilling the Batman Pit with acid generating waste rock during mine closure.	An analysis to determine the viability of backfilling the Batman Pit has been completed. The analysis considered backfilling of the pit by rehandling waste dump material which is located adjacent to the south side of the pit. It is assumed that the backfilling will not begin until after all the ore is mined from the bottom of the pit (i.e. end of mine life). Based on this analysis, the total backfill operating costs will be approximately $450,000,000 to $500,000,000 and will require approximately six to nine years to complete. The elevation of the ramp exit of the pit is 131m amsl. The pit volume from 131m to the pit bottom is approximately 289,500,000m3. The elevation of the ramp entrance onto the waste dump is 150m amsl. The volume of waste dump material available for backfilling from 150m elevation to the top of the waste dump is approximately 249,400,000m3. The waste dump material available for backfilling as calculated will fill the pit to approximately the 117m elevation. Using a density of 1.8, there are approximately 450,000,000 tonnes of waste dump material to be rehandled. Backfilling the Batman pit with the waste material renders the project uneconomic and is therefore not considered to be a viable option. It is important to note that this analysis does not consider the capital costs that may be incurred due to the replacement of trucks and/or hydraulic excavators
56	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Section 3.73 provides alternative water treatment options considered. The proposed option involves discharge of treated water from Batman Pit in the 2012- 13 and 2013-14 Wet seasons, concluding prior to the 2014 Dry season, then the operation of a new WTP subject to a decision to proceed with the project. The water balance modelling	This EIS contemplates Mt Todd progressing into operations. The management of water during the current "Care and Maintenance" phase is controlled by the DME and not Vista Gold. Vista Gold becomes responsible for Mt Todd after a FID has been made. We have included post FID aspects in the EIS.

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				discussed in Chapter 10 assumes Batman Pit will be empty and water held in other retention ponds (RP1 and RP7) substantially reduced prior to the commencement of mining. Discuss the alternative options I contingencies that have been considered I are available should Vista Gold not manage to empty the pit by the end of the 2013-14 Wet season, and/or RP1 and RP7 retain significant volumes of water by the end of this period or at the point when mining is due to commence.	
62	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Provide more detail on the presence of lead in the tailings from the addition of lead nitrate to the chalcocite-rich ore. Discuss the implications, if any, for biota that may be exposed to lead in tailings supernatant water. Discuss the potential for impacts to other sensitive rece tors from indirect pathways.	Lead nitrate may be required during processing of some of the ore because it contains chalcocite, a secondary copper mineral that may be present in up to 4% of the ore mined on site. This ore will be set aside for processing with lead nitrate in order to reduce the consumption of cyanide and make processing of this ore economic. Residual lead nitrate will be locked within the chalcocite minerals in the TSFs. In contact with the many anions present in the ore slurry the entire lead nitrate is changed into insoluble lead compounds which effectively locks up the lead and prevents leaching of the added lead from the tailings dams. In essence lead is not in the tailings supernatent water in concentrations that present a risk to the environment, they have formed soluble compounds are effectively locked in the TSF's.
65	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Pit water modelling	Explain why the increased pit dimensions since the modelling was undertaken and consequent underestimation of pit inflows are unlikely to have a significant effect on the water balance. Further in the water balance summa ,the draft EIS states the following, "Underestimation of the footprint of the pit will have a significant impact on expected inflow and this may affect assumptions regarding transfer rates to & from the in from the pit which may then impact transfers	Appendix I of the draft EIS describes the potential changes from the Batman Pit footprint increase from the 117.4 ha presented in the water balance model to the subsequently proposed 137 ha. Appendix K of the draft EIS describes the predicted groundwater inflows to the pit. Although the increased footprint would result in a greater accumulation of runoff from storm events, the only removal of water from the pit will be via pumping, and the pumping rate will be controlled by Vista Gold. If treatment of the pumped water is necessary, the pit pump-out rate can be set and transfers among the various water management facilities can be adjusted such that the water treatment plant capacity is not exceeded. Updating of the site-wide water balance model will take into account the increased footprint of the Batman Pit and the resulting

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				from other areas of the mine. " This appears to conflict with the previous conclusion.	storm water and groundwater inflows to the pit, and water transfer rates among the various water management facilities will be adjusted accordingly.
69	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Appendix J	The draft EIS ro OSes discharge from a new WTP to the Edith River, but does not provide a clear statement on anticipated water quality from the WTP, or discharge water quality in the Edith River. Appendix J, page in states that Vista Gold proposes to meet the water quality for ecosystem protection to meet the requirements of any future waste discharge licence (WDL), and at page 24 states that discharged water will be of a better quality than that discharged to date and volumes will decrease. While the NT EPA recognises that water quality criteria will be established in a future WDL, Vista Gold must be able to provide some indication of expected or proposed water quality output from the proposed WTP. The draft EIS contains numerous references to "the WDL", or to "meeting criteria defined in the WDL"(e. g. Executive Summary page xi; page 2-42; page 10-20; page 23-7). It is not clear, other than at Appendix J, page iii, what WDL is being referred to (current or future). It is assumed that references are to a future WDL that establishes discharge criteria for an operating mine, and that Vista Gold is proposing improved discharge water quality over that required under WDL178-2. Provide further information on the anticipated water quality from the WTP and expected quality entering the Edith River from controlled discharge.	In error we omitted to include the section (or reference to the same) of the PFS that contains the detailed information on the WTP. We have included it as part of the this supplement ; Attachment F - PFS VOL VIII Appendix N Water Treatment Plant FINAL
71	PAUL PURDON Director Pollution Control Northern Territory Environment		RP5	The existing catchment for RP5 is approx.. 33ha and appears to include the top section of the enlarged WRD, the process plant area and potentially the new run-of- mine (ROM) pad. These are all likely to produce	RP5 is not diverted to Batman Creek, rather, it sends to the WTP. The drainage basin for RP5 is 33.1 ha. For the DFS, TT recommends isolating the RP5 basin from the WRD, so that RP5 accepts stormwater runoff from the plant site only.

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	Protection Authority			contaminated runoff and the proposed bunded area is likely to require treatment (page 10-31). It is not clear where these areas are to drain to if RP5 is to be diverted to Batman Creek Provide information in the Supplement on the following: • the catchment area for RP5; • whether RP5 will be retaining contaminated stormwater runoff; • If not, where the contaminated areas in the catchment will report to; • If so, the revised objective for RP5 as a retention pond rather than a sediment trap and what the proposed treatment will be before it is "diverted to Batman Creek".	
72	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			RP2 currently receives drainage from ~33ha around and below the LGOl stockpile. The LGOl stockpile area falls within the enlarged Batman Pit footprint so will be reduced significantly overtime. The draft EIS indicates in Chapter 12 that the LGOl stockpile AMD will be contained and treated at the WTP. The new LG02 stockpile may partially drain to TSFl but otherwise is stated as draining to the WTP via the equalisation pond. RP2 therefore does not seem to have much, if any, catchment in the near future. The Supplement should provide more information on the role of RP2 and whether it will intercept clean or contaminated runoff.	The new RP2 will collect water from the relocated LGO only and water eill report to the WTP.
73	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			RP6 is shown in Figure 10-4 as discharging to Batman Creek but no details of RP6 are given elsewhere. Provide more information on RP6 and its current and future function.	RP6 is an artefact from previous reports used to describe the process pad (the process plant and pad retention pond is collectively referred to as RP5). All RPs send to the WTP.

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84	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			The draft EIS proposes transfers to the equalisation pond subject to capacity in the equalisation pond. Will operating procedures establish rules to prioritise transfers from retention ponds and other water management bodies? Is there anything to restrict selective pumping from ponds to the WTP?	Pumping hierarchy from the various RPs to the EQ Pond has not been established in the PFS water balance model. Incorporating this structure into the DFS water balance will be investigated.
87	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Please clarify the statement: "the model shows that a small amount of excess water maybe discharged from the Edith River during the first three years of operation. ..". Does this model prediction have any bearing on actual/anticipated water management in relation to the WTP and discharges?	Make up water need for process is 2,427 m3/hr (based on design criteria by Proteus). Given the WTP rate of 500 m3/hr, and the ability for the WTP effluent to be recycled back into process, all WTP effluent is consumed. Additionally, WTP effluent may be used to suppress dust on site during the dry season, should an excess be available. The WTP treats to discharge limits established for the receiving water bodies. The key point is that we recycle water recovered from the TFS's which provides sufficient water for the operation.
92				Section 10.14 does not contain management procedures for when rainfall events exceed the water management system design. Rather, these procedures are briefly outlined in Section 10.2.4. The Supplement should provide a clear, more detailed explanation, including diagrams, of contingencies for managing stormwater in defined 'extreme' events.	The water balance model is allowed to model extreme events such as Boxing Day 2011. Water management procedures during pre-production allow the retention ponds to send to TSF1 as a possible solution to uncontrolled discharges.
93	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Indicate whether cut-off drains, V-drains and diversion drains to direct non-contaminated water around the site would be rock lined or vegetated to prevent excessive erosion.	Rock lining will be used.
99	PAUL PURDON Director Pollution Control Northern Territory Environment Protection			The removal of RP3 as a storage facility has significantly reduced the site's ability to cope with failures of plant or unknown events that resultin increased collection/production of AMD in the short term. Provide a clear explanation of how such incidents will be	All retention ponds must send to the water treatment plant. A process fluid management plan, which includes containment of upsets at the mill, will be implemented to address failures at the plant. RP3 storage is a hangover from the site being put into care and maintenance and not required as part of the operating plan.

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	Authority			managed.	
100	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			The EIS Guidelines section 4.4 TSF requested that contingency arrangements including reporting protocols be included for dealing with both minor leakage and catastrophic failure of the tailings darn. Catastrophic failure of a TSF is given a moderate risk rating in Chapter 5 due to its potential consequences but is not dealt with in Chapter 10. The Supplement should include contingencies for this occurrence given the proximity ofTSF2 to Stow and Horseshoe Creeks and its design to withstand a 100 year ARI event in the longer term.	An emergency action plan for the TSF will be developed as part of the detailed design.
101	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			ITEM 1 Additionally, provide a discussion on the appropriateness of the 100 year ARI standard for the long term closure of TSFs.	No formal guidelines exist for the Northern Territories. The 100-year, 72-hr duration storm is typically used as a design basis.
102	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Settlement pond	Page iii of Appendix I states "...installation of cut off drains to divert uncontaminated runoff from around the site and into Batman Creek via a settlement pond'. Provide more detail on the location, pond capacity, pump capacity and pumpline infrastructure, exact discharge location and what monitoring is proposed at the settlement pond.	This level of detail to be discussed as part of the DFS.
127	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Risk Assessment	The risk assessment in the draft EIS has been undertaken against EPBC Act significant impact criteria. It should be noted that significant impact criteria are relevant at the EPBC Act referral stage in determining whether a proposal is a controlled action (requiring assessment) and also for determining whether offsets are required in accordance with the Offsets Policy.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				Once a project is determined a controlled action under the EPBC Act, the acceptability of impacts (rather than the significance of impacts) to MNES is relevant. Nevertheless, as the significant impact criteria have been used as the basis for the risk assessment, it is important that all criteria are addressed. The Gouldian Finch is listed as endangered and migratory, however, not all the endangered and migratory significance criteria appear to have been considered. Notably, the criterion "disrupt the breeding cycle of a population "is absent from the risk assessment. It is important that this criterion is addressed in the Supplement with respect to the Gouldian Finch.	
128	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority				Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
129	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority			Specific trigger values and management actions regarding dust-related impacts to Gouldian Finches are required. Accepting that there are uncertainties over an applicable dust criterion for fauna (14.4 Potential impacts on fauna, Vol. I), and in the absence of tailored academic research, further consideration may be given to the comparison of Gouldian Finches with humans (eg. Inhalation rates, as discussed in 6.1.5 Potential Sources of Impact, V01. 5) or other analogous research so as to establish appropriate dust criteria. Dust-related impacts should be quantified and represented (including in maps) with Gouldian Finches as the sensitive receptor	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				focus. It is particularly important that due consideration is given to potential impacts resulting from the small number of days in which maximum dust emissions are predicted to take place (e. g. when 24-hour ground level concentrations of P10 of greater than 200µg/m3 are predicted). The resultant trigger values and management actions should be based in science and soundly reasoned in the Supplement.	
130	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Mitigation measures	Specific trigger values and management actions may also be required for any further impacts identified while addressing land clearing and air sac mite impacts to Gouldian Finches, as discussed below, depending on their level of associated risk.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
131	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Assessment of impacts	Further research is required on the potential impacts of simultaneous exposure of Gouldian Finches to both increased dust from the proposal and air sac mites (Stemostoma tracheacolum). This is necessary to describe the likely effects on the local Gouldian Finch population. It is noted that consideration has been given to the fact that impacts to the finch by dust may be exacerbated by the presence of air sac mites (Assessment of risks of impacts on threatened species and the Mt Todd fauna, Appendix H, Vol 5). This consideration should be expanded upon and potential impacts quantified in the Supplement. Appropriate trigger values and mitigation measures will be required to address the combined impact of dust and the air sac mite on Gouldian Finches.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
134	PAUL PURDON Director Pollution Control Northern Territory		Dust Management Plan	According to 16.5 Dust Emission Management and Mitigation Measures, Vol. I, a Dust Management Plan (DMP) is proposed for the project. It is noted that in	Please refer to Attachment J - Revised Regional Veg Fig 4-3 for more detailed regional vegetation data. There is very little work done globally on the effects of dust on other fauna.

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	Environment Protection Authority			the absence of published fauna criteria, the air quality assessment criteria considered for use in the impact assessment and applied to the DMP is focussed primarily on human health and well-being.	We have made some extrapolations to extend this to Gouldian Finches as an example. There is a more detailed commentary on this in the supplementary to the EIS in the Gouldian Finch comments.
135	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Dust Management Plan	The scope of the DMP should be expanded to include fauna, notably the Gouldian Finch. Specific trigger values and management actions regarding dust-related impacts to Gouldian Finches should be researched and included within the DMP. This should be a commitment in the Supplement.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
136	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority		Offsets	It is suggested in the draft EIS that there is currently a high residual risk the proposal will have a serious impact on the Gouldian Finch. If a significant residual risk remains following development of additional avoidance and mitigation measures as discussed above, offsets should be proposed with reference to the Offsets Policy. If offsets are necessary, amongst other things, they need to be in place for the duration of the impact and maintain or improve the viability of the protected matter, as per the Offsets Policy. It is strongly recommended that the proponent be familiar with the Offsets Policy and associated Offsets Assessment Guide when developing offsets.	Vista Gold will purchase Northern Territory based carbon offsets to fulfil legislative requirements of the carbon pricing mechanism, subject to availability and commercial competitiveness of the offsets. We will comply with the legislation applicable ate the time. Currently it is unknown what the EPBC Act Environmental Offsets Policy will entail. We have based our position on the following statement published May 28, 2013 by AMEC EPBC ACT Environmental Offsets Policy On the 24th August 2011 the Hon Tony Burke, Minister for Sustainability, Environment, Water, Population and Communities (SEWPaC) released the government response to the independent review of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). In response the Government has released a draft EPBC Act Environmental Offsets Policy for public consultation. AMEC will be making a submission and welcomes feedback from members. AMEC has been extremely active and vocal in this area, even prior to the AMEC Environmental Regulation and Approvals Forum that was held on the 20th May 2011. At the Forum the participants expressed their complete dissatisfaction with the current application of environmental offsets at the State and Federal level. Participants observed that many offsets appear to be based on an ‘ad hoc’ approach and open to abuse.

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					A perverse and unacceptable outcome has become an incentive for government agencies to accept cash contributions as offsets with little supporting policy to do so. To further hinder the application and use of offsets, only a limited number of offset agreements are publicly available. These are usually included as conditions on Ministerial Statements. A large number of offsets (~80%) are private deals done with government agencies. Therefore, new proponents have little guidance as to what constitutes an acceptable offset. http://www.amec.org.au/policies/environment-and-water/epbc-act-environmental-offsets-policy
147	MIKE FAWCETT Director Mining Remediation		Hydrology Setting	"GHD observed significant ground water seeps down gradient of the eastern and southern walls of the tailings dams, and the seeps appeared to be providing the flow in Horseshoe Creek" - Appendix K Hydrogeology The significant seeps from TSF I allow a direct pathway for highly contaminated water to discharge into Horseshoe Creek either through or under the embankment. It is stated as a management measure the "existing tailings storage facility, heap leach pad and associated infrastructure should be rehabilitated to either significantly reduce seepage or improve seepage water quality" In order to meet this management measure Vista need to understand the current volumes of the seeps. Vista should calculate the sulfate / thiocyanate discharge rates to Horseshoe Creek to quantify seepage rates to assist with seepage modelling outputs (Earth Systems 2011)	When TFS is operated as a TSF then there is almost no seepage. Currently it is not operated as a TSF and this is driving a different outcome.
160	Paul Purdon -		Consultants'	Recommendation I: The scope of the	Based on the available kinetic testing data, NAF material shows no propensity

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	Response to DR Jones Environmental Excellence recommendations		recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	geochemical test work that has been done must be expanded to include a more rigorous assessment of the potential environmental risk posed by non-PAG material given the key role that this material is proposed to play in providing the outer cladding for the mine landforms. NTEPA RESPONSE: Dr Jones recommendation relates to the need to understand the level of risk posed by non-acid generating waste, which can contain elevated levels of salinity and metals. This has not been effectively addressed in the draft EIS As the proponent is proposing to use this material for construction of outer layers of the WRD and TSFs, its use is fundamental to the project as proposed. Should the material prove to be unsuitable for the proposed use then a significant revision of the project will be required. In addition to fulfilling recommendation I in the Supplement, the NT EPA requires the proponent to confirm and refine the criteria for selecting PAF, uncertain and NAF waste rock.	to generate metal leachate without the onset of acid generation. All NAF samples that produced circum-neutral pH values also produced low concentrations of metal leachate. However, the onset of acidity did produce an increase in metal concentrations. A detailed description of the determination of PAF and Non-PAF is included in appendix L. This follows industry standards which we have adhered to with some rigor.
161	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	ITEM 1 Recommendation 2: For those structures that will be required to endure and maintain their functional integrity for a long time post closure a structural lifetime should be specified and an ARI that is more appropriate to minimise risk over this lifetime be used as the basis for the design and performance assessment. NTEPA RESPONSE: In the Supplement, the NT EPA requires that an engineering design life be proposed and the currently proposed ARI be revised accordingly, consistent with the recommendation.	No formal guidelines exist for the Northern Territories. The 100-year, 72-hr duration storm is typically used as a design basis.

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162	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 3: Up-to-date water balance modelling should be undertaken that addresses the current project scope and incorporates the probability of occurrence of extreme events. When this model is produced it should be subjected to peer review by an appropriately qualified independent expert. NTEPA RESPONSE: The NT EPA requires, in the Supplement, statements in the draft EIS to be verified through transparent and up-to-date water balance modelling, consistent with the recommendation made by Dr Jones. Peer review is riot expected to be provided in the Supplement, but may be required by DME prior to final approval.	The climate portion of the water balance model is based on real site data, coupled with correlated gage data for the Katherine area (to extend the period of record). Recent extreme events, such as Boxing Day 2011, are captured in the climate sub-model of the water balance. Additionally, the number of consecutive rain days is allowed to range up to the maximum number of consecutive rainfall days observed for the site, so that monsoon conditions are represented.
163	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 4: The capacity of the proposed water management and treatment system should be reviewed to ensure that it is capable of accounting for the predictions from the updated water balance model. NTEPA RESPONSE: Statements in the draft EIS identify that if the water balance is in correct then the currently identified input volumes to the WTP may also be incorrect. The capacity of the proposed water management and treatment system is required to be revisited in the Supplement, consistent with the recommendation.	The water balance modellers coordinate directly with the water treatment plant designers to ensure treatment capacity is optimized for site water management. The detailed water balance model in included in Appendix W in the PFS
164	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to	Recommendation 5: Modelling of the performance of the proposed design for the store and release covers and GCL-based cover (for the WRD) should be updated to assess the effect of potential extreme rainfall event scenarios. NTEPA RESPONSE: The NT EPA considers the	We have solicited a recognised expert to answer the technical points raised in the question; The following response was provided by Vista Gold's rock mechanics expert, Mr Kenneth Rippere. "Based on my experience as project manager for the engineering study for waste rock design at Newmont's Batu Hijau mine on Sumbawa Island, Indonesia, steeper waste rock faces are effective in tropical environments. The Batu Hijau mine is in a similar tropical climate, although

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			the draft Environmental Impact Statement.	performance of the cover design identified in the draft EIS to be a significant risk. The climatic conditions that will create the most challenging conditions for the cover system include high rainfall conditions creating deep drainage in the WRD or very dry years creating cracking and desiccation of the cover material. The NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the modelling as requested where reasonable estimates of input parameters exist. Where reasonable estimates of input parameters do not exist, provide a justification why they don't exist, and detail a plan to achieve the required reliable numerical predictions of cover performance before MMP assessment.	the area is jungle rather than savannah. The World Bank wanted a 3:1 face angle (17 degrees) on waste dump faces but Newmont desired a steeper, 2:1 angle (25 degrees) for several reasons. These included the reduced footprint which lessened the environmental impact, the greater ease of shedding rainfall, and a significant reduction in mine haulage costs. Other considerations involved the reduction in topsoil and subsoil materials needed for cover, again an environmental advantage. The work, which won the World Bank's acceptance, was undertaken by Golder Associates (Perth) in conjunction with other consultants. Golder won the 2006 award for Engineering Excellence (Western Australia) for this effort." Waste rock dumps, once established, are inherently stable at the angle or repose. There is no real reason to decrease this angle unless some cover including revegetation is planned. If failure of a waste rock dump occurs, it is due to failure of the overloaded foundation materials or a reduction in the strength and/or permeability of the incorporated materials. The WRD at Mt Todd will be founded on rock and the materials are indurated, minimizing the likelihood that they will degrade over time. The high, steep WRD at Mt Todd, once established, should remain stable in the overall sense: the challenges arise from the details of the inter-lift liners, and these are critical to the performance of the dump, both in terms of stability and the ability to inhibit the development of acidic drainage. The purpose of these liners is to (permanently) intercept percolating rainfall and direct it away from the PAG materials enclosed within the core of the dump. Due to the induration of the rock materials, the dump should remain free-draining over time: without the liners, percolation would rapidly lead to oxidation and the generation of acid. So, the liners are an essential component of the Mt Todd WRD design, regardless of the face angle. In an active waste rock dump (i.e. during mining operations), the materials continue to shift to some degree as the loading environment changes and percolation moves particles around, leading to settlement. Moreover, the crestal portion is over-steeped by a few degrees and will continue to fall away, eventually settling at the repose angle. So there is measurable settlement and observable ravelling as dumping progresses. Behind the really active area, settlements can continue to occur for some time, although to an ever-decreasing degree.

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					At Mt Todd, the liners, along with the bedding and cover layers must accommodate such displacement while ensuring that that percolating waters are forever directed outward, rather than inward. As the liners slope outward at 2 degrees, or 5%, they represent potential sliding surfaces for the overlying materials. The engineering of this design will require consideration of many factors, including deformation tolerance, stability over a range of temperatures, puncture resistance, frictional characteristics, and developing an understanding of behaviour under intense precipitation events (in perpetuity). Numerical modelling should resolve some of the issues associated with the design and point towards optimization
165	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 6: The proponent provide substantially more detail about the construction of the waste rock dump with emphasis on incorporating best practice strategies to mitigate as far as practicable the future AMD risk of this structure. NTEPA RESPONSE: The NT EPA is concerned that a sustainable and technically feasible design has not been proposed for the WRD. The proposed high and continuously sloping WRD profile elevates the risk of AMD. Alternative design with lower WRD profiles is required to be considered and discussed the Supplement. In addition to the recommendation made by Dr Jones, the NT EPA requires the WRD design to be significantly advanced to provide confidence that there will not be a significant difference between what is proposed in the draft EIS, and what is ultimately constructed.	Vadose modelling has been conducted for the current designs that have been relied upon. This detailed information is included in appendix Y
166	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the	Recommendation 7: The proponent provide justification for the change from a store and release cover to a GCL-based cover since it will have a substantive bearing on how the cover will interact with both the physical and biological environment.	Vados modelling has been conducted for the current designs that have been relied upon. This detailed information is included in appendix. We do not anticipate substantial changes that will require consideration.

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			supplement to the draft Environmental Impact Statement.	NTEPA RESPONSE: The NT EPA is not convinced that the proponent has adequately evaluated and presented the most appropriate WRD and cover design. In addition to the recommendation made by Dr Jones, in the Supplement the proponent is required to identify what alternative designs (including lower WRD profiles) were evaluated forthe proposed WRD and the basis for selecting the proposed GCL-based cover system over other alternatives.	
167	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 8: The proponent should provide evidence of the successful long term implementation of a GCL-based cover system in similar climate regime and, as recommended above, undertake predictive performance modelling incorporating the effects of climate variability. Recommendation 10: The proponent undertakes slope failure modelling to assess the effect of the proposed inter-bench GCL seepage interception layer on the long term stability of the structure. NTEPA RESPONSE: In order to fully evaluate the appropriateness of the currently proposed design of the WRD and cover system the NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the modelling as requested where reasonable estimates of input parameters exist. Where reasonable estimates of input parameters do not exist, provide a justification why they don't exist, and detail a plan to achieve the required reliable numerical predictions before MMP assessment. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation. The NT EPA understands	GCL's are used all over the world and are standard practice. GCL's were selected in contrast to clay, which was evaluated, because it does not have the characteristic of shrinking and cracking that clay exhibits in environments that exist in the NT.

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				that the GCL-based cover for the proposed WRD may be unprecedented. If this is the case provide detailed justification why this design is appropriate and detail a plan to achieve the required reliable numerical predictions of cover performance in the Supplement	
168	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 9: The proponent undertakes consolidation modelling to assess the structural viability of the proposed inter-bench GCL seepage interception layer, and the physical viability of the proposed GCL-based surface cover. NTEPA RESPONSE: In order to fully evaluate the appropriateness of the currently proposed design of the WRD and cover system the NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the modelling as requested where reasonable estimates of input parameters exist. Where reasonable estimates of input parameters do not exist, provide a justification why they don't exist, and detail a plan to achieve the required reliable numerical predictions before MMP assessment.	We have solicited a recognised expert to answer the technical points raised in the question; The following response was provided by Vista Gold's rock mechanics expert, Mr Kenneth Rippere. "Based on my experience as project manager for the engineering study for waste rock design at Newmont's Batu Hijau mine on Sumbawa Island, Indonesia, steeper waste rock faces are effective in tropical environments. The Batu Hijau mine is in a similar tropical climate, although the area is jungle rather than savannah. The World Bank wanted a 3:1 face angle (17 degrees) on waste dump faces but Newmont desired a steeper, 2:1 angle (25 degrees) for several reasons. These included the reduced footprint which lessened the environmental impact, the greater ease of shedding rainfall, and a significant reduction in mine haulage costs. Other considerations involved the reduction in topsoil and subsoil materials needed for cover, again an environmental advantage. The work, which won the World Bank's acceptance, was undertaken by Golder Associates (Perth) in conjunction with other consultants. Golder won the 2006 award for Engineering Excellence (Western Australia) for this effort." Waste rock dumps, once established, are inherently stable at the angle or repose. There is no real reason to decrease this angle unless some cover including revegetation is planned. If failure of a waste rock dump occurs, it is due to failure of the overloaded foundation materials or a reduction in the strength and/or permeability of the incorporated materials. The WRD at Mt Todd will be founded on rock and the materials are indurated, minimizing the likelihood that they will degrade over time. The high, steep WRD at Mt Todd, once established, should remain stable in the overall sense: the challenges arise from the details of the inter-lift liners, and these are critical to the performance of the dump, both in terms of stability and the ability to inhibit the development of acidic drainage.

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					The purpose of these liners is to (permanently) intercept percolating rainfall and direct it away from the PAG materials enclosed within the core of the dump. Due to the induration of the rock materials, the dump should remain free-draining over time: without the liners, percolation would rapidly lead to oxidation and the generation of acid. So, the liners are an essential component of the Mt Todd WRD design, regardless of the face angle. In an active waste rock dump (i.e. during mining operations), the materials continue to shift to some degree as the loading environment changes and percolation moves particles around, leading to settlement. Moreover, the crestal portion is over-steeped by a few degrees and will continue to fall away, eventually settling at the repose angle. So there is measurable settlement and observable ravelling as dumping progresses. Behind the really active area, settlements can continue to occur for some time, although to an ever-decreasing degree. At Mt Todd, the liners, along with the bedding and cover layers must accommodate such displacement while ensuring that that percolating waters are forever directed outward, rather than inward. As the liners slope outward at 2 degrees, or 5%, they represent potential sliding surfaces for the overlying materials. The engineering of this design will require consideration of many factors, including deformation tolerance, stability over a range of temperatures, puncture resistance, frictional characteristics, and developing an understanding of behaviour under intense precipitation events (in perpetuity). Numerical modelling should resolve some of the issues associated with the design and point towards optimization.
169	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 10: The proponent undertakes slope failure modelling to assess the effect of the proposed inter-bench GCL seepage interception layer on the long term stability of the structure. NTEPA RESPONSE: In order to fully evaluate the appropriateness of the currently proposed design of the WRD and cover system the NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the modelling as requested where reasonable estimates of	We have solicited a recognised expert to answer the technical points raised in the question; The following response was provided by Vista Gold's rock mechanics expert, Mr Kenneth Rippere. "Based on my experience as project manager for the engineering study for waste rock design at Newmont's Batu Hijau mine on Sumbawa Island, Indonesia, steeper waste rock faces are effective in tropical environments. The Batu Hijau mine is in a similar tropical climate, although the area is jungle rather than savannah. The World Bank wanted a 3:1 face angle (17 degrees) on waste dump faces but Newmont desired a steeper, 2:1 angle (25 degrees) for several reasons. These included the reduced footprint which lessened the environmental impact, the greater ease of shedding rainfall, and a significant reduction in mine haulage costs. Other

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				input parameters exist. Where reasonable estimates of input parameters do not exist, provide a justification why they don't exist, and detail a plan to achieve the required reliable numerical predictions before MMP assessment.	considerations involved the reduction in topsoil and subsoil materials needed for cover, again an environmental advantage. The work, which won the World Bank's acceptance, was undertaken by Golder Associates (Perth) in conjunction with other consultants. Golder won the 2006 award for Engineering Excellence (Western Australia) for this effort." Waste rock dumps, once established, are inherently stable at the angle or repose. There is no real reason to decrease this angle unless some cover including revegetation is planned. If failure of a waste rock dump occurs, it is due to failure of the overloaded foundation materials or a reduction in the strength and/or permeability of the incorporated materials. The WRD at Mt Todd will be founded on rock and the materials are indurated, minimizing the likelihood that they will degrade over time. The high, steep WRD at Mt Todd, once established, should remain stable in the overall sense: the challenges arise from the details of the inter-lift liners, and these are critical to the performance of the dump, both in terms of stability and the ability to inhibit the development of acidic drainage. The purpose of these liners is to (permanently) intercept percolating rainfall and direct it away from the PAG materials enclosed within the core of the dump. Due to the induration of the rock materials, the dump should remain free-draining over time: without the liners, percolation would rapidly lead to oxidation and the generation of acid. So, the liners are an essential component of the Mt Todd WRD design, regardless of the face angle. In an active waste rock dump (i.e. during mining operations), the materials continue to shift to some degree as the loading environment changes and percolation moves particles around, leading to settlement. Moreover, the crestal portion is over-steeped by a few degrees and will continue to fall away, eventually settling at the repose angle. So there is measurable settlement and observable ravelling as dumping progresses. Behind the really active area, settlements can continue to occur for some time, although to an ever-decreasing degree. At Mt Todd, the liners, along with the bedding and cover layers must accommodate such displacement while ensuring that that percolating waters are forever directed outward, rather than inward. As the liners slope outward at 2 degrees, or 5%, they represent potential sliding surfaces for the overlying

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					materials. The engineering of this design will require consideration of many factors, including deformation tolerance, stability over a range of temperatures, puncture resistance, frictional characteristics, and developing an understanding of behaviour under intense precipitation events (in perpetuity). Numerical modelling should resolve some of the issues associated with the design and point towards optimization
170	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 11: The proponent should test the proposed design (including catchment and drainage structures) with a well- regarded and tested 30 event-based computer geomorphic model. NTEPA RESPONSE: In order to fully evaluate the appropriateness of the currently proposed design of the WRD and cover system the NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the modelling as requested where reasonable estimates of input parameters exist. Where reasonable estimates of input parameters do riot exist, provide a justification why they don't exist, and detail a plan to achieve the required reliable numerical predictions before MMP assessment.	This is addressed by the response to the item above (169). Additional modelling work has been committed to in the detailed stage of design.
171	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 12: The issue of encroachment of flood events on the toe of TSF 2 needs to be addressed in the design of this structure and associated water diversion channels. NTEPA RESPONSE: The NT EPA requires that the issue of encroachment be addressed in the Supplement as recommended by Dr Jones. In addition, the proponents required to address issues of long term stability and containment with regard to design life. Include technical discussion on the need for long term maintenance of diversion channels	"The downstream shell of TSF2 will be constructed using Non-PAG waste rock material. Selectively sized waste rock will be used for embankment construction based on a scour analysis to prevent erosion. The scour analysis will be performed during the feasibility study phase of the project. An erosion protection bund constructed at the downstream toe adjacent to the horseshoe and stow creeks will be incorporated into the design, if required. Note that the downstream toe of TSF1 constructed from selectively sized waste rock did not exhibit noticeable erosion after the December 26, 2011 storm event which caused significantly high stream flows in Horse Shoe Creek. "

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				or more appropriate fail-safe diversion designs.	
172	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 13: A comparison should be made in the Supplement to the EIS between the latest Australian Darn Safety Guidelines to provide assurance that these Canadian Darn Safety guidelines (1999) provide a similar required level of assurance. NTEPA RESPONSE: In the Supplement the NT EPA requires the design criteria for construction of the proposed TSFs based on the ANCOLD Guidelines on Tailings Darns. Planning, Design, Construction, Operation and Closure, May 2012.	A comparison of recommended factors of safety for tailings dams by the Canadian Dam Association (2007) and ANCOLD (2012) is presented in Attachment C. The predicted factors of safety for the current designs of TSF1 and TSF2 exceed the ANCOLD (2012) recommended factors of safety. The ANCOLD (2012) design standards will be used for the detailed design of TSF1 and TSF2. **Additional Comments** Attachment C
173	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 14: Additional analysis will be needed for assessment of resistance to seismic events, especially in relation to proposed upstream lift method of construction. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the analysis as requested where reasonable estimates of design parameters exist. Where reasonable estimates of design parameters do riot exist, provide a justification why they don't exist, provide a preliminary analysis in the Supplement and detail a plan to achieve the required reliable design predictions before MMP assessment.	A detailed seismic analysis has been performed in compliance with the Canadian Dam Association (2007). This will be revisited during the detailed design phase (DFS) to ensure compliance with ANCOLD, as per answer to 172 above.
174	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the	Recommendation 15: The performance of the proposed store and release cover should be assessed using dynamic (i. e. non averaged) climate data, specifically addressing the issue of extended periods of high rainfall. NTEPA RESPONSE: NT EPA requires a detailed	We have solicited a recognised expert to answer the technical points raised in the question; The following response was provided by Vista Gold's rock mechanics expert, Mr Kenneth Rippere. "Based on my experience as project manager for the engineering study for waste rock design at Newmont's Batu Hijau mine on Sumbawa Island, Indonesia, steeper waste rock faces are effective in tropical

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			supplement to the draft Environmental Impact Statement.	response to Dr Jones's recommendation in the Supplement.	environments. The Batu Hijau mine is in a similar tropical climate, although the area is jungle rather than savannah. The World Bank wanted a 3:1 face angle (17 degrees) on waste dump faces but Newmont desired a steeper, 2:1 angle (25 degrees) for several reasons. These included the reduced footprint which lessened the environmental impact, the greater ease of shedding rainfall, and a significant reduction in mine haulage costs. Other considerations involved the reduction in topsoil and subsoil materials needed for cover, again an environmental advantage. The work, which won the World Bank's acceptance, was undertaken by Golder Associates (Perth) in conjunction with other consultants. Golder won the 2006 award for Engineering Excellence (Western Australia) for this effort." Waste rock dumps, once established, are inherently stable at the angle or repose. There is no real reason to decrease this angle unless some cover including revegetation is planned. If failure of a waste rock dump occurs, it is due to failure of the overloaded foundation materials or a reduction in the strength and/or permeability of the incorporated materials. The WRD at Mt Todd will be founded on rock and the materials are indurated, minimizing the likelihood that they will degrade over time. The high, steep WRD at Mt Todd, once established, should remain stable in the overall sense: the challenges arise from the details of the inter-lift liners, and these are critical to the performance of the dump, both in terms of stability and the ability to inhibit the development of acidic drainage. The purpose of these liners is to (permanently) intercept percolating rainfall and direct it away from the PAG materials enclosed within the core of the dump. Due to the induration of the rock materials, the dump should remain free-draining over time: without the liners, percolation would rapidly lead to oxidation and the generation of acid. So, the liners are an essential component of the Mt Todd WRD design, regardless of the face angle. In an active waste rock dump (i.e. during mining operations), the materials continue to shift to some degree as the loading environment changes and percolation moves particles around, leading to settlement. Moreover, the crestal portion is over-steeped by a few degrees and will continue to fall away, eventually settling at the repose angle. So there is measurable settlement and observable ravelling as dumping progresses. Behind the really active area, settlements can continue to occur for some time, although to an ever-

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175	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 16: The issue of differential consolidation must be addressed in assessing cover design for such large TSFs since failure to do this could result in a depression developing in the middle of the structure and compromising the environmental performance. NTEPA RESPONSE: The NT EPA considers that differential consolidation will have a significant impact on the proposed final land form. NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement, including the analysis as requested where reasonable estimates of design parameters exist. Where reasonable estimates of design parameters do riot exist, provide a justification why they don't exist, provide a preliminary analysis to 'advanced conceptual' stage in the Supplement and detail a plan to achieve the required reliable design predictions before MMP assessment.	A consolidation and settlement analysis will be included in the detailed feasibility study phase of the project.
176	Paul Purdon - Response to DR Jones Environmental Excellence		Consultants' recommendations and NTEPA Guidance on further	Recommendation 17: The proponent should assess the feasibility and cost of relocating the tailings to the pit at the end of mine life. NTEPA RESPONSE: The NT EPA requires the proponent to assess, in the Supplement, all	Backfilling the Batman pit with the waste material renders the project uneconomic and is therefore not considered to be a viable option. It is important to note that this analysis does not consider the capital costs that may be incurred due to the replacement of trucks and/or hydraulic excavators.

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	recommendations		information required in the supplement to the draft Environmental Impact Statement.	options to reduce the long term risk posed by above ground tailing storage at the site, including the feasibility and cost of relocating the tailings to the pit at the end of mine life.	Tailings from TSF2 would need to be re-fluidised and pumped into the pit from their lined storage facility. What has been currently allowed for is the closure of the tailings storage facilities that ensure protection of the environment.
177	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 18: A higher level of confidence about the potential volumes of water produced from the pit is required so that the water treatment plant has sufficient design capacity. NTEPA RESPONSE: The NT EPA requires the proponent to detail, in the Supplement; the potential volumes of water produced from the pit and demonstrate that the water treatment plant has sufficient design capacity consistent with Dr Jones's recommendation. In addition, the NT EPA requires, in the Supplement that the proponent discusses in detail, the post-mining pit water quality issues including the acceptability of creating a large body of potentially poor quality water, and the expected long-term impacts on fauna. In addition the proponent should further investigate the extent to which the TSFs will be a contributor of seepage to groundwater during operations.	The potential volumes of water produced from the pit depend on natural precipitation falling within the pit footprint area and groundwater inflow to the pit. The maximum pumping rates for pit dewatering will be for pumping storm water out of the pit. The rate therefore will be controlled by Vista Gold. If treatment of the storm water is needed, the pumping rate will be set to fit within the design capacity of the water treatment plant. The precipitation volumes resulting from the 10-year average recurrence interval (ARI), 72-hour duration storm event and the 100-year ARI, 24-hour duration storm event were developed from Bureau of Meteorology (BOM 2012) data for precipitation depth for the storm events and the proposed phased increases in the size of the Batman Pit. The precipitation was assumed to fall uniformly over the pit and any contributing catchment area outside the pit. As the pit size increases during mine development, the contributing catchment area outside the pit would decrease until the pit comprises the entire drainage area by the start of Phase 2. The total volumes of storm water runoff to the pit at the end of each phase of mine development (when the pit reaches its maximum size for that phase) were calculated using the SCS Curve Number method (USDA 1996). The volumes ranged from 120,654 m3 for Phase 1 to 306,258 m3 for Phase 4. As mentioned previously, the pumping rates for pit dewatering will be controlled by Vista Gold and, if treatment of the storm water is needed, the pumping rate will be set to fit within the design capacity of the water treatment plant. The rate of groundwater inflow to the pit will vary with time as the configuration of the pit changes. The inflow rates are shown graphically in Figure 6-1 of Appendix K of the draft EIS. The predicted inflow rate increases from a few liters per second (L/s) at first to about 31 L/s in the second year due to the initial rapid deepening of the pit. As deepening slows and the pit is expanded laterally, the predicted inflow rate decreases to about 17 L/s by year 7, and then, with the progressive deepening of the pit, increases gradually to about 30 L/s by the end of mining. Groundwater inflow to the pit would be partially offset by evaporation from the pit, which was not taken into account

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					by the groundwater model, so the pumping rates required to dewater the pit of influent groundwater would be somewhat less than the predicted groundwater inflow rate. The maximum predicted groundwater inflow rate of 31 L/s equates to 111.6 m3/hr, which is approximately 22.3 percent of the water treatment plant design capacity of 500 m3/hr. As mentioned previously, if treatment of the water removed during pit dewatering is necessary, the pumping rates will be subject to control by Vista Gold and will be set to fit within the design capacity of the water treatment plant. Any updates of the site-wide water balance model will incorporate the rates of groundwater inflow to the pit as predicted by the groundwater flow model.
178	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 19: The final version of the pit closure water balance model that is presented in the supplement to the EIS should incorporate in full the critical drivers that apply to the actual development scenario for which approval is sought. NTEPA RESPONSE: NT EPA considers that the Supplement should provide a detailed response to Dr Jones's recommendation.	Critical drivers for the pit closure water balance include 1) precipitation falling on the water surface in the pit, 2) runoff from the pit walls, 3) evaporation from the water surface in the pit, 4) evaporation from the pit walls, and 5) groundwater inflow to or outflow from the pit. Each of these drivers was included in the pit closure water balance model incorporated into the groundwater flow model, as described in the draft EIS Chapter 11 and Appendix K. Runoff from the area outside the pit will be prevented from entering the pit by a berm constructed around the pit, so outside runoff is not a driver in the pit closure water balance. The pit was modelled with the ultimate configuration it would have at the end of mining. The closure model simulated a period of 500 years after closure, and stabilization of the pit lake and the drawdown cone around the pit was calculated to take approximately 345 years. The long-term annual average value for each of the critical drivers was used as input to the model. Values for each were described in the draft EIS. Extreme events were not considered significant in the long term. For example, the volume of water that would accumulate in the pit lake from the 100-year ARI, 24-hour duration storm was calculated to be 0.31 ML, which is about 0.37 percent of the pit lake volume of 83.8 ML at the equilibrated lake stage of -15 mAHD. That precipitation event would cause a rise of about 0.25 m in the pit lake stage. Climate change that resulted in higher or lower rates of precipitation to and/or evaporation from the pit lake would produce slightly higher or slightly lower equilibrium stages in the pit lake, but since a portion of the change in precipitation or evaporation would be made up for by a consequent change in the rate of groundwater inflow to the pit lake, no large change in the pit lake stage would be expected. Absent a large increase in the pit lake stage, evaporation would remain the sole component of outflow from the pit lake, and the pit lake would remain a terminal groundwater sink and as

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					such would not present a hazard to water quality in the shallow groundwater system.
179	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 20: The proponent should demonstrate that it has genuinely considered and evaluated other options for the pit, rather than presenting the poor quality pit lake as the only alternative. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	We have not predicted a poor quality pit lake. Backfilling has been considered as an option but considered not economical. Details of the costing to backfill the pit are included in this supplement by reference to our response to question.
180	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 21: The site water balance modelling on which the sizing of the WTP and associated infrastructure has been based should be rerun to ensure that the proposed operation has a high probability of being able to manage its water without the occurrence of an uncontrolled discharge of untreated water. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	The water balance modellers coordinate directly with the water treatment plant designers to ensure treatment capacity is optimized for site water management. The detailed water balance model in included in appendix W in the PFS
181	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 22: The proponent should clarify the length of time likely to be needed for active water treatment post decommissioning in the context of the total life of the project that has been provided in the EIS. NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	Based on the Preliminary Feasibility Study level work, it is anticipated that the active water treatment system will be operational for four years following the end of mine operations. This will be further refined once seepage analysis is available at the Detailed Feasibility Study. Additionally, the active waste treatment system will remain operational until the effectiveness of the passive water treatment is proven.
182	Paul Purdon -		Consultants'	Recommendation 23: The proponent needs	Passive treatment is an acceptable method for the treatment of ARD/ML

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	Response to DR Jones Environmental Excellence recommendations		recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	to provide a much more technically convincing case for the viability of passive treatment systems to mitigate post closure water quality issues. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	(MEND, 2009; Price, 2009) and successes were well documented at the recent International Mine Water Association conference (IMWA, 2013). Metals of concern that have been identified during the geochemical characterization program include copper, lead, nickel and zinc, all of which are suitable for treatment under anaerobic conditions. Additionally, iron, aluminium and arsenic can be treated under either anaerobic or oxidizing conditions. Based on kinetic data, sulphate concentrations will be approximately 10mg/L. The passive treatment system will be designed to Detailed Feasibility Study level following completion of seepage analysis of the waste rock facility.
183	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 24: The proponent clarify in the Supplement to the EIS which water quality objectives are intended to provide the basis for its water quality compliance regime during the operating life of the project. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	Vista Gold has used the Declared Beneficial Use of the Edith River objective of aquatic ecosystem protection (Gazette Reference G23 11 June 1997). The surface water monitoring program (updated annually) will provide data to be used for compliance and water management for downstream ecosystem protection throughout the life of the mine.
184	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 25:the proponent make use of the excellent (and peer reviewed) work done in support of the current(Jan 2013) water discharge plan for Mt Todd to proactively develop a 95% ecosystem protection strategy to be presented in the supplement to the EIS. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	Monitoring for 2012/2013 discharges show that the 95% species protection trigger values for cadmium, nickel and zinc were not exceeded at the sampling point SW10, downstream of the site. (copper was elevated at SW10 due to the train derailment in December 2011). By meeting the 80% species protection dilution factor at SW4, the concentrations for all metals in the discharge during discharge were below ANZECC & ARMCANZ (2000) 95 % species protection trigger values, with the exception of Cu and Zn. Please note that there is no intention for Vista Gold to develop a 95% ecosystem protection system. The weight of empirical data does not support the need to target this level of protection.
185	Paul Purdon - Response to DR Jones Environmental		Consultants' recommendations and NTEPA Guidance on	Recommendation 26: The proponent should clarify why it may be seeking exemption for sulphate, arsenic and other oxyanions in discharge standards applied to the Edith	This sentence did not originate from the EIS; it is copied from a 2011 Water Management Update which is not relevant to the current water management process as described in the Waste Discharge Plan (GHD 2013) and, as such, does not need to be addressed in this supplement.

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	Excellence recommendations		further information required in the supplement to the draft Environmental Impact Statement.	River. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	
186	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 27: The proponent commit to implementing continuous measurements of flow, pH, and EC at key monitoring locations. Recommendation 27: The proponent commit to implementing continuous measurements of flow, pH, and EC at key monitoring locations. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	Continuous measurement of Height, Flow, EC, pH and Temperature is already undertaken at monitoring points located on the Horshoe and Stow Creeks as well as the Edith River. Additional continuous monitoring sites will be established where it is identified that such additional information will be of use operationally to ensure protection of the receiving environment.
187	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 28: Arsenic and antimony should be included in the standard water quality analysis suite NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement	The standard water quality monitoring suite of analyses meets the requirements of the current WDL 178-2. We note that neither of these elements has been recorded in any appreciable values.
188	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the	Recommendation 29: The proponent considers implementing a form of in situ biological monitoring so that time series of upstream downstream difference biological response data can be produced. NTEPA RESPONSE: NT EPA requires a detailed	In situ biological monitoring is not appropriate for this site as variations in water flows during the wet season would create risks for monitoring personnel and the likelihood of monitoring equipment being dislodged and washed away. Further, previous biological monitoring has not detected any adverse impacts on macro invertebrates living downstream of the mine discharge site during previous discharge of poor quality water. As the water to be discharged from the mine in future will be of a higher quality, it is unlikely that adverse impacts

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			supplement to the draft Environmental Impact Statement.	response to Dr Jones's recommendation in the Supplement.	will be detected in downstream populations.
189	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 30: The proponent should specifically address potential disseminated fugitive near surface seepage (especially in relation to post closure risk mitigation) in the supplement to the EIS. NTEPA RESPONSE: NT EPA requires a detailed response to Dr Jones's recommendation in the Supplement.	As per the EIS, passive interception systems are planned for both the mining and closure phases. Depending on the stage of the project these systems would constitute a mixture of wetlands, drains and sumps to capture any potential contamination via seepage or runoff. While it is known that the geological surface layers of the Mt Todd area are highly weathered, the hydraulic conductivities of this zone are generally very low as outlined in the Hydrogeology section. The low hydraulic conductivities are also evidenced by the lack of any significant spatial groundwater contaminant transport over the preceding history since suspension of operations. While the low conductivities reduce the risks, they also permit time to monitor and manage any contamination movement. Groundwater monitoring infrastructure and associated groundwater monitoring programmes enacted during the mining phase will be the one of the mechanisms to identify and quantify in detail the extent of any near surface seepage from legacy or new operational facilities. The additional information gained from such monitoring programmes will be used to inform and adjust facility management and design of any active of passive collection and treatment infrastructure. The details of such systems and knowledge would be presented as part of operational mining approval processes. It is also suggested that under operational conditions, the likelihood for, extent and quality of seepage, will be better than that witnessed from abandoned legacy structures site since operations last ceased.
190	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation I. Substantial further intensive survey work is required in order to adequately assess impact in relation to risk of this proposed development upon the largest known population of this threatened species. That work should document the number of Gouldian finches breeding in the habitat area proposed to be cleared or otherwise subject to substantial disturbance. NTEPA RESPONSE: NT EPA agrees that significant information gaps remain. The paucity of data makes it inappropriate to draw conclusions on the acceptability of the project as described. In	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				the Supplement, the proponent is required to present the results of substantial further intensive baseline surveys that will allow statistically relevant conclusions to be drawn about the current parameters such as population, breeding, forging and behaviour of this population of Gouldian finch. This is required to include a systematic and comprehensive survey that provides an explicit and reliable assessment of the number of Gouldian finches currently breeding in any area proposed for clearing or intensive modification. The design of the suite of intensive baseline surveys is to be integrated and consistent with Prof Woinarski's recommendations, and designed and carried out by an appropriately qualified ecologist.	
191	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplment to the draft Enviromental Impact Statement.	Recommendation 2. Further intensive sampling is required to assess the use of the lowland habitat in the proposed development area by Gouldian finches for forging and access to water, with such study designed to allow an adequately informed assessment of risks associated with clearing of lowland habitat and of use of contaminated water sources. NTEPA RESPONSE: In the supplement, the proponent is required to present the results of intensive surveys of the use of lowland habitat in the proposed development area by Gouldian finches. The surveys are to include intensive sampling throughout the late Dry season and Wet season particularly offoreging and access to water. The surveys are to be consistent with the recommendations by Prof Woinarski, and designed and carried out by an appropriately qualified ecologist.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
192	Paul Purdon -		Consultants'	Recommendation 3. Notwithstanding much	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian

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	Response to DR Jones Environmental Excellence recommendations		recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	uncertainty about extent of impacts, the proposed development is expected to have a significant impact upon this population. A far more specific set of effective mitigation measures is required to be developed and implemented in order to minimise that impact. NTEPA RESPONSE: In the Supplement, the proponent is required to present a suite of mitigation measures developed in consideration of the outcomes of the baseline surveys. The mitigation measures are to be directly specific to potential impacts, are to provide an assessment of the likelihood and extent to which they will reduce risks and consequences of the proposed project, and designed by an appropriately qualified ecologist. The full program of baseline surveys, impact assessment, impact mitigation, population monitoring, feedback and contingencies is to be developed consistent with Prof Woinarski's recommendations, and designed by an appropriately qualified ecologist.	Finch queries".
193	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 4. Previous monitoring programs have been statistically inadequate to detect changes in population size at this site, and should not be used to conclude that (i) the population size has been stable, (ii) previous mining activity has had no impact; and hence (iii) the proposed mining activity will also have no impact. NTEPA RESPONSE: The Proponent has not demonstrated that the project will be unlikely to impact this population of the Gouldian finch. In the Supplement the proponent is required to describe the likely impacts to the known Yinberrie Hills population of Gouldian finches from all aspects of the project. The impact	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				assessment is to be based on outcomes of baseline survey and available literature, and revision of the risk assessment consistent with Prof Woinarski's recommendations. The full program of baseline surveys, impact assessment, impact mitigation, population monitoring, feedback and contingencies is to be developed consistent with Prof Woinarski's recommendations, and designed by an appropriately qualified ecologist.	
194	Paul Purdon - Response to DR Jones Environmental Excellence recommendations		Consultants' recommendations and NTEPA Guidance on further information required in the supplement to the draft Environmental Impact Statement.	Recommendation 5. Should the proposed mining developments proceed, a consolidated package of linked monitoring programs is required that will assess trends in Gouldian finch population size, define impacts of the development, and measure the efficacy of mitigation and other management actions. Such a monitoring program must have substantially more statistical power than existing monitoring, must have an adequate pre-impact baseline (preferably of at least two years), and must have clear thresholds and trigger points that are linked to effective remedial actions. NTEPA RESPONSE: In the Supplement, the proponent is required to present a detailed monitoring program that considers the outcomes of baseline surveys and impact assessment and integrates and gives feedback on the effectiveness of mitigation measures. In addition, the monitoring program is to include clear thresholds and triggers to allow a process for adaptive management and contingencies for undesirable monitoring outcomes. The program should be demonstrated to have sufficient statistical power to reliably detect a population change (increase or reduction) of at least 10% per	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				year. The full program of baseline surveys, impact assessment, impact mitigation, population monitoring, feedback and contingencies is to be developed consistent with Prof Woinarski's recommendations, and designed by an appropriately qualified ecologist.	
195	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Water Management	Management of mine wastewater in a tropical environment is always a major problem because of the volume of water involved and its potential rapid dispersal across large areas of the environment during periods of flooding. The Edith, Fergusson and then the Daly Rivers provide the major transport routes for water-borne contaminants from Mount Todd to the coast, ultimately discharging into the Joseph Bonaparte Gulf. The Nauiyu Aboriginal community (population -500), stationed on the Daly River, makes use of its water for community purposes, tourism and recreational fishing and is at risk from any chronic or acute transport of high contaminant levels. During the wet season, the volume of water carried by these rivers is considered sufficient to dilute any overflow from the mine to acceptable levels. Consequently, discharge of contaminated water during the wet season is generally permitted by the NTEPA, provided contaminant concentrations do not exceed levels specified within the Water Discharge Licence (WDL). The WDL is a public document available from the NTEPA, but was not provided with the EIS. On examination, it is found that numerical values for release are not specified. In addition, they have not	To reiterate response for comment 87, make up water need for process is 2,427 m3/hr (based on design criteria by Proteus). Given the WTP rate of 500m3/hr, and the ability for the WTP effluent to be recycled back into process, all WTP effluent is consumed. Additionally, WTP effluent may be used to suppress dust on site during the dry, should an excess be available. The WTP treats to discharge limits established for the receiving water bodies.

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				been calculated and specified in the EIS. Management of mine wastewater during operations is done by a variety of contingency, mitigation and management measures prepared in response to an analysis of risk. A wide raft of water management risks have been considered and reported in chapter 5 of the EIS, along with proposals for risk mitigation. Of these risks, the most important in respect of communities and users downstream of Mount Todd include: * Overflow from water management structures (e.g. retention ponds) due to extreme rainfall event(s) - this may result in large volumes of chemically contaminated water entering watercourses; * AMD generated by extreme rainfall events - this may result in chronic transport of acid and potentially toxic metals and metalloids in watercourses; * Contamination of surface waters as a result of hazardous materials spills - this may create localized areas of toxic impact; and * Physical failure of water management structures - this could result in release of large volumes of chemically contaminated water across local areas of land and into the watercourses.	
196	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Biosecurity	The principal secondary risk associated with water management issues is biosecurity - in particular the health and abundance of aquatic and terrestrial species that are rare, endangered or culturally valuable (e.g. as food). These have also been considered and management practices suggested in Chapter 5 and in Appendix Z (EMP Framework).	The intent of any post closure designs are aimed to reduce and remove ongoing active management or active mitigation measures, whilst ensuring protection of the surrounding environment from the closed site .Financial resources past the project lifespan obviously cannot continue to support active management indefinitely. It is Vista Gold's intention not to repeat the mistakes which have been made during previous operations of the Mt Todd Site.

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				In general, risk mitigation measures offered by Vista Gold during operations are consistent with normal industry practice and appear to be suited to the tasks. They are suited to mining operations, where the company is available to maintain and manage them continuously. However, their suitability to post-closure, where resources for on-going maintenance and management have departed with the company, must be questioned.	
197	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of AMD	Management of AMD is one of Mount Todd's most serious challenges, which will continue well into the future if this project is allowed to proceed. Almost half (47%) of the material to be recovered from the Batman Pit is classed as potentially acid forming (PAF) in nature. Most of this material will be transported to and remain on the surface as either waste rock or tailings, creating a risk of chronic AMD over hundreds of years. Unless this material is well managed in perpetuity, or if the structures are left uncompleted due to early closure of Mount Todd, the Northern Territory is likely to see an outcome worse than that experienced at Rum Jungle over the past 40 years. Within a few years of closure, the Rum Jungle mine had become one of Australia's most notorious pollution problems, due to bacterial oxidation of exposed sulphides and consequent chronic release of acid and metals into the East Finniss River - and this effectively led to the 'death' of the Finniss River until active management was once again applied. The TSF (12ha) and WRD (54ha) at Rum Jungle are small in comparison	Based on the available kinetic testing data, NAF material shows no propensity to generate metal leachate without the onset of acid generation. All NAF samples that produced circum-neutral pH values also produced low concentrations of metal leachate. However, the onset of acidity did produce an increase in metal concentrations. A detailed description of the determination of PAF and Non-PAF is included in appendix L. This follows industry standards which we have adhered to with some rigor. Multiple cover design and WRD design configurations were considered over the development of the facility design presented in the EIS. The facility design considered overall slope angles of 20, 29, and 35 degrees. The preferred design reported was the middle and used a 29 degree overall slope. Additionally, three different cover designs in addition to a no cover option were considered. The preferred WRD design using the 29 degree with the petticoat cover reduced infiltration to approximately 7% of annual precipitation. The 35 degree slope models had annual infiltration of 13% (petticoat), 32% (cap top only), and 11% (full cover), and the 20 degree slope models had infiltration of 14% (petticoat) and 6% (full cover). The preferred cover and facility design therefore was optimized for engineering design and potential of ARD release due to flux of water through the facility. The design of the WRD considered climatic conditions of the site and though some facilities do have issues with facility stability in the tropics that is not anticipated at this project. Stability modelling was performed and showed a sufficient Factor of Safety for the design of the WRD with an overall 29 degree outer slope. Observation of the existing WRD has also shown no physical

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				to those envisaged to remain when Mount Todd is closed. One of the major contributors to the risk of chronic AMD at Mount Todd is the size of the planned waste rock dump and volume of tailings produced. The finished waste rock dump is expected to be 350m high, cover approximately 217ha and contain around 510Mt of waste rock. An impression of its anticipated size and visual impact is obtained from in Figure 1 - a reproduction of Plate 9-3 in the EIS. The WRD is the larger structure towards the left of the Figure. There will also be two tailings storage facility (TSF) containing a total 223Mt of tailings spread over 147ha, when completed.	weathering of the material and change in slopes due to degradation. The one meter thick cover unit is intended to be constructed of erosion resistant material that will protect the underlying waste rock and GCL. The overlying soil material is for the growth of vegetation and may be subject to some erosion as vegetation populations are established. The underlying one meter unit will be sufficiently competent to provide protection until the full vegetative cover is established. The existing WRD is generating some ARD and it has been acknowledged that the WRD will be a source of ARD. The facility closure cover design is intended to minimize the additional ARD generated, but will not completely eliminate the ARD potential. The exact timing of ARD generation from new material being placed on the facility has not been established at this time, but will be considered as part of the Feasibility Study level work. The short term kinetic testing (~30 weeks) of PAG and uncertain material showed that sufficient neutralization capacity exists to prevent the generation of ARD. However, the long term tests (> 100 weeks) showed consumption of the neutralization capacity and ARD generation suggesting that the source could develop during the operational period of the mine. It should be noted that kinetic testing of the Non-PAG material has taken place, so no benefit of this material has been considered to this point. Therefore the ARD impacts considered and mitigation measures planned on based on the most conservative use of the data.
198	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of AMD	Vista Gold proposes to minimise the potential for AMD by maximizing its use of non-acid forming (NAF) materials and minimizing the area of the waste rock footprint from where AMD might be generated (Appendix Y, §3.8.3). This means constructing a tall structure, rather than a much broader and flatter one. The WRD structure proposed may not be optimal and implications for engineering design and potential AMD generation have not been described. Vista Gold relies on encapsulating PAF waste rock within compounds constructed with an NAF shell, covered with intermittent geochemical layers and topped with 200mm	Multiple cover design and WRD design configurations were considered over the development of the facility design presented in the EIS. The facility design considered overall slope angles of 20, 29, and 35 degrees. The preferred design reported was the middle and used a 29 degree overall slope. Additionally, three different cover designs in addition to a no cover option were considered. The preferred WRD design using the 29 degree with the petticoat cover reduced infiltration to approximately 7% of annual precipitation. The 35 degree slope models had annual infiltration of 13% (petticoat), 32% (cap top only), and 11% (full cover), and the 20 degree slope models had infiltration of 14% (petticoat) and 6% (full cover). The preferred cover and facility design therefore was optimized for engineering design and potential of ARD release due to flux of water through the facility. The design of the WRD considered climatic conditions of the site and though some facilities do have issues with facility stability in the tropics that is not anticipated at this project. Stability modelling was performed and showed a

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				of plant growth medium to minimise AMD. However, the level to which this structure will protect the environment from chronic AMD from the WRD must be questioned on two counts: • First, experience with similar structures at Rum Jungle suggests that waste rock dumps are generally unstable under tropical conditions and that significant on-going maintenance is likely to be required; and • 200mm of plant growth medium and 1 m of NAF may not be sufficient to generate an erosion-resistant layer of vegetation across the surface and walls of the structure. Vista Gold acknowledges that, despite these and a number of other mitigation measures proposed, the residual risk of AMD from the expanded WRD remains high (Table 5-6, p5-20). Although control might be achieved during mining operations, the unanswered questions are how much AMD will be generated, when it will start to be generated and for how long will it be generated once the site has been surrendered.	sufficient Factor of Safety for the design of the WRD with an overall 29 degree outer slope. Observation of the existing WRD has also shown no physical weathering of the material and change in slopes due to degradation. The one meter thick cover unit is intended to be constructed of erosion resistant material that will protect the underlying waste rock and GCL. The overlying soil material is for the growth of vegetation and may be subject to some erosion as vegetation populations are established. The underlying one meter unit will be sufficiently competent to provide protection until the full vegetative cover is established. The existing WRD is generating some ARD and it has been acknowledged that the WRD will be a source of ARD. The facility closure cover design is intended to minimize the additional ARD generated, but will not completely eliminate the ARD potential. The exact timing of ARD generation from new material being placed on the facility has not been established at this time, but will be considered as part of the Feasibility Study level work. The short term kinetic testing (~30 weeks) of PAG and uncertain material showed that sufficient neutralization capacity exists to prevent the generation of ARD. However, the long term tests (> 100 weeks) showed consumption of the neutralization capacity and ARD generation suggesting that the source could develop during the operational period of the mine. It should be noted that kinetic testing of the Non-PAG material has taken place, so no benefit of this material has been considered to this point. Therefore the ARD impacts considered and mitigation measures planned on based on the most conservative use of the data. **Additional Comments** Attachment B
199	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of Seepage	Closely aligned with AMD is the problem of seepage of contaminated water from the WRD and TSFs. RP1 acts as a repository for runoff from the Waste Rock Dump, and although this water is to be treated prior to disposal, the pond is not lined and therefore remains a source of potential AMD transport to groundwater as a result of normal recharge. It could not be determined from the EIS if TSF1 is adequately lined, so its potential for seepage into groundwater could not be established.	These seeps are a result of an improper use of TSF-1, designed as a tailings facility not for water storage. These seeps are a result of over pressurizing the facility and removing the role of the under drains. The acidic leachate is a result of acidic water being placed into TSF-1, not from the tailings. Once operations begin, the acidic water will be removed and the underdrains will again be commissioned. During operation, TSF-1 will operate as designed.

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				Significant groundwater seeps are said to be observed down gradient of the southern and eastern walls of the TSFs and were thought to be providing flow to Horseshoe Creek (§11.3.4, p11-48. The source of this water is unknown and although it is likely to be coming from TSF1, the rates of seepage through TSF1 and RP1 are not known, have not been modelled and will not be evaluated until after the EIS has been completed. The new TSF2 will be lined and is not expected to contribute to groundwater as a recharge or discharge point, but will eliminate natural recharge in an estimated area of 300ha (§11.3.4, p11-4). The consequences of eliminating groundwater recharge from beneath TSF2 to river flow or groundwater quality and availability are neither explained nor interpreted.	
200	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of Surface water and water-borne contaminants	The increased potential for chronic AMD means that management of surface water and water- borne contaminants will remain one of the most significant environmental legacies and future risks posed by the Mount Todd mine. Unfortunately, there are numerous problems associated with the documents attached to the EIS that describe how surface water is to be managed. This detracts from the EIS and creates a situation where assessment of water management systems and water-related impacts is difficult. The more important of these concerns are described below. The EIS relies largely on outcomes from the Goldsim model, but the model is described only in a series of documents that are not	Goldsim has the capability to perform short-term forecasts (with uncertainty), in the event one or more of the RPs may overtop. The model would first test each RP to determine if overtopping may occur, it then enters a subroutine that runs a weather forecast. The results of the forecast are exported to the parent model and if an overtopping event is imminent, water is sent from the RP to the TSF. The DFS level model may be refined to include such forecasting for the pre-production phase. The Goldsim model is described in greater detail in the supplemental report (see standalone document).

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				provided as part of the EIS (Appendix I, p15). This makes it difficult to assess the usefulness of Goldsim to the EIS and its suitability for evaluating risks associated with water management. A number of scenarios (e.g. transfer of water to the TSF (Appendix 1, p8-9)) have not been included in the modelling suggesting that the models are incomplete and that the outcomes may be flawed.	
201	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of Surface water and water-borne contaminants	The charts provided in Figure 2 are of no use as legends and values are displayed only as question marks. Even though it is suggested that exclusion of groundwater seepage into, or out of, the pit may alter the assumptions regarding required transfers to the water treatment plant (WTP), it has been excluded from mine water balance calculations (Appendix I, p12). The schematic of the mine infrastructure and transfers associated with the supply of production phase demands of water, shown in Figure 4, is of no use as legends and values are displayed only as question marks. Appendix I contains examples where details of studies or their outcomes could not be found (e.g. § 2.8.6, p21; § 2.8.7, p 23) and where assumptions or expectations have been made. The rationale behind the assumptions is not clearly described, making it difficult to assess relevance of each assumption. Data relating to water quality and its impacts are not well collated or summarized in the	We have checked that table and in neither the printed or electronic versions we cannot find any formatting issues. We assume that this is related to a configuration issue on your software. There is a printed copy available for collection at our office in Darwin if you would like one. We do not agree that the collation of data has not been done well. All of the threats and actuals are described in the WDL supporting documentations. An annual update of this information is also available via the NTEPA & www.mttodd.com.au websites

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				main report, making it difficult to evaluate the extent of impacts of mine generated water on aquatic life in nearby river systems. For example, there is a general discussion on the toxic effects of certain chemical species (AI, Fe and Mn) on aquatic life in Appendix 0, but the actual water quality data for the mine is attached as an Appendix in Appendix J. Chapters 10 (Surface Water) and 14 (Fauna) do not appear to bring this data together to provide solid evidence of whether or not concentrations of water-borne chemical species represent a threat to aquatic fauna in any of the nearby watercourses or river.	
202	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management of Surface water and water-borne contaminants	Information related to the risk of chemical species of special interest to the public (e.g. As and Cd) appears notably absent from this work. Water quality data provided does not appear to be discussed in terms of lethal doses, bioaccumulation and potential human health risks. There does not appear to be an attempt to predict potential future impacts on aquatic fauna diversity and abundance, or on human health, should chronic AMD occur. The absence of collated data related to flow rates in local watercourses, dissolution rates, decay rates and geochemical data related to tailings and waste rock makes it difficult to perceive the extent of impact that AMD generation from the TSF or WRD would have. The large volumes of waste rock and tailings planned for surface placement suggest that chronic leakage from any of these facilities would most likely have a devastating impact.	Arsenic has not been flagged as a chemical of concern at this site. Cadmium is monitored daily during discharge and monthly at other times and 2013 monitoring has shown Cd to be below 95% species protection trigger values at site SW10 downstream of the mine discharge site. The use of lethal doses is not appropriate for use in environmental protection, where possible all testing conducted uses sub lethal impacts such as growth and reproduction to determine a 10% impact on the exposed population. AS discussed previously a study on bioaccumulation of metals in fish and the impacts on human health has been conducted. As discussed in Chapter 10 of the EIS, It is proposed that TSF2 will operate as a zero discharge facility with management incorporated into the design in case of mechanical failure and other causes of system overflows or excess drainage.
203	Matthew Punch		Structural	Vista Gold's modelling suggests that the	The downstream shell of TSF2 will be constructed using Non-PAG waste rock

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	NLC Prepared by Dr Howard Smith APChem Scientific Consultants		integrity of TSF 2 and WRD	southern and western walls of TSF2 and the eastern edge of the WRD will be located in areas that are prone to flooding. Floodwater velocity in these areas may be sufficient to cause scouring, degradation and erosion of embankments and batters (Appendix I, Figure 8 and p 37). Although it is unlikely that there will be catastrophic failure of the TSF, scouring and degradation of the NAF materials used as covers in the WRD is a concern. The slow degradation of NAF materials over time will gradually increase the risk of exposure of PAF materials in the lower reaches of the WRD. In turn, this would ultimately lead to a significant contribution to chronic AMD. It is difficult to predict how long this would take, because information related to stability of the NAF material (e.g. friability, natural decay rates) could not be found in the EIS.	material. Selectively sized waste rock will be used for embankment construction based on a scour analysis to prevent erosion. The scour analysis will be performed during the feasibility study phase of the project. An erosion protection bund constructed at the downstream toe adjacent to the horseshoe and stow creeks will be incorporated into the design, if required. Note that the downstream toe of TSF1 constructed from selectively sized waste rock did not exhibit noticeable erosion after the December 26, 2011 storm event which caused significantly high stream flows in Horse Shoe Creek.
204	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Summary and Recommendations	Water management is the single most important challenge faced by Vista Gold in reopening Mount Todd. This report has therefore focused largely on the risks around generation of chronic AMD and the impacts of waterborne contaminants on the natural environment beyond the life of mine. The risk of chronic AMD over many centuries is high and the key contributing factors are: 1. the large volume of PAF waste rock to be deposited on the surface; 2. the relatively thin NAF (1m) and plant growth medium (0.2m) barriers to be used to stabilize the waste rock dump; 3. Potential scouring and decay of NAF material through extreme weather events	The Mt Todd project is located in a highly metalliferous district that outcrops at the surface and has contributed to natural discharges of metals to the ecosystem for millennia. Whether the project proceeds, this condition will continue. As such, the natural ecosystem that has developed has adapted itself to these conditions. Since 2000 there have been a number of discharges from Mt Todd into the Edith River, the most recent being February 2012. At the time samples are taken both upstream and downstream, also annual macro and micro-invertebrate samples, and there has been no measurable impact on the environment. The hydrologic modelling is not incomplete. Extensive hydrologic modelling has been completed using actual meteorological data from the region and has incorporated voluminous data from simulations that predict weather conditions for centuries. The predicted water balance for the pit lake through the 500-year simulation period is shown in Figure 11-8. The potential impacts

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				and flooding; and 4. The large volume of alkaline tailings to be stored on the surface. Coupled with what appears to be an incomplete modelling and an absence of important physical information (e.g. seepage rates and dilution factors for rivers), it is difficult to justify support for the EIS as it currently stands. In particular, the sections of the EIS that address water management, hydrology and impacts on aquatic fauna (especially food species) should be revised and the data presented in a more coherent fashion. Vista Gold should provide conclusive evidence that demonstrates the expanded WRD and TSF structures will protect the environment from chronic AMD once maintenance of these structures ceases and the company has withdrawn. The extent of the amount of AMD (and therefore the risk) resulting from the slow decay of these structures also needs to be calculated. If these matters cannot be satisfactorily addressed, the PAF generated by the mine should be interred in the pit at the end of mining, or consideration giving to scrapping the project. A decision on whether or not to scrap the project cannot be taken lightly because its successful completion would remove an existing legacy issue. This decision must ultimately be based on a relative evaluation of current legacy risk against the future legacy risk from the closed-out Vista Gold project. At present, it is difficult to arrive at a definitive conclusion on relative risks because	on local flora and fauna are incorporated into the macro and micro-invertebrate studies as well as data from the Eco toxicological testing. There are specialist's reports in these areas included within the EIS do not support the notion that modelling is incomplete. There are a number of peer reviewed reports detailing the work done which are included in appendix K. As part of the process of mine closure the DME will require evidence that the closure criteria have been met before releasing Vista Gold of its liability(s). The structures, like the WRD and TSF's, will have been there for more than a decade before closure and the rate of decay if any will be known. Given the hardness of the NAF material it is unlikely that decay will be a feature. If this was an oxide project a different rehabilitation regime would need to be employed.

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				some crucial information appears to be missing. These are covered amongst the specific recommendations outlined below.	
205	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Specific Recommendations	The general summary provided above is based largely on experience and the quality of information provided in the EIS. The specific recommendations made below seek to address information that is, or appears to be missing. This information or references to its location in the EIS is to be provided as part of the Supplementary EIS documentation. Although legislation does not specifically allow for additional public input following the provision of supplementary information, this should be allowed in this instance to ensure that the new information provided adequately addresses the concerns raised above.	As this part of the proponents response is is provided as background and summary comments no response from Vista Gold has been offered.
206	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Documents	The Appendices should be proof read, corrected and resubmitted where necessary as part of the supplementary documentation.	As this part of the proponents response is provided as background and summary comments no response from Vista Gold has been offered.
207	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		AMD: An excessive amount of PAF material will be left on the surface.	Potentially acid-forming material should not be placed on the surface but should be returned to the Batman pit for interment below the final groundwater level.	Chapter 24 describes the proposed approach to closure and rehabilitation of the Project. Unless otherwise stated, closure and rehabilitation information has been sourced from the Mt Todd Gold Project PFS Reclamation Plan (the Reclamation Plan) (Appendix Y). The Reclamation Plan focuses on the reclamation earthworks associated with closing existing and future mine features during and following the completion of mining operations. The potential impacts and associated management measures identified in this chapter contribute to the closure and AMD components of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence; likelihood and residual risk ratings for impacts associated with closure and AMD seepage after management measures are implemented. An analysis to determine the viability of backfilling the Batman Pit has been completed. The analysis considered backfilling of the pit by rehandling waste

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					dump material which is located adjacent to the south side of the pit. It is assumed that the backfilling will not begin until after all the ore is mined from the bottom of the pit (i.e. end of mine life). Based on this analysis, the total backfill operating costs will be approximately $450,000,000 to $500,000,000 and will require approximately six to nine years to complete. The elevation of the ramp exit of the pit is 131m amsl. The pit volume from 131m to the pit bottom is approximately 289,500,000m3. The elevation of the ramp entrance onto the waste dump is 150m amsl. The volume of waste dump material available for backfilling from 150m elevation to the top of the waste dump is approximately 249,400,000m3. The waste dump material available for backfilling as calculated will fill the pit to approximately the 117m elevation. Using a density of 1.8, there are approximately 450,000,000 tonnes of waste dump material to be rehandled. Backfilling the Batman pit with the waste material renders the project uneconomic and is therefore not considered to be a viable option. It is important to note that this analysis does not consider the capital costs that may be incurred due to the replacement of trucks and/or hydraulic excavators. Tailings from TSF2 would need to be refluidised and pumped into the pit from their linned storage facility. What has been currently allowed for is the clousre of the tailings storage facilities that ensure protection of the environment.
208	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		AMD: The thickness of NAF and PGM used to cover the waste rock is inadequate.	ITEM 1 -See response to Comment 101 above. Where potentially acid-forming materials has to remain on the surface, the non-acid forming (NAG) and plant-growth (PGM) covers should be increased in thickness.	No PAF materials remain on the surface at closure. Plant Growth Media is not used to cover any of the areas that are encapsulating PAF. This is because plant (shrubs, small trees etc.) may alter the effectiveness of the capping.
209	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		AMD: The stability of NAF proposed for use as long-term cover material is not demonstrated.	Rates of decay and erosion of NAF material should be determined and plans developed for long-term management of cover stability.	Due to the long-term nature of this project rates of decay will be known before environmental bonds are returned to Vista Gold. Mt Todd has the fortunate advantage of very hard NAF rock which will be used for the protection of the PAF and the >5% of oxide from the early mining waste. As stated in response to 204 above there is no erosion of the NAF expected.
210	Matthew Punch NLC		AMD: The long-term stability of	Landform modelling should be employed to demonstrate stability of the final landform	The detailed design of the drainage will be completed as part of the DFS work. Work done to date ensures that there has been sufficient area for the volumes.

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	Prepared by Dr Howard Smith APChem Scientific Consultants		the landform is not discussed or demonstrated.	structures (particularly the WRD) over at least a 1OOO year period. This should be interpreted in terms of potential generation of AMD.	Different types of landform protection / design will be evaluated during operations and this knowledge will form the detail of the closure plan.
211	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		AMD is seeping into ground water from TSF1	Additional tailings should be placed in TSF1. Preferably, TSF1 should be removed and the impacted area rehabilitated.	The current acidic surface conditions a TSF1 are not reflective of the future alkali operating conditions. Section 2.6.4 of the EIS provides an overview of the operational strategy of for TSF1 which is expected to receive an additional 62 Mt of alkali tailings in the first 4 to 5 years of operation. Re-establishing appropriate operational practices at TSF1 will see re-opening of the existing toe-drain and underdrain system that conveys seepage water to the return water pond for further re-use in operations. Use of the existing TSF1 underdrainage system correctly is expected to significantly lower uncontrolled seepage rates. In addition, alkaline process water is planned to be pumped into TSF1 during mining, thereby lowering dissolved metal concentrations in leachate. Chapter 24 of the EIS outlines the closure and rehabilitation strategy for TSF1 which includes a cover system designed to minimise water infiltration and oxygen ingress to minimise AMD generation, and the seepage collection system is designed to control and treat any AMD generated.
212	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		AMD: Return of PAF materials to the pit	A cost-benefit analysis to demonstrate the feasibility of interment of tailings and waste rock to the pit following mining should be provided.	An analysis to determine the viability of backfilling the Batman Pit has been completed. The analysis considered backfilling of the pit by rehandling waste dump material which is located adjacent to the south side of the pit. It is assumed that the backfilling will not begin until after all the ore is mined from the bottom of the pit (i.e. end of mine life). Based on this analysis, the total backfill operating costs will be approximately $450,000,000 to $500,000,000 and will require approximately six to nine years to complete. The elevation of the ramp exit of the pit is 131m amsl. The pit volume from 131m to the pit bottom is approximately 289,500,000m3. The elevation of the ramp entrance onto the waste dump is 150m amsl. The volume of waste dump material available for backfilling from 150m elevation to the top of the waste dump is approximately 249,400,000m3. The waste dump material available for backfilling as calculated will fill the pit to approximately the 117m elevation. Using a density of 1.8, there are approximately 450,000,000 tonnes of waste dump material to be rehandled. Backfilling the Batman pit with the waste material renders the project uneconomic and is therefore not considered to be a viable option. It is important to note that this analysis does not consider the capital costs that may be incurred due to the replacement of trucks and/or hydraulic excavators.

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					Tailings from TSF2 would need to be re-fluidised and pumped into the pit from their lined storage facility. What has been currently allowed for is the closure of the tailings storage facilities that ensure protection of the environment
213	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Seepage of groundwater into Horseshoe Creek to the south and east of TSF1.	The rate of seepage and quality of this water should be monitored to determine if it is carrying chemical contamination or is a source of AMD from the TSF.	A number of groundwater bores are located around the TSF1. These bores are included in the current groundwater monitoring programme undertaken by Vista Gold. A number of surface water monitoring locations also exist along Horseshoe creek which is also included in current routine surface water monitoring programmes. Upon recommencement of mining these monitoring programmes will be continued, and adjusted in anticipation of potential contamination issues, or via feedback from the results of such monitoring activities.
214	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Lack of groundwater recharge beneath TSF2.	The consequences of the loss of groundwater recharge from the area beneath TSF2 on flow rates in surrounding watercourses should be determined and addressed in the EIS.	Due to the rock type under TSF2 there is no recharge affected by the footprint. This is highlighted by the fact that the watercourses rise and fall immediately as a product of rainfall. That is there is no absorption and drainage latter. Modelling of this is detailed in appendix K
215	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Increase in flow in the Edith River during the first 5 years of mining	The chemical and AMD loads and concentrations contributed by TSF1 and other mine sources of seepage should be estimated and interpreted in terms of dilution and risk to the environment and people using the Edith and Fergusson Rivers.	Due to the low rates of hydraulic conductivity in ground waters at the Mt Tod site, the volumes of seepage which has the possibility of inflow into the Edith River, as a proportion of surface water flows will be extremely low and in the order of less than one percent. As outlined in the Surface Water appendix, maximum modelled seepage rates are 19,200 cubic meters per day in year 7 during the wet season. 90% of this seepage is to be captured and transferred for equalisation. The risk of the remaining 10% of seepage entering the Edith River will then be proportional to the spatial extent of movement necessary, and any factors may assist or impede such movement. If operational monitoring programmes determine that there is an elevated risk to the Edith River from seepage contamination, as a result of mitigation failure, then appropriate actions will be undertaken to ensure downstream communities and users and not impacted.
216	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Scouring and erosion of parts of the WRD during flood events.	Scouring and erosion of the WRD (and TSF) structures should be modelled, interpreted in terms of structure stability and leaching of contaminants into watercourses. This information should then be fed into management plans for each structure modelled.	We have included expert advice in the current designs of the WRD and TSF's. Below is the response prepared for another question of the slope stability considerations which highlights the amount of effort that has been done to address erosion considerations for this project. Based on the available kinetic testing data, NAF material shows no propensity to generate metal leachate without the onset of acid generation. All NAF samples that produced circum-neutral pH values also produced low concentrations of metal leachate. However, the onset of acidity did produce an

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					increase in metal concentrations. A detailed description of the determination of PAF and Non-PAF is included in appendix L. This follows industry standards which we have adhered to with some rigor. Multiple cover design and WRD design configurations were considered over the development of the facility design presented in the EIS. The facility design considered overall slope angles of 20, 29, and 35 degrees. The preferred design reported was the middle and used a 29 degree overall slope. Additionally, three different cover designs in addition to a no cover option were considered. The preferred WRD design using the 29 degree with the petticoat cover reduced infiltration to approximately 7% of annual precipitation. The 35 degree slope models had annual infiltration of 13% (petticoat), 32% (cap top only), and 11% (full cover), and the 20 degree slope models had infiltration of 14% (petticoat) and 6% (full cover). The preferred cover and facility design therefore was optimized for engineering design and potential of ARD release due to flux of water through the facility. The design of the WRD considered climatic conditions of the site and though some facilities do have issues with facility stability in the tropics that is not anticipated at this project. Stability modelling was performed and showed a sufficient Factor of Safety for the design of the WRD with an overall 29 degree outer slope. Observation of the existing WRD has also shown no physical weathering of the material and change in slopes due to degradation. The one meter thick cover unit is intended to be constructed of erosion resistant material that will protect the underlying waste rock and GCL. The overlying soil material is for the growth of vegetation and may be subject to some erosion as vegetation populations are established. The underlying one meter unit will be sufficiently competent to provide protection until the full vegetative cover is established. The existing WRD is generating some ARD and it has been acknowledged that the WRD will be a source of ARD. The facility closure cover design is intended to minimize the additional ARD generated, but will not completely eliminate the ARD potential. The exact timing of ARD generation from new material being placed on the facility has not been established at this time, but will be considered as part of the Feasibility Study level work. The short term kinetic testing (~30 weeks) of PAG and uncertain material showed that sufficient neutralization capacity exists to prevent the generation of ARD. However, the

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					long term tests (> 100 weeks) showed consumption of the neutralization capacity and ARD generation suggesting that the source could develop during the operational period of the mine. It should be noted that kinetic testing of the Non-PAG material has taken place, so no benefit of this material has been considered to this point. Therefore the ARD impacts considered and mitigation measures planned on based on the most conservative use of the data.
217	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Water quality data	Detailed wet and dry season water quality data, also provided as graphical trends, should be provided and annual total loads of metals and metalloids entering the downstream environment calculated.	Water leaving the mine site will have been treated via the treatment plant and meet the 80% species protection regime for the Edith River. The issue of how much of what enters the system is controlled by the Waste Discharge Licence. This is updated periodically and determines the loads that will need to be complied with. We are unable to predict what licence conditions may change and are therefore unable to develop the tables and their graphs for the project. We can however commit to ensuring we always meet our licence conditions and that environmental stewardship is critical to Vista Gold continuing to have a successful project.
218	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Watercourse flow rates	Peak flow rates for a number of key watercourses are not provided. These should be provided and used to calculated dilution rates of harmful metals and metalloids being carried into the downstream environment.	Water leaving the mine site will have been treated via the treatment plant and meet the 80% species protection regime for the Edith River. The issue of how much of what enters the system is controlled by the Waste Discharge Licence. This is updated periodically and determines the loads that will need to be complied with. We are unable to predict what licence conditions may change and are therefore unable to develop the tables and their graphs for the project. we can however commit to ensuring we always meet our licence conditions and that environmental stewardship is critical to Vista Gold continuing to have a successful project
219	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Discharge criteria	Waste discharge criteria expressed as concentrations and loads of individual chemical species should be calculated and provided.	Waste discharge criteria are expressed as concentrations as it is the concentration of a chemical and the duration of exposure that can impact adversely on exposed populations. To accurately measure the load of a chemical would require high resolution sampling as making assumptions of loads based on daily or monthly sampling would be erroneous and inaccurate.
220	Matthew Punch		Surface water:	A brief description of the Goldsim model and	Similar to comment 200, refer to the standalone supplemental document

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	NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Suitability of the models to water management	how it works should be provided with supplementary documentation.	describing the Goldsim model. **Additional Comments** Attachment D
221	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Models are missing some input streams	Models should be rerun to include all available information and the results re-presented. Where there is a valid reason for excluding a variable, this should be fully explained along with any other assumptions involved. Discuss on teleconference with A. Sawicki.	During the DFS the models will be updated to include the output of the detailed civil design of both the plant and drainage areas. With these inputs it is expected that there will be no significant change to the outputs. Until we complete the detailed landform design the minor changes to input streams are not able to be included. All modelling will be validated during operations with actual data.
222	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Surface water: Chemical species of public interest have not been considered	Water quality results for species such as As and Cd should be clearly presented and interpreted in terms of bioaccumulation potential and impacts on human health.	The water quality objectives for the Edith River are for aquatic ecosystem protection. This objective forms the basis of the WDL requirements. Cadmium has not been measured above the 95% species protection default trigger value at the downstream site SW10. Further, in 2012, after the train derailment at the Edith River crossing, Food Standards Australia and New Zealand (FSANZ) supported by the NT Department of Fisheries conducted an extensive risk assessment to assess the impacts of trace elements (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc) in the diet. This study found that the amount of fish flesh sourced from the Edith River that could be consumed by children 2 to 5 years was 2.1 kg/day before the respective health-based guidance value was exceeded. The maximum number of fish livers that could be consumed by children 2 to 5 years is 31 before the respective health-based guidance value was exceeded.
223	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Aquatic fauna: Bioaccumulation of metals in riverine food species.	Concentrations of metals in riverine food species (particularly those listed in Appendix S - Jawoyn Ecological Knowledge) should be analysed and interpreted in terms of potential human health impacts.	Notwithstanding that the train derailment was not related in any way to Mt Todd it has provided valuable information about the resilience of the loacl environment. In 2012 after the train derailment at the Edith River crossing the Food Standards Australia and New Zealand (FSANZ) supported by the NT Department of Fisheries conducted an extensive risk assessment to assess the impacts of trace elements (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc) in the diet. The amount of fish flesh and livers that could be safely consumed was calculated for fish sourced from the Edith River in a long term dietary exposure. The Daly River was used as a control site. Edith River showed higher median values for cobalt, copper, manganese and zinc and similar values to fish from the Daly River for cadmium, lead and nickel,

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					with mercury being lower in the Edith River. The amount of fish flesh sourced from the Edith River that could be consumed by children 2 to 5 years was 2.1 kg/day before the respective health-based guidance value was exceeded. The maximum number of fish livers that could be consumed by children 2 to 5 years is 31 before the respective health-based guidance value was exceeded. As this research was conducted after the train derailment spilling copper concentrate into the Edith River, these results are considered to be a "worst case scenario" with conditions improving over time. The Department of Fisheries is considering conducting an additional study in the future.
224	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Aquatic fauna: Bioaccumulation of metals in riverine food species.	The potential impacts on riverine species of changed water quality as a result of mining operations and chronic AMD should be estimated and interpreted in terms of human health.	Biological monitoring programs have been conducted on an annual basis according to Lamche, G. (2007). The Darwin-Daly Regional AUSRIVAS Models – Northern Territory: User Manual. Aquatic Health Unit –Department of Natural Resources, Environment and the Arts. Report 06/2007D. These annual programs have not detected any adverse impacts on populations living downstream of the mine discharge site. Notwithstanding that the train derailment was not related in any way to Mt Todd it has provided valuable information about the resilience of the local environment. In 2012 after the train derailment at the Edith River crossing the Food Standards Australia and New Zealand (FSANZ) supported by the NT Department of Fisheries conducted an extensive risk assessment to assess the impacts of trace elements (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc) in the diet. The amount of fish flesh and livers that could be safely consumed was calculated for fish sourced from the Edith River in a long term dietary exposure. The Daly River was used as a control site. Edith River showed higher median values for cobalt, copper, manganese and zinc and similar values to fish from the Daly River for cadmium, lead and nickel, with mercury being lower in the Edith River. The amount of fish flesh sourced from the Edith River that could be consumed by children 2 to 5 years was 2.1 kg/day before the respective health-based guidance value was exceeded. The maximum number of fish livers that could be consumed by children 2 to 5 years is 31 before the respective health-based guidance value was exceeded. As this research was conducted after the train derailment spilling copper concentrate into the Edith River, these results are considered to be a "worst case scenario" with conditions improving over time. The Department of Fisheries is considering conducting an additional study in the future.
225	Matthew Punch		Aquatic fauna:	Consumption rates of riverine food species by	Notwithstanding that the train derailment was not related in any way to Mt

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	NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Bioaccumulation of metals in riverine food species.	Aboriginal people living downstream of Mount Todd should be determined and used in conjunction with the estimation of water-borne contaminant concentrations to interpret impacts in terms of human health.	Todd it has provided valuable information about the resilience of the local environment. In 2012 after the train derailment at the Edith River crossing the Food Standards Australia and New Zealand (FSANZ) supported by the NT Department of Fisheries conducted an extensive risk assessment to assess the impacts of trace elements (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc) in the diet. The amount of fish flesh and livers that could be safely consumed was calculated for fish sourced from the Edith River in a long term dietary exposure. The Daly River was used as a control site. Edith River showed higher median values for cobalt, copper, manganese and zinc and similar values to fish from the Daly River for cadmium, lead and nickel, with mercury being lower in the Edith River. The amount of fish flesh sourced from the Edith River that could be consumed by children 2 to 5 years was 2.1 kg/day before the respective health-based guidance value was exceeded. The maximum number of fish livers that could be consumed by children 2 to 5 years is 31 before the respective health-based guidance value was exceeded. As this research was conducted after the train derailment spilling copper concentrate into the Edith River, these results are considered to be a "worst case scenario" with conditions improving over time. The Department of Fisheries is considering conducting an additional study in the future.
226	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Aquatic fauna: Aquatic river health	Detailed scientific studies of the impacts of AMD and other mine- generated chemical species on Nymphoides crenata (water lily), catfish, jewfish, turtles (long and short-necked) file snakes, yabbies' and water goannas should be undertaken.	The results of the study discussed above do not provide any indication that bioaccumulation of metals in food species are of concern to downstream consumers. Further, to assess bioaccumulation in several of the species listed would require permits from the Parks and Wildlife Commission and sampling would also place researchers at risk.
227	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Aquatic fauna: Aquatic river health	A river health monitoring program should be developed and provided with the supplementary documentation.	Routine monitoring of aquatic macro invertebrates and aquatic sediments is currently conducted by Vista Gold as outlined in and required by Waste Discharge Licence 178-2. These two environmental variables are the current surrogates for river health. If results of monitoring programmes or other evidence dictate expansion of monitoring to other environmental variables, such alterations will be made.
229	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management Plans: No long-term management plan for the WRD.	The management plan for the WRD should be developed and submitted as part of the supplementary documentation.	A preliminary waste rock management plan has been developed to supplement this response, entitled Technical Memorandum -Preliminary Waste Rock Management Plan Evaluation. This item will be addressed in more detail as part of the completion of the DFS and permitting phases of the project. Attachment E - Prelim plan has been prepared.

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					Additional Comments Attachment E - Prelim plan has been prepared.
230	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants		Management Plans: No contingency plans for dealing with chronic or acute AMD.	The Supplementary EIS should predict potential impacts on aquatic fauna diversity and abundance, and on human health, should chronic AMD occur. Contingency plans for dealing with long-term AMD issues should be developed and submitted as part of the supplementary documentation.	Based on the available kinetic testing data, NAF material shows no propensity to generate metal leachate without the onset of acid generation. All NAF samples that produced circum-neutral pH values also produced low concentrations of metal leachate. However, the onset of acidity did produce an increase in metal concentrations. A detailed description of the determination of PAF and Non-PAF is included in appendix L. This follows industry standards which we have adhered to with some rigor. Multiple cover design and WRD design configurations were considered over the development of the facility design presented in the EIS. The facility design considered overall slope angles of 20, 29, and 35 degrees. The preferred design reported was the middle and used a 29 degree overall slope. Additionally, three different cover designs in addition to a no cover option were considered. The preferred WRD design using the 29 degree with the petticoat cover reduced infiltration to approximately 7% of annual precipitation. The 35 degree slope models had annual infiltration of 13% (petticoat), 32% (cap top only), and 11% (full cover), and the 20 degree slope models had infiltration of 14% (petticoat) and 6% (full cover). The preferred cover and facility design therefore was optimized for engineering design and potential of ARD release due to flux of water through the facility. The design of the WRD considered climatic conditions of the site and though some facilities do have issues with facility stability in the tropics that is not anticipated at this project. Stability modelling was performed and showed a sufficient Factor of Safety for the design of the WRD with an overall 29 degree outer slope. Observation of the existing WRD has also shown no physical weathering of the material and change in slopes due to degradation. The one meter thick cover unit is intended to be constructed of erosion resistant material that will protect the underlying waste rock and GCL. The overlying soil material is for the growth of vegetation and may be subject to some erosion as vegetation populations are established. The underlying one meter unit will be sufficiently competent to provide protection until the full vegetative cover is established. The existing WRD is generating some ARD and it has been acknowledged that

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					the WRD will be a source of ARD. The facility closure cover design is intended to minimize the additional ARD generated, but will not completely eliminate the ARD potential. The exact timing of ARD generation from new material being placed on the facility has not been established at this time, but will be considered as part of the Feasibility Study level work. The short term kinetic testing (~30 weeks) of PAG and uncertain material showed that sufficient neutralization capacity exists to prevent the generation of ARD. However, the long term tests (> 100 weeks) showed consumption of the neutralization capacity and ARD generation suggesting that the source could develop during the operational period of the mine. It should be noted that kinetic testing of the Non-PAG material has taken place, so no benefit of this material has been considered to this point. Therefore the ARD impacts considered and mitigation measures planned on based on the most conservative use of the data.
2	Rob Law Environment Centre NT Policy Officer	1	Legacy issues and expansion of current proposal	The Mt. Todd mine is arguably the largest and most damaging of legacy mines in the Northern Territory, with a long history of environmental problems. Whilst Vista Gold argues that project approval will allow these legacy issues to be properly addressed, the considerable expansion of the mine under this proposal will create much larger environmental risks that need to be carefully considered. The site is referred to as a brownfields site, however will involve a significant increase in the footprint of the mine, including expanding the main batman pit into the ecologically significant Yinberrie Hills, an expanded tailings storage facility (tsf) and a new tsf, and a waste rock dump the size of Ayers rock. As stated in our submission to the guidelines, we believe that the strategy of getting in a new miner to address legacy mine issues, as has been variously considered at other sites, is a risky and inappropriate approach to rehabilitation. This strategy has, in other	Unfortunately we do not have access to your records so are unable to provide a list of reports to your department for you. WE have searched your website but to no avail. We have listed below the two incidents that have been reported by Vista Gold; 2009 – 10: No reportable incidents 2010 – 11: No reportable incidents 2011 – 12: 1 reportable incident 27:12:11. Uncontrolled discharge from RP1 following boxing Day flood event where site received >384 mm of rain in a 12 hour period resulting in a rise of the river >10m. Associated flooding saw the Western Diversion drain breached which resulted in clean water runoff from the Yinberrie Hills quickly filling RP1 and subsequent over flow over the spillway for 3 days. Volume of discharge is unknown however results of company and independent sampling indicted no measurable impact the downstream receiving environment. 2012 – 13: 1 reportable incident. Uncontrolled discharge from RP2 & RP5 as a result of a localised storm following a power outage and pump failure. Discharge ceased at 0400 on 23:02:13. Total discharge not known but it was estimated that approximately 10 ML discharged from RP2 and a smaller volume from RP5. Analytical results from sampling performed by Vista and independently by the DME indicate that the uncontrolled releases had no measurable impact the downstream receiving environment.

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				instances, proven vulnerable to the economics of the renewed mining activities, and the technical capacities of the new proponent. In the case of Redbank, dalliance with a mining proposal that eventually proved uneconomic has contributed nothing towards rehabilitation. In the case of Rum Jungle, the proponent was observed to withdraw from three party discussions on rehabilitation objectives once approvals were granted; enter liquidation after a few short years of technical mismanagement; and abandon the site, which now remains an additional environmental hazard in the highly contaminated mining province. Vista gold should be required to maintain the site in a better condition than when it was purchased rather than 'an equal or better condition' as it states in the EIS. Furthermore, the project alternatives should more clearly address a scenario of immediate rehabilitation of the site. The proponent should compare costs and likely outcomes of immediate rehabilitation, to plans for rehabilitation after further mining. In addition, ongoing liability for rehabilitation should be more clearly defined. The guidelines specify that the proponent detail the history of incidences at the mine including those since Vista Gold took over operation. There is no mention of the recent overflow of 2 retention ponds in February 2013 and the release of 2 million litres of contaminated water into the Edith River from retention pond 1 in April 2013. Similarly, in 2011 uncontrolled discharges occurred from retention pond 1 and discharged in to the	

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				Edith River. The number of incidences highlights the risks associated with high rainfall events and the inadequacy of existing infrastructure to deal with the local climatic conditions.	
4	Rob Law Environment Centre NT Policy Officer	1.5.3	Water management and contamination risks including AMD	Mount Todd has been the source of numerous contamination incidences in to the nearby Edith River over the years, several of which have occurred under Vista Gold's management. We maintain that it is unacceptable for any untreated water to be released into the Edith River even if it is considered legal under the Waste Discharge Licence (WDL) it does not reflect the expectations of the community. Vista Gold needs to demonstrate a strong commitment to becoming a 'no pollution mine' during the operation to satisfy a social licence to operate. The EIS states that "all potentially contaminated water exiting the site during normal operating and rainfall conditions will be treated prior to discharge to meet criteria defined in the Waste Discharge Licence." Given the demonstrated risk of flash flooding in the area, a commitment should be made that all water be treated prior to discharge. This would require investing a water plant capable of higher volumes than currently proposed. The residual risks for overflow from the retention ponds, severe rainfall event leading to AMD in surface runoff, and failure of retention pond wall or creek diversion were all considered medium. Overflow from RP1, RP2, HLP and RP5 can occur during high intensity storms and is the result of insufficient pump capacity on pipelines to the equalisation pond. Retention Pond 1 has	It is anticipated that during operations, water management and any potential associated issues will be entirely different to the current situation where an excessive water inventory is present on site. Vista is committed to operating and managing water according to the regulatory requirements that will apply during operations. Further surface water modelling refinements will be undertaken during the Feasibility Study stage of the Project with the results incorporated into detailed design and the Mine Management Plan and relevant Environmental Management Plans that will be subject to DME approval. It is not anticipated that there will be any significant change to the model. However if there is a significant change to the Project, the DME may require Vista Gold to submit another EIS.

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				been the largest source of contaminated water over previous years so this should be strengthened to prevent overflow. The environmental impact of such events and the history of contamination from such events should require these risks to be low. The comments in the EIS recognise that additional engineering requirements are needed yet it is not clear how this has been responded to. If the proponent cannot implement measures to reduce this risk then approval should not be granted. Surface water modelling should provide maps of changed surface water flows under the new topography of the mine at different stages of operation and closure.	
16	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.	10	Retention pond 1 (RP1)	What is clear from the EIS documentation is that Acid Rock Drainage & Metal Leaching (ARD/ML) will be an ongoing issue in RP1 and potentially in the rivers downstream. AFANT is extremely concerned that Vista Gold has not adequately addressed the issues of controlled/uncontrolled discharge from RP1 during mine operation and it seems that the easy solution of a waste discharge is the preferred option in case of large rain events which occur most wet seasons in this catchment. The EIS documents have identified that the water storage capacity in RP1 will be reduced due to infill from the WRD and although it states that the retention pond will be deepened, it is unclear on the impact of this on water discharge. AFANT request that Vista Gold is required to	Refer to A. Butler memorandum on RP1 deepening. Overall lowering RP1 by 3 meters will increase the capacity to the projected requirement once the WRD has been fully constructed. This adjustment to RP1 may be modelled in the DFS level water balance model to confirm no overtopping events would be expected under typical conditions for the site during operations. Extreme events will be the exception. We note that during this scenario the dilution ratio will be very high and no measurable impact to the environment is expected (as has been the case in the past). After operations the source of AMD is eliminated by encapsulation and therefore the natural stormwater runoff will occur.

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				investigate or provide alternative solutions including raising the RP1 Dam wall and installing larger pumps to provide greater protection to the downstream river systems so water can be treated prior to discharge. While we fully understand the site limitations and the risk of extreme rainfall events at the Mt Todd mine site, we believe that Vista Gold has not fully investigated alternative management arrangements to address solutions to restrict or remove the requirement of untreated water discharges from RP1. Based on past experience and the current situation at the site, AFANT also has a concern with the assumptions and apparent confidence that there will be no ARD/ML from the waste rock dump after mine closure. If this is proven incorrect the sheer scale of the waste rock dump will create significant and difficult legacy issues at the site. AFANT is concerned that there is no plans to substantially increase the size and freeboard of RP1 considering the acknowledged risk and expectation of ongoing untreated discharge from this water body.	
17	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.	10	Retention ponds RP2 and RP5	The small retention ponds RP5 and RP2 below plant and low grade ore stockpile have been proven insufficient to control site run-off of acid mine drainage water during rain events from the low grade ore stockpile and mine plant areas. It is apparent that a number of incidents have	The existing RP2 will be closed and a new retention pond associated with the LGO stockpile will be sized prior to production. The exact sizing of the new RP2 will be determined as part of the DFS. The RP5 liner will also be replaced prior to production and will be for the collection of non-contact stormwater from the plant only. In summary the current ponds RP2 & RP5 will not be utilised during operations or as part of the Closure Plan.

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				occurred when ARD/ML water has been released into the environment from these small storages. AFANT is extremely concerned that this risk does not appear to be acknowledged or addressed in the EIS. While AFANT understands from the documents that the LGO stockpile will be reprocessed and removed, this area still poses a risk of ARD/ML water discharge during the mine operations. It is clear that the retention ponds RP5 and RP2 and current pumping systems have been insufficient to collect and control water discharges. AFANT requests further information on what actions the company will undertake to protect the Batman Creek and the Edith River from ARD/ML water discharges from the mine plant and low-grade ore stockpile areas. AFANT has concerns with the site infrastructure planning and layout considering the extreme rainfall events that are common in the mine location and the risk associated with proximity of key mine assets adjacent to waterways. AFANT is also concerned regarding the statement (Vol 1, 10-16) that run off from the low-grade ore stockpile and plant area during the closure phase will be decommissioned and allowed to drain untreated into the Batman Creek. This area has shown over recent years to produce ARD/ML water and	

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				needs to have an effective long term treatment solution.	
34	Dr Anne Walters Strategic Projects Officer The Parks and Wildlife Commission of the Northern Territory	10	Water Management	Water management at the site relies upon dry season evaporation and wet season release (after treatment). The site is currently at capacity. We are interested in how Vista Gold will manage water release in response to extreme weather events or changes in weather conditions into the future.	Chapter 10 addresses the surface water aspects of the Project. It summarises the existing surface water environment, including water resources, hydrology, water quality and water monitoring in the vicinity of the Project. This chapter provides an assessment of: • existing water containment infrastructure through water balance modelling; • flood risk and existing stormwater management; • current and proposed water quality, • current and proposed water quality monitoring program. Potential impacts and mitigation relating to stormwater, flooding, water quality and hazardous substances is discussed. Detailed surface water assessment is provided in the following Appendices: • Surface Water Assessment - Hydrology (site water balance models, and stormwater and flood management) - Appendix I; and • Surface Water Assessment and Monitoring Program (current and future water quality, water treatment plant, monitoring program) - Appendix J. The potential impacts and associated mitigation measures identified in this chapter form the basis of the surface water component of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence, likelihood and residual risk ratings for surface water impacts after management measures are implemented. Chapter 1 provides a recent history of water management at Mt Todd since Vista Gold assumed control of the site, and Chapter 14 provides a discussion about aquatic fauna impacts and management.
43	Xavier Schobben Director Environmental Health Branch Dept. of Health	10	Surface Water	While "direct results to fish through gill exposure to heavy metals, including copper and bioaccumulation through the food chain" has been identified as a potential adverse effect, a monitoring program to alleviate public concerns does not appear to have been considered. The effect on downstream fisheries was identified as being of concern to stakeholders, and the establishment or contribution to a fish monitoring program is highly recommended. There does not appear to be any commitment from Vista Gold	Notwithstanding that the train derailment was not related in any way to Mt Todd it has provided valuable information about the resilience of the loacl environment. In 2012 after the train derailment at the Edith River crossing the Food Standards Australia and New Zealand (FSANZ) supported by the NT Department of Fisheries conducted an extensive risk assessment to assess the impacts of trace elements (arsenic, cadmium, cobalt, copper, lead, manganese, mercury, nickel and zinc) in the diet. The amount of fish flesh and livers that could be safely consumed was calculated for fish sourced from the Edith River in a long term dietary exposure. The Daly River was used as a control site. Edith River showed higher median values for cobalt, copper, manganese and zinc and similar values to fish from the Daly River for cadmium, lead and nickel, with mercury being lower in the Edith River. The amount of fish flesh sourced

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				regarding the monitoring of edible fish in the Edith River. The mine has the potential to socially impact on the local Aboriginal population through the erosion of hunting/fishing practices if reassurance of the safety of fish stocks is not provided. While the benefits of monitoring macro invertebrates and fish community structures is acknowledged, the general public is more concerned with the bioaccumulation of heavy metals in fish species significant to recreational and commercial fishermen.	from the Edith River that could be consumed by children 2 to 5 years was 2.1 kg/day before the respective health-based guidance value was exceeded. The maximum number of fish livers that could be consumed by children 2 to 5 years is 31 before the respective health-based guidance value was exceeded. As this research was conducted after the train derailment spilling copper concentrate into the Edith River, these results are considered to be a "worst case scenario" with conditions improving over time. The Department of Fisheries is considering conducting an additional study in the future.
44	Xavier Schobben Director Environmental Health Branch Dept. of Health	10	Surface Water	The potable water supply for the site is privately managed. Surface water from the Raw Water Darn (RWD) will be filtered, chlorinated and then UV sterilised prior to storage. It should be noted that turbidity in the raw water may be seasonally affected and will impact on the effectiveness of both UV and chlorine disinfection steps. Chlorine residuals should be monitored at point of use and regular water samples taken for bacteriological testing by a NATA accredited laboratory. Waste water treatment will be either via septic tanks or packaged treatment plant. Once a decision has been made as to the type of waste water treatment system that will be installed, the Department of Health will require a wastewater works design approval to be submitted prior to the installation of a system. Estimated daily flows to be in the order of 165kL per day. Further information is provided in the attached DOH Fact Sheet 700: Requirements for Mining and Construction Projects.	We thank you for the additional information and will ensure it is incorporated during the detailed design phase of the project. We are aware that there are a significant number of separate approvals, and in some cases licences, required to operate.
63	PAUL PURDON Director Pollution Control Northern Territory	10	Surface Water General water management	In general terms the information provided in the draft EIS on proposed surface water management is in some cases unclear or inconsistent. For some issues it is not clear	Similar to comment 21, a GFA figure will be produced as part of the DFS.

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	Environment Protection Authority			whether text is referring to the existing situation, modelling results or proposed management. The NT EPA recognises that detailed engineering will inform final water management system design, yet further information is required to enable an adequate assessment of what is proposed. To assist the assessment of the proposal, the following is requested: • Map(s) showing layout of all existing and proposed water retention/ treatment and discharge infrastructure including, wherever possible, proposed drainage channels for "clean" and "dirty" surface water and proposed pipelines between retention bodies and infrastructure. If accurate mapping is not able to be provided, conceptual or schematic layout(s) should be provided. (Appendix I, page 8 refers to pipeline schematics: "Schematics of pipelines can be found in figures 2-I to 2-5 of Mt Todd Gold Project Water Management Update-Appendix I-M (Jan 2011 Vista Gold)". It is unclear whether this report may be of assistance in meeting the above request.	
137	MIKE FAWCETT Director Mining Remediation	10.1.3	Local Catchments	Under the Water Act 1992, the declared beneficial use of surface water from the Edith River and its tributaries is the protection of aquatic ecosystems Please reference the current legislation, the Water Act 2011	Erratum: Water Act 1992 should read Water Act 2011.
138	MIKE FAWCETT Director Mining Remediation	10.1.7	Current Surface Water Quality	Units for the conductivity are wrong for some sites. mS/cm must be changed to µs/cm	Conductivity amendments for Figure 10.5: SW2 EC 18 µS/cm, SW3 EC 37 µS/cm, SW4 EC 52.15 µS/cm, SW10 34.5 µS/cm
64	PAUL PURDON	10.18	Current Fate and	The draft EIS cites the lack of total organic	The lack of TOC within the localised downstream reach of the Edith River

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	Director Pollution Control Northern Territory Environment Protection Authority		Effects of Contaminants	carbon (ToC) in sediments and large particle size for sediments in the Edith River as a major reason for why monitoring has not shown an impact on macro invertebrates in locations studied. Is Vista Gold proposing to monitor for impacts in locations further downstream from the mine site where ToC and sediment particle size may not act to limit metal retention?	system is suspected to be one of the possible reasons for the absence of an impact on macro invertebrate populations. The spatial extent of the Edith monitored to date ends at the Stuart Highway, and it is agreed that aquatic environments further downstream may have different levels of sediment TOC. Monitoring of macro invertebrates beyond the Stuart Highway is not being considered by the company at this stage, primarily due to the increasing complexity and inability to separate out any effects of macro invertebrate impact from other sources. Such sources can include anthropogenic factors such as the 2011 Train derailment, runoff from adjacent cropping and farming, or natural factors such as the confluence of the Ferguson River or localised habitat variation.
67	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance results	Variation in the proposal since the water balance modelling was completed, for example, the increased footprint of the Batman Pit and 30L/s groundwater inflows, could lead to scenarios outside of the modelling predictions. Provide discussion on this to demonstrate that any such variation outside of the model parameters will not lead to significant changes in the model out uts beyond those predicted.	Groundwater inflows to Batman Pit are not modelled in the PFS water balance. The DFS level water balance may be refined to include pit inflows.
68	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results - Water Containment Facilities - Operations Phase	The proposed capacity (as modelled) of the equalisation pond is 30 000m . This is stated as sufficient to receive transfers from RP1, RP2, RP5, TSFl, TSF2 and Batman Pit to prevent overflows during normal operations at a WTP rate of 300m'/h (years I-3) and 500m'/h (years 4-12). Appendix I(page ii) states that capacity of the equalisation pond is sufficient to receive transfers from Batman Pit, RP1, HLP, and RP2. • Please confirm the full suite of retention ponds and water management facilities that will transfer water to the equalisation ponds for treatment (years I-3 and years 4-12 if there is any difference between years). • Please explain the reason for the difference	The WTP will treat water from the following: RP1, RP2, RP3, RP5, the HLP and RO discharge from the power plant. The WTP also accepts a bleed stream from the TSFs. The WTP is designed to treat at a rate of 500 m3/hr throughout the life of the mine. Additionally, the LGOS retention pond (currently identified as RP2) will be relocated and resized. During pre-production, retention ponds may send to TSF1 as a possible solution to uncontrolled discharges.

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				in WTP capacity rate between years I-3 and years 4-, 2. • Has an increased capacity rate for the WTP of 500m'/h in the first three years been considered as a contingency should mining operations commence prior to the assumed emptying of Batman Pit and substantial dewatering of RP1 and RP7? • Would increasing the capacity of the equalisation pond further reduce the likelihood of retention pond overflows?	
70	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results	Simulated flows shown in Table 10-5 indicate overflows at RP1, RP2 and RP5 in the Wet season due to insufficient pump capacity on pipelines to the equalisation pond during extreme rainfall events. The draft EIS also states (Chapter 2, page 2- 39) that RP5 will be diverted into Batman Creek and on page10-18, "RP5 overflows are to be expected given its function as a sediment trap rather than an RP". Chapter 12 of the draft EIS states, "Water chemistry in Batman Creek, RP5 and RP6 (MWH 2006) indicates that AMD is occurring from the existing process plant and pad area".	The DFS level water balance model will include the following to mitigate the risk of overtopping events: deepening of RP1, relocating and resizing of RP2 and pre-emptive pumping to the TSFs prior to an extreme storm event during the pre-production phase.
79	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results - post closure phase	Given the uncertainties associated with the passive treatment method post closure, there is concern that this method will be unable to cope with the potential seepage flows that would otherwise be actively transferred to the WTP during operation. This uncertainty should be discussed in the Supplement, including contingencies in the event that the mine closes ahead of schedule.	During the Detailed Feasibility Study, a seepage analysis will be undertaken to estimate the volume of water requiring to be treated following closure. This will be combined with kinetic analytical data to design a passive treatment system
80	PAUL PURDON Director Pollution	10.2.4	Water Balance Results - Water	Explain in more detail how the catchment of RP1 will be reduced as the WRD increases in	RP1 accepts basin surface runoff, seepage from the WRD and direct precipitation onto the RP1 pond surface. As the WRD grows, it occupies area

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	Control Northern Territory Environment Protection Authority		containment facilities - operations phase	size, thereby reducing the surface flows to RP1.	that formerly contributed surface runoff. During operation, all precipitation occurring on the WRD is assumed to enter the dump and report to RP1 in the form of seepage.
81	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results - Water containment facilities - operations phase	Provide a detailed map showing the proposed diversions around the WRD and where surface runoff would report to from different areas of the WRD as it expands.	Similar to comment 21, a GFA figure will be produced as part of the DFS.
82	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results - Water containment facilities - operations phase	ITEM 1 - Describe the staging of the capping of successive WRD lifts that would allow clean water to shed into diverted channels away from RP1, including at what stage of the WRD scheduling the diversion channels would be constructed	At this stage of the project, a year by year build-out of the WRD has not been completed. For cost estimating purposes it was assumed that concurrent reclamation would occur annually, but as no scheduled build-up of the WRD has been produced, this is not shown on figures. Diversion channels and down chutes conveying stormwater run-off from the WRD have not yet been designed at this phase of the project. These items will be addressed as part of the completion of the DFS and permitting phases of the project.
83	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results	Pages 10-18, 10-19: states that water management leading up to and during peak rainfall is likely to invoke different operating rules to those used in the Goldsim model. The same expression is used in Appendix I (page ii), which also states, "could involve measures such as temporary transfers of excess water to the TSP'. The language used is non-committal, yet the proposed management measures leading up to and during peak events are listed as commitments (Chapter 23) and will be considered as such by the NT EPA.	Pre-emptive pumping from the RPs to the TSFs is considered a possible remedy to uncontrolled discharges during the pre-production phase.
85	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water balance results - Water supply - operations phase	Describe the implications of a failure in water supply for dust suppression for 4% of days in the year after year three. Provide contingencies for these failures, particularly during high risk periods for dust generation.	The water balance model results do not indicate any failure in water supply from the RWD, even for the least (most extreme) result. In essence, the RWD stage is always greater than the lowest elevation at the RWD, for all scenarios.

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139	MIKE FAWCETT Director Mining Remediation	10.2.4	Water Balance Results	"Seepage flow from the future TSF-is estimated to vary between 6.5m3/day and 52.5m3/day. Seepage flow from the proposed TSF2 will vary between 25m3/day and 176m3/day and will require transfer to the WTP until a passive treatment wetland is constructed"	Similar to comment 6, seepage is to be included in the DFS level water balance. We have made provision for the water to be transferred until the site is closed.
140	MIKE FAWCETT Director Mining Remediation	10.2.4	Water Balance Results	Horseshoe Creek and Edith River are in close proximity to TSF 2 making any proposed passive treatment wetland system difficult to construct.	No passive treatment is planned for TSF2 as it will be lined and considered a zero-discharge facility. This will be further evaluated during the Detailed Feasibility Study.
141	MIKE FAWCETT Director Mining Remediation	10.2.4	Water Balance Results	How will Vista ensure the wetland system is constructed to treat volumes up to 176m3/day of acid and metal laden water?	The waste rock facility will be constructed to minimize rainfall from entering the rind and coming in contact with PAG material. As such, following final closure of the waste rock facility, drain-down will occur that will be treated by a combination of the active and passive treatment, with the active treatment plant remaining on-line until it is proven that the passive treatment system is considered effective. During the Detailed Feasibility Study, a seepage analysis will be undertaken to estimate the volume of water requiring to be treated following closure. This will be combined with kinetic analytical data to design a passive treatment system. The value of 176m3/day is expected within the first year only. Seepage rates <50m3/day are more likely within two years of the cessation of mining. It should be noted that the source of AMD will be eliminated due to the progressive rehabilitation of the WRD and the operation of the TSF's under an basic (+10pH) environment. **Additional Comments** Attachment B is WRD design evaluation dated June 11, 2012
142	MIKE FAWCETT Director Mining Remediation	10.2.4	Water Balance Results	"If all water storages are at or near capacity, excess water will be redirected to the TSFs up to the height of beached tailings for temporary storage". Table 10-5 indicates overflows from RP1, RP2, RP5 and HLP would most likely occur in the first 4 years of operating. Given that TSF 2 will not be constructed in the first four years, does TSF I have the capacity to receive	The volume of water to be sent to the TSF1 will be determined from the DFS water balance model.

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				excess water from RP1, RP2, RP5 and HLP after heavy rain events? Does the storage volume 4680ML account for the fact that the TSF can only receive water up to the height of the beached tailings?	
143	MIKE FAWCETT Director Mining Remediation	10.2.4	Contaminated Water	"Given the existing conditions in Batman Pit, and the large exposure of PAF material on the high wall (much of which will remain above water), it is highly likely that post-mining the Batman Pit lake will become acidic" - Chapter 12, Section 12.31, pp. 12-11 Is Vista planning for the pit water to become acidic from AMD generated from the exposed pit wall rock? Does this adhere to their closure objectives of controlling acid-generating conditions, ' reducing or eliminating the acid and metal loads of seepage and runoff water; physically and chemically stabilise mine waste?	A pit lake study is yet to be undertaken. An evaluation of the pit lake model will be undertaken following the completion of the groundwater model during the Detailed Feasibility Study. The water modelling does not predict that the pit fills to overflow. It is most likely that the source of AMD will scale over and "shutdown" as a source. Under the water surface there is not enough oxygen for the natural AMD process to occur.
74, 75, 76, 77, 78	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.4	Water Balance Results	The draft EIS highlights a number of times that shorter duration and higher intensity rainfall events pose greater risk to overflow from the water conveyance infrastructure and smaller retention ponds on the site (RP2, RP5 and HLP). This is predicted in the water balance model, which the draft EIS explains as most likely the result of insufficient pump capacity on pipelines to the equalisation pond during extreme rainfall events. Given the increased likelihood of overflows from smaller retention ponds, additional risk controls (e. g. structural) proposed for these retention ponds, other than the proposals to increase pump capacity and pump to the	The water balance is structured so that no overtopping is allowed at the equilization pond as the chemical characteristics within the lesser RPs is considered more benign than that which is found in the EQP, which receives water from all RPs on site. As such, the threat of overtopping would occur at the lesser retention ponds but never at the EQP. RP2 (the LGOS pond) will be re-located and re-sized. RP5 will be relined. Last, site protocol dictates that water may be pumped from the RPs to the TSF during pre-production as a pre-emptive measure prior to an extreme storm event, the details of the protocol are to be established in the DFS. Retention ponds are designed to the 100-year ARI.

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				TSFs, should be discussed. Include in the Supplement: • Measures planned to reduce these modelled overflows from RP2, RP5 and the HLP for the life of the mine; • The proposed structural changes to be made at each retention pond/storage pond on site; • The changes to the pumpline infrastructure at the retention/storage ponds on site; • The changes to the pump capacity at the retention/storage ponds on site; and • The current design standard (or engineer estimated design standards) and the proposed design standard for each retention/storage pond.	
86	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.2.5	Water balance summary	Post closure - Indicate how long it would take for the seepage flows from tailings storages to be reduced to the rates predicted in the draft EIS and whether the flows would be treated actively in the interim.	The predicted minimum seepage rate of approximately 6.5 m3/day corresponds to start-up of stacking operations in TSF1 while the maximum seepage rate of 152.3 m3/day corresponds to end of stacking operations in TSF1. Similarly, the minimum Seepage rate of 25m3/day for TSF2 corresponds to start of stacking operations whereas the maximum seepage rate of 176 m3/day corresponds to end of life conditions. Post closure, seepage flows from TSF1 are expected to report to a passive treatment wetlands. AS TSF-2 is lined, it is not expected to require treatment. In summary it is predicted that the flows will be at residual levels in under for years, hence the four year period. This also ties to the areas that are revegetated as they will require some of the same before a successful comparison to a reference survey site.
66	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.21	Water containment - Infrastructure	A footnote to Table 10-3 states the storage capacity of the equalisation pond is "reported to be equivalent to 5 days MP Capacity (36ML) but in foot is only 30ML in the Goldsim model'. Please confirm the proposed capacity of the equalisation pond (in ML and days WTP capacity).	60,000 m^3 capacity, or 5 days at 500m3/hr.

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88	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.3.5	Impacts from flooding and stormwater- Table 10-6 and Table 19 in Appendix I.	Explain why the value for the 100 year ARI intensity for Batman Creek is lower than that of the 10 year ARI intensity.	The rainfall intensities for Batman Creek have been entered incorrectly The correct values are as follows; concentration 2.74 hrs, which are 32mm/hr (10yr) and 57mm/hr (100yr). These revised rainfall values would produce flood peaks that agree with the reported flood peaks in Table 20. Table 19 is amended to include rainfall values for Batman Creek of 32mm/hr (10yr) and 57mm/hr (100yr). Stow Creek The flood peak reported in Table 20 (691 m3/s) is an overestimate compared to the result (546 m3/s) obtained with model inputs reported in Table 19. We have amended Table 20 to reflect a flood peak of 546 m3/s. We will have to assume the correct flood peak was used to obtain the flood outline in Figure 9 or accept that it is slightly pessimistic in terms of the extent of flooding. Attachment L - Appendix I - Surface Water Assessment - Hydrology Rev 2.doc contains the updated tables
89	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.3.6	Flood and stormwater management measures	The diversion channel designs for Horseshoe and Stow Creeks appear very simplistic with very little design detail to assess. The diversion channels contrast completely with the natural creek channels, particularly with respect to sinuosity. This would suggest that flow velocities are likely to be increased by the diversion channels. Information needs to be provided on: • how these channels would key in to the original upper and lower reaches of the creeks so that erosion of the lower reach and progressive degradation of the upper reach are minimised;	This level of detail to be discussed as part of the DFS. The purpose to date is to ensure that there is a design that can achieve the project requirements and that we are able to make the capital cost provisions in the economic model.
90	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.3.6	Flood and stormwater management measures	• whether the lower reach would be protected from increased velocities caused by the diversion or what measures would be taken in the diversion channel to reduce velocities in higher flows to maintain the integrity of the natural channel;	Riprap will be used. We know where there is a good source of very hard rock.

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91	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.3.6	Flood and stormwater management measures	• Whether the 100 year ARI is an appropriate, post-closure criterion for diversion design when considering the TSF.	No formal guidelines exist for the Northern Territories. The 100-year, 72-hr duration storm is typically used as a design basis.
94	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.4	Surface water contamination	The suggested changes to better separate clean and contaminated stormwater runoff will create more complex drainage areas. Procedures for measuring inflows to the ponds to validate the modelled predictions and allow for future adaptive management should be provided in the Supplement.	Inflows and outflows via pumps will be measured by flow meters, or calculated via pumping records and measured flow rates. Inflows from direct incident rainfall can be calculated from rainfall records. Inflows from catchment runoff could be measured via a physical structure such as a weir, but would only be feasible where the runoff combines to a single consolidated flow prior to entry of the pond. Direct measurement of the surface runoff from broad catchment areas such as TF1 would be impractical and fraught with error. Calculation of inflows from catchments to ponds typically will be done via measurement of the change in pond water level, and accounting for other difficult to isolate flows such as seepage and evaporation via other data or typical approaches
95	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.4.5	Management and mitigation of surface water contamination - passive/semi-passive water treatment	There is no information available in the draft EIS to be able to determine the suitability or appropriateness of the proposed semi active/passive treatment system for use at the mine. The Supplement should provide: • An indication of when proposed semi-passive water treatment will be conducted if finalised; and	The passive water treatment system will be further evaluated during Detailed Feasibility level design. Presently at the Preliminary Feasibility Stage, the conceptual design has the passive treatment system being built following closure and drain down has reached an acceptable level. An assessment of the drawdown will be undertaken during Detailed Feasibility level work. There is no reliance on this. It is a logical contingency as the source of AMD is addressed during operations and closure activities as it low cost and may provide some advantage.
96	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.4.5	Management and mitigation of surface water contamination - passive/semi-passive water treatment	• Contingencies that may have been considered should the proposed passive or semi-passive water treatment be found to be ineffective/ not a viable option.	The water treatment system will remain operational until the effectiveness of the passive treatment system has been proven.
97	PAUL PURDON Director Pollution Control Northern Territory Environment Protection	10.4.5	Management and mitigation of surface water contamination - Sewage treatment	Page 10-33: potential need for a WDL for proposed sewage treatment plant. Can Vista Gold provide any indication of the anticipated water quality from the proposed Sewage Treatment Plant?	Vista to procure permit for leach field/septic system, if required.

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98	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	10.4.5	Management and mitigation of surface water contamination - TSF2	It is difficult with the information provided to assess how the toe of TSF2 is placed relative to higher flows in Horseshoe and Stow Creeks. Discuss how the drainage systems proposed for the TSF2 would be protected from flooding or damage associated with high flows.	The downstream shell of TSF2 will be constructed using Non-PAG waste rock material. Selectively sized waste rock will be used for embankment construction based on a scour analysis to prevent erosion. The scour analysis will be performed during the feasibility study phase of the project. An erosion protection bund constructed at the downstream toe adjacent to the horseshoe and stow creeks will be incorporated into the design, if required. Note that the downstream toe of TSF1 constructed from selectively sized waste rock did not exhibit noticeable erosion after the December 26, 2011 storm event which caused significantly high stream flows in Horse Shoe Creek.
144	MIKE FAWCETT Director Mining Remediation	10.4.5	Management and Mitigation of Surface Water Contamination	TSF2 "It is proposed that TSF2 will operate as a zero discharge facility with management incorporated into the design in case of mechanical failure and other causes of system overflows or excess drainage" "The water quality of seepage collected in the underdrain seepage collection sump will be monitored regularly and the water discharged directly to natural drainages if its quality meets discharge standard" The two statements are contradictory. Will TSF2 pump all seepage back into the TSF facility or will discharge occur under certain conditions?	Seepage from the tailings mass will be collected by a network of over drains placed atop the geosynthetic liner. The underdrains will be placed below the liner to collect and manage incidental groundwater inflows to prevent liner uplift immediately after installation. As such, discharge from the underdrains is likely to be classified as non-contact. To ensure compliance with discharge water quality standards, the water quality from the underdrains will be monitored prior to discharge.
145	MIKE FAWCETT Director Mining Remediation	10.4.5	Management and Mitigation of Surface Water Contamination	Does Vista believe the water quality of the seep will likely meet potential discharge requirements of 95% ANZECC water quality guidelines?	See page from TSF2 will be recirculated within the process circuit with no untreated discharge planned. See response to Question 144 for further clarification regarding the design intents for the over drain and underdrain system. It is unlikely that the water quality of seepage from facilities that generate AMD will meet 95% ANZECC & ARMCANZ (2000) 95% trigger values. However, this water is proposed to be diverted to passive/semi passive water treatment systems. The location and final form of the passive treatment systems have not yet been determined, however, the water quality to be treated will be used to design the systems. These systems will be designed to ensure that the water

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					leaving the passive treatment systems will meet the WDL specified limits at the designated monitoring location on the Edith River. Please note that there is no intention for Vista Gold to develop a 95% ecosystem protection system. The weight of empirical data does not support the need to target this level of protection.
146	MIKE FAWCETT Director Mining Remediation	10.6.2	Surface Water Monitoring Program	Please include estimated acidity load as a parameter to be reported each month.	Measuring acidity will not provide additional information for environmental protection. The Eco toxicological testing conducted on the proposed discharge water provides an integrated assessment of environmental impacts including the effects of acidity. The Ecotox testing in combination with the routine monitoring program specified in the Discharge Management Plan will provide sufficient information to manage the mine discharge for downstream ecosystem protection.
105	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	11	Hydrogeology	The hydrogeology report indicates that following mine closure, the 1m drawdown contour continues to expand westward from the Batman mine pit into the Yinberrie Hills. Figure 11-12 shows continued extension of the predicted drawdown to 500 years and although it sits within the mining lease appears to affect a considerable area of vegetation. Chapter 13 discusses drawdown impacts briefly in the context of the threatened bladderwort and Chapter 14 includes no discussion of this potential issue. It is unclear how long and to what extent this drawdown would continue and what the likely impacts to affected vegetation in the Yinberrie Hills would be. This should be discussed in the Supplement in the context of the significance of the vegetation in the affected area of the Yinberrie Hills to listed fauna, particularly the Gouldian Finch, and what this continued expansion of drawdown might mean for fauna populations in the long term.	The impermeable nature of the hornfels in the western portion of the mine sites, and the hornfels basement rock to the south and east are expected to cause a localised drawdown of the water table (Appendix K). The basement rock to the east is overlain by the less metamorphosed Burrell Creek Formation and is more permeable. This is likely to result in a reversal in groundwater flow towards the pit. Groundwater in the vicinity of water storages (to the east and south of the pit) at the mine site is causing water mounding and contamination of groundwater with metals. Areas to the immediate north and west of the mine (hornfels) are unlikely to suffer significant lowering of the water table or contamination (Appendix K of the Draft EIS). Mounding and contamination are proposed for rehabilitation during the course of the mine life. Areas of hornfels to the west of the pit are unlikely to be affected by drawdown from mining. Areas to the east and south of the mine are largely cleared and this will expand during mine development. None of the above potential impacts is likely to occur in the vicinity of the threatened bladderwort. As there is no drawdown modelled to the west of the Batman Pit (Yinberrie Hills SOCS) no impact is likely to occur.
148	MIKE FAWCETT Director Mining Remediation	11.6	Management Measures	No groundwater monitoring program has been provided.	The details of a groundwater monitoring programme are considered to be operational details, and as such are addressed within the Mining Management Plan framework and approval process. Vista Gold will ensure the proposed

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				Please provide a groundwater monitoring program that outlines: 1. The monitoring bores to be sampled 2. The parameters to be monitored. (Tracer TSF signature parameters should be included in the program for bores surrounding the TSF, i. e. N03-N02, NH3, Thiocyanate, Total cyanide, WAD cyanide) 3. The frequency of monitoring	groundwater monitoring programme for the site in production, thoroughly considers all of the potential contamination sources, monitoring frequency and types of parameters necessary for adequate environmental assessment. A copy of the current Management Measures is included in the current MMP which is in the DME library
106	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	12	Acid and Metalliferous Drainage 12.3.3 Tailings Storage Facilities	The draft EIS states there is an increased risk of increasing uncontrolled seepage flow rates from a raised TSFl if left unmanaged, and proposes reinstating the existing underdrainage system to minimise potential impacts at TSFl. At page 12- 16 the draft EIS states the operational concept that TSFl will become a "zero discharge facility with all contact water from TSFl contained within the process circuit". Refer Figure 11-13 (Volume I).	When TFS is operated as a TSF then there is almost no seepage. Currently it is not operated as a TSF and this is driving a different outcome. **Additional Comments** Since cessation of mining activities in 2000, TSF1 has been used to store contact water as required for site wide water management. The use of TSF1 as a holding pond has resulted in increased water levels in RP7 and expansion of the pool which is contrary to the design intent. The outlet to the collector drains which collect and discharge tailings seepage to the lined return water pond have also been shut to enable storage of water within the TSF. The combination of increased water levels in RP7 and closure of the underdrain outlets has resulted in seepage along the downstream portions of the embankment. Planned treatment and discharge of contact water for future operations will enable lowering of water levels in RP7. Lower water levels in RP7 combined with recommissioning of the underdrain system by opening the outlets are expected to reduce or prevent seepage through the embankment. As a contingent design measure, a peripheral downstream drain has been included in the design for TSF1 expansion to intercept and collect seepage flows observed at the downstream toe of the embankment. The quoted flow rates of 9,600 m3/day and 10,200m3/day represent decant rates from TSF1, not seepage rates. A seepage analysis for TSF1 will be performed during the Feasibility Study phase of the project. The location south of the existing heap leach pad was considered as an alternative site for TSF2 as discussed under Section 3.7.4 of the EIS. The

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					proposed location for TSF2 east of batman pit minimizes disturbance to identify cultural heritage sites and the existing Horseshoe Creek and Stow Creek.
107	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	12	Acid and Metalliferous Drainage 12.3.3 Tailings Storage Facilities	What will "reinstating the existing underdrainage system "involve?	We need to remove the concrete blocks from the decant tower inlets and open the valves at the decant pond.
108	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	12	Acid and Metalliferous Drainage 12.3.3 Tailings Storage Facilities	When during production is this work to be carried out?	This work will be done as soon as there is a requirement for process water. There may be some opportunity to do this earlier when the TSF is converted from its current pH to a basic state. This will simply be a recirculation of the water at a managed pH.
109	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	12	Acid and Metalliferous Drainage 12.3.3 Tailings Storage Facilities	Are there other management and/or contingency measures proposed for seepage from TSFl?	The current acidic surface conditions a TSF1 are not reflective of the future alkali operating conditions. Section 2.6.4 of the EIS provides an overview of the operational strategy of for TSF1 which is expected to receive an additional 62 Mt of alkali tailings in the first 4 to 5 years of operation. Re-establishing appropriate operational practices at TSF1 will see re-opening of the existing toe-drain and underdrain system that conveys seepage water to the return water pond for further re-use in operations. Use of the existing TSF1 underdrainage system correctly is expected to significantly lower uncontrolled seepage rates. In addition, alkaline process water is planned to be pumped into TSF1 during mining, thereby lowering dissolved metal concentrations in leachate. Chapter 24 of the EIS outlines the closure and rehabilitation strategy for TSF1 which includes a cover system designed to minimise water infiltration and oxygen ingress to minimise AMD generation, and the seepage collection system is designed to control and treat any AMD generated. A number of groundwater bores are located around the TSF1. These bores are included in the current groundwater monitoring programme undertaken by Vista Gold. A number of surface water monitoring locations also exist along Horseshoe creek which is also included in current routine surface water monitoring programmes. Upon recommencement of mining these monitoring programmes will be continued, and adjusted in anticipation of potential contamination issues, or via feedback from the results of such monitoring activities.

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110	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	12	Acid and Metalliferous Drainage 12.3.3 Tailings Storage Facilities	How does the statement of "zero discharge" equate with Figure 11-13 (Volume I) predicting an increase in stream flow in the first five years of mining as a result of increased seepage from TSFl?	Zero discharge refers to the state that occurs when the TSF is operated as a TSF. It will take some time before the legacy issues are not effecting the environment.
111	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	13	Flora and Vegetation	The composition of dust and its potential effects on vegetation has not been discussed. The potential for particulate Sulphidic material and other contaminants to become airborne and have impacts (on vegetation within the Yinberrie Hills) should be discussed. The draft EIS states in Section 13.5, "Consequences of some of the potential impacts (on vegetation and flora in the Yinberrie Hills) will be subject to monitoring as described in Section 13.6". No monitoring measures are included in the section 13.6 Management Measures. Although this issue was raised following the preliminary review of the draft EIS, the only alteration made to this section was the removal of the words "and monitoring" from the 13.6 heading. Monitoring of the Yinberrie Hills vegetation for dust impacts must be described in the Supplement.	Please refer to Attachment H - EIS Supplementary reporting relating to Air Quality Assessment
112	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	14	Fauna 14.3.3 Aquatic Fauna	Stow Creek appears to be affected by a "higher level of impact'. However, no appropriate control/reference sites on similar order watercourse(s) to the Stow are provided for any comparative assessment. Comparison against the larger Edith/Fergusson is not considered appropriate. Discuss the monitoring and investigation that is proposed to quantify and assess the cause and 'level' of the impact on	The statement "appears to be affected by a 'higher level of impact" is an incorrect interpretation by the reader. Section 5.2 of the Aquatic Fauna Appendix clearly states that the observed separation of Macro invertebrate community compositions between Stow creek sites and Edith/Ferguson river sites is likely to be due to catchment wide influences rather than pollutant sources. The validity of this statement is also evidenced by the similarities in macro invertebrate community composition from Stow creek sampling sites above any possible impact from the Mt Todd Site to Stow creek sites below or within any possible assumed zone of contamination. Given the now known difference in macro invertebrate community composition of the Stow Creek

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				Stow Creek.	sites, it is agreed that comparison to a more similar catchment like Stow creek would possibly yield a more informative assessment of the effects of the existing site and future mining activity. Vista Gold commits to the improvement of macro invertebrate monitoring in Stow Creek and will investigate if any reference catchments are scientifically suitable and/or make alterations to the distribution of sampling sites along the Stow Creek reach.
113	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	14.4.3	Aquatic fauna	Generally, the designs of the diversion channels for Horseshoe and Stow Creeks appear to be simplistic and lack the sinuosity of the original channels leading to the possibility that velocities of bank full events could be significantly higher. This could lead to erosion of the natural channel downstream of the diversion, progressive degradation upstream of the diversion depending on sheer stresses, and also impede fish passage. This should be considered in considerably more detail in the Supplement.	The assumed increase in velocities at peak flow while possibly exacerbated by diversion straightness will be offset to some degree by the channel width being wider than that of the natural channel. While situated in a higher part fo the catchment and possibly within differing substrate, the existing TSF1 diversion channel has not evidenced any significant erosion impacts as a results of channel alignment or possible velocity increase. While an increase in flow velocities is agreed to potentially impact on fish passage such velocities, as per fluid dynamics, are greatest in the middle of the stream and reduce towards the channel edges via friction effects. The frequency and duration of any high velocity events will also be limited to one or two times a year and last less than 12 hours and should also be taken into account when considering impacts to fish passage. The graphical representation of the diversions in the EIS incorrectly infer that the final diversion will be a smooth flatbed channel when in reality the underlying substrate will have many imperfections to increase flow friction and for aquatic fauna to exploit.
114	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	14.4.3	Stow Creek diversion channel	The draft EIS states, "The hydraulic modelling that has been undertaken for the diversion channel only addresses the 100 year, 24-hour storm event. There has been no modelling undertaken to investigate 'normal' flow periods through the diversion channel. Flow modelling will be completed under a number of higher frequency flow scenarios to determine if the diversion channel provides conditions sufficient to meet guidelines for providing fish passage in fishways". This hydraulic modelling must be presented in the Supplement with commitments to implementation of appropriate strategies for fish passage and erosion mitigation if required. Details of the required strategies should be included.	Hydrologic modelling in conjunction with 1-D hydraulic modelling was used to extend the existing flood outlines from previous studies (1992 ,1995, 2010), and to assess flood immunity and impacts on existing and proposed mine infrastructure, including storage embankments at TSF 1 and 2, during a 100 year ARI design event. This study was undertaken in order to understand the extent of flood inundation including flood levels and flood velocities during a 100 year ARI storm event, and to determine the required dimensions of the diversion channel. Flow modelling under 'normal' flow conditions will be undertaken prior to detailed design in order to determine if the diversion channel provides conditions sufficient to meet guidelines for providing fish passage. See also Attachment G - Fish Passage.
115	PAUL PURDON	14.4.3	Habitat loss	This section provides the reader with a list of	The assumed increase in velocities at peak flow while possibly exacerbated by

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	Director Pollution Control Northern Territory Environment Protection Authority			what would be expected in a well-designed diversion channel and indicates that a revegetation plan will be developed. This information needs to be more definitive in the Supplement so that an assessment of the residual risks can be made. The revegetation plan needs to be included with a detailed discussion of the design of the diversion and the measures that will be implemented to enable revegetation despite Wet season flows through the diversion. The plan should include details of a monitoring program to assess the success of revegetation and contingencies if revegetation is not occurring as expected.	diversion straightness will be offset to some degree by the channel width being wider than that of the natural channel. While situated in a higher part of the catchment and possibly within differing substrate, the existing TSF1 diversion channel has not evidenced any significant erosion impacts as results of channel alignment or possible velocity increase. The graphical representation of the diversions in the EIS incorrectly infer that the final diversion will be a smooth flatbed channel when in reality the underlying substrate will have many imperfections to increase flow friction and for aquatic fauna to exploit. As an integral part of the Security Bond management process includes establishing a similar reference site against which we then compare various characteristics to ensure a minimum level of likeness. Only when likeness is achieved is Vista Gold released from its obligations and that portion of the Security Bond is returned.
3	Rob Law Environment Centre NT Policy Officer	14.5	Risks to Fauna - Gouldian Finch Gouldian finch habitat	The EIS currently does not adequately address concerns we raised in our previous submission to the guidelines surrounding Gouldian Finch habitat. The summary of potential impacts from the project in the Executive Summary of the EIS acknowledges the significance of the area for Gouldian Finch habitat, coinciding with the largest known breeding population of the endangered species. It also notes elsewhere in the EIS that the project poses a high risk for population decline and will interfere with recovery of the species. Vista's proposal can be seen to impact upon the best remaining NT. *(sic)* The greatest threat to the Gouldian Finch is through habitat change. Page 22-9 of the EIS states that “the endangered Gouldian finch population in the Yinberrie hills is assessed as being at high risk of experiencing long term	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				decrease in size. This would not be conducive to the recovery of the species." In light of this the project should be considered seriously questionable. The mitigation measures to address this risk are not adequate and seem to accept that Gouldian finch habitat impacts are simply inevitable. The focus of risk mitigation on Gouldian Finch populations emphasises dust minimization strategies. Whilst this could have a potential impact, little is known about the impact of dust, whereas direct impacts of clearing nesting trees will have a known serious impact. The executive summary states that clearing at the above low level is unlikely to have any significant impact on threatened species and populations. This is not true and does not reflect the high risks noted elsewhere. In addition the proponent should assess in more detail the toxicology of onsite ponds for Gouldian Finches and other wildlife. As stated in our submission to the guidelines, the EIS should describe the risk posed to any local wildlife by anticipated levels of Weak Acid Dissociable (WAD) cyanide in any onsite water storage facilities (particularly : the decant / polishing ponds) and the TSFs, with discussion of toxicology for Gouldian Finch. Reference should be made to ANZECC and any other relevant guidelines, and the residual CNwad *(sic)* target level should be justified.	
116	PAUL PURDON Director Pollution Control Northern Territory	14.5	Risks to Fauna - Gouldian Finch	This section only deals with dust as a risk and no other risk sources. There needs to be further discussion of why other risks to the finch and its habitat are discounted.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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	Environment Protection Authority				
117	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	14.6.1	Terrestrial vertebrates	There is no commitment to expand the Gouldian Finch monitoring in this section. It is considered that uncertainties associated with the current knowledge of habitat availability in the Yinberrie Hills for Gouldian finches should be reduced before mining commences. Impacts may be detectable through monitoring but arresting declines that become apparent through monitoring may not be possible by the time they are detected.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
39	Lisa Bradley Manager, Environmental Assessment NT Environment Protection Authority	15	Gouldian Finch Breeding Sites at Yinberrie Hill	While being nominated for listing in the NT Heritage Register, have not been included in the heritage section of the Draft EIS or in the Draft Cultural heritage Management Plan.	Gouldian Finch Breeding Sites were nominated in May 2001 under the old Heritage Conservation Act 1991. An assessment report was considered by the Heritage Council in September 2008, but no declaration followed that assessment process. Under the new Heritage legislation commenced on 01 October 2102 the breeding sites are not listed on the heritage register, and therefore it is not appropriate to consider these sites in the draft Cultural Heritage Management Plan.
118	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16	Air quality Assessment procedure	No assessment is made of the need to protect the habitat of the Gouldian Finch on the site from adverse effects of dust and the hot plume from the power station. The Supplement should provide a discussion to justify this.	Please refer to Attachment H - EIS Supplementary reporting relating to Air Quality Assessment
119	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16	Dust emissions	The estimate of dust emissions is considered to involve a number of optimistic assumptions: • Wind erosion occurs only in Dry season; • No dust generation after hydrocyclone feed sump; • 70 % reduction in dust from crushing screening, conveyors (method of control not specified); • Moisture reduces dust emission from haul	Please refer to Attachment H - EIS Supplementary reporting relating to Air Quality Assessment

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				roads, and maximum dust controls used on haul roads - reduces dust emissions by further 90 %; • No dust from light vehicle travel; • No dust from sealed roads (ie, secondary dust ignored); • No dust from tailings storage. No sensitivity analysis for dust emissions was evident in the report, so the importance of various dust controls is not established in the assessment. This needs to be discussed further in the Supplement.	
120	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16	Ausplume model predictions	The predicted peak concentrations of CO and NO2 are relatively low and probably not an issue at a remote site, except for the possible impact of the hot plume with the adjacent hills and the Gouldian Finch habitat. Provide further discussion of alternative locations of the power station to avoid this impact. The Ausplume model is considered a satisfactory method for predicting ground level concentrations of the various contaminants. It is noted that the model setup used a low surface roughness (conservative) and flat terrain. The latter is generally satisfactory, but will not predict plume impingement, if any, with the hill adjacent to Batman Pit, which contains Gouldian Finch habitat. The implications of this to the model predictions should be discussed.	It is very unlikely that birds would be exposed to a hot plume from the on-site power generation facilities. A simple calculation using Briggs plume rise equations was made to support this. The power station will be located approximately 2 km away from the known nesting habitat of the Gouldian Finch. In the air quality impact assessment the plume was modelled with an exhaust discharge velocity of 48 m/s, a temperature of greater than 400 °C and stack diameter of 3 m. As the exhaust plume is hot, the plume will rise near vertically to many hundreds of metres unless 'bent over' by a cross wind. To gain an indication of the plume temperature at its centreline as it passes over the Finch habitat (i.e. when strong winds are directed from the stack to the habitat), the plume rise was modelled for a neutral2 5 m/s wind. Under this condition, the centreline of the dispersing plume was calculated to rise from the gas turbine exhaust to a height of 462 m. At a distance 2 km away the plume was calculated to yield a dilution ratio (relative to the release at the stack) of greater than 5,000:1. Under all wind conditions it is expected that the gas turbine exhaust will be diluted by at least 1000 times (i.e. a dilution ratio of 1000 to 1). Using this minimum dilution ratio, if a bird was to fly through the exhaust plume in the Gouldian Finch habitat area, it would experience an air temperature rise of no more than 0.5 °C For lower wind speed conditions the plume rise will be greater given the substantial buoyancy and momentum in the plume, and so the plume is expected to rise over the Yinberrie Hills.

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					At higher wind speeds, the plume rise is less; however the increased wind speed further dilutes the plume centreline to dilution ratios in the order of ten thousand to one or greater. At these dilution ratios the plume centreline temperature is indistinguishable from the ambient temperature. Please refer to Attachment H - EIS Supplementary reporting relating to Air Quality Assessment
121	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16		The predicted peak concentrations of CO and NO2 are relatively low and probably not an issue at a remote site, except for the possible impact of the hot plume with the adjacent hills and the Gouldian Finch habitat. Provide further discussion of alternative locations of the power station to avoid this impact.	AS to Email
122	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16		Predicted dust deposition rates are very high in the area to the north-west of Batman Pit. The predicted peak deposition rate of 30g/m2/month is 15 times the acceptable level of 2g/m2/month. While this would not be of significance in a mine site, or even in a remote rural area close to the mine, there is a concern that the peak dust deposition seems to occur in the habitat for the Gouldian Finch. This conflict requires further consideration in the Supplement.	Please refer to Attachment H - EIS Supplementary reporting relating to Air Quality Assessment
123	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	16	Mitigation and monitoring	The proposed dust management measures are discussed in a generic way. There is no commitment to monitoring or to performance indicators for dust, particularly within the Yinberrie Hills Site of Conservation Significance. Further details and commitments relevant to dust impacts on the Yinberrie Hills are required in the Supplement.	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".
124	PAUL PURDON Director Pollution Control Northern Territory Environment	18	Traffic and Transport	No measures are stated for spills or accidents on any road. Large and regular volumes of environmentally hazardous materials are being transported in close proximity to the Edith River and tributaries, where regular	**Emergency Response Procedures** An Emergency Response Plan (ERP) has been developed as part of the Safety Management System for Mt Todd Project. The ERP will provide procedures for responding to a range of potential emergencies including safety incidents, traffic accidents, natural disasters, environmental incidents and spill response.

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	Protection Authority			road flooding events 22 Matters of Generaloccur. Detail the proposed Emergency Responses and Emergency management of this transport risk with specific regard to the potential impacts posed by spills to the environment.	An Emergency Response Team will be trained to respond and assist to emergencies and spills along the mineral transport route. The team will be supported by a dedicated emergency response vehicle, which would be equipped to provide equipment for fire control, spill clean-up, and/or first aid capability as required. Key highlights of the management plan are detailed below: **Training** Contractors employed for driving of heavy vehicles are to be accredited licence holders and have adequate training for the specific equipment to be operated. Prior to commencement of work, contractors are to supply copies of licences and appropriate training records for inclusion in Mt Todd training records. All contractors will undergo an induction program. The induction program will include information on the following: • Requirements of the Traffic Management Plan (TMP); • Emergency Response Procedures including spill response • Information about the causes of operator fatigue and symptoms, and management of fatigue and strategies for making lifestyle changes • Hazard Incident Reporting System **Monitoring And Reporting** An audit trail system will be developed between the contractor and Vista to certify benchmarks for the TMP. This will includes verifying weights, schedules, driving speeds, load type carried, collection and delivery points. A Hazard Incident Reporting System will be implemented at Mt Todd. All traffic/transport associated incidents including harm to fauna or livestock are to be reported via the Incident Reporting System as soon as practical. An Annual Environmental Management Report (AEMR) will be prepared for Mt Todd Mine. The AEMR will provide a summary of the traffic/transport initiatives implemented, present the results of the road monitoring programme, and report on any traffic/ transport associated incidents during

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					the 12 month period. **Emergency Response Procedure** The primary consideration in a vehicle accident is to respond to the immediate first aid needs of any injured persons. **First Response** The next priority in any accident response is to attend to any fire fighting task and address any spill. **Communication** As soon as practical, communication must be made with base so that the spill recovery crew can be dispatched, and so that police and regulatory agency can be contacted. When police arrive onsite, control is to be handed to them. **Response Equipment** Each waste transport vehicle will have radio or satellite phone, first aid kit, and fire extinguisher, and additionally will have witches hats, star pickets, sledgehammer, and barricade tape. The spill recovery trailer will in addition to the above be equipped with accident emergency response equipment (normal emergency services kit) as its crew may well be the first rescue services on site. It will also have equipment for spill recovery, including tarps, shovels, drums, lights, diatomaceous earth, absorbent booms and pads, drum- mount type vacuum cleaner and genset, disposable overalls and dust masks, hand and face cleaning facility, etc.
125	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	18	Traffic & Transport	Storage of hydrocarbons - no area for storage is specified. The draft EIS indicates that it will be "close to heavy equipment workshop". There is a risk of release to the environment from storage (820,00L) and use (90,000L/day).Provide more details about storage location, and assessment and mitigation of risk.	Diesel will be stored on-site for mining equipment and some vehicles. The current API 650 tank (600kL storage capacity) will store the diesel fuel and distribution of the fuel will be as required basis through combination of pipelines, fuel trucks etc. It is planned to have a single diesel storage area close to the heavy equipment workshop. Refuelling facilities will be provided in the heavy vehicle workshop area for the vehicles belonging to the operation. The specific location is subject to the detailed drainage design which will be completed at the deated design stage. There are a number of design guidelines that we commit to complying with.

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					The two major design considerations will be that bunding will contain a minimum of 110% of the largest tank and that separation between delivery trucks and "normal operations" can be achieved. Risks have been detailed in Chapter 5 - specifically (LA02, SW14, GW09 and WA03). Below is a except from SW14 for your reference; • Design, storage and handling of hazardous materials to Australian standards and regulations • Consult with NT WorkSafe to further manage and reduce risk • Lubricating oil stored in tank with bunded area with spill protection • Waste oil stored in tank within bunded area and held for collection by contractor for reprocessing and recycling • Spill clean-up procedures developed and implemented • Regular inspections of storages, tanks and bulk containers and the integrity of bunded areas and containment systems • Testing for chemicals included in surface water monitoring program • Back up protective bunding
23	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.	19		A number of issues and risks contained in the EIS need to be considered in relation to the financial environment and potential failure if economic factors go against the project in the early years of production. While the EIS addresses the best case scenario regarding financial viability, it is essential that the alternative is considered as well. The international financial situation, gold price and exchange rates play a big part in ensuring viability of this project. History has shown that NT governments are willing to circumvent best practice and bend regulatory process in order to get mines up and running or keep struggling mines operating. This is a significant risk that needs to be managed.	The mine economics are very dependent on the spot price of gold. Before a decision is made to proceed with the project economics will need to be robust. It is likely that part of the funding will be via debt and this will ensure that a rigorous due diligence process is completed before operations commence. It is unlikely that the Security Bond will be as high as $150 million as there has been a number of activities completed (including water treatment) that reduce to scope of the legacy issues at Mt Todd. Money is set aside before we disturb the environment and this principal is fundamental to ensuring there is adequate monies to close the mine knowing there will be no long term impact. The government holds the security bond. As an integral part of the Security Bond management process includes establishing a similar reference site against which we then compare various characteristics to ensure a minimum level of likeness. Only when likeness is achieved is Vista Gold released from its obligations and that portion of the Security Bond is returned. There is a four year closure period. During this monitoring will continue to

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				The mine management plans and progressive rehabilitation needs to be implemented, regulated and enforced by government which has not always been the case. The potential financial risk to government and taxpayers if this project fails and is required to be cleaned up must be factored into any bond. It is essential that the rehabilitation bond is sufficient to address the size and scale of the significant new risks and threats at the site in the event of an emergency shutdown. AFANT sees significant risks at the site if the cost of managing the ongoing operational requirements of the site like pumping and water management is not adequately covered while an affective closure can be put into place. AFANT has real concern with a number of the assumptions and management arrangements made in the EIS that could have significant environmental impact in the event of an emergency mine shut down. The requirement to have large pumping and other onsite operational infrastructure and management to prevent or minimise any offsite environmental impacts during operation, is an untenable risk in the possible event of a emergency mine shutdown. Particular issues that need to be considered are: • pumping requirements for contaminated groundwater interception and removal; and • spillage of contaminated water from	prove the effectiveness of the closure measures.

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				retention ponds	
49	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	2	Project description Monitoring pond	There is no information provided in the draft EIS on the monitoring pond other than that the water treatment plant(WTP) discharges to a monitoring pond then directly to Batman Creek- discharging throughout the year(Chapter 10, page 10-, 6). The location is given as 'next to Batman near the old HLP'. Provide more details on the pond capacity, pump capacity and pump-line infrastructure, exact discharge location and what monitoring is proposed.	We have yet to do the detailed engineering which will detail the capacity of the pond. Existing modelling has determined that the anticipated area will be more than adequate to manage the volumes. Detailed work carried out during the DFS stage will finalise the sizing's. We have made provision in the economic model for the cost of this infrastructure. The capacity of this pond will be determined by subsequent modelling in GoldSim.
7	Rob Law Environment Centre NT Policy Officer	2.3.4	Economics of the mine and ore processing scenarios	The draft EIS economic projections are based on a scenario of a US$1400 an ounce gold price, whilst currently gold price is below US$1250. Whilst Vista Gold has publicly stated that the gold price will determine whether or not the project will go ahead it is important to consider the potential risks posed by a volatile gold price. It is important that the project budget for rehabilitation and mine site closure is not compromised throughout the mine life by cost cutting measures. In addition to the $150 million estimated cost of rehabilitation and closure, there are likely to be unforeseen legacy issues that should be considered at the outset. The draft EIS considers under project alternatives two scenarios; a 30,000 / 33,000tpd ore processing facility versus a 50,000tpd ore processing facility. The lower levels of ore processing would generate less waste and requirements for TSF capacity and water processing. As well as that the 30,000tpd scenario would provide maximised returns and operating margins. As this scenario is likely to have less environmental	The mine economics are very dependent on the spot price of gold. Before a decision is made to proceed with the project economics will need to be robust. It is likely that part of the funding will be via debt and this will ensure that a rigorous due diligence process is completed before operations commence. It is unlikely that the Security Bond will be as high as $150 million as there has been a number of activities completed (including water treatment) that reduce the scope of the legacy issues at Mt Todd. The second part of the question refers to the two scenarios of which the main difference is one seeing the mining phase over 13years and the other 17years. There is very little difference in the final residual landforms, just timing.

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				impact, we recommend that if the project is approved it is approved for this capacity only.	
37	Valerie Smith Director Planning and Policy Tourism NT	2.5	Adequacy of the Proponent's response to the relevant guideline requirements for the Mount Todd project	We have noted that consideration has been given by the Proponent as to the potential impact on short-term accommodation in the Katherine area.	Chapter 7 describes the outcomes of a Social Impact Assessment (SIA). It describes the existing social environment and assesses the ways in which the Project may impact on the community and other stakeholders, including both positive and negative potential impacts. Mitigation measures to avoid or minimise impacts are assessed. Chapter 19 discusses the socio-economic characteristics of the Project, and the impact on the local, regional and Northern Territory economies in terms of direct effects on employment, income and production. A detailed Social Impact assessment is provided in Appendix F. The potential impacts and associated mitigation measures identified in this chapter contribute to the Community component of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence, likelihood and residual risk ratings for community impact after management measures are implemented.
38	Valerie Smith Director Planning and Policy Tourism NT	2.5	Adequacy of the Proponent's response to the relevant guideline requirements for the Mount Todd project	The accommodation options outlined appear appropriate to mitigate the risk workers associated with the project displace tourist markets from commercial accommodation properties in the region	Please refer to the response to the question above.
40	Lisa Bradley Manager, Environmental Assessment NT Environment Protection Authority	2.5	Potential for significant social impacts resulting from increased demand for housing in the Katherine region for accommodation of the operational workforce.	The Draft EIS (page 7 – 15) identifies that a combination of new and existing housing will be required in Katherine to support approximately 120 workers. This figure is at odds with previous advice underpinning planning and land release work for the Katherine region. Clarification regarding the projected level of demand for housing in the Katherine region would help to enable a more detailed assessment of the likely social impacts of this proposal.	The numbers of personnel has not changed from the advice previously given. 7-15 describes how the 350 personnel will be sourced and accommodated. There is a subset of 120 which are likely to required family housing. This is in addition to 100 single employees and 60 people from the existing Katherine population. There will be a small number of key personnel accommodated at Mt Todd; these will generally be emergency and specialised employees. Chapter 7 describes the outcomes of a Social Impact Assessment (SIA). It describes the existing social environment and assesses the ways in which the Project may impact on the community and other stakeholders, including both positive and negative potential impacts. Mitigation measures to avoid or minimise impacts are assessed.

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					Chapter 19 discusses the socio-economic characteristics of the Project, and the impact on the local, regional and Northern Territory economies in terms of direct effects on employment, income and production. A detailed Social Impact assessment is provided in Appendix F. The potential impacts and associated mitigation measures identified in this chapter contribute to the Community component of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence, likelihood and residual risk ratings for community impact after management measures are implemented.
20	Amateur Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.	2.6.4	New diversion drains	AFANT has concerns with the design of creek diversions around TSF2. The structures should be constructed in a natural or best practice river diversion practice to include some natural roughness and rehabilitation, not just channel or drain as it appears is the current plan.	The preliminary designs of the diversion channels were developed using the Hydraulic Toolbox 2.1 developed by the United States Federal Highway Administration. This Hydraulic design tool estimates shear stresses along channel bottom and bends. Based on the estimated shear stresses, the channels were designed with a grouted rip rap lining to provide adequate erosion protection. Detailed designs of the diversion channels will be developed during the design phase of the project.
10	Rob Law Environment Centre NT Policy Officer	20	Alternatives for energy supply	The EIS guidelines specify that the proponent must investigate renewable sources of energy supply, yet the draft EIS does not appear to have done this. The project greenhouse gas emissions and energy requirements are significant and it is imperative that these alternatives are properly investigated. The energy needs of the mine are considerable, 80MW of normal demand and 96MW of peak demand. There are currently a number of renewable energy companies looking for opportunities to work with remote mines either off grid or fringe of grid and these opportunities should be further explored. The Environment Centre NT has held conversations with large scale solar technology companies and they have stated that providing the needs of the Mt Todd gold mine from solar, and or a solar mix with gas is technically and economically feasible.	The proposed gas turbine power plant is a significant initiative to minimise greenhouse gas emissions for the project. Approximately 18,000 GWh of electricity is forecast to be generated from the turbine over the life of the project. This equates to a greenhouse gas intensity of 0.38 t CO_2-e/kWh. The latest emissions intensity estimate for Northern Territory grid electricity is 0.77 t CO_2-e/kWh (National Greenhouse Accounts Factor July 2013). The emissions intensity of the proposed power plant is less than half the current emissions intensity of the Northern Territory grid electricity. The plant will export a portion of the electricity generated to the Northern Territory grid, therefore, providing electricity for other Northern Territory users at a lower emissions intensity than the current grid electricity. The feasibility of incorporating renewable energy generation was considered by Vista Gold during the PFS. A utility scale photo-voltaic system was considered the most commercially mature renewable energy system for the project. However, at the time of project planning, the costs associated with a utility scale photo-voltaic system were not considered commercially feasible. The costs associated with the generation of electricity from the gas turbine were estimated by Vista Gold as $70/MWh. The latest indicative costs for utility scale ground-mounted, fixed-tilt photo-voltaic systems based on the recent ACT Government solar tenders are $178-$186/MWh. These costs were

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				Moreover, the use of renewable energy sources would be an important way to reduce the projects emissions profile. The project is expected to generate over 10.5 Million tonnes of CO2-e over the life of the project. The largest contributor to this is energy consumption, which makes up 79% of emissions. The value of looking at meeting part of the projects energy needs through a solar system would reduce carbon liabilities under the Clean Energy Act. Concentrated solar thermal plants (CST) are currently in operation around the world and include the capacity for energy storage. Vista gold should explore different renewable energy scenarios such as a large scale 20MW+ solar CST plant to a 10MW system of Photo-voltaics to supplement its energy needs. A large scale CST plant would require working with Power and Water and the Northern Territory government for support. A smaller PV system of around 5-20MW is likely to pay for itself over time and would be an important precedent for encouraging mines to uptake renewable energy in the Northern Territory. The Environment Centre NT would be happy to assist Vista Gold in investigating renewable energy options for the mine.	for a 13 MW and a 7 MW system. Vista Gold will continue to identify opportunities to minimise energy consumption for the project.
9	Rob Law Environment Centre NT Policy Officer	20.4	Offsets	The EIS acknowledges Vista's requirements under the Clean Energy Future legislation to purchase offsets under the Carbon Farming Initiative. The proponent should commit to purchasing NT based carbon offsets to support regional economies and potentially Indigenous people through the growing number of savannah fire abatement projects.	Vista Gold will purchase Northern Territory based carbon offsets to fulfil legislative requirements of the carbon pricing mechanism, subject to availability and commercial competitiveness of the offsets.
19	Amateur	21.5	Tailings Dams	The EIS documents highlight that after	A majority of subsurface seepage will be contributed by the existing TSF1.

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	Fishermen's Association of the NT Inc. Craig Ingram AFANT Executive Officer.		TSF1 and TSF	closure 83 mega litres of untreated water will enter the ground water systems per year from the two tailings facilities TSF1 and TSF2. This poses an unacceptable environmental risk on downstream water uses and the environment. TSF1 With the increased height of the tailings dam from a head of 16 mt to approximately 34 mt it will increase water pressure during operations and the risk of contamination of the ground water system which Vista Gold plans to manage during operations through interception and extraction. The current tailings facility is acknowledged as having existing downstream surface and ground water seepage and contamination of leakage below the wall. It is acknowledged that this leakage of contaminated ground water will escalate with the increased capacity and height of the TSF1. AFANT is concerned that if these management systems are not sufficient or incomplete, ongoing and significant increase in ground water contamination will occur from TSF1. The EIS has outlined that the volumes of ARD/ML water that will flow into the ground water systems from TSF1 will be between 400-800 M3, or between 0.4 and 0.8mgl /day or 292 MGL per year. AFANT believes that the potential increase in ARD/ML water contamination to shallow ground water systems and local water ways	Seepage through TSF2 is not expected as it is designed as a geosynthetic lined facility. Engineering controls will be evaluated and included in the final design which will collect and/or intercept subsurface seepage from TSF1. A peripheral toe drain is included in the current design to collect seepage flows from TSF1. Additional seepage management features that will be considered in the detailed design will include measures to minimize hydraulic heads such as efficient pond water management, installation of vertical wick drains and thickening the tailings to higher solids content prior to deposition in the TSF. Additionally, installation of a cut-off wall will also be evaluated to intercept lateral migration of seepage plume, if predicted. In addition to the above we have incorporated a cyanide destruction plant which will ensure that any seepage will not contain more the <10ppm of WAD Cn. The underdrains for the TSF's flow to the decant pond where the water is collected and recycled back to the process plant. When the TSF's are operated as a TSF then the head pressure is lowered during operations. At closure the water is sheded off and the underdrains closed. The TSF is not a source of AMD as the operational pH is required to be above 10 (basic) due to the presence of Cn. In essence the key to changing what is currently occurring at Mt Todd is the project going back into operations and the TSF be operated as it was designed.

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				caused by an increase in head of water in the tailings dam is an unacceptable risk and request that further consideration and explanation on how this will be managed. TSF2 AFANT has some issues with the site of a tailings storage facility TSF2 in the existing bed of a water course through both the risk of the creek during flooding undermining the integrity of the proposed TSF2 facility, as well as the increased potential for leaking contaminated water or run into surface and ground water. We believe that further explanation on the measures that will be undertaken to ensure the long term integrity and security of this facility and protection to the environment from erosion or leaking is required.	
126	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	22	Matters of National Environmental Significance General	In determining whether to approve the proposal under the Environment Protection and Biodiversity Conservation Act (EPBC Act), the Australian Government will consider, among other things, the acceptability of impacts to matters of National Environmental Significance (MNES). The draft EIS states that "The residual risk to the Yinberrie Hills population of the Gouldian Finch is 'High"'. It is strongly recommended that the Proponent consider, develop and propose avoidance, mitigation and/or management measures to reduce the risk to the listed endangered and migratory Gouldian Finch (Erythrura gou/of ae) and also consider implementing these within the proposed Dust Management Plan (DMP). In the event	Please refer to "Attachment K - EIS Supplementary Expert Response Gouldian Finch queries".

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				that after consideration of avoidance and mitigation measures a residual significant impact to the Gouldian Finch from the proposal is anticipated, the proponent should Consider, develop and propose appropriate offsets with reference to the Australian Government's EPBCAct Environmental Offsets Policy, October 2012 (the Offsets Policy).	
36	Dr Anne Walters Strategic Projects Officer The Parks and Wildlife Commission of the Northern Territory	23		Power to the site has been identified as an issue and gas has been identified as the preferred option. Has Vista Gold considered using solar or other technologies? For example, one possibility is the use of solar power to create steam. Steam powered electrical generators are common worldwide. Over the mine's life (19 years), the use of solar/steam may not only reduce costs, but steam could be vented to the atmosphere increasing evaporation rates and reducing contaminated water.	The proposed gas turbine power plant is a significant initiative to minimise greenhouse gas emissions for the project. Approximately 18,000 GWh of electricity is forecast to be generated from the turbine over the life of the project. This equates to a greenhouse gas intensity of 0.38 t CO2-e/kWh. The latest emissions intensity estimate for Northern Territory grid electricity is 0.77 t CO2-e/kWh (National Greenhouse Accounts Factor July 2013). The emissions intensity of the proposed power plant is less than half the current emissions intensity of the Northern Territory grid electricity. The plant will export a portion of the electricity generated to the Northern Territory grid, therefore, providing electricity for other Northern Territory users at a low emissions intensity than the current grid electricity. The feasibility of incorporating renewable energy generation was considered by Vista Gold during the PFS. A utility scale photo-voltaic system was considered the most commercially mature renewable energy system for the project. However, at the time of project planning the costs associated with a utility scale photo-voltaic system were not considered commercially feasible. The costs associated with the generation of electricity from the gas turbine were estimated by Vista Gold as $70/MWh. The latest indicative costs for utility scale ground-mounted, fixed-tilt photo-voltaic systems based on the recent ACT Government solar tenders are $178-$186/MWh. These costs were for a 13 MW and a 7 MW system. Vista Gold will continue to identify opportunities to minimise energy consumption for the project.
11	Rob Law Environment Centre NT Policy Officer	23.3.18	Rehabilitation	The residual risks for closure and rehabilitation are concerning, remaining high and medium after the implementation of identified controls. The argument of the proponent for gaining approval of the mine rests on the capacity to deal with the legacy issues of Mount Todd. However, there	The risk assessment is in included in Chapter 5 of the EIS and provides a detailed assessment and mitigation of risks to an acceptable level. The reclamation Plan (appendix Y) does address minimisation of risk and environmental impact. Specifically by minimising footprints of residual landforms, progressive reclamation during operations and incorporating long-term sustainable designs for high rainfall environments. The question of backfilling the pit in addressed in item 5 of this submission.

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				remains a high residual risk of ineffective mine closure, and a medium residual risk that rehabilitation occurs at a rate slower than planned, and insufficient rehabilitation practices. The consequences of ineffective mine closure are critical and have the potential for long term environmental impacts that would outweigh any benefits from the mine. ITEM 1 The proponent should be required to demonstrate stronger commitments to final site rehabilitation and mine closure and risk minimisation strategies. The final changes to the topography of the mine site will be significant, and include a 350 metre waste rock dump, with no backfilling of the batman pit occurring. The EIS guidelines require the proponent to discuss options of backfilling the pit, and given the amenity impact of a waste rock dump the size of Uluru and changes to site hydrology this should be addressed. ITEM 2 The final design does not reflect the lowest potential impact to the environment and stakeholder expectations. The WRD should be backfilled into the pit if approval of the mine is to be granted. This would require also that active dewatering and pit water treatment is required in the closure stages. There should also be appropriate modelling done on changes to surface water and ground water flows under the proposed landform. The EIS states final rehabilitation completion criteria be developed towards the closure of the mine. ITEM 3 Such criteria should be developed and agreed upon in the early	These items will be addressed as part of the completion of the DFS and permitting phases of the project.

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				stages in the event of an unexpected exit from the mine by Vista Gold due to unforeseen circumstances. In this event, closure criteria should be clear for what is expected of Vista Gold by all stakeholders and responsibility cannot be passed back on to the NT government. There should also be appropriate modelling done on changes to surface water and ground water flows under the proposed landform.	
35	Dr Anne Walters Strategic Projects Officer The Parks and Wildlife Commission of the Northern Territory	24		We are also interested in how Vista Gold will manage the site beyond the life of the mine. The water quality issues and (potentially) the waste areas may cause significant contamination into the future. How will Vista Gold minimise long-term impacts on the surround natural environment following the closure of the mine?	Chapter 24 describes the proposed approach to closure and rehabilitation of the Project. Unless otherwise stated, closure and rehabilitation information has been sourced from the Mt Todd Gold Project PFS Reclamation Plan (the Reclamation Plan) (Appendix Y). The Reclamation Plan focuses on the reclamation earthworks associated with closing existing and future mine features during and following the completion of mining operations. The potential impacts and associated management measures identified in this chapter contribute to the closure and AMD components of the project risk assessment undertaken in Chapter 5. The project risk assessment includes consequence; likelihood and residual risk ratings for impacts associated with closure and AMD seepage after management measures are implemented.
231	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants	24	Managements Plans: No provisions for long-term maintenance of surface structures.	An in-perpetuity trust should be established to fund on-going maintenance of the TSFs and WRD to remove the risk of long-term AMD.	This is the fundamental principal of our government holding a security bond. As an integral part of the Security Bond management process includes establishing a similar reference site against which we then compare various characteristics to ensure a minimum level of likeness. Only when likeness is achieved is Vista Gold released from its obligations and that portion of the Security Bond is returned. There is a four year closure period. During this monitoring will continue to prove the effectiveness of the closure measures.
54	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	3	Project Alternatives	Alternative water containment strategies during operations should be discussed in relation to managing wet season inventories to prevent or minimise untreated discharges of potentially contaminated water, particularly in more intense rainfall events. Reasons should be given as to why discharges	As a product of running hundreds of iterations of the GoldSim model a number of water containment strategies have been considered. We have included more detail in this supplement in Attachment D - Goldsim Water Model Supplement to EIS. During operation of the WTP will ensure there is no residual impact on the

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				may be required and why the community should accept liability for the residual impacts of these discharges.	downstream water courses likely. We will ensure that the 80% Species Protection regime is complied with. This will be monitored and regulated by the NTEPA via the established WDL process.
6	Rob Law Environment Centre NT Policy Officer	3.6.2	Tailings Storage Facilities and Heap Leach Pad (3.8.1)	The project will involve an increase in capacity of the TSF1 as well as a new TSF2. The EIS does not adequately address existing seepage issues with TSF1. The proponent should compare projected tailings characteristics, including AMD potential, to that encountered by the previous operation. The draft statement should describe the potential for seepage via fracture zones at each TSF. There should be greater commitments to the use of impermeable layers and seepage recovery systems to protect underlying potable groundwater aquifers from tailings dam contents and seepage, and to ensure appropriate containment of cyanide. Whilst we welcome that TSF2 is designed as a zero-discharge facility, the same requirements should be made for the increased capacity of TSF1. Water balance results in chapter 10 show that seepage rates from the TSF's during the Dry Season increase slightly from 9,600m^3/day to 10,200m^3/day seven years into the operations phase. Such seepage rates are not acceptable for a modern day mine seeking best practice. The fact that TSF2 is placed over an ARI 100 year flood extent warrants further scrutiny. Addressing this risk from creating a creek diversion is not adequate. Alternative locations should have been described in the project alternatives chapter to avoid increasing risks of overflow and seepage from	The current water balance models decant return from the TSF only. Seepage losses are not currently modelled but will be included in the DFS level water balance. **Additional Comments** Since cessation of mining activities in 2000, TSF1 has been used to store contact water as required for site wide water management. The use of TSF1 as a holding pond has resulted in increased water levels in RP7 and expansion of the pool which is contrary to the design intent. The outlet to the collector drains which collect and discharge tailings seepage to the lined return water pond have also been shut to enable storage of water within the TSF. The combination of increased water levels in RP7 and closure of the underdrain outlets has resulted in seepage along the downstream portions of the embankment. Planned treatment and discharge of contact water for future operations will enable lowering of water levels in RP7. Lower water levels in RP7 combined with recommissioning of the underdrain system by opening the outlets are expected to reduce or prevent seepage through the embankment. As a contingent design measure, a peripheral downstream drain has been included in the design for TSF1 expansion to intercept and collect seepage flows observed at the downstream toe of the embankment. The quoted flow rates of 9,600 m^3/day and 10,200m^3/day represent decant rates from TSF1, not seepage rates. A seepage analysis for TSF1 will be performed during the Feasibility Study phase of the project. The location south of the existing heap leach pad was considered as an alternative site for TSF2 as discussed under Section 3.7.4 of the EIS. The proposed location for TSF2 east of Batman Pit minimizes disturbance to identified cultural heritage sites and the existing Horseshoe Creek and Stow Creek.

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				TSF2 from flooding events. There remains a residual risk of medium for the failure of the Tailings Storage Facilities. The environmental impacts of such an occurrence are considered extreme and so proper engineering solutions should be invested in to reduce this risk to low. Similarly the increase in the capacity of the TSF1 will have a high residual risk to increased long term risk to groundwater, and a medium residual risk for TSF2. These residual risks currently demonstrate that the project cannot adequately address the environmental risks posed by expanding the capacity of the Mt Todd gold mine.	
5	Rob Law Environment Centre NT Policy Officer	3.8.2	Waste Rock Dump	One of the biggest concerns of the project to the community is the intention to create a waste rock dump 350 metres high and 217 ha in area. Such an enormous WRD is unacceptable and even more so in that the proponent intends to retain the WRD after mine closure as a landscape feature. The EIS guidelines specify that the proponent address visual amenity, yet the impacts of the WRD on amenity have not been properly addressed. Imagery using GIS of the WRD should be provided in the EIS showing the WRD from different vistas such as the Stuart Highway and other key tourist areas. The EIS also states that it will develop a waste rock management plan to specify how waste rock will be handled and AMD risk avoided. Details of this plan should be more clearly addressed in the EIS, as approval will be dependent upon the proponent demonstrating that such risks can be mitigated.	Vadose modelling has been conducted for the current designs that have been relied upon. This detailed information is included in appendix Y. This demonstrates the effectiveness of the current design to protect the environment from AMD. An analysis to determine the viability of backfilling the Batman Pit has been completed. The analysis considered backfilling of the pit by rehandling waste dump material which is located adjacent to the south side of the pit. It is assumed that the backfilling will not begin until after all the ore is mined from the bottom of the pit (i.e. end of mine life). Based on this analysis, the total backfill operating costs will be approximately $450,000,000 to $500,000,000 and will require approximately six to nine years to complete. The elevation of the ramp exit of the pit is 131m amsl. The pit volume from 131m to the pit bottom is approximately 289,500,000m^3. The elevation of the ramp entrance onto the waste dump is 150m amsl. The volume of waste dump material available for backfilling from 150m elevation to the top of the waste dump is approximately 249,400,000m^3. The waste dump material available for backfilling as calculated will fill the pit to approximately the 117m elevation. Using a density of 1.8, there are approximately 450,000,000 tonnes of waste dump material to be rehandled. Backfilling the Batman pit with the waste material renders the project

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				The Environment Centre NT also wish to stress that it is unacceptable to propose leaving the WRD on site at mine closure, and this should be backfilled into the Batman pit. This option should have been detailed under project alternatives in chapter 3.	uneconomic and is therefore not considered to be a viable option. It is important to note that this analysis does not consider the capital costs that may be incurred due to the replacement of trucks and/or hydraulic excavators
42	Xavier Schobben Director Environmental Health Branch Dept. of Health	4	Legislation	Please include the Public and Environmental Health Act 2071. This Act will apply for the registration of accommodation, and design approval for the waste water treatment facility, as well as in general assuring that no public health nuisance arises during the construction phase and actual operation of the project. Food Act 2004. This Act is applicable to any commercial food preparation area associated with the site. The Act also requires food business registration with the Department of Health.	Chapter 4, Section 4.3.11 Other Legislation. Other legislation that may be applicable to the project includes: Northern Territory Public and Environmental Health Act 2011 - addresses matters deemed to be a public health nuisance, regulates the registration of accommodation facilities, applies to the design and approvals for on-site waste water systems. Northern Territory Food Act 2004 - requires all commercial food preparation areas and food businesses to be registered and allows the Dept of Health to identify the risks of the business, target inspections and respond to complaints and provide them with information about food safety.
45	Xavier Schobben Director Environmental Health Branch Dept. of Health	4	DOH Fact Sheet 700: Requirements for Mining and Construction Projects	The proponent and contractors must take note of the current DOH Fact Sheet 700: Requirements for Mining and Construction Projects (Refer attachment) It is the responsibility of the proponent to obtain DOH approvals and licences for the mining site, however contractors have rarely heeded this directive and as such DOH is generally unaware of the contractor's name let alone the commencement of works. It is the proponent's responsibility to alert DOH Environmental Health of the commencement of works and so in this case, the proponent will be required to contact either Karla James or Chris Blow at the DOH Environmental Health Office in Katherine:	We thank you for the additional information and will ensure it is incorporated during the detailed design phase of the project. We are aware that there are a significant number of separate approvals, and in some cases licences, required to operate.

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				Karla James: ph. 8973 9061 or karlajames@nt. gov. au Chris Blow: ph. 8973 9062 or christopher. blow@nt. gov. au	
46	Xavier Schobben Director Environmental Health Branch Dept. of Health	4	Radiation Protection (Table 8-7)	Radiation is a potential issue and has not been mentioned in the draft EIS. If the operator has any material that is a radiation source, as defined under the Radiation Protection Act, the operator must apply for all relevant authorities under that Act. It is the responsibility of the operator to apply for all relevant authorities. If naturally occurring radioactive material (NORM) is found on site, it may, possibly, require appropriate authorities to possess it. For more information, the operator should refer to the following internet location: WWW. nt. gov.au/health/radiation protection	We thank you for the additional information and will ensure it is incorporated during the detailed design phase of the project. We are aware that there are a significant number of separate approvals, and in some cases licences, required to operate. There will be some devices used at Mt Todd that will require Radiation licence(s) to be held but Vista Gold.
228	Matthew Punch NLC Prepared by Dr Howard Smith APChem Scientific Consultants	4	Management Plans: No long-term management plan for the Batman Pit.	The management plan for the Batman Pit should be developed and submitted as part of the supplementary documentation.	A Mine Management Plan (MMP), which incorporates our Water Management Plan (WMP), is updated each year and submitted to the DME for approval. A MMP & WMP will be required to reflect current legistivative and environmental condition at the time. When a FID is made then work would start on updating the MMP & WMP before work can commence at Mt Todd. In summary a Management Plan for Batman Pit currently exists and this will be updated before work commences at Mt Todd.
57	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	5	Environmental Risk Assessment	SWO1 and SW02: Both identified risks have a residual risk rating of medium. It is not clear how this rating has been reached (e. g. likelihood and consequences for each risk after proposed mitigation measures are implemented are not provided and justified). The risk assessment and discussion on surface water management throughout the draft EIS uses terminology such as "extreme"	Please refer to Attachment I - EIS Supplementary responses relating to Surface Water assessment.

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				rainfall event, "severe" rainfall event and "normal conditions", yet these terms are not defined. It is not clear what scale of event is considered normal or requires additional management response. Page 10-16 - states that "significant water storage will be designed for the containment of at/east monthly and likely extreme wet season rainfall', while Appendix I(page i) states design for the "containment of at least monthly and preferably extreme wet season rain...". Further information is requested on: • Justification for the risk rating of medium for risks SWO1 and SWO2; • Definition of terms used to describe rainfall events, including "normal conditions", "severe" and "extreme" rainfall; • Clarification on the anticipated rainfall event(s)that significant water storage infrastructure will be designed for; and • The exceptional circumstances where retention ponds are expected to overflow.	
59	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	5	Environmental Risk Assessment	Table 5-6, SW04 - Residual Risk of Failure of the WTP should be reassessed or further justified. The consequences of failure are considered to be higher than stated; this is the only treatment option provided for all the acid and metalliferous drainage (AMD) waters from the site.	Please refer to Attachment I - EIS Supplementary responses relating to Surface Water assessment
61	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	5	Land contamination	The draft EIS states that operations will comply with the International Cyanide Management Code (ICMC). Provide an indication of what it entails to be a signatory to the ICMC and whether Vista Gold intends to become a signatory.	Compliance with ICMC is a very detailed process. Details of what is required can be found at http://www.cyanidecode.org/about-cyanide-code/cyanide-code Mt Todd would need to progress to certification in the early phase of operations. We have adopted the guidelines as design criteria for our facilities.

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				Outline what management measures will be implemented to ensure that the ICMC will be complied with.	The "International Cyanide Management Code For the Manufacture, Transport, and Use of Cyanide In the Production of Gold" (Code) was developed by a multi-stakeholder Steering Committee under the guidance of the United Nations Environmental Program (UNEP) and the then- International Council on Metals and the Environment (ICME). The Code is an industry voluntary program for gold mining companies. It focuses exclusively on the safe management of cyanide and cyanidation mill tailings and leach solutions. Companies that adopt the Code must have their mining operations that use cyanide to recover gold audited by an independent third party to determine the status of Code implementation. Those operations that meet the Code requirements can be certified. A unique trademark symbol can then be utilized by the certified operation. Audit results are made public to inform stakeholders of the status of cyanide management practices at the certified operation. The objective of the Code is to improve the management of cyanide used in gold mining and assist in the protection of human health and the reduction of environmental impacts Detailed information can be found at: http://www.cyanidecode.org/about-cyanide-code/cyanide-code
58	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	5-6	Risk	Table 5-6, SW02 -'Lower RP1 as low as possible prior to wet season'- clarify how the volume of RP, is to be lowered to mitigate this risk (is it via treatment in the proposed WTP?).	RP1 will be lowered by a combination of evaporation, treatment via the WTP and bleed in the process water system and release in accordance with a WDL.
25	Mt Todd, Vista Gold EIS – Ian Hollingsworth	6.2	Present and interpret water quality monitoring data for surface water in the area of the project	**Detailed Comment** This requirement should have explicitly referred to the ANZECC guidance on water quality monitoring, specifying determination of background water quality and before after control impact monitoring. **Vista Gold Action** There is no assessment of background water quality in EIS Chapter 10 that would inform reliable monitoring of perturbations from the	The use of a direct toxicity assessment (DTA) follows ANZECC & ARMCANZ (2000) protocols and provides a site specific integrated assessment of the impacts of water discharged from the site. As such it provides a better indication of potential environmental effects to downstream populations that the application of the ANZECC & ARMCANZ (2000) default triggers values. Further, water quality on the site has continually improved over the years and Vista Gold has invested heavily in treating the water in RP3 to a quality where the majority of metals meet ANZECC & ARMCANZ (2000) default trigger values. Therefore, the water to be discharged from the site in 2013/2014 wet season will be of higher quality than that discharged in the past. Vista Gold has many years of background water quality data and this has been presented in the EIS

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				mine site on background conditions. The impact assessment is based on relatively unreliable Eco toxicity study results, which the specialist report identified as preliminary. The lack of reasonable intervention, apart from reviewing discharge conditions, in the waste discharge licence for this site also reduces confidence that discharge of poor quality water will be managed to minimise environmental impact.	Appendix J.
26	Mt Todd, Vista Gold EIS – Ian Hollingsworth	7.5	Surface water runoff from the mine site does not impact downstream water quality	**Detailed Comment** This requirement should have explicitly referred to the ANZECC guidance on water quality monitoring, specifying determination of background water quality and before after control impact **Vista Gold Action** Following on from the comment above, the assessment of surface water impact is inaccurate and Vista Gold's ability to manage impact has not been demonstrated.	Vista Gold has sufficient background water quality data from the upstream SW2 monitoring location to derive site specific trigger values and is in a position to calculate these trigger values if required to meet future WDLs. The BACI mentioned in the comment applies to biological monitoring for detection of ecological impacts. Water quality is sampled as part of the assessment but an ongoing water quality monitoring program provides more appropriate information for managing water quality for downstream ecosystem protection. Surface water is sampled from background and downstream sites to meet the requirements stated in this comment.
28	Mt Todd, Vista Gold EIS – Ian Hollingsworth	7.7	Rehabilitation, decommissioning and closure Rehabilitation achieves a stable and functioning landform which is consistent with the surrounding landscape and other environmental and stakeholder values; and the decommissioning, rehabilitation	**Detailed Comment** Considering that this site currently represents a large public liability and Visa Gold's project description will triple the footprint of the operation, ITEM 1 the closure plan does not give any indication that the landform design will be stable and self-sustaining or that water and solute balance will be controlled in the near or long term. ITEM 2 The cover specification in Chapter 24 for plant growth medium is inadequate. ITEM 3 The soil investigation in Chapter 9 does not include any site investigation, landscape or soil rehabilitation objectives designed to reflect natural edaphic	We have solicited a recognised expert to answer the technical points raised in the question; The following response was provided by Vista Gold's rock mechanics expert, Mr Kenneth Rippere. "Based on my experience as project manager for the engineering study for waste rock design at Newmont's Batu Hijau mine on Sumbawa Island, Indonesia, steeper waste rock faces are effective in tropical environments. The Batu Hijau mine is in a similar tropical climate, although the area is jungle rather than savannah. The World Bank wanted a 3:1 face angle (17 degrees) on waste dump faces but Newmont desired a steeper, 2:1 angle (25 degrees) for several reasons. These included the reduced footprint which lessened the environmental impact, the greater ease of shedding rainfall, and a significant reduction in mine haulage costs. Other considerations involved the reduction in topsoil and subsoil materials needed for cover, again an environmental advantage. The work, which won the World Bank's acceptance, was undertaken by Golder Associates (Perth) in conjunction

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			and closure program is integrated into the mine plan and considered as part of mining operation, rather than as a separate phase at the end of mine life.	constraints. ITEM 4 Consequently, the engineering specifications in the closure plan do not support the rehabilitation objectives. The guidelines did not specify a reasonable level of site investigation into soil and landscape conditions. Consequently the information needed to support a reasonable landscape rehabilitation plan has not been collected. **Vista Gold Action** The closure plan needs to schedule rehabilitation activities and identify reduction in site liabilities to closure and relinquishment. The closure plan needs to refer to soil and landform descriptions and characterisation undertaken at sufficient resolution to identify hill slope environmental variation and to support reestablishment of self-sustaining ecosystems in context with the local environmental range.	with other consultants. Golder won the 2006 award for Engineering Excellence (Western Australia) for this effort." Waste rock dumps, once established, are inherently stable at the angle or repose. There is no real reason to decrease this angle unless some cover including revegetation is planned. If failure of a waste rock dump occurs, it is due to failure of the overloaded foundation materials or a reduction in the strength and/or permeability of the incorporated materials. The WRD at Mt Todd will be founded on rock and the materials are indurated, minimizing the likelihood that they will degrade over time. The high, steep WRD at Mt Todd, once established, should remain stable in the overall sense: the challenges arise from the details of the inter-lift liners, and these are critical to the performance of the dump, both in terms of stability and the ability to inhibit the development of acidic drainage. The purpose of these liners is to (permanently) intercept percolating rainfall and direct it away from the PAG materials enclosed within the core of the dump. Due to the induration of the rock materials, the dump should remain free-draining over time: without the liners, percolation would rapidly lead to oxidation and the generation of acid. So, the liners are an essential component of the Mt Todd WRD design, regardless of the face angle. In an active waste rock dump (i.e. during mining operations), the materials continue to shift to some degree as the loading environment changes and percolation moves particles around, leading to settlement. Moreover, the crestal portion is over-steeped by a few degrees and will continue to fall away, eventually settling at the repose angle. So there is measurable settlement and observable ravelling as dumping progresses. Behind the really active area, settlements can continue to occur for some time, although to an ever-decreasing degree. At Mt Todd, the liners, along with the bedding and cover layers must accommodate such displacement while ensuring that that percolating waters are forever directed outward, rather than inward. As the liners slope outward at 2 degrees, or 5%, they represent potential sliding surfaces for the overlying materials. The engineering of this design will require consideration of many factors, including deformation tolerance, stability over a range of temperatures, puncture resistance, frictional characteristics, and developing

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					an understanding of behaviour under intense precipitation events (in perpetuity). Numerical modelling should resolve some of the issues associated with the design and point towards optimization.
8	Rob Law Environment Centre NT Policy Officer	8	Climate Change Risks	Climate change risks are acknowledged in the EIS and state the project will need to give special consideration to the increased risks of flash flooding and the need to review the design flood level criteria for the mine and design outcomes. The assessment of climate change risks in the risk management chapter is not adequate and should be revised. For instance the potential increased risk of flooding is considered in the risk assessment to be of moderate consequence and unlikely likelihood, and residual risk of low. This does not reflect the assessment within the EIS' climate change report. The project should be designed for a 500 year ARI design event rather than 100 year ARI, in order to build in the additional risks of climate change. The management measures identified by the proponent are vague and should be revised to be more specific about how the risks have been built into the design of the different aspects of the project. We support GHD's advice that Vista Gold should invest in a standard weather station at the Mt Todd site to enable systematic monitoring of conditions and for future projections. This appears to be left out of chapter 8 in the project commitments and should be invested in by the company to provide better data into the future and allow more adaptive management to occur.	We don't see the link between climate change and ARI. That is, ARI only uses actual data and not hypothetical climate change predictions. Vista Gold has already established a weather Station at Mt Todd and has been collecting that data for the past 2 years.
60	PAUL PURDON Director Pollution Control Northern Territory	9	Land Soil management	Provide an indication in the Supplement of: • whether it will be 'practicable 'to respread topsoil immediately after stripping; • where within the site the soil is likely to be	Re-spreading of topsoil is only practicable when a receptor site is available to receive topsoil removed from a donor site. The practicalities of the planned operation as detailed in the EIS and PFS preclude re-spreading of topsoil as no donor sites will immediately be available to receive stripped topsoil.

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	Environment Protection Authority			stockpiled for future use if it cannot be respread; and • whether covering inactive stockpiles with weighted plastic or tarpaulins (as indicated in Appendix Z) would be considered a practical option by the operator.	Locations of topsoil stockpiles will be delineated during the detailed design prior to commencement of construction. The practicalities associated with civil construction dictate that topsoil stockpiles will be located close to areas where re-spreading of the stockpiled material will occur so as to reduce haulage costs and minimise the degree of handling of this material so as to preserve it's structural integrity and biological activity. Covering soil stockpiles with weighted plastic or tarpaulins would only be considered where short term stockpiles are constructed that are intended for imminent re-spreading and where the risk of sediment mobilisation during storm events is high. Stockpiles that will be inactive for extended periods of time will be revegetated to maintain soils structure, organic matter content and microbial activity.
103	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	Appendix I	Hydrology	Page 16: states pumping will be from the WTP via a monitoring pond to Batman Creek/Edith River "throughout the year". The model assumes year-round discharge. • Clarify that year-round discharge from the WTP is proposed.	Under normal operation, there will be no discharge of the water (from WTP) to the Batman Creek however the WTP has provision to discharge into the Batman creek if operational need arises. The water treatment plant effluent goals were set at 80% of the effluent limit to provide a safety factor. Table below summarises the effluent limits and goals for the WTP.
104	PAUL PURDON Director Pollution Control Northern Territory Environment Protection Authority	Appendix I	Hydrology	• What are the potential impacts of year-round discharge to Batman Creek, Stow Creek and the Edith River during times of low or no flow?	Assuming the discharge will only be of adequate quality for the receiving environment, the likely impact will be the increased moisture availability in the aquatic environment and the potential additional growth of aquatic flora and fauna which would otherwise be supressed during the dry season. This additional growth will obviously be exploited by species favourable to the adjusted conditions. Current modelling indicates that releasing water from the site during any dry season is unlikely. However we have included this as a contingency as there is always a possibility of extraordinary events occurring, either climatic or operational.
149	MIKE FAWCETT Director Mining Remediation	Appendix J	Appendix J Section 3.6.2 - Retention pond 7	Investigations on seepage rates from TSF I in 2011 highlighted two modes of discharge: 1. Migration through/under the embankment 2. Downward migration into the	When TFS is operated as a TSF then there is almost no seepage. Currently it is not operated as a TSF and this is driving a different outcome. We do note that the TSF should not have been filled with storm water above the tailings beach level. This was done due to an instruction by the NT Government and has damaged the TSF.

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				groundwater Recommendations included calculating sulfate/thiocyanate discharge rates in Horseshoe Creek and changes to the monitoring regime of surface/groundwater quality Have these recommendations been implemented?	The question does not contain any recommendations so we are unable to comment on their implementation.
151	MIKE FAWCETT Director Mining Remediation	Appendix J Section 2.4	Waste Discharge License	During a time of discharge how does Vista propose to analyse the daily water samples in time to ensure that if the monitoring value is breached, the discharge can be adjusted lower or cease altogether?	The current WDL 178-2 is valid until September 2014. The water sampling methodology and triggers for cessation of discharge are detailed in Appendix 2 of WDL 178-2 where if the rolling 7 day 80'' percentile for an anolyte exceeds a Monitoring Value, determined under condition 14 at monitoring point SW4, Vista will implement the Investigation Process for Exceedance of Dilution Factors. However, it is anticipated that that during operations, water management and any potential associated issues will be entirely different to the current situation where an excessive water inventory is present on site. Vista is committed to operating and managing water according to the regulatory requirements that will apply during operations.
150	MIKE FAWCETT Director Mining Remediation	Appendix J Section 4.2	Dilution Factor	The dilutions stipulated in the Discharge plan are calculated using the water quality from SW2 monitoring site (upstream Edith Creek) However, water from the tributary Stow Creek joins the Edith River before SW4. Stow Creek has high Cu and Zn concentrations which will affect the capacity of diluting RP1 discharge measured at SW4. Vista must adjust the calculations for discharge rates to account for the higher metal load in the diluent.	The dilution factors calculated from the BurrliOZ species sensitivity distribution program (Campbell et al. 2000) were used to derive monitoring values for Cu and Zn to be met at SW4. SW4 monitoring will provide information on the combined concentrations of metals from SW2, Stow Creek and the mine discharge. Provided the monitoring values are met at SW4, 80% of the downstream ecosystem will be protected from a reversible 10% decrease in growth or reproduction.
152	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	Assessment would generally include: • Identification of lithologies in the proposed mining areas • Representative sampling of these lithologies	No response required as this is an introduction to questions below

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				• Identification of the net acid producing potential and metal leaching potential of each lithology • Development of a WR management strategy which identifies how problematic lithologies will be identified, selectively handled and management both short and long term. AMD Assessment by GHD for Mt Todd • The EIS identified three lithologies within the proposed expansion to the Batman Pit - Grewacke, Shale and Mixed greywacke/shale. • They have identified that they will potentially generate 510Mt - with most of the waste coming from expansion of the pit, in addition to smaller amounts of material from the process plant area and potentially sludge from the WTP (would appear to be 16Mt based on figures below). • They have identified that there is PAF (233Mt), uncertain (101Mt) and NAF material (160Mt) within the lithologies from Batman Pit. • 87 WR samples (from five drill holes) were subjected to ABA Nine samples (three from each lithology) were then subjected to kinetic tests. Two tailings samples were subjected to ABA. One of these has gone on to kinetic testing. • The kinetic testing undertaken identified: • PAF leachate is acidic with elevated concentrations of Ag, A1, Cd, Co, Cu, Pb, Ni, Zn - with cells producing neutral pH leachate showed elevated levels of As and Sb. • Uncertain has the potential to generate acidity with elevated concentrations of Al, As,	

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				Cu, Cl. • NAF/non-PAG had a neutral pH with elevated levels of Zn and Cl. • Tailings will exhaust their current alkalinity and eventually generate acid. Tailings leachate was elevated in Ag, Al, As, Cl, CN, Cu, Mo, Sb, So4. From the information reviewed it is not possible to ascertain if the sampling was representative, however it does appear to be a limited dataset when compared to most AMD assessments reviewed previously.	
153	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	However it is quite clear that there is the potential to generate AMD including elevated levels of metals from PAF and uncertain WR and tailings and generate elevated levels of metals from NAF material. Therefore any waste rock management strategy should include: 1. Preliminary sulphur cut-off values for waste rock management have been provided in the EIS. However, this preliminary work needs to be developed into a clear and easily implemented PAF identification and segregation strategy, which includes an operational policy which can be easily implemented on a day to day basis in the Pit.	A waste rock operational plan will be developed during the Detailed Feasibility Study that will include a PAF identification and segregation strategy. Parameters utilised in the current assessment are included in appendix L
154	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	2. The potential for NAF to leach metals does not appear to have influenced its proposed use as a construction and rehabilitation material. As such, further assessment of NAF material should be undertaken, prior to any approval being granted for its use on site.	Based on the available kinetic testing data, NAF material shows no propensity to generate metal leachate without the onset of acid generation. All NAF samples that produced circum-neutral pH values also produced low concentrations of metal leachate. However, the onset of acidity did produce an increase in metal concentrations.
155	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	3. All uncertain material should be managed as PAF.	The mine study (Appendix B of the Preliminary Feasibility Study) has included material classified as uncertain scheduled such that it is placed inside the ultimate waste dump. Therefore it has been treated as PAF

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156	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	4. A Cyanide management plan should be developed which specifically addresses the potential disposal of CN tailings into (potentially acidifying conditions) TP1.	The process plant design (Appendix E of the Preliminary Feasibility Study) calls for cyanide detoxification and has been included in the design. As such, cyanide will not enter the tailings at levels considered harmful i.e. >10ppm WAD
157	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	5. Detailed designs should be developed for the short and long term management of seepage from TP1 (due to the fact that it is unlined).	When it is operated as deigned seepage is collected via the decant system. During operations TSF is closed by capping the surface so the water is shed off and the underdrains are blocked. That is to say there is no ongoing seepage that needs to be considered after closure. **Additional Comments** There are no site features designated as TP-1. It is assumed that reference is being made to TSF1. Note that TSF1 was constructed with a compacted base of in-situ soils with an estimated compacted permeability of 1x10-7m/s or less. Therefore, the rate and quantity of flux through the compacted foundation is expected to be low. Engineering controls for seepage management will be further evaluated and developed during the design phase of the project.
158	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	6. There does not appear to be a design for the construction of TP2, while only very preliminary designs are provided for the expansion of the WR Dump. These will have to be developed and modelled.	Noted **Additional Comments** There are no site features designated as TP-2. It is assumed that reference is being made to TSF2. Detailed design for TSF2 will be developed during the design phase of the project.
159	MIKE FAWCETT Director Mining Remediation	Appendix L	Geochemistry Program	8. Although some statements in the EIS lead you to believe that a Water Treatment Plant is going to be used i.e. 'RP1 waters will be treated in the WTP prior to discharge during mining' - there was not any detailed information on the WTP.	A water treatment plant was designed to the Preliminary Feasibility Study Level (Appendix N). “Water Treatment Plant FINAL”. Because the plant is relying on a dilution from the Edith River during the times were there is a positive water balance (wet seasons), off-site discharge can only occur during periods of adequate flow in the Edith River. . Given that treated water demand is more than 4 times of the WTP capacity, (treated water can be used on site, especially for process plant make up water and for site dust suppression), no surplus effluent is available for discharge into the Edith River. If it is found that the site cannot use treated water during the dry season, on-site storage can be explored, or modularized NF units can be brought to site. These releases of water will be controlled by a Waste Discharge Licence (WDL), the format is likely to be similar to the current WDL178.
132	PAUL PURDON	Appendi	Assessment of	Please also note that Figure 4-3, Regional	Please refer to Attachment J - Revised Regional Veg Fig4-3 for more detailed

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	Director Pollution Control Northern Territory Environment Protection Authority	x M, Vol 4	Impacts	Vegetation Types between Katherine and Pine Creek (Appendix M, Vol. 4) does not appear to contain the vegetation data it is attributed. Without further advice, this figure is taken as being the same map as Figure 64, Gouldian Finch Habitat Appendix, Vol. 5.	regional vegetation data
31	Allan Warchot Medical Entomology Dept of Health	Appendi x P	Biting Insect Assessments	A baseline biting insect assessment was carried out for the proposed mine development, and has been attached as Appendix P. Due to the detailed investigation being carried out, there are no major comments from Medical Entomology. However there are a few minor comments, which are provided below. a) Executive Summary Page xvii Biting Insects – Dot Point 5 of Impact Assessment/Proposed Management The sentence reads 'treating artificial ponding with an undiluted bleach solution or a residual insecticide'. Undiluted bleach should only be used in artificial receptacles such as drums, buckets, rainwater tanks etc that are sourced from North Queensland, to prevent the introduction of the dengue mosquito. Artificial ground ponding created by development such as borrow pits, sediment ponds, water ponds etc should not be treated with bleach. This comment also applies to Dot Point 6 in Section 14.6.2 Biting Insects-Mitigation b) Section 14.3.2 Biting Insects Page 14-13 The second paragraph on this page appears	Section 14.3.2 Biting Insects Seasonal Abundance The 2012-2013 trapping program recorded a peak in mosquito numbers during April, with an average of 768 mosquitos per trap. More than half of these were the floodwater mosquito, Aedes normanensis. May was the next most productive month for mosquitoes with an average 101 mosquitos per trap; followed by February and March with an average 72 and 79 per trap respectively. These are relatively high peak season numbers, and indicate the presence of numerous breeding sites in the Mt Todd mine site area. The most common mosquito species found at the mine site during 2012 -2013 trapping program was *Aedes normanensis,* the floodwater mosquito. It is considered to be a major pest species by the Northern Territory Department of Health. This species accounted for approximately 44% of all mosquito species recorded. Generally 30 or more adult female *Aedes normansensis in* a monitoring trap that is set in residential areas indicates a likely pest problem. This threshold was exceeded to a large extent in all but one trap site in April 2012, indicating seasonally high pest problems in most areas of the mine site. Section 14.6.2 Biting Insects Mitigation (and Executive Summary page xvii) A 10% chlorine solution will only be used to treat items/equipment/machinery introduced to the mine site from North Queensland; i.e. items that have the potential to contain even small amounts of ponded water and thus the potential to transport eggs of *Aedes aegypti*, the dengue mosquito.

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				misleading. It mentions mosquito populations were regarded as relatively low, however the first paragraph in this page mentions April recorded an average of 768 mosquitoes per trap, which is regarded as a relatively high number of mosquitoes. This would need to be clarified in the supplementary to the EIS	