

Disposal of By-products at the Douglas Mine Site
Applications for Planning Permit and Works Approval
PROPONENT RESPONSE TO SUBMISSIONS

ATTACHMENT B

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RESPONSES BY MATTERS RAISED

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NOTES

Submission number format XXXX-NN

Where:

XXXX = “HRCC” if submission or response was made to Horsham Rural City Council; or
 “EPA” if submission or response was made to Victorian Environment Protection Authority

NN = Number of submission as shown on EPA website; or
 Referral Authority:

 WCMA = Wimmera Catchment Authority

 GHCMA= Glenelg Hopkins Catchment Management Authority

 ERR = Earth Resources – Regulation

 GWMW = Grampians Wimmera Mallee Water

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MATTER	SUB NO.	SUBMISSION	ILUKA RESPONSE
1	Groundwater Contamination General		
1.1	EPA-02, HRCC-01, HRCC-02, HRCC-03, HRCC-04, HRCC-10, HRCC-11, HRCC-14, HRCC-17, EPA-03, EPA-07	Numerous submitters expressed concern regarding the potential for contamination of groundwater that could lead to exposure of humans and a change in groundwater quality that would reduce its beneficial uses.	<p>Iluka is confident that the information and evidence provided in the applications and supporting documents shows that concerns in regard to groundwater contamination are unfounded</p> <p>For groundwater contamination that has an adverse impact to occur each of the following conditions must be met:</p> <ol style="list-style-type: none"> Water must pass through the by-products substances from within the by-products must dissolve in the water the water with the dissolved substances must flow with the groundwater to a location where an adverse impact could occur the amount of the substances that is in the groundwater at the location must be sufficient to result in pollution. <p>In this case:</p> <ol style="list-style-type: none"> Water will pass through the by-products and mix with the groundwater. Based on the genesis of the materials existing in water systems for millions of years, the substances clearly do not dissolve in the groundwater. Ground water quality monitoring, analysis of water currently in contact with by-products and results of laboratory testing the materials prove conclusively that the by-products which are primarily sands, are not readily soluble. The Jacobs report states "In summary, while there are a range of potential contaminants present in the by-products, the contaminants are not readily soluble and therefore present a low risk to groundwater quality". The predicted flow paths of groundwater water from Pit 23 is mixed do not impacts on the Glenelg River, Lake Kanagulk or groundwater drawn from existing stock and domestic bores. The concentrations of any substances in in groundwater at the locations where an adverse impact could occur cannot reach concentrations which could be harmful. <p>It is evident that concerns in regard to groundwater contamination raised in submissions, have been addressed and these concerns are not justified.</p>
2	Conceptual Hydrogeological Model		
2.1	EPA-02	CDM Smith report suggests groundwater flow from Pit 23 is to Bitter Swamp, the Glenelg River, McGlashin Swamp and Tea Tree Lake	CDM Smith reports the model prediction that groundwater flow from Pit 23 is exclusively to the northwest and to McGlashin Swamp and a drainage line that runs into that swamp. As stated in the response to 1.1 above. no groundwater flow from Pit 23 to the other water bodies mentioned is predicted or expected.
2.2	EPA-02	The surface water discharges (springs) on the neighbouring property to the west of Pit 23 have been ignored	This statement is incorrect. Section 3.6.2 of hydrogeological modelling report clearly acknowledges the existence of the springs and Figure A27 of the same report shows that the model predicts discharge of groundwater at drainage lines in which the springs are located
2.3	EPA-06	Springs on numerous other properties and the use of groundwater have been ignored.	This statement is untrue. All springs in predicted flow paths from Pit 23 have been considered, see Section 3.6.5 of the hydrogeological modelling report.
2.4	EPA-02	Figure A39 of the hydrogeological modelling report shows that flow from Pit 23 to Salt Creek is likely because if the relative elevations of 180 m and 165 m respectively	<p>This statement is incorrect due to a misinterpretation, by the submitter, of groundwater flow directions from groundwater contours</p> <ul style="list-style-type: none"> the 180 m groundwater contour does not pass through Pit 23; and groundwater flow from Pit 23 to the creeks and drainage lines that flow to the Glenelg River would require that flow to be parallel to the groundwater contours, which cannot occur.
2.5	EPA-02	Landowners to the west of White Lake have access to water of high quality	This statement is true, but not relevant to the proposal. This is because the aquifer in that area is different to that in the area of the mine site. Groundwater flow under the area to the west of White Lake travels toward the east so if water from Pit 23 theoretically reaches White Lake it could not flow to the area to the west of White Lake

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2	Conceptual Hydrogeological Model continued		
2.6	HRCC-04, EPA-01, EPA-02, EPA-04, HRCC-08, EPA-03	<p>The hydrogeological model does not include “gravel aquifers”, “high flow aquifers”, “rapid flow aquifers” or flow to and in the basement aquifer.</p> <p>Evidence of fast flowing aquifers in the area include:</p> <ul style="list-style-type: none"> • experience in drilling of a bore on a property approximately 10 km NE of Pit 23 indicates a slow flowing aquifer at around 12 metres below surface and a fast flowing aquifer at around 24 metres below surface. It is suggested that model has only taken the upper level into account; • a report by Cameron & Jakobson 1992 was provided to Iluka but evidence in that report in relation to Fulham hole was ignored. The evidence from the report referred to is that there is always some flow at Fulham hole but after a wet period the flow increases to 10 megalitres per day and creates a cone of sand on the river bed. • water from Pit 23 is disappearing so rapidly it may be through a fracture in the basement rock and ending up who knows where; • observations of groundwater flow into the Glenelg River at the waterhole next to Fulham Homestead; • water disappearing rapidly from Pit 23; • anecdotal evidence of rapid infiltration of water due to sub-surface cavities, dams not holding water and water disappearing rapidly from tracks. • The fact that a fast flowing aquifer was identified in the report on the Strathlynn bore field 	<p>The information provided on the drilling of the bore is interpreted as indicating that the aquifer is in the Loxton-Parilla Sands with the permeability being higher at the base of the unit. Since the water table in the area of the Douglas mine site is generally in the lower part of the Loxton-Parilla Sands the model has been calibrated to the properties of the deeper part of the sands, which is the opposite of what is suggested in the submission.</p> <p>The Cameron and Jakobson report was provided to CDM Smith and Jacobs and the groundwater modelling report makes reference to the Cameron and Jakobson report in sections 3.6.2 and .6.4.2. In Section 6.4.2 it is noted that the model is consistent with observations by Cameron and Jakobson of permanent water holes.</p> <p>Strong groundwater flow into the Glenelg River, as occurs next to the Fulham Homestead, occurs when the river is incised into the Loxton-Parilla Sands creating a direct connection between the sands and the river. Because the Loxton-Parilla Sands is more permeable than the Basement, discharge of groundwater maintains the water hole and this has been represented in the hydrogeological model. The observations of groundwater flow to the river do not support the presence of a “fast flowing aquifer” that is more permeable than what has been included in the model.</p> <p>Water is not disappearing rapidly from Pit 23. There is a permanent pool in the base of the pit because the groundwater level is above the base of the excavation. The basement is known to be a relatively low permeability aquifer and there is no evidence of excessively fractured zones in the area. Available photographs and geologists reports on mining indicate the pit 23 floor consists of heavy plastic clay.</p> <p>In contrast to the supposition of the existence of zones of extremely high permeability, the evidence against the existence of such zones in connection with Pit 23 includes:</p> <ul style="list-style-type: none"> • the geology of the area is extremely well understood due to the extensive drilling that has occurred, including 9868 exploration holes, so if a zone of extremely high permeability did exist it would have been identified; • if an aquifer or pathway to the basement aquifer of extremely high permeability did exist and was connected to the base of Pit23 then the groundwater mounding under that pit that has been observed would not occur; • the Loxton-Parilla Sands are represented in the model as a very permeable aquifer with a permeability of up to 15 m/day, which is close to the upper end of the typical range for medium grained sands; • construction reports for bores in the area show yields ranging from 0.1 to 0.9 L/s with most <0.3 L/s. These yields are typical of medium-grained sand with variable silt/clay content and limited saturation thickness. None of these bores intersected a zone of higher permeability than that assumed in the modelling; and • The report on the Strathlynn bore field does state that the aquifer from which water is drawn from an aquifer that is a buried paleochannel containing gravel and sand that could be said to be a fast flowing aquifer. The report also makes it clear that the aquifer was identified after a detailed search for such aquifers in a wide area, including the Douglas mine site. The aim of this work was to identify a suitable high yielding aquifer as close as possible to the Douglas mine site. If such an aquifer existed within the Douglas mine site there is little doubt that it would have been identified and developed in preference to the Strathlynn bore field. <p>It is apparent that no gravel, fast flow or rapid flow aquifers in connection with Pit 23 exist.</p> <p>The evidence in support of the safety of the proposal includes the above facts, in conjunction with the concentration and solubility data presented that make impact on groundwater quality insensitive to flow patterns. The predicted flow patterns are a contingency against adverse impact above that provided by the inherent stability of the substances in the by-products.</p>
2.7	EPA-01	Experience in drilling of a bore on a property approximately 10 km NE of Pit 23 indicates a slow flowing aquifer at around 12 metres below surface and a fast flowing aquifer at around 24 metres below surface. It is suggested that model has only taken the upper level into account	The information provided is interpreted as indicating that the aquifer is in the Loxton-Parilla Sands with the permeability being higher at the base of the unit. Since the water table in the area of the Douglas mine site is generally in the lower part of the Loxton-Parilla Sands the model has been calibrated to the properties of the deeper part of the sands, which is the opposite of what is suggested in the submission.
2.8	EPA-01	Drawdown due to pumping from bores on a property approximately 10 km NE of Pit 23 could result in a rapid flow of groundwater from the mine site to the property.	This suggestion is inconsistent with the suggestion of an aquifer of extremely low permeability because the high permeability would mean the effect of pumping would spread but the magnitude of the drawdown would be small, potentially inducing negligible effect on hydraulic gradient and therefore flow.

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2	Conceptual Hydrogeological Model continued		
2.9	HRCC-09	Filter bag content and gypsum are very fine and may leave pit with seepage water	<p>The in-situ ore bodies at Douglas had been subject to rainfall infiltration for hundreds of thousands of years. Ultra-fine material was present in the mined ore and required removal by the on-site Wet Concentrator Plant and also at the Hamilton MSP; if this material was mobile then it would not have been present in the mined ore. The stability of fine solid particles in a consolidated matrix of granular solids is a basic sediment stability premise that applies in geology, civil engineering and geotechnical engineering. The mobility of fine particles contravenes these fundamental premises.</p> <p>If the seepage from Pit 23 contained ultra-fine particles of or containing NORM the quality of groundwater in an around Pit 23 would have changed significantly. Results of groundwater monitoring show that this is not the case.</p> <p>The submission provides no evidence of particulate matter leaving the pit with water seeping from the pit.</p>
2.10	HRCC-09	Measurements of groundwater level at BW36 and BW45 indicates rises since 2012.	<p>Locally elevated groundwater levels have been measured beneath Pit 22 and Pit 23, which are due to seepage of water from the disposal of wet tailings from the WCP (which ceased in early 2012). The rise in groundwater level measured in BW36 is associated with this historical disposal of wet tailings mined at the site, the effect of which has been simulated by the hydrogeological model</p>
2.11	HRCC-09	Activity concentrations of Ra-226 and Ra-228 at BW36 have risen dramatically 0.3 to 1.2 Bq/L for Ra-228 and 0.1 to 0.5 Bq/L for Ra-226. These changes indicate that: the predictions of time for travel of water particles are wrong; and the claim that there has been no increase in radium concentrations in groundwater attributable to by-product disposal is invalid.	<p>Actual results of activity concentrations at BW36 since January 2012, which have been contained in presentations made to the ERC, are:</p> <ul style="list-style-type: none"> • for Ra-226, minimum 0.1 Bq/L, maximum 0.58, average 0.29 Bq/L • for Ra-228, minimum 0.26 Bq/L, maximum 1.63, average 0.68 Bq/L <p>Activity concentrations peaked in July 2013 but have subsequently subsided. Natural, temporal spatial variations in radium concentrations are expected based on the mass load of radio-isotopes in the region being much greater than the contribution of Iluka's by-products disposal and the solubility of the by-products is low. Trends are inconsistent with the hypothesis that radium leached from the by-products is the source of the elevated activity concentrations.</p> <p>Similar increases in radium activity concentrations followed by a decrease have been observed at other times and locations including prior to disposal of by-products and at locations well outside of the area that could possibly be affected. This constitutes evidence of the natural variation.</p> <p>It evident that the observed variations in radium activity concentrations at BW36 is not the result of leaching of radium from the by-products in Pit 23 and therefore cannot be used to assess the rate of water particle travel or to challenge the model predictions in this regard, or dispute the conclusions that there has been no increase in radium concentrations attributable to by-product disposal.</p>
2.12	HRCC-09	The groundwater level below Pit 23 is rising (an average of 2.75 m). This indicates that the water is spreading as the increase would have been 8 metres if contained within the area of the pit	<p>The modelling recognises that in open pits there is the potential for rainfall-derived recharge to increase. However the proportion of rainfall that reaches the water table is still small because continuous and high rainfall events are required to sufficiently wet the unsaturated zone to result in recharge and any ponding at surface will result in loss due to evaporation.</p> <p>Where the water table is shallow (3.5 to 8 m depth) and readily receives recharge, the groundwater levels have only varied by 1 to 1.5 m in response to rainfall variations. This is not because the aquifer is rapidly draining all of the rainfall. The response to rainfall is a function of the portion of rainfall that infiltrates, aquifer permeability and storage (specific yield).</p> <p>The increase in groundwater level beneath Pit 22 is interpreted to be up to 4 m due to seepage of water from historical disposal of wet tailings. Yet, groundwater levels in surrounding bores (BW23, BW29, BW42 and BW45) have varied by only up to 0.5 m, of which BW42 is actually influenced more strongly by seepage from the on-site Freshwater Dam. In other words, the mounding of the water table is localized beneath Pit 22 and Pit 23. If the permeability of the aquifer were much higher than what has already been modelled, the mound would spread out resulting in lower groundwater levels beneath the pits and higher groundwater levels in the surrounding bores.</p> <p>Similarly, if the permeability were much higher, a steep hydraulic gradient between Pit 23 and McGlashin Swamp would not exist as recharge would not be sufficient to maintain the hydraulic gradient.</p>
2.13	HRCC-17	Groundwater and Glenelg River tributaries may become a conduit to the Glenelg River	<p>The basis of this submission is contrary to the predictions of the hydrogeological modelling that seeping form Pit 23 will not flow with the groundwater to the Glenelg River or any of its tributaries.</p> <p>The submission provides no evidence that contradicts the model predictions.</p>

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2	Conceptual Hydrogeological Model continued		
2.14	EPA-06	Anecdotal evidence supports the proposition that permeability of the regional aquifer may be significant higher than has been input to the modelling.	See response to 2.6
2.15	EPA-06	Pit 23 is a zone of high recharge that causes sub-surface cavities as confirmed by Pit 23 not retaining water during periods of a flooding	A large number of photographs taken during the mining of Pit 23 show now evidence of sub-surface cavities. If the suggested phenomenon was real there would evidence of such cavities in the pit wall. There is no such evidence. Pit 23 does retain water after periods of high rainfall.
2.16	EPA-06	The basement has been modelled as impervious in nature. The dry bores indicate water flow through the basement. If the basement geology was taken into account the groundwater contours would show funnels centred on the dry bores. The basement potentially provides a rapid flow aquifer to the Glenelg River at Fulham Hole.	The statement in regard to the treatment of the basement in the model is incorrect. The basement is represented by a saturated unit with a permeability of 0.1 m/day with permeability of up to 0.2 m/day being considered in the uncertainty analysis. Dry bores simply mean the groundwater level is below that at which the bore is screened. The hypothesis of some sort of plug hole through which water was flowing to the basement is highly inconsistent with the measured groundwater levels across the mine site and would require some highly incredible basement geology. The suggestion that the basement could be a rapid flow pathway to the Glenelg River is unfounded.
2.17	EPA-06	The McAuley and Armour report provided to Iluka has been ignored particularly the interpretation in that report that Lake Kanagulk is a source of significant recharge	This statement is incorrect as the report referenced in the submission was supplied to and reviewed by CDM Smith and Jacobs. These reviews noted that this report was prepared before measurements of groundwater levels in the vicinity of Lake Kanagulk were made. Such measurements have subsequently made and they show the groundwater level to be well below the water level in the Lake. While the McAuley and Armour interpretation was not based on groundwater level measurements the current interpretation that there is no connection between Lake Kanagulk and the groundwater is based on hard evidence and therefore the actual measurements are preferred.
2.18	EPA-06	The perched water table that runs directly under the mine site has been caused by Iluka's activities	It is assumed that this submission refers to the ridge or elongated mound in the groundwater that runs from the south-west to the north-east to the east of Pit 23. It should be noted that: <ul style="list-style-type: none"> • Groundwater contours based on measurements made in 2002, i.e. prior to any possible impact from mining, show the ridge or elongated mound to exist corresponding to a ridge in the basement; and • CDM Smith found that the changes in groundwater levels due to mining activities have not resulted in changes in groundwater flow directions.
2.19	EPA-06	With the return of groundwater levels to the pre-mining condition there will be groundwater flow to the east and onto the Glenelg River	The statement is incorrect. See response to 2.12 in regard to pre-mining contours that show that were such that flow to east from Pit 23 was and is not possible.
3	Hydrogeological Model Accuracy		
3.1	EPA-02	In reference to elevated radium concentrations being observed at locations where the model predicts arrival of water from previous by-product disposal locations at some time in the distant future, could the model be wrong	The model was developed, calibrated and utilised by highly experienced and qualified modellers using extensive data There is no reason to suspect that the model is wrong

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3	Hydrogeological Model Accuracy continued		
3.2	EPA-04	The cross-section across the mine site shows: <ul style="list-style-type: none"> the Glenelg River to be at a higher elevation than White lake when in reality it is some 20 metres lower; and Pit 23 to be holding water when the base of the pit is known to be porous. 	The cross-sections are only schematic, as is clearly stated, to communicate key features of the groundwater system. The discharge of groundwater to the Glenelg River has been simulated in the model based on correct elevations, as shown in Figures A34 to A36. Showing water in Pit 23 is accurate since the water table is currently above the base of the pit.
3.3	HRCC-09	There is uncertainty in the groundwater contours in the vicinity of Pit 23 due to the small number of monitoring bores in the area. The modelling predicts groundwater flow to the northwest but this has not been confirmed by test bores	Groundwater flow directions have been interpreted from groundwater levels collected from monitoring bores not just within the vicinity of Pit 23 (BW29, BW36, BW45, WRK300 and WRK301) but also from bores located down gradient between the pit and groundwater discharge zones (BW5, BW6, BW27, BW28, BW28A, BW28) as well as bores to the northeast (BW7, BW30 and BW51). The interpreted and simulated groundwater flow directions are consistent with the topographical controls on the water table and locations of known groundwater discharge zones, and there is high confidence in the interpretation of flow directions.
3.4	EPA-06	The modelling shows parallel flow lines from Pit 23 to McGlashin Swamp but the salinity of water from bores ranging from 2000 to 18000 EC indicating different strata and potential flow paths	Data provided shows water from bores down gradient of Pit 23 have salinities ranging from 5,000 to 10,000 mg/L and that from a bore adjacent to the hypersaline White Lake to be >10,000 mg/L The predicted water particle tracks are a prediction of water particle movement from Pit 23 groundwater salinity will be affected by many other factors than water flowing from Pit 23.
3.5	EPA-06	Groundwater contours for the restored Pit 23 show concentric rings, contrary to the predicted parallel flow paths.	It is unclear which groundwater contours are being referred to. The only plans showing concentric rings is Figure A38 on the CDM Smith hydrogeological modelling report that shows the difference in predicted water levels if the proposal is implemented. This plan is not providing any indication of predicted absolute water levels.
3.6	EPA-ERR	The hydrogeological model is appropriate for regional scale assessment but at the mine scale has notable differences between observed and modelled groundwater flow raising some uncertainty in the predictions of flow directions	Figure A25 of the hydrogeological report does show some differences between interpreted and simulated groundwater contours to the northeast of Pit 23 but not to the extent that would lead to different predicted flow directions or point of discharge. Construction of perpendicular lines to either the interpreted or simulated contours shows groundwater flow directions from Pit 23 are to the north-northwest. As the interpreted and simulated contours become closely aligned down gradient both predict discharge at McGlashin Swamp and the drainage line that runs into that swamp.
4	Errors in or Clarification Required in Hydrogeological Modelling Report and the Particle Tracking of Seepage Water Report		
4.1	EPA-02	Figures A7, A8 and A9 show pits on the western side of Elliotts Back Lane that do not exist	This statement is correct. The shapes shown are mineral sand ore bodies that were not mined. This makes no difference to the modelling or the predictions made using the model.
4.2	EPA-GWMW	It is stated that the predicted arrival times of water particles from Pit 23 at two of the bores are outside of the 2020-2455 range but is unclear if the arrival times are above or below that range.	As shown in table 2.1 of the particle tracking of seepage water report water, particles are predicted to arrive at IWB3 and IWB4 in 2010
5	Groundwater Impact Assessment		
5.1	EPA-01	The particle flow map shows the possibility that Barton Swamp (in Lake Toolondo) could be impacted.	The water particle tracks clearly show that groundwater flow below Pit 23 is exclusively to the north west while Toolondo reservoir is some 15 to 20 km to the northwest. There is no indication whatsoever of any impact in the vicinity of Lake Toolondo.
5.2	HRCC-09	The assessment notes a predicted increase in groundwater level at Pit 23 of 1.3 metres, yet there is already an average increase of 2.75 m	What the report on the groundwater impact actually says is: <i>The extended period of enhanced recharge associated with future disposal of by-products through to 2037 is predicted to cause groundwater levels to be up to 1.3 m higher in 2037 than would be the case if disposal ceased in 2017.</i> The prediction is that the groundwater will reach a level that is 1.3 m higher than it would reach if the proposal was not implemented.

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5	Groundwater Impact Assessment continued		
5.3	EPA-06	The environmental value of the Glenelg River from Rocklands to Fulham has been undervalued since it refers to it as “degraded” and not worthy of preservation. Reference is made to descriptions provided by Dr Ian Rutherford that the river had significant value and “only needs flow restoration to being in good condition.	The CDM Smith hydrogeological modelling report states that the Glenelg River has “.... <i>significant environmental, recreational and aesthetic values although they may become degraded due to changes in flow regimes caused by diversion of water their water for agricultural and domestic use</i> ”. This statement is in no way contrary to that of Dr Rutherford. At no point has it been inferred that the Glenelg River is not of value and worthy of preservation. Iluka has no need to downgrade perceptions of the value of the Glenelg River because no adverse impact on that river is predicted because of low solubility and flow patterns.
5.4	EPA-06	Any ecosystem damage to Fulham Hole would be catastrophic to the Glenelg River because the range of ecological values at that location. Connectivity with the river has been acknowledged yet virtually ignored.	Iluka agrees that adverse impact at Fulham Hole must be prevented; however, no such adverse impact from the proposal is predicted. Particle track predictions do show that groundwater will flow from the eastern side of mine site to the vicinity of Fulham Hole however this does not mean that Fulham Hole is under threat. The low solubility of the potential contaminants in the by-products makes the risk low even before consideration of the effects of dilution and dispersion. Furthermore, this remains irrelevant to the assessment, and it should be considered in conjunction with the absence of flow path from Pit 23 to the Glenelg River.
6	Errors in or Clarification Required in Groundwater Risk Assessment Report		
6.1	EPA-GWMW	One more bore is shown in the report than can be identified in Victorian State Groundwater Database (WMIS)	WIMS notes that the shallow Domestic and Stock bore WRK079462 is no longer active. This bore doesn’t appear in the on-line portal “Visualising Victoria’s Groundwater”.
7	Radiation General		
7.1	HRCC-02, HRCC-08, HRCC-10, EPA-06, EPA-07	Numerous submitters expressed general concerns in regard to radiation including exposure through contamination of groundwater and air.	The potential for exposure to radiation through groundwater contamination is addressed in the response to 1.1. The radiological impact report contains the results of a study completed by Southern Radiation Services that leads to the conclusion that the potential impact of exposure to radiation resulting from implementation of the proposal is negligible. This study has been the subject of review by the Department of Health and Human Services (DHHS). DHHS found that “ <i>appropriate methods were used in the Southern Radiation Services report to estimate radiation doses and that these methods were applied correctly. The Department is also of the view that the conservative assumptions used in the report to estimate the radiation doses were reasonable</i> ”. DHHS also completed a detailed independent assessment of radiation doses from the various potential exposure pathways and found that “ <i>The Department’s ‘first principles’ review has found that even after taking extremely conservative assumptions that the radiation doses estimated to be attributable to the operation of Pit 23 both during the proposed disposal period and following site rehabilitation are so low as to be of no public health or environmental concern.</i> ” It is evident that general concerns in regard to radiation exposure are not justified. The expert assessment by Southern Radiation Services has been supported by DHHS and finds that the risks from exposure to radiation are negligible.
7.2	HRCC-04	Potential impact of lead produced by the Uranium and Thorium decay chains not considered	The potential impact of lead produced through the uranium and thorium decay was not considered because quantity is extremely small. Southern Radiation Services have calculated that the rate at which stable lead will be produced from the 2,190,000 tonnes of by-products is less than one gram per year. The additional lead produced would have negligible effect.
7.3	HRCC-04	Statement on low dose rates is equivocal in that it includes an, "if correct", qualifier	The use of the language was part of an explanatory statement.
7.4	HRCC-04	Applications make no reference to 300 µSv limit on dose from a single source	The 300 µSv/year represents an action trigger level. The 1000 µSv/year limit specified in <i>Radiation Act 2005</i> and associated regulations is the parameter to assess predicted dose rates.
7.5	HRCC-04	Comparison of airborne radioactivity with typical background levels in Australia rather than background levels at Douglas	The reference to typical background levels in Australia is made in the description of the existing (pre-mining) environment and simply makes the point that airborne radioactivity at the mine site pre-mining were similar to typical background levels in Australia. No comparisons are made between predicted airborne radioactivity and typical background levels in Australia.

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7	Radiation General continued		
7.6	HRCC-04	Claims are made that the by-products are inert but they are radioactive	The applications and supporting documents make no claim the MSP by-products are inert, in fact the word "inert" is not used in relation to the MSP by-products. The fact that the by-products are radioactive has never been hidden in any way. All Iluka's mineral sands products sold and by-products returned from Hamilton radioactive by definition.
7.7	EPA-01	What effect will a 2%, 3% or 10% rise in radioactivity levels emanating from the capped and rehabilitated Pit 23 have on the marketing of local produce? The risks of leachate and radioactivity from Pit 23 are too great to allow even this small rise in radioactivity in what is pristine farming country.	The predicted increase in radiation emanating from the rehabilitated pit is zero. This prediction is made by both Southern Radiation Services and the DHHS.
7.8	HRCC-08, EPA-06	Friends and family have been lost to cancer and the risk of this should not be increased	The DHHS has considered the risk of cancer and found the risk to nearby residents to be low.
7.9	HRCC-09	Why does radioactive waste from thousands of hectares of mining operations need to be disposed of in one 20 Hectare pit?	The option of disposing of the by-products has been identified as the best available in terms of the environment, practicality and economic benefit The materials can be disposed of in Pit 23 without adverse impact on the environment or public health.
7.10	HRCC-09	Activity concentrations of Po-216 and Bi-212 in by-products have been requested from DHHS	The data requested is contained in Table 3 of Attachment C to the application for Works Approval.
7.11	HRCC-09	If the seepage flows to the north-west in a column, the proposed attenuation with distance will also be far too low as what goes into a water column will most certainly come out at the other end at the same concentration.	Water seeping from Pit 23 will join and mix with the groundwater that is flowing to the north-west. Should the concentration of any potential contaminant in the water seeping from Pit 23 (i.e. the source concentration) be higher than that in the groundwater, then the concentration in the mixture of the groundwater and the seepage will be less than the source. As the groundwater flows to the northwest further dilution will occur and the concentration in the mixture will be further reduced. Jacobs modelled the effects of dilution and dispersion on the concentration in the groundwater and determined that the concentration in groundwater discharging to the surface would be one fiftieth of the source concentration. It is evident that the water seeping from Pit 23 will not plug flow and that the concentration of any potential contaminant in groundwater discharging to the surface will be a small fraction of the source concentration. Furthermore, the source concentration is low due to the low solubility of the potential contaminants in the by-products.
7.12	HRCC-09, EPA-08	The radiological hazard will be increased 50 fold by a 50 fold increase in the quantity of by-products. The hazard will be further increased by and an increase in the quantity of radium, which will dissolve and enter the groundwater, in the pit due to radioactive decay.	The hazard associated with the proposal has been assessed and found to be extremely low. The premise, on which the submission is based, that the quantity of radium will be increased by radioactive decay, is incorrect. The nature of radioactive decay is that the activities of Ra-226 and Ra-228 cannot be higher than the head of chain radionuclide. As quickly as radium is produced by radioactive decay, it then itself decays to form the next radionuclide in the chain.
7.13	HRCC-09	Lower activities of daughter isotopes indicates loss prior to mining, therefore they will leach	ANSTO Minerals, the operator of the laboratory that performed the radionuclide analysis, were approached in regard to the apparent disequilibrium indicated by the reported results. ANSTO have provided a detailed response that could be provided, if required, but in summary ANSTO's response was that: <ul style="list-style-type: none"> • The apparent disequilibrium is a product of limitations in the analytical techniques rather than the of the materials; and • There is no reason to assume that the materials are not in secular equilibrium Since the materials are considered to be in secular equilibrium there is no valid indication that leaching of radionuclides have or will leach.

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7	Radiation General continued		
7.14	HRCC-09, EPA-05	The predicted increases in dose rates are significantly lower than those shown in the ARPANSA Technical Report No. 141: Scientific Basis for the Near Surface Disposal of Bulk Radioactive Waste.	<p>The ARPANSA Technical Report described the use of RESRAD Model for the prediction of dose rates under a range of scenarios but in all scenarios it is assumed that the Th-232 and U-238 head of chain activities of the radioactive materials are 500 Bq/q. The corresponding activities of the by-products in this case are 17 Bq/g and 4.3 Bq/g for Th-232 and U-238 respectively.</p> <p>It appears that the submitters have incorrectly assumed that the conditions applied in the technical report corresponding to agricultural use are appropriate. These assumptions for the agricultural scenario include:</p> <ul style="list-style-type: none"> • a house built on the site whereas the building of a house be prohibited; • an individual spending 8 hours per day on the site, 365 days per year, whereas 100 hours per year is a more reasonable estimate; • all consumed food and water being sourced from the site whereas: <ul style="list-style-type: none"> ○ no food would be produced on the site; and ○ the groundwater in the regional aquifer is non-potable due to its salinity • an annual rainfall of 1000 mm/year whereas rainfall in the Douglas area averages 450 mm/year • an erosion rate of 1 mm/year whereas the erosion rate at the site is conservatively estimated to be 0.5 mm/year <p>The “Remote Site” scenario described in the technical report assumes that:</p> <ul style="list-style-type: none"> • No house is built on the site • An individual spend 84 hours per year on the site • 1% of consumed food and water is sourced from the site • An annual rainfall of 300 mm/year • An erosion rate of 0.3 mm/year <p>This scenario employed provides a more accurate representation of maximum dose rates for both thorium and uranium in the order of 1 mSv per year. When this figure is corrected for the actual activity concentrations in the by-products, the dose rates from thorium and uranium reduce to 0.03 and 0.009 respectively giving a total maximum dose rate of 0.039 mSv/year</p> <p>The radiological report provides a detailed comparison of the RESRAD modelling results and the predictions of the first principles model including the conclusion that when the differences to the inputs are accounted for the predicted maximum increases in dose rates from the two models are similar and below the prescribed limit.</p>
7.15	EPA-06	While leachability of radionuclides is low the quantity is large because 20,000,000 tonnes of by-products will be disposed of.	The applications specify that the quantity of radioactive material to be disposed of under the proposal is between 1,547,000 and 2,873,000 tonnes.
7.16	EPA-06	There is a risk to people fighting fires that involve vegetation that has absorbed radionuclides.	The low solubility of radionuclides and the five metre separation between radioactive materials and the surface mean that uptake of radionuclides by plants would be minimal and therefore the risk to fire-fighters would be negligible.
8	Radon		
8.1	HRCC-02, HRCC-09	Lack of monitoring for radon	<p>Radon monitoring that has been conducted by Iluka includes:</p> <ul style="list-style-type: none"> • Frequent and regular monitoring from 2004 to 2007 showed consistent low results, typically less than the detection limit of 5 to 12 Bq/m³ compared to the ARPANSA recommended trigger level for a radiation protection program including monitoring of 1000 Bq/m³. • The resumption of radon monitoring, in Pit 23, in July 2014 to verify estimates made by Southern Radiation Services <p>All results obtained since the resumption of monitoring have been reported to the DHHS and the Douglas ERC and have been below the detection limit</p>

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8	Radon continued		
8.2	HRCC-02, HRCC-09, EPA-08, EPA-05, EPA-06, EPA-07	Results of radon measurements made by the Kanagulk Landcare group	<p>Results of measurements of radon concentrations at locations ranging from 850 to 6,200 metres from the centre of Pit 23 have been reported by the Kanagulk Landcare Group ranging from 35 to 69 Bq/m³. These results are inconsistent with results of measurements made by Iluka that show the radon concentrations in Pit 23 to be below the detection limit of 10-11 Bq/m³.</p> <p>Iluka does not accept the measurements or results reported by the KLG.</p> <p>The DHHS have recently conducted short term real time monitoring at the site with the results being consistent with those of the measurements made by Iluka. The DHHS investigation is continuing with paired detectors of different types being used.</p> <p>The estimates made by Southern Radiation Services of radon emanation rates and resultant concentrations that would be experienced by the critical receptor are based not only on single-sample measurement results but also an understanding of the mechanism of radon emanation and extensive field experience. The DHHS' independent peer review of the work of Southern Radiation Services confirms the appropriateness of the methodology used and the DHHS' independent estimate of the annual dose increase to the critical receptor due to radon emanating from Pit 23 during by-product disposal is 0.02 mSv/year, which is negligible.</p> <p>Both Southern Radiation Services and DHHS estimate that the increase in dose rate to the critical receptor due to radon emanating from the backfilled Pit 23 would be zero.</p> <p>In summary it can be said with a very high degree of confidence that exposure to radiation of members of the public by inhalation of radon would be minimal and not create a risk to health.</p>
8.3	EPA-06	As areas such as the TSF and Pit 19 dry out radon gas emissions rise.	This submission is based on the results of radon concentration measurements discussed in the response to 8.2. In any case the proposal does not include a situation of drying out of radioactive material near the surface.
8.4	HRCC-09	When disposed will be a clean state and it will take time for radium to leach and effect radon concentrations. As radium levels increase so will the release of radon. Groundwater flows will spread the radium keeping the concentrations low in the vicinity of the by-products so radon concentrations will remain low close to the by-products.	<p>This submission is based on the following assumptions, each of which is invalid:</p> <ul style="list-style-type: none"> the radium present in the by-products will dissolve. It will not. radon emanation is dependent on radium dissolution which is false radium levels will increase over time due to radioactive decay. This is not possible, as the rate of radium production through radioactive decay will be equalled by the rate of radium decay. <p>The submission is contradictory in that it is that radium concentrations will both increase and decrease.</p> <p>The submission seeks to explain why measured radon concentrations in the pit are low but provides no valid reason. The radon concentrations in the pit currently provide the most accurate estimate of the radon concentrations that will occur in the pit during the disposal phase.</p>
9	Errors or Clarification Required in Radiological Report		
9.1	HRCC-09	For calculation of radon emanation rate a density of 2900 kg/m ³ was used rather than 1600 kg/m ³ .	The 2900 kg/m ³ is the average solids specific gravity of the mineral particles. 1600 kg/m ³ is the bulk density of the mixture of by-products. If the 1600 kg/m ³ value had been used the estimate of radon emanation rate could only have been lower.
9.2	EPA-06	The radiation risk assessment assumes a cap thickness of 3 metres and an erosion rate of 0.3 mm/year	<p>The Radiological report clearly states that:</p> <ul style="list-style-type: none"> “On closure of Pit 23 a 5m cover of compacted soil will isolate the radionuclides from the surface environment”; and “For the purposes of this model, an estimate for erosion at this site of 0.5mm/y is assumed.”
10	Traffic		
10.1	HRCC-07	The potential danger of radioactive materials being transported, especially in the event of a spill	<p>The “potential danger” is assessed as being low because:</p> <ul style="list-style-type: none"> Transport operations must comply with the ARPANSA Code of Practice for the Safe Transport of Radioactive Material (2008); The extensive history of the use of the route by trucks carrying heavy mineral concentrate and by-products without significant incident. <p>In the very unlikely event that an accident were to occur – such as a truck overturning – the volume of by-product is small, easily contained, and easily recovered. As required under the conditions of the Radiation Management Licence the DHHS (among a number of entities) would be immediately notified and would oversee Iluka's response to ensure that exposures to the public are negligible.</p> <p>Iluka would undertake radiation monitoring of the ground surface at the accident site to ensure (and satisfy DHHS) that by-product material was recovered and surface gamma radiation dose rates were returned to background levels.</p>

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10	Traffic continued		
	10.2	HRCC-07 The impact of traffic on amenity in Balmoral	A search of Iluka's incident management system showed that since mining and on-site processing of ore concluded at Douglas in March 2012 there have been no complaints relating to truck traffic through Balmoral. During this time the volume of truck traffic was the same as that proposed.
	10.3	HRCC-10 The roads are not suitable for B-double vehicles	The much higher traffic volumes that occurred during the operational life of the Douglas mine were assessed at the time by VicRoads and the Councils as satisfactory.
11	Rehabilitation		
	11.1	HRCC-04 Neil Marriot surveyed the site before mining and should be the one that is consulted on species selection rather than the regulators	Consultation with the relevant regulators cannot be replaced by consultation with other parties. Consultation with Neil Marriot in addition to the relevant regulators is a reasonable and sensible suggestion.
	11.2	HRCC-04 Storage of subsoil and topsoil for an additional 20 years will result in the loss of native seed stock, soil flora, microbes, fungi etc.	The area currently occupied by Pit 23 was used for agriculture pre-mining and therefore did not and does not contain native seed stock. Iluka has an excellent track record regarding successful revegetation and rehabilitation of mine sites. Iluka is currently rehabilitating some mine sites, utilising subsoil and topsoil taken from the site prior to mining some 30 years ago, with excellent results
	11.3	HRCC-04 Monitoring for subsidence required for 10 years and for groundwater quality and radiation emissions for many more years	It is proposed that monitoring will continue until closure criteria specified by the responsible authority are met
	11.4	HRCC-04 1,067,000 tonnes (1.157 million m ³ of overburden excess to requirements for Pit 23. The fate of this overburden must be known as placing it in Pit 23 would reduce the volume of void space available for by-products in Pit 23.	The data on overburden available contained in the applications demonstrate that there is sufficient overburden for the five metre cap. What happens to the overburden not used for the cap is work under the mining licence and will therefore be regulated and controlled by Earth Resources – Regulation. Overburden will be managed appropriately under the existing regulatory regime. The fate of overburden other than that used for the backfilling of Pit 23 is irrelevant to the proposal and the applications. The void space available for by-products is stated in the application. Placement of overburden in Pit 23, other than a small amount being used for intermediate cover and that for the five metre cap, is not proposed.
	11.5	HRCC-04, EPA-06 The erosion rate assumed for calculation of the life of the cap above the by-products is too low.	Southern Radiation Services and the DHHS have reviewed data available on erosion rates and both have concluded that, for the purpose of the assessment, an erosion rate of 0.5 mm/year is appropriate. DHHS note that its estimate is highly conservative as a best estimate would be 0.05 mm/year. The erosion rate used is in fact conservative and no evidence to the contrary has been provided in submissions. It should be noted that the erosion rate is not critical to the impact assessment because the Southern Radiation Services' assessment is that, even if the cap was eroded away completely the maximum increase in dose to any member of the public would be less than the prescribed limit.
	11.6	HRCC-14 The by-products should be covered with a 10 metre thick cap rather than five metres	As outlined in response to 7.1, both Southern Radiation Services and DHHS have concluded that radiological impact to human health and the environment from the proposal, which proposes a 5 metre thick cap over the disposed by-products, is negligible. Increasing the cap thickness to 10 metres cannot be justified by the additional protection provided.
	11.7	HRCC-14 The area should be planted with long-lived indigenous perennial species	This is what is proposed.
	11.8	HRCC-16 EPA-WCMA The finished surface should be as near as possible to the pre-mining surface as a void would not return surface water flows to their original catchments	This is what is proposed. The proposal does not include leaving a void.
	11.9	HRCC-16 EPA-WCMA Frequency and duration of rehabilitation monitoring should be specified.	The proposal is that rehabilitation monitoring be conducted until the results of that monitoring show that monitoring is no longer required.

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12	Site Selection		
12.1	HRCC-03, HRCC-04, HRCC-07, HRCC-08, EPA-08, HRCC-14, EPA-06	By-product disposal should be limited to by-products of the processing of ore mined at Douglas. MSP by-products should be disposed of at the location where they were mined. Returning by-products to their "source" is "best practice". Return of by-products to their source mines in proportion to mine production is possible	<p>The applications detail the reasons why Pit 23 at Douglas is superior to the return of by-products to the source mines which include:</p> <ul style="list-style-type: none"> • the predicted adverse impacts of the Pit 23 at Douglas are so small that they could not be smaller at other sites; • the risks associated with storage and handling of radioactive by-products are proportional to number of storage locations and the number of times the material must be loaded and unloaded. Use of Pit 23 at Douglas requires by far the minimum number of storage locations and the amount of handling; • while the risks during transport are small they are proportional the distance travelled and the Pit 23 at Douglas option requires transport over the shortest distance; <p>The above reasons are sufficient to identify Pit 23 at Douglas as a better alternative for disposal of by-products than returning them to the source mines.</p> <p>The suggestion that return of by-products to their source mine is "best practice" is incorrect as return of by-products to their source mine has higher levels of environmental risk, and greater impact with higher disturbance?</p> <p>The suggestion of return to source is ideological rather than logical. An industry in which the return of wastes to origin of the feedstock from which the wastes were produced has not been identified by Iluka.</p>
12.2	EPA-08, EPA-05, EPA-06	Claims that Iluka cannot afford to return by-products to interstate mines are illogical as ore is already transported to Hamilton. Iluka is using this claim to put pressure on Council	<p>The case for the use of Pit 23 at Douglas for Hamilton MSP by-product disposal is not based on cost considerations alone, see response to 12.1.</p> <p>It will be noted that identification of Pit 23 at Douglas as the best alternative has been done without consideration of costs.</p> <p>While emphasising that that selection of Pit 23 at Douglas has not been made on the basis of cost, the fact that it a lower cost option can be seen as an advantage in that no unnecessary cost burden is placed on the operation of the Hamilton MSP.</p>
12.3	HRCC-NCC, EPA-05	Based on the ARPANSA Code the site is not suitable	<p>It should be noted that:</p> <ul style="list-style-type: none"> • ARPANSA is the Commonwealth radiation regulator but has no jurisdiction in Victoria where the DHHS is the regulator; • ARPANSA publishes a number of codes of practice and safety guidelines that the State agencies select for compliance by way of conditions attached to Radiation Management Licences; • Iluka's Radiation Management Licence is conditioned such that compliance with the following ARPANSA codes is required: <ul style="list-style-type: none"> ○ "Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing, 2005" (the Mining Code); ○ "Code of Practice for the Safe Transport of Radioactive Material,2008"; ○ "Code of Practice for the Security of Radioactive Sources ,2007"; and ○ "Code of Practice for Safe Use of Fixed Radiation Gauges, 2007" • These relevant ARPANSA codes do not suggest that the site is unsuitable.
13	Errors or Clarification Required in Applications		
13.1	EPA-04	Iluka have estimated the amount of "other material" to be 22,000 tonnes but the applications show an estimate of 50,000 tonnes +/- 30%	Both applications state that the estimated total quantity of concrete and steel is 50,000 tonnes +/- 30%. This is different to earlier documents that are now redundant and not part of the applications.
13.2	HRCC-09	The planning permit application states that mining commenced at Douglas in 2004 but if fact it was in August 2005	Site works commenced in 2004.
13.3	HRCC-09	Composition of total MSP by-products incorrect in Table 3.1.2 in attachment A to planning permit application	Corrected table provided.

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13	Errors or Clarification Required in Applications continued		
13.4	HRCC-09	Radionuclide activity in groundwater in vicinity of and in Pit 23 shown as being identical Tables 4.4.1 and 4.4.3 in attachment A to planning permit application	Data tabulation error acknowledged and a corrected table 4.4.3 has been provided. Correct activity concentrations for water collected from Pit 23 for Ra-226, Ra-228 and U-238 are 0.040, 0.084 and 0.050 Bq/L rather than 0.066, 0.315 and 0.043 Bq/L. The correction supports the proposition of low solubility.
14	Future Regulation		
14.1	EPA-02	Quantity of by-products, including monazite, will be allowed to be increased.	While the quantity of by-products, including monazite, would increase beyond that allowed under current approvals, the evidence shows that this increase would not result in any increase in adverse impact.
14.2	HRCC-02, HRCC-11	Independent radiation testing of both air and groundwater should be required Independent monitoring for at least 100 years is required.	The current and proposed arrangement for groundwater monitoring is as follows: <ul style="list-style-type: none"> • Samples are collected by a contractor independent of Iluka with bores to be sampled being specified in the approved environmental monitoring program although additional bores may be sampled at the direction of Iluka • The contractor is responsible for delivery of samples to the laboratory • Samples are analysed at an independent NATA accredited laboratory Samples of dust are collected in equipment owned and operated by Iluka with samples being analysed for radiation activity at an independent NATA accredited laboratory. Radon detectors are provided by an independent supplier and exposed to the air by Iluka using procedures specified by the supplier before being returned to the supplier (a NATA accredited laboratory) for analysis. It is apparent that there is, and there is proposed to be, a reasonable degree of independence in the radiation monitoring regime. Logically, the proposal is that monitoring should be conducted until the results of that monitoring show that monitoring is no longer required.
14.3	HRCC-04	Proposal is not in compliance with 2009 Work Plan variation.	Since it is proposed to excise the area required for the proposal from the mining licence, compliance with the work plan will be replaced with compliance with conditions are attached to new approvals.
14.4	HRCC-04	The Murray Basin Stage 2 EES (Kulwin and WRP) states that MSP by-products “will be returned to secure pits.”	At the time of publication of this EES it was necessary to provide for a range of options for the disposal of MSP by-products, consequently the possibility of disposal at those mine sites was included. Subsequently disposal of those by-products to Douglas was identified as the lowest risk and impact option mainly due to the impracticality of maintaining open voids with groundwater inflow at Kulwin and WRP pits. Kulwin and WRP have no open voids suitable for disposal of by-products.
14.5	HRCC-04, HRCC-09, EPA-07	Pit 23 should be classified in the same way as any Shire landfill and therefore should be lined and satisfy the requirements of the landfill BEPM The product from the Hamilton MSP is manufactured waste not mining waste The proposal includes the disposal of 45 tonnes of concrete and 5 tonnes of steel as well as dust bags from the Hamilton MSP, therefore the pit should be lined. The construction waste from other Iluka sites should be placed in Near Surface Facility requiring greater containment.	The proposal does include the disposal of concrete and steel but the estimated quantities are 45,000 and 5,000 tonnes respectively. The disposal of these materials is included in the proposal because Pit 23 is the most logical place for their disposal. The concrete and steel represent 2% of the total material to be disposed of, and is included in the proposal as these materials may be contaminated with particles of sand that are similar or identical to the sand primarily disposed of to Pit 23 without adverse impact. It would be Iluka’s preference to recover or dispose of steel and concrete elsewhere, however, the proposal includes this allowance as a contingency for steel which cannot be decontaminated readily, and concrete footings which have pores filled with mineral sands. The DHHS have determined compliance with the ARPANSA “Near Surface Code” is not required in this case.

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14	Future Regulation continued		
14.6	HRCC-04	Possible impacts of NORM in dust particles not considered in application for Works Approval because such matters are not regulated under the Environment Protection Act 1970. If EPA not regulating then HRCC should insist on seeing the Radiation Management Plan and Radioactive Waste Management Plan.	Iluka is happy to provide HRCC with the opportunity to view copies of these plans. It is noted that at the present time the council holds neither the regulatory jurisdiction nor the technical expertise in radiation management.
14.7	HRCC-04	The applications state that a requirement for the modelling and review of stormwater management could be included in conditions attached to a permit. This "could" be a "must"	The application correctly states that a condition relating to stormwater modelling and review could be attached to a permit, the decision as to whether such a condition is attached to the permit belongs to the responsible authority. Iluka has no objection to such a condition.
14.8	HRCC-04, HRCC-11	Matters relating to the selection of bores to be monitored, who does the monitoring and the duration of monitoring should not be left to Iluka. Monitoring for at least 100 years is required	It is proposed that the monitoring regime, that includes which bores, how long and who does the work, will be detailed in management plan that must be to the satisfaction of the responsible authority, i.e. HRCC. The expectation is that Iluka will propose a regime and the responsible authority will decide if is adequate and appropriate. Logically, the proposal is that monitoring should be conducted until the results of that monitoring show that monitoring is no longer required.
14.9	HRCC-04	Restrictions on material not specified should be prohibitions	If material is not listed in the management plan then its disposal would be prohibited.
14.10	HRCC-04, HRCC-09	Monitoring programs to be developed and implemented should be designed and implemented prior to approval. The two additional bores to be developed in the future are too little, too late.	Monitoring of groundwater and air quality is already undertaken in accordance with the approved work plan. The results of this monitoring have been used as input to assessments of potential impacts that are detailed in the applications and supporting documents. On-going monitoring is proposed to enable confirmation of the assessments and detect any departures to enable mitigation and prevention of unexpected impacts. The need for additional monitoring prior to approval cannot be identified.
14.11	HRCC-04	A review of the radiation monitoring program that is independent of DHHS is required to ensure the site is safe	The DHHS is the relevant regulatory authority and have both the duty and the expertise.
14.12	HRCC-04	A commissioning plan is required since the proposal is different to that described in the original EES and a new EES should be required for the direct disposal of by-products in large quantities rather than co-disposal at a ratio of 1:140	The original EES states: <i>"Monazite from the secondary processing plant will be buried on the floor of the pits where it will be covered by tailings, overburden and topsoil."</i> There is no reference to co-disposal of MSP by-products at specified ratios. A commissioning plan associated with a works approval may be required for the works required to establish a facility. In this case the facility already exists.
14.13	HRCC-04	It must be determined that proposal will create a state of potential danger to the quality of the environment or any segment of the environment.	This statement is made without evidence of the potential danger to the quality of the environment and in the face of significant evidence provided in the applications and supporting documents that that no such potential danger will be created.
14.14	HRCC-04	The bond would need to held for many years post 2035	It is proposed that the bond arrangement, including provisions for return, be as close as practical as the arrangements for the current bond held under the Mineral Resources (Sustainable Development) Act 1990. This would include return of the bond when agreed closure criteria are met. The timing of the return of the bond should be linked to the timing of those criteria being met. There is no expectation that the bond would be returned in 2035 when MSP by-product disposal is completed.

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14	Future Regulation continued		
14.15	EPA-04	At a facility open 24/7 how can it be ensured that control is maintained over what is disposed of?	Iluka act to prevent unauthorised access to the Douglas mine site including Pit 23. Vehicular access is restricted by a boom gate with swipe card activation or from the site office by remote control by Iluka personnel.
14.16	EPA-04	Ships from around the world transport heavy mineral concentrate from Port Thevenard to Portland. Who ensures the ships arriving at Thevenard are clean before loading	Iluka considers the risk of heavy mineral concentrate and finished product contamination to be greater than by-product contamination. This is managed by regular sampling of feed as received at Hamilton.
14.17	HRCC-09, HRCC-11	What if environmental impacts are deemed to be too great in future? Who has to deal with it in a hundred years' time? What happens in 100, 200, 1000 years when this concentrated material is no longer being monitored	The long term impacts have been considered in the basis of the proposal where precautionary principles have been applied.
14.18	HRCC-09, EPA-05	ARPANSA Technical Report No. 141 states that "the water table in the area should be of sufficient depth below the planned disposal structures to ensure that groundwater is unlikely to rise within 5 metres of the waste." And that the facility design includes "a base that will inhibit the migration of radionuclides from the waste into the environment".	The quotation from ARPANSA Technical Report No. 141 relates to the provisions in ARPANSA "Code of Practice for the Near Surface Disposal of Radioactive Waste in Australia, 1992" (the Near Surface Code). The relevance of this code must be considered in light of the following: <ul style="list-style-type: none"> • The by-products in the proposal have been shown to be of low solubility; • Iluka's Radiation Management Licence is conditioned such that compliance with the following ARPANSA codes is required: <ul style="list-style-type: none"> ○ "Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing, 2005" (the Mining Code); and ○ "Code of Practice for the Safe Transport of Radioactive Material (2008)"; ○ "Code of Practice for the Security of Radioactive Sources ,2007"; and ○ "Code of Practice for Safe Use of Fixed Radiation Gauges, 2007"; and • the Near Surface Code specifically states that it is not intended to apply to waste covered by other Commonwealth codes of practice, such as the Code of Practice on the Management of Radioactive Wastes from Mining and Milling of Radioactive Ores, 1982, which the Mining Code supersedes. <p>The decision by the State regulator, the DHHS, to require compliance with the Mining Code rather than the Near Surface Code was made on the basis of what is required to adequately protect the environment, employees and members of the public from radiation. The DHHS have confirmed the view that the conditions attached to the existing radiation management licence are appropriate for the proposal, which is understandable because of the similarity between what is currently done and that proposed.</p>
14.19	HRCC-09, EPA-07	ARPANSA Technical Report No. 141 refers to the International Atomic Energy Agency (IAEA) codes and IAEA technical document 1380 includes guidance on the void space required for particular quantities of waste. According to this guidance: <ul style="list-style-type: none"> • Pit 23 does not provide sufficient void space; and • A buffer zone of at least 150 Ha is required. 	The assumed link between the regulation of the current proposal and a technical report produced by the IAEA is tenuous to say the least as it is through a reference in ARPANSA Technical Report 141 which a publication that relates the Near Surface Code that is not applicable in this case. It should be noted that: <ul style="list-style-type: none"> • compliance with the Mining Code and the Transport Code are requirements of the Radiation Management Licence; • compliance with licence conditions has been achieved to date and can be expected in the future; and • the regulatory regime to date has been successful in mitigating impacts of radiation.
14.20	EPA-06	Elevated radium activity concentrations have been detected at some bores and should have triggered an investigation by Iluka and DHHS	Changes in radium activity concentrations have been measured in water from bores: <ul style="list-style-type: none"> • prior to the commencement of by-product product disposal; • at locations where water flow from by-product disposal locations is not predicted to occur; and • at locations where water flow from by-product disposal locations is not predicted to occur until well into the future. <p>Furthermore:</p> <ul style="list-style-type: none"> • rises in radium activity concentrations have not been observed at locations where water from by-product disposal locations has arrived. • The quantity of radionuclides disposed of or proposed to be disposed of is small compared to that in region. <p>The evidence supports the proposition that the by-products are not the source of the observed changes in radium activity concentrations</p>

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14	Future Regulation continued		
14.21	HRCC-11	The shire does not have the ability to police this operation.	Regulation under the Radiation Act by the DHHS will continue as a primary regulatory instrument. The proposal includes six monthly environmental performance reports to the responsible authority (i.e. HRCC) with independent auditing of such reports, if required by the HRCC. The provision of public access to the reports is also included in the proposal.
14.22	HRCC-11	State Government should finish their job, not give it to local government	Iluka have taken direction from Victorian State Government agencies and the Minister for Planning on the approvals pathway.
14.23	HRCC-13	An official approval process should be a regular (every 4 years) function of the disposal of by-products at the Douglas mine site. There should be a requirement for all variations to the proposal to be considered during the suggested "official approval process.	The need for new approvals for an operation that is unchanged, known to have been undertaken in conformance with all conditions and has not resulted in an unexpected environmental impact has not been identified. It is proposed that all work will be in accordance with a management plan approved by the responsible authority and that the management plan cannot be varied without the consent of the responsible authority. Under this proposal requests for variations to the plan could be subject to any level of consultation determined by the responsible authority.
14.24	HRCC-13	The period of operation needs to be defined as the MSP operation could continue for unlimited decades.	The applications state that the disposal of MSP by-products will be for the remainder of the operating life of the MSP and specifies that life to be up to 20 years.
14.25	HRCC-13	An ongoing official approvals process is required. Work Plan variations have significant social implications for the community and any variation should be subject the official approvals process.	It is proposed that any changes to the management plan be approved by the responsible authority
14.26	HRCC-13	Iluka should be required to fund the provision of health care (counselling and regular blood checks) and infrastructure for the local community.	Iluka has an established process for the consideration of requests from the community for funding for community support. Since 2007, in excess of \$355,000 has been provided to various community projects in south-western Victoria including in excess of \$177,000 in the Horsham/Douglas/Kanagulk area. Iluka considers applications for funding community projects; however, health care is considered a function of state and individual responsibility.
14.27	HRCC-14	The proposal would enable MSP by-products produced at Hamilton to be disposed of at Douglas irrespective of where the feed to the MSP originates	The quantity of by-products that could be disposed of under the proposal is limited by the capacity in the void.
14.28	HRCC-14	The area should be planted with long-lived indigenous perennial species	This is proposed.
14.29	HRCC-15 EPA-GHCMA	The adequacy of the existing monitoring bore network should be determined and additional bores constructed, if required.	Both CDM Smith and Jacobs completed an analysis of the adequacy of the existing monitoring bore network and recommended the installation of additional bores. The installation and monitoring of the additional bores is part of the proposal.
14.30	HRCC-16 EPA-WCMA	A clear understanding of the surface water management approach is required to ensure sediments do not leave the site and impact on adjacent areas. Detailed modelling of stormwater interception, collection and storage systems should be done prior to the pit being filled	It is for this reason that the proposal includes modelling and review of the surface water management prior to the pit being filled to the point where run-off from the pit area is possible.

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14	Future Regulation continued		
14.31	HRCC-16 EPA-WCMA	Formal and legally binding triggers and hold points should be established that require approval to proceed to be obtained from the responsible authority.	Accepted.
14.32	HRCC-16 EPA-WCMA	Evidence should be provided that to demonstrate that the existing surface water management facilities have been subject to a 1:100 rainfall event	This evidence can and will be provided as part of surface water management plans.
14.33	EPA-07	<p>The following requirements of the Near Surface Code should be met:</p> <ul style="list-style-type: none"> • A decommissioning plan • An institutional control period; and • radioactive waste classification <p>The proposal for a five metre thick cover would indicate the by-products would be classified as Category B under the Near Surface Code</p>	<p>See response to 14.18 for explanation why the Near Surface Code does not apply in this case.</p> <p>It should also be noted the proposal includes:</p> <ul style="list-style-type: none"> • The development and approval of a rehabilitation plan that would be the equivalent of a decommissioning plan • Rehabilitation monitoring until rehabilitation success has been demonstrated and further monitoring is not required, which is more logical means of setting an “institutional control period” than just prescribing a duration <p>The proposed cap thickness is not based on categorisation in accordance with the Near Surface Code therefore classification cannot be inferred from the cap thickness.</p>
14.34	EPA-07	Is there any intention to extract material from Pit 23 in the future?	<p>Iluka has no current plans for extracting material from Pit 23 in the future.</p> <p>It is acknowledged the possibility exists that, as a result of changes in the market and/or available technology, at some time in the future the deposited by-products could be seen as a resource and extraction could be proposed. It is important to note that any such proposal would require separate approvals to that now being sought.</p>
14.35	EPA-07	The EPA and HRCC have no authority over radioactive waste management in the future and there is uncertainty as to what guidelines will be applied.	<p>This statement is incorrect.</p> <p>As the responsible authority the HRCC could condition any permit issued to give the HRCC regulatory control over any aspect of the proposal. Iluka suggests that regulation and control over radioactive waste management should be placed in the hands of DHHS that has statutory role in such regulation and control, which DHHS will fulfil irrespective of the role taken by HRCC. Duplication of roles is unnecessary and unproductive. If the HRCC adopts this approach then there is no uncertainty as to what guidelines will apply.</p> <p>The EPA’s role in regulation and control of radioactive waste management is dependent whether it is determined that the by-products are radioactive and whether a condition of pollution or environmental hazard has arisen or is likely to arise. The application for works approval contains data showing that the by-products are radioactive and Iluka submits that a condition of pollution or environmental hazard has not arisen nor is likely to arise. The EPA will make a determination on this matter and the result of that determination will determine the role of the EPA in regulation and control in the future.</p>
14.36	EPA-07	The “problems” that exist at the Douglas site need to be addressed before any further development takes place.	Current activities are being conducted in compliance with regulatory requirements.
14.37	EPA-ERR	It is recommended that the EPA reviews groundwater monitoring data (level and chemistry) to assess mining impacts on groundwater as the basis for reviewing risks of the proposal and the potential mobility of by-products in-situ.	<p>The hydrogeological modelling report provides the results of detailed consideration of historical disposal activities and their effects on groundwater levels. This formed the basis for conceptualising and calibrating the model that has been shown to be able to predict effects on localised and regional scales. The report also provides the results of detailed consideration of hydrochemical data with no evidence of breakthrough of radium associated with historical disposal of wet tailings.</p> <p>The work recommended has been done.</p>

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14	Future Regulation continued		
14.38	EPA-ERR	It is recommended that the EPA review the groundwater monitoring program to ensure it is based on risk uncertainty to ensure the monitoring regime, including sampling location, assessment of results, triggers and reporting requirements are appropriate	It is agreed that an appropriate monitoring regime is required and the proposed mechanism by which this will be achieved is: <ul style="list-style-type: none"> • Iluka design the regime in consultation with consultants and present a proposal to the HRCC as responsible authority • The HRCC reviews the proposed monitoring regime in consultation with the EPA, DHHS, Earth Resources-Regulation and determine its acceptability • When the monitoring regime is acceptable in form and substance it will be included in the management plan required by the planning permit.
14.39	EPA-ERR	It is recommended that a condition be placed on approval that specific closure criteria be submitted prior to commencement of closure activities to ensure relevant regulatory authorities are satisfied with closure outcomes.	Iluka agrees with this recommendation.
14.40	HRCC-NCC	The submitter shares the concerns of the KLG and ERC and believes an up-dated environmental impacts assessment is required before monazite disposal should be allowed to proceed.	Iluka acknowledges that the KLG consider further environmental impact assessment is required. It is not correct to say that ERC as a whole shares this view. Iluka consider the impact assessment contained in its proposal is comprehensive.
15	Past Regulation		
15.1	EPA-02, HRCC-04, EPA-04, EPA-02, HRCC-13	Variation approved in 2009 (2009 Var.) not made public prior to approval	<p>The variation to the Work Plan of 2009 (2009 Var.) was outlined and discussed at the Douglas Environmental Review Committee (ERC) meetings in February 2009, and May 2009. It was noted at the August 2009 ERC meeting that the variation had been approved. Membership of the ERC includes three representatives of the community and a representative of the Kanagulk Landcare Group (KLG).</p> <p>The minutes of the February 2012 ERC meeting record the statement by the KLG representative that he was provided with a copy of the 2009 Var. after the ERC meeting of May 2009 and that the KLG made a submission to the Minister on the matter.</p> <p>No community concerns or complaints in regard to the 2009 Var. were raised at the ERC meetings of February, May, or August 2010 the minutes for which show that community representatives were present at each.</p> <p>It is the part of the role of community representatives of the ERC to act as a conduit between the community, the regulators and Iluka and it was expected that the community representatives would have provided community feedback to the forum. Iluka consider the consultation through the ERC adequate.</p> <p>In addition to briefing the ERC with and therefore making it known publically, the HRCC planning manager and local MP were briefed on the variation.</p>
15.2	HRCC-04	2009 Var. was approved without risk assessment or geological and hydrological studies in accordance with ARPANSA and ICPR guidelines.	<p>The potential contaminants were of low solubility due to their genesis. This is consistent with current information, and was accepted as sufficient for the risk to groundwater quality and surface water bodies to be considered low. Additional work completed confirms this view.</p> <p>The DHHS determined which ARPANSA guidelines should be followed and included compliance with those guidelines as a condition of the Radiation management Licence,</p>
15.3	EPA-02	2009 Var. permitted quantity of monazite to be disposed of increased dramatically from 9700 tonnes expected to be returned to Douglas by 2011	The 9,700 tonnes of monazite quoted is in fact the quantity of monazite returned to Douglas in, not by 2011. Table 2.2 of the 2009 Var. shows a total 29,930 tonnes of monazite was expected to be returned to Douglas by the end of 2011.
15.4	HRCC-04	2009 Var. approval was based on erroneous information in regard to groundwater salinity.	The request for the 2009 Var. contains neither reference to groundwater quality monitoring results nor any reference to such results to justify the proposal.
15.5	HRCC-04	Non-adherence to EES proposal for co-disposal of by-products	The EES makes no reference to co-disposal of by-products
15.6	HRCC-11	There have been changes in places that were not fully explained to the community	Details of all variations to the work plan have been provided to the ERC prior to approval

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15	Past Regulation continued		
15.7	HRCC-04, EPA-05	KLG has lost faith in DHHS on radiation DHHS have assured the community that what is being done is safe but this advice in direct conflict with ARPANSA technical guidelines	Iluka has full confidence in the in DHHS and other Victorian State regulatory agencies. Iluka consider that allegations of DHHS being in conflict with ARPANSA technical guidelines is based on a misinterpretation of those guidelines
15.8	HRCC-04	Monitoring of radium in groundwater may be erroneous because of bores being blocked by tree roots.	Detailed reviews of available monitoring data completed by CDM Smith and Jacobs have shown the data available to be sufficient to draw conclusions in regard to the low impact to date.
15.9	HRCC-13	The community consultative committee is not fit for decision making purposes and should not have decision making powers. The function of the committee is to act as conduit to the community	If the committee being referred to is the ERC, then Iluka is in supports this recommendation.
15.10	EPA-05	The ERC chairman resigned in November 2014 and has not been replaced.	There have been three meetings of the ERC since November 2014 which have been chaired by a senior representative of Earth Resources – Regulation or an independent person appointed by Earth Resources-Regulation.
15.11	EPA-06	The 2009 work plan variation was approved on the basis that “no-one uses the groundwater in the district”	The request for a variation submitted and approved in 2009 contains no reference to results of groundwater quality monitoring. The decision by the Minister was that the proposed variation would have no significant increase in adverse impact. Potential impacts on groundwater were considered in detail in the EES and the Minister determined that the impacts of the variation would be insignificant. Subsequent monitoring has shown that the Minister was correct and it is wrong to suggest that Iluka relied on an assumption in regard to use of groundwater to justify the variation.
15.12	EPA-06, EPA-07	Work Plans were not consistent with the EES and the dilution of MSP by-products with on-site produced tailings has not always been followed resulting in radioactive material being concentrated on the surface.	The EES makes no mention of the mixing of MSP by-products with on-site produced tailings. The Work Plan describes both mixing of MSP by-products with on-site produced tailings and direct disposal to pits as alternatives The suggestion that material of high radioactivity has been placed on the surface is incorrect.
15.13	EPA-06, EPA-07	DHHS has failed to enforce compliance with codes of practice and is dismissive of any requirement for compliance with and ARPANSA documents	See response to 15.7.
15.14	EPA-07	Questions provided prior the ERC meeting on 28 May 2012 were not asked and the minutes of that meeting are incorrect	At the ERC meeting of August 2012 the minutes of the meeting in May 2012 were accepted, by the ERC, without amendment.
15.15	EPA-07	Regulations have been neglected and Pit 23 is unsafe for the environment, farming enterprises and health of the local community	Both Earth Resources –Regulation and DHHS have monitored compliance with the regulations that apply. Submissions both state that current operations are compliant with those regulations.

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16	Past Performance		
16.1	HRCC-01	Wetland not replaced	<p>It is assumed that this remark relates to the unfenced wetland within the Pit 19 footprint.</p> <p>The facts are that:</p> <ul style="list-style-type: none"> • prior to mining there were two low-lying ephemeral wetland areas, one of 13.9 Ha immediately to the west of Pit 19 and one of 3.7 Ha between Pit 19 and Pit 22; and • in addition to the “natural” wetlands there were four small farm dams totalling 0.191 Ha within the area utilised for run-off-mine ore storage; and • following rehabilitation: <ul style="list-style-type: none"> ○ the reduction in “natural” wetland area will be 1.9 Ha with this area being made available for agriculture; and ○ two of the dams will be reinstated and new dam will be constructed further to the south. <p>The change in wetland systems will be negligible.</p> <p>The proposal does not include removal of wetlands.</p>
16.2	HRCC-02	No radiation tests of which the results are publically available since 2005 and no mandatory testing since	<p>The following radiation testing and reporting occurs:</p> <ol style="list-style-type: none"> a) Personal radiation monitoring has been and will continue to be performed quarterly b) Sampling and analysis of dust for radioactivity has been and will continue to be conducted six-monthly c) Sampling and analysis of groundwater for radium has been and will continue to be conducted quarterly <p>Results of (a) and (b) are reported to DHHS six monthly and the results of (c) are reported to the Douglas Environmental Review Committee quarterly.</p>
16.3	HRCC-04, HRCC-05, EPA-06, EPA-07	Excessive dust on neighbouring property during mining phase	<p>Iluka have and continue to reduce dust emissions as far as reasonably practical, and to maintain compliance with dust emission expectations. The dust referred to was not generated by the by-product disposal operation and is therefore irrelevant to the consideration of the applications.</p> <p>The applications include an assessment of the potential for dust generation and show that comfortable compliance with EPA recommended guidelines is expected.</p>
16.4	HRCC-04, EPA-08	Dust monitors were placed at the “wrong sites” with respect to prevailing winds	<p>Initially two dust deposition gauges were installed to the south of the operation and three to the north. In 2014 an additional three gauges were installed, two to the east and one to the west. The location of dust deposition gauges was such that excessive dust deposition rates from mining and rehabilitation activities would be detected.</p> <p>High volume samplers are used to provide measurements of particulate concentrations in the air and, in accordance normal practice, have been located at sensitive receptors, i.e. residences.</p>
16.5	HRCC-04, EPA-08	Dust monitors were only operated on one in six days so high wind days were avoided.	<p>Dust deposition gauges operate continuously over three month periods.</p> <p>High volume samplers are run on a one in six day cycle so that, measurements are made on each day of the week. This is standard practice and there is equal probability of sampling on windy days as on calm days.</p>
16.6	HRCC-04	A spillage of ore occurred from a train travelling from Hopetoun to Hamilton. The spill was hushed up and quickly cleaned up.	<p>There was a spillage of heavy mineral concentrate from a train in February 2012. The spillage was due to the failure of a door locking system.</p> <p>This incident was report to the DHHS as is required under the Radiation Management Licence. DHHS attended the site and provided guidance on recovery and clean-up.</p> <p>The transport of heavy mineral concentrate by train was temporarily suspended while the failure mechanism was identified and rectified through implementation of engineering and administrative controls.</p> <p>This chain of events illustrates the fact that the management regime in place is sufficient.</p> <p>The suggestion that there was any attempt to hide this event is rejected.</p> <p>Transport of radioactive materials by train is not part of the proposal.</p>
16.7	HRCC-04	There have been, at least, two spills from trucks on the Natimuk-Hamilton Road.	<p>There have been two spills of Echo ore on the Natimuk-Hamilton Road when trucks overturned.</p>

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16	Past Performance continued		
16.8	HRCC-04, EPA-08	Poor compaction during backfilling of Pits 9 and 10 resulting in subsidence resulting in loss of agricultural production from the land.	<p>Iluka acknowledge subsidence did occur.</p> <ul style="list-style-type: none"> the subsidence is being rectified, at Iluka's cost, in accordance with a plan developed with the landowner; the land has not been handed back and this will not be done until it meets the specifications required by the landowner and the regulatory authority; the landowner continues to receive compensation for the loss of productive land in accordance with the agreement between Iluka and the landowner plus by being given access to additional land; and the regulator's geotechnical experts have visited the site and found no issues of concern, a fact of which the landowner has been advised. <p>This is an example of the how the regulatory processes and Iluka's compliance is effective.</p>
16.9	HRCC-04	A drain around Pit 10, has not been properly constructed and the landowner and the ERC have been misled in regard to the capacity of the drain	The Pit 10 final landform, including the drain in question was approved as part of the 2009 Var., which was discussed at various ERC meetings, outlined the indicative void design, which was then signed off on by the relevant authorities. The void has been constructed in line with the indicative design and the department have visited the site with their geotechnical staff and have found no issues of concern; this has been reiterated to the landowner.
16.10	EPA-04	In 2004 SKM recommended monitoring of groundwater to the west and south at discharge points (springs). It is understood that some monitoring has been done to the west but not to the south except 6km downstream	While the springs have not been monitored the groundwater in the area of the springs has.
16.11	HRCC-04	<p>There have been a number of discharges of surface water from the site that are the result of bad practice rather than periods of high rainfall and have reached the Glenelg River.</p> <p>There have been 5 releases of water from the area of Pit 19 not two.</p>	<p>It is acknowledged unintentional discharges of surface water have occurred.</p> <p>The two mentioned in the application for works approval are the only two for which notices or orders have been issued by the regulatory authorities</p> <p>All such discharges have been reported to the ERC and the minutes of ERC meetings show that discharges occurred on 19 to 20 January 2007, 25 November 2008, 13 March 2009, 29 August 2009 and 30 October 2009. In each case:</p> <ul style="list-style-type: none"> water flowed off-site and on to a dam on a neighbouring property; the quality of the water discharged was good and caused no adverse impact; and no water reached the Glenelg River <p>Discharges occurred in December 2010, and January 2011, which flowed via a dam on a neighbouring property to the Glenelg River. These discharges occurred during a period of high rainfall that included:</p> <ul style="list-style-type: none"> 140 mm of rainfall during 6-8 December 60.6 mm of rainfall 2.5 hours on 7 December 2010 103.2 mm of rainfall recorded at the Balmoral weather station on 8 December 2010, which was a record daily high 222.2 mm of rainfall recorded at the Balmoral weather station for December 2010, which was a record high for any month. 124.4 mm of rainfall at the mine site during 12-14 January <p>The discharges that occurred were the subject of pollution abatement notices issued by the EPA that were complied with and revoked.</p> <p>In July 2013, following rainfall of 58 mm during 13-15 July, turbid water was discharged and flowed to a dam on a neighbouring property with no outflow from that dam. The discharge of the subject of notice issued under Mineral Resources (Sustainable Development) Act 1990 requiring certain works, all of which were completed.</p> <p>It is clear from the above that:</p> <ul style="list-style-type: none"> discharges had little or no impact and no impact on the Glenelg River; on two occasions discharged water has reached the Glenelg River and record high rainfall was a major contributing factor. <p>Iluka accepts that any such discharge is unacceptable and for that reason the proposal includes the work required to ensure that there is no such discharge from the area of land to be used,</p>

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16	Past Performance continued		
16.12	HRCC-04	Lack of definition of meaning of “environment” in Iluka’s Environment, Health and Safety Policy”. Suggestion that “environment” is limited to work environment.	The reference to “Environment” in Iluka’s EHS policy clearly includes the natural and social environment. This is evidenced by the inclusions in the list of what is required by the policy the development of effective plans for rehabilitation of disturbed areas, the efficient use of resources, in particular energy, water and land and engagement with our communities.
16.13	HRCC-09	KLG has asked for bores to be installed to northwest of Pit 23 many times since 2012 and these requests have been refused.	The sequence of events is as follows: <ul style="list-style-type: none"> in November 2012, KLG requested that more bores be installed and suggested that the existing network seemed somewhat random. Iluka explained that results from the monitoring of the existing network were required to develop a better understanding of the groundwater regime to inform the siting of additional bores. in October 2013 a technical study was commissioned to develop, calibrate and utilise a hydrogeological model to predict water particle flow paths from all pits in which tailings and by-products had been disposed, including Pit 23. on the recommendation of the hydrogeologist completing the technical study, six new bores were installed around Pit 22 and Pit 23 in December 2013/January 2014 to enable additional data, specific to the Pit 22/23 area to be collected the hydrogeological experts were asked to assess the adequacy of the existing network and provide recommendations on additions required. the hydrogeological recommendations were accepted and included in the proposal.
16.14	EPA-08	Presentation of monitoring results at the ERC is extremely poor	Iluka always has been more than happy to make changes to the presentation of monitoring data to the ERC on the basis of requests by ERC members Opportunities are provided at every ERC meeting for members to ask questions relating to and clarification of the data presented.
16.15	EPA-08	At meetings of the ERC Iluka was asked why “guidelines” published when the mine was approved had not been followed and the response was either that Iluka was unaware of the guidelines or the guidelines had been changed without the knowledge of the locals.	Current operations at the Douglas Mine site, including the disposal of by-products into Pit 23, are being carried out in compliance with all relevant legislation, regulations and guidelines.
16.16	EPA-08	Iluka guaranteed that the tailings pit would be impermeable thus protecting the water table and natural water drainage to streams and rivers yet even after heavy rains the pits do not store water.	The “guarantee” mentions appears to relate to statements made in the original EES in regard to the disposal of fine tailings from on-site processing that contain around 75% water. It is stated in the EES that investigations into the storage of tailings from on-site processing show that very little seepage is expected to occur because of the low permeability of the floor of the pit and the TSF, and active pumping of water from pit floors. References to disposal of mixtures of fine and coarser tailings from on-site processing in the original work plan and three subsequent variations to that plan make no mention of impermeable pit floors. The observation that the pits do not hold water after heavy rain is incorrect. An impermeable base is not necessary for protection of groundwater if liquid seeping through the base will not adversely impact on that quality.
16.17	EPA-08	Iluka’s monitoring and interpretations are questionable	The monitoring program is part of a work plan that has been approved by the relevant regulator, Earth Resources-Regulation and all results are reported to that regulator plus to the ERC, the membership of which includes representatives of the EPA and DHHS.
16.18	EPA-05	Variations have allowed voids and hills to be left across the mine site so the landform no longer resembles the pre-mining conditions	Specifics related to topography changes: <ul style="list-style-type: none"> A void (Pit 10) was approved, in 2009, subject to landowner consent; raised surface topography produced by the tailings storage facility is in accordance with the original work plan and has not been changed; 76 Ha of the area occupied by Pit 19 will be higher than the pre-mining level and: <ul style="list-style-type: none"> will resemble the original and surrounding landform; and has been audited by the regulatory authority and found to be in compliance with the approved work plan; and The area of land that will not be of a landform similar to pre-mining or surrounding area is 13% of the area disturbed at Douglas and the owner of the land accepted the landform.

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16	Past Performance continued		
16.19	EPA-05	EPAC Act conditions were not complied with when sites were mined before RTBC habitat was “secured”	It is deduced as a reference to the Environment Protection and Biodiversity Act 1999. The original mining proposal was referred to the Australian Government Minister for the Environment who determined that the proposed mine was not controlled action there approvals under the EPBC Act were not required.
16.20	EPA-06	Iluka does not have a good track record with the community and the Australian National University removed Iluka from the list of ethical companies.	<p>In 2012 a social impact assessment of Iluka’s Australian operations in which 117 households in the in the Douglas\Balmoral\Cavendish region were interviewed. Results showed that 75% of those interviewed saw Iluka as a positive contributor to the region with 72% agreeing that Iluka always tries to address concerns raised by the community.</p> <p>The proposition that Iluka does not have a good track record with the community is not supported by the vast majority of community members.</p> <p>It should be noted that:</p> <ul style="list-style-type: none"> • In October 2014 ANU announced its intention to divest stocks of Iluka and six other companies • The ANU decision was based on the results of an analysis completed by the Centre for Australian Ethical Research (CAER) • Iluka engaged with CAER and identified significant flaws in the methodology used and significant information gaps • Other companies impacted by the decision identified similar flaws and took legal action against CAER • The processes, methodology and assumptions made by CAER have been heavily criticised by independent bodies including environmental, social and governance assessment groups <p>That Iluka was seen by CAER to be directly involved in the fossil fuel industry shows the lack of diligence and, as a result, lack of understanding.</p>
16.21	EPA-06	Work Plans were not consistent with the EES and the dilution of MSP by-products with on-site produced tailings has not always been followed resulting in radioactive material being concentrated on the surface.	<p>The EES makes no mention of the mixing of MSP by-products with on-site produced tailings.</p> <p>The Work Plan describes both mixing of MSP by-products with on-site produced tailings and direct disposal to pits as alternatives</p> <p>The allegation that material of high radioactivity has been placed on the surface is incorrect.</p>
16.22	EPA-07	Operations to date have not been conducted in accordance with Mining Licence 5637 because operations have not been compliant with the Near Surface Code.	See response 12.3...
16.23	EPA-07	The testing procedures have been in-house, protected and are questionable.	See response to 14.2.
16.24	HRCC-04, EPA-05	Overfilling of Pit 19 There is an investigation by the Mining Warden currently underway into the overfilling of Pit 19	<p>While it is acknowledged that more material was returned to Pit 19 than originally planned is must be noted that:</p> <ul style="list-style-type: none"> • Earth Resources – Regulation, the regulator responsible for determining compliance or otherwise with the Work Plan, has audited the activities in and around Pit 19 and found satisfactory compliance with the Work Plan; • The original Work Plan (2003) states that “Restored landforms will be shaped to resemble pre-mining terrain”. It is for this reason that additional material, including tailings from on-site processing were placed in Pit 19 rather than the TSF because the pre-mining landform in the Pit 19 area was a ridge whereas the TSF is located in a lower flat area and the disposal of the material to Pit 19 enabled the restored landforms to more closely resemble those pre-mining • The applications include a commitment that the highest point in the final landform of the Pit 23 area will be no higher than that of the pre-mining landform, which is a commitment that is additional to that made in the Work Plan. <p>The allegation that works related to Pit 19 are not compliant with the Work Plan is incorrect.</p> <p>Iluka would willingly cooperate with any investigation by the Mining Warden, if any such investigation is occurring or does occur in the future. The relevance of any such investigation to this assessment in not apparent.</p>

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16	Past Performance continued		
16.25	HRCC-04	Filling pit voids with slimes	Section 8.1 of a variation to the Work Plan approved in 2004 includes the disposal of sand and slimes to pit voids as does Section 1.4.2 of the Radiation Management Plan attached to the 2009 Var. The allegation that placing slimes in pit voids is not compliant with the Work Plan is incorrect.
16.26	HRCC-04	Non-return of a sensitive erodible sub-catchment	A response to this submission is not possible due to lack of definition.
16.27	HRCC-04	Material for which capacity was to be provided by raising the wall of the Tailings Storage Facility (TSF) was placed in Pit 19 prior to the approval of 2009 Var.	The timeline for placement of tailings into Pit 19 is as follows: <ul style="list-style-type: none"> • Tailings from on-site processing were placed in Pit 19 between August 2008 and April 2010; • The 2009 Var. was approved on 24 August 2009 • The first delivery of heavy mineral concentrate from a mine other than Douglas to the Hamilton MSP was made after the approval of the 2009 Var. • The first delivery of ore from the Echo mine to Douglas was made after the approval of the 2009 Var. It is therefore apparent that all material placed in Pit 19 prior to the approval of the 2009 var. originated from the Douglas mine and therefore the allegation is incorrect.
16.28	HRCC-04	Bad operating practices resulted areas of high radioactivity in Pit 19 that were subsequently removed to Pit 23.	It is standard practice, as described in Section 2.6.2 of the Radiation Management Plan provided with the 2009 Var., for: <ul style="list-style-type: none"> • gamma dose rate surveys to be conducted on the surface of disposed tailings, overburden, subsoil and topsoil to ensure that after rehabilitation is complete the gamma dose rate at the surface meets regulatory requirements; and • material to be removed from areas of elevated gamma dose rates to be removed and buried elsewhere at greater depth. What is described in the submission is in compliance with the Work Plan and is good practice.
16.29	HRCC-04	Hamilton MSP by-products were disposed of to the edge of Pit 9 close to a neighbouring residence. After a complaint from the resident DHHS ordered the material to be removed.	The sequence is as follows: <ul style="list-style-type: none"> • MSP by-products were removed from Pit 9 in early 2010 and from Pit 10 in late 2010/early 2011; • In early 2011 Calytrix Consulting completed a gamma dose survey on the subject property and reported that dose rates were lower than the pre-operational survey but that the presence of heavy mineral concentrate at a number of locations was detected. • On 7 September 2011, DHHS visited the property and, in a letter to the landowner: <ul style="list-style-type: none"> ○ Noted that: <ul style="list-style-type: none"> • Small amounts of windblown radioactive particulate matter were identified; • There was no significant short or long term radiation health risk; and • The identified material was removable ○ Recommended that: <ul style="list-style-type: none"> • Windblown radioactive material be removed from the property • Further spread of material to the property be minimised • Clean-up of the property was completed in early 2012 • DHHS did not order MSP by-products to be removed from Pit 9; Iluka elected to remove the material from land it did not own. The allegation of a DHHS order is incorrect and the matter was dealt with in line with good operating practice.
16.30	HRCC-04	Iluka's current practice is not in compliance with 2009 Var.	The relevant regulator, Earth Resources – Regulation, has clearly stated that Iluka is in compliance with the work plan which includes the 2009 Var.
16.31	HRCC-04	The Douglas EES stated that there should be no more than a 3 km footprint open at any one time, however at the cessation of mining there was a footprint of about 14 km.	The EES states that the mining footprint will typically be 2000 metres long however this does not include the footprint of areas that are partially backfilled, in various stages of rehabilitation, occupied by plant and infrastructure. All land clearing and earthworks was completed in compliance with the approved work plan. The relevance of this submission to applications relating to a single void of known area is not known.

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16	Past Performance continued		
16.32	HRCC-04	<p>Operating rules for the Strathlynn bore field show a lack of understanding of groundwater flows resulting in damage to the Glenelg River.</p> <p>This matter was raised at the ERC but nothing was done.</p>	<p>The operating rules for the Strathlynn bore field were set by Grampians Wimmera Mallee Water and included:</p> <ul style="list-style-type: none"> The hydraulic conductivity between the surface water and groundwater in the vicinity of the Glenelg River must be maintained, with a gradient of ground flow toward the river, as measured at Observation bore 9; The maximum allowable drawdown will be at a water level in Observation bore 9 of 149.9 mAHD, which represents an effective decline of 0.8 m from the current (July 2007) static water level. <p>The minutes of February 2010 ERC meeting state that Iluka was working with GWMWater to ensure the protection of the environment during the operation of the Strathlynn bore field and this work led to a change in the operating rules to include the following:</p> <ul style="list-style-type: none"> The hydraulic conductivity between the surface water and groundwater in the vicinity of the Glenelg River must be maintained, with a positive gradient of ground flow OB 8 to OB 9; In the event that a positive gradient is not achieved between OB8 and OB9, Iluka are to immediately cease all pumping from the well field and alert GWMWater of the situation <p>The operating rules were adhered to at all times and groundwater flow to the Glenelg River was maintained. No evidence of impact to the river has been presented.</p> <p>A review of the minutes of all meetings of the ERC from August 2007 to August 2012 show the only mention of this matter to be on May 2012 when it was suggested that the river level monitoring point was inappropriate.</p> <p>The minutes of the May 2012 ERC meeting also state that the meeting was advised that the Strathlynn bore field had not been used since October 2010.</p> <p>The Strathlynn bore field was last used in October 2010 and the Groundwater Licence expired on 10 October 2012. With no foreseeable use Iluka chose not to renew the licence.</p> <p>The matter of the operating rules is one for GWMWater to consider if and when an application for a Groundwater Licence is made in the future.</p> <p>The relevance of this submission to the applications is not clear.</p>
17	Community Engagement		
17.1	HRCC-01	The site tour at the information session was "one-sided"	The site tour covered all areas and operations included in the proposal.
17.2	HRCC-04	When raising a complaint about dust on his property, a landowner was told by an Iluka manager that if the complaint resulted in work being stopped the landowner would be responsible for the consequent cost to Iluka.	Iluka believes this allegation to be false.
17.3	HRCC-04	There has been several variations to the work plan since 2009 on which there was no consultation with the KLG or ERC nor approval by the Minister	This statement is incorrect as there have been no variations to the work plan submitted or approved since June 2009. (the 2009 Var.)
17.4	HRCC-04, EPA-06, EPA-07	<p>Despite several requests the KLG has requested copies of the Radiation Management Plan and Radioactive Waste Management Plan and the requests have been denied.</p> <p>A FOI application for access to these plans from DHHS but the application was refused.</p>	Iluka has provided summaries of these plans that can be accessed through the Iluka website. As per the letter distributed with the minutes of the May 2014 ERC meeting, Iluka has made it clear that anybody wishing to view the entire plans can do so at the Hamilton MSP. Since the offer to allow viewing of plans only one person has taken up that opportunity and that person is not associated with the KLG.
17.5	HRCC-04	Very poor communication since early 2012, although meetings between Iluka and KLG were held on three occasions.	Meetings held between ERC meetings and attended by Iluka and the KLG were instigated by Iluka, however after four meetings (May 2012, Aug 2012, Oct 2012 & Jan 2013) they ceased as the KLG representatives indicated they could not attend the meetings.

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17	Community Engagement continued		
17.6	EPA-06	Senior managers of the Douglas mine have been arrogant, underhand and dishonest.	<p>Iluka rejects this suggestion in regard to the behaviour of managers.</p> <p>A review of the minutes of ERC meetings reveals that the opposite is the case.</p>
17.7	EPA-07	The community has not been given sufficient time to prepare and submit objections with Iluka providing vast volumes of information at the “eleventh hour”	<p>Significant events in the provision of information to the community and/or representative of the community include:</p> <p>May 2013 Initial communication on the proposal to the ERC</p> <p>August 2013 Briefing of the ERC including update on the approvals process and preliminary results of hydrogeological modelling</p> <p>April 2014 Briefing of the HRRC and Earth Resources-Regulation including preliminary results of technical studies</p> <p>July 2014 Briefing of outgoing National Party MP Hugh Delahunty and incoming candidate Emma Kealy</p> <p>Briefing of Southern Grampians and West Wimmera shires including preliminary results of technical studies</p> <p>November 2014 Briefing of Glenelg Hopkins CMA including preliminary results of technical studies Briefing to ERC including preliminary results of technical studies</p> <p>February 2015 Site tours by MPs Emma Kealy and David Davis and local media journalists Update to ERC</p> <p>March 2015 Proposal and technical document summaries made available on Iluka website Presentation of information package to HRCC attended by representatives of EPA, DHHS, Department of Environment, Water, Land Planning</p> <p>May 2015 On site proposal meeting with EPA, HRCC, other councils and potential referral authorities (DHHS, CMAs, GWMWater, neighbouring Councils)) Update to ERC</p> <p>June 2015 Technical reports provided to HRCC and DHHS Posting of technical report summaries on Iluka website plus copies of technical reports available on request Individual consultations with neighbouring landowners Applications for planning permit and works approval lodged</p> <p>July 2015 Commencement of exhibition and submission period Site tours of Hamilton MSP and Douglas mine site by HRCC Councillors and officers Community Information Session at Kanagulk Hall</p> <p>August 2015 Submission period ends Section 20B conference in the Balmoral Hall Update to ERC</p> <p>It should be noted that:</p> <ul style="list-style-type: none"> • The vast majority of the information on the proposal was contained in the Information Package presented to the HRCC on March 2015 and Council was advised that the information provided could be provided to the public if Council chose to do so; • The technical reports were made available to the community prior to the submission of applications and commencement of the exhibition period; • The EPA and HRCC determined the time provided for submissions to be made, which was more than required under the legislation • The conduct of the 20B Conference was such that community members were provided the opportunity to express their views after the period for submissions had ended <p>It is apparent from the above that Iluka has been open and transparent throughout the process and has made information available at earliest opportunity.</p>

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17	Community Engagement continued		
17.8	EPA-07	All of the documents referred to in the "Expert Reports" should be available to the public.	All of the documents are to be made available to the public via the EPA website
17.9	EPA-07	Requests to Iluka for copies of the Radiation Management Plan –Murray Basin Operations and Radioactive Waste Management Plan – Murray Basin Operations have been made but the documents have not been provided.	See response to 17.4