

Environmental Assessment

S75W Application to modify approved layout and staging of Awaba Waste Management Facility - Project Approval (Consolidated) 10_0139



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Report: MOD 1 – 29 April 2014

Development Application

Application: 10_0139 (Consolidated)

Proponent: Lake Macquarie City Council

Approval Authority: Minister for Planning and Infrastructure

Land: Lot 372 DP 723259; and the existing road reserves on Wilton, Wangi and Dorrington roads along the sewer pipeline route.

Project: Awaba Waste Management Facility Expansion Project

Statement of Certification

I certify that I have prepared the contents of this document and to the best of my knowledge:

1. it contains all available information that is relevant to the environmental assessment of the proposed development to which the document relates; and,
2. it is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

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Lake Macquarie City Council

Signature:

Date: 29 April 2014

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Executive Summary

Lake Macquarie City Council (LMCC) is proposing to expand the capacity of the Awaba Waste Management Facility (AWMF) located off Wilton Road Awaba, within the Lake Macquarie Local Government Area (LGA). Council has obtained Project Approval for the landfill expansion (Project Approval [Consolidated] 10_0139) and is currently working on the detailed design of the extensions.

The AWMF is situated on Crown Land that is controlled by LMCC as the appointed Corporate Manager of the Awaba Waste Management Reserve Trust (R170042).

The majority of the proposed works are situated within Lot 372 DP 723259, which has an area of 32.5 hectares including the existing landfill operations. Approximately 23.5 ha comprises the existing AWMF facility and the majority of the remaining 9ha comprises natural bushland.

The proposed works also include the construction of a sewer pipeline between the AWMF and Rathmines No.6 WWPS and redevelopment of the road intersection at Wangi and Wilton Roads. The sewer pipeline route will follow the existing road reserve.

The planned expansion of the AWMF is just one component of Council's broader waste management strategy that also includes the well advanced implementation of a phased three bin source separated organic waste management process and the future construction of an in-vessel green waste compost facility, adjacent to the existing AWMF.

Council has obtained Project Approval for the landfill expansion and is currently working on the detailed design of the extensions.

During the detailed design process, it has been identified that a number of minor changes to the approved concept are required to allow the project to be successfully completed.

These changes include modification to the proposed staging of cell construction and landfilling and leachate and stormwater management infrastructure. It is proposed to modify the consent by replacing appendices 3, 4 and 6 of the Project Approval (Consolidated) with new plans, showing the changes, and minor changes to the Statement of Commitments.

It is Council's opinion that the proposed changes are minor and are unlikely to introduce any adverse environmental or social impacts.

This report describes the proposed modifications and addresses the likely environmental impacts of the proposed changes.

1. Project Background

As delegate of the Minister for Planning and Infrastructure, Project Approval 10_0139 was granted by the NSW Planning Assessment Commission on 8 May 2013.

Project Approval was granted pursuant to Part 3A of Environmental Planning and Assessment Act 1979 as a *transitional Part 3A Project*.

An appeal to the NSW Land and Environment Court (10473 of 2013) challenging the Project Approval by Centennial Coal was filed on 19 July 2013. The appeal related only to biodiversity conditions. A conciliation conference was held on 23 October 2013 and the parties (Centennial Coal, the Department of Planning and Infrastructure and Lake Macquarie City Council) reached agreement that the Project be approved in the same terms as the approval granted by the Planning Assessment Commission (on 8 May 2013), with certain amendments to the biodiversity offset conditions. The Court made orders in accordance with the parties' agreement, which in effect amended the Project approval. A consolidated set of conditions for the Project, incorporating the Court approved amendments to the conditions (23 October 2013) was issued by the Department 13 November 2013.

The landfill engineering design for the Project is now currently well advanced. To date, the design has progressed to 85% Detailed Design. This work has been undertaken in consultation with the NSW Environmental Protection Authority (EPA) and it is anticipated that the design will be submitted for review and approval to the EPA and the NSW Mine Subsidence Board in March 2014.

During the detailed design phase, it has been identified that a modification of the approved plans is required to allow the development to proceed. The proposed modifications are discussed in further detail below and are considered to be minor changes which allow the approved development to remain substantially the same at that approved.

This application is made subject to Schedule 6A of the *Environmental Planning & Assessment Act 1979*, which provides that section 75W continues to apply for the purpose of the modification of a project applications approved before or after the repeal of Part 3A of the Act.

2. Proposed Modifications and Environmental Assessment

The modification application proposes to:

- A. amend the Project Approval by modifying the approved plans at appendices 3 – key components of proposed expansion, 4 - Staging Plan and 6 – Stormwater and Groundwater Management Infrastructure of Project Approval (consolidated) 10_0139 by replacing these plans with new plans:
 - SK060 rev A dated 19.12.13 – components of proposed works;
 - SK061 rev A dated 19.12.13 – staging of landfill areas;
 - SK062 rev A dated 19.12.13 by GHD Job.No.22-16920 –stormwater and groundwater management infrastructure; and,
- B. amend two Statement of Commitments as a result of the proposed changes:

Waste Management (4th bullet point): “LMCC will extend the gas extraction infrastructure into the proposed new landfill areas A, B and C on a

progressive basis into the future so that the capacity for gas capture and energy generation will be enhanced”.

Visual Landscape (1st bullet point): *“LMCC will progressively excavate, fill and revegetate Areas A and B and subsequently fill and revegetate Area C (11 cells in total across Areas A, B and C) cells one to nine as shown in the approved Staging Plan in **Figure 6.9**, SK061 rev A dated 19.12.13 – staging of landfill areas, which has been developed to minimise the visual impacts of the proposed development”.*

The proposal is discussed in greater detail below:

2.1. South West Leachate Pond

The modification includes removal of the proposed 6-8 ML leachate basin that is currently shown at the approved plans – Appendix 6 ‘proposed leachate pond’.

The modified plans at Appendix 1 show the removal of the structure at new plans SK062 rev A dated 19.12.13 by GHD Job.No.22-16920 –stormwater and groundwater management infrastructure.

Environmental Assessment

The development of the Site Water Balance, which was informed by the Hydrological Evaluation of Landfill Performance (HELP) model (US EPA), showed that the provision of additional leachate storage capacity by means of a second leachate storage pond, as detailed at *Appendix 6 – Stormwater and Groundwater Management Infrastructure*, would not be required.

All leachate generated at the site can be appropriately contained, collected and disposed of utilising the existing leachate pond and disposal of leachate to the Rathmines No.6 WWPS, satisfying Condition 18 – Leachate Management, of the Project Approval.

Subject to the requirements at Condition 18 – Leachate Management, there are considered to be adequate protections in place to ensure the environment of the locality is protected.

Removal of the leachate basin is not considered likely to introduce any adverse biophysical or social impact to the locality. Removal of the basin will decrease odour impacts that may occur on-site by reducing the amount of potential emission sources on-site.

Removal of the need to construct the basin also reduces additional excavation and construction on-site and the potential for any short-term impacts on the receiving environment resulting from construction activity.

There are considered to be no additional or cumulative environmental impacts arising from the proposed modification in addition to those matters considered under the original application.

This change does not require the modification of any conditions of consent or the statement of commitments.



Figure 1- existing approved plan (appendix 6) showing the proposed leachate basin to be removed from approved plans.

A copy of the proposed modified plan is shown at Appendix 1.

2.2 - Northern Containment and Diversion Structure

The proposed modification includes the addition of an in-situ concrete containment and diversion structure to be constructed at the northern boundary of the site within the 10 metre boundary setback, to prevent the mixing of off-site clean water overland flows with on-site leachate management.

The proposed structure is shown at new plans SK060 rev A dated 19.12.13 – components of proposed works and SK062 rev A dated 19.12.13 – *Stormwater and Groundwater Management Infrastructure* by GHD Job.No.22-16920.

The modified plans at Appendix 1 below show the general location of the proposed structure.

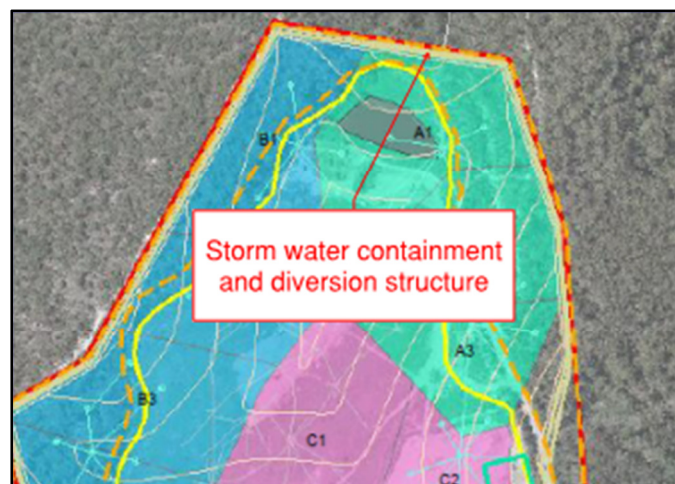


Figure 2 – existing approved plan (appendix 3) showing the proposed location of the diversion structure.

Environmental Assessment

3-dimesional modelling of the proposed expansion of the landfill and its final profile indicated that clean-water run-off from an area north of the site boundary, approximately 1000m² in footprint, would be trapped in a basin formed by the natural

contours north of the site boundary and the final contours of the proposed landfill extension.

It is proposed that a containment and diversion structure be constructed immediately adjacent the northern side boundary and within the proposed 10m on-site boundary setback to divert clean water from entering the site.

The planned structure will likely have a height of less than two metres and be constructed along a section of the northern boundary to divert clean water around the site.

The clean water run-off captured from the off-site area north of the boundary will be conveyed by gravity through a suitably sized drain for discharge through an energy-dissipating structure along the eastern perimeter of the site.

The location of this discharge would be equivalent to the discharge of clean water run-off currently captured from the slopes north-east of the site.

It is also proposed to discharge the clean-water run-off from the northern slopes of the final landfill cap, once this cap is revegetated. Prior to revegetation, the run-off from the northern batters of the landfill will be captured as leachate within the leachate containment structures of the respective landfill cells.

New plan SK62 – *Stormwater and Groundwater Management Infrastructure*, shows the planned stormwater flows resulting from the proposed addition of the diversion and containment structure and connection to the proposed stormwater collection drains. 'For construction' details of the stormwater management scheme inclusive of the proposed structure, can be finalised with the submission of information as required at Condition 19 – Soil, Water and Leachate Management Plan.

The proposed containment and diversion structure is proposed within an area already planned to be cleared of vegetation to provide a 10m boundary setback between the footprint of the landfill and the property boundary. In this regard, no additional land clearing to that already proposed, as considered under the original Environmental Assessment, is required.

The site of the structure was comprehensively assessed as part of the original Environmental Assessment and is considered to be suitable for the structure.

In context with the scale of works planned for the whole site, the scale of the addition is minor and is not considered likely to introduce any adverse visual impacts to the locality.

There are no known heritage items in the vicinity of the planned works for the structure. The site of the structure was comprehensively assessed for cultural heritage.

It is considered that there are sufficient environmental controls in the existing consent conditions to ensure that the works undertaken do not interfere with the receiving environment. In particular, Conditions 17, 18, 19 and 45 provided protections.

The diversion structure is planned to ensure that clean and dirty waters do not mix in order to better protect the downstream environment. In this regard, the proposed change is considered likely to improve the quality of the environment at this location and provide a better environmental outcome than currently approved.

A copy of the proposed modified plan is shown below at Appendix 1.

2.3 South West Temporary Sediment Basin

The application proposes to modify the approved plan at Appendix 4 –staging plan, to provide consistency within the Environmental Assessment that details the proposed temporary sediment basin planned for the south-west corner of the site incorporated as landfill space, post decommission of the proposed temporary basin.

The modified plan SK061 – Staging of Landfill Areas, at Appendix 1, show this clarification.

Environmental Assessment

Appendix 3 –key components of the proposed expansion, of the approved plans, shows a sediment basin to be retained and extended at the south west boundary of the site.

Under the current approved plans, the location of the basin is excluded from the proposed footprint of landfilling during stage B4, this is inconsistent with the proposed landfill concept for the site, assessed under the Environment Assessment for the project.

The planned sediment basin is required during the initial stages of development on-site, however the basin will not be required for stormwater management during the later stages of landfilling.

During this latter period, it is proposed that the basin be decommissioned and incorporated into the final landfill footprint. This change is consistent with the approved extent of excavation and the contours for the proposed emplacement as shown at current approved plans (Appendix 3 and 6) that show this area being within the planned footprint of the landfill.

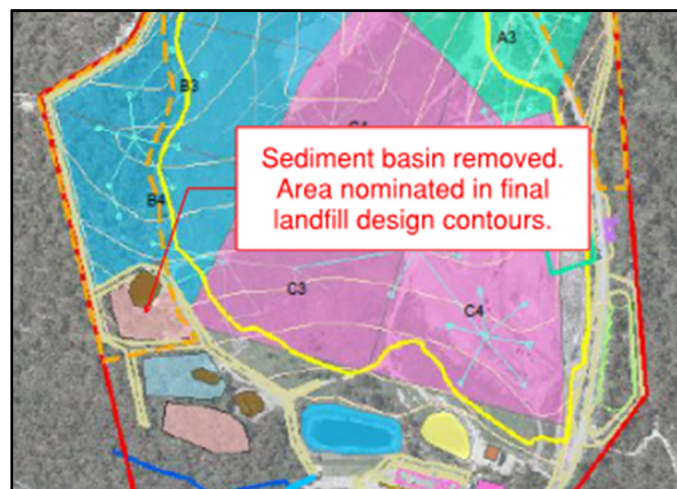


Figure 3 – existing approved plan (appendix 3) showing location of sediment basin. Note design contours run through this area. However, the area is excluded in error from the landfilling staging plan.

The inconsistency in the plans exist where the sediment pond shown in appendix 3 - key components of the proposed expansion, is not shown as temporary and therefore excluded in the area of landfilling known as 'B4', as currently shown at the approved staging plan. As a result this area is omitted from the final landfill footprint. Notwithstanding the approved design contours of the final landfill cap are shown in this area. The omission of the area from the landfill staging plan is a plan drafting error.

As it can be seen within the Environmental Assessment, the footprint as detailed in volume 2 appendix D GHD drawing SK013 revision C, as partially shown below at figure 4, details final landfill design contours and therefore the landfill footprint over the area that was omitted from the approved staging plan.

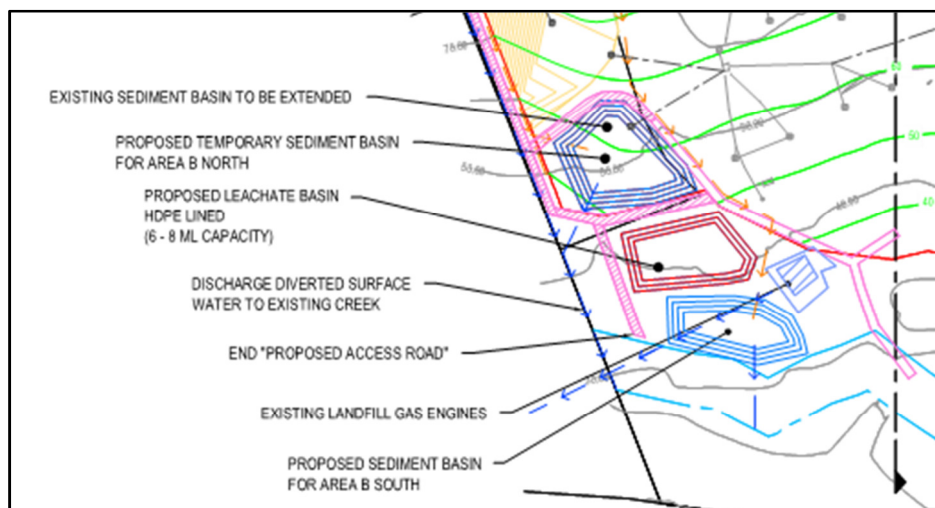


Figure 4 – extract from proposed plans contained within original Environmental Assessment that show the basin as temporary with the final landfill design contours overlaid.

This proposed modification will correct an error in the approved plans.

There are considered to be no environmental impacts resulting from correction of this error.

The area of excavation is within the existing approved footprint and the final approved contours at this location will not be exceeded.

This modification will require a change to the approved Statement of Commitments (SOC). A modified copy of the SOC is detailed below at Appendix 2.

A copy of the proposed modified plan is shown below at Appendix 1.

2.4 Staging Plan

The application proposes to modify the approved landfilling staging plan at Appendix 4 – Staging Plan by replacing this for new plan SK061 rev A dated 19.12.13 – staging of landfill areas.

The proposed modification will result in a change from eleven to nine landfill cells completed in five construction stages, as follows:

- Construction Stage 1 – cells 1 and 2;
- Construction Stage 2 – cells 3 and 4;
- Construction Stage 3 – cells 5 and 6;
- Construction Stage 4 – cells 7 and 8; and,
- Construction Stage 5 – cells 9a and 9b.

The proposal will require a change to the approved SOC.

Environmental Assessment

Approved plan Appendix 4 –staging plan, shows the approved stages of landfilling as shown below at figure 5.

During the detailed design phase, it has been established that the approved staging plan is not considered the best means of constructing and operating the landfill.

The proposed staging plan is preferred to the approved staging plan as the modified scheme:

- is designed to prevent the construction of undesirably large lined areas ahead of landfilling, which may lead to excessive exposure of landfill liner to UV radiation and weathering and the capture of stormwater;
- minimises the working cell area through the life of the landfill, significantly decreasing the overall volume of leachate generated throughout the life of the landfill;
- provides more appropriately shaped cells to allow for more symmetry and hence control of the working tip face to minimise the quantity of exposed waste at any point in time. This will minimise odours and vermin attraction; and,
- the updated staging plan better facilitates progressive capping and rehabilitation of the landfill by planning smaller stages prior to completion, capping and rehabilitation. This will minimise leachate generation, improve surface water quality, minimise odours and improve visual amenity.

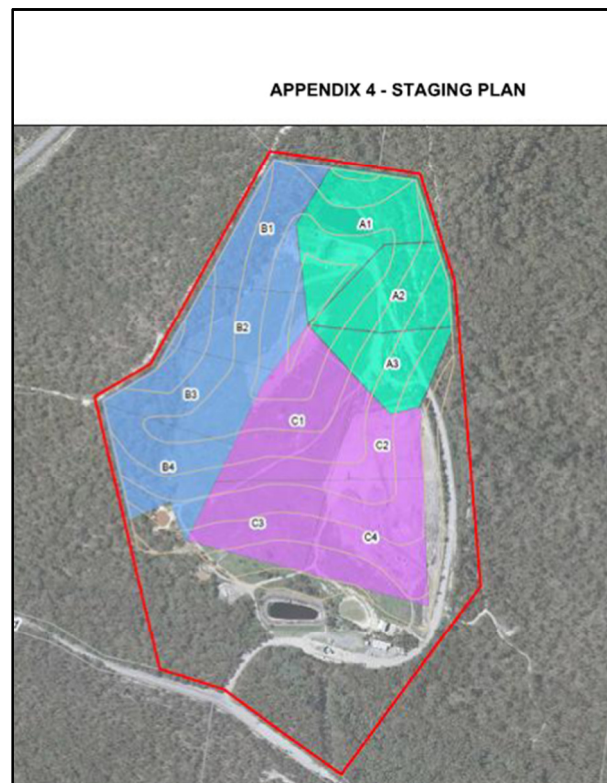


Figure 5 – approved staging plan as shown at Appendix 4.

The proposed change to the staging does not seek to alter the approved contours of the landfill and therefore is unlikely to introduce any additional visual or odour impacts to the locality, then originally considered under the Environmental Assessment.

The landfill will be filled in a systematic manner, as required by Condition 7(d) with nine cells instead of eleven as previously proposed, but in five construction stages instead of three as originally approved.

In this regard, it is recommended that the staging of landfilling be modified from three large stages A, B and C (11 cells) to the construction of five smaller construction stages (9 cells).

The proposed change does not alter the proposed footprint, landfill contours or extent of landfill on the site.

It is considered that the change will improve the environmental management of project during the construction and operation phases of the landfill.

A copy of the proposed modified plan is shown below at Appendix 1.

3. Justification and Conclusion

The proposed modification seeks to remedy inconsistencies in the approved plans and improve the function and environmental impacts of the landfill and the constructability of the development.

There are no material increases in impacts likely resulting from the proposed changes to the approved development as originally considered under the 'Environmental Assessment'.

The footprint and finished contours of the landfill emplacement are not proposed to be altered.

The modifications do not require any additional vegetation clearing.

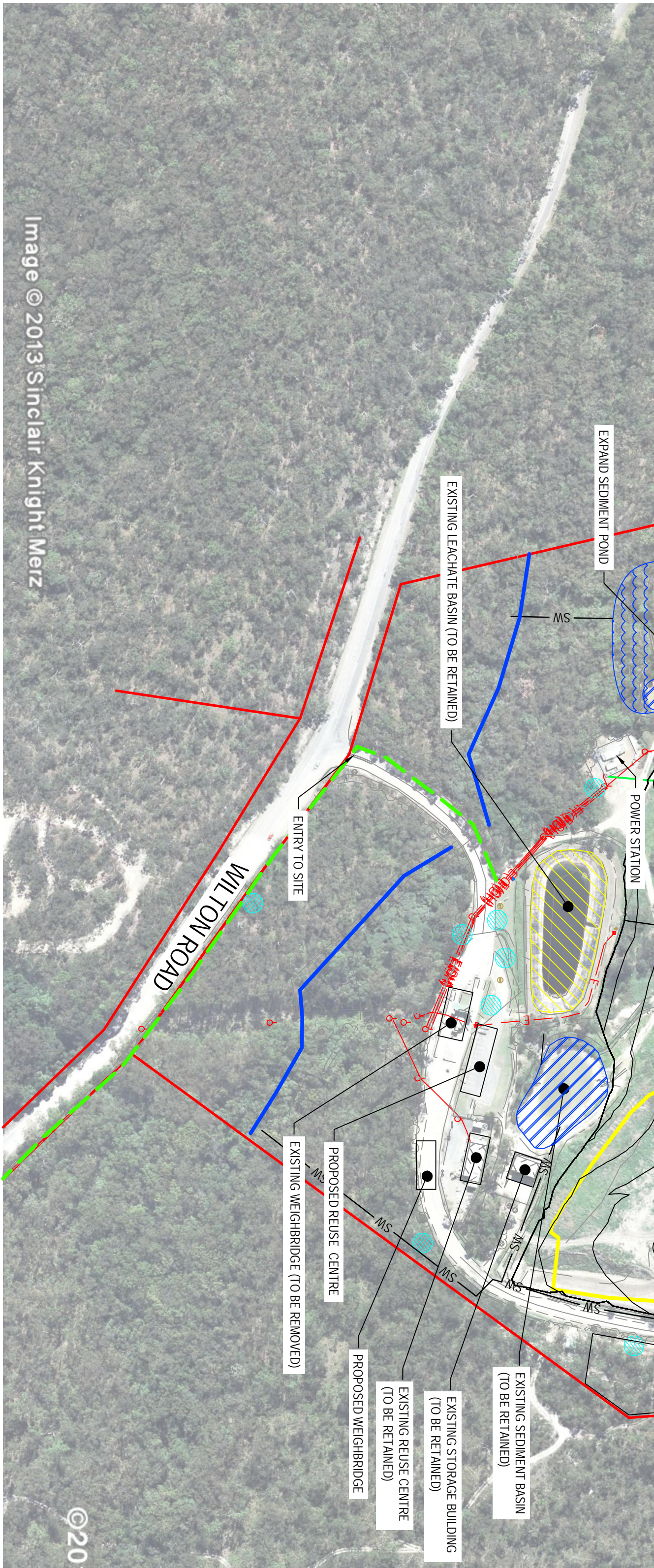
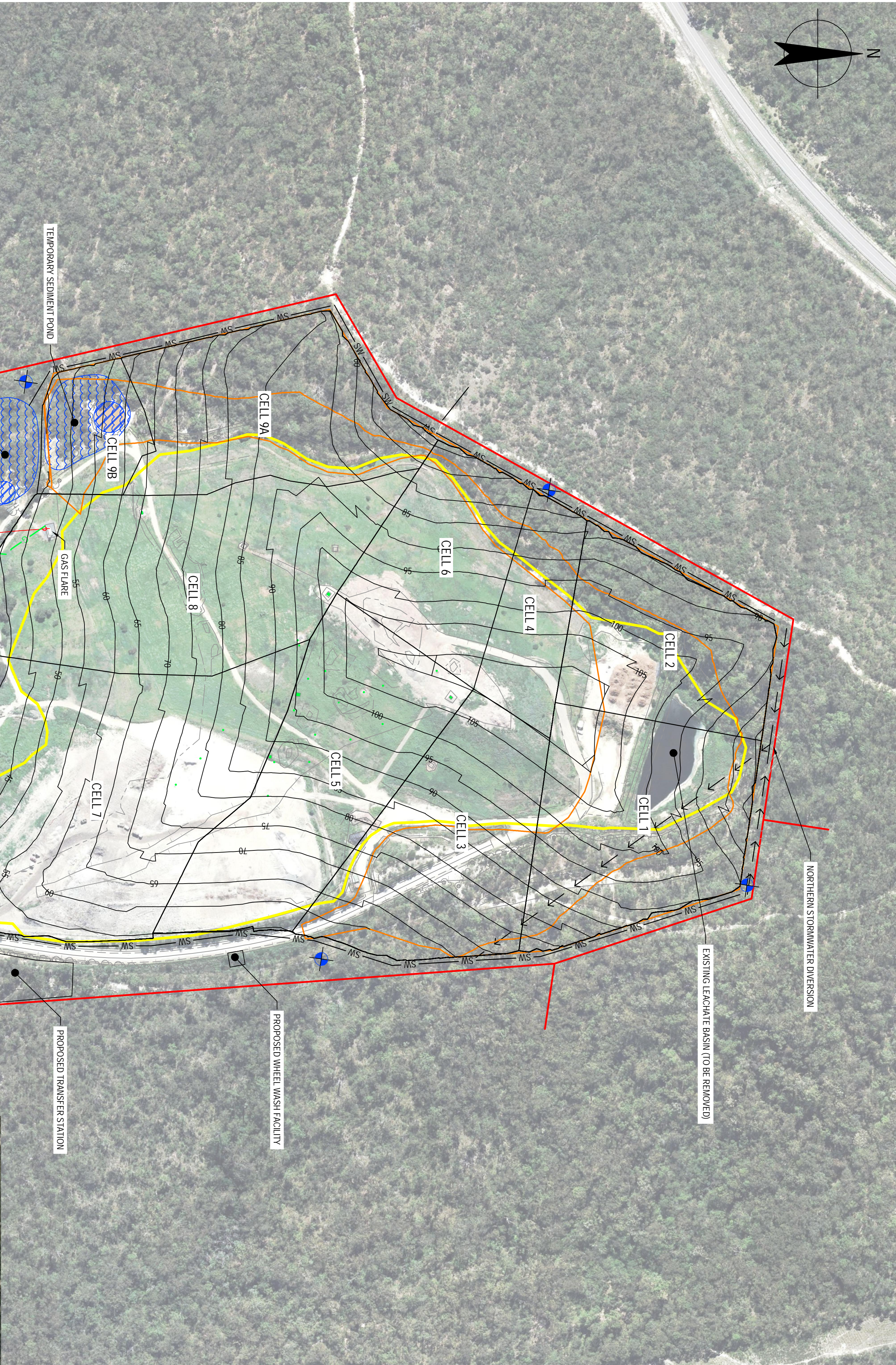
The changes seek to ensure that the construction and operational phases of the proposal do not introduce any adverse impacts to the environment.

It is considered that the scale of the changes proposed in context with that already approved are minor and the proposed modified development is considered to be sustainably the same as that approved.

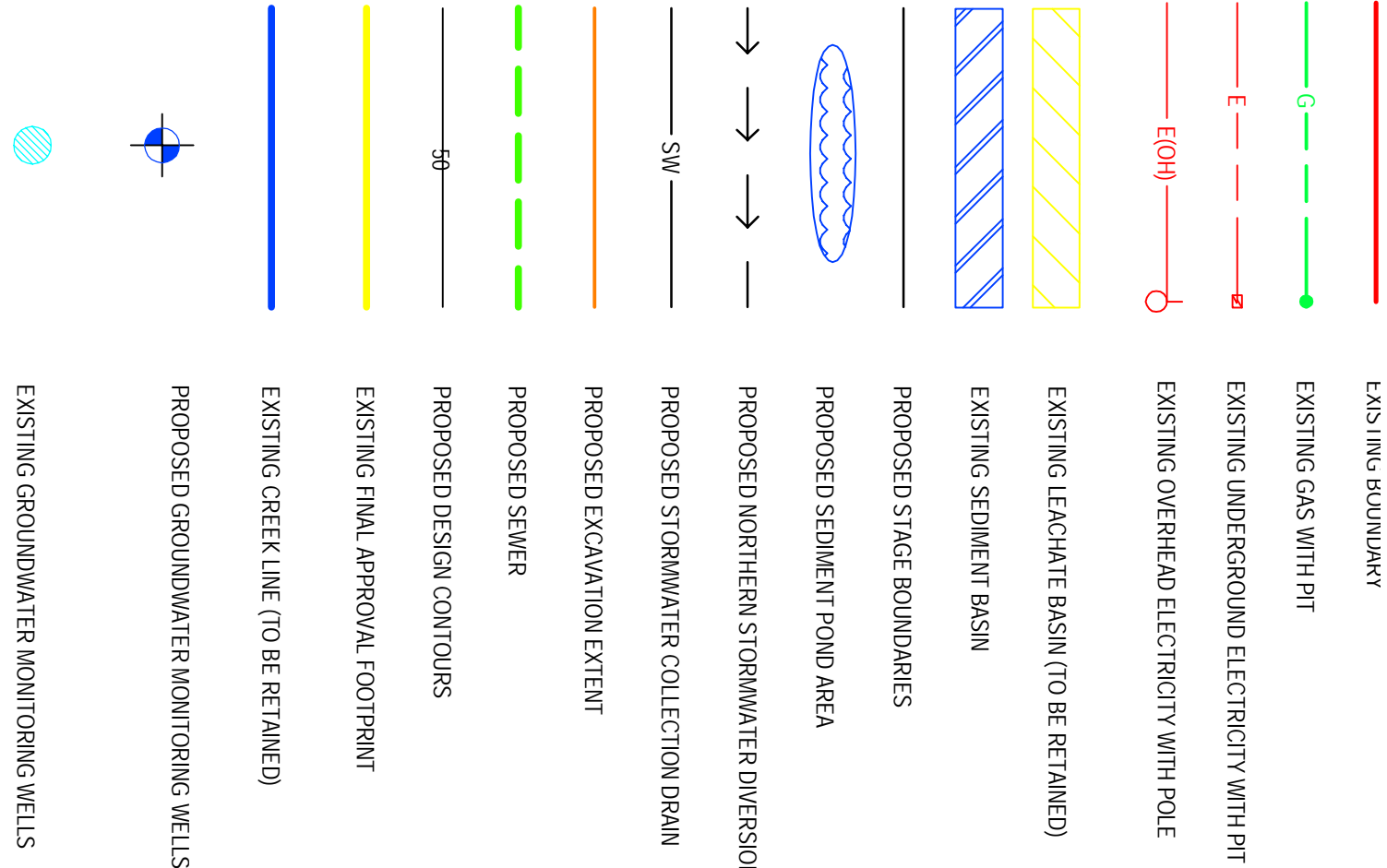
It is recommended that the modifications be approved pursuant to s75W of the Act, to allow the finalisation of the detailed engineering design of the landfill.

Appendices

- 1. proposed modified plans**
- 2. revised statement of commitments**



LEGEND



PRELIMINARY

rev	description	RW	app'd	date
A	PRELIMINARY			19.12.13

LAKE MACQUARIE CITY COUNCIL
AWABA WASTE MANAGEMENT FACILITY

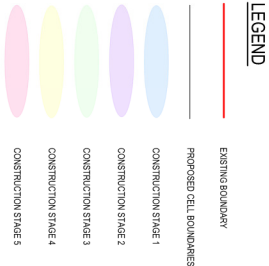
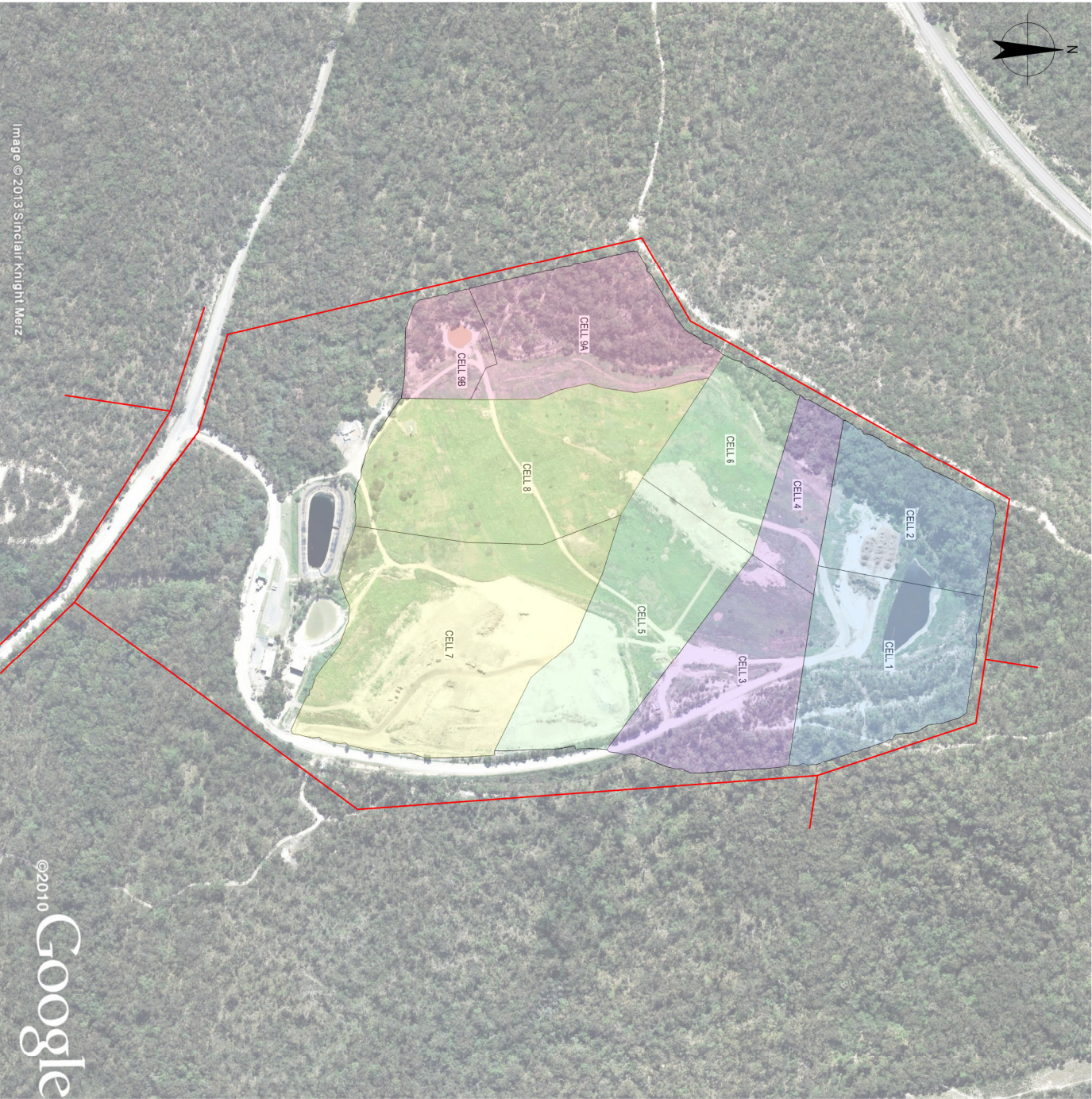
COMPONENTS OF PROPOSED WORKS



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scale: AS SHOW/1: A1 job no.: 22-16920
date: DEC 2013 rev no.: A
approved (PD) SK060



PRELIMINARY

rev	description	app'd	date
A	PRELIMINARY	RW	19.12.13

LAKE MACQUARIE CITY COUNCIL
AWABA WASTE MANAGEMENT FACILITY
STAGING OF LANDFILL AREAS
CELL 1 TO 9



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scale 1:2000 for A1 job no. 22-16920
date DEC 2013 rev no. A
approved (PD) SK061



LEGEND

- EXISTING BOUNDARY
- EXISTING LEACHATE POND
- EXISTING SEDIMENT POND
- PROPOSED STAGE BOUNDARIES
- PROPOSED SEDIMENT POND AREA
- PROPOSED NORTHERN STORMWATER DIVERSION
- PROPOSED STORMWATER COLLECTION DRAIN
- PROPOSED GROUNDWATER MONITORING WELLS
- EXISTING GROUNDWATER MONITORING WELLS

PRELIMINARY

rev	description	app'd	date
A	PRELIMINARY	RW	19.12.13

LAKE MACQUARIE CITY COUNCIL
AWABA WASTE MANAGEMENT FACILITY
STORMWATER AND GROUNDWATER
MANAGEMENT INFRASTRUCTURE



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scale 1:2000 for A1 job no. 22-16920
date DEC 2013 rev no. 1 A
approved (Pd) SK062

PROPONENT'S STATEMENT OF COMMITMENTS (consolidated)

Statement of Commitments

Issue	Commitments
<ul style="list-style-type: none"> General 	<ul style="list-style-type: none"> LMCC will undertake the proposed works as described in this EA in accordance with the mitigation and management measures identified in this EA. LMCC will ensure that a Construction Environmental Management Plan (CEMP) is prepared and implemented for the proposed works. The CEMP will detail appropriate mitigation measures for a range of construction activities and will address soil erosion and sediment control, slope stability, uncovering of contaminated, saline and/or acid sulfate soil, spill management, dust suppression, construction noise and vibration (as a minimum). LMCC will gain all necessary approvals and permits supporting both the construction and operational phases, including: <ul style="list-style-type: none"> Updating and obtaining a reissue of the existing EPL (Licence No. 5873) for the site, or obtaining a new EPL for the site; and Obtaining approval under Section 15 of the <i>Mine Subsidence Compensation Act 1961</i>. LMCC will update and continue to apply the existing LEMP for the AWMF to incorporate any new management/mitigation measures and monitoring requirements considered necessary for the proposed works. LMCC will undertake community consultation as identified in Section 4.4 during the exhibition period of this EA Report, including holding information sessions for the community and stakeholders. LMCC will ensure that site monitoring is undertaken in accordance with the existing and future Environmental Protection Licence (EPL) for the site.
Waste Management	<ul style="list-style-type: none"> LMCC will ensure that during construction the site will be kept clear of unnecessary construction waste. Waste materials generated during the construction phase on both the AWMF site and along the sewer pipeline route will be recycled or reused wherever possible in the first instance. LMCC will stockpile and reuse soil and vegetation required to be excavated/cleared for the new landfill cells and either reuse these resources as daily cover material for the active tipping face (soil) or process as green waste and use as mulch (vegetation). LMCC will, wherever practical, place any felled trees or tree limbs in nearby surrounding bushland to act as potential habitat for fauna and reduce the volume of green waste. LMCC will extend the gas extraction infrastructure into the proposed new landfill Areas A, B and C on a progressive basis into the future so that the capacity for gas capture and energy generation will be enhanced. LMCC will continue to apply cover material to the active tip face to suppress any litter from becoming airborne during strong winds and escaping into the surrounding environment. LMCC will also continue to undertake litter patrols to manage stray litter. LMCC will construct the additional facilities at the AWMF out of recycled materials, wherever possible. LMCC will adopt a phased "three-bin source separated organics" processing system as its preferred waste processing technology for targeting domestic waste, which includes the implementation of a three bin system for domestic use (general rubbish, recycling and organic waste).
Soil and Contamination	<ul style="list-style-type: none"> LMCC will ensure that an <i>Erosion and Sediment Control Plan</i> (ESCP) will be prepared and implemented in accordance with the <i>Managing Urban Stormwater: Soils and Construction Volume 2</i> series (DECC, 2008a, 2008b and 2008c) prior to works commencing. The ESCP should include a range of measures in accordance with best practice, including but not limited to progressive/staged vegetation clearing,

Issue	Commitments
	<p>implementation of sediment fences and flow diversion structures, covering or wetting of stockpiles, usage of excavation materials as future daily cover, ceasing of works and checking the integrity of erosion and sediment controls during heavy rainfall, stabilisation of access points and the installation of rumble grids at access points, and rapid backfilling of excavated pipeline trenches.</p> <ul style="list-style-type: none"> LMCC will ensure that an <i>Acid Sulfate Soils Management Plan</i> must be prepared for the proposed works in accordance with the <i>Acid Sulfate Soils Manual</i> (Stone et al., 1998) that will focus on the trenching works for the installation of the sewer pipeline. LMCC will ensure that a <i>Salinity Management Plan</i> will be prepared for the proposed works that will focus on the trenching works for the installation of the sewer pipeline. LMCC will ensure that a <i>Contamination Management Plan</i> is prepared and implemented in the event that contaminated land is encountered during excavation. In such an event, works would cease immediately and OEH would be notified. Emergency measures (such as diversion of surface runoff away from contaminated areas) would also be implemented in a timely fashion. Prior to construction, LMCC will consider the existing Geotechnique Report (Appendix F) and the results of the subsidence risk assessment currently being undertaken by Centennial Coal to support an application being prepared to support future mine-workings. (This report is currently being prepared in partnership with LMCC, the Mine Subsidence Board, Centennial Coal, GSS Environmental, GHD and MSEC). LMCC will undertake a design review to ensure that the final design considers the worst case mine subsidence parameters, and will accommodate the worst case ground movement identified in either document without suffering structural failure or compromising environmental protection. LMCC will facilitate the management of erosion and sediment in the operational phase through stability control measures, utilisation of the proposed wheel wash facility, progressive revegetation of capped landfill area and utilisation of the proposed road to minimise surface and vegetation disturbance.
Water Quality and Hydrology	<ul style="list-style-type: none"> LMCC will ensure that a Site Water Management Plan is prepared and implemented. This Plan will be developed in consultation with the Office of Water and shall include: <ul style="list-style-type: none"> Site Water Balance, which will include: <ul style="list-style-type: none"> Sources and security of water supply, Water use on site, and Water management on site. Surface Water Management Plan which will include: <ul style="list-style-type: none"> Detailed baseline data on surface water flows and quality, Surface water impact assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts, A program to monitor surface water flows and quality, and A protocol for the investigation and mitigation of identified exceedences of the surface water impact assessment criteria. Groundwater Management Plan which will include: <ul style="list-style-type: none"> Detailed baseline data on groundwater levels and quality, Groundwater impact assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts, A program to monitor groundwater levels and quality, and A protocol for the investigation and mitigation of identified exceedences of the groundwater impact assessment criteria. In accordance with the site's EPL, LMCC currently undertakes

Issue	Commitments
	<p>groundwater quality monitoring using annual or quarterly grab samples at five sites. Parameters monitored include alkalinity (as calcium carbonate), aluminium, ammonia, arsenic, biochemical oxygen demand (BOD), barium, benzene, cadmium, calcium, chloride, chlorinated volatile compounds, chromium (hexavalent), chromium (total), cobalt, conductivity, copper, ethyl benzene, fluoride, iron, lead, magnesium, manganese, mercury, nitrate, organochlorine pesticides, organophosphate pesticides, PCBs, phosphate, polycyclic aromatic hydrocarbons, potassium, sodium, sulfate, toluene, total phenolics, total dissolved solids, total organic carbon, total petroleum hydrocarbons, zinc, pH. It is expected that the EPL will be amended for the site to account for the proposed site changes, and LMCC will continue to undertake monitoring according to the amended licence conditions. In addition, LMCC propose to install additional groundwater monitoring wells as shown in Figure 5.5 to enable improved monitoring of groundwater quality.</p> <ul style="list-style-type: none"> • LMCC will ensure that, should dewatering of groundwater be required as part of any excavation works, a licence is sought under the <i>Water Management Act 2000</i>. • LMCC will ensure that a <i>Stormwater Management Plan</i> is prepared and implemented for the construction phase of the proposed works to mitigate the impacts on water quality. • LMCC will ensure that temporary stormwater quantity and quality management measures are implemented during the construction phase, including the installation of silt curtains, hay bale filters and stormwater diversions. • In accordance with the site's EPL, LMCC currently undertakes stormwater quality monitoring using annual or quarterly grab samples at four sites. Parameters monitored include alkalinity (as calcium carbonate), aluminium, ammonia, arsenic, biochemical oxygen demand (BOD), barium, benzene, cadmium, calcium, chloride, chlorinated volatile compounds, chromium (hexavalent), chromium (total), cobalt, conductivity, copper, ethyl benzene, fluoride, iron, lead, magnesium, manganese, mercury, nitrate, organochlorine pesticides, organophosphate pesticides, PCBs, phosphate, polycyclic aromatic hydrocarbons, potassium, sodium, sulfate, toluene, total phenolics, total dissolved solids, total organic carbon, total petroleum hydrocarbons, total suspended solids, zinc and pH. <p>LMCC will ensure that the quality of stormwater leaving the site will be in accordance with the limits outlined by ANZECC (2000) and the existing EPL.</p> <ul style="list-style-type: none"> • LMCC will ensure that a 30m buffer zone will be established from the watercourse centre-line and that all water management measures, both temporary construction phase measures and permanent measures, are located outside of this buffer. • LMCC will ensure that the proposed expansion will incorporate appropriate design principles for leachate basins, including ensuring that basin liners are utilised, active storage depths in the proposed basins are 0.75m from the permanent water level to the level of the primary spillway, and overflows from the basins are conveyed to the outfall(s) via 0.5m deep rock lined channel with base widths of 2m and side slopes of 1(V):2(H). • With regards to Hunter Water Corporation assets, LMCC will ensure that no sludge will be discharged to the receiving access chamber, if required.
Leachate	<ul style="list-style-type: none"> • Leachate will be managed in accordance with best practice: <ul style="list-style-type: none"> - The entire new landfill area will be lined (implementing a 'piggyback' liner over the existing waste using a LLDPE liner; - Leachate will be collected, treated and managed/disposed of appropriately for the operational lifetime of the landfill; and - The landfilling operations will be carefully staged, with care taken at all times to minimise the inflow of water into active landfill areas.

Issue	Commitments
	<ul style="list-style-type: none"> LMCC will incorporate aeration in the proposed 8ML leachate pond, as discussed in Section 6.4.4 and determined in consultation with HWC, such that surplus leachate disposed of to the sewer network (via the proposed sewer pipeline) meets HWC's quality requirements. The existing 6ML leachate pond will be retained, and operated in series to provide additional physical treatment. LMCC will ensure that engineering cell design drawings that meet EPA specifications (including the provision of cross sections, cell extension lining, anchoring and capping, leachate collection and disposal system and gas collection system) will be developed as part of the detailed design. LMCC note that this information is also required as part of the required application to vary the existing EPL (Licence No. 5873) to permit the construction of the cell extension. LMCC will seek to establish a Trade Wastewater Agreement with HWC for the discharge of leachate from the AWMF site to the HWC sewer system. LMCC will ensure that a sewer flowmeter is installed, and a sampling point established, at the AWMF package pumping station so that volumes and quality of leachate discharged to the HWC sewer network can be monitored. LMCC currently undertakes leachate quality monitoring via quarterly grab samples at one location, and this includes testing for alkalinity (as calcium carbonate), ammonia, biochemical oxygen demand (BOD), calcium, chloride, fluoride, iron, magnesium, manganese, nitrate, organochlorine pesticides, potassium, sodium, sulfate, total phenolics, total organic carbon, total petroleum hydrocarbons, total suspended solids and pH. LMCC will ensure that leachate quality monitoring continues in accordance with the conditions of the new EPL to be issued for the site.
Flora and Fauna	<ul style="list-style-type: none"> LMCC will ensure that a BioBanking Agreement is formalised for the site. LMCC will finalise a <i>BioBanking Statement</i> for the Lot 372 Development Site and a <i>BioBanking Agreement</i> for the proposed BioBank Site (comprising part of Lot 372, part Lot 373 and an additional suitable area of land (yet to be made available)) to offset the removal of 2,302 <i>Tetratheca juncea</i> plants and 7.2ha of native vegetation communities at the site (of a total 8.55ha of vegetation to be impacted). LMCC will make provision for these offset sites to be managed in perpetuity for conservation. The areas proposed to be biobanked on Lot 372 and 373 are shown in Figure 1. <u>LMCC will within 60 days of the commencement of vegetation clearance (other than for survey or conservation management purposes), ensure that a restrictive covenant burdening Lot 463 DP 1138964 be registered in favour of the Minister for Planning and Infrastructure, to implement LMCC's Biodiversity Offset Strategy.</u> <u>LMCC's Biodiversity Offset Strategy includes:</u> <ul style="list-style-type: none"> <u>- the offsetting of 33,853 <i>Tetratheca juncea</i> credits, calculated under the NSW Biobanking calculator, to offset the removal of 2,302 <i>Tetratheca juncea</i> plants at the site; and,</u> <u>- the offsetting of 392 Ecosystem credits, calculated under the NSW Biobanking calculator, to offset the removal of 7.2ha of native vegetation communities at the site (a total of 8.55ha of vegetation is to be impacted).</u> <u>LMCC will provide DP&I with a <i>BioBank Site Biodiversity Offset Management Plan</i> that commits the proposed Awaba BioBank Offset Site as shown on Figure 2 of the "Biobanking Assessment Report Awaba BioBank Site – Lot 463, Wilton Road, Awaba NSW" prepared by Niche September 2013 to in-perpetuity management and a fund deposit calculated on this basis. The required management actions will be determined in consultation with OEH and can be estimated using Part A of the BioBanking Credit Pricing Spreadsheet (OEH, 2011c).</u> LMCC will ensure that Lot 372 is acquired from the Crown such that

Issue	Commitments
	<p>ownership is transferred to LMCC, prior to the BioBanking Agreement being formalised.</p> <ul style="list-style-type: none"> It is noted that there is an existing mining lease and an exploration lease over the proposed biobanking site (ML1452 and EL5138). LMCC will ensure that consent from the leaseholder, the Minister for the Environment and the Minister for Resources and Energy, will be obtained for the proposed biobanking agreement prior to the agreement being finalised. Upon establishment of the Awaba Biobank Site, LMCC will ensure that 392 Ecosystem Credits of the required vegetation types and 33,853 <i>Tetratheca juncea</i> Species Credits will be retired within the BioBanking Scheme. LMCC will ensure that a <i>Vegetation Management Plan</i> is prepared and implemented prior to commencement of the proposed works that will include details pertaining to procedures for clearing, landscaping and revegetation/rehabilitation works that are planned for the AWMF site during the construction, operational and post-closure phases and also immediately following completion of the installation of the sewer pipeline. The plan will include a <i>Vegetation Clearing Protocol</i> and a <i>Weed Management Sub-Plan</i>. LMCC will ensure that a <i>Fauna Management Plan</i> is prepared and implemented prior to commencement of the proposed works that will provide a protocol for responding to the detection and relocation of native fauna present in trees, hollows and logs that lie within the proposed areas for clearing. LMCC will ensure that details regarding the most appropriate season(s) to undertake clearing with regard to reducing disturbance to fauna (especially nestlings) are included in addition to details regarding the proposed management of pest species during the proposed works. Where they have been prepared and where applicable, LMCC will consider the details set out in <i>Recovery Plans</i>, <i>Threat Abatement Plans</i> or <i>Priority Action Statements</i> for listed threatened species and incorporate relevant mitigation measures into the <i>Fauna Management Plan</i>. Suitably experienced wildlife handlers will be present during pre-clearance surveys to relocate any fauna located during the works.
Air Quality and Odour	<ul style="list-style-type: none"> LMCC will ensure that a <i>Construction Environmental Management Plan</i> is prepared and implemented prior to commencement of the proposed works, and that this plan will include management/mitigation procedures for air quality, odour and dust, including minimising the number of stockpiles on site, limiting unnecessary vegetation clearing, and reducing/controlling the number of trips and trip distances where possible. LMCC will ensure that standard odour management practices for landfill sites will be utilised in the operational phase of the works, including the continuation of current practices such as daily covering/capping of the active tip face, gas monitoring programs and an odour complaints register. LMCC will ensure that standard air quality management practices for landfill sites will be utilised in the operational phase of the works, including the maintenance of gas collection infrastructure, power generation unit, flare stack, and plant and equipment on site, and a flare stack emission monitoring program. LMCC will ensure that air quality, odour and dust mitigation measures are implemented during the operational phase of the works, including covering/capping of waste, gas emission monitoring programs, and maintenance of gas infrastructure and site plant/equipment. LMCC currently undertakes environmental monitoring of methane which includes monthly, in-situ monitoring of %(v/v) methane inside buildings at the site and also on the surface of the landfill. LMCC will ensure that this monitoring continues. Additional gas monitoring locations are proposed as part of the works as shown in Figure 5.4 of the EA. LMCC will prepare an Odour Control Plan and provide it to Hunter

Issue	Commitments
Aboriginal Heritage	Water in support of the development application.
	<ul style="list-style-type: none"> LMCC will ensure that a <i>Cultural Heritage Management Plan</i> is prepared in partnership with the registered Aboriginal stakeholders and implemented for the construction phase of the proposed works. The CHMP will demonstrate that effective community consultation with local Aboriginal communities has been undertaken during the preparation of the Plan. The CHMP will include procedures for ongoing Aboriginal consultation and involvement, management of all Aboriginal cultural heritage values associated with the project area, the responsibilities of all stakeholders, details of proposed mitigation and management strategies of all sites; including any additional investigation processes, salvage activities, monitoring, etc.; procedures for the identification and management of previously unrecorded sites (excluding human remains), and compliance procedures in the unlikely event that non-compliance with the CHMP is identified.
	<ul style="list-style-type: none"> LMCC will ensure that further archaeological survey around the creek lines at the AWMF site and sub-surface testing of the midden site identified along the pipeline route is undertaken prior to the commencement of construction works to determine the full nature and extent of these archaeologically sensitive areas. These investigations will initially comprise a series of 1m² probes spaced evenly over the area of impact along the creek line, but may be expanded if artefact densities warrant further investigation or salvage. A monitoring and collection program will then be undertaken by the registered Aboriginal stakeholders during all proposed sub-surface excavations to allow collection of any artefacts that may be disturbed in this area (with subsequent relocation and reburial “in country” and in a location that will not be subject to any future impacts).
	<ul style="list-style-type: none"> LMCC will ensure that a minimum buffer of 5m around culturally modified trees to be retained will be delineated and enforced to reduce the impacts on these sites. LMCC will conduct further investigations during the detailed design phase as to whether an increase in the size of the buffer distance around culturally modified trees of the project is achievable given site constraints.
	<ul style="list-style-type: none"> LMCC will provide an opportunity for the Registered Aboriginal Parties (RAPs) to monitor the initial ground disturbance works associated with all sections of the excavations (ground surface impacts) so that any potentially impacted artefacts may be collected by the RAPs.
	<ul style="list-style-type: none"> LMCC will develop and implement an Aboriginal Cultural Heritage Induction Program for all personnel associated with the project, to make them aware of the site’s Aboriginal heritage values and artefacts that are to be conserved at the site.
	<ul style="list-style-type: none"> LMCC will ensure that any new Aboriginal artefacts located uncovered due to the development and/or sub-surface excavation or monitoring activities will be recorded and registered with the EPA as part of the assessment process in accordance with the requirements of Section 89A of the NPW Act.
	<ul style="list-style-type: none"> LMCC will ensure that work is ceased immediately in the event that any bone or stone artefacts, discrete distributions of shell or any other objects of potential cultural association are uncovered during earthmoving or other activities, in accordance with the <i>National Parks and Wildlife Act 1974</i>, “stop work” provisions.
	<ul style="list-style-type: none"> LMCC will ensure that strategies for the management of Aboriginal sites will be developed in collaboration with the Registered Aboriginal Parties and documented in an Aboriginal Cultural Heritage Management Plan, as recommended by the two Aboriginal Cultural Heritage Assessment Reports (ACHAR).
	<ul style="list-style-type: none"> LMCC will ensure that archaeological excavations of known or Potential Archaeological Deposit/archaeological sensitivity will be conducted (as recommended by the ACHAR) where impacts may result from construction works. The objective of any such excavations will be to confirm whether there is a likelihood of any objects being present (and therefore impacted by the works), and where this is the case to develop appropriate management strategies in collaboration with the Registered

Issue	Commitments
	Aboriginal Parties and to formalise these in an Aboriginal Cultural Heritage Management Plan.
Non-Aboriginal heritage	<ul style="list-style-type: none"> LMCC will ensure that none of the non-Aboriginal heritage items identified in the vicinity of the proposed works will be impacted by the proposed works by making the Contractors aware of the items and ensuring the Contractors avoid them.
Visual Landscape	<ul style="list-style-type: none"> LMCC will progressively excavate, fill and re-vegetate Areas A and B and subsequently fill and re-vegetate Area C (11 cell areas in total across Areas A, B and C) cells on to nine as shown in the approved Staging Plan in <u>Figure 6.9, SK061 rev A dated 19.12.13-staging of landfill areas</u>, which has been developed to minimise the visual impacts of the proposed works. LMCC will ensure that the application of daily cover to the active tipping face is continued during the construction and operational phases of the works to ensure regular concealment of the landfill emplacement. LMCC will ensure that revegetation and rehabilitation will be undertaken at the site once the landfill has reached capacity, so that effective concealment of the emplacement will be achieved in the long term.
Greenhouse Gas	<ul style="list-style-type: none"> LMCC will continue to recover gases produced by the AWMF for energy generation and to minimise GHG emissions from the AWMF landfill. LMCC will increase the potential for landfill gas harvesting and electricity generation on site through the expansion of gas extraction infrastructure at the site. Prior to the commencement of the proposed works, LMCC will review the design of the final landfill gas management infrastructure to ensure that it meets the objective of capturing the majority of the gases from the landfill emplacement. LMCC will continue to monitor landfill gases generated for reporting purposes.
Traffic and Transport	<ul style="list-style-type: none"> LMCC will ensure that a <i>Construction Traffic Management Plan</i> is prepared and implemented for the proposed works. LMCC will ensure that the intersection of Wilton/Wangi Roads is upgraded to appropriately provide for existing traffic volumes and to reduce average delays experienced at the intersection for vehicles turning right onto Wangi Road.
Hazards and Risks	<ul style="list-style-type: none"> LMCC will continue to undertake the procedures detailed in the <i>Awaba Landfill Environmental Management Plan</i> (LMCC, 2006) to achieve compliance with the EPL issued for the site. LMCC will undertake a detailed risk review during the detailed design of the proposed additions, and any additional mitigation measures identified as being required will be incorporated into the <i>Awaba Landfill Environmental Management Plan</i>. LMCC will revise the site-specific <i>Fire Management Plan</i> within the <i>Awaba Landfill Environmental Management Plan</i> to ensure it remains current considering the proposed works. LMCC will continue to implement OH&S practices and adhere to relevant OH&S standards to ensure employee and user safety at the AWMF site. LMCC will work with HWC, as required, to enable the AWMF, pipeline and WWPS risks to be managed in an integrated manner. The standards defined in Section 3 and Section 7 of the Australian Standard AS3959-2009 (Construction of buildings in bush fire-prone areas) will be adopted as minimum design standards during the detailed design phase.
Noise and Vibration	<ul style="list-style-type: none"> LMCC will ensure that a <i>Noise and Vibration Management Plan</i> is prepared in accordance with the <i>Interim Construction Noise Guideline</i> (DECC, 2009b) and implemented for the construction phase of the

Issue	Commitments
	<p>proposed works.</p> <ul style="list-style-type: none"> • LMCC will continue to undertake the procedures detailed in the <i>Awaba Landfill Environmental Management Plan</i> (LMCC, 2006) to mitigate operational noise at the site. • LMCC will ensure that construction normally takes place only between the hours of 7am to 6pm Monday to Friday, and 8am to 1pm Saturday, with no construction on Sundays or Public Holidays. LMCC will obtain prior written permission from the EPA for any construction activities which are required outside these times. • LMCC will ensure that a Construction Noise Management Plan (CNMP) is prepared and implemented prior to commencement of construction activities. The Noise Assessment will be performed in accordance with the NSW Industrial Noise Policy (EPA 2000) or the relevant policy adopted by the EPA at the time of the Noise Assessment and is expected to include the following: <ul style="list-style-type: none"> - Identification of any noise sensitive locations (these will be mapped or described); - The existing background and ambient noise levels determined for each sensitive receiver; - Derivation and identification of the project-specific noise levels for each sensitive receiver; - The expected noise level and noise character (e.g. tonality, impulsiveness, vibration, etc.) likely to be generated from noise sources during operation. Noise source data will be included for each source in 1/1 or 1/3 octave band frequencies including methods or references used to determine noise source levels; - The noise levels likely to be received at the most sensitive receivers, including potential impacts for any identified significant meteorological conditions; - The findings of the predictive modelling and direct monitoring will be discussed and, where relevant noise criteria have not been met, additional mitigation measures will be recommended; - Details of any proposed mitigation will be provided, including the attenuation that will be achieved and the revised noise impact predictions following mitigation; and - After application of all feasible and reasonable mitigation measures, the residual level of noise impact will be quantified by identifying locations of where noise level exceeds the criteria and the extent of exceedance; numbers of people or areas affected; time when criteria will be exceeded; likely impact on activities; change in ambient conditions; and the result of any community consultation or negotiated agreement.