



Proposal

McArthur River
Mine

AUSTRALIA



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1 PROJECT UNDERSTANDING

1.1 Background

The Northern Territory Environment Protection Authority (EPA) has submitted a notice¹ to McArthur River Mining to carry out an Environmental Audit Program in relation to spontaneous combustion at the Northern Overburden Emplacement Facility (NOEF). A copy of the EPA notice is provided in **Appendix A**.

Emissions from the oxidation of sulphide ore include sulphur dioxide (SO₂), exposure to which can have acute and chronic effects on human health. The notice states that “...MRM have provided SO₂ monitoring data to the EPA which indicates levels recorded at several locations outside the premises may be exceeding National Environment Protection Measure (NEPM) standards”.

1.2 Environmental Audit Program

The EPA notice requires MRM to conduct an Environmental Audit Program to satisfy the following **six requirements**:

1. Determine the extent, nature and sources of SO₂ and other airborne pollutants generated from the waste rock dump/NOEF area within the premises;
2. Undertake an ambient air monitoring and atmospheric dispersion modelling program to determine whether sensitive receptors are being impacted by SO₂ emissions emanating from the premises;
3. Undertake a quantitative and qualitative evaluation and assessment of the emissions of SO₂ and other airborne pollutants beyond the boundary of the premises as a result of air emissions from the waste rock dump/NOEF;
4. Conduct an environmental risk assessment should it be determined that SO₂ emissions and other airborne pollutants from the premises are impacting on sensitive receptors;
5. Identify proposed approaches to address and remediate sources of SO₂ emissions and other airborne pollutants should it be determined that the premises are a source of emissions of SO₂ and other airborne pollutants; and
6. Develop and implement a reporting regime for ambient air monitoring and atmospheric dispersion modelling to the EPA and for the communities that may have an interest in the reporting.

The audit will be implemented through an overarching plan ('the plan'), as per *notice condition 1*, which will document the methods, schedule, and reporting regime for each component of the audit.

¹ NT EPA, 8 October 2014, *Notice to Carry Out Environmental Audit Program. Issued pursuant to section 48 of the Waste Management and Pollution Act*

The EPA notice specified a number of key dates by which certain elements of the audit were expected to be completed:

- *“...The Plan, which incorporates notice conditions 6 to 8, must be submitted within 28 days from the date of the notice accompanied with the suitably qualified expert’s and auditor’s written endorsements...”*
- *“...airborne emissions from the waste rock dump / NOEF to be assessed and initial atmospheric dispersion modelling undertaken within 28 days of the notice...”*
- *...the results of the modelling referred to above are to be made available in the form of a report to the EPA within 14 days of the modelling being finalised...*
- *...ambient air monitoring campaigns to include the 2014/15 wet season and 2015 dry season...*
- *...all requirements of the audit program to be completed by 30 September 2015.”*

1.2.1 Preliminary Consultation with EPA

Following a discussion between Julie Crawford (MRM) and Chris Taylor (URS) on 13 November, URS contacted Peter Vasel (NT EPA) on MRM’s behalf to discuss the Environmental Audit Program.

The objective of the preliminary consultation was to propose an adjusted scope and timeline for the audit program, which would be more practical for MRM and alleviate the immediate requirement to commence ambient monitoring for the 2014/15 wet season, whilst still delivering the goals of the overarching audit program.

The EPA acknowledged that the initial deadlines would not be complied with, but agreed with the proposed alternate approach outlined below:

- Submit the plan, which has been reviewed and approved by a suitably qualified auditor, to the EPA
- Assess the airborne emissions from the NOEF through a desk-top analysis and complete atmospheric dispersion modelling to provide an initial risk assessment
- Undertake an unmanned aerial vehicle (UAV) survey at the mine to gather in-plume data from the NOEF to determine extent, nature and source characteristics of the plume and provide necessary data for dispersion model validation
 - the EPA acknowledged that this will provide interim data within the 2014/15 wet season and alleviate the immediate requirement for MRM to install ambient air monitors
 - the UAV study will provide high quality data for the spontaneous combustion plume and pollutant emissions, including temperature mapping of the NOEF and derivation of SO₂ emission rates from real-time data
- Complete a detailed dispersion modelling study using the UAV data to validate predictions
 - validation of the initial modelling study can be undertaken at an earlier opportunity using real-time monitored data from a one week UAV study versus a six month ground level ambient monitoring campaign

- Installation of ground level monitoring for SO₂ and particulate matter at Devils Springs, Borrooloola and one further location closer to MRM, delayed to run for the 2015 dry season and 2015/16 wet season
- Complete additional atmospheric dispersion modelling at the end of each ambient air monitoring season.

With the exception of ground level monitoring, no specific timeline was specified for the completing the above scope of works. However, there is an expectation from the EPA that MRM will complete and submit the plan by 19 December 2014. The UAV study and initial dispersion modelling study would be likely to commence early in 2015.

The proposed schedule for completing the Environmental Audit Program is presented in **Section 5**.

1.3 URS Relevant Project Experience

The URS project team has extensive experience of air quality assessments for MRM and has developed meteorological and dispersion models for the sites that have undergone regulatory scrutiny. These existing models will allow URS to minimise the time and cost associated with the initial modelling aspects of this project. The URS team is also experienced in negotiation with regulatory agencies, including NT EPA, and has developed air quality monitoring and compliance plans to satisfy agency requirements. This experience of agency expectations will reduce the time required to agree and finalise a practical and effective plan with the EPA.

1.3.1 Projects for Xstrata / Glencore

McArthur River Mine Expansion Project EIS and SEIS (Aug 2011)

URS was commissioned to undertake an air quality and greenhouse gas assessment for the Phase 3 Development Project Environmental Impact Statement (EIS) at McArthur River Mine. This assessment considered the potential air quality and greenhouse gas impacts of this expansion in the context of NT, Commonwealth and international guidance. Impacts on local air quality were assessed for emissions from the mine and power station using the CALPUFF atmospheric dispersion model. All defined project goals were predicted to be achieved. Greenhouse gas emissions were quantified and found to be not material in the context of current national, state and sectoral emissions. It was proposed to continue the existing programme of monitoring for dust deposition, lead and zinc at MRM and Bing Bong Port supplemented with monitoring for nitrogen dioxide and particulate matter.

McArthur River Mine Power Station modelling (June 2012)

URS was retained to assess power station options for the McArthur River Mine using atmospheric dispersion modelling. The aims of the study were to confirm whether a proposed alternative augmentation of existing power generation would achieve the environmental goals of the project and compare predicted ground level concentrations of nitrogen dioxide with those reported in the Environmental Impact Statement. These results showed that the proposed option would provide a significant reduction in ground level concentrations relative to the options considered in the EIS.

McArthur River Mine scrubber and concentrate shed (Jan 2013)

URS was commissioned to evaluate the dust emissions from a concentrate shed subject to proposed mitigation measures (scrubber) associated with the MRM Phase 3 expansion. This assessment focused on the release of fine particulate matter with high concentrations of zinc and lead from the scrubber stack. The impacts of these releases were assessed by quantifying expected air emissions and local scale atmospheric dispersion modelling. Results of the study indicated that the proposed scrubber and concentrate shed design would be acceptable in terms of local air quality impact. A detailed, cumulative modelling exercise was recommended to account for all emissions sources currently operating and proposed at MRM.

McArthur River Mine Phase 3 – updated mine plan (March 2013)

URS undertook a detailed, cumulative air quality assessment, adopting the approach of the EIS, to fully quantify the impacts from the scrubber, mine and Phase 3 Development. The aim of the assessment was to determine if the ambient air quality standards will be breached with the inclusion of emissions from the concentrate shed scrubber and if the conclusions drawn in the EIS remain valid. This assessment focused on the release of fine particulate matter because the EIS modelling results showed that this pollutant was most likely to impact on human health. It was determined that the conclusions drawn in the EIS remain valid.

McArthur River Mine Bing Bong Port Concentrate Shed (Feb 2013)

URS was commissioned to evaluate the dust emissions from a concentrate shed subject to proposed mitigation measures at the Bing Bong Port facility. This assessment focused on the release of fine particulate matter with high concentrations of zinc and lead from the proposed baghouse. The impacts of these releases were assessed by quantifying expected air emissions and local scale atmospheric dispersion modelling. Results of the study indicated that the proposed dust mitigation measures would ensure that the project air quality goals would be achieved.

Mount Isa Mines Transitional Authority (2010-2011)

URS was commissioned by Xstrata Mount Isa Mines to provide air quality advice in support of its application for a three year Transitional Authority. The works included scoping and review of specialist atmospheric dispersion modelling studies undertaken to predict the dispersion of dust and heavy metal emissions from mining activities, fossil fuel combustion, ore processing and fugitive emissions. The outcomes of these studies were used to determine the commitments and draft conditions in the Environmental Management Plan.

An audit of Xstrata Mount Isa Mines' on-site dust monitoring programme was undertaken in parallel. The audit was undertaken to ensure that monitoring equipment was fit for purpose and strategically located to ensure data could be used as a means to control on-site dust emissions. This included the review of on-site particulate and meteorological monitoring data to identify 'trigger' thresholds for corrective actions. The Transitional Authority was granted in 2011.

1.3.2 **Other relevant projects**

Pacific Aluminium, Increased Bauxite Project, NT (2013)

Pacific Aluminium commissioned URS to complete a number of technical studies to support a Mine Management Plan Amendment associated with a proposed increase to the volume of bauxite mined from the existing Gove mine leases, NT. This included an assessment of dust impacts from mining, transport and storage of the ore. URS carried out a week-long dust survey at the operating bauxite mine and alumina refinery to supplement existing data and establish baseline conditions. A comprehensive review of existing and proposed mine and refinery activity data was undertaken to develop an emissions inventory. Prognostic and diagnostic meteorological modelling was completed, followed by detailed atmospheric dispersion modelling of dust (PM₁₀/PM_{2.5}) using the inventory data. The technical study proposed a number of potential mitigation measures to reduce the impacts of dust emissions associated with the increase in bauxite production.

DLPE, East Arm Wharf Expansion Environmental Approvals, NT (2010)

URS was commissioned by the Department of Lands, Planning and Environment (DLPE) to undertake a range of environmental assessment and regulatory approval documentation for the East Arm Wharf Expansion Project, including an Environmental Impact Statement. URS supported DLPE during discussions with the Northern Territory Environmental Protection Authority to ensure a favourable outcome for the project. URS completed the project on time with proceeding local and Federal Government approvals.

Caltex Refineries, Lytton Refinery Air Quality Consultancy Services, Qld (2009-2014)

URS was retained to provide strategic and technical advice to Caltex on a range of environmental issues, including air emissions, and assisting in negotiations with regulators regarding licence compliance. For air emissions, detailed meteorological and dispersion modelling was carried out using TAPM and CALPUFF. The objective of the modelling was to demonstrate compliance with ambient air quality standards and consider options for a licence amendment. The methodology was developed in consultation with the Department of Environment and Heritage Protection (EHP) and model validation was carried out using data from multiple ambient monitoring stations.

Throughout 2013 and 2014, URS then provided support to Caltex for license amendment application which included both urban planning support and the provision of technical air quality advice around stack sampling, SO₂ emissions and odour. URS also drafted monitoring and response plans to be incorporated into Caltex procedures. These services required significant engagement with EHP by URS' air quality specialists. An amendment to the license was granted in 2014, providing Caltex with increased operational flexibility in exchange for appropriate environmental safeguards.

2 SCOPE OF WORKS

URS has developed the below scope of works in accordance with the Environmental Audit Program requirements and associated conditions, as detailed within the EPA notice¹ issued to MRM and initial consultation with the EPA.

2.1 Development of Audit Plan ('the plan')

URS will develop a detailed plan to meet the requirements of the environmental audit program. This will include air quality monitoring and modelling and health risk assessment. The plan will set out the expected outcomes of the work and a timetable for delivery. Any deviations from the Notice will be documented. In developing the plan, URS will work with MRM to ensure that all aspects of the plan are practical and achievable. A draft plan will be submitted to MRM for review and one round of comments will be incorporated before a final plan is issued to be endorsed by an auditor.

URS anticipates that the draft plan will be completed and issued to MRM within two weeks of commissioning.

2.1.1 Approved Auditor Role

URS will provide an accredited Environmental Auditor to review the final plan versus the requirements of the EPA notice and provide an endorsement of the plan to the EPA. The Environmental Auditor will also be advised by a URS air quality specialist.

The URS audit team will remain separate to the URS project team undertaking the scope of works and will review the plan independently. This approach was discussed with the EPA in the preliminary consultation and is acceptable to the EPA.

Details of two accredited URS auditors, including career summary and project experience, are provided in **Section 7.3**.

URS expects that the audit and endorsement of the plan will be completed within one week following issue of the final document to the auditor.

2.2 Source Identification and Analysis

“Req 1. Determine the extent, nature and sources of SO₂ and other airborne pollutants generated from the waste rock dump/NOEF area within the premises...”

A desk-based approach to determining the extent, nature, and sources of SO₂ from the NOEF will be adopted to inform the initial dispersion modelling study and risk assessment. Subsequent to this, a more robust, in-situ approach to determining, analysing, and modelling the spontaneous combustion sources at the NOEF will be undertaken through completing a UAV survey.

2.2.1 Desk-based Study Overview

URS will liaise with MRM site management to obtain, where available, details of previous spontaneous combustion events within the NOEF, including but not limited to:

- locations and number of emission sources
- extent of burning (e.g. approximate area)
- duration of burning
- weather conditions prior and during the events
- any photographic evidence taken during events.

URS will estimate emission rates of SO₂ and other airborne pollutants from spontaneous combustion through undertaking a stoichiometric analysis, requiring the concentration of sulphide minerals in the waste material and the sulphide oxidation rates to be determined.

A formal request for information (RFI) would be submitted to MRM prior to undertaking the analysis.

The RFI will be issued to MRM within two weeks of commissioning. The desk-based study is expected to be completed within two weeks of receiving all required information from MRM.

The results of the desk-based study will be presented within a technical note and used to inform the initial dispersion modelling exercise.

2.3 Site Based Unmanned Aerial Vehicle (UAV) Study

This subsection presents the proposed approach to undertaking a robust, in-situ approach to determining and analysing the spontaneous combustion sources at the NOEF, in addition to monitoring / mapping in-plume and ambient SO₂ concentrations and meteorological parameters over the site and surrounding areas.

The EPA acknowledged that this study will provide quality, real-time data within the 2014/15 wet season and alleviate the immediate requirement for MRM to install ambient air monitors. It will enable validation of the initial modelling study at an earlier opportunity using real-time monitored data from a one week UAV study versus a long term ground level monitoring campaign.

2.3.1 UAV Study Overview

URS will supervise and manage a UAV survey at the mine site, which will be undertaken with an Australian specialist UAV supplier, Aerosonde Pty Ltd. The scope of the UAV site survey will comprise:

- Drafting of a Health, Safety and Environment Plan (HSEP) for the site survey
- Deployment of an Aerosonde[®] Mark 4.7 UAV system within a pre-defined area of airspace above the site and surrounding area, encompassing the townships of Borroloola and Devils Springs
- Attachment of an electro-optic / infrared (EO-IR) camera and infrared thermometer to the UAV for mapping the location, extent, and characteristics of the spontaneous combustion source(s) within the NOEF
- Attachment of a meteorological monitoring sensor to the UAV, capable of recording real-time data for atmospheric pressure, temperature, wind speed, and wind direction

- Integration of a self-contained, data logging SO₂ sensor on to the UAV with a limit of detection to 0.1 ppm, for real-time monitoring and mapping of SO₂ concentrations within the plume and the surrounding area
- Use of a multi-spectral digital still camera package to provide photogrammetry for a three dimensional model of the site
- Relay of real-time data from the UAV to the temporary operations base at the MRM site.

URS proposes to deploy the Aerosonde® UAV for **three day time and two night time flights**, which will include carrying out transects of the plume at varying heights, in addition to mapping the characteristics of the NOEF spontaneous combustion source. Night time dispersion was raised as a particular concern during initial consultation with the EPA and the study will address this directly.

One of the day time flights will be carried out from the mine site, where further mapping of the NOEF will be undertaken, out to Borroloola and Devils Springs townships for plume tracking, SO₂ measurements, and meteorological monitoring. The EO-IR and digital still cameras, infrared thermometer, SO₂ monitor and meteorological sensor will be employed for each flight mission, where the UAV payload allows.

Deploying the UAV throughout day and night time hours will capture various atmospheric conditions and potentially varying source characteristics. The EO-IR camera will be used to identify and map the location, dimensions, and surface temperature of the NOEF source. Visualising the plume from above will also enable the dispersion characteristics of the plume to be assessed, particularly with respect to meteorological conditions and identified sensitive receptor locations.

With the SO₂ sensor attached, the UAV will be flown within the plume to collect a comprehensive dataset of SO₂ concentration data at varying distances from the spontaneous combustion source. These data points would be collected in the X, Y, and Z axes to enable a three dimensional representation of the SO₂ dispersion characteristics to be analysed.

A pre-determined flight path would be established on each day of the survey, accounting for Australian Civil Aviation Safety Authority (CASA) regulations and approvals, observed and forecasted weather conditions, and spontaneous combustion activity. This is to allow optimum data collection to achieve the aforementioned objectives of the survey.

All survey data collected by the UAV would be relayed to the Aerosonde temporary operations base at the MRM site and pre-processed for further analysis by URS. URS will supervise operations and provide on-site data analysis. This will include up to date guidance with respect to ideal flight paths and times to obtain the required meteorological, in-plume and spontaneous combustion source data. URS will also liaise with MRM to ensure all activities undertaken on site during the survey are in accordance with the approved schedule and health and safety plan. URS will provide updates on the progress of the UAV survey on a daily basis to MRM, including flight plans for each day.

The assumptions and limitations relating to the proposed site based UAV survey are stated in **Section 6**. A summary of Aerosonde Pty Ltd is provided in **Section 7.2**.

2.3.2 Anticipated UAV Survey Timeline

The date for commencing the UAV survey would be agreed in consultation with MRM and Aerosonde. Aerosonde will obtain the necessary CASA approvals required to operate the UAV for the survey period, prior to undertaking the site works.

URS anticipates that a minimum of three weeks would be required prior to commencing the site works to obtain the necessary approvals and mobilise the survey equipment to Darwin.

An example schedule for completing the site based survey is presented in Table 2-1, requiring nine days in total for the site works. Once commissioned, a detailed schedule of works and flight plan for the survey will be submitted to MRM for review and included within the plan.

Table 2-1 Example UAV site based survey timeline

Day No.	Task(s) undertaken	Objective
1	Survey team travel to site (2 x Aerosonde personnel & 1 x URS personnel)	
2	Site inductions and setup of UAV equipment and temporary operations base	
3	UAV survey flight – <i>Day time</i> transect through plume and over NOEF (11 am – 5 pm)	High resolution thermal mapping of spontaneous combustion source, imaging of source location and extent, plume dispersion characteristics, extensive SO ₂ and meteorological monitoring within plume at varying elevations, terrain mapping
4	UAV survey flight – <i>Day time</i> transect through plume and over NOEF (11 am – 5 pm)	
5	UAV survey flight – <i>Day time</i> over Borroloola and Devils Springs (11 am – 5 pm)	As above, in addition to recording plume tracking, SO ₂ attenuation with distance and concentrations over sensitive receptors, local meteorological variations with height and distance, terrain mapping
6	Rest day *	
7	UAV survey flight – <i>Night time</i> transect through plume and over NOEF (12 – 6 am)	High resolution thermal mapping of NOEF area, plume dispersion characteristics during night time conditions, SO ₂ in-plume concentrations and meteorological variables at varying heights
8	UAV survey flight – <i>Night time</i> transect through plume and over NOEF (12 – 6 am)	
9	Survey team travel from site	

* At least one rest day is anticipated, which may be dictated by weather conditions or site activities, and is not fixed within the schedule. CASA regulations stipulate that operators of the UAV are required to take regular downtime from piloting.

2.3.3 Analysis of UAV Survey Data

At the completion of the UAV site survey, the collected data will be provided to URS by Aerosonde Pty Ltd. The data will be processed and analysed for the purposes of assessing:

- The extent, nature, and sources of SO₂ from the NOEF, including dimensions and temperature profiles
- Meteorological conditions throughout the flight hours, including atmospheric pressure, temperature, wind speed and wind direction
- The SO₂ X, Y, and Z concentration profile within the plume to determine the dispersion characteristics of SO₂ and back calculation to derive emission rate of SO₂ from the spontaneous combustion source
- Creation of a digital terrain model (DTM) from three dimensional photogrammetry.

URS will undertake a comprehensive analysis of all EO-IR imagery captured by the UAV to determine the location of the spontaneous combustion sources within the NOEF. Subsequently, the precise source dimensions will be calculated and the temperature profile of the source area identified relative to the surrounding waste material. These data will be used within the atmospheric dispersion modelling study (see **Section 2.5.2**) to represent the spontaneous combustion source input conditions.

The meteorological data recorded by the UAV will undergo extensive analysis for the purposes of assessment versus the recorded SO₂ concentrations and overall plume dispersion characteristics as captured by the EO-IR camera. Further, the capture of meteorological data in the X, Y, and Z direction will provide an opportunity to process localised atmospheric variables to validate the atmospheric dispersion modelling at differing vertical levels. This will allow URS to determine the accuracy of the meteorological model developed to make dispersion predictions.

The use of the SO₂ sensor during the UAV flight hours will provide a large number of SO₂ concentration data points at various locations within the plume. Pre-processing of these data points to create a manageable and readable data file will enable a plot of SO₂ concentrations versus distance from the source in all directions. This will allow analysis versus meteorological data and visual imagery. In addition, these data will be analysed and combined with dispersion modelling to back calculate concentrations of SO₂ to the source location at the NOEF and derive an emission rate for use in subsequent dispersion modelling.

2.3.4 UAV Key Equipment Summary

The Aerosonde® UAV Mark 4.7

The UAV that will be employed at the site is the Aerosonde® Mark 4.7. It provides affordable aerial surveys, delivering imagery from low altitudes not available through other survey methods, with the ability to fly within gaseous plumes such as those released from the NOEF.

The UAV was initially developed with the needs of meteorological operations in mind and has completed a number of these missions around the world for meteorological services and research organisations based in countries including Australia, the USA, Japan and Korea.

The Aerosonde[®] Mark 4.7 includes an automated launch and recovery system, including launching from a car-top. With a payload including the EO-IR camera, the UAV can fly continuously for 10 hours or more.

The Aerosonde UAV is integrated into an established operating network of ground control technologies, enabling data recorded by the UAV to be efficiently relayed to the Aerosonde ground team on site for immediate collation.

A picture of the Aerosonde[®] Mark 4.7 is presented in Figure 2-1, with an example image taken from the UAV presented in Figure 2-2.

The SO₂ Sensor

A wireless SO₂ monitor will be attached to the UAV for each flight. URS will deploy a ToxiRAE Pro or similar SO₂ sensor within the UAV payload, capable of providing:

- continuous data logging of SO₂ readings at one second intervals
- wireless access to real-time instrument readings from any location
- a SO₂ monitoring resolution of 0.1 ppm.

Figure 2-1 The Aerosonde® Mark 4.7 UAV



Figure 2-2 Example digital still image captured by an Aerosonde UAV from 150 m above ground level (full resolution not presented due to file size)



2.5 Atmospheric Dispersion Modelling

“Req 2. Undertake an ambient air monitoring and atmospheric dispersion modelling program to determine whether sensitive receptors are being impacted by SO₂ emissions emanating from the premises...”

This section provides URS’s approach to undertaking atmospheric dispersion modelling. The requirement to commence the ambient air monitoring element of the audit program is delayed until the 2015 dry season and the proposed approach to the ambient air monitoring program is provided in **Section 2.9**.

The EPA notice stipulates that the Environmental Audit Program should include a **minimum of three** dispersion modelling studies, relating to:

- a) airborne pollutant emissions from the waste rock dump / NOEF to be assessed through initial atmospheric dispersion modelling;
- b) a minimum of two additional air dispersion model runs are to be completed during the operation of the ambient air monitoring stations.

Given the preliminary consultation outcomes stated in **Section 1.2.1**, URS proposes to undertake a total of four dispersion modelling studies:

- *Study ‘A’* – Initial dispersion modelling
- *Study ‘B’* – Dispersion modelling incorporating UAV survey data
- *Study ‘C’* – Dispersion modelling following 2015 dry season ambient monitoring
- *Study ‘D’* – Dispersion modelling following 2015/16 wet season ambient monitoring

As required by the EPA, all dispersion modelling, assessment, and reporting would be completed in accordance with the New South Wales document – *Approved Methods for the Modelling and Assessment of Air Pollutants in new South Wales* (DEC, 2005).

2.5.1 Dispersion Modelling Study ‘A’

The results of the desktop study approach, outlined in **Section 2.2**, would be used to determine the source characteristics at the NOEF for the initial dispersion modelling study. The sensitive receptor locations to be assessed will be agreed with MRM prior to commencing the modelling study.

Given the nature of the spontaneous combustion sources and scale of the area of concern, URS proposes to use the CALPUFF (v6.42) atmospheric dispersion model. CALPUFF is suitable for the assessment of near and far-field impacts in complex flow or dispersion situations, and under light wind speed conditions. CALPUFF is a non-steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport. The capability to predict dispersion under calm wind conditions (e.g. night time inversion) is particularly important for near-ground level sources such as those present at the NOEF.

The CALPUFF model requires hourly sequential meteorological data as an input to predict the dispersion of airborne pollutant emissions. URS proposes to use CSIRO’s The Air Pollution Model (TAPM v4.0.4) to simulate three-dimensional, gridded weather data for the last 12

months (e.g. October 2013 – September 2014), which covers the period within which spontaneous combustion events have occurred.

The three-dimensional wind field will be refined for local terrain effects using the CALMET model. Observed meteorological data from the Bureau of Meteorology (BoM) stations located at MRM's airstrip and at Boroloola Airport would be purchased and assimilated into the simulation to ensure that variations in regional meteorology are represented in the dispersion model.

As noted above, URS holds existing meteorological and dispersion models of MRM. These models will require only minor modification to include the NOEF source. URS will, therefore, be well-placed to deliver this task quickly and cost-effectively. This model has also passed regulatory scrutiny, minimising the risk of extended consultation on methodology.

2.5.2 Dispersion Modelling Study 'B'

Following analysis of the UAV survey data, URS will undertake further atmospheric dispersion modelling, which will adopt the same approach as Study 'A', with the following adjustments:

- Source input data for spontaneous combustion will be derived from the UAV survey data analysis;
 - source location and dimensions
 - source emission rate of SO₂ and temperature
 - comparison of derived emission conditions using UAV survey data versus desktop stoichiometric analysis (as per 'Part 1' proposal)
- Meteorological variable data for atmospheric pressure, temperature, wind speed and wind direction will be compared to the meteorological modelling to validate model predictions

Using the emission rates calculated using UAV data, the dispersion model will be used to predict SO₂ concentrations at the identified sensitive ground level receptors over a full year of meteorological data, as per the scope summarised in the **Section 2.5.1**.

2.5.3 Dispersion Modelling Study 'C' and Study 'D'

The two additional model runs are to be completed in conjunction with the ambient air monitoring schedule. The monitoring schedule will cover both the 2015 dry season and the 2015/16 wet season.

URS proposes to undertake one additional model run (*Study 'C'*) at completion of the 2015 dry season monitoring campaign, and the second additional run (*Study 'D'*) following the end of the 2015/16 wet season campaign.

For each additional model run, the simulated meteorological data will be revised to incorporate monitored weather data recorded at each ambient air station and the BoM stations during the period. The recorded meteorological and air pollutant data from each monitoring site will enable further model validation to be undertaken at the respective locations for the monitored period.

URS assumes that the source characteristics input to the dispersion model would remain the same as those used for *Study 'B'* dispersion modelling. Should there be a requirement to re-assess the extent, nature, and sources of SO₂ and other airborne pollutants from the NOEF, for example because of changes at MRM, URS will provide MRM with an additional fee proposal.

2.6 Results Analysis

“Req 3. Undertake a quantitative and qualitative evaluation and assessment of the emissions of SO₂ and other airborne pollutants beyond the boundary of the premises as a result of air emissions from the waste rock dump/NOEF...”

For each dispersion model study 'A' to 'D', the predicted concentrations of SO₂ and other airborne pollutants output by the model will be analysed at the identified sensitive receptor locations and for the wider region through mapped concentration contour plots. The results will be assessed against the relevant assessment criteria (i.e. NEPM air standards).

Notice condition 8(e) states that “...ongoing validation of the atmospheric dispersion model is to be conducted during the operation of the ambient air monitoring stations”. The additional model runs 'B', 'C', and 'D' will provide an opportunity for statistical analyses of the modelled versus monitored data for the purpose of validating both the predicted meteorological variables and pollutant concentrations. For *Study 'B'*, the validation of the model will be based on the UAV survey data. Assessment of any predicted exceedances of the criteria in *Study 'C'* and *Study 'D'* will be compared to the maximum 1 hour and 24 hour levels recorded at each ambient monitoring station.

2.7 Environmental Risk Assessment

“Req 4. Conduct an environmental risk assessment should it be determined that SO₂ emissions and other airborne pollutants from the premises are impacting on sensitive receptors...”

The results analysis undertaken as part of each dispersion model study and the data recorded at the ambient air monitoring stations will be used to determine if an environmental risk assessment is required. If a risk assessment is required, it will be developed in consultation with the EPA, focussed on human exposure at off-site sensitive receptors predicted and / or monitored to be impacted by SO₂ and other airborne pollutants emitted from the NOEF.

As per *notice condition 15(j)*, the assessment will “...follow accepted environmental health risk assessment principles and guidelines, including hazard identification and dose response, exposure assessment and risk characterisation, and likely sensitive receptor health assessment.”

The risk assessment would be completed in accordance with enHealth's guideline documents:

- *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards* (2012)
- *Australian Exposure Factor Guide* (2012).

This proposal includes for up to three environmental risk assessments being undertaken, one at the completion of each validated dispersion model *Study 'B' to 'D'*. The extent of each assessment would be subject to the results of dispersion modelling, ambient monitoring, and EPA consultation.

Should any further risk assessments be required throughout the Environmental Audit Program, URS will provide MRM with an additional fee proposal.

2.8 Mitigation and Management Measures

“Req 5. Identify proposed approaches to address and remediate sources of SO₂ emissions and other airborne pollutants should it be determined that the premises are a source of emissions of SO₂ and other airborne pollutants...”

URS will provide a review of best available techniques for the prevention, mitigation, and management of spontaneous combustion from the NOEF, including input from:

- Consultation with MRM staff
- Mine Safety operations Branch (May 2011) *Spontaneous Combustion Management Guideline (MDG 1006)*
- United States EPA *AP-42, Volume 1, Fifth Edition*
- European Commission Integrated Pollution Prevention and Control; *Reference Documents on Best Available Techniques (BREF)*
- Other research documents.

Should the dispersion model runs and/or ambient monitoring results indicate exceedances of the assessment criteria at sensitive off-site receptors, recommendations for mitigation and management will be provided within the respective deliverable.

2.9 Ambient Air Monitoring Campaign

“Req 2. Undertake an ambient air monitoring and atmospheric dispersion modelling program to determine whether sensitive receptors are being impacted by SO₂ emissions emanating from the premises...”

Following the completion of the UAV study and associated atmospheric dispersion modelling *Study 'B'*, URS will undertake an ambient monitoring program to determine whether sensitive receptors are being impacted by SO₂ emissions emanating from the site. The proposed monitoring locations include, but are not limited to:

- the Devils Springs outstation
- the Borroloola Township
- a third site to be determined based on information gathered during earlier phases of the plan.

URS understands that MRM are required to, as a minimum, undertake sulphur dioxide (SO₂), particulate, and meteorological monitoring at these three locations. URS proposes to conduct two ambient monitoring campaigns, each lasting three months in duration, during the **2015 dry**

season (June to August 2015) and the **2015/16 wet season** (December 2015 to February 2016).

URS will deploy an ambient air monitoring team (see **Section 7.1.1**) which has designed and implemented numerous monitoring programs around the world for nearly every major industrial sector and a wide range of regulatory bodies. The team will deliver on the objectives outlined in the EPA Notice in the most practical and cost effective way possible.

2.9.1 **Monitoring Overview**

URS will undertake continuous ambient air monitoring at the three locations outlined in the EPA notice during the 2015 dry season and 2015/2016 wet season and determine the following parameters:

- The ambient concentration of SO₂
- The ambient concentration of PM₁₀
- Wind speed and direction
- Temperature and relative humidity
- Barometric pressure
- Rainfall
- Solar Radiation.

URS intend to use a web based 'real-time' data logging system which will enable MRM to view live data from any web enabled device, and receive real time SMS/email alarms at user defined set points, i.e. if SO₂ concentrations exceed the 10th percentile of the relevant National Environment Protection Measure (NEPM) standard, an alert will be issued.

Appendix B details URS's proposed ambient air monitoring methodology, which will be undertaken in accordance with the relevant monitoring standards stated in the EPA Notice.

The assumptions and limitations relating to the proposed ambient air monitoring program are stated in **Section 6**.

2.9.2 **Daily Checking**

Air quality data collected from the monitoring stations will be reviewed every business day by an experienced technician. This will enable URS to identify any equipment failure, should it occur. This process will assist with maximising the data capture rates, aiming to achieve a capture rate exceeding 95%. Records of daily checks will be kept and will be available to MRM upon request.

2.9.3 **Monthly Equipment Checks**

As a way of reducing costs, URS has assumed that a MRM staff member will be available to undertake simple monthly calibration and maintenance checks that should not take longer than 30 minutes at each monitoring site. URS will provide the nominated staff member with comprehensive training from URS personnel during the initial site visit and telephone and email support during the monitoring period. Should this not be practical, URS can adjust our

cost estimate to utilise URS staff to conduct these simple monthly calibration and maintenance visits.

2.9.4 Monitoring Completion

At the completion of monitoring, following the 2015/2016 wet season, a URS staff member will travel to MRM, and conduct the required final calibrations and maintenance to validate the data collected over the monitoring term.

URS assumes that the monitoring equipment will remain in-situ at the completion of the monitoring program for further monitoring events that may be required by MRM post completion of monitoring program. Therefore, no allowance has been made for removing equipment from site. Should the equipment need to be re-located at the completion of the monitoring program, URS would be happy to assist and provide estimates at the time of de-commissioning.

2.9.5 Data Validation and Reporting

URS will review and validate the monitoring data on a monthly basis for inclusion in the monthly data report. Data validation will be undertaken in accordance with the appropriate AS/NZ standard, the *Air Quality Sampling Manual* (Qld Government, 1997), *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2005) and the *Good Practice Guide for Air Quality Monitoring and Data Management* (NZ Ministry for the Environment, 2009).

The **monthly report** will consist of a simple letter report and a validated data set in excel format.

The meteorological and air pollutant data recorded at each location will be also utilised within the additional dispersion modelling *Studies 'C' and 'D'*, as outlined in **Section 2.5.3**.

3 DELIVERABLES

3.1 Environmental Audit Program

“Req 6. Develop and implement a reporting regime for ambient air monitoring and atmospheric dispersion modelling to the EPA and for the communities that may have an interest in the reporting...”

URS’s proposed reporting regime for all elements of the Environmental Audit Program is presented in Table 3-1 overleaf.

URS will submit each deliverable to MRM for review and comment, prior to finalisation and issue to the EPA.

Table 3-1 URS deliverables relating to the Environmental Audit Program

Deliverable	Work item	Relevance to Audit Program	Summary
Master Document	<i>The plan</i>	<i>Notice condition 1, 4 and Requirement 6</i>	Addressing all requirements of the Environmental Audit Program; documenting the proposed methods, schedule, and reporting regime for each component. To include the ambient air monitoring program and UAV schedule of works and flight plan for the site based UAV survey.
Auditor Endorsement	<i>Auditor review and endorsement of the plan</i>	<i>Notice condition 4</i>	URS accredited Environmental Auditor to review the final plan versus the requirements of the EPA notice and provide an endorsement of the plan to the EPA
RFI	<i>Desk-based Study: Source Identification and Analysis</i>	<i>Requirement 1</i>	Letter issued to MRM requesting information relating to the location, extent, and nature of existing and previous spontaneous combustion events at the mine site.
Technical Note	<i>Desk-based Study: Source Identification and Analysis</i>	<i>Requirement 1</i>	Documenting desk-based empirical analysis of spontaneous combustion source(s). Dependent on RFI response from MRM.
Study 'A' Technical Report	<i>Atmospheric Dispersion Modelling Study 'A'</i>	<i>Requirements 2 and 3</i>	Initial dispersion modelling study of SO ₂ and other pollutant emissions from NOEF, assessing potential impacts to identified sensitive off-site receptors, with concentration contours. This report will also include details of the desk-based source analysis study.
Environmental Audit Report 1	<i>UAV Survey & Atmospheric Dispersion Modelling Study 'B'</i>	<i>Requirements 1, 2, and 3</i>	Detailing site based UAV survey approach and data analysis of imagery, source characteristics, in-plume SO ₂ , ambient SO ₂ , and meteorological parameters captured by UAV. To include dispersion model validation for equivalent monitored period and subsequent update to <i>Study 'A'</i> dispersion model for source characteristics and meteorological variables.
	<i>Environmental Risk Assessment (if required)</i>	<i>Requirement 4</i>	Presenting the approach, analysis, and derived risk to human health at sensitive off-site receptors. Required if <i>Study 'B'</i> modelling results exceed assessment criteria.
Monthly Reports	<i>2015 Dry Season Ambient Air Monitoring Campaign</i>	<i>Requirements 2 and 6</i>	URS to review and validate the monitoring data on a monthly basis for inclusion in each monthly data report. Consisting of a letter report and a validated data set in excel format.
Environmental Audit Report 2*	<i>Atmospheric Dispersion Modelling Study 'C'</i>	<i>Requirements 2 and 3</i>	Following ambient monitoring of the 2015 dry season , <i>Study 'B'</i> model will be updated to include meteorological data from the assessed period. To include validation of model versus ambient air pollutant data for equivalent period.
	<i>Environmental Risk Assessment (if required)</i>	<i>Requirement 4</i>	Presenting the approach, analysis, and derived risk to human health at sensitive off-site receptors. Required if modelling and/or monitoring results exceed assessment criteria.

Deliverable	Work item	Relevance to Audit Program	Summary
Monthly Reports	<i>2015/16 Wet Season Ambient Air Monitoring Campaign</i>	<i>Requirements 2 and 6</i>	URS to review and validate the monitoring data on a monthly basis for inclusion in each monthly data report. Consisting of a letter report and a validated data set in excel format.
Environmental Audit Report 3*	<i>Atmospheric Dispersion Modelling Study 'D'</i>	<i>Requirements 2 and 3</i>	As for model <i>Study 'C'</i> ; updated to incorporate ambient monitoring data for 2015/16 wet season .
	<i>Environmental Risk Assessment (if required)</i>	<i>Requirement 4</i>	Presenting the approach, analysis, and derived risk to human health at sensitive off-site receptors. Required if modelling and/or monitoring results exceed assessment criteria.
HSE Plan	<i>UAV Site Based Survey and Ambient Air Monitoring Program</i>	<i>Mandatory Health, Safety and Environmental planning for all site based works</i>	The HSEP will be developed for both the UAV site based survey and the ambient air monitoring campaigns. The HSEP will be developed by the Project Manager and reviewed by a URS Regional Health and Safety Manager.
Technical Note	<i>Mitigation and Management Review</i>	<i>Requirement 5</i>	Documenting a review of best available techniques for preventing, mitigating, and managing spontaneous combustion sources at the NOEF. Recommendations to be included in the Environmental Audit Report(s), if required.

* Audit Reports No. 2 and No. 3 will incorporate the approach, results, and analyses of the ambient air monitoring regimes for both monitoring periods (2015 dry and 2015/16 wet seasons)

3.2 Consultation with the NT EPA

Condition 4 of the EPA notice to MRM states that "...the Plan must be developed by a suitably qualified expert in ambient air monitoring and atmospheric dispersion modelling...and endorsed by an approved auditor appointed to perform the audit program."

As part of the Environmental Audit Program, consultation is likely to be required between the EPA, the suitably qualified expert and the auditor, prior to undertaking the following tasks:

- installation of ambient air monitoring stations and additional stations to provide adequate spatial coverage for exposure and criteria assessment
- the ambient monitoring campaign for the 2015 dry season and 2015/16 wet season, with monitoring stations installed for an agreed term or terms
- where atmospheric dispersion modelling or actual monitoring results exceed the relevant criteria, undertake a risk assessment that is to be developed in consultation with the EPA.

URS will consult with the EPA, as required, as the suitably qualified expert in coordination with MRM. The extent of URS's involvement in the consultation process with the EPA is not known at this time so this has not been included in the cost estimate. We anticipate that the majority of consultation will be carried out by email and telephone. However, there will be an opportunity for face to face consultation with the EPA in Darwin during mobilisation for the UAV study.

As stated in **Section 2.1.1**, URS will provide an approved auditor to review and endorse the Plan.

4 HEALTH, SAFETY AND ENVIRONMENT

4.1 Safety Management Systems

URS is accredited to the AS/NZ 4801:2001 Safety Management System (SMS) and OHSAS 18001:2007 Standards. This certification demonstrates that URS is a leader in OH&S strategy, management and prevention; in the implementation of projects and day to day business operations. As part of this accreditation URS is frequently audited by an external body (Bureau Veritas) to ensure compliance with the standard.

URS's Safety Management System comprises 100 operating procedures which are regularly reviewed and updated by a team of Health & Safety Advisors who record and monitor the safety performance of each office, under the direction of the Australia New Zealand Regional Health and Safety.

4.2 Health, Safety and Environment Plan

It is a URS company requirement that a Health, Safety and Environmental Plan (HSEP) is completed for all projects that involve fieldwork. Central to the plans is a hazard analysis, a tool with which the project manager and field staff identify hazards associated with the project.

Hazards are identified and then a quantitative risk/hazard analysis is carried out. Appropriate control measures are identified from URS's Safety Management Standards and incorporated into the overall plan. The HSEP will contain the following information specific for the MRM project:

- Emergency Response Arrangements
- Communication Plans
- Travel Plans
- Site access, description and plans
- Scope of work
- Details project specific Job Safety and Environmental Analysis (JSEA)
 - One JSEA will be undertaken for the UAV site based survey
 - One JSEA will be undertaken for the ambient air monitoring program and updated for each subsequent site visit
- Project team for all the associated activities
- Permitting requirements
- Training Requirements
- Personal Protective Equipment
- Notification / consultation arrangements
- Records of Toolbox Talks, inductions, amendments / changes to work activities and re-evaluation of associated risks
- Incident Reporting.

The HSEP will be developed for both the UAV site based survey and the ambient air monitoring campaigns. The HSEP will be developed by the Project Manager and reviewed by a URS Regional Health and Safety Manager familiar with practical, social and political issues associated with working in Northern Territory.

The HSEP will be distributed to field staff working on the project. The Project Manager will then ensure that all requirements, including all risk control measures, of the plan are in place prior to commencement of work. The Project Manager will be assisted by a coordinator to assist with logistics, mobilisation and movements, health & safety, and equipment storage and shipping.

4.3 UAV Site Based Survey

The site based UAV survey team will comply directly with all CASA and Customer Safety regulations. The relevant regulations and guidelines available for mission planning and execution will be adhered to at each stage of the survey.

URS will work closely with Aerosonde to conduct comprehensive risk management for every flight. This involves identifying and assessing all hazards, developing controls and making decisions, implementing the controls, and supervising and evaluating the conduct of the flight mission and the effectiveness of the controls.

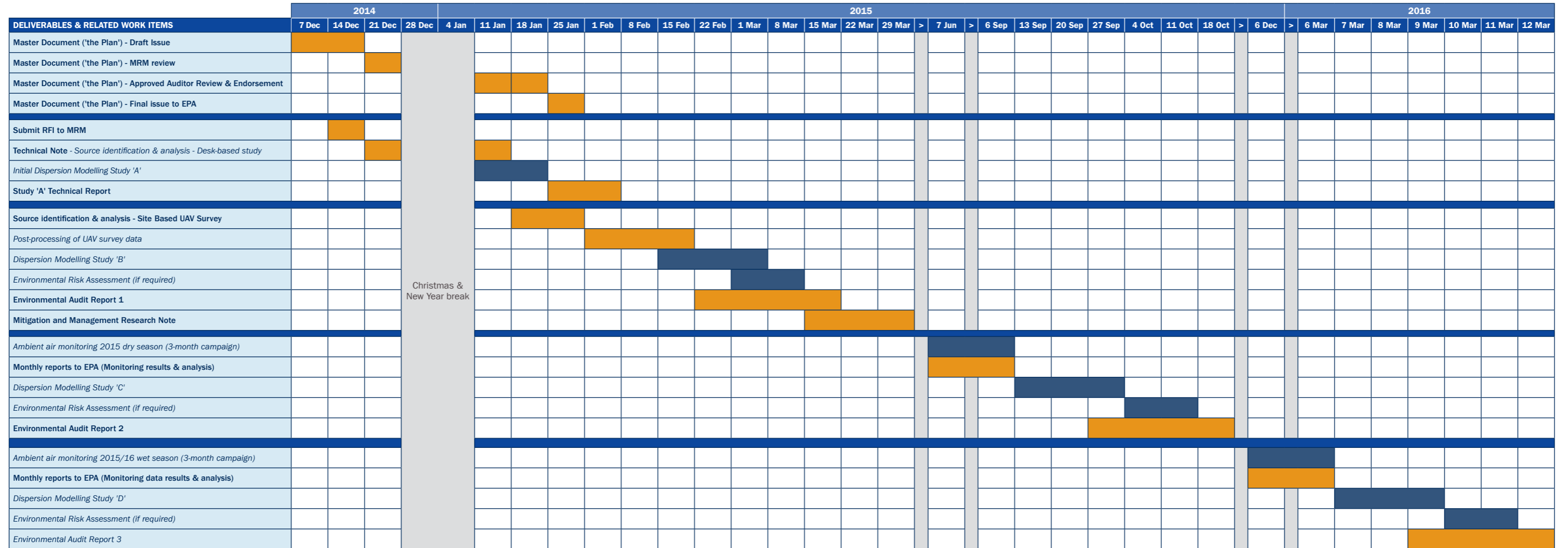
The focus of the survey is to collect high quality data to achieve the study objectives. Therefore, if the environment prohibits successful collection of imagery and data, URS and Aerosonde would convene and decide to proceed or delay launch until more suitable conditions are present.

5 PROPOSED SCHEDULE

5.1 Environmental Audit Program

The Environmental Audit Program schedule presented in Figure 5-1 is preliminary and based on the adjusted scope agreed with the EPA, as outlined in **Section 1.2.1**. The proposed schedule is dependent upon agreement with MRM and the necessary consultations with the EPA.

Figure 5-1 Proposed Environmental Audit Program Schedule



LEGEND
 Deliverable
 Work Item

6 ASSUMPTIONS AND LIMITATIONS

6.1 Site Based UAV Survey

For the survey team to complete the proposed scope of works relating to the site based survey, URS assumes that MRM will be able to fulfil the following requirements:

- Access to and use of the mine's airstrip
- Use of a site vehicle for the transport and launch of UAV aircraft
- Use of a storage and maintenance facility (e.g. small hanger) for the duration of the survey
- Use of office space for setting up temporary operations base for the duration of the survey
- Provision of shipping and travel expenses for the survey team and all equipment from Darwin to the mine site and vice versa
- Provision of site accommodation and meals for the survey team for the duration of the survey
- If necessary, assistance in securing an off-site location for the launch and operation of the UAV.

6.2 Ambient Air Monitoring Program

URS is aware that there are a number of practical and logistical limitations associated with the proposed monitoring program (**Section 2.9**) at the sites stipulated in the EPA Notice. URS has therefore based the scope and cost estimate on the following assumptions / limitations:

- A reliable 220 volt power supply will be provided by MRM at each monitoring location (either mains or generated).
- No allowance has been made for test and tag requirements for the powered supplies or any electrical equipment used on-site. Should MRM require electrical equipment to be tested and tagged, MRM will supply site based personnel to test and tag equipment to the site's requirements.
- It is assumed that a storage facility will be available at MRM for holding ambient monitoring equipment prior to our team's arrival.
- URS will arrange for shipping of the environmental enclosures to MRM but it will be MRM's responsibility to transport these to each of the monitoring locations (once defined) and connect to the 220 volt power supply.
- No allowance has been made for URS technician's accommodation or meals whilst at the mine site. MRM will pick-up URS staff from McArthur River airport and transport them to the monitoring locations and return them to the airport at the completion of the work. MRM will also be responsible for providing URS with mine accommodation and meals whilst URS staff is working on-site.
- It is assumed that a MRM staff member will be available to undertake monthly checks of the instrumentation. This is likely to take no more than 30 minutes at each site to

complete and URS will provide training to the staff member during installation of the equipment.

- URS has made an allowance (0.5 days per trip) in its ambient schedule for unplanned delays associated with adverse weather conditions that may restrict site works. However, should this allowance not be sufficient to cover delays outside URS's control, additional costs will be charged on a time and materials basis to MRM.
- URS has allowed for two site visits (commissioning and decommissioning), should additional visits be required due to unforeseen circumstances (such as equipment breakdown/fault), the costs associated with the visit will be negotiated with MRM and charged on a time and materials basis.
- MRM will be responsible for ensuring that the equipment is not damaged in any way. MRM will be liable for any damaged caused to the equipment that is not due to URS's actions. No allowance has been made to install security measures around the sites, should it be required.
- URS has allowed up to 4 hours for staff members to undertake a site induction. Should further time be required to complete site inductions the costs associated with this will be negotiated with MRM and charged on a time and materials basis.

Should any of the above be unattainable or MRM require further assistance than that proposed, URS would be happy to modify our scope and/or costs to reflect an alternate approach.

6.3 Atmospheric Dispersion Modelling

URS assumes that the spontaneous combustion source characteristics derived from the UAV site survey will be input to the dispersion model for each modelling Study ('B', 'C', and 'D'). Should there be a requirement to re-assess the extent, nature, and sources of SO₂ and other airborne pollutants from the NOEF, URS will provide MRM with an additional fee proposal.

7 PROJECT TEAM

The proposed URS project team to be tasked with undertaking the scope of works outlined in **Section 2** is provided below, summarising each team member's relevant experience and capabilities. Full CVs for URS personnel can be provided on request.

7.1 URS Project Team

Chris MacHunter (Principal in charge)

Chris MacHunter is a Principal Hydrogeologist with over 19 years of professional experience in the URS Darwin office. His experience as a Hydrogeologist comprises extensive groundwater exploration for mining or domestic supplies. He has also implemented geophysical surveys and interpreted the data to aid borehole site locations.

Chris is the manager of the URS Darwin Office and is involved in project management and project direction to EIS projects within the Northern Territory including the East Arm Wharf Environmental Impact Study and East Point Ocean Outfall Public Environmental Review for the Northern Territory Government.

Dr Chris Taylor (Project management)

Chris is a Senior Associate Environmental Scientist and URS air quality team leader for Brisbane. He specialises in air quality, dispersion modelling, greenhouse gas assessments and climate change. He has extensive experience in the assessment and modelling of air pollution impacts for a wide range of sectors, including mining, oil and gas, ports and industry across Asia Pacific, Middle East and Europe.

Recent projects include taking the role of technical lead for the air quality and greenhouse gas components of the MRM Phase 3 Expansion EIS, in addition to associated studies for MRM's power station and the Bing Bong Port facility. Chris has also provided Expert Witness services in relation to the climate change impact of Xstrata's Wandoan Coal Mine and is the project manager for BMA's Red Hill Mining Lease project. He was also responsible for leading technical negotiations with the Queensland Department for Environment and Heritage Protection on behalf of Caltex regarding changes to the environmental authority for the Lytton Refinery.

Damian Pawson (Atmospheric dispersion modelling)

Damian is a Senior Air Quality Scientist with over eight years' experience in atmospheric dispersion modelling, air pollution monitoring, greenhouse gas emissions assessment, and project management. He has extensive experience in the assessment and modelling of air pollution impacts across a wide range of projects. These include the management and delivery of technical air quality studies for major mine, industrial, transport and port infrastructure developments in Australia, the UK, Europe, and the Middle East.

Damian completed the dispersion modelling for the MRM proposed scrubber and concentrate shed, associated with the Phase 3 expansion. Damian also led an ambient air quality baseline survey and associated dispersion modelling study for Pacific Aluminium's bauxite mine and refinery located at Nhulunbuy, NT. Other relevant projects have included assessment of emissions relating to the mining, storage, and processing of mineral ores, coal, and gold at various sites within Queensland and Victoria.

Dr Dina Makarynska (Data management and processing)

Dina is an Associate Environmental Scientist with expertise in, air quality, climate change, hydrology, coastal and ocean studies. Dina has more than 20 years' experience and extensive skills in project management, theoretical and numerical modelling of physical processes in the atmosphere, surface waters, ocean and solid Earth, data processing, statistical and spatial data analysis and assimilation. Her research has featured in more than 40 scientific publications. Dina is also experienced with meteorological, hydrological and oceanographic data collection and has taken part in multiple field research and monitoring campaigns.

Dina completed the MRM Bing Bong Port dispersion modelling study relating to a metal dust emissions from a concentrate shed. She also provided data management and analysis relating to meteorological modelling for a Pacific Aluminium bauxite mine and refinery air quality study in Nhulunbuy, NT.

Dr Tony Jong (Source identification and analysis)

Tony is the URS Geochemistry Lead for Australia. He has a PhD in Environmental Chemistry with over 15 years' experience in environmental and geochemical investigations for resource, industrial and government projects in Australia and overseas. Tony's strength is his understanding and experience with applying geochemical principles to assess mechanisms regulating the processes in terrestrial and aquatic environments to better understand, predict and mitigate environmental impacts and minimise project risks. Tony has extensive experience in geochemical characterisation of mine materials (overburden, rejects, ore and tailings).

He was responsible for the Ensham Coal Mine and Costerfield Gold Mine waste rock geochemical characterisation programs, and the geochemistry component of the Red Hill Mining Lease Project EIS, New Lenton Project EIS and Dysart Coal EAR, and was involved in the geochemical investigations for the Alpha Coal and Kevin's Corner Coal Project EIS.

Róisín Smit (Environmental Risk Assessment)

Róisín Smit is a Senior Associate Environmental Scientist working in the environmental sector since 2001. She has worked for a number of key clients within a wide variety of sectors, including mining, industry, oil and gas, landfill, and chemical works.

Róisín's main technical field of work is as a human health risk assessor and has organised and delivered a number of commercial technical training courses in the field of quantitative risk assessment. She is experienced in exposure modelling, vapour migration modelling and the assessment of air emissions. Utilising this data and working with stakeholders, Róisín aims to deliver a risk based approach to sites which otherwise may require remediation. She has co-authored a number of the UK Environment Agency's Soil Guideline Value publications.

Russell Griffiths (UAV Imagery Processing and Analysis / GIS Specialist)

Russell has over seven years' experience as a Geographical Information System (GIS) Operator in the environmental consulting industry. Project experience includes GIS data creation, spatial analysis, drafting, and map preparation across the broader disciplines of geoscience, surface water, terrestrial and marine ecology.

7.1.1 URS Ambient Air Monitoring Team

Peter Stacey (Ambient Monitoring Project Manager)

Peter is an Associate Air Quality Scientist with over 10 years' experience and specialist knowledge in the measurement of ambient air pollution and industrial emissions. He has worked on some of the largest routine ambient monitoring networks in the New Zealand including those owned by ARC, MfE, and Ravensdown.

Peter has extensive experience in most fields of air quality measurement including the measurement of: particulate (TSP, PM₁₀ and PM_{2.5}), oxides of nitrogen (NO_x), carbon monoxide (CO), sulphur dioxide (SO₂), and all meteorological parameters.

Peter has developed ambient monitoring programmes for a number of clients with a complete understanding of the relevant instrument installation requirements and capabilities.

Andrew Curtis (Ambient Monitoring Project Director)

Andrew Curtis has over 25 years' engineering experience and has specialised in air pollution for over 15 years. He is one of New Zealand's leading air quality specialists, and a certified hearings commissioner. His extensive experience covers a wide range of private and local government clients across all aspects of air quality.

Andrew is the national air quality team leader for URS New Zealand, and acts as the final signatory on nearly all air quality deliverables for URS. His broad range of skills gives him a comprehensive grasp of air quality principles. This means that monitoring programme and reporting will be overseen, reviewed, and signed off by one the most experience air quality professional in Australasia, ensuring all compliance requirements are met and quality is delivered.

Donovan van Kekem (Lead Ambient Air Monitoring Specialist)

Donovan is an Associate Air Quality Scientist with 12 years' experience in New Zealand and Australia, particularly in air quality assessments. Donovan began his career as an ambient field technician primarily setting up, calibrating, servicing and troubleshooting faults at ambient monitoring stations for a wide range of airborne contaminants. The role also included reporting, QA/QC, and data validation of the results.

Donovan has project managed, designed and implemented a wide variety of ambient monitoring programmes in NZ, Australia and beyond for all of the major industry sectors. As such, he has utilised an extensive range of monitoring equipment from all of the major suppliers. This extensive knowledge of equipment means he understands all the options available to meeting the projects specific requirement.

Jeremy Hunt (Ambient Air Monitoring and Analysis)

Jeremy has over five years' experience in the air quality field, with expertise in environmental monitoring and analysis of data. Jeremy has been involved in many projects involving setting up, calibrating, and servicing ambient monitoring stations. This has also involved data capture, management, validation, interpretation and reporting of the monitoring results.

Relevant Ambient Air Monitoring Experience

URS's experienced ambient air quality monitoring team have worked on a wide range of monitoring programs similar to that required by MRM. These include two Xstrata Coal sites:

- *Rolleston Coal Mine Expansion* – EIS baseline air quality monitoring program. Donovan designed and installed a continuous PM₁₀ monitoring program encompassing both dry and wet seasons for the Rolleston coal mine expansion EIS.
- *Abbott Point Bulkcoal* – two consecutive years of PM₁₀ monitoring programs around the boundary of the coal port operations to assess APB's off-site emissions. These programs utilised a combination of particulate monitoring technologies to monitor PM₁₀ in discrete averages and continuous programs. Meteorological monitoring was conducted at a number of sites for this project.

7.2 Site Based UAV Survey Team

Aerosonde Pty Ltd (UAV Provider and Operator)

Founded in 1995, Aerosonde Pty Ltd designs, manufactures and services a range of UAVs of the same name. Based in Melbourne, Australia, the company's employees are experienced in all facets of unmanned aviation — providing a single resource for customers seeking either systems or operational services.

Aerosonde's skilled aircraft operators have more than 12 years of experience conducting flight operations, accumulating more than 6,000 flight hours on behalf of their customers. Aerosonde and its aircraft operators have received airworthiness certification by CASA, the first certification program of its kind in the world.

Aerosonde is a strategic business of AAI Corporation, an operating unit of Textron Systems, a Textron Inc. company. For further information on Aerosonde, visit <http://www.aerosonde.com> or contact URS.

Aerosonde will deploy two UAV operators to McArthur River Mine for the duration of the site based survey. This will enable one operator to pilot the UAV and a second to monitor data capture as it is received from the aircraft.

7.3 Approved Auditing Team

Ken Mival (Environmental Auditor)

Ken Mival is an Engineering Geologist with over 44 years' experience in the fields of engineering geology, geotechnical and environmental engineering, and has worked on major projects in these fields in Australia, Central and Southern Africa, United Kingdom, New Zealand, Singapore and Papua New Guinea.

In the last twenty years he has been primarily involved in environmental assessments and audits, and the management of contaminated land.

Ken was accredited by the EPAV as an Environmental Auditor (Contaminated Land) in 1993. He has undertaken environmental assessments, health risk assessments, contaminated land management, statutory and due diligence audits for many large and small projects. These

include statutory environmental audits for several of the Melbourne Docklands Development Precincts including a \$60m remediation of the West Melbourne Gasworks; Victoria Harbour; Yarra's Edge; the Western Link of Melbourne City Link Elevated Freeway; a number of explosives and chemical sites; several landfill sites; and other major due diligence audits for the Commonwealth, and multinationals.

Joe Duran (Environmental Auditor)

Joe has over twenty seven years' experience working as a hydrogeologist with over twenty five years as a consultant in the waste and contaminated land industries in Australia and the USA. During this time Joe has gained particular experience in regulatory agency negotiation, project planning/strategy development and co-ordination of large multidisciplinary site investigations.

Joe was appointed as an Environmental Auditor pursuant to Section 53S(1) of the Environment Protection Act 1970, in the category of Contaminated Land. He has completed statutory environmental audits for a number of projects, including an audit for former industrial land in Yarraville, Victoria that is being redeveloped for medium and high density residential use; redevelopment of the former Age Buildings on Spencer Street, Melbourne to a high density residential tower; and, an audit to assess potential vapour intrusion to residential properties adjacent to the former Islington Railyards, Adelaide.

John Conway (Air Quality Specialist Audit Support)

John has more than 21 years' experience in air quality, with more than 18 years in consultancy gained in Australia, the UK and Ireland. Key areas of expertise include air dispersion modelling, odour monitoring / modelling, ambient air quality studies, occupational hygiene assessments, indoor air quality surveys and air quality management (management plans, works approvals, auditing) in a range of industry sectors including mining, power, oil & gas, water, waste, transport and industrial.

Specifically, John has undertaken a range of auditing roles including an independent audit of dust monitoring locations (site visit), equipment and the Air Quality Management Plan for the Xstrata Ravensworth Operations coal mine in the Hunter Valley, NSW; compliance audit (desk-based) of the Bulga Coal mine in the Hunter Valley, NSW; a verification audit of the long-term dust monitoring program (site visit) during the construction works of the Port Botany Expansion project in Sydney, NSW and an audit (desk-based) of the Alcoa meteorological station at Bancell Road, WA to assess compliance against licence conditions.

8 FEE PROPOSAL

8.1 Environmental Audit Program

A breakdown of the fee estimate for undertaking the scope of works, as specified in **Section 2**, and providing the deliverables outlined in **Section 3**, is provided in Table 8-1.

This fee estimate is provided on a Time and Materials basis as per the URS personnel rates stated in Table 8-2. Subcontractor costs and URS expenses will be charged at cost plus a 5% handling fee.

Table 8-1 Fee proposal breakdown

URS work item	Summary of tasks included	Fee (exc. GST)
Environmental Audit Program Plan (the plan)	Draft <i>the plan</i> to satisfy all audit program requirements. Teleconference with MRM to discuss the Plan before submission of draft <i>plan</i> . Incorporate review comments and issue final <i>plan</i> .	\$22,178
Audit and endorsement of the plan	Final <i>plan</i> to be reviewed by approved auditor and endorsement produced for issue to the EPA	\$7,755
Desk-based source identification and analysis	Issue RFI to MRM. Desk-based study to calculate spontaneous combustion source characteristics. Produce technical note.	\$5,535
Initial atmospheric dispersion modelling Study 'A'	Meteorological and atmospheric dispersion modelling and post-processing of airborne pollutant emissions from spontaneous combustion. Include model output analysis versus criteria and produce mapped contour plots.	\$7,837
Study 'A' Technical Report	Draft technical report detailing <i>Study 'A'</i> methods, results, and desk-based analysis of source identification, initial dispersion modelling. Teleconference with MRM to discuss and finalise before submission of final report.	\$6,553
Site based UAV survey (URS and Aerosonde Pty Ltd)	Aerosonde Pty Ltd costs include: <ul style="list-style-type: none"> - CASA approvals - Payload integration of met sensor, SO₂ sensor, EO-IR camera, digital survey camera - Purchase of SO₂ sensor - 8 days on site for field crew - 30 flight hours to cover proposed schedule - Ground testing of all equipment before travel - Mobilising field crew and equipment return travel from Melbourne to Darwin 	\$114,681
	URS onsite supervision for duration of UAV survey	\$15,886

URS work item	Summary of tasks included	Fee (exc. GST)
	URS post-survey data processing and analysis	\$24,623
	URS travel expenses from Brisbane to Darwin	\$1,050
Atmospheric dispersion modelling Study 'B'	Including UAV monitored source data, derivation of emission rates, meteorological data and SO ₂ concentrations to enable model validation. Update Study 'A' model input parameters, model output analysis versus criteria and produce mapped contour plots.	\$17,859
Environmental Audit Report 1	Draft audit report detailing UAV survey approach and outcomes, Study 'B' methods, results, and analysis of dispersion modelling, and environmental risk assessment (<i>if required</i>). Report to include mitigation and management recommendations. Teleconference with MRM to discuss and finalise before submission of final audit report.	\$18,544
Ambient Air Monitoring Program 2015 dry season & 2015/16 wet season	Capital purchase and shipping of monitoring equipment: <ul style="list-style-type: none"> - 3 x monitoring enclosures - 3 x PM₁₀ BAMs - 3 x SO₂ analysers - 3 x gas calibrators - 3 x gas calibration bottles - 3 x meteorological stations 	\$240,500
	Installation of three ambient monitoring stations, to monitor SO ₂ , PM ₁₀ , and meteorological parameters.	\$36,900
	Daily checks, QA/QC and reporting for the combined six month monitoring period (three months in 2015 dry season and three months in 2015/16 wet season)	\$9,400
	Audit / calibration and decommissioning of monitoring stations at the completion of the study	\$14,300
Atmospheric dispersion modelling Study 'C'	Including monitored meteorological data for the 2015 dry season monitoring campaign. Include model output analysis versus criteria, validation versus air pollutant monitored data, and produce mapped contour plots.	\$16,144
Environmental Audit Report 2	As for Report 1, but with 2015 dry season monitoring analysis and model Study 'C', including validation of model versus ambient air monitoring data.	\$11,462

URS work item	Summary of tasks included	Fee (exc. GST)
Atmospheric dispersion modelling Study 'D'	Including monitored meteorological data for the 2015/16 wet season monitoring campaign. Include model output analysis versus criteria, validation versus air pollutant monitored data, and produce mapped contour plots.	\$16,144
Environmental Audit Report 3	As for Report 2, but based on <i>Study 'D'</i> and including validation of model versus ambient air monitoring campaign data for 2015/16 wet season.	\$9,941
Mitigation and management review	Research and review of best available techniques for preventing, mitigating, and managing spontaneous combustion. Produce a technical note of findings for issue to MRM.	\$5,957
Health, Safety & Environmental Plan	Production of HSEP to include the site based UAV survey and ambient monitoring campaigns. This will include a HAZID workshop and review by URS Regional Health and Safety Manager.	\$13,240
Project management	Project kick off meeting to confirm the proposed scope and schedule of works. Document and financial control, including internal technical review and sign-off. Liaison with MRM for duration of project.	\$29,786
Additional expenses	Meteorological data purchased from BoM	\$420
TOTAL (exc. GST)		\$646,695

Table 8-2 URS personnel hourly rate

URS personnel	URS Role level (<i>Project role</i>)	Hourly rate (exc. GST)
Chris MacHunter	Principal Hydrogeologist <i>(Principal in charge)</i>	\$228
Dr Chris Taylor	Senior Associate <i>(Project manager and technical review)</i>	\$199
Damian Pawson	Senior Air Quality Scientist <i>(Dispersion modelling and technical reporting)</i>	\$152
Dr Tony Jong	Principal Geochemist <i>(Source identification and analysis)</i>	\$215
Dr Dina Makarynska	Associate Air Quality Scientist <i>(Data management and processing)</i>	\$165
Róisín Smit	Senior Associate Environmental Scientist <i>(Environmental risk assessment)</i>	\$161
Monique Hards	GIS / Mapping Technician <i>(Contour mapping and drafting)</i>	\$114
Jennifer Pittorino	Group Administrator <i>(Report formatting and document control)</i>	\$106
URS Ambient Air Monitoring Team		
Peter Stacey	Associate Air Quality Scientist <i>(Ambient Monitoring Project Manager)</i>	\$140
Andrew Curtis	Air Quality Team Leader, URS NZ <i>(Ambient Monitoring Project Director)</i>	\$200
Donovan van Kekem	Associate Air Quality Scientist <i>(Ambient Monitoring Lead Air Quality Scientist)</i>	\$170
Jeremy Hunt	Air Quality Scientist <i>(Ambient Monitoring Air Quality Scientist)</i>	\$130
URS Approved Auditing Team		
Ken Mival	Senior Principal <i>(Environmental Auditor)</i>	\$330
Joe Duran	Senior Principal <i>(Environmental Auditor)</i>	\$330
John Conway	Senior Associate Air Quality Scientist <i>(Air Quality Specialist Audit Support)</i>	\$228

8.1.1 Consultation with the NT EPA

The extent of URS's involvement in the consultation process with the EPA is not known at this time. As such, a fee estimate has not been provided for any consultation meetings. These would be carried out on a time and expenses basis as described above.

We anticipate that the majority of consultation will be carried out by email and telephone. However, there will be an opportunity for face to face consultation with the EPA in Darwin during mobilisation for the UAV study.

8.2 Terms and Conditions

To expedite the award of the contract, URS proposes to use the terms and conditions of the Glencore Coal MSA dated 1 April 2014 as a basis of negotiation for a new contract.

For your convenience, a copy of this MSA is included as **Appendix C**. Please note amendments may be required to cover the nature of the services to be provided and that finalisation of the contract is conditional to URS Corporate approval.



APPENDIX A EPA NOTICE ISSUED TO MRM (8 OCTOBER 2014)

NOTICE TO CARRY OUT ENVIRONMENTAL AUDIT PROGRAM

Issued pursuant to section 48 of the *Waste Management and Pollution Control Act*

Issued to: McArthur River Mining Pty. Ltd.
ACN 008 167 815
34A Bishop Street
STUART PARK NT 0820

Relating to the Premises at: McArthur River Mine,
Carpentaria Highway,
Borroloola,
Northern Territory.

TAKE NOTICE THAT I, William John Freeland, Chairperson and authorised delegate of the Northern Territory Environment Protection Authority (NT EPA) for the purposes of section 48 of the *Waste Management and Pollution Control Act* (the Act), have reason to believe that:

1. McArthur River Mining Pty Ltd (MRM), are the mine operators of McArthur River Mine on Mineral Leases MLN 1121, MLN1122, MLN 1123, MLN 1124, MLN1125 and MLN 582 (the premises);
2. The NT EPA has received pollution reports of potential off-site environmental impacts related to fumes, odours and smoke emanating from the waste rock dump within the premises known as the North Overburden Emplacement Facility (NOEF) from:
 - (a) members of the public on the Carpentaria Highway;
 - (b) residential properties to the North West, North and North East of the premises including the town of Borroloola;
 - (c) the Department of Mines and Energy; and
 - (d) NT Worksafe.
3. Authorised officers of the NT EPA inspected the premises on 8 and 9 July 2014 and:
 - (a) observed, on the morning of the 8 July 2014, a significant smoke like plume from the top section of the waste rock dump/NOEF towards the North West;
 - (b) observed grey smoke like discharges from numerous points along the top of the North West and South East faces of the waste rock dump/NOEF on 8 and 9 July 2014;
 - (c) observed heavy earthmoving machinery working on the waste rock dump/NOEF at and near the sources of smoke like discharges on 8 and 9 July 2014; and

- (d) detected strong odours at several points within the premises and along the Carpentaria highway.
4. MRM have provided sulfur dioxide monitoring data to the NT EPA which indicates sulfur dioxide levels recorded at several locations outside of the premises may be exceeding National Environment Protection Measure (NEPM) standards.
5. Notwithstanding section 6 of the Waste Management and Pollution Control Act, the Act applies to contaminants or waste namely, sulfur dioxide airborne pollutants from the premises that have been detected beyond the premises' boundary.

AND I HEREBY REQUIRE, for the reasons specified above and pursuant to section 48 of the Act, McArthur River Mining Pty Ltd to conduct the environmental audit program specified below:

Environmental Audit Program

1. To determine the extent, nature and sources of sulfur dioxide and other airborne pollutants generated from the waste rock dump/NOEF area within the premises;
2. To undertake an ambient air monitoring and atmospheric dispersion modelling program to determine whether sensitive receptors are being impacted by sulfur dioxide emissions emanating from the premises;
3. To undertake a quantitative and qualitative evaluation and assessment of the emissions of sulfur dioxide and other airborne pollutants beyond the boundary of the premises as a result of air emissions from the waste rock dump/NOEF;
4. To conduct an environmental risk assessment should it be determined that sulfur dioxide emissions and other airborne pollutants from the premises are impacting on sensitive receptors;
5. To identify proposed approaches to address and remediate sources of sulfur dioxide emissions and other airborne pollutants should it be determined that the premises are a source of emissions of sulfur dioxide and other airborne pollutants; and
6. To develop and implement a reporting regime for ambient air monitoring and atmospheric dispersion modelling to the NT EPA and for the communities that may have an interest in the reporting.

Notice Conditions

The Plan

1. MRM must develop a detailed plan (the Plan) to address the requirements of the environmental audit program;
2. All requirements of the environmental audit program included in the Plan must be completed by 30 September 2015;
3. The Plan must contain time frames for two ambient monitoring campaigns which is to include the 2014/15 Wet season and the 2015 Dry season;
4. The Plan must be developed by a suitably qualified expert in ambient air monitoring and atmospheric dispersion modelling;
5. The Plan must be endorsed by an approved auditor appointed to perform the environmental audit program;

6. The Plan must include but not be limited to the provision of specific details of methodologies for:
- (a) determining the nature, concentrations and rates of air emissions from the waste rock Dump/NOEF;
 - (b) atmospheric dispersion modelling of emissions from the waste rock dump/NOEF;
 - (c) ambient air monitoring campaign of sulfur dioxide at locations beyond the boundary of the premises;
 - (d) ambient air monitoring of any other airborne pollutants of concern following an assessment of the waste rock dump/NOEF;
 - (e) details of the locations of the sites chosen for ambient air monitoring of sulfur dioxide and any other airborne pollutants;
 - (f) incorporation of meteorological monitoring requirements as part of the agreed ambient air monitoring station locations;
 - (g) the form of reporting and communicating the results of the ambient monitoring and atmospheric dispersion modelling on a regular basis to the NT EPA and the community that must include an investigation of making available on line real time ambient air monitoring data on the MRM web site;
 - (h) reporting and investigating exceedances of sulfur dioxide ground level criteria at any of the ambient monitoring station locations; and
 - (i) undertaking an environmental risk assessment and providing recommendations for actions to address the source(s) of off- site sulfur dioxide emissions.

Ambient air monitoring

7. The Plan's methodologies must be developed to include but not be limited to the following specific ambient air monitoring requirements:

Priority installation requirements

- (a) in consultation with the NT EPA, the priority installation of two ambient air monitoring stations one of which is to be located at Devils Springs outstation and one at Borroloola Township which are to commence monitoring for sulfur dioxide as soon as possible;
- (b) a reporting and follow up investigation regime for the two ambient air monitoring stations mentioned in 7(a) above which will inform the NT EPA on a daily basis whenever levels of sulfur dioxide monitored at the two ambient monitoring stations exceed the 10th percentile of any of the National Environment Protection Measure (NEPM) standards;

Additional requirements

- (c) additional and sufficient number of ambient air monitoring stations to provide adequate spatial coverage for exposure and criteria assessment to be agreed in consultation with the NT EPA, the suitably qualified expert and the auditor;

- (d) in consultation with the NT EPA, the suitably qualified expert and the auditor agree to an ambient air monitoring campaign for the 2014-15 Wet season and 2015 Dry season;
- (e) all ambient air monitoring stations must be installed for a term or terms that are agreed upon in consultation with the NT EPA, the suitably qualified expert and the auditor;
- (f) all ambient air monitoring stations are to be compliant with AS3580.4.1-1990 and AS2922 and operated, calibrated and maintained in accordance with approved quality assurance procedures so as to provide reliable data;
- (g) siting for the meteorological sensors for the facilitation of atmospheric air dispersion modelling must be in compliance with AS2923 and USEPA (2000) EPA454/R-99-005;
- (h) continuous meteorological measurements are to be taken at all ambient air monitoring stations to facilitate atmospheric dispersion modelling validation requirements;
- (i) continuous meteorological measurements at all ambient air monitoring stations must include but not be limited to :
 - i. wind speed;
 - ii. wind direction; and
 - iii. air temperature.

Atmospheric dispersion modelling

8. All atmospheric modelling, assessment and reporting must be in accordance with the New South Wales document titled: *Approved methods for the Modelling and Assessment of Air Pollutants in New South Wales, DEC 2005* and must include but not limited to the following:
- (a) atmospheric dispersion modelling using an atmospheric dispersion model such as the CSIRO TAPM Version 4 or similar to model the air emissions from the premises and include detailed air quality input assessment of air emissions from the premises;
 - (b) specifically, airborne pollutant emissions from the waste rock dump/NOEF are to be assessed and initial atmospheric dispersion modelling be undertaken within 28 days of this notice;
 - (c) the results of the modelling referred to in 8(b) above are to be made available in the form of a report to the NT EPA within 14 days of the modelling being finalised;
 - (d) in addition to 8(b) above provision of a minimum of two additional air dispersion model runs during the operation of the ambient air monitoring stations which must align with the agreed campaigns referred to in 7(d);
 - (e) ongoing validation of the atmospheric dispersion model is to be conducted during the operation of the ambient air monitoring stations; and
 - (f) the results of the additional atmospheric dispersion modelling are to be included in a report to be made available to the NT EPA within 14 days of the modelling being finalised;

Reports

9. The reports mentioned in 8(c) and 8(f) above must assess any exceedances of ground level criteria and compare the maximum 1 hour and 24 hour levels recorded at each ambient air monitoring location with relevant ground level criteria and make an assessment as to the relative contribution of the premises to those maximum ground level concentrations;
10. The reports mentioned in 8(c) and 8(f) above must also include the modelling and mapped contours of the ground level concentrations for sulfur dioxide and a comparison of the concentrations to the relevant air quality criteria;
11. The Plan which incorporates requirements 6 to 8 above must be submitted within 28 days from the date of this notice accompanied with the suitably qualified expert's and auditor's written endorsements;
12. MRM can commence conducting the program of works described in requirements 6 to 8 above provided any works is consistent with the Plan;
13. Any proposed amendments to the Plan must be submitted to, and approved by the NT EPA prior to the amendment being implemented, noting that the NT EPA may require MRM to revise, amend and or resubmit the proposed amendment or the Plan;

Web site

14. Results or reports of the atmospheric dispersion model, meteorological and air quality data submitted to the NT EPA as part of requirements 7 to 10 must be fully reported on the MRM publically accessible website within 5 business days after being submitted to the NT EPA;

Environmental Audit Report

15. The results of the program of works detailed in the Plan must be submitted to the NT EPA within 28 days of the conclusion of each campaign in the form of an Environmental Audit Report ("the Report").

The Report must include but not be limited to:

- (a) summary coverage of the instrumentation, sampling and analysis methodology, compliance with siting requirements, instrument standards, data handling procedures and quality assurance used for ambient air monitoring;
- (b) all ambient monitoring results to be in graphical time series form expressed as 3 minutes, 1 hour and 1 day averages;
- (c) a table providing statistical analyses of all ambient air monitoring results for each of the above averaging times;
- (d) each table must provide at least the following parameters: the number of exceedances of the relevant standards, the maximum, 99.9th percentile, 99th percentile, 90th percentile, median, mean, percentage data recovery for each day, and minimum measured levels;
- (e) assess any exceedances of ground level criteria and compare the maximum 1 hour and 24 hour levels recorded at each monitoring location with relevant ground level criteria and make an assessment as to the level of contribution of the premises to the maximum ground level concentrations;
- (f) an evaluation, discussion, comparison with criteria and other Australian sites and quality assessment of the ambient sulfur dioxide monitoring data;

- (g) a summary and discussion of the atmospheric air dispersion modelling undertaken;
- (h) where atmospheric dispersion modelling or actual monitoring results exceed the relevant criteria undertake a risk assessment that is to be developed in consultation with the NT EPA;
- (i) in conducting the risk assessment identify environmental risks, as a result of sulfur dioxide or other airborne pollutants being emitted from the premises;
- (j) identify and present all of the details of the environmental risk assessment that will be conducted for potential off site receptors and follow accepted environmental health risk assessment principles and guidelines and include hazard identification and dose response, exposure assessment and risk characterisation, and likely sensitive receptor health assessment;
- (k) where it is determined that levels indicate potential environmental risks, include conclusions and recommendations to prevent, rectify, rehabilitate or minimise potential environmental harm; and
- (l) any other actions that are planned at the premises so that there are no exceedances of the relevant criteria of sulfur dioxide or other airborne pollutants at the offsite receptors;

16. The Environmental Audit Report produced under requirement 15 must be made available on the MRM publically accessible website within 10 business days after being submitted to the NT EPA;

Submissions

17. All submissions to the NT EPA required by this notice are to be provided in both electronic and hard copy form, all other submissions required are to be provided in electronic form only to the following address:

Northern Territory Environment Protection Authority
Street address: Darwin Plaza Level 2, 41 Smith Street Mall, Darwin NT 0800.
Postal address: GPO Box 3675, Darwin NT 0801
Email: Pollution@nt.gov.au

END OF CONDITIONS


William John Freeland

28 / 10 / 14
Date

**Chairperson of the NT EPA
Delegate of the Northern Territory Environment Protection Authority**

Important Notice

1. Failure to comply with a notice to conduct an environmental audit is an offence under section

51(1) of the Act and may incur significant penalties and/or other statutory action.

2. You will not be taken to have submitted the results of the environmental audit program required by this Notice until the requirements of section 51(2) of the Act have been satisfied.
3. Additional offences specific to the conduct of an environmental audit are established under section 52 of the Act.
4. Pursuant to section 67 of the Act, a person must not perform an environmental audit for the purposes of an environmental audit program unless the person is registered in a register established under section 68 of the Act or is specifically exempted from that requirement by Regulation. A current register of qualified persons is available from:
http://www.ntepa.nt.gov.au/waste-pollution/compliance/audits/qualified_persons or by contacting the NT EPA on telephone (08) 8924 4218.
5. The NT EPA is as defined in the Act or it's authorised Delegate.
6. This notice takes effect on the date on which it is served upon you.

APPENDIX B PROPOSED AMBIENT AIR MONITORING METHODOLOGY

B.1 Methodology, Equipment and Logistics

URS will arrange for three air quality shelters to be transported to the McArthur River Mine and liaise with MRM staff onsite to place the shelters at each of the three monitoring locations (Devils Springs outstation, the Borroloola Township and one other). URS will also ship all of the monitoring equipment directly to MRM. Once the shelters have been connected to a local (or generated) power supply of 220 volts, two URS staff members will travel to each of the monitoring locations and install and calibrate the monitoring equipment. The equipment that will be installed at each of the sites will consist of the following (or similar):

- A Teledyne T100 UV fluorescence SO₂ analyser
- A Thermo FH62-C14 PM₁₀ Beta Attenuation Monitor (BAM)
- A Teledyne T702 UV Precision Calibrator
- A TAPI 701 Zero Air Source
- A SO₂ Reference Standard Calibration Gas
- A Harvest Electronics Industrial Telemetry Unit
- A 10 m Telescopic Mast
- A Vaisala WMT52 Ultrasonic Anemometer
- A Temperature/RH/Pressure Module
- A Rain Gauge - Davis 0.2mm
- Solar Radiation - Davis 6450
- A compact air conditioned environmental enclosure.

It is URS' understanding that it is MRM's preference to own the above required monitoring equipment. URS have costed in the facilitation of purchasing and shipping the equipment to MRM for installation on the project and will on-bill the cost of the equipment to MRM. MRM will be responsible for insuring the equipment once purchased.

B.2 Monitoring Stations

Monitoring will be undertaken in accordance with the following standards:

- AS/NZ 3580.1.1:2007 Australian New Zealand Standard Methods for sampling and analysis of ambient air - Part 1.1: Guide to siting air monitoring equipment
- AS/NZ 3580.9.11:2008 Methods for sampling and analysis of ambient air- Method 9.11: Determination of suspended particulate matter-PM10 beta attenuation
- AS 3580.14:2011 Australian Standard Methods for sampling and analysis of ambient air – Part 14: Meteorological monitoring for ambient air quality monitoring applications
- AS/NZ 3580.2.2:2009 Methods for sampling and analysis of ambient air – Method 2.2: Preparation of reference test atmospheres-Compressed gas method
- AS 3580.4.1-2008 Methods for sampling and analysis of ambient air – Method 4.1: Determination of sulphur dioxide-Direct reading instrumental method

- Siting according to USEPA EPA454/R-99-005.

URS propose to install compact ambient air quality shelters and 10 m meteorological masts at three locations around MRM similar to that pictured in Figure B-1.

Figure B1 Compact Ambient Air Quality Monitoring Station



URS intend that the shelters will be of a sufficient size to enable additional monitoring equipment at these locations should additional parameters need to be monitored in the future (i.e. continuous PM₁₀, etc).

B.2.1 SO₂ Monitoring

URS propose to use Teledyne T100 UV fluorescence SO₂ analysers to continuously monitor the ambient SO₂ concentrations at each of the proposed monitoring sites. The Model T100 uses the proven UV fluorescence principle, coupled with a state of the art user interface to provide easy, accurate, and dependable measurements of low level SO₂. Exceptional stability is achieved with the use of an optical shutter to compensate for PMT drift and a reference detector to correct for changes in UV lamp intensity. A hydrocarbon 'kicker' and advanced optical design combine to prevent inaccuracies due to interferents.

Figure B2 Teledyne T100 UV fluorescence SO₂ analyser



To ensure compliance with the AS/NZ standard URS also propose to install an auto calibration system to enable automated daily audits and monthly manual calibrations of the analysers. This system will consist of a zero air generator, alpha standard calibration gas and a Teledyne T702 Precision Calibrator. The Model 702 Precision Calibrator provides an ideal means of calibrating ambient air analysers in an economical, high-value manner. A microprocessor controls all functions including temperature control of the restrictor/ orifice flow regulators, flow control system and ozone generator, ensuring accurate temperature-independent performance.

Figure B3 Teledyne T702 UV Precision Calibrator



All automatic calibration results will be reviewed during URS's proposed daily checks for compliance with the data quality criteria and initiate a recalibration should the instrumentation drift out of compliance.

B.2.2 Particulate Monitoring

URS propose to install a Thermo FH62-C14 PM₁₀ BAM at each of the proposed monitoring locations to measure the concentration of particulates at each of the monitoring locations. The Thermo BAM can be fitted with a range of monitoring inlets should other size fractions such as PM_{2.5} or TSP need to be monitored. The Thermo Scientific Continuous Ambient Particulate Monitor measures particulate mass concentrations, and consists of a C14 source and detector in a compact 19-inch rack-mountable enclosure. The FH62C14 automatically advances the filter tape based upon a user-defined frequency or particulate loading and is designed to meet U.S. and International Particulate Monitoring Regulations. Figure B4 shows a BAM similar to that proposed for this project.

Figure B4 Thermo FH62-C14 PM₁₀ BAM



B.2.3 Meteorological Monitoring

URS propose to install an automatic weather station at each of the proposed monitoring locations to enable comparison of measured pollutant concentrations with the meteorological conditions at the time of collection. URS propose to measure the parameters listed in Section 2.9.1 with meteorological sensors similar to that presented in Figure B5.

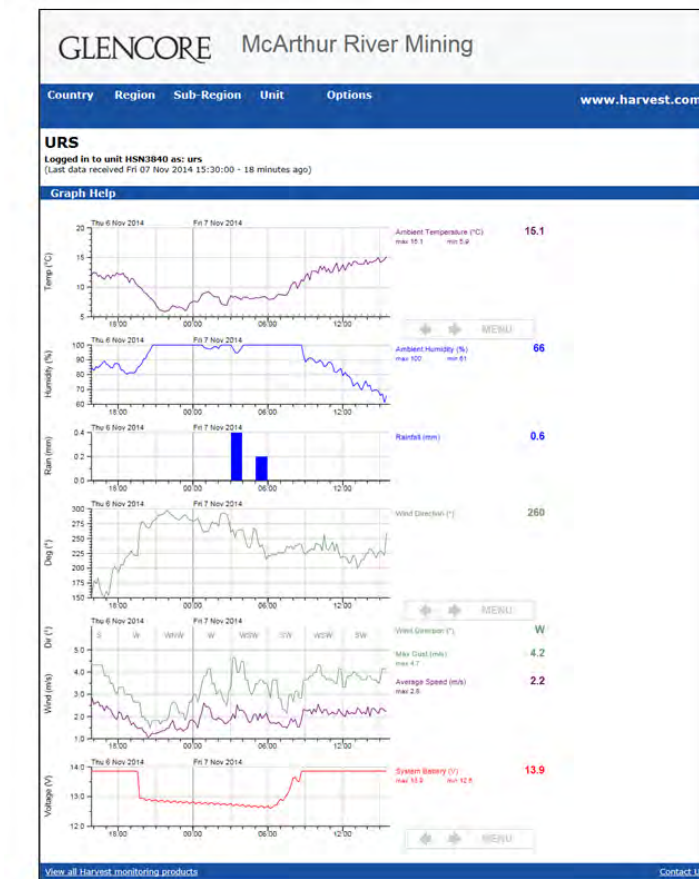
Figure B5 Weather Station and WMT52 Ultrasonic wind sensor



B.2.4 Industrial Telemetry System

A Harvest Industrial telemetry unit (ITU) will be used to collect data from the equipment at each station. Collected data will be stored on a secure server and displayed on a dedicated password protected website. The ITU will also send alerts to nominated personnel via SMS/email messages should SO₂ concentrations exceed defined limits. Figure B6 shows an example of how the data will displayed on the website. The data on this web site can be visualised a variety of time series and downloaded in user defined periods into CSV format.

Figure B6 Weather Station and WMT52 Ultrasonic wind sensor



B.3 Quality

The ambient air quality monitoring program will be supported by URS's accredited quality management systems. These quality management systems provide confidence that quality will be achieved for the life of the monitoring project. Quality is a continued expectation within URS culture.

Our Quality Management System (QMS) has been developed in accordance with the ISO 9001:2008 Quality Management System standard. This ensures that accurate, timely information and communication is maintained amongst URS staff and clients, as well as the quality of work. The QMS is certified to ISO 9001:2008 by Bureau Veritas and has been governing the development of our processes since 1995.

The following quality procedures and principles are applied to all URS projects:

- complying with statutory obligations, standards, specifications and codes of practice
- gaining the knowledge and skills to perform through training, mentoring, and self-study
- communicating with others to solve problems quickly, improve efficiency and improve team performance through effective communication and keeping commitments
- reviewing all work for accuracy and completeness to assist in identifying, reporting, investigating and resolving all non-conformances and taking action to prevent recurrence
- following established procedures, including document management processes
- improving continually to reduce process time, decrease cost, and improve quality
- sharing best practices and lessons learned to prevent problems and improve processes.

MRM can be assured that the monitoring program will be conducted to the highest standards by URS's competent and experienced professional project team, ensuring consistent, high quality data and reporting is provided to MRM.

All monitoring reports issued to MRM over the course of the project will undergo a peer review process. This will ensure the ongoing accuracy, consistency and quality of all deliverables in line with the URS and MRM quality management systems.

In addition, URS have the following certifications, and this project will be managed and audited in accordance with these:

- Occupational Health & Safety Certificate URS AUS & NZ: BSO-OHSAS 18001:2007
- Quality Certificate URS AUS & NZ: AS/NZS ISO 9001:2008
- Environment Certificate URS AUS & NZ: AS/NZS ISO 14001:2004
- Health & Safety Certificate URS AUS & NZ: AS/NZS 4801:2001
- Accident Compensation Corporation (ACC) Certificate.



APPENDIX C GLENCORE COAL MSA DATED 1 APRIL 2014

GLENCORE

Umbrella Agreement - Consultancy Services

Dated: 1st April 2014

Glencore Coal Pty Ltd ("Principal")
URS Australia Pty Ltd ("Consultant")

Umbrella Agreement - Consultancy Services

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Details

Parties	Principal and Consultant	
Principal	Name	Glencore Coal Pty Ltd
	ABN	18 082 271 930
	Address	Level 38, Gateway 1 Macquarie Place Sydney NSW 2000 AUSTRALIA
	Email	Tony.Egan@Glencore.com.au
	Attention	Tony Egan
	Copy	Legal Counsel
Consultant	Name	URS Australia Pty Ltd
	ABN	46 000 691 690
	Address	Level 4, 407 Pacific Highway Artarmon NSW 2064 AUSTRALIA
	Email	Saul.Martinez@URS.com
	Attention	Saul Martinez Consultant's Relationship Representative
	Copy	Legal Counsel
	QBSAA Licence No. (if applicable)	N/A
Recitals	A	It is intended that the Clients will engage the Consultant to provide the Services for certain Projects from time to time.
	B	The Consultant will perform the Services in accordance with this agreement and any Project Terms agreed with the Clients on a Project-by-Project basis.
Agreement Term	From the date of this agreement until the date that is three years after the date of this agreement (with option to extend)	
Governing Law	The governing law is New South Wales.	

General terms

1 Definitions and interpretation

1.1 Definitions

In this agreement and the Project (unless the context otherwise requires):

Agreement Term means the period of this agreement, as specified in the Details.

Authority is any:

- (a) government department;
- (b) local government council;
- (c) governmental or statutory authority;
- (d) any other party under a Law,

which has a right to impose a requirement or whose consent is required with respect of the Services or the Project.

Business Day is a day other than:

- (a) a Saturday, Sunday;
- (b) 27, 28, 29, 30 or 31 December; or
- (c) a public holiday in:
 - (i) Sydney, where the Site is in New South Wales; or
 - (ii) Brisbane, where the Site is in Queensland.

Change Order means an agreement to change the Services between the relevant Client and the Consultant in the form set out in Schedule 3.

Client means the Principal or any Related Body Corporate of the Principal that may require the provision of Services under this agreement.

Client's Representative means the authorised representative of the Client appointed in accordance with this agreement. For each Project, the person appointed as the Client's Representative is identified in the Project Terms.

Confidential Information is any object, document or other confidential information that is the property of the Principal or the Client (or any copy or record of any such object, document or confidential information), or any confidential report concerning the business or finances of the Principal or the Client obtained by the Consultant, and includes any information relating to the performance of the parties' obligations under this agreement.

Created Intellectual Property is:

- (a) all works (including literary and artistic works and other copyright works and the Documentation), inventions, discoveries, improvement to existing inventions or processes and novel designs whether or not registrable as designs or patents throughout the world including any development or improvements to equipment, technology, methods, processes or techniques made by, or on behalf of, the Consultant during or arising out of the performance of the Services; and
- (b) all existing and future copyright throughout the world in the things referred to in paragraph (a) above.

Consultant's Representative means the authorised representative of the Consultant appointed and replaced in accordance with this agreement. For each Project, the person appointed as the Consultant's Representative is identified in the Project Terms.

Corporations Law means the *Corporations Act 2001 (Cwth)*.

Details is the section of this agreement headed "Details".

Documentation is all documentation which the Consultant is required to produce (including any produced by its subcontractors) in accordance with this agreement and the Project Terms including plans, drawings, specifications, calculations, models, equipment, information and other data stored by any means.

Fees means the fees set out in part A of Schedule 2.

GST is a goods and services tax, as governed by the GST Act.

GST Act is *A New Tax System (Goods and Services Tax) Act 1999 (Cwth)*.

Indemnified Parties are the Principal, the Client and their respective officers, employees and agents.

Insolvent shall mean with respect to a party that:

- (a) is (or states that it is) insolvent (as defined in the Corporations Law);
- (b) has a Controller (as defined in the Corporations Law) appointed to any part of property;
- (c) is in receivership, in receivership and management, in liquidation, in provisional liquidation, under administration or wound up or has had a Receiver appointed to any part of its property;
- (d) is subject to any arrangement, assignment, moratorium or composition, protected from creditors under any statute, dissolved (other than to carry out a reconstruction or amalgamation while solvent on terms approved by the other party to this agreement);
- (e) an application or order has been made (and, in the case of an application, it is not stayed, withdrawn or dismissed within 30 days),

resolution passed, proposal put forward, or any other action taken, in each case in connection with that person, which is preparatory to or could result in any of paragraphs (a), (b), (c) or (d) above;

- (f) is taken (under section 459(F)(1) of the Corporations Law) to have failed to comply with a statutory demand;
- (g) is the subject of an event described in section 459(C)(2)(b) or section 585 of the Corporations Law (or it makes a statement from which the other party to this agreement reasonably deduces it is so subject); or
- (h) is otherwise unable to pay its debts when they fall due; or
- (i) something having a substantially similar effect to paragraph (a) to (h) happens in connection with that person under the law of any jurisdiction.

Intellectual Property Rights means all intellectual property rights, including but not limited to, the following rights:

- (a) patents, copyright, rights in circuit layouts, designs, trade marks (including goodwill in those marks), domain names and any right to have confidential information kept confidential;
- (b) any application or right to apply for registration of any of the rights referred to in paragraph (a); and
- (c) all rights of a similar nature to any of the rights in paragraphs (a) and (b) which may subsist in Australia or elsewhere,

whether or not such rights are registered or capable of being registered.

Key Personnel means, for each Project, the Key Personnel specified in the Project Terms.

Law is:

- (a) Commonwealth and State legislation including regulations, by-laws or other subordinate legislation;
- (b) common law and equity;
- (c) Authorities' requirements; and
- (d) guidelines of the Commonwealth, State and local governments and Authorities with which the Consultant is legally required to comply.

Losses means liabilities, expenses, losses, damages and costs (including but not limited to legal costs on a party-party basis, whether incurred by or awarded against a party).

Milestone Dates means, for each Project, any fixed date to be met by the Consultant in performing any of its obligations under this agreement and the Project Terms, as specified in the Project Terms.

Milestone Payments means, for each Project, any fixed payments to be made by the Client in consideration for the performance by the Consultant of the Services by the corresponding Milestone Dates, as specified in the Project Terms.

Moral Rights means rights of integrity of authorship, the right of attribution of authorship of a work and the right not to have authorship of a work falsely attributed, as defined in the *Copyright Act 1968 (Cwth)*.

PPSA means the *Personal Property Securities Act 2009 (Cth)*.

Pre-Existing Intellectual Property means any Intellectual Property Rights owned by a party or the Client before execution of this agreement or the relevant Project Terms or any Intellectual Property Rights that comes into existence after the date of this agreement or the relevant Project Terms otherwise than in connection with this agreement or the relevant Project Terms.

Principal's Standards and Policies means:

- (a) the corporate standards and policies available to be downloaded at <http://www.glencorexstrata.com/about-us/policies/>; and
- (b) any other Client-specific policies or standards identified in the Project Terms.

Program is the program referred to in clause 5.2(a).

Project means the project described in the relevant Project Terms.

Project Terms means the agreement between the Client and the Consultant describing the specific requirements of the Client in respect of the Services, which must be in the form set out in Schedule 1.

QBSAA means the *Queensland Building Services Authority Act 1991 (QLD)*.

Reimbursable Expenses means the expenses payable by the Client to the Consultant in accordance with part B of Schedule 2 and the Project Terms.

Related Body Corporate has the meaning given to it in the Corporations Law.

Services means, for each Project, the consultancy services to be provided by the Consultant, as described in the Project Terms, and includes the supply of Documentation.

Site means, for each Project, the Client site(s) described in the Project Terms.

Site Requirements means, for each Project, the requirements relating to the Site(s) as described in the Project Terms.

Tax Invoice is an invoice which complies with GST Law relating to the production and form of tax invoices for GST purposes.

Term of the Project means, for each Project, the period set out in the Project Terms.

Third Party Material means material or documentation owned by a third party that is included, embodied in or attached to the Documentation or used as part of the performance of the Services.

1.2 References

In this agreement (unless the context otherwise requires):

- (a) references to parts, clauses, schedules, exhibits and annexures refer to them of, in and to this agreement;
- (b) a reference to this agreement includes all schedules, exhibits and annexures to this agreement;
- (c) a reference to **including, includes** or **include** must be read as if it is followed by **(without limitation)**;
- (d) a reference to a court is to an Australian court;
- (e) a reference to a party is to a party to this agreement;
- (f) where an expression is defined, any other part of speech or grammatical form of that expression has a corresponding meaning;
- (g) the singular includes the plural and vice-versa;
- (h) a reference to any legislation or legislative provision includes any statutory modification or re-enactment of, or legislative provision substituted for, and any subordinated legislation issued under, that legislation or legislative provision;
- (i) headings do not affect the interpretation of this agreement;
- (j) a reference to any party includes that party's executors, administrators, substitutes, successors and permitted assigns; and
- (k) a reference to \$, AUD or dollar is to the lawful currency of the Commonwealth of Australia.

2 Services

2.1 Provision of Services

The Consultant offers to provide the Services to the Clients, and the Clients will from time to time engage the Consultant to provide the Services, on a Project-by-Project basis.

Notwithstanding any other clause in this agreement or the Project Terms, in providing the Services, the Consultant is only required to exercise the degree of skill, care and diligence normally exercised by its peers in the consulting profession, at the time the services are rendered and within the limits prescribed by the Client.

2.2 Consultant's responsibilities

The Consultant must:

- (a) perform the Services in accordance with:
 - (i) this agreement;
 - (ii) any applicable licenses and consents;
 - (iii) all lawful and all reasonable standards, rules, directions and requirements set by any Authority;
 - (iv) the relevant Project Terms; and
 - (v) any additional, special terms and conditions agreed between the Consultant and the Client;
- (b) comply with all relevant Laws in all jurisdictions in performing the Services;
- (c) comply with all reasonable directions of the Client relating to the performance of the Services from time to time;
- (d) consult with the Client throughout the performance of the Services;
- (e) use all reasonable efforts to coordinate its activities so as to support and facilitate, in the Client's best interests, the timely and efficient completion of all work and other activities to be performed for the Client by any other person;
- (f) establish procedures for quality assurance in relation to the performance of the Services;
- (g) ensure that the Documentation and all designs, materials and methods of using, fixing or working that it proposes or specifies:
 - (i) comply with all Laws and relevant Australian Standards applicable to the Services and the relevant Project; and
 - (ii) do not infringe the Intellectual Property Rights or other protected rights of any third party;
- (h) subject all Documentation to appropriate levels of internal checking and approval before issuing the Documentation to the Client;
- (i) regularly update the Client concerning the manner and timing of the performance of the Services; and
- (j) give the Client copies of any relevant documents issued by any Authority.

2.3 Access to Site

- (a) The Client must provide access to its Site(s) as reasonably necessary to enable the Consultant to provide the Services. The Consultant

must, if using or accessing the Site(s), comply with all reasonable directions, policies and procedures relating to occupational health and safety (including training and induction) and security in operation at the Site(s), including the Site Requirements.

- (b) The Consultant must complete such safety or other training or induction as the Client directs.

2.4 Changes to the Services

- (a) If the Client wants to vary the Services:

- (i) the Client must make a request to the Consultant in writing, setting out the proposed variations;
- (ii) within 14 days after receiving the Client's request, or within another period agreed by the Consultant and the Client, the Consultant must respond in writing to the Client specifying what impact the proposed variations will have on:
 - (A) the Milestone Payments (if any) for the Project;
 - (B) the Services or Documentation;
 - (C) the Consultant's ability to perform its obligations under the Project Terms (including its ability to meet Milestone Dates); and
 - (D) the Project Terms generally;

and the cost of providing such information is included in the Fees and will not entitle the Consultant to any adjustment to the Fees; and

- (iii) within 14 days after receiving the Consultant's response pursuant to clause 2.4(a)(ii), or within another period agreed by the Consultant and the Client, the Client must give the Consultant a written notice accepting or rejecting the response.

- (b) If the Consultant wants to vary the Services:

- (i) the Consultant must make a request to the Client in writing, setting out the proposed variations and specifying what impact those variations will have on:
 - (A) the Milestone Payments (if any) for the Project;
 - (B) the Services or Documentation;
 - (C) the Consultant's ability to perform its obligations under the Project Terms (including its ability to meet Milestone Dates); and
 - (D) the Project Terms generally; and

- (ii) within 14 days after receiving the request or within another period agreed by the Consultant and the Client, the Client must give the Consultant a written notice accepting or rejecting the Consultant's request.
- (c) Any variation in the Services takes effect from the date on which the parties execute a Change Order. The Project Terms will be amended to give effect to the Change Order.
- (d) Any request made by the Client under clause 2.4(a) may involve increases in or additions to, reductions in or omissions from, or changes in the character or the quality of the previous Services. If the change requires the omission of the work, the Client may have the omitted work carried out by itself or others or not as it sees fit. No omission will constitute a basis to allege that the Client has repudiated this agreement regardless of the extent or timing of the omission.
- (e) No change to the Services invalidates this agreement or any Project Terms.
- (f) Any change to the Services made necessary due to any default of the Consultant in the performance of its obligations under this agreement or the Project Terms will not result in any adjustment to the Fees or any other claim.
- (g) The Consultant may request a change for its own convenience which may be approved by the Client's Representative in its absolute discretion. Except to the extent expressly included in any approval from the Client's Representative, the Consultant shall have no entitlement to any adjustment to the Fees in relation to a change approved under this clause 2.4(g).

2.5 Conflict of interest

- (a) The Consultant warrants that, at the date of this agreement, there is no conflict of interest existing between the Consultant performing the Services and the Consultant performing any other work for any third party.
- (b) The Consultant must not engage in any activity which might conflict with the Principal's or the Client's interests under this agreement or the Project Terms.
- (c) The Consultant must immediately inform the Principal on the Consultant's becoming aware of the existence, or possibility, of a conflict of interest of the type referred to in this clause 2.5.

2.6 Anti-corruption requirements relating to the Services

- (a) In providing the Services under this agreement, the Consultant must not seek, accept, offer, give or permit any payment, service, gift or other value from or to any person or firm as a condition or result of doing business with the Consultant, the Principal or the Client, if doing so would be in violation of applicable law, including any Anti-Corruption Laws.

- (b) The Consultant represents and warrants that neither it nor any of its directors, officers or employees nor, to its knowledge, any of its sub-consultants, agents or representatives has directly or indirectly made, and, further, that it shall not make any contribution, gift, bribe, rebate, payoff, influence payment, kickback or other payment to any person, private or public, whether in money, property or services to:
 - (i) obtain favourable treatment or to secure any contracts, agreements or commitments;
 - (ii) pay for favourable treatment or for any contracts, agreements or commitments secured; or
 - (iii) obtain special concessions in violation in any material respect of any Anti-Corruption Laws.
- (c) The Consultant represents and warrants that any compensation paid by or to the Consultant in connection with the Services will be for legitimate, bona fide goods and/or services.
- (d) The Consultant must take particular care to ensure the propriety of all interactions with government officials and other persons who might have authority or influence, directly or indirectly, over customers or any matters relating to the Services, including the sale, marketing, promotion, importation, licensing or distribution of any products thereof.
- (e) The Consultant agrees that no part of the monies or other consideration paid under this agreement will accrue for the benefit of any government official or candidate, regardless of the existence or non-existence of a relationship between the Consultant (or any of its representatives) and such government official or candidate.
- (f) In performing the Services and its other obligations under this agreement and the Project Terms, the Consultant must comply with the Principal's Standards and Policies.
- (g) The Principal and each of the Clients have the right to audit the Consultant's books of account and financial records for the purpose of determining whether the Consultant has complied with this clause 2.6. Upon request by the Principal or the Client, the Consultant must promptly make the books of account and financial records available for this purpose.
- (h) The Consultant:
 - (i) authorises the Principal, each of the Clients and its agents to make enquiries and obtain information about the Consultant, its subconsultants, agents and representatives from references supplied by the Consultant and any other source, to verify the information given to the Principal and the Client, to determine the reputation and credit standing of the Consultant and for other customary due diligence purposes; and

- (ii) agrees to use reasonable efforts to obtain similar authorisations from its representatives, agents and subconsultants if required by the Principal or each of the Clients.
- (i) The Consultant must notify the Principal and each of the Clients without delay of any allegation received by the Consultant of any Anti-Corruption Law or any breach of any Principal's Standards and Policies by the Consultant or its subconsultants, agents or representatives.
- (j) Without limiting the Principal's and the Clients' rights under clause 12 (Term and Termination), the Principal and each of the Clients may terminate this agreement and the Project Terms immediately by giving written notice to the Consultant if the Consultant fails to comply with its obligations under this clause 2.6 or otherwise breaches any Anti-Corruption Laws.
- (k) For the purposes of this clause 2.6, "**Anti Corruption Laws**" means the *Foreign Corrupt Practices Act* (USA), 1977, the *Corruption of Foreign Public Officials Act* (Canada), 1998, c. 34, the *Bribery Act* (U.K.), 2010, c. 23 (in each case, whether or not applicable to the Consultant), and any other law concerned with the prevention of bribery and corruption applicable to the Consultant.

3 Monitoring progress and reporting

3.1 Progress meetings

- (a) The Client and the Consultant will meet at the times set out in the Project Terms (or otherwise as agreed in writing between the Client and the Consultant) to discuss any issues in relation to the provision of the Services. The Consultant must ensure that the Consultant's Representative and the Client must ensure the Client's Representative is reasonably available to attend such meetings.
- (b) The Consultant and the Principal will meet on a regular basis, as required, to discuss any issues in relation to the provision of the Services and any other issues associated with this agreement.

3.2 Reporting

The Consultant must provide the Client with reports in accordance with the Project Terms.

3.3 Review of Documentation

- (a) The Consultant must give the Client for its review, copies of all Documentation (including amended versions) as soon as they are prepared and must allow sufficient time before, for example, their issue for tender or construction for the Client to determine whether the Documentation is adequate to ensure compliance with the requirements of this agreement or the Project Terms and to comment if necessary.

- (b) Review of any Documentation by the Client or the Client's Representative is solely for the purpose of monitoring the performance of the Consultant, and neither the Client nor the Client's Representative undertakes any responsibility or duty of care to the Consultant.
- (c) No comment on, approval or review of, or failure to comment on, approve or review, any Documentation by the Client or the Client's Representative shall:
 - (i) relieve the Consultant of its obligations and liabilities under this agreement or the Project Terms; or
 - (ii) constitute acceptance by the Client of the performance of the Consultant's obligations under this agreement;

4 Personnel and subcontracting

4.1 Consultant's Representative

- (a) The Consultant must appoint a representative for each Project who must:
 - (i) at all times have authority to act on behalf of the Consultant in respect of this agreement and the Project Terms; and
 - (ii) be approved by the Client.
- (b) The Consultant must ensure that the Consultant's Representative is not replaced without the prior approval of the Client.
- (c) The Consultant's Representative must liaise with, and report to, the Client on all aspects of the Services.

4.2 Client's Representative

The Client will appoint a representative who must at all times have authority to act on behalf of the Client for each Project in respect of this agreement and the Project Terms.

4.3 Personnel

- (a) The Consultant warrants that it will provide appropriately qualified, competent, skilled and experienced personnel to perform the Services.
- (b) The Consultant must ensure that the Key Personnel perform the Services for which the Key Personnel are responsible as specified in the Project Terms and that the Key Personnel are not removed from their positions or replaced without the prior written approval of the Client.
- (c) The Client may direct the Consultant to remove from any activity connected with the Services, any person employed in connection with the Services who, in the opinion of the Client, is guilty of misconduct or is incompetent or negligent or is otherwise interfering with the orderly progress of the Services.

4.4 Subcontractors

- (a) The Consultant must not subcontract the performance of all or any part of the Services without first obtaining the Client's written approval.
- (b) If the Client gives its written approval in accordance with clause 4.4(a), the Consultant must ensure that the subcontractor appointed by it:
 - (i) performs the Services (or any part thereof) with the same level of professional skill, care and diligence expected of the Consultant; and
 - (ii) complies with the Consultant's obligations under this agreement and the Project Terms.
- (c) The Consultant's obligations under this agreement are not lessened or otherwise affected by subcontracting the performance of all or any of its obligations.

5 Time

5.1 Performance of Services

The Consultant must perform the Services in accordance with the approved Program.

5.2 Program

- (a) The Consultant must, by the time specified in the Project Terms, submit a program for the performance of the Services, in a network diagram format and identifying all Milestone Dates and review periods, for the Client's approval. For the avoidance of doubt, the Client will be entitled to request changes to the Program before giving its approval.
- (b) The Consultant must ensure that the Program is updated:
 - (i) monthly; and
 - (ii) within the time stipulated in a written request by the Client to show progress achieved and, where appropriate, changes to the sequence and duration of activities required to meet the Milestone Dates (including the effect (if any) of an extension of time) together with any corresponding changes to the Consultant's resources to be utilised and that 2 copies of each update (in colour) are promptly provided to the Client.
- (c) When it provides any updates to the Program in accordance with clause 5.2(b), the Consultant must also provide a detailed written explanatory statement which describes the changes from the previous version of the Program and the reasons for those changes.

5.3 Milestone Dates

The Consultant must complete the Services by the corresponding Milestone Dates set out in the Project Terms, or by such other Milestone Dates as are approved by the Client.

5.4 Stages

If the Consultant is performing the Services in stages (such stages to be specified in the Project Terms), the Consultant:

- (a) must not commence the Services in respect of any stage without the prior written approval of the Client; and
- (b) is not entitled to payment for any Services performed without that written approval.

5.5 Delays

(a) The Consultant must, on becoming aware of any matter which does or may delay the performance of the Services, promptly give written notice to the Client with detailed particulars of:

- (i)
 - (A) any delay to those parts of the Services required to be completed by the Milestone Dates;
 - (B) details of the cause of that delay and how the Milestone Dates are likely to be affected; and
 - (C) the Consultant's recommendations to minimise the effect of that delay; and

- (ii)
 - (A) any delay to any other parts of the Services;
 - (B) the nature of the delay;
 - (C) the extent of that delay; and
 - (D) the Consultant's recommendations to minimise the effect of that delay.

(b) Within one week of giving a notice of delay referred to in clause 5.5(a):

- (i) the Consultant must convene a meeting with the Client to develop measures to reduce the effects of the delay on the progress of the Services and the Project; and
- (ii) if the Consultant is unable to agree with the Client within one week of the meeting as to the measures to implement to reduce the effects of the delay on the progress of the Services and the Project, the Client may specify the measures to be taken by the Consultant.

- (c) If the cause of the delay is due to an act or omission of the Consultant, then the Consultant must implement the measures referred to in clause 5.5(b) at its own cost. If the cause of the delay is not due to an act or omission of the Consultant, then the Consultant will be entitled to a reasonable extension of time. The measures to be implemented by the Consultant may include:
 - (i) rescheduling and reprogramming the Services; and
 - (ii) accelerating performance of the Services by any reasonable means including increasing the Consultant's resources employed in performance of the Services.

5.6 Suspension

- (a) The Client may at any time give written notice to the Consultant to suspend the performance of all or any part of the Services, provided any such suspension cannot exceed six months.
- (b) If the Consultant receives a written notice from the Principal under clause 5.6(a), the Consultant must immediately suspend the performance of the Services (or the relevant part).
- (c) The Client may at any time give written notice to the Consultant to resume the performance of the Services that have been suspended.
- (d) If the Consultant receives a written notice under clause 5.6(a):
 - (i) the Consultant must immediately resume performing the part of the Services which has been suspended; and
 - (ii) unless the need to suspend was occasioned by the Consultant's failure to comply with this agreement, the Client must extend the Milestone Dates affected by the suspension by a period equal to the period of suspension.

6 Payment

6.1 General

Subject to the proper performance of the Services, the Client must pay the Consultant the Fees and any Reimbursable Expenses in accordance with this agreement and the Project Terms.

6.2 No additional charges

- (a) The Consultant acknowledges that the Fees and Reimbursable Expenses are inclusive of all costs and expenses the Consultant may incur in performing the Services and its other obligations under this agreement and the Project Terms.
- (b) The Consultant must not charge the Client (and the Client is under no obligation to pay) for any costs or expenses in addition to the Fees and Reimbursable Expenses.

6.3 Milestone Payments

On the Milestone Dates specified in the Project Terms, the Consultant may submit a Tax Invoice to the Client for the corresponding Milestone Payment.

6.4 Changes to Milestone Payments

Changes to the Milestone Payments associated with a variation in the Services must:

- (a) not exceed any reasonable additional cost; and
- (b) take fully into account any reduction in cost.

6.5 Progress payments

Notwithstanding any Milestone Payments to be made in accordance with clause 6.3, the Consultant will be entitled to submit a Tax Invoice to the Client on a monthly basis for Fees and Reimbursable Expenses claimed in respect of Services performed during the relevant period.

6.6 Payment

- (a) Except if there is a genuine dispute regarding the amount payable under the Tax Invoice submitted under clause 6.3 or 6.5, and unless otherwise specified in the Project Terms, the Client must pay the Consultant on the later of:
 - (i) 30 days after receipt of a correctly rendered Tax Invoice;
 - (ii) the receipt by the Principal's Representative of the certificates of insurance referred to in clause 10.2;
 - (iii) receipt by the Principal's Representative of a signed statutory declaration in the format set out in Part A of Schedule 4 (Consultant's Declarations), stating that:
 - (A) all remuneration payable to employees of the Consultant has been paid;
 - (B) all amounts payable to consultants, suppliers and subconsultants have been paid; and
 - (C) the premiums for all insurance policies required to be effected under this agreement have been paid, during the period from the date of commencement of any Services to the date of the statutory declaration; and
 - (iv) if the Site is in New South Wales, the Consultant giving the Client a duly signed written statement (in a form approved by the Client) which complies with the Consultant's obligations under section 127 of the *Industrial Relations Act 1996* (NSW), Schedule 2 Part 5 of the *Payroll Tax Act 2007* (NSW) and section 175B of the *Workers Compensation Act 1987* (NSW) to provide a statement to the "principal contractor" as contemplated by those Acts. At the date of

this agreement, a duly completed signed written statement in the form issued by the New South Wales Government (which is set out in Part B of Schedule 4 (Consultant's Statement)), accompanied by the required certificate of currency in respect of its workers compensation insurance, will comply with the requirements of this clause 6.6(a)(iv).

- (b) Where the Site is in Queensland, notwithstanding the above and subject to clause 6.7, the Client must pay the Consultant within 15 Business Days of the receiving the Consultant's Tax Invoice.

6.7 Set off

The Client may deduct and set off from the moneys otherwise due and payable to the Consultant under this agreement any money due and payable or which may become due and payable from the Consultant to the Client under this agreement or the Project Terms.

6.8 Audit

- (a) In order for the Client to ensure that the Consultant is complying with its obligations under this agreement and the Project Terms, and to verify the Fees and Reimbursable Expenses payable by the Client, the Consultant must, and must procure that its permitted subcontractors, grant the Client and its nominees access to the Consultant's (or its subcontractor's) premises and data, records, accounts and other financial material or material relevant to the performance of the Services.
- (b) For the purposes of clause 6.8(a), the Consultant must, at its cost, ensure that it keeps full and complete records relating to its performance of the Services.

6.9 Building and Construction Industry Security of Payment Act 1999 (NSW)

Clause 6.9 applies where the Site is in New South Wales.

- (a) The Consultant must:
 - (i) promptly and without delay give the Client and the Client's Representative a copy of any notice the Consultant receives from any of its subcontractor; and
 - (ii) ensure that each subconsultant promptly and without delay gives the Client and the Client's Representative a copy of any notice that the subconsultant receives from another party,

under any of sections 15, 16 or 24 of the *Building and Construction Industry Security of Payment Act 1999* (NSW) ("**Security of Payment Act**").

- (b) If the Client becomes aware that a subconsultant is entitled to suspend work (which forms part of the Services) pursuant to section 27 of the Security of Payment Act, the Client may (at its absolute discretion) pay the subconsultant such money that is or may be owing to the

subconsultant in respect of work forming part of the Services, and any amount paid by the Client is recoverable from the Consultant as a debt due and payable to the Client.

- (c) The Consultant must indemnify the Client against all damage, expense (including lawyers' fees and expenses on a solicitor/client basis), loss (including financial loss) or liability of any nature suffered or incurred by the Client arising out of:
 - (i) a suspension by a subconsultant of work which forms part of the Services pursuant to section 27 of the Security of Payment Act;
 - (ii) the Client's defence of a claim by the Consultant for recovery of money retained by the Client pursuant to section 26B of the Security of Payment Act;
 - (iii) any payment withholding request by any subconsultant under section 26A of the Security of Payment Act or the creation of any liability of the Client under section 26C of the Security of Payment Act; and
 - (iv) a failure by the Consultant to comply with its obligations under clause 6.9(a).
- (d) If the Consultant makes a payment claim to the Client under the Security of Payment Act and the Consultant applies for adjudication of the payment to be made, the nominating authority for the purposes of section 17(3)(a)(ii) of that legislation is The Institute of Arbitrators and Mediators Australia.
- (e) For the purposes of this clause 6.9, a reference to:
 - (i) a subconsultant refers to any party engaged by the Consultant, its subconsultants or any other party to carry out work which forms part of the Services; and
 - (ii) work refers to work which the Consultant is or may be required to execute or provide under this agreement and includes equipment, services (including design work), materials, plant and temporary works.

6.10 *Building and Construction Industry Payments Act 2004 (QLD)*

Clause 6.10 applies where the Site is in Queensland.

- (a) The Consultant must:
 - (i) promptly and without delay give the Client and the Client's Representative a copy of any notice the Consultant receives from a subconsultant; and
 - (ii) ensure that each subconsultant promptly and without delay gives the Client and the Client's Representative a copy of any notice that the subconsultant receives from another party,

under any of sections 19, 20 or 30 of the *Building and Construction Industry Payments Act 2004* (QLD) (“**Security of Payment Act**”).

- (b) If the Client becomes aware that a subconsultant is entitled to suspend work (which forms part of the Services) pursuant to section 33 of the Security of Payment Act, the Client may (at its absolute discretion) pay the subconsultant such money that is or may be owing to the subconsultant in respect of work forming part of the Services, and any amount paid by the Client is recoverable from the Consultant as a debt due and payable to the Client.
- (c) The Consultant must indemnify the Client against all damage, expense (including lawyers’ fees and expenses on a solicitor/client basis), loss (including financial loss) or liability of any nature suffered or incurred by the Client arising out of:
 - (i) a suspension by a subconsultant of work which forms part of the Services pursuant to section 33 of the Security of Payment Act; and
 - (ii) a failure by the Consultant to comply with its obligations under clause 6.10(a).
- (d) If the Consultant makes a payment claim to the Client under the Security of Payment Act and the Consultant applies for adjudication of the payment to be made, the nominating authority for the purposes of section 21(3)(b) of that legislation is the Institute of Arbitrators and Mediators Australia.
- (e) For the purposes of this clause 6.10, a reference to:
 - (i) a subconsultant refers to any party engaged by the Consultant, its subconsultants or any other party to carry out work which forms part of the Services; and
 - (ii) work refers to Services which the Consultant is or may be required to perform or provide under this agreement.

6.11 Taxes

- (a) Unless otherwise expressly provided in this agreement, the Consultant must pay all taxes including sales tax, payroll tax, levies, duties and assessments due in connection with the Services and its other obligations under this agreement and the Project Terms.
- (b) If any supply made under this agreement and/or the Project Terms is or becomes subject to GST, the party to whom the supply is made (“the **Recipient**”) must pay to the party making the supply (“the **Supplier**”), as consideration in addition to any consideration payable or to be provided elsewhere in this agreement, subject to issuing a Valid Tax Invoice, an additional amount on account of GST, such amount to be calculated by multiplying the consideration by the applicable rate of GST.

- (c) Any amount in respect of GST payable under clause 6.11(b) must be paid to the Supplier on or before the last business day of the month following the month in which the Recipient receives a Tax Invoice.
- (d) A party need not make a payment for a taxable supply made under or in connection with this agreement or the Project Terms until it receives a Tax Invoice for the supply to which the payment relates.
- (e) If any party is required to reimburse or indemnify the other party for a cost, expense or liability (**Cost**) incurred by the other party, the amount of that Cost for the purpose of this agreement is the amount of the Cost incurred less the amount of any credit or refund of GST to which the party incurring the Cost is entitled to claim in respect of the Cost.

7 Intellectual property

7.1 Pre-existing Intellectual Property

Nothing in this clause 7 affects the ownership of any Pre-existing Intellectual Property.

7.2 Third Party Material

The Consultant must obtain all necessary permissions before including any Third Party Material in the Documentation or using Third Party Material as part of the Services.

7.3 Created Intellectual Property

- (a) Subject to clause 7.4, the Consultant assigns to the Client all of the Consultant's right, title and interest in any Created Intellectual Property upon its creation.
- (b) The Consultant must do all further things necessary to assign the Consultant's right, title and interest in any of the Created Intellectual Property to the Client.
- (c) If the right, title and interest in any of the Created Intellectual Property is not capable of being assigned to the Client, the Consultant must ensure that the Client is irrevocably licensed to use that Created Intellectual Property.
- (d) The Consultant warrants that the Consultant's Created Intellectual Property, and its use, does not infringe and will not infringe the intellectual property rights of any person.
- (e) The Consultant must indemnify the Indemnified Parties against all damage, expense (including lawyers' fees and expenses on a solicitor/client basis), loss (including financial loss) or liability of any nature suffered or incurred by the Indemnified Parties arising out of any claim that the Consultant's Created Intellectual Property, or its use by or on behalf of the Indemnified Parties, infringes the intellectual property of a third party.

7.4 Licence

- (a) To the extent that the Client needs to use any of the Consultant's Pre-existing Intellectual Property or any Third Party Material to receive the full benefit of the Services, the Consultant must grant or obtain for the Client an irrevocable, perpetual, world-wide, royalty free, non-exclusive licence (including the right to sublicense) to use, reproduce, adapt, modify, publish and communicate the Consultant's Pre-existing Intellectual Property and Third Party Material;
- (b) To the extent that the Consultant needs to use any of the Client's Pre-existing Intellectual Property or the Created Intellectual Property for the purpose of performing its obligations under this agreement or the Project Terms, the Client grants to the Consultant for the Term of the Project, a royalty-free, non-exclusive, non-transferable licence to use, reproduce and adapt the Client's Pre-existing Intellectual Property and the Created Intellectual Property solely for the purpose of providing the Services.

7.5 Warranty

- (a) The Consultant warrants that the Client's use of the Consultant's Pre-existing Intellectual Property, Third Party Material, and Documentation will not infringe the Intellectual Property Rights of any person.
- (b) If someone claims that the Client's use of all or part of the Consultant's Pre-existing Intellectual Property, Third Party Material, and Documentation infringes their Intellectual Property Rights, the Consultant must, in addition to any other rights that the Client may have against it, promptly, at the Consultant's expense:
 - (i) use its best efforts to secure the rights for the Client to continue to use the affected materials free of any claim or liability for infringement; or
 - (ii) replace or modify the affected materials so that they do not infringe the Intellectual Property Rights of any other person, without any degradation of the performance or quality of the affected materials.

7.6 Moral Rights

To the extent permitted by law, the Consultant must procure from any person (including its employees, subcontractors and agents) who is an author of the Consultant's Pre-existing Intellectual Property, Third Party Material, or Created Intellectual Property, an unconditional and irrevocable assignment or waiver of all Moral Rights in respect of such Consultant's Pre-existing Intellectual Property, Third Party Material, or Created Intellectual Property so as to enable the Client and the Principal to use or reproduce such works without identifying or attributing authorship, and to amend such works in any manner the Client or the Principal see fit.

8 Consultant's warranties

The Consultant warrants and represents that:

- (a) it has the authority and power to execute, deliver and perform its obligations under this agreement and the Project Terms;
- (b) it has all rights, title, licences, interests and property necessary to lawfully perform the Services;
- (c) it and its personnel, including the Key Personnel, have the necessary experience, skill, knowledge and competence to perform the Services;
- (d) subject to the standard of care required by clause 2.1, the Services will be reasonably fit for the purpose set out in the Project Terms;
- (e) if it is required to be licenced under the QBSAA to carry out Services in Queensland it currently holds and will maintain the required licence;
- (f) it has the expertise, experience and capability, including sufficient and competent employees or subconsultants to provide the Services efficiently and expeditiously; and
- (g) subject to the standard of care required by clause 2.1, the Services will be:
 - (i) complete, accurate and free from material faults or defects;
 - (ii) provided with professional skill, care and diligence;
 - (iii) carried out by appropriately qualified, competent, skilled, experienced and professional persons; and
 - (iv) provided in accordance with all current relevant industry standards, and guidelines (including all applicable international standards).

9 Damages

9.1 Indemnity

The Consultant indemnifies the Indemnified Parties to the extent and in the proportion caused or contributed to by the Consultant or its subconsultants against all Losses they directly sustain or incur as a result of:

- (a) any breach of this agreement or the Project Terms by the Consultant, including a breach of any warranty;
- (b) any negligent, unlawful or wilful act or omission of the Consultant (including its employees, agents and subcontractors);
- (c) any infringement by the Consultant of the Intellectual Property Rights or Moral Rights of any third party; or
- (d) any breach of any Law in any jurisdiction by the Consultant,

except to the extent that any negligent act or omission of the Client contributed to the relevant liability.

9.2 Liability

Notwithstanding any other clause in this agreement, the Consultant's liability, whether under the law of contract, tort, or equity, by operation of state or federal legislation or otherwise, arising from or in connection with the provision of the services is limited in the aggregate by the following conditions:

- (a) where the Fees are \$100,000 or less and where the Project is reasonably categorised by the Client to be a standard or low risk Project (noting that unless expressly stated otherwise, as a default position, a project will be considered standard or low risk) the limit of liability shall be \$2,500,000;
- (b) where the Fees are greater than \$100,000 or the Project is categorised by the Client to be a high risk Project (prior to the execution of the Project Terms), the parties must agree to a limit of liability (which must not be less than \$2,500,000), at the time of executing the Project Terms, for any Project; and
- (c) where the Fees are greater than \$100,000 or the Project is categorised by the Client to be a high risk Project (prior to the execution of the Project Terms), and the Parties fail to agree a limit of liability for whatever reason, and decide to proceed with a Project, the limit of liability in respect of that Project shall be:
 - (i) \$3,500,000 where the Fees are greater than \$100,000 and less than \$250,000; and
 - (ii) \$5,000,000 where the Fees are \$250,000 or more.

The limit of liability will be subject to the following carve outs:

- (i) personal injury or death suffered by any person;
- (ii) infringement of the intellectual property rights of any third party;
- (iii) wilful misconduct of the Consultant or its subconsultants (or the officers or employees of any of them);
- (iv) a breach of Law by the Consultant or its subconsultants (or the officers or employees of any of them);
- (v) fraudulent or criminal conduct of the Consultant or its subconsultants (or the officers or employees of any of them); or
- (vi) any liability which by law cannot be limited.

To the maximum extent permitted by law and notwithstanding any other provision of this Agreement, neither party is liable to the other party in respect of any indirect, consequential or special losses (including loss of revenue, loss of profit, loss of custom, loss of goodwill, loss of overhead recovery, loss of business opportunity, loss of the use of property, loss of contract, loss of production, loss of financing charges or cost recovery, loss of the use of money and payment of liquidated sums or damages under any other

agreement) howsoever arising, whether under contract, in tort, in equity, under statute or otherwise.

Notwithstanding any clause to the contrary, in no event shall the Consultant be liable for any costs arising from or related to the design and construction of any works or services undertaken by any other party (other than the Services).

10 Insurance

10.1 Obligation to maintain insurance

Without in any way limiting or affecting the Consultant's other obligations under this agreement, the Consultant must maintain, with a reputable insurer, from the date of this agreement until 3 years after the completion of the Services, the following insurance policies:

- (a) public and third party liability insurance with an overall limit of ten times the Fees (with a minimum of \$10,000,000) for any one occurrence;
- (b) workers compensation insurance in accordance with the requirements of the *Workers Compensation Act 1987* (NSW) or the *Workers Compensation and Rehabilitation Act 2003* (QLD) (as the case may be); and
- (c) professional indemnity insurance with a limit of \$5,000,000 for each and every claim and in the aggregate per Project.

10.2 Certificates of currency

On the reasonable request of the Client, the Consultant must give the Client copies of any certificates from an insurer or insurers proving the currency and coverage of each insurance policy referred to in clause 10.1.

11 Force majeure

11.1 Occurrence of unforeseen event

A party (**Affected Party**) is excused from performing its obligations under this agreement and the relevant Project Terms to the extent it is prevented by circumstances beyond its reasonable control (other than lack of funds for any reason or any strike, lockout and labour disputes in respect of the Consultant only), including but not limited to acts of God, natural disasters, acts of war, riots and strikes outside that party's organisation.

11.2 Notice of force majeure event

When the circumstances described in clause 11.1 arise or are reasonably perceived by the Affected Party as an imminent possibility, the Affected Party must give notice of those circumstances to the other party as soon as possible, identifying the effect they will have on its performance. An Affected Party must make all reasonable efforts to minimise the effects of such circumstances on the performance of this agreement.

11.3 Termination

If non-performance or diminished performance by the Affected Party due to the circumstances under clause 11.1 continues for a period of more than 30 consecutive days, the other party may terminate this agreement and the relevant Project Terms immediately by giving the Affected Party written notice.

11.4 Consequences of termination

If this agreement and the relevant Project Terms are terminated under clause 11.3:

- (a) each party will bear its own costs and neither party will incur further liability to the other; and
- (b) where the Consultant is the Affected Party, it will be entitled to payment for work performed prior to the date of intervention of the circumstances described in clause 11.1.

12 Term and Termination

12.1 Agreement Term

- (a) This agreement continues in force for the Agreement Term, unless terminated earlier.
- (b) The Agreement Term may be extended by the Principal for further period(s) of 1 year on the terms and conditions then in effect by giving written notice to the Consultant by no later than 30 days before the end of the then current Agreement Term. The Consultant shall advise whether it accepts the request within 7 days. Any extension in accordance with this clause 12.1(b) takes effect from the end of the then current Agreement Term. For the avoidance of doubt, silence shall not indicate acceptance.

12.2 Term of Project

Each Project will continue for the Term of the Project specified in the Project Terms, unless terminated earlier by the Client in accordance with clause 12.4.

12.3 Termination by the Principal

The Principal may terminate this agreement by giving written notice to the Consultant if:

- (a) the Principal wishes to terminate this agreement for convenience (provided that the Principal gives the Consultant at least 30 days written notice of such termination);
- (b) the Consultant breaches a material provision of this agreement where that breach is not capable of remedy;
- (c) the Consultant breaches any provision of this agreement and fails to remedy the breach within 14 days after receiving notice requiring it to do so;

- (d) there is any change in the direct or indirect beneficial ownership or control of the Consultant;
- (e) the Consultant disposes of the whole or any part of its assets, operations or business other than in the ordinary course of business;
- (f) the Consultant ceases to carry on business; or
- (g) if the Consultant is Insolvent.

12.4 Termination by the Client

The Client may terminate the Consultant's engagement in respect of any Project, under the relevant Project Terms, by giving written notice to the Consultant if:

- (a) the Client wishes to terminate the relevant engagement for convenience (provided that the Client gives the Consultant at least 30 days written notice of such termination);
- (b) the Consultant breaches a material provision of the Project Terms or this agreement where that breach is not capable of remedy;
- (c) the Consultant breaches any provision of the Project Terms or this agreement and fails to remedy the breach within 14 days after receiving notice requiring it to do so;
- (d) there is any change in the direct or indirect beneficial ownership or control of the Consultant;
- (e) the Consultant disposes of the whole or any part of its assets, operations or business other than in the ordinary course of business;
- (f) the Consultant ceases to carry on business; or
- (g) the Consultant is Insolvent.

12.5 Automatic termination of Project Terms

All Project Terms will automatically terminate if this agreement expires or terminates for any reason.

12.6 Consequences of expiration or termination

- (a) On expiration or termination of this agreement or any Project Terms the Consultant must:
 - (i) cease performing the Services within the time specified in the written notice;
 - (ii) return to the Client (or, at the Client's option, destroy) all of the Client's Confidential Information, Documentation (including native files) and other materials provided by the Client to the Consultant in relation to the Services within the time specified in the written notice; and

- (iii) submit a Tax Invoice to the Client for Fees and Reimbursable Expenses claimed in respect of Services performed up to the date of termination or expiry;
- (b) The Client must pay the Consultant, except if there is a genuine dispute regarding the amount payable under the Tax Invoice submitted pursuant to clause 12.6(a)(iii), any Fees and Reimbursable Expenses in respect of the Tax Invoice, on the later of:
- (iii) 30 days after receipt of a correctly rendered Tax Invoice;
 - (iv) the receipt by the Principal's Representative of the certificates of insurance referred to in clause 10.2;
 - (v) receipt by the Principal's Representative of a signed statutory declaration in the format set out in Part A of Schedule 4 (Consultant's Declarations), stating that:
 - (A) all remuneration payable to employees of the Consultant has been paid;
 - (B) all amounts payable to consultants, suppliers and subconsultants have been paid; and
 - (C) the premiums for all insurance policies required to be effected under this agreement have been paid,

during the period from the date of commencement of any Services to the date of the statutory declaration; and
 - (vi) if the Site is in New South Wales, the Consultant giving the Client a duly signed written statement (in a form approved by the Client) which complies with the Consultant's obligations under section 127 of the *Industrial Relations Act 1996* (NSW), Schedule 2 Part 5 of the *Payroll Tax Act 2007* (NSW) and section 175B of the *Workers Compensation Act 1987* (NSW) to provide a statement to the "principal contractor" as contemplated by those Acts. At the date of this agreement, a duly completed signed written statement in the form issued by the New South Wales Government (which is set out in Part B of Schedule 4 (Consultant's Statement)), accompanied by the required certificate of currency in respect of its workers compensation insurance, will comply with the requirements of this clause 6.6(a)(iv).
- (b) Where the Site is in Queensland, notwithstanding the above clause 12.6(b), the Client must pay the Consultant within 15 Business Days of the receiving the Tax Invoice.

12.7 Termination does not affect accrued rights

Termination of this agreement or any Project Terms does not affect any accrued rights or remedies of the Client, Consultant or Principal.

12.8 Survival

Clauses 7 (Intellectual Property), **Error! Reference source not found.**(Indemnity), 10(Insurance) and 14(Announcements and confidentiality) survive the termination of this agreement.

9.3 Termination

If the Client repudiates this agreement and the Consultant accepts that repudiation, thereby terminating this agreement, the Consultant is entitled to damages but is not entitled to any other compensation (including compensation for any benefit conferred or unjust enrichment, in the nature of restitution or calculated on a quantum meruit basis).

13 Dispute resolution

13.1 Disputes

- (a) Except in relation to an application for urgent or injunction relief, the Client, the Principal and the Consultant must comply with this clause 13.1 before commencing legal action in respect of any dispute under this agreement or the Project Terms.
- (b) The Principal or the Client (as the case may be) must give written notice of any dispute to the Consultant. The Consultant must give written notice of any dispute to the Principal and the Client.
- (c) If the Client and/or the Principal and the Consultant are unable to resolve a dispute the subject of a written notice given under clause 13.1(b) within 10 days after the giving of such notice, either party may refer the dispute to the senior representatives of the Client and/or the Principal and the Consultant for resolution.
- (d) If the senior representatives of the parties are unable to resolve the dispute within 10 days of its referral in accordance with clause 13.1(c), either party may refer the dispute to the chief executive officers of the Client and/or the Principal and the Consultant for resolution.
- (e) If the chief executive officers of the parties are unable to resolve the dispute within 10 days of its referral in accordance with clause 13.1(d), either the Client and/or the Principal or the Consultant may, after giving written notice to the other(s) of its intention to do so, commence legal action in respect of such dispute.
- (f) Notwithstanding this clause 13:
 - (i) neither party is prevented from seeking urgent interlocutory relief; and
 - (ii) the Client may commence litigation without first complying with the dispute resolution process set out in clauses 13.1(a) to 13.1(e), if the Consultant serves on the Client a payment claim and/or adjudication application (as those terms are used in the *Building and Construction Industry Security of*

13.2 Dispute resolution not to delay performance of the Services

Notwithstanding the other provision of this clause 13, the Consultant must:

- (a) proceed without delay to continue to perform the Services and its other obligations under this agreement; and
- (b) comply with all directions of the Client including any direction in respect of a dispute being dealt with in accordance with this clause 13.

14 Announcements and confidentiality

14.1 Announcements

- (a) The Consultant may not advertise or issue any information, publication, document or article for publication or media releases or other publicity relating to the Services, this agreement, the Project Terms, any Project, the Principal's business or the Client's business and activities without the prior written approval of the Principal and/or the Client (as appropriate).
- (b) The Consultant must refer to the Principal any enquiries from the media concerning the Services, any Project or the Principal's or a Client's business and activities.
- (c) The Consultant may not, and must ensure that its employees and its subcontractors and their respective employees do not, take any photographs or video recording of the Services or the Project, without the prior written approval of the Client.

14.2 Confidentiality

- (a) The Consultant must not, and must ensure that its employees and subconsultants do not, either during the provision of the Services or after the expiry or earlier termination of this agreement, disclose or give to any person any Confidential Information except:
 - (i) to officers, employees and subconsultants of the Consultant who require the Confidential Information for the purposes of this agreement and who the Consultant ensures have agreed to be bound to this confidentiality undertaking;
 - (ii) with the prior written consent of the Principal which consent may be given or withheld in its absolute discretion or given subject to any conditions the Principal requires; or
 - (iii) if the Consultant is required to do so by law or stock exchange rules or in connection with legal proceedings.
- (b) The Consultant must only use the Confidential Information for the purpose of exercising its rights or performing its obligations under this agreement.

- (c) The Consultant must, if required by the Principal at any time, execute a separate confidentiality agreement in a form acceptable to the Principal.
- (a) Except to the extent required under section 275(7) of the PPSA, each party agrees that it will not disclose any information of the kind listed in section 275(1) of the PPSA pursuant to a request made by an interested person described in section 275(9) of the PPSA.

14.3 Reproduction of Documentation

The Consultant must ensure that:

- (a) all Documentation; and
- (b) anything recording, containing, setting out, or making reference to the Services or Project,

are used, copied, supplied or reproduced only for the purposes of performing the Services and its other obligations under this agreement unless it has obtained the prior written approval of the Client.

15 Notices

15.1 Form

Unless expressly stated otherwise in this agreement, all notices, certificates, consents, approvals, waivers and other communications in connection with this agreement or the Project Terms must be in writing, signed by the sender (if an individual) or an authorised representative of the sender and marked for the attention of the person identified in this agreement or the Project Terms (as applicable) or, if the recipient has notified otherwise, then marked for attention in the last way notified.

15.2 Delivery

All notices, certificates, consents, approvals, waivers and other communications must be:

- (a) left at the address set out or referred to in this agreement or the Project Terms (as applicable);
- (b) sent by prepaid ordinary post (airmail if appropriate) to the address set out or referred to in this agreement or the Project Terms (as applicable);
- (c) subject to clause 9.4, sent by email to the email address set out or referred to in the Details (or, in the case of the Client, the Project Terms); or
- (d) given in any other way permitted by Law.

However, if the intended recipient has notified a changed postal or email address, then the communication must be to that address.

15.3 When effective

All notices, certificates, consents, approvals, waivers and other communications take effect from the time they are received unless a later time is specified.

15.4 Receipt - post

If sent by post, all notices, certificates, consents, approvals, waivers and other communications are taken to be received three days after posting (or seven days after posting if sent to or from a place outside Australia).

15.5 Receipt - email

If sent by email, all notices, certificates, consents, approvals, waivers and other communications are taken to be received:

- (b) at the time shown in the delivery confirmation report generated by the sender's email system; or
- (c) if the sender's email system does not generate a delivery confirmation report within 12 hours after the time the email is sent (unless the sender receives a return email notification that the email was not delivered, undeliverable or similar) at the time which is 12 hours from the time the email was sent.

9.4 Email

Notices given pursuant to clauses 2.6, 5.6, 12 or 13 or payment claims under the *Building and Construction Industry Security of Payment Act 1999* (NSW) and the *Building and Construction Industry Payments Act 2004* (QLD) (as applicable) may not be sent electronically by email or as an attachment to an email and will not be effective for the purposes of this agreement if sent by email (although a party may send a copy of the communication by email).

15.6 Receipt - general

Despite clauses 15.4 ("Receipt - post") and 15.5 ("Receipt - email"), if they are received (or taken to be received) after 5.00pm in the place of receipt or on a non-Business Day, they are to be taken to be received at 9.00am on the next Business Day.

16 General

16.1 Governing law

This agreement and the Project Terms are governed by the law in force in New South Wales. Each party submits to the non-exclusive jurisdiction of the courts of that place.

16.2 Construction

No rule of construction applies to the disadvantage of a party because that party was responsible for the preparation of, or seeks to rely on, this agreement or any part of it.

16.3 Rights and remedies not affected

The rights, powers and remedies provided in this agreement are cumulative with and not exclusive of the rights, powers or remedies provided by law independently of this agreement.

16.4 Entire agreement

This agreement, along with the relevant Project Terms, will constitute the entire agreement between the Principal, the Consultant and the Client in respect of the Services, and will supersede all previous agreements, understandings and negotiations in respect of the Services.

16.5 Priority

If there is inconsistency between this agreement and the Project Terms, the Project Terms will prevail to the extent of that inconsistency.

16.6 Variation and waivers in writing

- (a) A party may exercise a right, power or remedy at its discretion, and separately or concurrently with another right, power or remedy. A single or partial exercise of a right, power or remedy by a party does not prevent a further exercise of that or of any other right, power or remedy. Failure by a party to exercise or delay in exercising a right, power or remedy does not prevent its exercise.
- (b) Except where expressly provided in this agreement, a provision of or a right created under this agreement or the Project Terms may not be:
 - (i) waived except in writing signed by the party granting the waiver; or
 - (ii) varied except in writing signed by the parties.

16.7 Nature of the relationship

- (a) Nothing contained or implied in this agreement or the Project Terms constitutes a party the partner, agent or legal representative of another party or of the Client for any purpose or, subject to clause 16.7(b), creates any partnership, agency or trust, and no party has any authority to bind another party or the Client in any way.
- (b) The Client may at any time give a written direction to the Consultant giving it specific agency roles including contract administration functions that form part of the Services. The Client may specify in such written direction the limits of authority that the Consultant has in respect of the agency role and the Consultant must not act outside the scope of the authority conferred on it under any such direction.

16.8 Joint and several

If the Consultant is comprised of more than one person:

- (a) the obligations of those persons as the Consultant under this agreement are joint and several; and

- (b) the Principal or the Client may proceed against any or all of them in respect of the Consultant's obligations in the Principal's or the Client's absolute discretion. The Principal or the Client is not obliged to make any claim against all the persons comprising the Consultant.

16.9 Third Party Reliance

This Agreement shall not create any rights or benefits to parties other than the Client and the Consultant. The Client must not in any way (directly or indirectly) provide, allow or enable the Consultant's documents or opinions to be included or referred to in any written material or relied upon by any third party. No party other than the Client shall have the right to rely on the Consultant's documents or opinions rendered in connection with the Services.

The Client agrees to indemnify and hold the Consultant harmless against all claims by the Principal, the Principal's related bodies corporate or the Client's related bodies corporate in excess of the limit of liability in clause 9 and in respect of consequential loss that would be otherwise excluded through the operation of clause 9. Further any claims by the Principal, the Principal's related bodies corporate or the Client's related bodies corporate shall be counted towards the Consultant's limit of liability to the Client under this Agreement. For the avoidance of doubt, this means that if a claim is made by the Principal for its reliance on the Consultant's documents, any such amount will reduce the Consultant's liability to the Client in respect of the Services to which the document relates.

16.10 No assignment

The Consultant may not assign or otherwise deal with its rights under this agreement or the Project Terms or allow any interest in them to arise or be varied in each case, without the consent of the Principal (in respect of this agreement) or the relevant Client (in respect of the Project Terms).

16.11 Counterparts

This agreement may be executed in any number of counterparts which, when taken together, shall constitute one instrument.

EXECUTED as an agreement.

Schedule 1 - Form of Project Terms

Project Terms

Parties	Client and Consultant	
Client	Name	[#]
	ABN	[#]
	Address	[#]
	Fax	[#]
	Attention	[#]
Consultant	Name	[#]
	ABN	[#]
	Address	[#]
	Fax	[#]
	Attention	[#]

The parties agree that these Project Terms will be governed by the terms of the agreement entitled "Umbrella Agreement - Consultancy Services" dated between Glencore Coal Pty Ltd and the Consultant ("**Agreement**").

If there is inconsistency between the Agreement and these Project Terms, these Project Terms will prevail to the extent of that inconsistency.

1 Project

Insert a brief summary of the:

(a) *Project (ie business requirements of the Client relevant to provision of the Services); and*

(b) *purpose of procuring the Services.*

2 Services

Note: Insert details of Services here

	Description of Services (attach additional pages if required)
1.	

	Description of Services (attach additional pages if required)
2.	
3.	
4.	
5.	

3 Site(s)

[To be inserted]

4 Site Requirements

[To be inserted (if any)]

5 Term of Project

From [] to []

6 Program

The Consultant must deliver the Program for the Client's approval by [insert]

7 Stages

[To be inserted (if any)]

8 Milestone Dates and Payments

Note: Insert Milestone payment amounts against the Milestone Dates. If Milestone Payments are not applicable, mark as 'Not Applicable'

Milestone date	Milestone	Milestone Payment

9 Estimated total Fees

[To be inserted]

10 Special conditions for payment (if any)

[To be inserted]

11 Documentation

Note: Insert details of Documentation here, including required format and Milestone dates

	Documentation	Format	Milestone date
1.			

	Documentation	Format	Milestone date
2.			
3.			
4.			
5.			

12 Reporting

Note: Insert details of required reports, including content, frequency (eg. weekly, monthly) and dates due

Report type and content	Frequency or date

13 Progress meetings

Note: Insert details of attendees, frequency (eg. weekly, monthly) and place of meetings

Meeting	Attendees	Frequency	Place

14 Consultant's Representative

[To be inserted]

15 Client's Representative

[To be inserted]

16 Key Personnel

[To be inserted]

17 Special conditions

[To be inserted]

Executed as an agreement

EXECUTED on behalf of [] by its authorised representative:

.....
Signature

.....
Name (block letters)

.....
Date

EXECUTED on behalf of [] by its authorised representative:

.....
Signature

.....
Name (block letters)

.....
Date

Schedule 2 - Fees and Reimbursable Expenses

Part A: Schedule of Fees and Services

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
Assessment and Design			
Civil/Structural	<ul style="list-style-type: none"> ▣ Civil and structural design and assessment ▣ Preliminary and detailed design (pre-feasibility, feasibility, concept, definition) ▣ Decommissioning / closure (planning, design and management) ▣ Chemical and process infrastructure ▣ Design and installation criteria for piles ▣ Due diligence ▣ Feasibility studies and conceptual design ▣ Foundation studies and design ▣ Geographical information system (GIS) design, implementation and management ▣ Independent (third party) peer review ▣ Infrastructure condition assessments ▣ Master planning ▣ Mine waste management design ▣ Numerical modelling (structural assessment) ▣ Owner's engineer ▣ Physical modelling specification and supervision ▣ Risk Assessment ▣ Safety design and engineering ▣ Seismic design criteria 	Senior Principal Principal Engineer Senior Associate Engineer Associate Engineer Senior Engineer Project Engineer Graduate Engineer Principal Designer Senior Designer Designer Senior Drafter Drafter Health, Safety and Environment Support	\$243 \$189 \$180 \$150 \$135 \$124 \$102 \$162 \$135 \$120 \$124 \$78 \$164
<u>NSW Contact</u>			
Ian Leach			
Saul Martinez			
02 4985 3500			
Bruce Spry			
02 8925 5500			
<u>Queensland Contact</u>			
Chris Dann			
Mike Lipscombe			
07 3243 2111			

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
<p>Roads and Rail</p> <p><u>NSW Contact</u> Ian Leach 02 4985 3500 Grant Dwyer Ian Stelfox 02 8925 5500</p> <p><u>Queensland Contact</u> Christophe Kowalczyk 07 3243 2111</p>	<ul style="list-style-type: none"> ▣ Seismic risk studies and analysis ▣ Systems engineering, integration and technical assurance ▣ Feasibility studies and conceptual design (pre-feasibility, feasibility, concept) ▣ Preliminary and detailed design (selection, definition, detail) ▣ Corridor studies and other roadway / traffic studies ▣ Due diligence ▣ Foundation studies and design ▣ Independent peer review ▣ Infrastructure condition assessments ▣ Numerical modelling ▣ Pavement design, condition assessment and investigation (road design, analysis) ▣ Rail capacity and operations strategic planning consultancy ▣ Rail electrification and power engineering ▣ Risk Assessment ▣ Route studies and alignment design ▣ Safety design and engineering ▣ Signalling and telecommunications ▣ Systems engineering, integration and technical assurance 	<p>Senior Principal Principal Engineer Senior Associate Engineer Associate Engineer Senior Engineer Project Engineer Graduate Engineer Principal Designer Senior Designer Designer Senior Drafter Drafter Health, Safety and Environment Support</p>	<p>\$243 \$189 \$180 \$150 \$135 \$124 \$102 \$162 \$135 \$120 \$124 \$78 \$164</p>
<p>Geotechnical</p> <p><u>NSW Contact</u> Tim Rannard 02 8925 5500 Nick Maynard 02 4985 3500</p>	<ul style="list-style-type: none"> ▣ Analysis – slope stability, seepage, deformation ▣ Foundation studies and design ▣ Geotechnical tunnelling ▣ Physical modelling specification and supervision ▣ Site Supervision ▣ Preliminary and detailed design (selection, definition, detail) ▣ Geotechnical investigation, analysis and assessment of subsurface conditions ▣ Geotechnical surveillance of highwalls and dumps ▣ Dam designs (water dams and tailings dams) 	<p>Senior Principal Principal Engineer Senior Associate Engineer Associate Engineer Senior Engineer Project Engineer Graduate Engineer</p>	<p>\$243 \$189 \$180 \$150 \$135 \$124 \$102</p>

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
<u>Queensland Contact</u> Rob Campbell Todd Armstrong 07 3243 2111	<ul style="list-style-type: none"> ▣ Design and assessment of foundations (inc. piles) ▣ Diversion design ▣ Due diligence ▣ Geotechnical logging of rock core ▣ Geotechnical design of tunnel support ▣ Ground improvement design ▣ Independent peer review ▣ Levee designs ▣ Numerical modelling ▣ Pavement and hardstand design ▣ Foundation design ▣ Risk Assessment ▣ Safety design and engineering ▣ Seepage analysis and groundwater assessment and studies ▣ Seismic design criteria ▣ Seismic risk studies and analysis ▣ Slope stability assessment ▣ Tailings Storage Facility (TSF) and dam design ▣ Tailings management ▣ Dam Safety Committee (DSC) consultation and analysis 	Principal Designer Senior Designer Designer Senior Drafter Drafter Health, Safety and Environment Support	\$162 \$135 \$120 \$124 \$78 \$164
Mechanical and Electrical <u>NSW Contact</u> Ken Eppleston 02 8925 5500	<ul style="list-style-type: none"> ▣ Design of pump stations and pipelines ▣ Design of slurry handling systems and slurry pipelines ▣ Decommissioning (planning, design and management) ▣ Due diligence ▣ Feasibility studies and conceptual design ▣ Independent peer review ▣ Infrastructure condition assessments ▣ Mechanical and electrical 	Senior Principal Principal Engineer Senior Associate Engineer Associate Engineer Senior Engineer Project Engineer	\$243 \$189 \$180 \$150 \$135 \$124

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
<u>Queensland Contact</u> Darren Smith Christophe Kowalczyk 07 3243 2111	<ul style="list-style-type: none"> ▣ Numerical modelling ▣ Preliminary and detailed design ▣ Process control and design ▣ Rail electrification and power engineering ▣ Risk Assessment ▣ Safety design and engineering ▣ Signalling and telecommunications ▣ Systems engineering, integration and technical assurance 	Graduate Engineer Principal Designer Senior Designer Designer Senior Drafter Drafter Health, Safety and Environment Support	\$102 \$162 \$135 \$120 \$124 \$78 \$164
Planning and Management			
Environmental Assessment and Management <u>NSW Contact</u> Craig Wellings 02 4985 3500 David Adams 02 8925 5500 <u>Queensland Contact</u> Rob Storrs David Curwen 07 3243 2111	<ul style="list-style-type: none"> ▣ Air quality assessments, monitoring and modelling ▣ Asbestos surveys and assessment, removal and permitting ▣ Baseline environmental, health, heritage and ecological studies (air, marine and terrestrial) ▣ Closure planning and design ▣ Coastal process modelling and assessment, climate change and sea level fluctuation ▣ Compliance audits and reporting ▣ Contaminated land and sites auditing, investigation, management, remediation and monitoring ▣ Decommissioning and demolition ▣ Dredge plume modelling and monitoring ▣ Dredging and reclamation design, on and off shore dredge disposal assessments ▣ Due diligence and site audits ▣ Dust assessments and modelling ▣ Ecology fauna and flora assessments ▣ Ecology offset plans ▣ Economic assessments ▣ Environmental Authority negotiations ▣ Environmental Authority amendments ▣ Environmental and land use planning 	Senior Principal Principal Scientist Principal Engineer Senior Associate Scientist Senior Associate Engineer Associate Scientist Associate Engineer Senior Scientist Senior Engineer Project Scientist Project Engineer Graduate Scientist Graduate Engineer Principal Designer	\$243 \$189 \$189 \$165 \$180 \$141 \$150 \$126 \$135 \$115 \$124 \$102 \$102 \$162

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
	<ul style="list-style-type: none"> ▣ Environmental impact assessment, mitigation and monitoring ▣ Environmental management ▣ Environmental Management Plans (EMP) ▣ Environmental management systems planning, management and auditing ▣ Environmental baseline, compliance, and reference monitoring ▣ Geochemical assessments and management including acid metaliferous drainage, acid sulfate soils ▣ Geographical information system (GIS) design, implementation, interpretation and management ▣ Geophysical surveys, scientific siting of bores, plume delineation ▣ Hazardous materials surveys and assessment ▣ Introduced marine pest surveys, expert advice and reporting ▣ Laboratory liaison, procedures and data validation and verification ▣ Licence obligations, permitting and government approvals (including, but not limited to, Environmental Impact Statements, Environmental and Ecological Risk Assessments, Due Diligence Auditing, Contaminated Sites Auditing, Mining Proposals and Rehabilitation/Closure Plans) ▣ Mine waste management studies ▣ Tailings management, storage planning, design, modelling, and delivery (pumps and pipes) ▣ Natural resource management economics ▣ Noise assessment and management ▣ Numerical modelling ▣ Plan of Operations ▣ Regulatory Action Plans (RAP) ▣ Rehabilitation planning, design and management ▣ Remediation planning, design, implementation and management ▣ Risk Assessment ▣ Route studies and alignments ▣ Site assessment and remediation 	<p>Senior Designer Designer Senior Field Technician Field Technician Senior Drafter Drafter Health, Safety and Environment Support</p>	<p>\$135 \$120 \$124 \$93 \$124 \$78 \$164</p>

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
	<ul style="list-style-type: none"> Spill modelling Strategic Cropping Land (SCL) assessments Soil assessments, erosion and sediments management Stream and river diversion design Surface water release criteria determination Surface water sampling and assessment Sustainability services Water management Waste management Waste rock management, planning strategies, acid rock drainage, storage design closure capping Workplace health and safety services, human health and environmental risk assessments 		
<p>Water</p> <p><u>NSW Contact</u> Nick Maynard 02 4985 3500</p> <p>Tim Rannard 02 8925 5500</p> <p><u>Queensland Contact</u> Chris Dann Mike Phillips Mark Stewart 07 3243 2111</p>	<ul style="list-style-type: none"> Aquifer hydraulic parameter determination Artificial recharge, storage and recovery studies Assessment of flood and erosion risks Borefield design, construction and manage Catchment planning, modelling and management Coastal process modelling and assessment Control structures Compliance reporting Culverts and road crossings design Dams Dam construction support Dam safety assessments Dam geotechnical investigations and analysis Drainage design Drilling and sampling supervision Economic assessments 	<ul style="list-style-type: none"> Senior Principal Principal Scientist Principal Engineer Senior Associate Scientist Senior Associate Engineer Associate Scientist Associate Engineer Senior Scientist Senior Engineer Project Scientist Project Engineer Graduate Scientist Graduate Engineer 	<ul style="list-style-type: none"> \$243 \$189 \$189 \$165 \$180 \$141 \$150 \$126 \$135 \$115 \$124 \$102 \$102

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
	<ul style="list-style-type: none"> ■ Erosion assessments ■ Erosion protection design ■ Embankment design ■ Expert witness, landcourt reporting ■ Final void water assessments ■ Flood risk management ■ Flood modelling (1D, 2D, and 3D) ■ Flood mitigation design ■ Geographical information system (GIS) design, implementation and management ■ Geophysical surveys ■ Groundwater contamination ■ Groundwater flow and transport modelling, contaminant transport, particle tracking (2D and 3D) ■ Conceptual groundwater models and predictive groundwater modelling ■ Groundwater management services ■ Groundwater supply studies, mine water supply installations ■ Groundwater rebound modelling ■ Hydraulic testing and data analysis ■ Hydraulic structure design (dams/spillway, outlets, weirs) ■ Hydraulic infrastructure design (culverts, bridges, channels) ■ Hydrochemistry and hydrogeochemistry, trends, predictions, databases ■ Hydrogeological and groundwater assessments ■ Hydrologic and hydraulic modelling ■ Independent peer review ■ Integrated water cycle management ■ Integrated mine water management ■ Integrated surface water – groundwater modelling ■ Isotope hydrogeology ■ Make good water supply agreements, assessments, conditions 	<ul style="list-style-type: none"> Principal Designer Senior Designer Designer Senior Field Technician Field Technician Senior Drafter Drafter Health, Safety and Environment Support 	<ul style="list-style-type: none"> \$162 \$135 \$120 \$124 \$93 \$124 \$78 \$164

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
	<ul style="list-style-type: none"> ▣ Management of groundwater licensing processes ▣ Marine structures design ▣ Mine dewatering optimisation studies, open pit and underground mines ▣ Mine closure and rehabilitation for long term water impacts ▣ Monitoring programme design, installation and testing ▣ Physical modelling specification and supervision ▣ Port capacity modelling ▣ Ports and harbour feasibility, concept and detailed design ▣ Regulatory approvals and annual reporting ▣ Remote sensing ▣ Risk Assessment ▣ River and creek diversions ▣ Sea water intrusion ▣ Sediment basins ▣ Seepage assessments, water and waste infrastructure, mitigation ▣ Spill management, spillway design ▣ Stream and river diversion design and regulatory compliance ▣ Storm water management ▣ Surface water management ▣ System design ▣ Vadose zone evaluations, groundwater vulnerability ▣ Vulnerability assessments ▣ Waste management ▣ Water balance establishment and management ▣ Water balance modelling ▣ Water quality assessment and management ▣ Water quality and resources, waterway enhancement ▣ Water quality modelling and monitoring 		

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
	<ul style="list-style-type: none"> ▣ Water resources management ▣ Water trading ▣ Water treatment, potable water supply, AMD/ARD, Industrial water treatment ▣ Water, wastewater treatment and recycling ▣ Well infrastructure design and assessment ▣ Water transfer, network modelling, distribution networks, transfer mains, pump station design 		
Social	<ul style="list-style-type: none"> ▣ Communications planning and management ▣ Community and stakeholder consultation ▣ Economic assessments ▣ Geographical information system (GIS) design, implementation and management ▣ Risk Assessment ▣ Social impact assessment, management and planning ▣ Social investment and community development ▣ Social planning and economic impact assessments ▣ Sustainability services 	Senior Principal Principal Scientist Principal Engineer Senior Associate Scientist Senior Associate Engineer Associate Scientist Associate Engineer Senior Scientist Senior Engineer Project Scientist Project Engineer Graduate Scientist Graduate Engineer Principal Designer Senior Designer Designer Senior Field Technician Field Technician	\$243 \$189 \$189 \$165 \$180 \$141 \$150 \$126 \$135 \$115 \$124 \$102 \$102 \$162 \$135 \$120 \$124 \$93
<u>NSW Contact</u> Chris Fay 02 8925 5500			
<u>Queensland Contact</u> Pat Vidler 07 3243 2111			

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
		Senior Drafter Drafter Health, Safety and Environment Support	\$124 \$78 \$164
Project and Construction Management <u>NSW Contact</u> Ian Leach 02 8925 3500 Bruce Spry 02 8925 5500	<ul style="list-style-type: none"> ▣ Commissioning planning and management ▣ Construction supervision and management ▣ Contract management ▣ Economic assessments ▣ EPCM services ▣ Erosion and sediment management ▣ Feasibility studies ▣ Master planning and integrated planning ▣ Obtaining external approvals ▣ Peer review ▣ Procurement management ▣ Project close-out ▣ Project controls and documentation ▣ Project management ▣ Report preparation ▣ Risk Assessment ▣ Site supervision ▣ Subcontractant and subcontractor management ▣ Tender document preparation and review 	Senior Principal Principal Scientist Principal Engineer Senior Associate Scientist Senior Associate Engineer Associate Scientist Associate Engineer Senior Scientist Senior Engineer Project Scientist Project Engineer Graduate Scientist Graduate Engineer Principal Designer Senior Designer Designer Senior Field Technician Field Technician Senior Drafter	\$243 \$189 \$189 \$165 \$180 \$141 \$150 \$126 \$135 \$115 \$124 \$102 \$102 \$162 \$135 \$120 \$124 \$93 \$124
<u>Queensland Contact</u> John O'Donovan 07 3243 2111			

Services Provided	Capabilities	Discipline	Hourly Rate (excl. GST)
		Drafter Health, Safety and Environment Support	\$78 \$164

Expert witness services are also available; however rates and any special conditions will need to be negotiated separately.

Part B: Reimbursable Expenses

The Consultant will be entitled to seek reimbursement for the following expenses only:

- pre-approved travel and accommodation expenses; and
- document reproduction and delivery charges.

Schedule 3 - Form of Change Order

Change Order

This Change Order serves to vary the Project Terms in accordance with the terms set out below. Unless specifically stated in this Change Order, all terms and conditions of the Project Terms continue unaffected.

Change Order number	
Details of change	
Effective date of change	
Effect on Services	
Effect on Milestone Dates and Payments	
Effect on Documentation	
Plan for implementing the change	
Other matters	

Client

Name (print)

Position

Signature

Date

Consultant

Name (print)

Position

Signature

Date

Schedule 4 - Consultant's Statement

PART A – CONSULTANT'S DECLARATION

Statutory declaration in the matter of Consultancy Services Agreement dated *[insert Date]* (**Contract**) between *[insert Name of Principal]* ABN *[insert ABN number]* (**Principal**) and *[insert Name of Consultant]* ABN *[insert ABN number]* (**Consultant**).

I, *[insert Name]* (**declarant**) of *[insert Name of Consultant]* in the state of *[insert State]* *[insert occupation]*, do solemnly and sincerely declare that:

- 1 I have knowledge of the relevant facts and am authorised by the Consultant to make this statutory declaration on its behalf;
- 2 all remuneration payable to employees of the Consultant for the Services during the period from the date of commencement of the Services to the date of this statutory declaration has been paid;
- 3 all amounts properly payable by the Consultant to its consultants, suppliers and subconsultants in respect of the Services have been paid; and
4. the premiums for all insurance policies required to be effected by Consultant under the Contract have been paid.

AND I MAKE this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *[Insert name of relevant legislation in the Jurisdiction concerning the making of declarations, eg Oaths Act 1867 (QLD), Oaths Act 1900 (NSW)]*.

DECLARED at *[insert place]* this *[insert Date]* before me:

Signature of authorised witness

Name of authorised witness (block letters)

Address of authorised witness

Capacity in which authorised witness
takes the statutory declaration

Signature of declarant

PART B – CONSULTANT’S STATEMENT (NSW ONLY)

See next page.



SUBCONTRACTOR'S STATEMENT

REGARDING WORKER'S COMPENSATION, PAYROLL TAX AND REMUNERATION (Note1 – see back of form)

For the purposes of this Statement a "subcontractor" is a person (or other legal entity) that has entered into a contract with a "principal contractor" to carry out work.

This Statement must be signed by a "subcontractor" (or by a person who is authorised, or held out as being authorised, to sign the statement by the subcontractor) referred to in any of s175B *Workers Compensation Act 1987*, Schedule 2 Part 5 *Payroll Tax Act 2007*, and s127 *Industrial Relations Act 1996* where the "subcontractor" has employed or engaged workers or subcontractors during the period of the contract to which the form applies under the relevant Act(s). The signed Statement is to be submitted to the relevant principal contractor.

SUBCONTRACTOR'S STATEMENT (Refer to the back of this form for Notes, period of Statement retention, and Offences under various Acts.

Subcontractor: ABN:

of

has entered into a contract with ABN: **(Note 2)**

Contract number/Identifier **(Note 3)**

This Statement applies for work between:/...../..... and/...../..... Inclusive, **(Note 4)**

subject of the payment claim dated:/...../..... **(Note 5)**

I, a Director or a person authorised by the Subcontractor on whose behalf this declaration is made, hereby declare that I am in a position to know the truth of the matters which are contained in this Subcontractor's Statement and declare the following to the best of my knowledge and belief:

- (a) The abovementioned Subcontractor has either employed or engaged workers or subcontractors during the above period of this contract. Tick [] if true and comply with (b) to (g) below, as applicable. If it is not the case that workers or subcontractors are involved or you are an exempt employer for workers compensation purposes tick [] and only complete (f) and (g) below. You must tick one box. **(Note 6)**
- (b) All workers compensation insurance premiums payable by the Subcontractor in respect of the work done under the contract have been paid. The Certificate of Currency for that Insurance is attached and is dated/...../..... **(Note 7)**
- (c) All remuneration payable to relevant employees for work under the contract for the above period has been paid. **(Note 8)**
- (d) Where the Subcontractor is required to be registered as an employer under the *Payroll Tax Act 2007*, the Subcontractor has paid all payroll tax due in respect of employees who performed work under the contract, as required at the date of this Subcontractor's Statement. **(Note 9)**
- (e) Where the Subcontractor is also a principal contractor in connection with the work, the Subcontractor has in its capacity of principal contractor been given a written Subcontractor's Statement by its subcontractor(s) in connection with that work for the period stated above. **(Note 10)**

(f) Signature Full name.....

(g) Position/Title Date/...../.....

NOTE: Where required above, this Statement must be accompanied by the relevant Certificate of Currency to comply with section 175B of the *Workers Compensation Act 1987*.

Notes

1. This form is prepared for the purpose of section 175B of the *Workers Compensation Act 1987*, Schedule 2 Part 5 *Payroll Tax Act 2007* and section 127 of the *Industrial Relations Act 1996*. If this form is completed in accordance with these provisions, a principal contractor is relieved of liability for workers compensation premiums, payroll tax and remuneration payable by the subcontractor.

A principal contractor can be generally defined to include any person who has entered into a contract for the carrying out of work by another person (or other legal entity called **the subcontractor**) and where employees of the subcontractor are engaged in carrying out the work which is in connection with the principal contractor's business.

2. For the purpose of this Subcontractor's Statement, a principal contractor is a person (or other legal entity), who has entered into a contract with another person (or other legal entity) referred to as the subcontractor, and employees/workers of that subcontractor will perform the work under contract. The work must be connected to the business undertaking of the principal contractor.
3. Provide the unique contract number, title, or other information that identifies the contract.
4. In order to meet the requirements of s127 *Industrial Relations Act 1996*, a statement in relation to remuneration must state the period to which the statement relates. For sequential Statements ensure that the dates provide continuous coverage.

Section 127(6) of the *Industrial Relations Act 1996* defines remuneration 'as remuneration or other amounts payable to relevant employees by legislation, or under an industrial instrument, in connection with work done by the employees.'

Section 127(11) of the *Industrial Relations Act 1996* states 'to avoid doubt, this section extends to a principal contractor who is the owner or occupier of a building for the carrying out of work in connection with the building so long as the building is owned or occupied by the principal contractor in connection with a business undertaking of the principal contractor.'

5. Provide the date of the most recent payment claim.
6. For Workers Compensation purposes an exempt employer is an employer who pays less than \$7500 annually, who does not employ an apprentice or trainee and is not a member of a group.
7. In completing the Subcontractor's Statement, a subcontractor declares that workers compensation insurance premiums payable up to and including the date(s) on the Statement have been paid, and all premiums owing during the term of the contract will be paid.
8. In completing the Subcontractor's Statement, a subcontractor declares that all remuneration payable to relevant employees for work under the contract has been paid.
9. In completing the Subcontractor's Statement, a subcontractor declares that all payroll tax payable relating to the work undertaken has been paid.
10. It is important to note that a business could be both a subcontractor and a principal contractor, if a business 'in turn' engages subcontractors to carry out the work. If your business engages a subcontractor you are to also obtain Subcontractor's Statements from your subcontractors.

Statement Retention

The principal contractor receiving a Subcontractor's Statement must keep a copy of the Statement for the periods stated in the respective legislation. This is currently up to seven years.

Offences in respect of a false Statement

In terms of s127(8) of the *Industrial Relations Act 1996*, a person who gives the principal contractor a written statement knowing it to be false is guilty of an offence if:

- (a) the person is the subcontractor;
- (b) the person is authorised by the subcontractor to give the statement on behalf of the subcontractor; or
- (c) the person holds out or represents that the person is authorised by the subcontractor to give the statement on behalf of the subcontractor.

In terms of s175B of the *Workers Compensation Act* and clause 18 of Schedule 2 of the *Payroll Tax Act 2007* a person who gives the principal contractor a written statement knowing it to be false is guilty of an offence.

Further Information

For more information, visit the WorkCover website www.workcover.nsw.gov.au, Office of State Revenue website www.osr.nsw.gov.au, or Office of Industrial Relations, Department of Commerce website www.commerce.nsw.gov.au. Copies of the *Workers Compensation Act 1987*, the *Payroll Tax Act 2007* and the *Industrial Relations Act 1996* can be found at www.legislation.nsw.gov.au.

Signing page

DATED: 1st April 2014

SIGNED by *ANTHONY EGAN*
as authorised representative for)
GLENCORE COAL PTY)
LTD in the presence of:)

Bill Maynard
.....
Signature of witness)

NICK MAYNARD
.....
Name of witness (block letters))

[Signature]
.....
By executing this agreement the
signatory warrants that the
signatory is duly authorised to
execute this agreement on behalf
of **GLENCORE COAL PTY
LTD**

SIGNED by *Saul Martinez*
as authorised representative for)
URS AUSTRALIA PTY LTD)
in the presence of:)

Bill Maynard
.....
Signature of witness)

NICK MAYNARD
.....
Name of witness (block letters))

[Signature]
.....
By executing this agreement the
signatory warrants that the
signatory is duly authorised to
execute this agreement on behalf
of **URS AUSTRALIA PTY
LTD**



GOVERNMENT OIL & GAS INFRASTRUCTURE POWER INDUSTRIAL

URS is a leading provider of engineering, construction, technical and environmental services for public agencies and private sector companies around the world. We offer a full range of program management; planning, design and engineering; systems engineering and technical assistance; construction and construction management; operations and maintenance; and decommissioning and closure services for power, infrastructure, industrial and commercial, and government projects and programs.

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