Further Assessment and Design Works Program

for

McArthur River Mine

May 2012

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Document History and Status

Issue	Revision	Issued to	Qty	Date	Reviewed by
1	1 (Draft)	METSERVE	1	7.5.2012	DM/BH
2	2 (Draft)	METSERVE	1	10.5.2012	DM
3	3 (Final draft)	METSERVE	1	17.5.2012	DM/BH/AB
4	4 (Final)	Xstrata	1	21.5.2012	JH

MET Serve Project Delivery System

Printed: **29 May 2012**
Last saved: **29 May 2012**
File ID: **00193963**
Project Manager: **Dave Moss**
Name of Organisation: **Xstrata Zinc**
Name of Project: **MRM Phase 3 Development Project**
Name of Document: **Further Works Program**
Document Version: **004**
Project Number: **XZ003**

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1 INTRODUCTION

This document provides an overview of the commitment to further environmental and engineering works that will be undertaken at McArthur River Mine (MRM). The work has been classified on the basis of area of focus within the mine and by discipline.

1.1 REPORTING

Updated progress and results of the studies outlined in this document will be presented annually in the MRM Sustainable Development Mining Management Plan (MMP). Any delays or required alternation to the work will also be outlined and justified in the MMP, as will any further study requirements that are identified.

2 OVERBURDEN CHARACTERISATION

2.1 OBJECTIVE

Improved overburden characterisation is required to better understand its long-term behaviour and potential environmental impact. This has applications across the project area, including the Overburden Emplacement Facilities (OEFs), the Tailings Storage Facility (TSF) and the final pit void.

2.2 STANDARD GEOCHEMICAL CHARACTERISATION

In late 2011, 915 overburden samples were collected from 18 drillholes for geochemical analysis. All of these samples are undergoing standard geochemical analysis including:

- Total Sulphur
- Net Acid Production Potential (NAPP) including:
    - Total Sulphur (S)
    - Acid Production Potential (APP)
    - Acid Neutralising Capacity (ANC)
- Net Acid Generation (NAG)
- Total Carbon (C)

These tests form the basis for Acid-Base Accounting techniques used to determine the classification of overburden material as either potentially acid forming (PAF) or non-acid forming (NAF).

2.3 SPECIALISED GEOCHEMICAL CHARACTERISATION

Results from the standard geochemical characterisation will be reviewed and interpreted by suitably qualified and experienced geochemists to determine any necessary specialised geochemical analysis that may be required (e.g. sulphur speciation, carbon speciation, kinetic NAG testing, sodicity, dispersion, multi-element analysis, etc.) for a detailed characterisation of the overburden material at MRM.

A report will be produced outlining the analysis undertaken, results, conclusions and recommendations. This will have applications in the improvement of the understanding of overburden material within the OEFs, the tailings material in the TSF and the chemistry of the planned final void surface of the open cut.

2.4 GEOLOGICAL BLOCK MODEL

In addition to the standard suite of geochemical characterisation analyses, the 915 overburden samples are also being tested for parameters which are used in the current MRM geological block model (maintained by Quantitative Group (QG)). This analysis included:

- Zinc (Zn)
- Lead (Pb)
- Silver (Ag)
- Iron (Fe)

- Copper (Cu)
- pH

The results from this analysis will be used to increase the resolution and reliability of the block model and will improve the prediction accuracy of PAF material.

2.5 FIELD PAF/NAF CLASSIFICATION

Classification of PAF and NAF material is currently based on the geological block model and the geological understanding of the ore body and overburden. A recent drilling program was undertaken targeting the hanging-wall waste material to increase the data density of the geological block model. Visual checks by the Pit Technicians are conducted on blasted material to confirm the accuracy of the block model predications prior to allocating material to PAF or NAF locations within the OEFs.

A site visit from an experienced and suitability qualified geochemist is planned to review the current in-field PAF/NAF classification processes and to provide an updated procedure. The review will seek opportunities to apply classification techniques independent of the block model predications, such as the use of samples from the drilling conducted to place blasting charges, while maintaining the use of geological block model predictions and visual assessment by Pit Technicians.

3 OVERBURDEN EMPLACEMENT FACILITY

3.1 OBJECTIVE

The OEFs are permanent structures designed to accommodate the overburden material extracted in the mining process. The North OEF (NOEF) and West OEF (WOEF) accommodates both PAF and NAF material, while the South OEF (SOEF) and East OEF (EOEF) will only receive NAF material. Following the overburden characterisation work outlined in **Section 2**, the following studies will be conducted to make any necessary improvement to the OEF design.

3.2 GEOCHEMICAL ASSESSMENT

A geochemical assessment of the OEFs will be conducted, primarily focusing on the NOEF where PAF material will ultimately be stored in discrete cells within NAF material and lined by impermeable clay.

The results of the overburden characterisation investigation (**Section 2**) will provide an improved understanding of the nature and distribution of PAF and NAF material that will serve as a basis for this review of the OEFs.

3.2.1 PAF Cell Geochemistry

Geochemical assessment of the PAF material will be conducted to determine the long-term behaviour of the PAF cells within the NOEF based on the current design and construction processes. The investigation will primarily focus on the potential for acid leachate from the PAF material and the heavy metal mobilisation that could be associated with such leachate, but will also address concerns over the potential for circumneutral drainage and other forms environmental contamination.

3.2.2 NAF Geochemistry

The geochemistry of the NAF material will be better understood following the geochemical analysis outlined in **Section 2**. Of particular focus will be the potential for NAF material to act as an acid-buffer to mitigate acid leachate. NAF material will also be assessed, utilising techniques such as column leach testing, for any potential seepage of environmental contaminants including the potential for circum-neutral drainage.

3.2.3 Clay Liner Chemistry

Clay material is sourced on site for use as a 600 mm liner in the NOEF to prevent water and oxygen infiltration to the PAF cells, and exfiltration of potentially contaminated leachate. The geochemistry of the clay will be assessed in this investigation, to confirm its suitability for this purpose, particularly to examine the susceptibility of the clay to chemical degradation such as any potential interactions with the PAF or NAF material.

3.3 GEOTECHNICAL ASSESSMENT

3.3.1 Clay Liner Review

The clay material will be classified and reviewed by a suitably qualified and experienced geotechnical engineer to confirm its suitability as a clay liner for the NOEF. Particular focus will be given to confirming the optimal thickness (currently 600 mm) and moisture content of the clay liner and its long-term stability and susceptibility to cracking during extended dry periods. Any alternative liner materials identified will be assessed in comparison to the current clay material used.

3.3.2 Final NOEF Cover Design

The cover design of the NOEF will be reviewed to assess the required thickness of the NAF cover that insulates the PAF cells from the environment.

The final cover design will also be reviewed to determine whether the clay liner material is sufficiently covered to maintain optimal moisture levels and determine the potential for cracking and degradation of the clay as a result of periods of variable moisture.

4 TAILINGS STORAGE FACILITY

4.1 OBJECTIVE

Tailings are deposited into the TSF, currently divided into three cells, soon to be four with the construction of an additional Cell. Cell 1 had tailings deposited by central thickened discharge and has been decommissioned and is undergoing rehabilitation. Cell 2 is currently used for tailings deposition (at approximately 48-53% solids). Cell 3 is currently used as a water management dam (WMD).

Within two years of tailings disposal in Cell 1, elevated sulphate was observed through routine monitoring of nearby Surprise Creek. While Pb and Zn concentrations have remained at background concentrations, a 2011 hydrogeochemical report on the TSF identified the potential for Pb and Zn breakthrough and the generation of acid leachate from the tailings.

MRM is committed to mitigating seepage from the TSF and will consider all available options, including but not limited to the reprocessing of tailings or relocation of TSF Cell 1. The following investigations will be conducted to determine the optimal seepage mitigation techniques and to identify potential improvements to the TSF design.

4.2 GEOCHEMICAL ASSESSMENT

A geochemical assessment of the tailings will be conducted to improve the understanding of this material and to develop any necessary strategies to mitigate environmental impacts (such as seepage). The review of the overburden material (**Section 2**) will have applications in the understanding of the tailings material.

4.2.1 Literature Review

The geochemists will conduct a review and evaluation of all available documentation relating to the TSF. This review will be used to determine knowledge gaps and develop a detailed plan of works for the geochemical review of the tailings.

4.2.2 Site Investigation

The geochemists will conduct site visits as required to investigate the seepage and to conduct sampling. Multiple, or even regular visits may be required by the geochemists.

4.2.3 Tailings Characterisation

Geochemical investigation of the tailings material will be conducted to characterise the material and determine its long-term behaviour. This work will assess the potential for tailings acidification, the acid neutralising potential of the tailings and the possibility of environmental contamination from the TSF. A detailed plan of works will be determined by a suitably qualified and experienced geochemist and may involve long-term column leach testing.

4.2.4 Recommendations

The investigation into seepage from the TSF will be multi-disciplinary (including geophysical, ecological and geotechnical investigations). Recommendations for seepage mitigations will be supplied by the geochemists to mitigate seepage from the TSF and manage tailings material long-term.

4.2.5 Monitoring

As well as the geochemical report on the tailings characterisation and seepage, a suitable long-term geochemical monitoring program will be developed and implemented to determine the progress of the selected mitigation techniques.

4.3 GEOPHYSICAL ASSESSMENT

4.3.1 Seepage Review

A geophysical investigation of TSF seepage will be conducted by suitably qualified and experienced geophysicists. This investigation will characterise the seepage from the TSF, identify preferential pathways of the seepage plume, and provide mitigation recommendations.

4.3.1.1 Literature Review

The geophysicists will conduct a review and evaluation of all available documentation relating to the TSF. This review will be used to determine knowledge gaps and develop a detailed plan of works for the geophysical review of the tailings.

4.3.1.2 Site Investigation

The geophysicists will conduct site visits as required to coordinate the collection of geophysical data. Multiple, or even regular visits may be required by the geophysicists.

4.3.1.3 Recommendations

The investigation into seepage from the TSF will be multi-disciplinary (including geochemical, ecological and geotechnical investigations). Recommendations for seepage mitigations will be supplied by the geophysicists to mitigate seepage from the TSF and manage tailings material long-term.

4.3.1.4 Monitoring

The geophysicists will also be responsible for developing any required long-term geophysical monitoring program to monitor the progress of seepage mitigation efforts. The monitoring frequency and geophysical techniques used will be determined by the geophysicist based on their investigations of the TSF and the mitigation techniques selected.

4.4 GEOTECHNICAL REVIEW

A suitably experienced and qualified geotechnical engineer will be commissioned to conduct a review of the TSF, its seepage, overall design and final cover design.

4.4.1 Seepage Review

4.4.1.1 Literature Review

The geotechnical engineers will conduct a review and evaluation of all available documentation relating to the TSF. This review will be used to determine knowledge gaps and develop a detailed plan of works for the geotechnical review of the TSF.

4.4.1.2 Site Investigation

The geotechnical engineers will conduct site visits as appropriate during their investigation of the TSF and during the implementation of the selected TSF mitigation techniques as required.

4.4.2 Tailings Cover Design Review

A review of the selected final cover design of the TSF is required to ensure the tailings material will be adequately stored as TSF cells are decommissioned and rehabilitated. This investigation will also include characterisation of the clay capping material used and justification for its use, and recommendations for improvements.

4.4.3 Recommendations

The geotechnical investigation will produce recommendations for seepage mitigation works required as part of the multi-disciplinary study of the TSF seepage. Recommendations for the final design cover and any required changes to the TSF design will also be documented.

5 GROUNDWATER

5.1 OBJECTIVE

Groundwater studies at MRM will be focussed on refining estimates of inflow into the final void and its water quality. This work will have major implications for the final closure options for the void and the operational water balance and management. Investigations into sulphate mitigation and groundwater monitoring will also continue on site.

5.2 GROUNDWATER MONITORING

Groundwater modelling at MRM will continue and additional monitoring points will be selected to collect data to improve groundwater modelling accuracy.

5.3 GROUNDWATER MODELLING

Investigation of the basement dolomite hydrology is under development to improve the understanding of deep pit inflows and the hydrogeological processes that will determine final void pit lake levels.

5.4 OTHER HYDROGEOLOGICAL INVESTIGATIONS

A management plan for shallow pit seepage aimed at reducing sulphate inflows prior to the 2012-2013 wet season is currently underway.

6 SURFACE WATER

Further surface water studies may be required depending on the results of planned groundwater investigations and cannot be ruled out at this stage. Any change in the water balance that results from groundwater investigations may necessitate a refinement of the site water management infrastructure.

The details of any planned surface water studies will be published in the annual Sustainable Development Mining Management Plan.

7 ECOLOGY

7.1 OBJECTIVE

Ecology work at MRM will be comprised of continuing monitoring and surveying, the development of a Pest Animal Management Plan, and further ecotoxicological (metals) investigations.

7.2 TERRESTRIAL FLORA AND FAUNA SURVEYS

Terrestrial flora and fauna surveys will continue to be conducted at MRM on a regular basis and will be comprised of field verification surveys incorporating quantitative and opportunistic sampling in the proposed Project expansion areas and ongoing assessment of habitats and ecosystems.

7.3 AQUATIC ECOLOGY MONITORING

Ongoing monitoring of aquatic ecology will provide further information to determine site waste discharge licence conditions.

7.3.1 Fish Monitoring

Fish Monitoring will continue at MRM. Objectives of the fish monitoring program are to:

- monitor fish populations in permanent and semi-permanent pools

- monitor populations of the freshwater sawfish, a Vulnerable species (EPBC Act)
- monitor fish diversity in temporary or semi-permanent pools and riffles
- monitor heavy metal levels in aquatic biota
- monitor fish passage success through the McArthur River Channel by:
    - implementing a tagging program of key fish species
    - assessing temporal migration patterns of the fish within the river and determining habitat associations and the utilisation of the Channel
    - sampling of key sites within the Channel as well as both upstream and downstream.

7.3.2 Macroinvertebrate Monitoring

Macroinvertebrate monitoring will continue at MRM. Objectives of the macroinvertebrate monitoring program include:

- collation of baseline data on the distribution and abundance of aquatic macroinvertebrates in selected habitats within the McArthur River and associated tributaries
- monitoring of aquatic macroinvertebrates following commencement of the operational phase of the McArthur River and Barney Creek Channel
- collection of surface water and fluvial sediment data at macroinvertebrate sampling sites
- collation of environmental variable data at macroinvertebrate sites
- analysis of macroinvertebrate data to provide comparison between treatments (exposed, channel and reference sites).

7.4 Pest Animal Management Plan

MRM is committed to the production of a Pest Animal Management Plan as outlined in the EIS.

7.5 Ecotoxicology Assessment

Ecotoxicology investigations are continuing. Results of the ecotoxicology assessment will factor in to the selection of TSF mitigation techniques identified in the investigations outlined in **Section 4**. This work will also inform application documentation for required waste discharge licences.

8 THE FINAL VOID

8.1 Objective

Further studies regarding the final void will be conducted to improve predictions of final void water level, water quality and potential environmental impacts associated with the various closure options.

8.2 Final Void Geochemical Characterisation

The drilling program conducted in late-2011 provides the opportunity to investigate the predicted final void surface geochemistry where drillholes have intersected with the planned final void surface, or where they have intersected strata that are representative of the final void surface.

In conjunction with the standard and specialised geochemical characterisation of overburden outlined in **Section 2**, a geochemical analysis of the final void surface geochemistry will be conducted. This investigation will characterise material that will ultimately remain exposed following the cessation of mining, determine its potential long-term chemical behaviour, and outline potential implications for the final void water chemistry.

Results and recommendations will be incorporated in a review of the final closure options for the void.

8.3 CLOSURE OPTIONS

While closure options for the final void have been outlined in the draft EIS, the multi-disciplinary studies outlined in the document will have applications in the decision making process for selecting the optimal closure scenario.

This final decision will be based on the results and recommendations of the following works:

- Geochemical modelling of the predicted final void surface
- Hydrogeological modelling of inputs to the final void
- Predicted final water chemistry (hydrogeochemical analysis).

9 IRRIGATION SCHEME

9.1 OBJECTIVE

The Project is expected to generate water at rates the order of 30 to 40 Ml per day. Most water will be managed within existing and proposed water storage facilities. It is proposed that excess water will be directed to irrigation. A more detailed evaluation of site suitability and constraints is now required to develop a detailed design plan.

An on-site feasibility study is required to positively establish the suitability of proposed soils and the sites for irrigation development and preparation of a management plan. This will include:

- Site soil survey.
- Impact assessment modelling and analysis for soils, surface water and groundwater.
- Conceptual irrigation system design (potential pivot and flood irrigation areas).
- Management plan including crop establishment, crop management, irrigation management, cattle management monitoring plan, and operational resources and skill requirements.
- Monitoring requirements.
- Risk management plan.

9.2 SOIL SURVEY

Based on a desktop evaluation of available land system and soil mapping, a number of target areas have been identified for field investigation and soil surveying to establish suitability for irrigated pasture development.

Target sampling areas have been prioritised on the following criteria:

- Areas outside existing and planned infrastructure and known sites of cultural heritage significance.
- First preference for pivot irrigation or red and yellow Dermosols (better drained soils).
- Second preference of flood irrigation of black Vertosols (seasonally waterlogged soils).
- Proximity to the proposed Cell 4 WMD to be constructed adjacent the TSF, in order to minimise pipeline distance.
- Areas deemed suitable for grazing management.
- Proximity to access infrastructure.
- Slopes generally less than 4 degrees.

Target sampling areas are not constrained with respect to location within or outside the mineral lease boundary.

9.2.1 Site condition and erosion survey

With consideration to identified soil types, a high level erosion assessment will be developed to:

- Identify areas of current erosion.
- Identify type of erosion.
- Identify erosion hazards (potential erosion from changed management) from a desktop study.
- Identify management measures by erosion type.

This assessment will be carried out according to Work Instruction *QWI-008 Site surveying and mapping.* Erosion condition will be recorded using *QMF-061 Erosion Survey Form.*

9.2.2 Soil profile characterisation

Soil pit sampling and profile characterisation will be carried out at an intensity sufficient to map soils to a scale of 1:25:000. This will involve sampling at a density of approximately 1 pit every 6.25 ha. Based on the minimum required area of 125 ha, this equates to 20 sampling pits. Provision for sampling of 25 pits has been made based on sampling the immediate buffer of the target irrigation area, and allowance for sampling of sites that prove unsuitable due to soil depth, impeding layers, sub-soil physical or chemical conditions etc.

Initial cores will be excavated by hand auguring at the time of the initial site reconnaissance. This will be followed by pit excavation for more detailed profile characterisation using a backhoe or excavator. Subject to local soil conditions, a tracked excavator may be required. Procedures for soil pit excavation are detailed in Safe Work Method *QWM-005 Machine based excavation for soil sampling*.

Soil profile parameters will be collected using the methodology outlined in the Australian Soil and Landscape Field Handbook, 2009. Procedures are outlined in Work Instructions *QWI-006 Land Assessment.* Consistent with McKenzie et al (2008), detailed profile characterisation will be carried out at approximately 30% of sampling sites. Mapping observation pits will be carried out at the balance of sites. Procedures are outlined in Work Instructions *QWI-001 Detailed Profile Characterisation* and *QWI-002 Mapping Observation pit characterisation.* Site data for detailed profile characterisation pits will be recorded using *QMF-054 Detailed pit sampling proforma,* and using *QMF-055 Mapping Observation pit sampling proforma* for mapping observation pits. *QMF-056 Soil pit proforma parameter codes* details relevant codes for these forms.

9.2.3 Soil chemical analysis

Consistent with McKenzie et al (2008), it is proposed that all detailed profile characterisation sites be analysed for chemistry. Samples will be collected from 10 cm deep intervals throughout the profile at the depths illustrated in *QMF-056 Soil pit proforma parameter codes*. Chain of custody for samples will be controlled through either *QMF-057 Chain of Custody Soils and Foliar TCT* or the equivalent provided by a NATA Certified laboratory.

A standardised set of soil chemical analysis sufficient to adequately characterize the soil profile suitability for irrigation development and to provide parameters for input to key models is set out in *QWI-007 Soil laboratory analysis for irrigated land use evaluation.*

9.3 IMPACT ASSESSMENT

The results from site and soil surveying will be used to provide input to quantitative and qualitative assessments of likely impacts of irrigation on soils, surface waters and ground-waters, and to inform management requirements.

9.3.1 Soils

Modelling/Analysis approach	Outcome
Water balance modelling using How Leaky	Estimation of crop water use demand (transpiration), evaporation, runoff and deep drainage to inform maximum irrigation application rates, frequency of irrigation and irrigation system hydraulic design. Modelling to be carried out using long term climate data (SILO Data Drill).
Soil rootzone salinity using SALF	Steady state root zone salinity modelling to estimate expected root zone salinity under current land use, and future root zone salinity resulting from long-term irrigation. This will allow estimation of the impact on crop sustainability.
Soil leaching fraction using SALF	Estimation of the maximum proportion of applied water (rainfall plus irrigation) leaching below the root zone under current land use and long-term irrigation. This provides an estimate of the maximum capacity of the soils to allow leaching of salts applied in irrigation water.
Soil deep drainage estimation using SALF	Quantification of the volume applied water (rainfall plus irrigation) leaching below the root zone under current land use and long-term irrigation. This will provide inputs on salt load and water volume inputs to the estimation of groundwater and lateral seepage impacts.
Crop yield modelling using SALF	Estimation of potential crop yield decline due to accumulation of salts in the root zone.
Leaching requirement using Rhodes Equation	The required level of leaching to avoid accumulation of salts in the root zone. This will allow evaluation of the minimum leaching requirement to remain below a maximum root zone salinity. In combination with the maximum leaching capacity from SALF modelling, this allows evaluation of the capacity of a soil to sustain irrigation.
Plant available water content (PAWC)	Estimation of plant available soil water holding capacity (PAWC) using effective rooting depth and a pedo-transfer function. PAWC is a key parameter in designing irrigation rates and scheduling, to maximise crop water use, and reduce deep drainage, runoff, and risk of erosion.

Modelling/Analysis approach	Outcome
Soil sodicity/permeability impacts – interaction of ESP and SAR	Direct evaluation of TEC analysis and assessment of permeability to quantify relative and absolute changes in soil permeability due to a range of possible irrigation water qualities, and to inform required chemical amendment of water prior to irrigation to maintain acceptable permeability.
Soil and crop nutrient buffer capacity	Direct estimation of soil and crop capacity to absorb and buffer nutrients applied in irrigation water and management treatments. Provides input of nutrient loss as runoff and leaching below the root zone as input into assessment of surface and groundwater impacts.

9.3.2 Surface Water

Modelling/Analysis approach	Outcome
Flow regime	Using estimates of runoff volumes (this study), topography and surface water flow volumes (based on prior studies), estimate impacts on surface water flow regime. This will be a high level evaluation, and may suggest the need for more intensive sampling model development if impacts are indicated to be significant, or more detailed investigation is required by the regulator.
Water quality	Using estimates of runoff volumes, nutrient concentrations and erosion hazards (this study), topography, surface water flow volumes and stream water quality (based on prior studies) estimate impacts on surface water quality and evaluate water quality against ANZECC guideline standards. This will be a high level evaluation, and may suggest the need for more intensive sampling model development if impacts are indicated to be significant, or more detailed investigation is required by the regulator.

9.3.3 Groundwater

Modelling/Analysis approach	Outcome
Groundwater recharge	Based on estimates of deep drainage under rain-fed and irrigation conditions, (this study), estimate the proportional increase in groundwater recharge from irrigation. This will be a high level evaluation, and may suggest the need for more intensive sampling and groundwater model development if impacts

	are indicated to be significant, or more detailed investigation is required by the regulator.
Groundwater quality	Using estimates of deep drainage and nutrient concentrations (this study), groundwater depth, volume, water quality and geological stratigraphy (based on prior studies) qualitatively estimate impacts on groundwater quality, and fate of nutrients leaching to groundwater. This will be a high level evaluation, and may suggest the need for more intensive sampling and groundwater model development if impacts are indicated to be significant, or more detailed investigation is required by the regulator.

9.4 CONCEPTUAL IRRIGATION SYSTEM DESIGN

Using the baseline studies and environmental impact analyses, a draft irrigation system location design will be prepared showing the envelope of areas suitable for irrigation system development, preliminary centre pivot locations, flood irrigation bay layouts (if applicable), pump station location and pipeline delivery line locations based on water to be sourced from the proposed Cell 4 (WMD adjacent the existing TSF.

The concept location plan will provide the basis for subsequent detailed hydraulic engineering design.

9.5 MANAGEMENT PLAN

An agronomy specialist will engage with the Property stock manager to understand the existing stock management system, herd type and existing skills. This will be necessary to ensure that proposed management plans for irrigated grazing integrates into the wider grazing enterprise, and to identify training requirements for implementation of an irrigated grazing program.

Following engagement with the local manager and completion of the site survey and conceptual irrigation design, a summary level management plan will be developed for the combined irrigation and grazing system addressing the following issues:

- Pasture species selection.
- Land preparation.
- Pasture establishment.
- Pasture nutrition.
- Pasture management / grazing systems - initial and during production.
- Weed management.
- Irrigation scheduling.
- Sub divisions.
- Pasture monitoring program.
- Operational resources and skills required.
- Recommended staff training program (management and monitoring).

9.6 MONITORING REQUIREMENTS

Using the baseline studies and environmental impact analyses of this study, an outlined monitoring program addressing both irrigated pasture system control and environmental compliance will be prepared. The monitoring program will be prepared in tabular format addressing:

- Parameter to be monitored.
- Specific elements/analyses for the parameter (where applicable).
- Number of monitoring sites.
- Frequency of monitoring.

For fixed monitoring installations or repeat sampling points, a map illustrating the proposed monitoring locations will be prepared.

9.7 RISK ASSESSMENT

A standard approach to risk assessment consistent with *AS/NZS ISO 31000* will be applied to evaluation of environmental and operational risks associated with the activities proposed under this irrigation development. An objective evaluation of risk likelihood and risk consequence will be made according to defined criteria to derive a risk rating with and without the implementation of control measures. Potential risks will be identified under the following categories:

- Irrigation management.
- Irrigation operations.
- Crop management.
- Soil management.
- Construction.
- Stakeholders and community.
- General operations.