REPORT

GROUNDWATER QUALITY MANAGEMENT PLAN

COCKLE CREEK SITE REDEVELOPMENT

BOOLAROO, NSW

19 MARCH 2010

DOC. REF: SG061313 RP11

REVISION 0

FOR

INCITEC FERTILIZERS LIMITED

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EXECUTIVE SUMMARY

Soil and Groundwater Consulting (S&G) has developed the Groundwater Quality Management Plan (GQMP) for the remediation phase of the Incitec Fertilizers Limited Cockle Creek site.

The GQMP has been developed to provide a consistent approach of the monitoring of groundwater at the site during the remediation program. The appropriate implementation of the GQMP will provide a reliable and valid data set for the assessment of the condition of the site's groundwater in response to the remediation program instituted.

It is anticipated that the data collected will provide a sound basis for the lifting of the Declaration of Remediation Site and the Significant Risk of Harm orders against the site in due course.

The GQMP should be implemented within the overall site safety plan development for the remediation phase of the site to ensure the safety of staff involved in these works.

TABLE OF CONTENTS

FIGURES

TABLES

DOCUMENT INFORMATION

Rev.	Status	Date	Company	Name
1	Draft	19 March 2010	Incitec Fertilizers Limited	Mr Mark Shelley
			Soil & Groundwater Consulting	File
Doc. Ref.: SG061313 Groundwater Management Plan CEMP 190310				

1. INTRODUCTION

The Incitec Fertilizers Limited (IFL) Cockle Creek manufacturing and distribution site located on Main Road, Boolaroo, New South Wales is to undergo remediation to remove the contaminated fill materials from across the site and retain these within an engineered containment cell to be constructed at the northern end of the site.

The contaminated fill was the result of mixing of smelter wastes and slag with site soil to provide a suitable surface for the former fertiliser manufacturing and distribution centre. The manufacturing works have now ceased at the site.

1.1 Objective

The Groundwater Quality Management Plan (GQMP) addresses the ongoing monitoring of groundwater quality during and post the remediation phase to provide an objective measure of the influence of the remediation program on the groundwater quality.

The aim and the expectation of this plan is to provide evidence of the improvement in groundwater quality as a result of the instituted remediation program In time, it is anticipated that this monitoring will allow the lifting of the Declaration of Remediation Site which has been imposed on the site by NSW EPA.

The GQMP provides the framework for the collection and assessment of groundwater quality data to ensure that it is both reliable and accurate measure of the condition of the groundwater at this site over time. The plan will provide a sound basis for the regular and consistent monitoring of groundwater quality.

The groundwater quality monitoring program will:

- Collect relevant groundwater data of suitable quality;
- Collect groundwater elevation and contaminant concentration data;
- Ensure adequate quality assurance procedures are used to ensure the validity of the collected data set;
- Collect appropriate quality control samples to verify that the laboratory data is both accurate and precise;
- Periodically review the trends in groundwater elevations and contaminant concentrations; and
- Periodically report the results to the stakeholders.

2. ASSESSMENT GUIDELINE & INVESTIGATION LEVELS

The overall assessment program has been developed with consideration of the *Guidelines for the Assessment and Management of Groundwater Contamination* (DEC, 2007).

2.1 Groundwater Environmental Values

Schedule 2 of the above guideline identifies various environmental values of groundwater which may be required to be protected depending on the location of the site. These environmental values are:

- Aquatic ecosystems - these include surface water ecosystems and groundwater ecosystems;
- Human uses - these include but are not limited to potable water supply, agricultural water supply (irrigation and stock watering), industrial water use, aquaculture and human consumption of aquatic foods, recreational use (primary and secondary contact with surface waters) and visual amenity of surface waters;
- Human health in non-use scenarios - this includes consideration of health risks that may arise without direct contact between humans and the groundwater, for example, exposure to volatile contaminants above groundwater contaminant plumes; and
- Buildings and structures - this includes protection from groundwater contaminants that can degrade building materials through contact, for example, the weakening of building footings resulting from chemically aggressive groundwater.

The above Guideline also notes that Schedule B(6) of the *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM 1999) provides a methodology for using generic or site specific groundwater investigation levels (GILs) to assess contaminated groundwater. The following six environmental values as presented in the NEPM are:

- aquatic ecosystems;
- aquaculture and human consumers of food;
- agricultural water;
- recreation and aesthetics;
- drinking water; and
- industrial water.

Section 2.2 of the Guideline identifies the *Australian Drinking Water Guidelines* (NHMRC & NRMMC, 2004) for assessment of drinking water and the 95% trigger values included in ANZECC 2000 for assessment of aquatic ecosystems. Both these documents form part of the National

Water Quality Management Strategy. ANZECC 2000 also provides assessment criteria for aquaculture, agricultural waters and recreational water uses.

The following table provides a summary of the environmental values of groundwater and their relevance to this site.

Table 1 – Summary of Relevant Environmental Values

Environmental Value	Comment	Relevance
Aquatic ecosystems	Groundwater may discharge to Cockle Creek, particularly in the long term as dewatering associated with the coal mine ceases.	Relevant
Aquaculture and human consumers of food	Low potential of use given site setting, distance from creek and proposed residential development. Ecosystem protection criteria likely protective.	Relevant although unlikely to be realised
Agricultural water	Brackish groundwater unlikely to be suitable for use in residential setting or for open space watering uses without treatment to remove salts. Low yield obtainable from shallow groundwater system.	Not Relevant
Recreation and aesthetics	Site distant from potential surface water receptor. Possible use of shallow groundwater for swimming pool makeup water in residential setting.	Relevant
Drinking water	Salinity unsuitable for potable use and presence of reticulated water supply makes this use improbable	Not Relevant
Industrial water	Residential setting proposed and so use unlikely due to zoning.	Not Relevant
Buildings and Structures	Unlikely to be realised given the light structures with shallow footings likely to be developed in a residential setting. Included due to shallow groundwater and possible risk.	Relevant

Based on the above assessment it is considered that the environmental values of Aquatic Ecosystems, Aquaculture, Recreation and Aesthetics and Buildings and Structures are the only environmental values likely to be relevant at this site. Whilst the use of groundwater at the site may be limited as an outcome of the site audit, the audit will have no influence beyond the site boundaries and so consideration of off site impacts to these values will require consideration and management.

The environmental receptor most likely to receive groundwater from the IFL site in the longer term is considered to be the marine water aquatic ecosystem of Cockle Creek, although it is acknowledged that groundwater may not currently discharge to this receptor as a result of the influence on groundwater levels of the Teralba Colliery. The assessment of groundwater contamination with respect to this receptor is considered to be conservative under the current hydrogeological regime, although it may be appropriate in the longer term when the Colliery closes down.

Section 105 of the *Contaminated Land Management Act* 1997 allows the Department of Environment, Climate Change and Water (DECCW) to "*make or approve*" guidelines for any purpose related to the objects of the Act. The criteria for the assessment program are therefore based on the following guideline document,

> *Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, 2000 (ANZECC 2000).*

The marine criteria were adopted as the salinity measured in the creek is similar to that of sea water. In order to provide a screening level of the risk to this ecosystem, the ANZECC 2000 trigger values for the protection of marine aquatic ecosystems at a 95% level of protection are considered appropriate for comparison with contaminants reported in groundwater beneath the IFL site.

The following table provides a summary of the relevant groundwater assessment criteria.

Table 2 - Groundwater Assessment Criteria

	Marine Aquatic Ecosystems	Aquaculture	Recreation and Aesthetics
	Adopted Criteria (µg/L)		
Metals			
Antimony	270[d]		
Arsenic	2.3[d]	0.05[f]	50
Barium	-		1,000
Beryllium	-		58[e]
Cadmium	5.5	0.0005 to 0.005[f]	5
Chromium (Total)	27.4	0.02[f]	50
Chromium (IV)	4.4	0.05[f]	50[c]
Cobalt	1		11[e]
Copper	1.3	0.005[f]	1,000
Lead	4.4	0.001 to 0.007[f]	50
Mercury	0.4	0.001[f]	1
Nickel	70	0.1[f]	100
Selenium	3	0.01[f]	10
Vanadium	100	0.1[f]	
Zinc	15	0.005[f]	5,000

	Marine Aquatic Ecosystems	Aquaculture	Recreation and Aesthetics
TPH			
TPH C_6-C_9	Based on MAH components		Based on MAH components
TPH C_{10}-C_{36}	650 [a]		650 [a]
Oils and Greases	10,000		10,000
BTEX			
Benzene	700		10 [b]
Toluene	180[d]		800 [b]
Ethylbenzene	5[d]		300 [b]
Xylene (total)	625[b]		600 [b]
Pesticides			
Aldrin	0.003	-	1
Chlordane	0.001	0.004[f]	6
Chlorpyrifos	-	-	2
DDT	0.0004[d]	0.001[f]	3
DDE	0.0005[d]	-	
DDD	-	-	
Dieldrin	0.01[d]	0.003[f]	1
Endosulfan	0.01	0.001[f]	40
Endrin	0.008	0.003[f]	1
Heptachlor	0.0004[d]	-	3
Lindane	0.007[d]	0.004[f]	10
Methoxychlor	0.007[d]	-	
Organics			
Polycyclic Aromatic Hydrocarbons (Total)			3 [b]
Benzo(a)pyrene	0.2[d]		0.01
Naphthalene	70		-
Phenol	400	-	
Polychlorinated Biphenyls	0.3[d]	0.002[f]	0.1

	Marine Aquatic Ecosystems	Aquaculture	Recreation and Aesthetics
VOCs			
1,1-Dichloroethene	250[d]		0.3
1,2-Dichloroethane	1,900		10
Tetrachloroethene	400[d]		10
1,1,1-Trichloroethene	270[d]		30
1,1,2-Trichloroethane	1,900[d]		
1,1,2,2-Tetrachloroethane	80[d]		-
Inorganics			
Ammonia	910	<0.1f	10
Chloride			400,000
Cyanide	4	0.005[f]	100
Fluoride	-	-	1.5 [c]
Nitrate (as N)	-		10,000
Nitrate (as NO_{3-})	700[d]	100[f]	-
Nitrite (as N)	-	0.1[f]	1,000
Sulphate			400,000
Sulphide	1		50
Phosphate		0.05[f]	

Notes:

a) Ministry of Housing Spatial Planning and the Environment, Netherlands (2006) Soil Remediation Circular

b) NSW EPA (1994) Guidelines for Assessing Service Station Sites

c) NHMRC & NRMMC (2004) Australian Drinking Water Guidelines

d) ANZECC (2000) Low Reliability Marine Trigger Value

e) USEPA (December 2009) Region 9, Regional Screening Levels for Tapwater

f) ANZECC (2000) Water Quality Guidelines for the protection of cultured fish, molluscs and crustaceans

3. GROUNDWATER MONITORING PROGRAM

The groundwater morning program conducted as part of the remediation and post remediation work is additional to that which is being undertaken as part of the Stage 1 Hot Spot Remediation works. The Stage 1 works are managed under a separate Environmental Management Plan (EMP) document.

The groundwater monitoring program described herein is effectively a continuation of the existing Environment Protection Licence requirements for groundwater monitoring at the site, with appropriate amendments taking into consideration the loss of some wells as a result of the proposed remediation programs occurring at both the IFL site and the adjacent Pasminco site.

3.1 Monitoring Well Rationale

The following wells are included in the monitoring network and should be preserved throughout the remediation program. It is noted that a number of the wells included under the existing Licence are located offsite and are most likely inaccessible or destroyed as a result of remediation works at the adjacent Pasminco site. These wells have been replaced by onsite wells located adjacent the relevant boundaries.

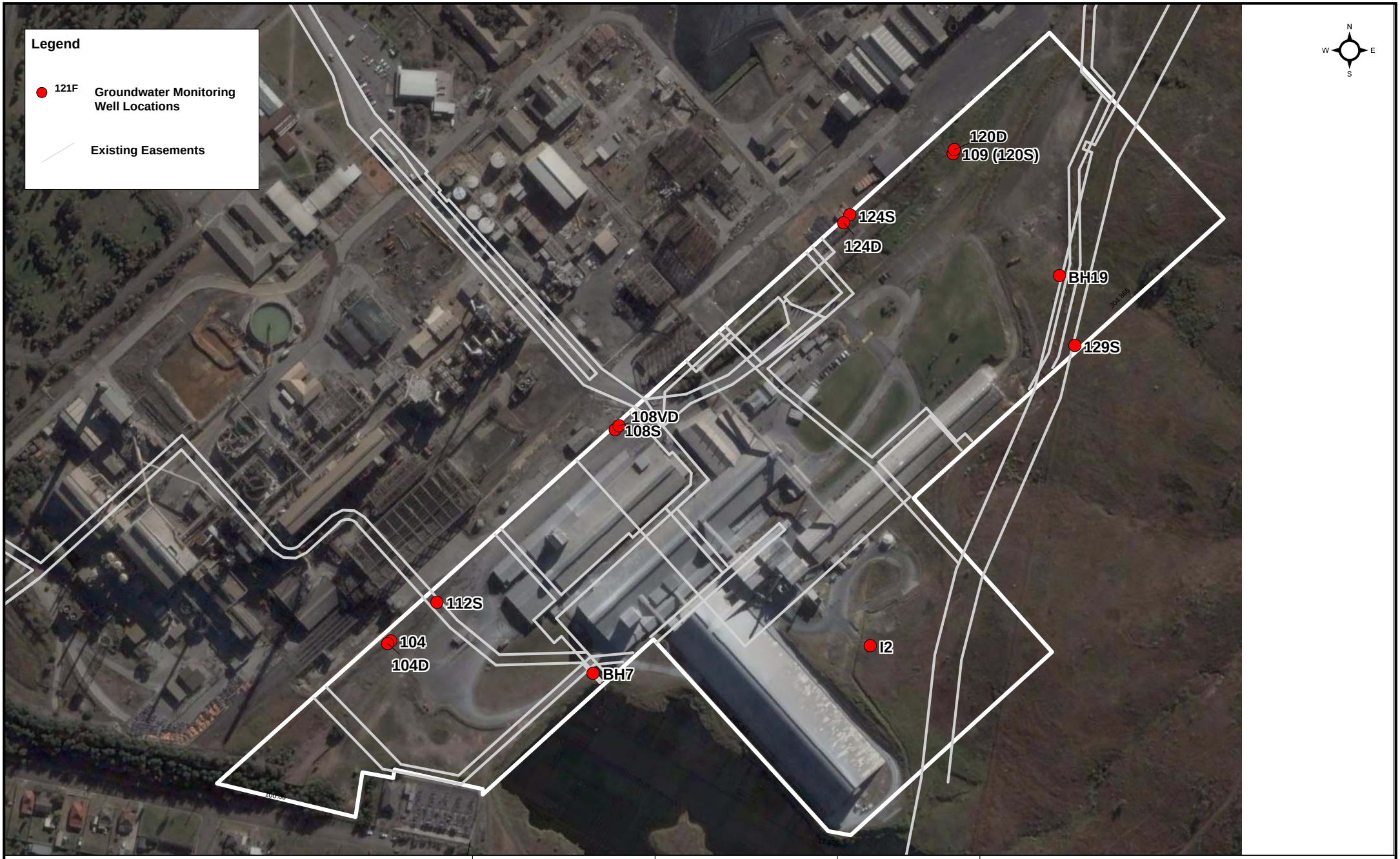
Table 3 - Groundwater Monitoring Wells

Role	Remediation Phase		
	Phase 2	Phase 3	Phase 4
Shallow Up Gradient	129S	I2	BH7
Shallow Internal	BH19	-	-
Shallow Down Gradient	124S	108S	104
	109(120S)	-	112S
Deep Down Gradient	124D	108VD	104D
	120D	-	-

If any of the designated monitoring wells are damaged or destroyed then they should be replaced unless it is not appropriate to do so, in which case an alternative groundwater monitoring point will be established.

The monitoring program includes the monitoring of both the shallow and deeper groundwater systems encountered at the site.

The location of the wells is shown in Figure 1.



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Drawn: DJN	Date: 11 March 2010	Job No.: SG061313	Project: Cockle Creek Assessments
Checked: AKW	Date: 12 March 2010	Title: GROUNDWATER MONITORING LOCATIONS	Sheet 1 of 1
File Name: Fig1 GQMP.wor	Scale: NTS A4		FIGURE 1

3.2 Data Quality Objectives

Data Quality Objectives (DQOs) have been developed for the project, as discussed in the following sections.

3.2.1 State the Problem

Previous investigations have identified widespread groundwater contamination with heavy metals likely to have originated from the historical operation of the neighbouring smelter and filling of the site. Groundwater is shallow in large areas of the site and has been impacted by surface water infiltration that has leached contaminants from the upper soil profile. This has resulted in the groundwater becoming contaminated.

3.2.2 Identify the Decision

The proposed groundwater monitoring program is intended to demonstrate the change in groundwater contaminant concentrations over time in response to the isolation of the source materials within an engineered cell.

3.2.3 Identify Inputs to the Decision

Inputs to the decision process are the analysis of the trend in analytical results over time at each of the monitoring wells. Information is also obtained in wells located near the up gradient site margins to provide an indication of the influent groundwater status entering the site so that the changing contribution to groundwater contamination for the site area is distinguishable over time.

3.2.4 Define the Study Boundaries

The study area boundary is defined as the IFL site boundary as shown in Figure 1. The site will be dividend into three phases for the site remediation program and eventually the site will be divided into two broad areas:

- one in the north containing the engineered containment cell; and
- the second in the south providing an area suitable for residential use.

3.2.5 Develop a Decision Rule

The objective of the monitoring program is to enable the removal of the Declaration of Remediation Site and the associated Significant Risk of Harm imposed on the site by NSW EPA. It is intended that the analytical data will be used, possibly with the assistance of numerical fate and transport modelling, to demonstrate that the site no longer poses any significant risk to the environment and in particular, potential impacts on Cockle Creek.

The criteria for establishing these outcomes is yet to be defined and this will most likely occur in consultation with the Site Auditor and regulatory authorities. The critical outcome for the decision

process is a declining concentration in key metal contaminants at each of the down gradient monitoring wells.

3.2.6 Specify Limits of Decision Error

Data quality indicators (DQIs) have been determined for completeness, comparability, representativeness, precision and accuracy of both field and laboratory data. The DQIs are presented in Section 3.3.

3.2.7 Optimise the Design for Obtaining Data

The proposed sampling and analytical program is based on the location of previously installed wells with the monitoring wells location based on providing the required level of objective data to make the assessment. This includes the assessment of up and down gradient boundary wells for the shallow, most impacted aquifer, and the inclusion of deeper aquifer monitoring wells at the down gradient boundary.

The proposed monitoring program is considered sufficient to provide the required data to make an informed decision regarding the on going risk posed by groundwater emanating from the site.

3.3 Data Quality Indicators

The pre-determined Data Quality Indicators (DQIs) for the project are discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters), and are shown in Table 4.2.

- Completeness – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

- Comparability - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods.

- Representativeness – expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.

- Precision - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.

- Accuracy - measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical

results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.

Table 4 – Data Quality Indicators

Completeness
All field work to be completed in accordance with the Sampling Analysis and Quality Plan (SAQP) and the Project Safety Plan (PSP)
Samples to be collected from each well in accordance with prevailing sampling guidelines using foot valve displacement pumps and dedicated LDPE tubing.
Field engineer / scientist to have appropriate field experience in groundwater sampling
All field sampling sheets to be completed fully including well identification, gauging data, purging data, sampling data and observations
100% of samples to be analysed within laboratory specified holding times by a NATA accredited laboratory
NATA accredited laboratories and NATA accredited analytical methodologies to be adopted for sample analysis
Comparability
All field work to be completed in accordance with the SAQP and the PSP
Field engineer / scientist to have appropriate field experience in groundwater sampling
Climatic conditions to be recorded on site inspection checklist and recorded on file
All groundwater samples to be collected using same method across the site and for each monitoring round
Samples to be stored in laboratory supplied containers, in a chilled cool box and transported to laboratory under chain of custody documentation within specified holding times
Representativeness
Groundwater to be sampled using methodologies as specified in the SAQP
Groundwater samples to be collected in accordance with prevailing guidelines in clean / preserved bottles provided by the laboratory and stored in chilled cool box for transport to the laboratory
Laboratory prepared trip blanks to be analysed at a rate of one sample per sampling event
Rinsate blanks are to be collected and analysed at a rate of one per day of investigations to demonstrate lack of cross contamination, unless dedicated equipment use for each well in which case these are not required
Precision
All field work to be completed in accordance with the SAQP and the PSP
Field duplicates (intra-laboratory) to be collected at a frequency of 5% and analysed for the same range of analytes as the primary samples.
Relative Percent Differences (RPDs) to be calculated for intra-laboratory duplicates, with the objective of all RPD's calculated being: o 0-30% for inorganics; and o 0-50% for organics.
Laboratory prepared trip blanks to be analysed at a rate of one sample per sampling event
Rinsate blanks are to be collected and analysed at a rate of one per day of investigations to demonstrate lack of cross contamination, unless dedicated equipment use for each well in which case these are not required
Laboratory internal QC to include duplicate samples for each analyte and will conform with the following: ▪ Surrogate spike recoveries to be between 70% and 130%; ▪ Matrix spike recoveries to be between 70% and 130%; ▪ Contaminants below detection limits for method blank samples; ▪ Matrix duplicate/laboratory duplicate RPDs to be less than 50%.
Laboratory internal QC to include as outlined in NEPM Schedule B(3) and in accordance Table 3 and with NATA requirements: ▪ reagent blanks

▪ method blanks ▪ matrix spikes ▪ matrix spike duplicates ▪ surrogate spikes ▪ reference materials laboratory control samples
Accuracy
All field work to be completed in accordance with the SAQP and the PSP.
All laboratories to be National Association of Testing Authorities (NATA) accredited for the analyses performed.
Field duplicates (inter-laboratory) to be collected at a frequency of 5% and analysed for the same range of analytes as the primary samples.
Relative Percent Differences (RPDs) to be calculated for inter-laboratory duplicates, with the objective of all RPD's calculated being: o 0-30% for inorganics; and o 0-50% for organics.
Secondary laboratory internal QC to include duplicate samples for each analyte and will conform with the following: ▪ Surrogate spike recoveries to be between 70% and 130%; ▪ Matrix spike recoveries to be between 70% and 130%; ▪ Contaminants below detection limits for method blank samples; ▪ Matrix duplicate/laboratory duplicate RPDs to be less than 50%.
Laboratory internal QC to include as outlined in NEPM Schedule B(3) and in accordance Table 3 and with NATA requirements: ▪ reagent blanks ▪ method blanks ▪ matrix spikes ▪ matrix spike duplicates ▪ surrogate spikes ▪ reference materials ▪ laboratory control samples

The following sections provide the basis for a Sampling Analysis Quality Plan (SAQP) noted in the table above. The Project Safety Plan will be developed through the HAZOP process for the site remediation.

3.4 Gauging and Sampling Frequency

It is proposed that the groundwater gauging and sampling program be conducted on a quarterly (3-monthly) basis throughout the remediation project. This frequency is considered appropriate given the relatively low rate of groundwater migration and will be of a sufficient frequency to detect any significant increases or decreases in groundwater quality in response to the remediation actions.

It is likely that this quarterly monitoring will continue for a period immediately after completion of the remediation program to provide sufficiently high frequency data to detect changes in the groundwater system and thus facilitate the removal of the regulatory Orders imposed on the site as soon as possible.

It is anticipated that a longer term monitoring program may be required after this initial post-remediation phase, and if required, this may be extended to an annual frequency. The final frequency will be dependent on discussions with the Site Auditor and the regulatory authorities.

3.5 Groundwater Gauging

The following provides a summary of the gauging works to be conducted for each round of monitoring:

- Identify the well is the correct well for monitoring. Take care at locations with a number of nested wells. If in doubt use total well depth and compare with tabulated data to verify correct well;
- Inspection of the wells head a surrounds to assess well integrity;
- Remove well cap and allow short period for well level stabilisation;
- Replace disposable gloves before commencing;
- Use a calibrated electronic dipper to measure the depth to the groundwater relative to the highpoint of the well casing;
- Check the well depth with the tape;
- Record the data and any observations;
- Decontaminate the tape between each well with Decon 90 and fresh water rinse.

3.6 Groundwater Sampling

The following provides a summary of the groundwater sampling works to be conducted for each round of monitoring.

- Ensure all equipment is available and calibrated appropriately before commencing;
- Ensure that a field trip blank has been provided by the laboratory;
- Purging of the well for sampling will be undertaken immediately after gauging;
- Commence sampling on the up gradient wells first as these washout be less contaminated
- Replace disposable gloves before commencing;
- Ensure the LDPE tubing is clean before use. If there is discoloration or any encrustation, the replace tubing. Connect Waterra foot valve pump and purge groundwater in accordance with prevailing sampling guidelines;

- Collect purge water for disposal;
- Use a calibrated Water Quality meter to measure the physical groundwater parameters periodically during purging and record all data;
- Ensure groundwater physical parameters have stabilised within acceptable bounds prior to completing the purging cycle. Record final set of field parameters prior to sampling;
- Sampling to be conducted following parameter stabilisation, with samples placed directly into sample bottles provided by the laboratory. In the case of metals analysis only the filterable component will be analysed. The metal samples will be filtered in the field using a 0.45 micron filter and the sample placed in the preserved sample bottle;
- Decontaminate all sampling equipment between each well with Decon 90 and fresh water rinse;
- Collect inter and intra-laboratory duplicates at a rate of no less than 5%;
- Collection at least one rinsate sample per day of sampling;
- Record all information on the field sampling sheets;
- The samples will be transported in a chilled cool box to the NATA accredited laboratory for selected chemical analysis under chain of custody documentation.

3.7 Analytical Program

Each primary and secondary sample will be analysed for the following parameters:

- Ammonia
- Arsenic
- Bicarbonate
- Cadmium
- Calcium
- Chloride
- Chromium
- Copper
- Fluoride
- Lead
- Magnesium
- Manganese
- Mercury
- Nickel
- Nitrate
- Phosphate
- Potassium
- Sodium
- Sulfate
- Total dissolved solids
- Zinc
- pH

In addition, the field based parameters Electrical Conductivity, pH and Oxidation Reduction Potential will be collected in the field as part of the purging / sampling program. The pH will also be included in the analytical program as a cross check.

3.8 Assessment and Reporting

The objective of the assessment is to provide temporal comparative data for assessment of contaminant trends. The data will therefore be included in a progressive spreadsheet so all the data is located in one location.

Gauging data will be reduced to the Australia Height Datum (AHD) level. The shallow aquifer data will be contoured using an appropriate software package or by hand, as appropriate. The hydraulic gradient across the site will be assessed. The contours will be plotted on a site plan and the inferred groundwater flow direction interpreted.

The groundwater analytical data will be compared against the relevant assessment criteria for the relevant environmental values of the groundwater. Exceedances will be highlighted within the table. The spatial data for each key contaminant including cadmium, copper, mercury, lead, zinc and pH will be plotted on a site plan to illustrate the contaminants distributions. The temporal trend data for each key contaminant will be plotted using a time versus concentration type plot and assessed for each of the monitoring wells.

A brief letter type report will be prepared following each monitoring round.

If quarterly monitoring is adopted then it is proposed that a summary report be prepared at the end of each calendar year and reported in January each year, summarising the monitoring data for the previous year's data and the historical trends.

4. CLOSURE

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It is anticipated that the data collected will provide a sound basis for the lifting of the Declaration of Remediation Site and the Significant Risk of Harm orders against the site in due course.

The GQMP should be implemented within the overall site safety plan development for the remediation phase of the site to ensure the safety of staff involved in these works.

5. LIMITATIONS

Purpose

1. This report was prepared by Soil & Groundwater Consulting ('**S&G**') for the sole use of the client identified in the body of the report (**'Client'**), in relation to the property identified in the body of the report ('**Site**') and in accordance with the scope of work agreed between S&G and the Client.

Standard

2. This report was prepared by S&G generally in accordance with the usual and accepted practices and standards for consultants at the time it was prepared. The data referred to in this report was obtained between the dates as set out in the body of the report ('Data Collection Period').

3. S&G is not responsible for any inaccuracies or omissions in this report outside the scope of work and purpose set out in the report. There was no indication to S&G during the data collection period that any information contained in this report was false.

4. Opinions and recommendations contained in this report are based on data provided by representatives of the Client, information gained during site inspection and fieldwork, employee interviews and information provided from government authorities' records and other third parties, to the extent to which such information has been sought and obtained.

Variation in Conditions

5. This report presents the results of an investigation and assessment program to determine the presence of a range of potential contaminants in soil or groundwater at the Site.

6. This report is based on the conditions encountered and information available during the Data Collection Period.

7. Subsurface conditions may vary significantly between sampling locations and depth intervals and at locations other than where data collection was performed. Contaminant concentrations may vary from day to day.

8. S&G does not accept any responsibility for any changes to the Site conditions that may have occurred after the Data Collection Period described in Clause 2 above, or for the impact of any such changes on this report.

Use of Report

9. This report must be read in its entirety.

10. This report may not be relied upon by any third party without the express written permission of S&G, which permission may be granted or withheld in S&G's absolute discretion.

11. No responsibility is accepted by S&G for use of this report, or any part of this report, in any context or for any purpose or for any party, other than the Client, and for the purpose identified in the body of the report.

12. The information in this report is considered to be accurate at the date of issue and is in accordance with conditions at the Site during the data collection period.

13. This report and the information contained in it should only be regarded as validly representing the Site conditions at the time of the data collection period unless otherwise explicitly stated in this report.

No third party warranties

14. No warranties, express or implied, are made to any third party in relation to the subject matter of this report, or the recommendations or conclusions expressed within it.