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Department of Transport

Report for Esperance Clean-up and Recovery Project

Esperance Town Site - Compliance and Performance Audit Report

June 2012

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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Executive Summary

The Department of Transport commissioned Mr Andrew Kohlrusch, a Western Australia Department of Environment and Conservation (DEC) accredited contaminated site auditor, to undertake a compliance and performance audit of the Esperance Clean-up and Recovery Project (ECRP) for the Esperance town site.

The ECRP was established in November 2008 by the Western Australian Government to undertake a thorough and comprehensive clean-up of the Esperance town site following the deposition of lead carbonate dust throughout the town as associated with the transport and storage of lead carbonate from the Magellan mine site to the port of Esperance.

This audit report provides a critical and independent review of those works undertaken by the ECRP since this time.

Purpose of the Audit

The audit was commissioned to assess whether the project:

1. met the objectives of the ECRP;
2. met the requirements of the Deed of Settlement; and
3. met the desired outcome of the Premier that the clean-up was “thorough and comprehensive”.

The key objectives of the ECRP were as follows:

1(a) To assess/audit levels of lead and nickel in homes, premises and public places in Esperance and determine the need for cleaning by reference to agreed standards and guidelines;

1(b) To remove lead and nickel residues in homes, premises and in public places to acceptable standards such that these contaminants do not pose a risk to the health of the Esperance community;

1(c) To validate the cleaning process;

1(d) To work with the Esperance community in this project and provide ongoing progress reporting; and

1(e) To undertake sentinel monitoring to ensure no re-contamination of the Esperance town site.

In general, the ECRP aimed to provide assurance to the Esperance community that the clean-up of the town site has been undertaken in accordance with best practice.

This report includes an assessment of the town site only, the audit of the Esperance Port is provided under separate cover.

The audit has been undertaken with reference to the WA DEC guideline *Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting* (DEC, 2009). However it is recognised that the ECRP is a unique project, for which specific sampling, clean-up and validation methodologies have been developed and as such standards and guidelines may not exist for all facets of the project. Where this was the case the auditor has used professional judgement and experience with similar projects to make

conclusions and recommendations in relation to the ECRP objectives.

Scope of Work

- Review of ECRP sampling and validation methodologies and cleaning management procedures;
- Site visit to observe ECRP activities;
- Stakeholder consultation;
- Review of sample validation results;
- Review of sentinel monitoring reports.

Conclusions

Over the course of the audit of ECRP activities the dedication of the ECRP team to the project, led by Mr Wayne Winchester (Project Director) and Mr Matthew Devenish (Project Manager), was evident. This included the establishment of a thorough protocol, continual community briefings and dedication to delivery of the project whereby each site was individually assessed on its merits. Furthermore the care taken in checking all the site data to preparing individual reports for the 2000+ properties sampled and cleaned, was noted.

The auditor provides the following conclusions on the works undertaken by the ECRP in the Esperance town site in relation to the objectives of the ECRP:

- **Objective 1 (a) To assess/audit levels of lead and nickel in homes, premises and public places in Esperance and determine the need for cleaning by reference to agreed standards and guidelines;**
  - The sampling and validation procedures were in general adequately defined in the sampling methodologies. Where changes were required as suggested by the auditor, the changes were not considered to materially affect the sampling methodologies, but provide clarification pertaining to specific steps in the procedures. The procedures were considered adequate to document the works to be undertaken. Field audits of validation works and validation of sample results by the auditor provided sufficient confidence that sampling and validation was undertaken in accordance with the methodologies prepared. It is the auditor's opinion that the sampling and validation works were sufficient to determine the levels of lead and nickel present in homes within the Esperance town site for the purposes of determining where clean-up was required.
- **Objective 1 (b) To remove lead and nickel residues in homes, premises and in public places to acceptable standards such that these contaminants do not pose a risk to the health of the Esperance community;**
  - The cleaning procedures prepared by the ECRP were generally sufficient to communicate the requirements of cleaning to be undertaken. While some limitations in the documentation were noted, appropriate explanation was provided by the ECRP team to demonstrate that these issues were not material. The site inspections conducted by the auditor, confirmed the completeness of the procedures. The consistent field teams and validation of documentation also provides further assurance to the auditor that cleaning works were thorough and comprehensive.

- **Objective 1 (c) To validate the cleaning process;**
  - It is considered by the auditor that the validation procedures following clean-up were adequate to provide assurance that the cleaning process was carried out to acceptable standards, providing confidence that the contaminants did not pose any further risk to the health of the Esperance community.
  - While an assessment of the QAQC results was not undertaken by the ECRP team, the auditor has undertaken a validation exercise to evaluate that QAQC procedures were sufficient to demonstrate the data representativeness, completeness, precision, accuracy and comparability. This provided an added level of assurance that the data is of an acceptable quality upon which to draw meaningful conclusions regarding sampling, clean-up and validation of the sites.
- **Objective 1 (d) To work with the Esperance community in this project and provide ongoing progress reporting; and**
  - The variety of community consultation measures provided and the feedback received by the auditor as part of the stakeholder consultation review suggests that the ECRP developed an open and honest relationship with the community which has resulted in the community developing respect for the ECRP team and its activities. The auditor considers the community consultation undertaken by ECRP more than adequate to meet the project objectives of providing ongoing progress reporting throughout the project.
- **Objective 1 (e) To undertake sentinel monitoring to ensure no re-contamination of the Esperance town site.**
  - Sentinel monitoring is ongoing and therefore a conclusion on the completeness of the sentinel monitoring cannot be undertaken at this stage.
- **Objective 2 To meet the requirements of the Deed of Settlement.**
  - The ECRP program was based on adopting either on standard procedures or developing methods through consultation with health professionals and/or environmental consultants. The auditor considers that based on the review of the procedures established for the ECRP, the explanations provided by the ECRP team on matters identified in the review, the observations made during the various site inspections conducted in January 2012 and the feedback obtained during the stakeholder review, the requirements of the Deed of Settlement with regards to the Esperance town site have been fulfilled.
- **Objective 3 To achieve the desired outcomes of the Premier that the clean-up would be 'thorough and comprehensive'.**
  - The auditor considers that the procedures developed for the ECRP, the manner in which the ECRP team delivered the project and the community input have combined to allow a robust, technically justifiable and comprehensive clean-up and validation of the Esperance Town site. All stakeholders should be proud of their contribution to this project and it remains an example of (while hopefully not required) how such a project should be planned and implemented.

1. Introduction

The Department of Transport commissioned Mr Andrew Kohlrusch, a Western Australia, Department of Environment and Conservation (DEC) accredited contaminated site auditor, to undertake a compliance and performance audit of the Esperance Clean-up and Recovery Project (ECRP) for the Esperance town site.

The ECRP was established in November 2008 by the Western Australian Government to undertake a thorough and comprehensive clean-up of the Esperance town site following the deposition of lead carbonate dust throughout the town as associated with the transport and storage of lead carbonate from the Magellan mine site to the port of Esperance.

This audit report provides a critical and independent review of those works undertaken by the ECRP since this time.

1.1 Reason for the Audit

The audit was commissioned to assess whether the project

1. met the objectives of the ECRP;
2. met the requirements of the Deed of Settlement; and
3. met the desired outcome of the Premier that the clean-up was “thorough and comprehensive”.

The key objectives of the ECRP were as follows:

- To assess/audit levels of lead and nickel in homes, premises and public places in Esperance and determine the need for cleaning by reference to agreed standards and guidelines;
- To remove lead and nickel residues in homes, premises and in public places to acceptable standards such that these contaminants do not pose a risk to the health of the Esperance community;
- To validate the cleaning process;
- To work with the Esperance community in this project and provide ongoing progress reporting; and
- To undertake sentinel monitoring to ensure no re-contamination of the Esperance town site.

In general, the ECRP aimed to provide assurance to the Esperance community that the clean-up of the town site has been undertaken in accordance with best practice.

The Deed of Settlement requires that the ECRP has:

“….undertaken the clean-up of the Esperance town site and the Esperance port in accordance with all relevant laws and all requirements, standards, notices and guidelines of the Department of Environment and Conservation and Department of Consumer and Employment Protection.”

And defines a Validation Report as:

“means the report commissioned by the State and carried out by a duly qualified third party consultant

and delivered to the State following completion of the clean-up of the Port Area and the town of Esperance that verifies and validates that the standards of clean-up referred to in clause 4.1[1] have been met."

This report includes an assessment of the town site only, the audit of the Esperance Port is provided under separate cover.

The audit has been undertaken with reference to the WA DEC guideline *Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting* (DEC, 2009). However it is recognised that the ECRP is a unique project, for which specific sampling, clean-up and validation methodologies have been developed and as such standards and guidelines may not exist for all facets of the project. Where this was the case the auditor has used professional judgement and experience with similar projects to make conclusions and recommendations in relation to the ECRP objectives.

[1] With regard to the standards of clean-up, clause 4.1 of the Deed states: *"EsPA and the State undertake to carry out the clean-up of works contemplated by this Deed in accordance with all relevant laws and all requirements, standards, notices and guidelines of the Department of Health, Department of Environment and Conservation and Department of Consumer and Employment Protection."*

2. Scope of Works

The scope of the audit is limited to a critical and independent review of investigation and clean-up procedures implemented by the ECRP and Port of Esperance to address possible lead carbonate contamination associated with the transport and storage of materials from Magellan mine site to the Port of Esperance. For clarity, the scope, findings and recommendations developed for the audit of the Port Esperance are provided under a separate cover.

A figure illustrating the spatial extent of works completed in the Esperance town site is provided in Appendix A.

The works consisted of sampling, cleaning and validation of an extensive list of locations across the Esperance town site. The locations included residential premises (houses), commercial premises (such as day care centres, schools) and public places (Esperance foreshore, playgrounds, catchment area, schools etc.).

In order to complete the audit, the following scope of works was undertaken for the town site.

2.1 Review of ECRP Sampling and Validation Methodologies and Cleaning Management Procedures

This included review of the sampling and validation methodologies and cleaning management procedures. The specific methods listed in Sections 3 and 4.

2.2 Site Visit

The audit team, comprising of DEC accredited auditor Mr Andrew Kohlrusch and auditor's assistant Ms Kylie Wells and Mrs Imogen Bird, visited Esperance from 9 to 13 January 2012. During this time site inspections of the town site and ECRP offices and laboratory were undertaken and clean-up and validation works at a number of residential properties were observed.

The site inspections were complemented by discussion with the ECRP team (in particular Mr Wayne Winchester and Mr Matt Devenish) to gain an understanding of how the project was set up including team selections and training, establishment (and subsequent modification, when necessary) of the sampling protocols and cleaning selection and training of contractors who conducted the clean-up work, the quality assurance program used to maintain the rigour and confidence in the program results and the manner in which the community consultation program was formulated and maintained.

2.3 Stakeholder Consultation

As part of the town site and port assessment, the auditor undertook discussions with community members during the site visit to gain an understanding of their satisfaction with the project. The audit team spoke with a variety of community members including; residents who had their houses cleaned as part of the project, members of community groups, local politicians and members of relevant government agencies. Further details on the scope of the community consultation undertaken are outlined in

Section 8.

2.4 Review of Sample Validation Results

In order to assess the implementation of the sampling, clean-up and validation procedures adopted by ECRP and evaluate the repeatability and reliability of the assessment and validation results, the auditor randomly selected files of 20 sites (equating to approximately 1%) to undertake a comprehensive validation assessment. The documents reviewed as part of the validation assessment are listed in Section 7.

2.5 Review of Sentinel Monitoring Reports

At the time of the audit, the sentinel monitoring for the first year of a two year program had been completed. Therefore, this audit provides comments on the first two rounds of monitoring only and includes some recommendations for ECRP's consideration for the completion of the monitoring program. Further assessment of the sentinel monitoring program will subsequently be required at its completion. The sentinel monitoring reports reviewed as part of this assessment are listed in Section 9.

3. Sampling, Validation and Cleaning Methodologies

To meet the objectives of the project, the ECRP developed a number of sampling, validation and clean-up methodologies. These methodologies were developed and broadly applied to the different premises and public facilities incorporated within the project. A list of the methodologies developed are provided as follows:

- Sampling and Validation Methodologies:
  - SA01 METHODOLOGY 01 Contents and Introduction
  - SA01 METHODOLOGY 02 Rainwater Tank Sampling
  - SA01 METHODOLOGY 03 Gutter Sludge Sampling
  - SA01 METHODOLOGY 04 Roof Surface Sampling
  - SA01 METHODOLOGY 05 External Surface Sampling
  - SA01 METHODOLOGY 06 Soil Sampling
  - SA01 METHODOLOGY 07 Carpet Sampling
  - SA01 METHODOLOGY 08 Roof Space Sampling
  - SA01 METHODOLOGY 09 Internal Surface Sampling
  - SA01 METHODOLOGY 10 Portable XRF Analyser Operating Procedure
  - SA01 METHODOLOGY 11 Validation Sampling
  - SA01 METHODOLOGY 12 Validation of Soil Removal
  - SA01 METHODOLOGY 13 Chain of Custody (COC) Procedure
  - SA01 METHODOLOGY 14 Archiving Procedure
  - SA01 METHODOLOGY 15 Laboratory Procedures
  - SA01 METHODOLOGY 16 Quality Control & Quality Assurance
  - SA01 METHODOLOGY 17 Waste Classification Sampling
  - SA01 METHODOLOGY 18 Microvacuum Sampling
  - SA01 METHODOLOGY 19 Sentinel Monitoring
- Cleaning Management Procedures
  - CL01 Managing Internal and External Cleaning
  - CL02 Managing Roof Space Cleaning
  - CL03 Managing Roof Surface, Gutter and Rainwater Tank Cleaning

Following sampling of each of the premises in accordance with the above procedures, a separate report

for each of the premises was issued detailing the sampling undertaken and whether or not cleaning was recommended. Following cleaning and validation (if required), a separate cleaning/validation report was issued for each of the premises. All premises were treated as separate cases.

4. Review of Sampling and Validation Methodologies

4.1 Introduction

Due to the unique nature of the project, specific sampling and validation processes for the sampling and clean-up were developed by the ECRP in lieu of any existing standards and/or guidelines. The Department of Transport previously commissioned Mr Paul Turner of GHD to undertake an independent review of the sampling methodologies outlined in the *Esperance Clean-up and Recovery Project – Site Sampling Methodology (February 2010).* The findings of this review are outlined in the *Esperance Clean-up and Recovery Project, Methodology and Process Audit Report (June 2010)* (reference: 61/25517/100018). A complete copy of this report is reproduced as Appendix B.

In summary, findings of this review indicated that:

- The sampling, cleaning and validation procedures were considered to be adequate to meet the objectives of the ECRP;
- The field audit of cleaning and validation sampling activities were implemented in accordance with documented procedures;
- Community consultation was found by the auditor to be robust and that general community feedback indicated an overall good feeling about the ECRP's work to date;
- ECRP team were observed by the audit team to display a high level of personal commitment to the success of the project (which was also observed by the community);
- The sampling, clean-up and validation works were developed and continually revised in a thorough, logical and technically defensible manner to ensure that the objectives of the project would be met.

As the project evolved during the sampling phase, some minor changes were made to these procedures. The finalised sampling methodology procedures have been documented in *SA01 – Esperance Clean-up and Recovery Project Full Sampling Methodology*. As part of this assessment GHD reviewed these revised documents with reference to the auditor comments prepared by Mr Paul Turner (GHD, June 2010) to:

- Identify changes that may have materially affected the procedure; and
- Confirm that recommendations made by Mr Turner have been incorporated into the revised procedures.

4.2 Documentation

The *Esperance Clean-up and Recovery Project – SA01 – Site Sampling Methodologies* outline the revised sampling methodology that was adopted as part of the sampling and validation phases of the clean-up project and include the following:

- General Introduction

- Rainwater Tank Sampling
- Gutter Sludge Sampling
- Roof Surface Wipes
- External Surface Wipes
- Soil Sampling
- Carpet Bulk Dust
- Roof Space Bulk Dust
- Internal Surface Wipes
- Laboratory Procedures
- Waste Classification

In addition to these procedures, the following procedures had been prepared since the initial phase of the audit undertaken in June 2010.

- Archiving
- Portable XRF Analyser Operating Procedure
- Validation Sampling
- Validation of Soil Removal
- Chain of Custody
- Quality Assurance and Quality Control
- Micro Vacuum Sampling

4.3 Documentation Review

4.3.1 Procedures

Based on this review, the auditor found that the revised procedures generally incorporated comments from the initial audit (GHD, June 2010). Amendments to the methodologies were focused around improved safety procedures, troubleshooting as part of the collection of suitable samples and an increased awareness of detailing site specific conditions at each sample location.

The new procedures generally complemented the sampling methodologies and provided further guidance on the operation of specific instruments, such as the XRF and micro-vacuum cleaner and/or details on quality assurance and quality control. Table 1 presents a commentary on the sampling procedures and modifications to those that had been in place in 2010.

Table 1 Documentation Review of Sampling and Validation Methodologies

Item	Procedure	Comments
Procedures Previously Reviewed		
1.	General Introduction	No comment.
2.	Rainwater Tank Sampling	No significant changes noted.
3.	Gutter Sludge Sampling	No significant changes noted.
4.	Roof Surface Wipes	Recommendations provided in the previous audit were included in the methodology. The methodology was amended to include vacuuming of surfaces only and sampling using a ghost wipe methodology has been removed from the procedure. A method for sampling and validating asbestos rooves has also been included in the methodology. These changes were not considered to materially affect the sampling methodologies, but provided clarification around some items.
5.	External Surface Wipes	Recommendations provided in the previous audit have been included in the methodology and the procedure was modified to stipulate that samples should be collected on smooth surfaces. It is the auditor's opinion that the sample procedure is adequate to document the process to be followed in the field.
6.	Soil Sampling	The soil sampling procedure was amended to include screening with the XRF as part of sample collection process. The XRF results were then to be used to select soil samples for laboratory analysis and confirmation of XRF results. It is the auditor's opinion that these changes clarified specific items within the methodology and the procedure was adequate to document the process to be followed in the field.
7.	Carpet Bulk Dust	Recommendations provided in the previous audit have been included in the methodology and the procedure was modified to include details on the make and model of the vacuum cleaner. The inclusion of isotopic testing of bulk carpet samples was also included to assist with the differentiation between typical household sources of lead and that from Magellan metals. It is the auditor's opinion that these changes clarified specific items within the methodology and the procedure was adequate to document the process to be followed in the field.

Item	Procedure	Comments
8.	Roof Space Dust Sampling	Recommendations provided in the previous audit have been included in the methodology. The ladder bag was no longer used as a dust sheet and instead a designated disposable plastic cover was used as a dust sheet to cover the work area. An additional methodology for roof spaces containing asbestos had also been added, which included enclosing the area around the manhole (drop sheets and masking tape) prior to sampling and disposal of materials following sampling. It is the auditor's opinion that these changes clarified specific items within the methodology and the procedure is adequate to document the process to be followed in the field.
9.	Internal Surface Wipes	In order to differentiate between typical household sources of lead and lead from Magellan metals, analysis of the area surrounding sample collection area with the XRF was included in this procedure. It is the auditor's opinion that these changes clarified specific items within the methodology and the procedure was adequate to document the methodology used.
10.	Laboratory Procedures	This procedure described the sample preparation methodology for soil and dust samples. This was originally undertaken by the ECRP sample team, but as of 14/04/2010 this was undertaken by the laboratory. It also included a three step procedure for cleaning the sieves used to filter dust samples. The procedure did not include details of laboratory analysis procedures, only sample preparation methodologies. From a health and safety point of view, it would be interesting to note if dust samples were sieved in a fume cupboard to manage dust and also how laboratory personnel determined if wearing of dust mask was necessary. The previous audit recommended that some confirmation sampling be undertaken of the food grade zip lock bags to confirm the absence of lead in these materials. This did not appear to have been undertaken. The absence of these inclusions is not considered to materially affect the sampling methodologies, and it is the auditor's opinion that changes made to the procedure were adequate to document the process followed.

Item	Procedure	Comments
11.	Waste Classification Sampling	The document provided a clear overview of waste classification for all materials including PPE, insulation and carpets disposed of as part of cleaning process. It did not include liquids. It outlines that a clean process had been established by ECRP for selection of a suitable disposal location as well as a sampling procedure agreed with by the receiving landfills. The auditor notes that the reference to the *Landfill Waste Classification and Waste Definitions (1996)* should be updated to reflect the most recent revision, which is; *as amended December 2009*. It was recommended that the document should have also outlined the waste classification procedure for roof, gutter and rain water tank cleaning water, which is understood to be disposed of in Albany. The absence of these inclusions is not considered to materially affect the sampling methodologies, and it is the auditor's opinion that changes made to the procedure are adequate to document the methodology used.
New Procedures		
12.	Portable XRF Analyser Operating Procedure	A portable Niton XRF was employed by the ECRP for onsite determination/initial screening of lead and nickel concentrations in soil, roof space, bulk carpet dust samples. The Niton was also used to assist in differentiating between typical household sources of lead and that from Magellan metals in external and internal surfaces. This procedure detailed the methodology for using the two models of XRF available for the ECRP. It also included a form that must be signed prior to use that the operator had undergone appropriate XRF training. The training includes ECRP XRF training as well as the *Portable Analytical Solutions Pty Ltd training sessions Certificate of Competency*.
13.	Validation Sampling Procedure	This procedure provides guidance on the validation sampling program and refers to the relevant sampling procedure for the appropriate validation sampling methodology.
14	Validation of Soil Removal	This procedure sets out the process of removal of soil where lead or nickel levels are found above guideline levels. Soil removal is outlined to be conducted by initially delineating the lateral and vertical extent of the impacted area by XRF testing, then removal of the soil in the identified impacted area by either shovel or mechanical excavator depending on the volume of soil to be removed (greater or less than 100 kg). It is noted that validation testing was not outlined in the procedure given the excavation of the soils was to be to pre-determined extents.

Item	Procedure	Comments
15.	Chain of Custody Procedure	This procedure outlines the order in which samples should be submitted to the laboratory and the appropriate documentation of samples and quality assurance and quality control samples on the chain of custody (COC). The requirements for a COC are generally consistent with that outlined in the *Development of a Sampling and Analysis Program* (DEC, 2001) guidance provided by the WA DEC.

Item	Procedure	Comments
16.	Quality Assurance and Quality Control	The QAQC requirements were previously included in the Laboratory Procedures in limited detail. The document indicates that the following quality assurance and quality control samples are collected as part of the sampling program: ◗ Rinsates – One water rinsate per cleaning process (the sample density was not provided). – Ghost wipe rinsate collected as required (the frequency of requirement was not provided). ◗ Field Blank – Ghost wipe prepared in the field, collected at a rate of 1:10. – Vacuum filter blank collected at a rate of 2 per COC. ◗ Method Blanks – Analysed at a rate of one per batch by the laboratory. ◗ Laboratory control sample – Two Certified Reference Material (CRM) samples per 250 samples. – Two Standard Reference Material (SRM) samples per 250 samples. The collection of QAQC samples is generally consistent with that outlined in the *Development of a Sampling and Analysis Program* (DEC, 2001) guidance provided by the WA DEC however, the auditor notes that blind replicate, split samples and transport blank samples have not been included. The ECRP stated that blind and split samples were not conducted for reasons relating to occupational health and safety. It was recommended that deionised water is used for rinsate samples and not distilled water as the latter can contain impurities that may results is positive metals readings. The document does not outline how the QAQC samples will be assessed as part of the project and the auditor notes that an assessment of QAQC has not been undertaken as part of the project. Further discussion on this is included in Section 7.
17.	Micro-vacuum Sampling	This procedure outlines roof surface sampling procedure using the micro vacuum. This was developed for use on asbestos rooves and was only used for a limited period of time as results were not comparable with swab sample. Sampling then reverted to collection of swab samples.

Item	Procedure	Comments
18	Archiving Procedure	This procedure forms part of the overall sampling methodology for ECRP. It focuses specifically on the handling of samples during the archive process. The procedure details safe work methods and numbering systems for archiving of soils.

5. Review of Cleaning Management Procedures

5.1 Introduction

The cleaning works were undertaken by contactors, which were managed by the ECRP team. The cleaning contract was divided into three separate areas based on the type and location of cleaning required. All cleaning was undertaken under close supervision of the ECRP team, who was responsible for making the final determination on where cleaning occurred and validating the cleaning process. This provided consistency and repeatability of the process.

5.2 Documentation

The following cleaning procedures had been prepared by the ECRP and reviewed by the auditor as part of this compliance and performance audit.

- CL01 Managing Internal and External Cleaning;
- CL02 Managing Roof Space Cleaning;
- CL03 Managing Roof Surface, Gutter and Rainwater Tank Cleaning.

5.3 Documentation Review

5.3.1 Cleaning Management Procedures

The cleaning management procedures outlined in CL01, CL02 and CL03 were designed to assist the ECRP Team (Principal Contractor responsible for overseeing the cleaning contractors) to manage cleaning works. They provide a logical risk based decision making process to assist in determining whether cleaning was required, and if so, the extent of cleaning necessary in each affected area of a premises. There was a strong emphasis on the need for an initial site visit to accurately determine the cleaning requirements on a case by case basis and the use of laboratory data as a guide to assist with the decision making process.

The cleaning management procedures, as outlined in the contract documents, indicated that the decision on where cleaning was to be undertaken was made by the ECRP team. This was initially conveyed to the cleaning contractor in a work order and then reiterated by the ECRP team in an on-site meeting prior to commencement of works to ensure clear written and verbal details of the cleaning requirements were provided. The process of obtaining a work order involved the issue of a cleaning work sheet for each premises, a site visit where the contractor's representative and the Principal's representative agreed on specific cleaning inclusions and exclusions. Following the site visit, the contractor would prepare an estimate for the work then the work order was issued by the Principal. Following cleaning, the ECRP Team then inspected the cleaning to ensure it had been completed to a satisfactorily level. Depending on the type of cleaning completed, different means of validation sampling (to ensure the cleaned area met the established guidelines), or a visual inspection were conducted by the ECRP team. For external surfaces, roof surfaces, internal surface and carpets, the validation sampling was completed in the same

manner as used for the initial sampling. Visual validation of gutters, roof spaces and rainwater tanks was also undertaken at this time. Clients who had their rainwater tanks cleaned or replaced were to be offered follow-up testing of rainwater following a period of significant rainfall. The procedures generally provided a clear step by step guide to the cleaning requirements specific to each affected area.

The accompanying contract documents outline the roles and responsibilities of the cleaning contractor and detail the specific cleaning methodology to be adopted for each area. The auditor acknowledges that cleaning procedures as outlined in the contract documentation could not be revised at this stage of his involvement in the audit. However, the auditor has identified areas within the cleaning management procedures where clarification on site items would be beneficial for completeness.

Key elements of each of the cleaning procedures are summarised in Table 2.

Table 2 Documentation Review of Cleaning Management Procedures

Item	Procedure	Comments
CL01.	Managing Internal and External Cleaning	The CL01 procedure provided guidance on how to determine appropriate internal and external cleaning locations. It also provided detailed information on the process associated with creating a work order, but does not included information on the sequence of cleaning and the cleaning validation process. It would have been beneficial to include it in all procedures for consistency. The CL01 procedure did not include any guidance on how a determination is made between wet cleaning and HEPA vacuum cleaning of internal and external surfaces. The contract document outlines the cleaning process for internal and external surfaces and the use of both wet cleaning methods and using the HEPA vacuum. In the contract document for internal surfaces it was unclear if the HEPA vacuum was used on all hard surfaces before wet cleaning, or if the HEPA vacuum was only used on selected hard surfaces.

Item	Procedure	Comments
CL02.	Managing Roof Space Cleaning	The CL02 document outlined issues to consider before cleaning roof spaces. It also indicates that cleaning validation is undertaken by taking photographs of the roof space. This must also include confirmation that insulation and wiring has been undertaken in accordance with relevant standards, as well as adequate cleaning completed. The contract outlined the specific steps to be followed during roof cleaning. The document indicated that the roof space must be accessed via external areas to reduce the potential for dust in the roof to enter internal areas. All internal roof access spaces were to be sealed to prevent dust. As part of the cleaning process any existing insulation was also removed and replaced with new insulation. All waste insulation and PPE materials were to be temporarily stored in locked containers at the Wylie Bay Refuse Site. See Section 7.1.3 for full details of waste disposal management. While detail was provided on how to remove insulation bats effectively from the roof space, the auditor notes that no information was provided on how to collect loose insulation effectively.
CL03.	Managing Roof Surface, Gutter and Rainwater Tank Cleaning	The CL03 document provided scenarios on how to determine what areas of the gutter were to be cleaned and when rainwater tanks should be cleaned. However, no scenarios were provided on the decision process for roof cleaning as a cleaning guideline (1.0 ug/cm^2) was established by the Steering Committee, reported in the sampling evaluation and no further guidance was required. The contract document outlined the cleaning procedure for roof, gutter and rainwater tanks as well as disposal requirements for liquid waste. The contract does not provide information on what to do if the roof was asbestos and the requirement for appropriate safety standards during working at height. However, the auditor understands that these items had been addressed and standard protocols provided to the contractor for these items.

5.4 Field Work Inspection

During the site visit, the audit team conducted a field audit to inspect the implementation of selected cleaning and validation works, this included:

- Gutter cleaning and validation – 10 January 2012
- Toolbox Meeting – 12 January 2012
- Carpet Cleaning – 12 January 2012

- External Surface Cleaning – 12 January 2012
- Internal Surface Cleaning – 12 January 2012

At the time of the site visit, all initial sampling work had been carried out and therefore could not be assessed. However, it is considered that discussions with ECRP Project Manager Mr Matthew Devenish and the intensive review of field notes within property files (Section 7) is adequate in determining that these activities were carried out in accordance with the relevant methodologies.

The following comments are made on each of the processes observed.

Gutter cleaning

The audit team noted that gutter cleaning and validation was undertaken in general accordance with *CL03 Managing Roof Surface, Gutter and Rainwater Tank Cleaning and* the following observations were made:

- Waste water from the gutter cleaning was collected and transported to Albany for disposal by a licenced DEC carrier.
- The downpipes were sealed prior to cleaning to reduce water discharge to down pipes.
- A food grade detergent was used during cleaning. Experience with gutter cleaning had resulted in a small amount of detergent being used to reduce the potential for bubbles to accumulate at the base of down pipes following rainfall.
- All Personal Protective Equipment (PPE) and cleaning cloths were bagged and disposed of at a licenced landfill facility.
- Validation was undertaken by visual assessment by the cleaning contractor, followed by further inspection by the ECRP team.

Toolbox Meeting

On Thursday 12 January 2012 the audit team attended a toolbox meeting with the ECRP team. The information supplied by the convenor of the meeting, Mr Wayne Winchester, covered all aspects of the program and was thorough in terms of providing the attendees with project updates. It was noted that the toolbox meetings were minuted as per the recommendations made in the initial audit report (GHD, June 2010).

Carpet Cleaning

The audit team noted that carpet cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning.* The following observations were made:

- The equipment was rinsed between each sampling event.
- The vacuum separator was replaced between each site.
- Two trained ECRP staff sampled and weighed the dust samples and provided guidance to the contractor on whether an area has been remediated to the established clean-up levels. Where sampling indicated the clean-up levels had not been achieved, the ECRP team informed the

contractor that further cleaning was required as per methodology *SA01 Module 11 Section 11.2.7 Guide to extended vacuum times*.

External Surface Cleaning

The audit team noted that external surface cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning.* The following observations were made:

- Contractors followed the relevant procedures;
- Cleaning rags were reused in some areas;
- Following cleaning, areas were XRF tested and or swab sampled by ECRP as per relevant procedures.

Internal Surface Cleaning

The audit team noted that internal surface cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning,* and the following observations were made:

- The XRF was used to assess areas where high lead concentrations had been reported (e.g. window sills).

It is the auditor's opinion that the ECRP team members who performed validations works and the contractors who undertook the cleaning demonstrated a thorough knowledge of the cleaning process.

6. Review of Sampling, Clean-up and Validation

6.1 Introduction

The ECRP conducted sampling, cleaning and validation of an extensive list of locations across the Esperance town site. The locations included residential premises (houses), commercial premises, day care centres, schools and public places (Esperance foreshore, playgrounds, catchment area, schools etc).

6.2 Documentation

The auditor has cited sampling and clean-up documentation with associated correspondence for each area as listed below:

Playgrounds

- Esperance Clean-up and Recovery Project, 2011, Lead Levels in Esperance Playgrounds, ECRP Sampling and Analysis Report, February 2011.
- Esperance Clean-up and Recovery Project, 2011, Correspondence to WALGA, Lead Levels in Playground Equipment, Letter dated 21 February 2011.

Esperance Foreshore

- Esperance Clean-up and Recovery Project, 2010, Correspondence to Shire of Esperance, *Foreshore sampling from port to pier*, Letter dated 30 September 2010.
- Esperance Clean-up and Recovery Project, 2011, Correspondence to Shire of Esperance, *Port to Pier Foreshore – The Esplanade*, Letter dated 16 June 2011.
- Esperance Clean-up and Recovery Project, 2011, Correspondence to Shire of Esperance, *Foreshore Park - Area H Pier to Jetty*, Letter dated 23 August 2011.
- Esperance Clean-up and Recovery Project, 2012, Correspondence to Shire of Esperance, *Port to Pier Foreshore – The Esplanade*, Letter dated 1 May 2012.

Wireless Hill Catchment Area

- Esperance Clean-up and Recovery Project, 2009, *Post Sampling Evaluation Site 1105.*
- Esperance Clean-up and Recovery Project, 2010, *Post Sampling Evaluation Site 1105.*
- Esperance Clean-up and Recovery Project, 2011, *Post Sampling Evaluation Site 1105.*
- Esperance Clean-up and Recovery Project, 2011, Map - *Soil Sampling Results For Lead, Moran Place Railway Dam,* September 2011.
- Esperance Clean-up and Recovery Project, 2011, Map - *Soil Sampling Results For Nickel, Moran Place Railway Dam,* September 2011.
- Esperance Clean-up and Recovery Project, 2011, Map - *Moran Place Railway Dam and Wireless Hill*

Catchment Area, Maximum Concentrations of Lead and Nickel in the Soil, November 2011.

- Esperance Clean-up and Recovery Project, 2012, *Cleaning Report Site 1105,* February 2012.

Broad Based Soil Sampling

- Esperance Clean-up and Recovery Project, 2010, Map - *Soil Sample Location, Results based on 300 samples 09/02/2010*, February 2010.
- Golder Associates, 2009, *Town of Esperance, Data Gap Analysis Sampling and Analysis Plan*, October 2009.

Day Care Centres

- Esperance Clean-up and Recovery Project, 2009, *Post Sampling Evaluation, Site ID 1011.*
- Esperance Clean-up and Recovery Project, 2009, *Post Sampling Evaluation, Site ID 1115.*
- Esperance Clean-up and Recovery Project, 2009, *Post Sampling Evaluation, Site ID 3100.*
- Esperance Clean-up and Recovery Project, 2009, *Validation Report, Site ID 3100.*

Schools

Given the level of information received on Esperance schools, a summary of the documentation provided by the ECRP and reviewed by the Auditor is provided in Table 3 below.

Table 3 School Documentation Reviewed

Site ID	Summary of documentation reviewed	Date
3367	Post Sampling Evaluation Report	29 Nov 2011
	Correspondence with School	
3175	Post Sampling Evaluation Report	9 Sep 2011
	Correspondence with School	
1136	Post Sampling Evaluation Reports	Mar 2010
	Cleaning Reports	
	Correspondence with School	6 Jul 2011
2671	Post Sampling Evaluation Reports	4-7 Oct 2010
	Soil sampling report	20 Dec 2010
	Asbestos monitoring results	Apr-May 2010
	Lead Clean-up and Removal Plan	4 Jan 2011
	Cleaning Reports	Jan-Jul 2011
	Correspondence with School	Jan 2011, March 2012

Other Public Premises

Given the level of information received on other public premises, a summary of the sample documentation provided by the ECRP and reviewed by the Auditor is provided in Table 4 below:

Table 4 Other Public Premises Documentation Reviewed

Site ID	Premises	Summary of documentation reviewed	Date
2825	Church	Post sampling evaluation	Nov 2010
		Correspondence with Church	Mar 2011
2822	Civic Centre	Post sampling Evaluation	Nov 2010
		Additional Roofspace results	Jun 2011
		Final Rainwater Report	Aug 2011
		Cleaning Report	Sep 2011
2793	Town Hall	Post Sampling Evaluation Report	Nov 2010
		Cleaning Report	Aug 2011
2824	Kindergarten	Post Sampling Evaluation Report	Nov 2010
		Cleaning Report	Oct 2011
2839	Playgroup	Post Sampling Evaluation Report	Dec 2010
		Updated Post Sampling Evaluation Report	Jun 2011
		Cleaning Report	Aug 2011
2888	Tennis Club	Post Sampling Evaluation Report	Jun 2011
		Cleaning Report	Oct 2011
1353	Mini-Golf	Post Sampling Evaluation Report	Jan 2010
		Updated Post Sampling Evaluation Report	Nov 2010
		Cleaning Report	Mar 2011
1099	Homestead	Post Sampling Evaluation Report	Nov 2009
		Cleaning Report	Jun 2011

Residential Houses

The documentation reviewed along with an in depth quality control review is detailed in Section 7 of this report.

6.3 Documentation Review

Key elements of each of the sampling, cleaning and validation programs are summarised in Table 5.

Table 5 Key Elements of Reviewed Documentation

Clean-up Area	Key Elements
Playgrounds	Following initial sampling and clean-up of 22 targeted playgrounds by the Esperance Shire in early 2008, the ECRP conducted further sampling and validation of the same playgrounds in 2009. Sampling and validation testing by the ECRP showed that the playgrounds did not contain any remaining lead fall contamination and that those samples from surface wipes of play equipment where elevated lead was present were directly attributed to the transfer of inbound lead from fibreglass slides and play equipment which had experienced weathering (generally over 10 years old). The reporting indicates that the DoH advised that the existing lead in the play equipment is not likely to pose a health risk to playground users given the nature of the lead not being readily bioavailable.
Esperance Foreshore	The ECRP conducted sampling of features along the Esperance foreshore area from the port to the pier in August and October 2010. The features sampled included amenities buildings, rotundas, picnic tables and soil. The sampling indicated that some areas contained lead and/or nickel concentrations which exceeded the guideline levels and therefore required cleaning. Cleaning was conducted in March, April and October 2011 until validation testing indicated lead and/or nickel concentrations were below the guideline levels. Where lead levels remained in excess of the guidelines, those concentrations were attributed to the existing lead within the surface material of the sampled feature.
Wireless Hill Catchment Area and Railway Dam	Sampling of water and sludge/sediment from the secured Railway dam and soil from the unsecured catchment area was conducted by ECRP in November 2009, October 2010, September 2011 and November 2011. The sampling indicated nickel and lead concentrations in soil and dam water and sludge/sediment exceeded the guideline levels. The cleaning report indicates that soil removal in the catchment area was conducted in December 2011 by means of delineating the lead and nickel contamination with an XRF then removal of soil and simultaneous validation testing of the area until XRF readings indicated lead and nickel concentrations were below guideline levels. Cleaning of the dam was conducted in January 2012 following the completion of catchment soil clean-up activities. The cleaning report indicates that the weeds and dam sediment were removed to a licenced waste facility and that scrubbing and flushing of the sump walls was also conducted. Liquid waste from this process was also captured and disposed at a licenced waste facility.

Clean-up Area	Key Elements
Day Care Centres	A sample of three day care centre cleaning and validation reports were reviewed by the Auditor. These day care centres were sampled in November 2009 and February 2011. The post sampling evaluation reports indicated that one of the three premises required cleaning due to lead concentrations exceeding guideline levels. The cleaning and validation of this premises was conducted in July, August and October 2011 and involved vacuuming and removal of carpet and soil. The validation report indicated that residual lead concentrations did not exceed the guideline levels.
Residential Houses	From 2009 to 2012, over 2000 residential premises were sampled by the ECRP and where required, cleaned and validated. A sample set of 20 residential premises were reviewed by the auditor and a thorough QA/QC review of the field, laboratory and transport documentation is included in Section 8 of this report.
Broad Based Soil Sampling of Esperance Town	Soil sampling from 300 locations across Esperance town was conducted in February 2010. The methodology for the soil sampling was based on the Sampling and Analysis Plan prepared by Golder Associates, October 2009. The Auditor has reviewed the Sampling and Analysis Plan and finds that it is adequate for the purposes of screening for soil contamination across the expected areas of lead fall impact. Mapping of the results from the soil sampling indicates the sample locations were well spaced across the area of interest and that XRF analysis revealed that the concentration of lead in those samples did not exceed the DEC Guidelines.
Schools	Sampling and clean-up documentation from a sample set of four schools (public and private) was reviewed by the Auditor. The schools reviewed were sampled for lead and nickel between March 2010 and September 2011, two of which indicated lead and nickel concentrations were below guideline levels in all areas sampled. As such, no cleaning was required. The remaining two schools reviewed were shown in the post sampling evaluation reporting to require cleaning given the detection of concentrations of lead and nickel in excess of guideline levels. Cleaning of the schools was conducted in January to July 2011 and involved cleaning of roof surfaces, gutters, sumps, ceiling voids, internal surfaces, carpets and associated dust control and monitoring during clean-up activities. Areas were cleaned until laboratory testing indicated nickel and lead concentrations were below guideline levels. In one carpet which was cleaned repeatedly the lead concentration remained above the guideline level however was shown not to be related to the Magellan lead fall source.

Clean-up Area	Key Elements
Other Public Premises	Sampling and cleaning documentation from a sample set of other public premises was reviewed by the Auditor. The public premises comprised a church, kindergarten, playgroup, community hall, tennis club, mini golf course, a homestead and civic centre. The sampling of these premises was conducted between November 2009 and June 2011. All locations reviewed excluding the church were shown in post sampling evaluation reporting to require some form of cleaning. Where required, areas were cleaned until laboratory testing indicated nickel and lead concentrations were below guideline levels or in some instances, residual lead concentrations were shown by isotopic testing to be unrelated to the Magellan lead fall source. These locations shown to contain non-Magellan lead sources were generally carpets (which had been cleaned repeatedly) or internal skirting material.

7. Validation of Results

While quality assurance and quality control samples were collected by ECRP during the sampling and validation works and QAQC was documented in the *SA01 Methodology 16 Quality Assurance and Quality Control* procedure, an assessment of the results was not undertaken by ECRP. To verify that the data was of an acceptable quality upon which to draw meaningful conclusions regarding sampling, clean-up and validation of the sites, the auditor has undertaken a detailed review of a sample set of selected sites. This included, but was not limited to, a review of the following documentation:

- ECRP field notes;
- Chain of Custodies;
- Laboratory reports;
- Documentation provided to residents;
- Work orders;
- Waste disposal documentation; and
- Calibration documentation.

Twenty sites were selected for the validation assessment, equating to approximately 1% of sites included in this audit. The sites were selected to ensure a good cross section of premises assessed, cleaned and validated throughout the duration of the project. The sites are listed in Table 6 below:

Table 6 List of Audit Validation Sites

Site ID	Summary of works undertaken	Date
1019	Sampling	18/11/2009
	Cleaning	06/07/2010 to 04/08/2010
	Validation	07/07/2010 to 21/09/2010
	Additional Sampling/Validation	21/09/2010 to 02/06/2011
1041	Sampling	26/10/2009
	Cleaning	05/07/2010 to 09/07/2010
	Validation	05/07/2010 to 09/07/2010
	Additional Sampling/Validation	31/08/2010 to 30/06/2011
1120	Sampling	23/12/2009
	Cleaning	13/08/2010 to 29/09/2010
	Validation	13/08/2010 to 05/10/2010

Site ID	Summary of works undertaken	Date
1435	Sampling	05/03/2010 to 26/08/2010
	Cleaning	01/10/2010 to 23/10/2010
	Validation	01/10/2010 to 25/11/2010
1457	Sampling	11/03/2010 to 11/09/2010
	Cleaning	16/09/2010 to 07/01/2011
	Validation	22/09/2010 to 20/07/2011
1484	Sampling	16/03/2010 to 14/09/2010
	Cleaning	20/10/2010 to 10/11/2010
	Validation	01/11/2010
	Additional Sampling/Validation	22/03/2011 to 12/08/2011
1511	Sampling	19/03/2010 to 09/09/2010
	Cleaning	07/07/2010 to 14/10/2010
	Validation	22/09/2010 to 26/11/2010
1578	Sampling	31/03/2010 to 07/09/2010
	Cleaning	01/08/2010 to 15/10/2010
	Validation	28/09/2010 to 22/11/2010
	Re-Clean/Validate Carpets	21/02/2011 to 27/06/2011
1684	Sampling	15/04/2010
	Cleaning	04/07/2010 to 16/08/2010
	Validation	30/07/2010 to 28/09/2010
1703	Sampling	22/04/2010 to 20/10/2010
	Cleaning	28/10/2010 to 05/11/2010
	Validation	28/10/2010
	Additional Sampling/Validation	30/06/2011 to 24/08/2011
1711	Sampling	04/05/2010 to 09/11/2010
	Cleaning (including soil replacement)	07/12/2010 to 27/02/2011
	Validation	18/12/2010 to 18/06/2011
2025	Sampling	11/06/2010

Site ID	Summary of works undertaken	Date
	Cleaning	04/02/2011 to 28/09/2011
	Validation	04/02/2011 to 19/09/2011
2085	Sampling	18/06/2010 to 27/01/2011
	Cleaning	23/02/2011 to 15/03/2011
	Validation	23/02/2011 to 16/07/2011
2250	Sampling	21/07/2010
	Cleaning	09/05/2010
	Validation	29/08/2010
2439	Sampling	26/08/2010
	Cleaning	20/05/2011 to 15/07/2011
	Validation	09/06/2011
	Additional Sampling/Validation	19/01/2012
2469	Sampling	19/08/2010
	Cleaning	15/03/2011 to 29/04/2011
	Validation	15/03/2011 to 29/04/2011
	Additional Sampling/Validation	16/06/2011 to 23/08/2011
2637	Sampling	29/09/2010 to 17/01/2011
	Cleaning	31/01/2011 to 27/04/2011
	Validation	31/01/2011 to 05/08/2011
2722	Sampling	06/11/2010 to 31/05/2011
	Cleaning	09/05/2011 to 03/06/2011
	Validation	31/05/2011 to 25/08/2011
2893	Sampling	17/12/2010
3373	Sampling	12/09/2011

Mr Matthew Devenish, ECRP Project Manager was interviewed by the Audit team with regards to the sampling, cleaning and validation process and provided an account of how the process was implemented from site assessment (anyone who was concerned that their premises was affected) to site selection (based on comprehensive testing), clean-up and validation. The audit team also noted the care with which Mr Devenish took in evaluating results (especially taking into account anomalies) prior to issuing a

validation report. The auditor was therefore satisfied that the protocols established were respected for each of the premises.

7.1 Field Program

7.1.1 Field Notes

The ECRP kept comprehensive field notes for each site assessed and remediated. The notes were recorded on a series of project specific templates to ensure consistency for each site. A review of the field documentation undertaken by the auditor identified the following field note template documentation:

- Sample Record Sheet (Rainwater tank/Gutter, Soil, Carpet, Roof, Surfaces);
- Carpet Bulk Dust Sampling Record Sheet (XRF Analysis);
- Validation Record Sheet.

The Sample Record Sheet was noted by the auditor to take a number of formats relevant to the sampling being undertaken. It is noted that following initial sampling of the entire premises, the Sample Record Sheet was amended to meet requirements of the additional sampling events. Although fields in the Sample Record Sheet were not consistent from initial sampling to additional sampling events, however the auditor noted that inconsistencies may be due to modifications to the field forms over time for the purposes of improving note taking.

The Carpet Bulk Dust sampling record sheet (XRF Analysis) was noted by the auditor to be a consistent form.

7.1.2 Chain of Custody Documentation

A review of the Chain of Custody (CoC) documents indicated that they appeared to be consistent with that outlined in the *Chain of Custody Procedure*. In the majority of cases the forms were signed by the person relinquishing the samples and the person accepting the samples at the laboratory. The courier consignment number was also included on the form. The ECRP team confirmed that the delay between relinquishment and receipt date is due to courier transportation. The auditor noted that there is no chain of custody from the sample location to the ECRP office where the samples are prepared for transport. The auditor noted however that consistent project teams conducted the sampling and validation works and that from the auditor's site visit and questioning of the project teams, he is confident that the team exercised due care in the transfer of samples from the field to the laboratory.

Overall, the COC documentation is considered adequate in providing a reliable tracking source for the samples in transit.

7.1.3 Waste Disposal Documentation

The auditor understands that waste generated as part of the sampling, clean-up and validation works was managed as follows:

- Liquid waste was collected in the contractor supplied liquid waste collection vehicle. When it was full

it was disposed of at a licensed liquid waste disposal facility in Albany, Western Australia.

- All PPE, waste insulation, etc., was bagged in accordance with the *Waste Classification Procedure* and stockpiled in a container and classed as dry waste. Once the container was full, the material was transported to a licensed waste disposal facility in Red Hill, located on the outskirts of Perth, Western Australia.
- No contaminated waste was disposed of in Esperance.

As a result, documentation on waste disposal was not included for every audited site, only on those where transportation to the designated disposal location was required.

Waste disposal documentation cited was related to liquid waste. It was noted that liquid waste disposal was traceable to specific residences with all appropriate fields filled out including volumes, sender and receiver details.

Dry waste disposal documentation cited related to weighbridge dockets (detailing landfill details, class and weight of waste to be disposed), letters regarding landfill waste acceptance approval and freight consignment notes.

7.1.4 Equipment Calibration

XRF Standard Calibration Form and Validation Form

The auditor noted an XRF standard check was performed at the commencement of each job and after every 20 assays. Where standard checks were not accurate, calibration was to be performed then the standard check was re-run. It is understood that the results of the follow-up check were generally recorded underneath the first results.

Standard checks conducted on the XRF were noted by the auditor to at times indicate a non-detect for nickel. Subsequently, nickel concentration readings taken at the premises would also be reported as non-detects. Although a potential for the premature cessation of cleaning may have resulted from these readings, laboratory samples were always collected following XRF testing to ensure any discrepancies in the field were picked up by the laboratory and if necessary, cleaning could be repeated.

XRF calibration certificates from the XRF supplier were also cited. The documentation cited appears to be adequate.

Vacuum Cleaning Register

Completed Vacuum cleaning registers were cited indicating the person using the vacuum, date signed out for use and parts of the vacuum which were cleaned/maintained and comments regarding parts requiring replacement.

The auditor noted that the form did not allow for interpretation of how often the vacuum cleaner was used to demonstrate adequate cleaning frequency, nor was it possible to correlate vacuum cleaner numbers with premises cleaned.

Given the validation sampling checks that took place at each premise, the auditor did not consider the

absence of these records affected the objective of the ECRP.

7.2 Laboratory Program

7.2.1 Laboratory Reports

The auditor notes that each sample location was provided with a unique sample identification. Initially, the sample identifications were based on the site address. However as the project progressed a more systematic sample identification nomenclature was developed based on the site ID number and standard labels for each sample area. The standard sampling nomenclature provided a unique and traceable sample ID.

A review of the laboratory supplied data, compared with that reported to the residents, indicated a general consistency in transcription of the data set. In some cases, the tracing of a sample from field notes to laboratory reporting then to ECRP reporting was not entirely straight forward (e.g. missing dates on lab reports, inconsistent sample labels) however this is noted by the auditor to be due to the format of the documentation provided for this review and is not likely to have an impact on the traceability of samples from raw data. The auditor notes that sample concentrations were generally rounded down from the laboratory reports to the ECRP reports, which while not recommended, was clarified by the ECRP in that the rounding of raw results was automated by Microsoft Excel. It is also noted that the original concentrations which had been rounded down were one or two orders of magnitude lower than the relevant guideline level for the medium of tested. Consequently, the auditor did not consider the rounding had any influence on the requirement for further action or would have failed to record concentrations that could have posed an unacceptable risk to human health.

The auditor noted that at the commencement of the project, truncation of results was being undertaken. This resulted in underestimation of results at some locations. Once the issue was identified, ECRP reviewed all existing data sets and undertook additional clean-up and validation in areas where truncation had resulted in under estimation of results.

7.3 Quality Assurance and Quality Control

The auditor notes that Quality Assurance and Quality Control (QA/QC) measures were undertaken throughout the sampling, clean-up and validation works in the form of duplicate sample collection and various types of blank sample collection (review of the QA/QC data confirms that blank samples did not contain any detectable concentrations of lead or nickel) as outlined in SA01 Site Sampling Methodology Module 16 and that internal quality checks were also conducted.

8. Review of Community Consultation

8.1 Introduction

The lead contamination incident in the town of Esperance generated a significant level of community concern and public outrage. Residents were particularly concerned about the long term impact of lead contamination on children's development and the health of the local pristine environment. There was also concern around the negative public image that resulted from the lead contamination and the impact this would have on the town's development and tourism industry, which supports much of the local businesses.

Given that the clean-up works focused around individual residential dwellings, the project also included on-going community engagement in a very sensitive environment. Consequently, to ensure successful clean-up, the involvement and co-operation of individual residents was essential to delivering successful clean-up.

In 2007, the Esperance Community Reference Group (ECRG) was established to communicate information for the State and Local governments to the Esperance community. This group included citizens from relevant government departments (DEC and DoH), local government, community groups and the port. The outcome from the ECRG included, but were not limited to the following:

- establishment of a blood lead sampling program;
- sampling and clean-up at selected locations;
- public presentations and public information sessions;
- investigations and subsequent improvements to the conveyor and ship loading infrastructure at the Esperance Port Authority;
- public campaign to promote Esperance;
- development of community newsletters, letter box drops and public meetings; and
- two public open days.

In October 2008, with a change in government a "Co-ordinator Esperance Community Consultations" was established, highlighting the importance of community consultation as part of this project. This was followed by a series of high profile public meetings in Esperance, which culminated in the development of the ECRP.

Although stakeholders were initially disgruntled with the response to the incident, the formation of the ECRG and subsequently the ECRP and the establishment of robust sampling protocols led by a dedicated team improved stakeholder sentiment over time.

Further detail outlining the community consultation undertaken prior to the development of the ECRP is outlined in the *Governance Model Under-pinning the Esperance Clean-up and Recovery Project* (DoT, 2012). This audit review focused on the community consultation undertaken by the ECRP only and no further comment is provided on that undertaken prior to 2009. It is noted however that community feedback to the audit team has highlighted the dramatic improvement in community involvement,

information sharing and re-establishing trust in the ECRP.

8.2 Community Consultation Techniques

While a detailed community consultation plan was not prepared by the ERCP, following discussions with Mr Wayne Winchester and Mr Matthew Devenish, the auditor understands that the following community consultation has taken place.

Documentation

The ECRP developed a Communications Plan (ECRP, 2009), which outlined the key stakeholders and communication techniques adopted for the project.

Public Presentations

A series of public presentations have been undertaken by the ECRP team over the duration of the project. These are listed in Table 7 below.

Table 7 Community Consultation Presentations

Date	Event	Activity	Audience
Bi-Monthly	Regular Project Updates	Report	Business, Community, Government
Apr-09	Rotary	Presentation	Community
Mid-09	Esperance Primary School P&C	Presentation	Parents and teachers
Oct-09	Agricultural Show	Manned display for 2 days	Community
Oct-09	Environmental Health Group	Presentation	WALGA Env. Health Professionals
Dec-09	Kalgoorlie-Boulder Chamber of Commerce and Industry	Presentation	Business
Mar-10	Over the Horizon	Presentation	Business, Community, Government
Mar-10	Environmental Health Group	Presentation	WALGA Env. Health Professionals
May-10	Rotary	Presentation	Community
Aug-10	Rotary	Presentation	Community
Oct-10	Agricultural Show	Manned display for 2 days	Community
Apr-11	Advertisement in Esperance Express	Seeking more clients for sampling	Community

Date	Event	Activity	Audience
Apr-11	Advertisement in Kalgoorlie Miner	Seeking more clients for sampling	Community
Oct-11	Agricultural Show	Manned display for 2 days	Community

Brochures

A number of brochures have also been developed to educate the town on the risks associated with lead, including:

- Esperance Clean-up and Recovery Project The Sampling, Cleaning and Validation Process; and
- Source of Lead – Esperance Clean-up and Recovery Project.

Web Site

A web site entitled OnCue was developed; OnCue (www.oncue.org.au), which provides information on the lead contamination and regular updates on the progress of the project.

Letter Correspondence

As part of the sampling and clean-up process, regular letter correspondence was provided to the residents on the progress of works at their dwelling. The ECRP developed a series of letter templates to communicate various stages of the sampling, clean-up and validation process to customers. The letter templates are listed in Table 8.

Table 8 Letter Communication Templates

Letter	Category	Title	Use
Letter 10	INITIAL CONTACT	Area of Interest	Within the area of interest
Letter 11	INITIAL CONTACT	Castletown Houses	Outside the area of interest
Letter 12	INITIAL CONTACT	Castletown Units	Units only
Letter 13	INITIAL CONTACT	Original stages	No longer in use
Letter 14	INITIAL CONTACT	Consent Form Only	To hand out to clients at the front counter
Letter 20	CLEANING REQUIRED	Results in and cleaning required	For original PSEs
Letter 30	CLOSEOUT	Thanks for the consent form but no sampling required	Consent form received but sampling not required.

Letter	Category	Title	Use
Letter 31	CLOSEOUT	Results in and no cleaning required	The sample results show premises is clean.
Letter 32	CLOSEOUT	No cleaning required - other sources detected	The premises has other sources of lead
Letter 33	CLOSEOUT	Cleaning declined by client	Client declines to have any cleaning conducted
Letter 34	CLOSEOUT	Re-cleaning declined by client	More cleaning required but client has declined
Letter 35	CLOSEOUT	Cleaning complete	Clean - no further cleaning required
Letter 36	CLOSEOUT	Cleaning complete but other sources detected	Clean but other sources of lead unrelated to the incident still present
Letter 37	CLOSEOUT	Cleaning offer withdrawn	Originally offered cleaning, but offer is withdrawn
Letter 40	OTHER RESULTS	Fresh Produce	Egg, fruit, vegetable testing
Letter 41	OTHER RESULTS	Blood Lead Level test results	Blood test results for our clients
Letter 42	OTHER RESULTS	Rainwater Final Testing Complete	Final RWT test (3 months after cleaning)
Letter 43	OTHER RESULTS	Additional samples to report	If ECRP prematurely closed the file
Letter 50	COMPENSATION	Where cleaning cannot be conducted	Asbestos rooves where ECRP cannot clean
Letter 51	CONFIRMATION	Of booking	Written confirmation of a booking
Letter 60	DELAYED RESULTS	Courtesy note	Courtesy note to alert the client of a delay
Letter 70	RESPONSE	To negative feedback	If it's necessary to respond to the criticism
Letter 71	RESPONSE	To questions about isotopic testing	A detailed description of isotopic test results

Reporting of Results Template

The ECRP developed a reporting template which is provided to all clients which summarises the results of sampling and validation tests undertaken at the premises. The report included all results for initial and

cleaning/validation (where required) sampling and a written summary of the outcome of the work completed at the premises.

Customer Feedback Forms

ECRP prepared a customer feedback form which was sent to each resident at the completion of the sampling and clean-up works. The responses were recorded in a spread sheet and follow up discussions were held with the residents, where required. The satisfaction ratings were recorded in the feedback forms and is tracked and reported in the OnCue Project Update.

Media

The *Communication's Plan* provided the following guidelines on communication with the media:

- All responses should be made in writing;
- Responses should come from an expert officer in the ECRP;
- Only questions relating directly to the clean-up project should be answered;
- Responses should be no longer than three paragraphs;
- All news media requests were to be immediately referred to Communications. The spokesperson for the ECRP project was the Director, ECRP.
- Where misleading information was published in the local media, consideration was given to submitting an advertorial column clearly branded to the project providing the correct information.

Following discussions with the ECRP the auditor understands that the ECRP do not encourage media coverage, but were happy to provide comment when requested.

Other Community Consultation

In addition to the formal community consultation techniques outlined above, numerous ongoing informal consultations were undertaken by the Project Director. The ECRP indicated that these included the following:

- Radio interviews;
- Interviews with and written submissions to the local print media;
- Interviews and articles by other project stakeholders on ECRP's behalf (such as Department of Health responding to questions about "lead in playgrounds");
- Ongoing, one-on-one community engagement that was undertake on a daily basis;
- Regular project updates to the Steering Committee;
- Regular personal updates to the CEO of the Shire of Esperance (generally every six months)
- Regular personal updates to the CEO of the Esperance Port (generally every six months)
- Ad hoc personal updates to the local Member of Parliament, Graham Jacobs (three to four times during the course of the project);

- Ad hoc personal updates to the local Nationals member, Wendy Duncan (three to four times during the course of the project);
- Ad hoc personal updates to the Minister of Transport (three times during the course of the project so far); and
- A personal briefing to the Premier of Western Australia in February 2012.

8.3 Documentation Review

The auditor reviewed the means by which community consultation was implemented by the ECRP. A review of available documentation is outlined in Table 9 and the stakeholder consultation review is included in Section 8.4.

Table 9 Documentation Review of Community Consultation Materials

Item	Procedure	Comments
1	Communication Plan	The Communications Plan identified the key stakeholders and their contact details and provided a general overview of the communication methods that were adopted as part of the project and a brief schedule of notifying key stakeholders on project progress. The Communications Plan is not consistent with the DEC *Community Consultation Guideline* (DEC, 2006). The auditor notes that this plan was out of date, with some changes to the key stakeholders.
2	Brochure - ECRP- The Sampling, Cleaning and Validation Process	The brochure provided a general overview of the project, an approximately timeline of the sampling, cleaning and validation works as well as the sentinel monitoring, which will be undertaken as part of the ECRP. It also included contact details for the ECRP team and the website address for people seeking further information. While the brochure clearly outlined the processes that were undertaken it would have been beneficial to include a comment qualifying that not all areas of all houses will be cleaned and the cleaning will be based on sample results.

Item	Procedure	Comments
3	Brochure - Source of Lead – ECRP	The brochure identified numerous sources of lead that are present around the home, highlighting that the presence of lead within houses may be a result of other factors and not just Magellan Metals. It provided information on how the handheld XRF and Isotopic testing were used to assist with the identification of these other forms of lead. Tips for managing lead dust within homes through appropriate cleaning techniques was also provided. It is the auditor's opinion that the brochure provides useful information on why other sources of lead (other than that from Magellan Metals) may be present in homes. The brochure was likely to assist in increasing people's awareness of lead in the home, which will ultimately support the ECRP in justifying why cleaning was not undertaken in some circumstances.
4	Website - OnCue	The website included a brief description of the town site clean-up, port clean-up and nickel exports. It also included a range of contact options for the ECRP should people require additional information. Accessibility of different community groups has also been considered, with a section on accessibility. Project updates were the main source of regular information provided on the website with project updates included on an approximate two-monthly basis from May 2009 to December 2011. The project updates were presented as a two to three page PDF document that outlines the progress of works. Steering committee meeting minutes, newsletters, media releases and relevant published reports were also included on the website. It is the auditor's opinion that the website is easy to navigate, well presented and professional. It provides a comprehensive range of information sources for the public and methods to contact ECRP where necessary.
5	Letter templates	The letter templates listed in Table 8 provided a standard response format to the most common communications that were required between ECRP and residents at each stage of the clean-up program. It is the auditor's opinion that the templates provided a good framework to ensure that all residents were provided information in a consistent manner and format. The language in the letters was concise and clearly communicated the message required. The auditor noted that a copy of the letter communication provide to each customer is included in the individual site's hard copy folder located at the ECRP office. Electronic systems were also developed, specifically to record and track the provision of letter correspondence.

Item	Procedure	Comments
6	Reporting or Results Template	The reporting of results template included a unique client identification number, address and small map outlining the site location. The results were then summarised in a clear table format, with any guideline exceedances highlighted. A brief conclusion of the assessment of results and outcomes for cleaning was then provided. The auditor considered the reporting template to be a very effective method of communicating results to clients in a manner that was easy to understand. The comments at the end of the document also provided a clear interpretation of the results.
7	Customer Feedback Form	The customer feedback form was attached to the following final cleaning completed letter templates: ◗ Re-cleaning, declined by client; ◗ No cleaning required – other sources detected; ◗ Cleaning complete; ◗ Cleaning complete, but other sources detected; and ◗ Cleaning offer withdrawn. The form included three questions on the sampling process and the cleaning process (where cleaning was undertaken) and offered final blood level testing to the customers. It was the auditor's opinion that the feedback form was clear and concise.

Item	Procedure	Comments
8	Customer Feedback Spread sheet	All stakeholder feedback was recorded in a spread sheet, in which all responses were collated, and any follow-up communication undertaken by ECRP was recorded. At the time the audit was conducted, the spread sheet included 347 responses (out of a total of 1,300 forms distributed). Responses were received from September 2010 to December 2011. The ECRP has calculated that this equated to a response rate of 26% and an overall satisfaction rating as recorded in the received responses, of greater than 90%. A review of the OnCue newsletters indicates that the satisfaction rating generally remained above 90% from May 2009 to December 2011. The auditor noted that since October 2011 where a negative comment or complaint was provided, the ECRP conducted follow up conversations and in some cases, rectification works to satisfy the client. This action was also recorded in the spread sheet. In addition, a letter template was prepared which provided a formal response from the ECRP to residents who provided negative responses on the feedback form. The spread sheet also tracked the progress of final blood lead level testing which could be requested on the customer feedback form. Where customers requested blood tests, the ECRP then followed up with letter correspondence to organise the testing. The spread sheet included comments on the follow up undertaken by the ECRP to ensure that these were undertaken. The auditor noted that in most cases, comments had been included to finalise occasions where blood tests were initially requested and then not undertaken.

8.4 Stakeholder Consultation Review

GHD is aware that community consultation undertaken by the ECRP has included a range of techniques including, letter drops, community meetings and one-on-one discussions.

The audit team individually met with a select number of stakeholders or held discussions over the phone to ascertain their satisfaction with the ECRP and community consultation that was undertaken as part of the project. Stakeholders interviewed by the audit team included representatives from the Shire of Esperance, the Esperance Chamber of Commerce and Industry, Department of Health (Public Health) and the ECRP Steering Committee. Five residents, who had sampling and cleaning works undertaken within their premises, were also interviewed as part of the process.

In order for the auditor to gain an understanding of the effectiveness of the community consultation undertaken as part of the ECRP, discussions were held with a selection of stakeholders to attain their opinion on the clean-up program. The discussion was focussed around the following questions:

- From a community perspective do you think the clean-up has been completed to the community's

satisfaction?

- From a community perspective what do you think has been the most impressive aspect of the clean-up?
- From a community perspective what do you think has been the least impressive aspect of the clean-up?
- Do you think that the community generally feel potential health risks have been mitigated?
- What do you think people will remember about the project?
- What is your lasting impression about the project?

The feedback provided by stakeholders interviewed is summarised as follows:

- Following the identification of lead contamination in the town, it was generally noted that communication with the community was limited and not provided within a satisfactory timeframe. This created a feeling of distrust and apprehension throughout the community.
- Since the commencement of the ECRP there had been a significant shift in the general attitude of the community. Most people reported a very high level of respect for the ECRP team, and recognised its efforts to re-establish community confidence in the clean-up project.
- There is a general consensus that the clean-up works have been completed to the community's satisfaction. However, some of the stakeholders also expressed a general community feeling that the works had gone on for a long time and they were looking forward to its completion.
- The stakeholders expressed satisfaction that the potential health risks had been mitigated successfully as a result of the work completed by the ECRP.
- The professionalism and branding of the sampling teams and strong focus on local employment were considered by a number of stakeholders to be the most impressive aspects of the project. The commitment and sincerity of the ECRP management team was also noted by a number of stakeholders as a positive aspect of the project.
- The delay between clean-up works following the contamination incident and the actual time it took to complete the sampling, cleaning and validation works was regularly identified as the least impressive aspects of the project. The auditor acknowledges that this opinion related to delays prior to the establishment of the ECRP.
- Some questions were also raised regarding the ongoing works that would be undertaken to confirm re-contamination did not occur and also the state's commitment to re-establishing Esperance's reputation.

8.5 Community Consultation Assessment

The auditor has reviewed the community consultation program undertaken by the ECRP with respect to the guidance outlined in the DEC Contaminated Sites Management Series, *Community Consultation Guideline* (DEC, 2006).

8.5.1 Community Consultation Techniques

Through a combination of public meetings, attendance at community events, development of brochures and regular project update postings on the designated website, it is considered that a wide range of communication techniques have been presented by the ECRP. The auditor considers that there may have been some additional benefit in providing the project updates in other forms such as at the local council offices.

The auditor understands that the ECRP team has always made itself available for discussions with community members when requested. Feedback from the stakeholder consultation review undertaken by the auditor indicates that this communication has been open and honest and appreciated by community members.

Discussion with the ECRP team and representatives from the Steering Committee and community groups indicates that community consultation has provided significant input in evolving the sampling, cleaning and validation procedures. This suggests that community feedback has been duly considered by the ECRP team and taken into account when making decisions associated with the clean-up works.

8.5.2 Extent of Community Consultation

Considering the sensitive nature of the contamination and the level of clean-up undertaken, the extent of community consultation undertaken is considered sufficient by the auditor.

It is recommended that consideration is given to the development of a summary report at the completion of the project, to define the project success factors, lessons learned and to illustrate to the community the level of work that has been undertaken. This report should also outline how community feedback was considered by ECRP through the clean-up program to clearly demonstrate the level of community input that was considered. This report should be made available to the public for information purposes.

8.5.3 Identification of Stakeholders

The Communications Plan provided a detailed list of key stakeholders. It is recommended that this list is updated on a regular basis to account for changes to this group.

8.5.4 Timing of Community Consultation

Based on the information provided, it appears that some level of community consultation has been undertaken at all stages of the project. However, stakeholder feedback received by the auditor suggests that prior to the development of the ECRP, the community did feel the timing of the community engagement activities and type of information was unacceptable. Stakeholder feedback obtained by the auditor suggests that the ECRP team has been successful in turning around the community distrust of the project and developing an open and honest relationship with the community. It is the auditor's opinion that community consultation undertaken by the ECRP has been appropriately timed throughout the duration of the project.

9. Review of Sentinel Monitoring

9.1 Introduction

This audit has been prepared during the implementation of the two year Sentinel Monitoring Program. At the time of this audit being conducted, the Round 1 and Round 2 Sentinel Monitoring reports (November 2010 to February 2011 and February 2011 to May 2011) of eight monitoring rounds had been prepared.

The following presents an evaluation of the data included in these reports. Further assessment will be required at the completion of the sentinel monitoring program (November 2012).

Sentinel monitoring has been established to ensure that recontamination of the town site is not occurring.

9.2 Documentation

The methodology for the sentinel monitoring is outlined in the following document:

- SA01 Site Sampling Methodology – Module 19: Sentinel Monitoring

At the time this audit was completed, the following monitoring reports were available:

- First monitoring round – 1 November 2010 to 1 February 2011
- Second monitoring round – 1 February 2011 to 1 May 2011

9.3 Documentation Review

The sentinel monitoring program rationale and methodology as well as sample locations are outlined in the ECRP document; SA01 Site Sampling Methodology, Module 19: Sentinel Monitoring.

The program includes:

- Eleven sample locations plus existing air monitoring undertaken by the Esperance Port;
- Sample locations were placed strategically throughout a number of areas across the town, two of which were outside the area of lead fall impact for control purposes;
- Nine samples were collected by placement of petri dishes in three locations at each premises while the other two were high volume dust monitoring gauges;
- The results were shown as mg/m^2 per month, which is a recognised unit of measurement and is also consistent with existing dust deposition gauges around the town site,
- Results are compared against initial lead levels and average levels for the program. Where concentrations of lead are detected, the source of the lead (Magellan or not Magellan) is determined;
- During the course of the two year monitoring period, sample results are assessed, reports prepared, and action taken if required at the end of each three month sampling period;
- A final report and recommendations will be prepared at the end of the two year period (November 2012).

The procedure indicated that petri dish internal and external monitoring is currently undertaken by the ECRP in conjunction with the ChemCentre.

The need for further continual monitoring will be reviewed based on the findings. The procedure states that actions will be taken if required. The auditor notes that there is no detail on the type or actions that may be required.

The auditor's review of the two available sentinel reports is presented in Table 10.

Table 10 Sentinel Monitoring Report Review

Sentinel Monitoring Report	Comments
First Monitoring Round -1 November 2010 to 1 February 2011	The first sentinel monitoring round included seven sample locations, six within impacted areas and one outside the impact area. Sampling at each location included three petri dishes, two located internally (one of which was in the roof space, the other in living areas) and one externally. The first monitoring round did not include HiVol dust monitoring gauges. The results of the monitoring showed: ◗ There were no detectable levels of lead or nickel for internal living areas ◗ All sites identified detectable levels of lead and nickel at the external sample point ◗ There appeared to be a consistently higher level of nickel detected along the rail and close to Port operations (external collection device) ◗ Lead levels were consistent throughout the monitoring locations (external collection device) ◗ Two of the sites returned previous isotopic results that were consistent with Magellan lead (external location)

Sentinel Monitoring Report	Comments
Second Monitoring Round – 1 February 2011 to 1 May 2011	In the second sentinel monitoring round, two additional monitoring locations were included to the seven used in Round 1. To ensure that external monitoring was consistent with that undertaken by the port, external sampling was changed to HiVol dust monitoring gauges for the second monitoring round. Internal sampling included two petri dishes, one in the roof space and a second generally in a living area. The findings showed: ◗ There were no detectable levels of lead or nickel for internal living areas, which is consistent with the previous round of sampling. ◗ There were no detectable levels of nickel in any roof space but two sites (the same two sites as in the previous round of sampling) returned a positive lead reading. ◗ All dust deposition bottle locations returned detectable levels of lead and nickel at the external sample point. All sample points returned levels of lead in sufficient quantity to allow isotopic testing. The results showed that all samples were not of Magellan origin; ◗ Sample results were not compared with that of round 1 given the change in sampling methodology.

A map showing the sample locations for the most recently reviewed Sentinel Monitoring Round (Round 2) is provided in Appendix C.

Based on the review of the sentinel monitoring completed to date, the auditor provides the following comments for ECRP's consideration in completion of the second year of the sentinel monitoring:

- *SA01 Site Sampling Methodology, Module 19: Sentinel Monitoring* indicates that actions will be undertaken where required. The auditor understands that a Sentinel Monitoring sub-committee assesses each report to look for elevated or unusual readings and provides contingent recommendations and actions as required.
- The auditor notes that *SA01 Site Sampling Methodology, Module 19: Sentinel Monitoring* does not include any detail on the laboratory methodology adopted to calculate the results.
- Based on the information provided in the Sentinel Monitoring reports, it is understood that the sampling is based on Australian Standards. It would be beneficial to reference this standard in the site sampling methodology.
- In the first Sentinel Monitoring Report (1 November 2010 to 1 February 2011) the auditor noted that for sample location 1021 sample results for PD2 and PD3 have been transcribed incorrectly and need to be switched.
- While the auditor was provided with an excel spread sheet of the raw data, the original laboratory reports were not provided and therefore a detailed validation of the results could not be undertaken. ECRP clarified that the excel spread sheets were provided by the ChemCentre and that no transcribing of data was performed. It is recommended that the chain of custody reports, original

laboratory reports and any field notes are included as an appendix to the Sentinel Monitoring Reports.

- It is recommended that results reported in the Sentinel Monitoring Reports are consistent with that provided by the laboratory and rounding should not be undertaken under any circumstances. Rounding has the potential to provide misleading information, which may result in inappropriate interpretation of results.
- Further information should be provided in the Sentinel Monitoring Reports on how results have been averaged. Considering that the data set at each location over the two year monitoring period is not going to exceed four points, it is recommended that all previous results are plotted to show trends, as opposed to averaging such a small data set.
- While the auditor acknowledges that the guidelines developed for the clean-up are not directly applicable to the sentinel monitoring, it is recommended that consideration is given to defining some form of guideline to which results can be compared in order to determine if results present a risk.
- As the data set increases, it is recommended that consideration is given to special representation of the results to assist with the identification of any possible trends.

10. Audit Assessment and Conclusions

The auditor provides the following conclusions on the works undertaken by the ECRP in the Esperance town site in relation to the objectives of the ECRP:

- **Objective 1 (a) To assess/audit levels of lead and nickel in homes, premises and public places in Esperance and determine the need for cleaning by reference to agreed standards and guidelines;**
  - The sampling and validation procedures were in general adequately defined in the sampling methodologies. Where changes were required as suggested by the auditor (Interim Audit Advice, Appendix D) the changes were not considered to materially affect the sampling methodologies, but provide clarification pertaining to specific steps in the procedures. The procedures were considered adequate to document the works to be undertaken. Field audits of validation works and validation of samples results by the auditor provided sufficient confidence that sampling and validation was undertaken in accordance with the methodologies prepared. It is the auditor's opinion that the sampling and validation works were sufficient to determine the levels of lead and nickel present in homes within the Esperance town site for the purposes of determining where clean-up was required.
- **Objective 1 (b) To remove lead and nickel residues in homes, premises and in public places to acceptable standards such that these contaminants do not pose a risk to the health of the Esperance community;**
  - The cleaning procedures prepared by the ECRP were generally sufficient to communicate the requirements of cleaning to be undertaken. While some limitations in the documentation were noted, appropriate explanation was provided by the ECRP team to demonstrate that these issues were not material. The site inspections conducted by the auditor, confirmed the completeness of the procedures. The consistent field teams and validation of documentation also provides further assurance to the auditor that cleaning works were thorough and comprehensive.
- **Objective 1 (c) To validate the cleaning process;**
  - It is considered by the auditor that the validation procedures following clean-up were adequate to provide assurance that the cleaning process was carried out to acceptable standards, providing confidence that the contaminants did not pose any further risk to the health of the Esperance community.
  - While an assessment of the QAQC results was not undertaken by the ECRP team, the auditor has undertaken a validation exercise to evaluate that QAQC procedures were sufficient to demonstrate the data representativeness, completeness, precision, accuracy and comparability. This provided an added level of assurance that the data is of an acceptable quality upon which to draw meaningful conclusions regarding sampling, clean-up and validation of the sites.
- **Objective 1 (d) To work with the Esperance community in this project and provide ongoing progress reporting; and**

- The variety of community consultation measures provided and the feedback received by the auditor as part of the stakeholder consultation review suggests that the ECRP developed an open and honest relationship with the community which has resulted in the community developing respect for the ECRP team and its activities. The auditor considers the community consultation undertaken by ECRP more than adequate to meet the project objectives of providing ongoing progress reporting throughout the project.

- **Objective 1 (e) To undertake sentinel monitoring to ensure no re-contamination of the Esperance town site.**
  - Sentinel monitoring is ongoing and therefore a conclusion on the completeness of the sentinel monitoring cannot be undertaken at this stage.
- **Objective 2 To meet the requirements of the Deed of Settlement.**
  - The ECRP program was based on adopting either standard procedures or developing methods through consultation with health professionals and/or environmental consultants. The auditor considers that based on the review of the procedures established for the ECRP, the explanations provided by the ECRP team on matters identified in the review, the observations made during the various site inspections conducted in January 2012 and the feedback obtained during the stakeholder review, the requirements of the Deed of Settlement with regards to the Esperance town site have been fulfilled.
- **Objective 3 To achieve the desired outcomes of the Premier that the clean-up would be 'thorough and comprehensive'.**
  - The auditor considers that the procedures developed for the ECRP, the manner in which the ECRP team delivered the project and the community input have combined to allow a robust, technically justifiable and comprehensive clean-up and validation of the Esperance Town site. All stakeholders should be proud of their contribution to this project and it remains an example of (while hopefully not required) how such a project should be planned and implemented.

11. Audit Recommendations for Future Reference

The following recommendations are provided for future reference where there is a requirement for broad scale clean-up of contamination. It is intended that the recommendations will be implemented in future development of methodologies and procedures for sampling, cleaning, validation, community consultation and monitoring.

11.1 Sampling and Validation Methodology Recommendations

- It would be beneficial for dust samples to be sieved in a fume cupboard to manage dust and to document how laboratory personnel determine if wearing of dust masks is considered necessary or not.
- The previous audit (GHD, June 2010) recommended that some confirmation sampling was undertaken of the food grade zip lock bags to confirm the absence of lead in these materials. It is understood that food grade zip lock bags were comprehensively analysed with XRF to determine if lead concentrations were present in the materials. It is further understood that no lead was detected during this analysis.
- The auditor notes that the reference to the *Landfill Waste Classification and Waste Definitions (1996)* should be updated to reflect the most recent revision, which is; *as amended December 2009*. It is recommended that the document should also outline the waste classification procedure for roof, gutter and rain water tank cleaning water, which is understood to be disposed of in Albany.
- It is recommended that critical assessment on the effectiveness of QA/QC procedures undertaken is conducted during the project.

11.2 Cleaning and Validation Practice Recommendations

Based on the cleaning works observed, the following recommendations are made for future consideration:

- It would be beneficial to provide a geo-referenced sketch of each site to avoid any confusion in exactly which areas required cleaning and validation. This will ensure that the interpretation of each sample location is understood correctly by various members of the sampling team (e.g. north, south, east and west might be better in terms of site orientation).
- Considering that a number of XRF readings are taken at each cleaning location, it would be beneficial to calculate the standard deviation of the results (as this information is recorded on the XRF display).
- The XRF Standard Check form should include a check box to indicate whether or not calibration was required and undertaken.

The auditor acknowledges that cleaning procedures as outlined in the contract documentation cannot be revised at this stage of the project. However, the auditor has identified aspects of the cleaning management procedures where clarification on site items would be beneficial for future consideration,

these are as follows:

- It is recommended that clarification is provided in the contract documents on where HEPA vacuuming in undertaken on hard surfaces prior to wet cleaning within the Internal and External Cleaning procedure.
- The Roof Space, Gutter and Rainwater Tank Cleaning procedure should include information on how to dispose of loose insulation materials.

11.3 Validation of Sample Procedures Recommendations

It is recommended that in future a detailed assessment of QAQC is undertaken to demonstrate the data representativeness, completeness, precision, accuracy and comparability. This provides an added level of assurance that the data is of an acceptable quality upon which to draw meaningful conclusions regarding sampling, clean-up and validation of the sites.

11.4 Community Consultation

Based on the auditor's review of the community consultation, the following recommendations are made for consideration by the ECRP:

- It is recommended that consideration is given to the development of a summary report at the completion of the project, to define the project success factors, lessons learned and to illustrate to the community the level of work that has been undertaken. This report should also outline how community feedback was considered by ECRP through the clean-up program to clearly demonstrate the level of community input that was considered. This report should be made available to the public for information purposes.
- The Communications Plan provided a detailed list of key stakeholders. It is recommended that this list is updated on a regular basis to account for changes to this group.

12. References

DEC (2006) *Community Consultation Guideline*. Contaminated Sites Management Series. DEC: Perth.

DEC (2009) *Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting.* Contaminated Sites Management Series. DEC: Perth.

DEC (2009) *Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009)*. DEC: Perth.

DEP (2001) *Development of Sampling and Analysis Programs*. Contaminated Sites Management Series. DEC: Perth.

DoT (2012) *Governance Model Under-pinning the Esperance Clean-up and Recovery Project*. DRAFT.

GHD (2010) *Esperance Clean-up and Recovery Project, Methodology and Process Audit Report (June 2010)*.

13. Assumptions and Limitations

This report presents the results of a methodology and process audit of sampling and clean-up methodologies and practices as prepared and conducted by the Esperance Clean-up and Recovery Project (ECRP), Department of Transport.

The audit was undertaken in response to a request from the Department of Transport to provide a further level of confidence that the ECRP has achieved its project objectives. The advice provided herein relates only to this purpose and must be reviewed by a competent person, experienced in contaminated site investigations, before being used for any other purpose. GHD Pty Ltd (GHD) and the auditor accept no responsibility for other use of the advice.

The audit was limited to the scope of works as outlined in section 2.0 of this report with regards to the Esperance town site.

This report should not be altered, amended or abbreviated, issued in part and issued incomplete in any way without prior checking and approval by GHD and the auditor. GHD and the auditor accept no responsibility for any circumstances that arise from the issue of the report that has been modified in any way as outlined above.

Appendix A

Figure 1 – Spatial Extent of ECRP Work

Legend N	Created By PG	Checked KW	Approved KW
	Date 07/06/2012	File location 61/27777/Esperance Townsite Report/Appendices	
	Revision 0	Source ECRP, 2011, A quick guide to sampling and cleaning, Department of Transport.	

Department of Transport
Esperance Cleanup and Recovery Project
Spatial Extent of ECRP Work

Figure 1
Appendix A

GHD

Appendix B

Methodology and Process Audit Report

GHD, 2010, Department of Transport, Esperance Cleanup and Recovery Project, Methodology and Process Audit Report, June 2010

CLIENTS | PEOPLE | PERFORMANCE

Department of Transport

Esperance Cleanup and Recovery Project

Methodology and Process Audit Report

June 2010

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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1. Introduction

The Department of Transport commissioned Paul Turner of GHD Pty Ltd, a Department of Environment and Conservation accredited Contaminated Sites Auditor (Accreditation Number: MR12-1209-12), to undertake a methodology and process audit of the sampling and cleaning procedures prepared for the Esperance Cleanup and Recovery Project (ECRP). It is understood that the methodologies and procedures have been designed to assess the levels of lead and nickel in homes, premises and public places in Esperance and subsequently remove any residual contamination through a clean up and validation program and provide sentinel monitoring to confirm recontamination does not occur. The methodologies have been developed by the Department of Transport with assistance provided by the Department of Health, Department of Environment and Conservation and Chemistry Centre.

This report outlines the findings of the review and presents conclusions on the suitability of the methodologies to achieve the project objectives.

The audit has been undertaken with reference to the Western Australia, Department of Environment and Conservation guideline *Contaminated Sites Auditors: Guidelines for Accreditation, Conduct and Reporting* (2009). However it is recognised that the Esperance Cleanup and Recovery Project is a unique project, for which the sampling and cleanup methodologies have been developed specifically for the situation in Esperance and as such standards and guidelines may not exist for all facets of the project. Where this is the case the Auditor has used professional judgement and experience with similar projects to make conclusions and recommendations.

2. Scope of Works

The purpose of the audit was to assess the suitability of the sampling and cleanup methodologies that have been specifically selected to enable ECRP to meet its objectives.

As part of the audit, the following scope of works was undertaken:

1. Review of documentation provided by ECRP to gain an understanding of the project background.
2. A critical and independent review of the documented sampling methodology, including:

   "Esperance Clean-up and Recovery Project, Site Sampling Methodology, (Kieron Smith, Department of Transport, 9 February 2010)".

   "ECRP Sample Record Sheet" (ECRP)
3. Complete a critical and independent review of the documented cleanup methodologies including:

   ECRP Cleaning Procedures - Internal and External Cleaning

   ECRP Cleaning Procedures – Roof Space Cleaning

   ECRP Cleaning Procedures – Roof Surface, Gutters, Downpipes and Rainwater Tanks

   ECRP Cleanup Guidelines
4. Undertake a visit to Esperance to meet the project team, discuss aspects of the project and observe implementation of the field sampling techniques.
5. Prepare a report of audit observations, findings and conclusions.

3. Review of Written Sampling Methodology

3.1 Documentation

The documentation reviewed as part of this audit included the following documents provided by ECRP:

- *Esperance Clean-up and Recovery Project, Site Sampling Methodology, (Kieron Smith, Department of Transport, 9 February 2010).*
- *ECRP Sample Record Sheet (ECRP)*

The documents were reviewed with reference to guidance in the following documents:

- *Contaminated Site Management Series guidelines*, Department of Environment and Conservation (DEC 2000 – 2010)
- *Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009)*, Department of Environment and Conservation (DEC 2009)
- *AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: non-volatile and semi-volatile compounds* (Standards Australia 2005)
- *AS 4874-2000 Guide to the investigation of potentially contaminated soil and deposited dust as a source of lead available to humans* (Standards Australia 2000)
- *AS 5667.1-1998 Water Quality – Sampling, Part 1: Guidance on the Design of sampling programs, sampling techniques and the preservation and handling of samples* (Standards Australia 1998)

3.2 Procedure Review

The *Esperance Clean-up and Recovery Project - Site Sampling Methodology (Feb 2010)* outlines the sampling methodology to be adopted as part of the sampling and validation phases of the cleanup project. It includes detailed methodologies for the following elements:

- General Introduction
- Rainwater Tank Sampling
- Gutter Sludge Sampling
- Roof Surface Wipes
- External Surface Wipes
- Soil Sampling
- Carpet Bulk Dust
- Roof Space Bulk Dust
- Internal Surface Wipes
- Laboratory Procedures
- Waste Classification Sampling

In general the procedures are based on recognised standard procedures. In accordance with normal industrial practice and guidance, the individual procedures have been modified to suit the local conditions found in Esperance and the particular circumstances of the exposure scenarios. The resulting procedures are well written, concise and suitable for use by non-specialised field sampling personnel. A review of the methodologies identified the following comments.

1.	General Introduction	The General Introduction clearly presents the overall aim of the ECRP and summarises the preparation of the procedures, and continues by outlining the overall sampling process in a clear and concise manner.
2.	The Rainwater Tank Sampling	In general the Rainwater Tank Sampling Procedure follows the intent of AS 5667.1:1998 *Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*. It is common for water samples to be kept at a temperature lower than that at the time of sampling. The procedure for Rainwater Tank Sampling does not provide any guidance on where and how the water samples should be stored following sampling. Changes in the water temperature are not considered to have a significant impact on lead and nickel results and as such this is not considered a critical issue.
3.	Gutter Sludge Sampling	The comparison of gutter sludge analysis results to guidelines presented in National Environmental Protection (Assessment of Site Contamination) Measure (NEPC 1999), referred to the NEPM. Although not referenced in the procedure, the NEPM forms the basis for the Department of Environment and Conservation Contaminated Sites Series Guideline *Assessment Levels for Soil, Sediment and Water* (DEC 2010), and as such comparison to the NEPM, is considered appropriate.
4.	Roof Surface Wipes	The procedure outlined is consistent with normal industry practice and is considered appropriate. It is understood that asbestos rooves are excluded from the proposed cleaning operations. It is considered that a comment to this effect should be included in the specification. Item 4 of the Method Section indicates a recommended wipe area of approximately 30 cm x 30 cm. It is considered that an explicit statement should be included to ensure the sampler measures the actual area tested. It is noted that in the sample record forms this information is required to be documented.
5.	External Surface Wipe	This procedure does not stipulate if samples would be collected from horizontal or vertical surfaces. If horizontal surface are present, it is considered that these should be sampled as a priority as they probably present the higher potential for lead dust contamination. Section 4.1 of AS 4874-2000 suggests that samples should be collected from external hard surfaces, such as patios and paths, by brushing as opposed to wipe sampling. It is noted that the external surface sampling at Esperance is completed by surface wiping. This suggests that sampling is focussed on smooth surfaces (e.g. painted window sills) as opposed rough surfaces (e.g. brickwork and walls). If this is the intent, guidance to this effect should be included in the procedure.

6.	Soil Sampling	Australian standard AS 4482.1-2005 states that soil sample containers should be laboratory washed or certified clean, and AS 4874-2000 states that samples should be collected into a polypropylene plastic container. The Soil Sampling methodology indicates that samples are collected into zip lock bags. Whilst this is not consistent with the relevant Australian Standards, it is considered that this departure will not have a significant impact of soil test results. It is noted that the specific procedure has been approved by the ChemCentre. Please refer to Item 10 below. In the "References" section of the Soil Sampling procedure, there is a typographical error where the publication date of AS 4482.1 is inadvertently stated as 2000 as opposed to actual publication date of 2005.
7.	Carpet Bulk Dust	The documented procedure is in general agreement with the method recommended in Section 3.6.2 of AS 4874-2000. It is noted that AS 4874 comments that different vacuum systems have different efficiencies and inter comparison of results is impossible. It is understood that a standard make and model has been chosen for the vacuum sampling, and it is suggested that these details should be included in the Equipment & Sundries list within the written procedure. It is also recommended that the make and model of the cyclone separators are also documented in the same way.
8.	The Roof Space Bulk Dust Sampling	The procedure does not stipulate if samples from within the internal roof cavity are collected from above or below insulation batts (if present). Collecting samples from the top of the installation batts is likely to identify higher concentrations than samples from below the batts. See Item 7 for comments regarding identification of vacuum cleaners and cyclone separators. The Roof Space Bulk Dust procedure does not provide any guidance on management (cleaning) of the tarpaulin or ladder bag after it has been used as a dust sheet.

9.	Internal Surface Wipes	Bullet point 7 of the Method Section of the procedure contains a typographical error in that it refers to “roof surface type”. Section 3.4 of AS 4874-2000 outlines requirements for certain reagents to be used during internal dust sample collection. There is no information in the Esperance sampling methodology to confirm that the reagents are consistent with that outlined in AS 4874-2000. It is suggested that the procedure contains a note advising of possible damage to materials and furniture surfaces from any reagents that may be present in the wipes used. Section 3.6.1.3 of AS 4874-2000 suggests that more than one wipe may be needed to collect all dust from a sample location. The specific methodology adopted for the Esperance project suggests that only one Ghost Wipe be used per sampling location. Provided this methodology is adopted consistently throughout the project, it will allow comparison between sampling locations.
10.	Laboratory Procedures	It is noted that the procedure includes a description of dust and soil preparation at the Sampling Office prior to dispatch to the laboratory. It is understood that this practice was discontinued in April 2010, and it is therefore suggested that the relevant description of the superseded procedure is moved to a separate document. A description of the quality control and quality assurance procedure is also included, which outlines QA/QC samples that will be collected as part of the sampling programme. The sampling rate is considered appropriate. Most of the sampling procedures require collected samples to be placed in zip lock bags. Whilst these are usually manufactured from “food grade” plastic materials, some confirmation tests should be undertaken to confirm the absence of lead in the materials.
11.	Waste Classification Sampling	The documented procedure presents a good overview of the waste classification and disposal processes in Western Australia. The sampling methods described are appropriate for the type of materials described. It is noted that the methodology is based on DEC guidance, and should be updated to reflect changes made in the *Landfill Waste Classification and Waste Definitions (2009) as amended* (DEC, 2009). It is recommended that the section of this methodology referring to Red Hill landfill criteria should also be reviewed with respect to possible changes in response to the revised DEC criteria.

4. Review of Cleanup Methodologies

4.1 Documents Supplied for Review

A number of documents relating to clean up procedures were supplied for background information and review purposes.

One was an explanatory document covering the development of the procedures, and included attachments prepared by the Department of Health, the Esperance Port Authority and the ChemCentre.

It is understood that the Explanatory Document was used to further develop cleaning procedures that will form the specifications for proposed tender documents for appointing cleaning contractor(s).

Based on this, the following draft tender specifications have been reviewed as part of this audit.

- Internal/External Cleaning Procedure
- Roof Space Cleaning Procedure
- Roof Surface, Gutters, Downpipes and Rainwater Tanks Cleaning Procedure
- ECRP Cleanup Guidelines

4.2 Comments on Procedures

It is considered that the specifications are presented in a logical sequence, with sufficient detail to allow a contractor to understand and interpret the required work load and activities, and the relevant roles and responsibilities of the contractor and Principal.

It is noted that the individual specifications contain health and safety information for the cleaning procedure and health surveillance requirements for the cleaning contractor. Included in these is the requirement for pre-start toolbox meetings and induction and job-specific training relevant to the Cleaning Services. It is recommended that each specification includes a requirement for evidence of the attendance at the toolbox meetings and the training received is retained by the contractor for inspection by the Principal‘s representative.

All specifications include a requirement for safe storage of equipment to prevent access by unauthorised persons. It is recommended that a requirement is included for regular cleaning of all equipment to ensure dust is not moved from premise to premise.

There is an item in each of the specifications relating to removal and/or replacement of asbestos materials as and when required. It is noted that this work is to be undertaken by a licensed asbestos removalist with appropriate insurance cover. In circumstances where asbestos materials are to be removed and/or replaced, it is recommended that the contractor be required to prepare an Asbestos Management Plan for the identified work at the specific premise in accordance with National Occupational Health and Safety Commission *Code of practice for the safe removal of asbestos 2nd Edition [NOHSC:2002-(2005)]*.

The specifications do not contain information on the timing of the specific cleaning operations with respect to each other where multiple cleaning is required. For example, it is recommended that roof space cleaning is completed prior to cleaning other internal areas of a premise to ensure any dust fall out from the roof during cleaning is collected in the internal cleaning.

4.3 ECRP Cleanup Guidelines

The ECRP Cleanup Guidelines includes a table summarising the nickel and lead guideline levels for rainwater tanks, roof surfaces, gutters, soils and internal and external surfaces readily accessible by children and adults.

GHD understand that the ECRP cleanup guidelines have been recommended by Department of Health with involvement of the Department of Environment and Conservation, and the ChemCentre prior to endorsement by ECRP.

5. Discussions with Project Team Members

During the period 17 to 18 May 2010, the auditor visited the EPRC Project office and met with the following personnel:

- Mr Wayne Winchester, Director, ECRP
- Mr Kieron Smith, Project Manager (Sampling), ECRP
- Mr Matthew Devenish, Project Manager (Cleaning), ECRP

Mr Winchester presented a history and overview of the project and explained the programme of sampling and inspection, and the proposed cleaning operations. Following this, the auditor held separate discussions with Mr Kieron Smith and Mr Matthew Devenish. In addition, informal discussions were held with several Field Sampling Team Supervisors and Technicians.

In the discussion with Mr Smith, the sampling procedures were discussed in detail based on the previous document review completed by the auditor. Key discussion points and suggestions included:

- Version numbers on the sampling forms would be beneficial to monitor the currency of the forms.
- The auditor understands that there is no record of 'tool box' meetings undertaken at the commencement of each day. However, records of the monthly meetings are recorded and circulated to ECRP. A copy of the meeting minutes from a recent monthly meeting was sighted by the auditor during the meeting. It could be beneficial to have a record of the 'tool box' meetings, particularly if important updates on procedures or processes are discussed.
- It is noted that the Property Identification Number (PIN) is only recorded on the front page of the sampling forms. It was considered that inclusion of the PIN on each page of the sampling form could be beneficial and assist in avoiding confusion in data sources.
- It was confirmed that water samples collected from the rainwater tanks are not filtered before sampling. This is to ensure the water test result is consistent with conditions in which the water would be used i.e. water is not filtered before tank water is used in gardens or even in showers in most cases.
- It is understood that no surface sampling is undertaken from asbestos rooves due to health and safety considerations.
- It was confirmed that all vacuum cleaners are of a standard make and model in an attempt to ensure repeatability and allow inter comparison of results.
- It appears that there are no records of routine maintenance or servicing of the vacuum cleaners. It was suggested that it would be beneficial to keep a record of any vacuum cleaner servicing undertaken.
- The Roof Space Bulk Dust procedure does not provide any guidance on management of the tarpaulin or ladder bag after it has been used as a dust sheet. The auditor understands that the bags are vacuumed at each location before the ladder is replaced in the bag. It is recommended that this procedure is included in the methodology. It is also recommended that the ladder bags are inspected on a frequent basis, and if necessary replaced, to reduce the potential of transporting dust to other premises.

- The auditor viewed a completed chain of custody (COC) report during the meeting. It is suggested that a copy of the COC is included in the sampling methodology for completeness.
- On receipt of the samples, the ChemCentre completes the COC and returns it by fax to ECRP. The auditor also viewed a COC from the ChemCentre and noted it to be completed correctly by the laboratory.
- It was noted that the only identifier on the COC is the date; it is recommended that a sequential numbered unique ID is included on each COC and recorded on the sampling records to allow better tracking of the COC's.
- The sample containers are transported to the laboratory using commercial couriers. As this step is not documented on the COC, it was recommended that the consignment note number be placed on the COC, and also the COC number (when adopted) be placed on the consignment note.
- A discussion on ECRP internal quality assurance and quality control highlighted the need for internal auditing of the sampling procedure. It is recommended that an internal audit of the sampling teams is undertaken on a regular basis to ensure consistency within the sampling teams and avoid complacency.
- During the discussion, it was noted that the Waste Classification Sampling methodology refers to a superseded version of the landfill waste classification guidelines. The Waste Classification Sampling procedure should be updated to make reference to the December 2009 amended version, *(DEC) Landfill Waste Classification and Waste Definitions (2009) as amended.* It is recommended that the section of this methodology referring to Red Hill landfill criteria should also be reviewed with respect to these revised DEC criteria.

The key outcomes of the discussion with Mr Matt Devenish included the examination of a Simplified Functional Block Diagram for Sampling and Evaluation to aid the understanding of the processes and interrelationship between the Sampling and Cleaning operations. Suggestions for minor amendments included:

- Seeking consent from the site owners/occupiers (client) should be included in the flow diagram as Step 1, which will then link into Step 2 - Bookings.
- At the end of the Data Analysis Process it was suggested that the site owner should be provided with a copy of the findings and recommendation which outlines any cleaning that is required.
- Further detail is required in the Validation process, with links back into the Sampling component (Step 3) and Data Analysis (Step 4) for consistency.
- In addition a number of suggestions were made to ease presentation and interpretation of the Functional Block Diagrams.

6. Observations of Sampling Field Procedures

The auditor conducted an inspection of the sampling procedures at two sites on the 18 May 2010. Each site was sampled by a different sampling team.

6.1.1 Site 1 Observations

At the first site the auditor observed the following sampling procedures:

- Entry to the premises
- Set up/clean down
- Risk assessment and check
- Preparation of all sampling bags
- Preparation of blanks
- Roof Surface Wipe Sampling
- Gutter Sludge Sampling
- External Surface Wipes
- Soil Sampling
- Internal Surface Wipe Sampling

Based on the observations, sampling was undertaken in accordance with the methodology, the following comments are made:

- External Surface Wipe samples were collected from vertical surfaces as the property did not have external window sills or similar horizontal surfaces conducive to sampling.
- Prior to collection of soil samples the surface of possible sample locations was inspected for soil condition. Areas demonstrating significant disturbance or water erosion were excluded as it was considered that dust deposition would not be representative of conditions relating to the period of potential contamination. The auditor supports this approach of using judgemental selection of sampling locations.
- Internal Surface Wipe samples were collected from locations such as window sills to account for child accessible areas and the top of door architraves for adult accessible areas.
- The auditor observed two blank samples being prepared, which is not consistent with the sampling methodology which states that three blank samples should be prepared at each site.
- This particular property did not contain rainwater tanks, and consequently Rainwater Tank Sampling was not observed.

6.1.2 Site 2 Observations

A second site was visited and the following sampling procedures observed:

- Roof Space Bulk Dust Sampling
- Carpet Bulk Dust Sampling

- Internal Surface Wipes

Based on the observations from the second site, the sampling was generally undertaken in accordance with the sampling methodology, however, there were a few minor variations observed and the following comments are made:

- Prior to the commencement of Roof Space Bulk Sampling a dust mat (tarpaulin or ladder bag) was not placed below the ladder before sampling.
- During Roof Space Bulk Sampling photos of the roof space and safety measures were undertaken in accordance with the sampling methodology. The vacuum dust was collected effectively and the area for sampling was measured prior to sampling.
- As part of the Carpet Bulk Dust sampling the area was marked out and the equipment was cleaned in accordance with the written methodology. The methodology states that vacuuming is to be undertaken at overlapping 5 cm spacing from left to right and then up and down. The sampling procedure observed included one pass up and down in a "vertical" direction, with the next pass not overlapping the preceding pass. In addition, the sampler did not undertake a second series of orthogonal "horizontal" passes.
- Internal Surface Wipe sample was undertaken in accordance wit the sampling methodology.

6.2 Summary of Field Observations

Discussions with the Sampling Team members indicated a good understanding of the aims of the project and their individual role in the ECRP Team. Members indicated a good appreciation of the procedures that had been developed.

In general the Sampling Teams performed the sampling in accordance with the written procedures, except for the following 2 observations:

- A dust mat (tarpaulin or ladder bag) was not placed under the ladder used to gain access to the roof space.
- Insufficient passes during the Carpet Bulk Dust collection.

In subsequent discussions with the Project Director and Project Managers, it was recommended that these items be addressed at the morning tool box meetings, and that a formal internal QA/QC audit programme be established to confirm adherence to the procedures. Records of each internal audit should be maintained. In addition the possible inclusion of a simplified sampling procedure on each sample record sheet was discussed to assist in reminding the sampling personnel of the key points.

7. Audit Conclusions and Recommendations

7.1 Overview

The entire Project Team demonstrated a strong commitment to achieving the aims of the project, and appeared to work together in a cooperative and supportive fashion.

In general the procedures are based on recognised standard procedures. In accordance with normal industrial practice and guidance, the individual procedures have been modified to suit the local conditions found in Esperance and the particular circumstances of the exposure scenarios. The resulting procedures are well written, concise and suitable for use by non-specialised field sampling personnel.

The procedures as written are considered suitable and appropriate to meet the aims of the project, and the recommendations in the following sections of the report are presented to increase clarity and understanding of sampling procedures and cleanup specifications, and to be able to demonstrate adherence to the procedures.

7.2 Sampling Methodology

During the audit a number of areas of improvement with respect to the sampling methodologies and their implementation were identified as detailed in the relevant sections of this report. The following section presents a number of recommendations in this regard:

- ECRP should implement a formal internal auditing process to ensure consistency in the sampling technique undertaken by each sampling team. Records of each internal audit should be maintained.
- Inclusion of a simplified sampling procedure on each sample record sheet to assist in reminding the sampling personnel of the key points.
- The details of the make and model of vacuum cleaner and cyclone separators selected for sampling should be included in the relevant written procedure.
- A procedure for management of the tarpaulin or ladder bag after it has been used as a dust sheet should be included in the Roof Space Bulk Dust sampling procedure.
- The ladder bags should be inspected on a frequent basis, and if necessary replaced, to reduce the potential of transporting dust to other premises.
- It is recommended that a sequential numbered unique ID is included on each COC and recorded on the sampling records to allow better tracking of the COC's.
- The sample containers are transported to the laboratory using commercial couriers. As this step is not documented on the COC, it is recommended that the consignment note number be placed on the COC, and also the COC number (when adopted) be placed on the consignment note.

7.3 Cleanup Methodology

It is considered that the specifications are presented in a logical sequence, with sufficient detail to allow a contractor to understand and interpret the required work load and activities, and the relevant roles and responsibilities of the contractor and Principal.

During the audit of the documented specification for cleaning services, a number of areas of possible improvement and clarification were identified as detailed in the relevant sections of this report. The following section presents a number of recommendations in this regard:

- There is a requirement for pre-start toolbox meetings and induction and job-specific training relevant to the Cleaning Services. It is recommended that each specification includes a requirement for evidence of the attendance at the toolbox meetings and the training received is retained by the contractor for inspection by the Principal's representative.
- It is recommended that a requirement is included in all specifications for regular cleaning of all equipment to ensure dust is not moved from premise to premise.
- In circumstances where asbestos materials are to be removed and/or replaced, it is recommended that the contractor be required to prepare an Asbestos Management Plan for the identified work at the specific premise in accordance with National Occupational Health and Safety Commission *Code of practice for the safe removal of asbestos 2nd Edition [NOHSC:2002-(2005)]*.
- It is recommended that the specifications include guidance on the timing of the specific cleaning operations with respect to each other where multiple cleaning services are required.

8. Assumptions and Limitations

This report presents the results of a methodology and process audit of sampling and cleanup methodologies prepared by the Esperance Cleanup And Recovery Project, Department of Transport.

The audit was undertaken in response to a request from the ECRP to provide a further level of confidence that the ECRP methodologies will achieve the project objectives. The advice provided herein relates only to this purpose and must be reviewed by a competent person, experienced in contaminated site investigations, before being used for any other purpose. GHD Pty Ltd (GHD) and the auditor accept no responsibility for other use of the advice.

The audit was limited to the review of documented sampling procedures and cleanup specifications, and a visual inspection of selected field sampling procedures. A review of the analytical results of samples and conclusions as to the condition of individual premises were not within the scope of this audit.

This report should not be altered, amended or abbreviated, issued in part and issued incomplete in any way without prior checking and approval by GHD and the auditor. GHD and the auditor accept no responsibility for any circumstances that arise from the issue of the report that has been modified in any way as outlined above.

GHD

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Document Status

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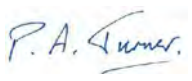
A	Paul Turner	Draft issued to Client for review				
0	Paul Turner	Imogen Bird		Paul Turner		2.07.10

Appendix C

Exerpt from Sentinel Monitoring Report – Round 2

Map of Sentinel Sites

Map of Sentinel Sites

Appendix D

Interim Audit Advice

GHD, 2012, GHD Letter to ECRP Re: Esperance Cleanup and Recovery Project, Interim Audit Advice, 31 January 2012

CLIENTS | PEOPLE | PERFORMANCE

31 January 2012

Wayne Winchester
Director - Esperance Cleanup and Recovery Project
Department of Transport
Unit 2B, 113 Dempster Street
ESPERANCE WA 6450

Our ref: 61/27777/118189
Your ref:

Dear Wayne

Esperance Cleanup and Recovery Project
Interim Audit Advice

1 Introduction

The Department of Transport has commissioned Mr Andrew Kohlrusch of GHD, a Western Australia, Department of Environment and Conservation (DEC) accredited contaminated site auditor, to undertake a validation audit of the Esperance Cleanup and Recovery Project (ECRP) and Esperance Port Cleanup Project.

It is our understanding that the aims of the project are to undertake a validation audit of the ECRP and the Port Authority to assess the effectiveness of the cleaning procedures and determine whether clean up guidelines have been achieved through the use of an appropriate validation sampling program.

At the conclusion of the audit, GHD are to prepare two validation audit reports for the Townsite and Port respectively. The Validation Audit Reports must achieve the following:

- Provide assurance to the Esperance community that the clean up has been undertaken in accordance with “best practice”; and
- Fulfil the requirements of the Deed of Settlement between the State of Western Australia, the Esperance Port Authority, Magellan Metals and its parent company Ivernia.

For clarity, the advice provided herein is not intended as a Validation Audit Report rather, this advice is intended to provide the ECRP with interim feedback regarding the appropriateness and adequacy of the clean up and validation program implemented within the Townsite.

As part of the audit, Mr Andrew Kohlrusch and his audit team, Ms Kylie Wells and Mrs Imogen Bird undertook a site visit to Esperance from 9 to 13 January 2012. During the site visit, the audit team held discussions with the ECRP team, reviewed part of the existing documentation for the project clean up and validation works, visited the Esperance Port and interviewed a range of community members.

This interim advice outlines the preliminary findings from the site visit and review undertaken to date and provides recommendations on specific elements of the works undertaken. The letter also outlines additional information required by the auditor to assist with the completion of the audit.

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2 Discussions with ECRP Team

During the site visit, the audit team conducted a number of meetings with the following ECRP Team members:

- Mr Wayne Winchester, Director RCRP
- Mr Matthew Devenish, Project Manager

The audit team was provided with a history of the project, overview of the works undertaken and key objectives that the ECRP are seeking to achieve from the validation and process audit.

3 Preliminary Findings of Document Reviews

A series of documents are to be reviewed as part of the audit (as stated in the tender brief DOT406377). Comments on the reports/documents that have been reviewed to date are presented in the following sections.

3.1 Site Sampling Methodologies

Site sampling methodologies are presented in the *Esperance Cleanup and Recovery Project – SA01 – Site Sampling Methodologies.* This document outlines the revised sampling methodologies that were adopted as part of the sampling and validation phases of the clean up project and includes the following:

- General Introduction
- Rainwater Tank Sampling
- Gutter Sludge Sampling
- Roof Surface Sampling
- External Surface Sampling
- Soil Sampling
- Carpet Sampling
- Roof Space Sampling
- Internal Surface Sampling
- Laboratory Procedures
- Waste Classification Sampling

It is understood that these methodologies were initially reviewed by Mr Paul Turner of GHD who presented comments in the *Methodology and Process Audit Report* (GHD, June 2010). The audit report presented a number of suggested improvements.

GHD has reviewed these revised documents with reference to the comments prepared by Mr Paul Turner (GHD, June 2010) to:

- Identify significant changes that may have materially affected the procedure; and
- Confirm that recommendations have been incorporated into the revised procedures.

Based on this review the auditor finds that the revised procedures generally incorporated comments from the initial audit (GHD, June 2010). Amendments to the methodologies were focused around improved safety procedures, troubleshooting as part of the collection of suitable samples and an increase awareness of detailing site specific conditions at each sample location.

Since the initial audit, a number of new procedures had been prepared, including:

- Portable XRF Analyser Operating Procedure
- Validation Sampling Procedure
- Chain of Custody
- Quality Control and Quality Assurance
- Microvacuum Sampling

The new procedures generally complement the sampling methodologies and provide further guidance on the operation of specific instruments, such as the XRF and microvacuum cleaner and/or details on quality assurance and quality control.

3.2 Clean up Procedures

The Audit team has also reviewed the following cleaning procedures:

- CL01 Managing Internal and External Cleaning
- CL02 Managing Roof Space Cleaning
- CL03 Managing Roof Surface, Gutter and Rainwater Tank Cleaning

The cleaning procedures outlined in CL01, CL02 and CL03 are designed to assist the ECRP Team (Principal Contractor responsible for overseeing the cleaning contractors) with managing cleaning works. They provide a logical risk based decision making process to assist in determining whether cleaning is required, and if so, the extent of cleaning necessary in each affected area of a premise. There is a strong emphasis on the need for an initial site visit to accurately determine the cleaning requirements on a case by case basis and the use of laboratory data as a guide to assist with the decision making process.

The cleaning procedures, as outlined in the contract documents, indicate that the decision on where cleaning is to be undertaken is made by the ECRP Team. This is conveyed to the cleaning contractor in an on site meeting to ensure clear written and verbal details of the cleaning requirements are provided. The procedures generally provide a clear step by step guide to the cleaning requirements specific to each affected area.

4 Field Audit Findings

During the site visit, the audit team conducted a field audit to inspect the implementation of selected cleaning and validation works, this included:

- Gutter cleaning and validation – 10 January 2012
- Toolbox Meeting – 12 January 2012

- Carpet Cleaning – 12 January 2012
- External Surface Cleaning – 12 January 2012
- Internal Surface Cleaning – 12 January 2012

The following comments are made on each of the processes observed.

Gutter cleaning and validation

The audit team noted that gutter cleaning and validation was undertaken in general accordance with *CL03 Managing Roof Surface, Gutter and Rainwater Tank Cleaning,* and the following observations were made:

- Waste water from the gutter cleaning is collected and transported to Albany for disposal by a licenced Department of Environment and Conservation (DEC) carrier.
- The downpipes were sealed prior to cleaning to reduce water discharge to down pipes.
- A food grade detergent was used during cleaning. Experience with gutter cleaning has resulted in a small amount of detergent being used to reduce the potential for bubbles to accumulate at the base of down pipes following rainfall.
- All Personal Protective Equipment (PPE) and cleaning cloths were bagged and disposed of at a licence landfill facility.
- Validation was undertaken by visual assessment by the cleaning contractor, followed by further inspection by the ECRP team.

Toolbox Meeting

On Thursday 12 January 2012 the audit team attended a toolbox meeting with the ECRP team. The information supplied by the convenor of the meeting, Wayne Winchester, covered all aspects of the program and was thorough in terms of providing the attendee with project updates. It was noted that the toolbox meetings were minuted as per the recommendations made in the initial audit report (GHD, June 2010).

Carpet Cleaning

The audit team noted that carpet cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning,* and the following observations were made:

- The equipment was rinsed between each sampling event.
- The vacuum separator was replaced between each site.
- Two trained ECRP staff sample and weigh the dust samples and provide guidance to the contractor on whether an area has been remediated to the established clean up levels. Where sampling indicates the clean up levels have not been achieved, the ECRP team inform the contractor that further cleaning is required.

External Surface Cleaning

The audit team noted that external surface cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning,* and the following observations were made:

- Cleaning rags were reused in some areas.

Internal Surface Cleaning

The audit team noted that internal surface cleaning was undertaken in general accordance with *CL01 Managing Internal and External Cleaning,* and the following observations were made:

- The XRF was used to assess areas where high lead concentrations had been reported (e.g. window sills).
- The ECRP team members who performed the sampling had a thorough knowledge of the process.

5 Esperance Port Site Visit

The audit team undertook a brief site visit of the Esperance Port and met the CEO, Shayne Flanagan. It is understood that the Port commissioned a report that was prepared by Emissions Monitoring and entitled '*Validation Sampling of the Lead Cleanup at Esperance Port* (March, 2010), report reference: EPN: DEC02 2007. GHD are currently waiting on a copy of this report to commence the audit of the Port area, which we understand will be made available following the Port board meeting in early February.

6 Community Consultation Findings

GHD is aware that community consultation undertaken by the ECRP has included a range of techniques including, letter drops, community meetings and one-on-one discussions.

During the site visit the audit team met with the following stakeholders to ascertain their satisfaction with the ECRP and community consultation that was undertaken as part of the project:

- Hon Dr Graham Jacobs MLA – Member for Eyre
- Grant Shipp – Esperance Chamber of Commerce and Industry
- Mr Rod Hilton and Paul Cliffton – Shire of Esperance, Acting CEO (director of Community Services) and Parks Manager respectively.
- Michelle Crisp – ECRP Steering Committee Member
- Pam Norris – ECRP Steering Committee Member
- Four residents ([redacted], [redacted], [redacted] and [redacted]) who had sampling and cleaning works undertaken at their house. People selected provided a diverse range of the community and/or had provided comments on the feedback survey undertaken by the ECRP.

Additional stakeholders, who are located in Perth or other regional areas outside Esperance will also be contacted over the next few weeks for community feedback interviews.

The feedback provided by stakeholders interviewed to date is generally summarised as follows:

- Following the identification of lead contamination in the town, it was generally noted that communication with the community was limited and not provided within a satisfactory timeframe. This created a feeling of distrust and apprehension throughout the community.
- Since the commencement of the ECRP there has been a significant shift in the general attitude of the community. Most people reported a very high level of respect for the ECRP team, and recognised their efforts to re-establish community confidence in the clean up project.
- Based on the people interviewed to date, there is a general consensus that the clean up works have been completed to the community's satisfaction. A number of stakeholders also expressed a general community feeling that the works had gone on for a long time and they were looking forward to its completion.
- The stakeholders expressed satisfaction that the potential health risks had been mitigated successfully as a result of the work completed by ECRP.
- The professionalism and branding of the sampling teams and strong focus on local employment were considered by a number of stakeholders to be the most impressive aspects of the project. The commitment and sincerity of the ECRP management team was also noted by a number of stakeholders as a positive aspect of the project.
- The delay between clean up works following the contamination incident and the actual time it took to complete the sampling, cleaning and validation works were regularly identified as the least impressive aspects of the project. The auditor acknowledges that this relates to time delays prior to the establishment of the ECRP.
- Some questions were also raised regarding the ongoing works that would be undertaken to confirm re-contamination did not occur and also the state's commitment to re-establishing Esperance's reputation.

7 Request for Additional Information

In order to assist with our audit of the sampling, cleaning and validation works, the following additional information is required to be provided by the ECRP:

- Evidence of internal audits undertaken on the field sampling, cleaning and validation works.
- A copy of waste disposal documentation for waste water from roof and gutter cleaning as well as asbestos removal and PPE disposal.
- A copy of the chain of custody reports for laboratory analysis.
- A copy of laboratory reports, including NATA certification (only excel database information was available electronically).
- Calibration records or certificates for the sampling equipment used.

It is understood that the ECRP are in the process of collating this information for our review.

8 Interim Conclusions

Based on the information reviewed to date, the following interim conclusions are made:

- Based on our review of the revised cleaning methodologies, the auditor finds that the revised procedures generally incorporated comments from the initial audit (GHD, June 2010). The new cleaning procedures (not previously reviewed as part of the initial Audit (GHD, June 2010)) generally complement the sampling methodologies and provide further guidance on the operation of specific instruments, such as the XRF and microvacuum cleaner and/or details on quality assurance and quality control.
- Overall, the validation and cleaning procedures documented were considered to be adequate to meet the objectives of the ECRP.
- As observed by the audit team, cleaning and validation sampling procedures were implemented in accordance with documented procedures, and cleaning was undertaken until such time that validation sampling had established that clean up criteria had been met or the risk suitably mitigated, using a risk based decision making process.
- With regards to community consultation, ECRPs approach was robust, employing a variety of community consultation techniques ranging from letter drops, community meetings and one-on-one discussions.
- Based on the information provided by stakeholders interviewed to date, the auditor has concluded that the general community feeling prior to the development of the ECRP Team was that communication was unsatisfactory and the initial time delays were unacceptable. The ECRP appear to have successfully re-built trust in the community and provided sincere, open and honest community consultation which has resulted in an overall good feeling about the project. The community seem to consider the work undertaken by the ECRP to be detailed and comprehensive, although in some cases excessive, and ultimately effective in reducing the risk of lead contamination in Esperance.
- At present, no interim audit advice is provided on the Port, as we are currently waiting on information from the Port which is expected to be made available following the Port board meeting in early February.
- While in Esperance, it was the teams' impression that the ECRP display a high level of personal commitment to the success of the project. This was also reflected in the feedback received from the community, many of which had the highest respect and admiration for the ECRP team specifically, Wayne Winchester and Matthew Devenish.
- Based on the review of information undertaken to date, it is our opinion that the sampling, clean up and validation works have been developed and continually revised in a thorough, logical and technically defensible manor to ensure that the objectives of the project are met.

9 Recommendations

Based on the review of documentation undertaken to date, the following recommendations area made:

Site Sampling Methodologies

- In the Validation Sampling Procedure; no details are provided on the validation methodology for roof surfaces, gutters, roof space and rainwater tanks. The auditor notes that these areas are validated by visual inspection only. It is recommended that a statement to this affect is included in the Validation Sampling Procedure for completeness.
- In the Chain of Custody Procedure; it would be beneficial to include a copy of the COC template as a reference.
- In the Quality Control and Quality Assurance document; the auditor notes that blind replicate's, split samples and transport blank samples have not been included.

  The document should include details on how the QAQC results are assess as part of the analysis program and where this QAQC review is reported.

  It is advisable that deionised water is used for rinsate samples and not distilled water as this often contains impurities that may result is positive metals readings.

Clean up Procedures

The auditor notes that the content of each document is not consistent. It would be beneficial to ensure that all three documents (CL01, CL02 and CL03) include the same elements (i.e. cleaning decision process for each element, reviewing the contractor estimate, creating a work order, the sequence of cleaning and the validation process).

Field Audit Observations

Based on the cleaning and validation works observed, the following recommendations are made for ECRP consideration:

- It would be beneficial for the ECRP sampling team to be provided with a collapsible table which can be used at each site to set up equipment. This would avoid finding a suitable location at each house which may inconvenience the owner and avoid cross contamination of other areas of the household.
- Rinsate samples should be collected at each sample location to confirm that samples have not been cross contaminated. The exclusion of rinsate samples may result in an overly conservative decision making process, where unnecessary cleaning may be undertaken in some areas, specifically, carpets.
- It would be beneficial to provide a sketch of each site to avoid any confusion regarding which areas require cleaning and validation. This will ensure that the interpretation of each sample location is understood correctly by various member of the sampling team (e.g. north, south, east and west might be better in terms of site orientation).
- Where possible, the XRF results should be correlated with follow up analysis of samples at a NATA certified laboratory.

- Considering that a number of XRF readings are taken at each cleaning location, it would be beneficial to calculate the standard deviation of the results (as this information is recorded on the XRF display).
- Cleaning rags should be replaced at each site to avoid cross contamination.

10 Concluding Comments

On review of the information provided in this interim audit advice, should you have any questions, please do not hesitate to contact us to discuss.

Yours sincerely
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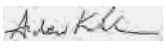
3	Andrew Kohlrusch		27/06/2012