

the immobilisation of waste referred to in the RAP have not been affected by NSW DECC (2008) and are still able to be used in NSW.

However, the Auditor considers that the preliminary waste classifications provided in the RAP to present an appropriate indication, in accordance with the NSW EPA (1999), of the potential types of waste materials that would be generated during the remediation works. The Auditor also considers that the information presented in the RAP will assist in the establishment of segregated stockpiles of the different materials generated during the excavation works.

If during the remediation works, fill and/or soil materials are encountered that are significantly different (composition, appearance, odour, pipework etc) to the surrounding materials and/or to the types of materials described within the RAP, then the Auditor requires that these materials be excavated and stockpiled separately for waste classification purposes.

The Auditor requires that details of the waste classifications for materials at the Site be provided to the Auditor for review periodically throughout the remediation works or at stages in the remediation works where new waste classifications are conducted.

While the Auditor considers that the immobilisation approvals proposed to be used on the Site appear to be appropriate for application to materials to be excavated from the Site, but the Auditor requires that the approvals are shown to be applicable prior to the use of any immobilisation approvals in the classification of excavated materials for off-site disposal.

The Auditor requires that the waste classification information, material tracking forms, truck dockets, survey information/plans and other associated information for all materials excavated from the Site be provided to the Auditor for review periodically during the remediation works or at stages in the remediation works where new waste classifications are conducted. This information is also required to be included in the validation report.

#### 5.10.5 Stabilisation and/or Treatment of Excavated Materials

The RAP stated that the proposed remedial activities associated with the stabilisation and/or treatment of significantly contaminated soils would require the identification of an alternative site at which these activities could be conducted.

The RAP stated that excavated materials classified as containing "free tar" or classified as "tar impacted materials" would be likely to be subject to the following processes:

- Pre-treatment – Excavated contaminated natural soils would comprise stiff clays and weathered shale bedrock materials that would require some pre-treatment to enable "sufficient mixing or blending to improve consistency of the material to be treated";
- Stabilisation – Based on the results of the previous investigations, the NSW EPA *General Approval for the immobilisation of coal tar* (NSW EPA Approval no. 2005/14) was applicable to tar contaminated materials excavated from the Site that met the concentration limits set out within the approval. It was stated that this approval allowed for the stabilisation of these materials by the addition of a reagent consisting of calcium or magnesium oxide based cement. It was stated that this process and the other specific conditions of the approval would be applied to the materials that met the concentration limits at the Site. It was stated that the treated material would then be able to be classified in accordance with NSW EPA (1999) using its leachable concentrations only. The NSW EPA Approval no. 2005/14 was provided in Appendix E of the RAP;

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- Treatment – Tar contaminated materials that contained concentrations that exceeded the limits set out in the NSW EPA Approval no. 2005/14 would be treated by thermal desorption via either direct or indirect heat treatment. It was stated that this treatment would likely result in a waste classification as "solid" or "industrial" waste for disposal in accordance with NSW EPA.

#### **Auditor's opinion**

The Auditor requires that the stabilisation and/or treatment activities conducted either on the Site or on the proposed alternative site are appropriately documented prior to the commencement of these works and during the works. The Auditor requires that this documentation includes at a minimum, materials tracking information, the origin of the materials on the Site, description of the materials to be stabilised and/or treated, the stabilisation and/or treatment methodologies, volumes of material stabilised and/or treated, sampling and analytical program, analytical results for materials both pre- and post- stabilisation and/or treatment, results of the monitoring and maintenance of treatment facilities, demonstration that the treatment facilities are operating in accordance with licences issued by NSW EPA and ultimate waste classifications. The Auditor requires that this information is provided to the Auditor for review periodically or at milestones, during the remediation works and that it be included in the validation report.

#### **5.10.6 Tracking of Excavated Materials**

The RAP stated that a "tracking system should be implemented to control and track the movement of materials on and off Site". The RAP further stated that the system would provide detailed information about the quantity and location of materials during each material handling phase of the works, including "excavation, stockpiling, processing (screening and crushing), re-use, off-site treatment and off-site disposal". It was also stated that tracking data would be "reconciled with documentation provided by waste transporters and waste receivers".

#### **Auditor's opinion**

Given the various methods in which excavated materials are proposed to be handled during the remediation works at the Site, the Auditor concurs with the need for a detailed tracking system for materials excavated from the Site and considers the system described in the RAP to be adequate for the purposes of the remediation works.

The Auditor requires that the tracking information including material tracking forms, truck dockets, volumes of materials treated and other associated information is provided to the Auditor for review periodically throughout the remediation works. This information is also required to be included in the validation report.

#### **5.10.7 In-situ Treatment of Residual Contamination**

The RAP stated that once excavations had been completed to the proposed extent, passive chemical treatment would be used to enhance biodegradation of the residual contamination in both soils and groundwater through the application of oxygen-releasing compounds. It was stated that the application would be undertaken by:

- Concentrated liquid injection at base of excavations – "to target source materials in deeper soil fractures"; and
- Broad-scale mixing with backfill at depth – "to provide coverage and mass to enable long term release of the chemical agent".

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### ***Auditor's opinion***

Prior to conducting any in-situ treatment on the Site, the Auditor requires that a plan detailing the treatment process, including the proposed type and volume of chemicals to be used, supporting evidence demonstrating the appropriateness of the chemical to be applied at the Site and application methodology be developed which will require endorsement by the Auditor prior to implementation on the Site.

### **5.10.8 Validation**

It was stated that validation of the remedial works will be conducted to demonstrate that the remediation objectives have been achieved. It was stated that validation report(s) would be prepared for those areas of the Site at which the validation criteria were achieved and that a long-term EMP would be prepared where on-going monitoring/management is required to ensure the suitability of the Site for the intended use(s). It was stated that the long-term EMP would include a GMP that would adopted an MNA approach to the management of groundwater at the Site.

Details of the validation plan to be adopted were provided in Section 9 of the RAP and are addressed in Section 6 of this SAR.

### **5.10.9 Site Reinstatement**

The RAP stated that at the conclusion of remediation and validation works the Site would be reinstated using imported virgin excavated natural materials (VENM) and, where possible, materials that have been excavated from the Site that meet stated criteria for beneficial re-use (see Section 6.1.2 of this SAR).

It was stated that during reinstatement, marker layers would be used to define areas that contained residual contamination at depths that may be exposed during future construction/maintenance on the Site. It was stated that this would likely apply to depths to 1.5 m bgs and as such it was expected that marker layers would not be installed in the footprint of the former gasworks other than around the Southern Gasholder. It was stated that the marker layer material should be made from High Density Polyethylene (HDPE) as it is an inert polymer highly resistant to chemical degradation.

The RAP stated that the backfilling and compaction conducted during the reinstatement of the Site must follow Australian Standard and Construction Codes of Practice including RailCorp Infrastructure Engineering Standards. These standards were provided as Appendix E to the RAP.

The RAP stated that at the completion of reinstatement works a survey of the Site should be completed that includes all retained structures and site features.

### ***Auditor's opinion***

The Auditor requires that the information demonstrating the suitability of the material to be used for the reinstatement works be provided to the Auditor for review, prior to the commencement of the re-instatement of the Site.

The Auditor requires that the survey of the Site referred to in the RAP be undertaken by a registered surveyor.

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### 5.11 Contingency Plan

The RAP presented a general contingency plan for the Site that listed a number of potential issues that may be encountered during remediation works and the proposed corrective actions, as summarised in Table 6 below.

**Table 6: Summary of contingency planning**

Potential issue	Proposed corrective action
Identification of suitable treatment site	Reassess preferred remedial options for onsite treatment, identify alternate treatment site(s)
Under-estimation of material volumes	Assess the need for a larger treatment site or a secondary site. Assess need for discriminatory sampling / classification to lower uncertainty. Discuss need for further funding if necessary.
Unexpected finding of free tar impacts in vicinity of Southern Gasholder	Explore possibility to dismantle Southern Gasholder, remediate then reassemble structure. Assess need to review groundwater remediation strategies and additional strategies for soil.
Soil treatment is ineffective	Consider and assess, from results of trials, additional treatment (and funding) if required. Consider disposal of material with higher contamination content (as industrial or hazardous waste).
Unmanageable mud in excavation zone	Improve drainage systems, use geotextile/gravel in soft areas, strip off slurry materials
Excessive stormwater	Minimise active contaminated work area, improve stormwater drainage
Excessive dust	Use water sprays, stop dust generating activities until better dust control can be achieved, apply interim capping measures
Excessively wet materials	Stockpile and dewater on-site or add absorbents
Excessive noise	Install noise barriers, augment muffler systems on machinery
Excessive vibration	Reassess vehicle movements and speeds
Ineffective odour controls	Assess and implement alternative control method including masking agents, chemical additives or containment materials
Equipment failures	Maintain spare equipment or parts, keep rental options available or shut down affected operations until repairs are made

#### **Auditor's opinion**

The Auditor notes that the items listed in the general contingency plan are typical of issues that may arise during the remediation works and considers that the proposed corrective measures are appropriate for application on the Site.

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## 5.12 Remediation Management

The RAP stated that the management of the remediation works on the Site required the development of an EMP, a Community Liaison Plan (CLP) and a Project Safety Management Plan (PSMP). The requirements for these plans as presented in the RAP are summarised below.

### 5.12.1 Environmental Management Plan

The RAP stated that an EMP to protect environmental values during the remediation and validation works was required to be developed prior to commencement of remediation and was to include the following components:

- Soil and water management plan;
- Air quality management plan;
- Noise and vibration management plan;
- Traffic management plan;
- Waste management plan; and
- Monitoring and auditing requirements.

The RAP provided a detailed description of the environmental management controls and monitoring that were to be compiled with on the Site during the completion of the remediation and validation works as follows:

- Hours of operation;
- Site access and security;
- Soil and water management including the controls on the locations of stockpiles, bunding, pumping out of excavations and bunded areas, landscaping and rehabilitation;
- Heritage monitoring requirements as recommended in the report by Heritage Concepts dated November 2006;
- Noise and vibration control measures and criteria as presented in relevant NSW DECC guidelines and Australian Standards;
- Air monitoring requirements including during the removal of asbestos impacted soils as stated in the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes and as required as part of the WorkCover permit for asbestos removal;
- Dust control and monitoring;
- Odour and vapour control and monitoring;
- Material transportation requirements;
- Handling and disposal of hazardous materials;
- Disposal of contaminated soil to be conducted in accordance with NSW DEC (2004) and the POEO Act and associated regulations. It was stated that a waste classification register, waste reduction progress report and waste accountability report would be implemented during the works as part of a waste tracking system for the remediation works;
- Management of visual aspects given the presence of adjacent residential housing;

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- Site signage and contact numbers;
- Complaint reporting and resolution; and
- Community consultation.

It was stated that for many components of the EMP, the details on the specific controls were subject to change based on the development approval consent conditions to be issued by the Department of Planning prior to the commencement of the works.

#### ***Auditor's opinion***

The Auditor considers that the RAP provided adequate detail on the framework for developing a suitable EMP and for monitoring requirements that need to be included in an EMP for implementation during the remediation works. The Auditor considers that if the EMP is appropriately developed and implemented it will ensure that remediation works will be undertaken in compliance with the regulatory requirements and that the impact to the environment and to neighbours from the remediation works will be limited.

The Auditor requires that the tracking system documentation including waste classifications be provided to the Auditor for review during the works and be included in the validation report.

### **5.12.2 Community Liaison Plan**

The RAP stated that a CLP would be required to be prepared to document the procedures to manage the community consultation process prior to and during the remediation works. It was stated that the CLP should address the sensitivity of the Burren Street residential properties that adjoin the western boundary of the Site and the greater Macdonaldtown/Erskineville area. It was stated that the CLP should include the following:

- Documentation of the ways in which the community were to be provided information on the remediation works;
- Processes for the management and resolution of complaints; and
- Provision of the key project contacts and stakeholders.

#### ***Auditor's opinion***

Given that the Site is directly adjoined by residential properties the Auditor considers that the development of a plan for community consultation and liaison prior to and during the remediation works, as outlined in the RAP, is appropriate.

### **5.12.3 Project Safety Management Plan**

The RAP stated that a PSMP would be required to be developed for the remediation and validation works on the Site. It was stated that the PSMP would be required to be developed with respect to the requirements of the NSW OH&S regulations and would need to include site-specific safety management plans (SSMPs), work plans relating to specific hazardous activities and safe work method statements (SWMSs). It was stated that the SSMPs would be used to convey important information to all site personnel, and will be used in the induction of new personnel. It was also stated that health and safety considerations would be given, based on WorkCover exposure standards for the workplace, to the potential concentrations of soil vapour that may be present at the Site once excavation works commence.

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The RAP stated that the PSMP would include detail on the following:

- "Project specific objectives and performance measures;
- Project contacts, personnel responsibilities and details;
- Conduct standards
- Incident/near miss reports and procedures;
- Hazards and hazard controls;
- Project specific SWMSs;
- Project specific contaminants and exposure scenarios;
- Project specific personal protective equipment;
- Decontamination procedures;
- Safety training and site induction; and
- Emergency response details."

***Auditor's opinion***

The Auditor considers that the RAP addressed the occupational health and safety issues that relate to the remediation works proposed to be undertaken on the Site. The Auditor notes that it is beyond the scope of the Audit to comment on the adequacy of the PSMP but, due to the hazardous nature of the contaminants to be addressed in the remediation works that the PSMP be reviewed for adequacy by a qualified occupational hygienist.