Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

Under the Minister for Planning's delegation of 4 March 2009, I approve the project referred to in Schedule 1, subject to the conditions in Schedule 2.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

S Haddad

Sam Haddad
Director-General
as delegate of the Minister for Planning

Sydney, 28th August 2009

SCHEDULE 1

Application Number:	07_0085
Proponent:	Coffs Harbour City Council
Approval Authority:	Minister for Planning
Land:	Lot 121 DP 876790, Lot 122 DP 876790, Martin Street Road Reserve, Coramba
Project:	Coramba Groundwater Remediation Project

DEFINITIONS

BCA	Building Code of Australia
Council	Coffs Harbour City Council
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
DECCW	Department of Environment, Climate Change and Water
Department	Department of Planning
Director-General	Director-General of Department of Planning, or delegate
EA	Environmental Assessment titled "*Coffs Harbour City Council Stage 1 Coramba Contaminated Groundwater Remediation Environmental Assessment*", prepared by GHD Pty Ltd, dated February 2009
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
Evening	The period from 6pm to 10pm
Land	Land means the whole of a lot, or continuous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Minister	Minister for Planning, or delegate
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
Project	The development as described in the EA
Proponent	Coffs Harbour City Council
RAP	Remediation Action Plan titled "*Remediation Action Plan, 5 Martin Street, Coramba NSW, Draft Revision 2*", prepared by WSP Environmental Pty Ltd, dated September 2006
Reasonable and Feasible	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements. Feasible relates to engineering considerations and what is practical to build
Response to Submissions	The Proponent's response to issues raised in submissions
Stage 1	Groundwater remediation using an air sparge system with soil vapour extraction and treatment of the collected contaminated soil vapour as described in the EA
Site	The land referred to in Schedule 1
Site audit report	As defined in the *Contaminated Land Management Act 1997*
Site audit statement	As defined in the *Contaminated Land Management Act 1997*
Site Auditor	As defined in the *Contaminated Land Management Act 1997*
Statement of Commitments	The Proponent's commitments in Appendix 1
VMP	Voluntary management proposal

SCHEDULE 2

ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

TERMS OF APPROVAL

2. The Proponent shall carry out the project generally in accordance with the:
   (a) EA;
   (b) RAP;
   (c) response to submissions;
   (d) statement of commitments;
   (e) VMP; and
   (f) conditions of this approval.

3. If there is any inconsistency between the above, the conditions of this approval shall prevail to the extent of the inconsistency.

4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with this approval; and
   (b) the implementation of any actions or measures contained in these reports, plans, programs, strategies or correspondence submitted by the Proponent.

LIMITS OF APPROVAL

5. The Proponent shall not commence groundwater treatment without the approval of DECCW.

6. The Proponent shall not intercept groundwater without prior approval from DECCW.

7. Groundwater treatment shall not cease without the approval of DECCW and the Site Auditor. The Proponent must provide a copy of the approvals to the Department within 7 days of receipt of the approvals.

   Note: this condition does not apply to temporary stoppages that may be required for maintenance and repairs.

STRUCTURAL ADEQUACY

8. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

   Notes:
   - *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
   - *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

DEMOLITION

9. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

10. The Proponent shall:
    (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

OPERATION OF PLANT AND EQUIPMENT

11. The Proponent shall ensure that all plant and equipment used on site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

MANAGEMENT PLANS/MONITORING PROGRAMS

12. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.

SPECIFIC ENVIRONMENTAL CONDITIONS

SOIL AND WATER

Discharge Limits

13. The Proponent shall comply with Section 120 of the *Protection of the Environment Operations Act 1997*.

Bunding

14. All chemicals, fuels and oils shall be stored in appropriately bunded areas, with impervious flooring and sufficient capacity to contain 110% of the largest container stored within the bund. The bund(s) shall be designed and installed in accordance with the:
    (a) requirements of all relevant Australian Standards; and
    (b) DECCW's *Storing and Handling Liquids: Environmental Protection* manual.

Management

15. Prior to the commencement of construction, the Proponent shall demonstrate to the satisfaction of the Director-General that Erosion and Sediment Controls have been implemented. The controls must:
    (a) be consistent with the requirements of Landcom's (2004) *Managing Urban Stormwater: Soils and Construction*;
    (b) manage activities that could cause soil erosion and generate sediment;
    (c) minimise soil erosion and the transport of sediment to downstream waters; and
    (d) be maintained during construction.

16. The Proponent shall prepare and implement a Groundwater Monitoring and Treatment Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General and site auditor for approval prior to the commencement of operation;
    (b) be prepared in consultation with DECCW;
    (c) include the final design of the Stage 1 remediation works;
    (d) detail baseline data on groundwater levels and quality; and
    (e) include:
        - groundwater treatment criteria;
        - a program to monitor groundwater levels, flows and quality;
        - maintenance program for the facility to ensure the on-going effectiveness of the groundwater treatment process;
        - a protocol for the investigation, notification and mitigation of identified exceedences of the groundwater treatment criteria;
        - mechanisms to report results to relevant agencies;
        - contingency measures to address exceedances and problems with the Stage 1 remediation works, including an investigation of alternative remediation treatment options.

AIR QUALITY

Air Quality Assessment Criteria

17. The Proponent shall ensure that the emissions from the operations of the project do not exceed the air quality impact assessment criteria presented in Table 1.

Table 1: Air Emission Limits

Pollutant	Unit of measure	Limit	Averaging Period
Benzene	mg/m^3	0.029	1 hour
Toluene	mg/m^3	0.36	1 hour
Ethylbenzene	mg/m^3	8.0	1 hour
Xylenes	mg/m^3	0.19	1 hour

Construction

18. The Proponent shall carry out all reasonable and feasible measures to minimise dust and noise generated by the project.

19. During construction, the Proponent shall ensure that:
    (a) all trucks entering or leaving the site with loads have their loads covered;
    (b) trucks associated with the project do not track dirt onto the public road network; and
    (c) public roads used by these trucks are kept clean.

Air Quality Monitoring

20. The Proponent shall prepare and implement an Air Quality Monitoring Plan for the project to the satisfaction of the Director-General. The plan must:
    a) be prepared in consultation with DECCW;
    b) be submitted to the Director-General for approval 1 months of the commencement of operation; and
    c) include:
        - a monitoring protocol to evaluate compliance with project air quality limits specified in condition 17; and
        - proposed mitigation measures in case of non-compliance with the project air quality limits specified in condition 17.

Odour

21. Except as may be expressly provided in an EPL for the project, the Proponent shall ensure that the project complies with Section 129 of the *Protection of the Environment Operations Act, 1997*.

    Notes:
    - *Section 129 of the Protection of the Environment Operations Act 1997, provides that the Proponent must not cause or permit the emission of any offensive odour from the site, but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.*

22. The Proponent shall ensure that an odour suppressant is available on site during remediation works, for use on malodorous materials, as may be required.

TRANSPORT

Vehicle Queuing and Parking

23. The Proponent shall ensure that the project does not result in any vehicles queuing or parking on the public road network.

NOISE

Operating Hours

24. The Proponent shall comply with the restrictions in Table 2, unless otherwise agreed by the Director-General.

    Table 2: Construction and Operation Hours for the Project

Activity	Day	Time
Construction	Monday – Friday	7:00am to 6:00pm
	Saturday	8:00am to 1:00pm
	Sunday and Public Holidays	Nil
Operation	All days	All times

Note: Construction activities may be conducted outside the hours in Table 2 provided that the activities are not audible at any residence beyond the boundary of the site.

Noise Limits

25. The Proponent shall ensure that the noise from the operation of the project does not exceed the noise limits presented in Table 3.

Table 3: Project Noise Limits (dB(A))

Day	Evening	Night		Location
$L_{Aeq\ (15\ minute)}$			$L_{A1\ (1\ minute)}$ or $L_{A\ max}$	
41	36	35	45	At any residence or other noise sensitive receiver

Notes:

a) To determine compliance with the $L_{Aeq\ (15\ minute)}$ noise level limits in the above table, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling where the dwelling (rural situations) is more than 30 metres from the boundary. To determine compliance with the $L_{A1\ (1\ minute)}$ noise level limits in the above table, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).

The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

b) The noise emission limits identified in the above table apply under meteorological conditions of:
- *wind speeds of up to 3 m/s at 10 metres above ground level; and*
- *temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.*

26. The Proponent shall ensure that the vibration from the operation of the project does not exceed the 'preferred' vibration levels applicable to a residential receiver as outlined in the DECCW's *Environmental Noise Management - Assessing Vibration technical guideline.*

Noise Monitoring

27. The Proponent shall prepare and implement a Noise Monitoring Plan for the project to the satisfaction of the Director-General. The plan must:
   a) be prepared in consultation with DECCW;
   b) submitted to the Director-General for approval 1 months prior to the commencement of commissioning; and
   c) include:
      - a program to validate the predicted noise emissions of the project, which involves carrying out monitoring during commissioning phase of the project; and
      - proposed mitigation measures in case of non-compliance with the project specific noise limits specified in condition 25.

CULTURAL HERITAGE

28. In the event that Aboriginal or historical objects are uncovered during the course of the project, then work in the immediate areas shall cease, the Director-General and appropriate authorities shall be notified and expert archaeological advice must be sought from an appropriately qualified professional. Works may only commence in this area with the written approval of the Director-General.

Note: The appropriate authorities are DECCW (Aboriginal objects) and the Heritage Office of the Department (historical objects).

BIODIVERSITY

29. Prior to the commencement of construction, the Proponent shall revise the Vegetation Management Plan (VMP) submitted with the EA, in accordance with the response to submissions report. All vegetation clearing and rehabilitation shall be undertaken in accordance with the revised VMP.

WASTE

30. The Proponent shall ensure that any waste generated on the site during the project is classified in accordance with the DECCW's *Waste Classification Guidelines* and disposed of to a facility that may lawfully accept the waste.

ENVIRONMENTAL MANAGEMENT STRATEGY

31. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General prior to carrying out any development on site, and:
    (a) provide the strategic context for environmental management of the project;
    (b) identify the statutory requirements that apply to the project;
    (c) describe in general how the environmental performance of the project would be monitored and managed;
    (d) describe the procedures that would be implemented to:
        - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
        - receive, handle, respond to, and record complaints;
        - resolve any disputes that may arise during the course of the project;
        - respond to any non-compliance;
        - manage cumulative impacts; and
        - respond to emergencies; and
    (e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the project.

INCIDENT REPORTING

32. Within 7 days of detecting an exceedance of the limits/performance criteria in this approval or an incident causing (or threatening to cause) material harm to the environment, the Proponent shall report the exceedance/incident to the Department, and any other relevant agency. This report must:
    (a) describe the date, time, and nature of the exceedance/incident;
    (b) identify the cause (or likely cause) of the exceedance/incident;
    (c) describe what action has been taken to date; and
    (d) describe the proposed measures to address the exceedance/incident.

33. The Director-General may require an update on compliance with all, or any part, of the conditions of this approval. Any such update shall meet the reasonable requirements of the Director-General and be submitted within such period as the Director-General may agree.

APPENDIX 1:
STATEMENT OF COMMITMENTS

5. Statement of Commitments

CHCC is committed to undertaking its activities in an environmentally responsible manner and effectively managing any risks that may lead to an impact on the environment.

5.1 Construction Environmental Management Plan

CHCC will prepare a Construction Environmental Management Plan (CEMP) prior to the commencement of construction. The CEMP will address the potential impacts referred in this EAR and will outline the environmental management practices and procedures to be followed during the site preparation and construction of the Project. The Draft CEMP will include:

- A summary of all the potential environmental aspects and impacts outlined in this Environmental Assessment;
- A description of all activities to be undertaken on the site during site preparation and construction;
- Statutory approvals and other obligations that will be fulfilled during site preparation and construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;
- Details of how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts;
- A description of the roles and responsibilities for all relevant employees; and
- Complaints handling procedures.

The mitigation measures to be incorporated into the CEMP include:

5.1.1 Air Quality Mitigation Measures

Construction Mitigation Measures

- Site managers should be provided with daily weather updates that will contain warnings of the onset of strong winds and, in particular, winds in the direction of sensitive receptors. The site manager could then take steps to pre-water construction areas and stockpiles before they are disturbed and cover disturbed soil where fugitive dust/odour may be generated;
- Physical barriers should be constructed to act as windbreaks for the construction site or for stockpile areas in times of high wind;
- Dust screens (e.g. shade cloth) should be installed on construction site boundaries that are adjacent to sensitive receptors;
- Storage piles should be a suitable height, width and slope and placed in areas protected from the wind and away from public places where possible. Spoil

stockpiles should be water sprayed regularly and dry material stockpiles should be covered;

- All trucks hauling dirt, sand, soil or other loose materials to and from the construction site should be covered;
- Earthmoving activities should be suspended during times of high winds, particularly when emission plumes are directed towards sensitive receptors;
- All construction vehicles, mobile plant and machinery should be maintained and operated in accordance with the manufacturers' specifications to minimise exhaust emissions; and
- Disturbance of contaminated soil surfaces should be minimised to reduce any potential odour impact during construction.

5.1.2 Soil, Erosion and Sedimentation Mitigation Measures

Water quality mitigation measures for the Proposal have been identified, with specific measures designed to protect the Orara River.

Measures to be implemented during the construction phase of the Proposal are:

- The design and installation of erosion controls will be undertaken in accordance with Managing Urban Stormwater, Soils and Construction Volume 1, the "Blue Book" (Landcom, 2004).
- At the vegetation clearing stage, the vegetation will be stockpiled and then mulched and spread over disturbed areas to provide a natural erosion barrier.
- Prior to commencement of earthworks there will be a range of measures put in place which include but will not be restricted to:
  - Construction of cut-off drains to prevent clean water from upstream and particularly flow from Martin Street flowing onto disturbed areas and hence become dirty water.
  - The diversion of those discharge points to the nearest watercourse so that clean water can be kept isolated from dirty water.
  - The stabilisation of exposed surfaces as soon as they can be practically stabilised following construction of that aspect of the works.
- A number of controls outside the specific work area will be put in place and these will include but will not be restricted to:
  - Refuelling of all mobile plant and machinery off-site.
  - Minimisation of disturbed areas so that the potential export of sediment is minimised.
  - The establishment and maintenance of a stabilised construction compound to reduce the area of overall disturbance for the project.
- Temporary sediment control measures will be constructed to capture water and sediment before it can leave the site or enter the Orara River. Conceptual design of the temporary sediment control measures will be undertaken using

the procedures outlined in Managing Urban Stormwater, Soils and Construction Volume 1 (Landcom, 2004) and with the following design features:

- Installation of sediment fences or similar erosion control devices downslope of stockpile and excavation areas;
- Limiting areas of vegetation and soil disturbance through delineating excavation areas to minimise the potential for erosion;
- Progressively rehabilitating and revegetating areas of disturbance including, where necessary undertaking short-term stabilisation of temporary stockpiles and disturbed areas.

- To minimise the potential impacts of flooding on trenching or excavation construction works, particularly any works below the 100 year flood level, the following measures should be implemented:
  - Monitoring of weather patterns during construction should provide some indication of the threat of flooding due to rainfall events;
  - Construction equipment and machinery should not be stored overnight within flood prone areas;
  - Water ponding in an excavation is to be managed on site (e.g. soak pit) in preference to offsite discharge; and
  - Any excavated trenches should be re-filled to minimise sediment loss from stockpiled material and the potential for this material to contribute to localised flooding, with any trench below the 100 year flood height to be covered with geotextile fabric until stabilised.
- A surface water quality monitoring programme for the construction period will be developed to monitor water quality upstream and downstream of the construction areas. Construction period monitoring will be carried out periodically and after rainfall events, along with assessment of the operation of soils, erosion and sedimentation mitigation measures. Monitoring during the construction and operational phases of the Proposal will examine the following indicators:
  - pH;
  - Electrical conductivity;
  - Turbidity; and
  - Dissolved oxygen.

5.1.3 Water Quality Mitigation Measures

Signage warning potential users of the river of the contamination in the vicinity of the bunded area and advice to community members to refrain from swimming or other recreational activities in the river from the footbridge and extending 150 metres downstream of the bunded area will be installed by CHCC to minimise risks to users of the river.

A soil and water quality monitoring program will be continued throughout the construction period, during operation and decommissioning of the extraction and

treatment system and continue for a period of six months. The program will be in accordance with Managing Urban Stormwater: Soils and Conservation (Landcom, 2004).

5.1.4 Hydrology and Flooding Mitigation Measures

During flooding events the underground soil vapour extraction component of the air sparging system will be inundated. WSP will design a cut off for the SVE system that will operate during elevated moisture conditions. Once the SVE system detects high moisture levels, it will turn off the system. This means that during high flow conditions in the Orara River the sparge system may be inactive.

5.1.5 Flora and Fauna Impact Mitigation Measures

- All plant and equipment should be sterilised using appropriate methods prior to entering the subject site to ensure no foreign disease, soil or organic matter including seeds are transported into the subject site.
- A comprehensive Erosion and Sediment Control Plan (ESCP) should be developed and implemented before, during and after the works to protect soils and prevent erosion after rainfall events and wind erosion within the subject site. The ESCP should be developed in accordance with the requirements of the NSW Department of Housing publication, *Managing Urban Stormwater: Soils and Construction* (1998).
- Several listed noxious weeds were present on the subject site including Camphor laurel, Chinese privet and *Senna pendula*. It is noted that Camphor laurels in some areas have become important stepping stone habitat with food resources for birds including some threatened species, in particular rainforest pigeons. Therefore, a program will be implemented of gradual removal and replacement with alternative habitat, to include native laurels and other fruiting rainforest trees, preferably those which fruit in Winter & Spring.
- A Vegetation Management Plan (VMP) has been developed for the site and will be amended to incorporate those species listed in Table 1 above.
- A weed management plan will be prepared for the subject site for implementation before, during and after the works are completed to prevent the spread of introduced species and declared noxious plants recorded within the subject site and wider study area as outlined in the VMP.
- A revegetation program will be implemented in conjunction with any weed control activities. Species to be used for revegetation will only consist of local native species as identified in the VMP.
- Corridor linkages will be strengthened where necessary by enhancement plantings as outlined in the VMP.

5.1.6 Cultural Mitigation Measures

Should any previously unrecorded Aboriginal sites or objects be detected during the course of development, work in the immediate vicinity of those objects will cease and the finds be reported to the DECC (National Parks and Wildlife Service - NPWS) and advice sought as to the appropriate course of action.

5.1.7 Noise Mitigation Measures

Construction Noise Recommendations

As far as practicable, the following general noise control measures will be incorporated in the construction EMP:

- Aim to minimise movements of equipment and personnel during noise sensitive periods, such as night time; and
- Staff arriving or leaving the site before 7 am or after 6 pm should be aware of the potential for noise impact at nearby receivers.

Due to the potential for construction noise goals to be exceeded GHD recommends that the following measures be taken into consideration during construction of all infrastructures associated with the project in order to reduce risk of noise impact:

- All work should be kept within the working hours prescribed by the DECC CNG. This includes trucks not arriving on site before 7:00 am. Should works out of these hours be needed, the work methods and noise goals of the DECC's CNG should be considered;
- Review available fixed and mobile equipment fleet and prefer more recent and silenced equipment whenever possible. In any case, all equipment used on site should be in good condition and good working order;
- Plan to use equipment, which is fit for the required tasks in terms of power requirements;
- All engine covers should be kept closed while equipment is operating;
- All combustion engine plant, such as generators, compressors and welders should be checked to ensure they produce minimal noise with particular attention to residential grade exhaust silencers;
- Vehicles should be kept properly serviced and fitted with appropriate mufflers. The use of exhaust brakes should be eliminated, where practicable;
- Where practical, machines should be operated at low speed or power and should be switched off when not being used rather than left idling for prolonged periods; and
- Machines found to produce excessive noise should be removed from the site or stood down until repairs or modifications can be made.

Work Ethics / Community Relations

- All site workers should be sensitised to the potential for noise impacts onto local residents and encouraged to take all practical and reasonable measures to minimise noise during the course of their activities; and
- The site manager (as appropriate) should establish contact with the local residents and communicate the remediation program and progress on a regular basis, particularly for when noisy activities are planned.

General Recommendations

As far as practicable, the following general noise control measures should be incorporated in the design:

- All external noise sources should be located so as to avoid direct line of sight with noise receivers;
- If possible, ventilation or exhaust openings should not face noise receivers;
- Aim to minimise movements of equipment and personnel during noise sensitive periods, such as night time; and
- Staff arriving or leaving the site before 7 am or after 6 pm should be aware of the potential for noise impact at nearby receivers.
- Hours of operation during construction will be limited to:
  - Monday to Friday: 7 am to 6 pm
  - Saturdays: 8am to 1pm
  - Sundays and Public Holidays: No construction work

Mechanical Plant – General Advice

- CHCC will investigate the operational requirements for the compressor and blower systems and where practical, optimise the required operational time with consideration to potentially noise sensitive time periods, such as night;
- CHCC will ensure equipment is kept properly serviced; and
- Where practical, machines should be operated at low speed or power and should be switched off when not being used rather than left idling for prolonged periods.

In-Principle Enclosure Design

- A four sided and covered enclosure should be constructed around the compressor and blower. Typically, an enclosure will provide a sound reduction in the range of 10 – 25 dB(A). The enclosure should extend to ground level, to preclude the potential noise flanking path through any air gaps between the walls and floor in the direction of the nearest receivers;
- There are a number of practical limitations to consider with the type of building materials used for enclosures, including ventilation, aesthetics and ease of removal once the project if complete. It is recommended that the acoustic influence of these be assessed at detailed design stage;

- For further effective attenuation at the source, enclosures should be internally lined with an appropriately rated acoustic material, minimising build-up of reverberant acoustic energy and the extent of transmitted acoustic energy through the building element material; and
- All equipment is to be vibration isolated, with consideration to manufacturers requirements.

5.1.8 Land Use and Infrastructure Mitigation Measures

- CHCC will continue to consult with the local community and affected residents during the construction and operational phases of the Project.
- CHCC will ensure that pedestrian access is maintained along Martin Street and across the foot bridge which crosses the river.
- CHCC will complete a dial-before-you dig search prior to any earthworks.

5.1.9 Visual Amenity Mitigation Measures

It will be necessary to reinstate vegetation cover over disturbed areas to minimise the visual impacts of construction and set up activities. In line with the VMP, appropriate planting of endemic species within the area disturbed will add biodiversity value to the area and provide an important riparian resource for the Orara River.

Given that the enclosure for the blower and compressor will need to be in place for at least 2 – 3 years it is recommended that it is constructed of quality materials and painted in appropriate colours to complement its location adjacent to the existing dwellings in Martin Street.

5.1.10 Health and Safety Mitigation Measures

Warnings to river users about contamination within the immediate vicinity of the bunded area at the bottom of Martin Street should, if heeded, minimise risks from this potential exposure pathway. Ongoing monitoring of river water quality provides ongoing information to assess health risks from recreational use of the river should the level of contamination change over time.

5.1.11 Waste Management Mitigation Measures

The following mitigation measures will be implemented to minimise waste generation and to manage those wastes that are generated:

- Excavated material would, wherever possible, be re-used on site, although some material will require offsite disposal;
- Contaminated material will be managed and disposed of;
- Topsoil will be reused in revegetation and rehabilitation of cleared areas;

- Where practical, vegetative matter, not including weeds, will be chipped and reused on-site. Logs and tree limbs suitable for habitat and or fauna refuge will be collected during clearing and placed in a location identified as suitable;
- Demolition waste materials will be recycled and/or reused on site, or transported to an approved recycling or waste management facility, as appropriate;
- Construction materials will be sourced and ordered in appropriate quantities to avoid the creation of excess waste, recycled and/or reused on site or on other projects where possible, or transported to an approved recycling facility;
- Suitable waste bins/receptacles will be provided throughout the work site to capture all waste streams;
- Separate containers will be provided for recyclable and non-recyclable materials. These materials will be transported to an approved recycling or waste management facility, as appropriate;
- Waste will be transported from the site when storage facilities are filled. The waste storage area will be kept tidy and well maintained;
- Liquid waste such as chemicals, fuel and lubricants, and their containers, will be disposed of in accordance with the requirements of the *Waste Classification Guidelines Part 1: Classifying Waste* (Department of Environment and Climate Change 2008); and
- Portable toilet facilities will be installed on site and emptied periodically by an approved contractor.
- Activated carbon waste will be disposed of appropriately.

5.2 Operational Management

Management issues to be addressed during the operation of the Project are as follows:

5.2.1 Hazard identification and exposure pathways

Based on the site assessments, the hazards which require management are:

- volatile contaminants in air (BTEX, TPH $C_6 - C_9$);
- contaminants in soil, wastes and waters; and
- standard construction site hazards.

Based on the proposed remedial strategy, potential environmental impacts are considered to relate to movement of soils through erosion or disturbance, movement of dust and generation of water and vapours.

Based on the proposed remedial strategy, potential human health exposure relates to:

- dermal (skin) contact with water, soil, dust, or vapours; and/or

- inhalation of volatiles, gases, fibres, soil or dust; and/or
- ingestion of water, soil or dust.

Controlling the above exposure pathways will effectively minimise the risks to workers in relation to the contaminated soil or water, and prevent offsite impacts.

5.2.2 Site management (operation phase)

Specific environmental requirements relating to the remediation works should include:

1. Establishment of contaminant control zones (CCZ) via temporary fencing, to prevent unauthorised access to impacted soils. Only personnel required for the works should enter the CCZ. All personnel and equipment should be appropriately decontaminated prior to exiting the CCZ.
2. Maintain erosion and sediment controls to prevent offsite migration of impacted soils or further contamination of surface water (e.g. by sediments).
3. Use appropriate methods to control the generation of dust and vapours, e.g. limit extent of works at any one time, use water sprays to keep soils moist (but not enough to generate surface water) and use hydrocarbon surfactants to control odours, cover work areas if required, or stop work if wind is sufficient to generate dust.
4. Conduct onsite monitoring for volatiles using a photoionisation detector (PID). The level of personal protective equipment (PPE) required should be based, in part, on the results of air monitoring.

An occupation health and safety plan should include the following:

- Additional personal protective equipment for workers within the contaminated control zone. Workers who may potentially come into contact with soils and/or vapours should be provided with a half face mask respirator fitted with organic filters, disposable cover-alls, disposable gloves and suitable amenities for decontamination. Decontamination should be conducted prior to exiting the site and before any hand to face activities or similar (e.g. eating, drinking, smoking, toilet breaks, etc.).
- Training of workers in the hazards posed by the contaminants. Training should include methods of work which minimise disturbance, dust creation and contact with the soil; and suitable hygiene procedures (e.g. washing hands before eating, removing soil from clothes and skin as soon as possible etc).

5.2.3 Hours of Operation

The hours of operation will be developed in consultation with the relevant authorities and landowners. It is envisioned that the air sparge will operate intermittently 24 hours per day.

Proposed hours of maintenance activity during operation phase will be limited to:

- Monday to Friday: 7 am to 6 pm

- Saturday: 8 am to 1 pm
- No work on Sundays or Public Holidays

The above may be varied due to emergency response requirements etc

5.2.4 Air Quality Monitoring

CHCC will monitor, in accordance with an approved monitoring plan, the emission rates of pollutants during operation of the SVE process to demonstrate compliance with the emission rate limits specified below. The plan will describe the method, frequency and actions to be taken if limits are exceeded.

Table 3 details the predicted results, DECC air quality criteria and the associated mass emission rate limits during the SVE process. The required mass emission rates and concentration calculations have been based on a 1-hour average criterion. It should be noted that benzene, ethyl benzene and PAH are classified under toxicity-based criteria, whereas toluene, xylene and phenol are classified under odour-based criteria.

Table 3 Derived Emission Limits

Constituent	DECC Criteria (1-hour avg., mg/m^3)	Reason for Classification	Mass Emission Rate Limit (g/sec) (1), (2)
Benzene	0.029	Toxicity	0.00015
Toluene	0.36	Odour	0.0019
Ethyl benzene	8.0	Toxicity	0.043
Xylene	0.19	Odour	0.0010
PAH (as Benzo[a]pyrene)	0.0004	Toxicity	0.0000021
Phenol	0.02	Odour	0.00011

(1) Based on unity run (1 g/sec) with a maximum predicted concentration of 93.54 mg/m^3 at Receptor 3.

(2) GHD assumed that 95% of each pollutant is removed from in-stack air treatment via two activated carbon drums connected in series.

5.2.5 Noise Monitoring

Due to the low background noise levels, the use of neutral wind conditions in modelling, reliance upon enclosure design to reduce noise levels and the extended time period of the potential noise source, additional noise monitoring would only be undertaken following commissioning and in response to valid complaint/s.

5.2.6 Contingency Plans

The purpose of the contingency plan is to identify unexpected situations that could occur during the remediation works, and specify procedures that can be

implemented to manage such situations and prevent adverse impacts to the environment and human health, and manage unexpected situations.

Contingency plans should include:

- Sediment control measures and bunding will be regularly inspected and maintained. If required, additional measures should be established.
- Dust emissions are to be confined within the site boundary. The following dust control procedures may be employed to comply with this requirement:
  - minimise work areas;
  - erection of dust screens around the perimeter of the site or dust generating activities;
  - securely covering all loads entering or exiting the site;
  - use of water sprays across the site to suppress dust (but not to generate runoff);
  - all stockpiles of soil or other materials likely to generate dust or odours are to be covered; and
  - changing or modifying work practices based on climatic conditions.
- No odours attributed to the work are to be detected at any boundary of the site during the works. The following procedures may be employed to comply with this requirement:
  - minimise work areas;
  - use of appropriate covering techniques such as the use of plastic sheeting to cover excavation faces or stockpiles; and
  - use of fine mist sprays and hydrocarbon odour mitigating agent on the impacted areas/materials.

5.2.7 Community Relations

As part of the Project, CHCC will nominate a community liaison contact and have procedures in place for the handling of complaints during operation.