

NEV Environmental Management Procedure

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1. Document Control

Document Number:	NEV051	Current Version:	1.1	Document Approver:	Head of NEV Water
Document Owner:	NEV Water	Controlled Document:	No	Date Approved:	20/9/2017

History of Revisions

Version	Revised By	Date	Nature of Changes
1.0	G Cameron	10/07/2017	First Draft
1.1	G Cameron	6/10/2017	Reviewed and expanded

2. Context

The proposed scheme forms part of the NEV residential sub-division project. NEV, as the WICA license holder, is responsible for the construction, operation and maintenance of all water infrastructure from source to customer connection.

3. Purpose

The aim of the Environment Management Procedure (EMP) is to detail the potential environmental impacts from NEV's water, wastewater and other services operations, and the mitigation measures to be employed to minimise or alleviate these potential impacts.

The area covered by this procedure is Lot 13 in Deposited Plan 1126998, which is the site of the proposed NEV residential sub-division project.

4. Abbreviations

CAR	Corrective Action Request
ERA	Environmental Risk Assessment
EMP	Environment Management Procedure
HACCP	Hazard Analysis and Critical Control Points
NEV	Narara Ecovillage Co-operative Limited
PIC	Peripheral Interface Controller

5. Environmental Policy

It is the responsibility of all workers and contractors to adopt environmentally-responsible work practices.



The *Environmental Protection Act* imposes a General Environmental Duty on all workers, namely that “a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm.”

NEV is committed to responsible environmental management, and conducts all operations considering environmental sustainability. NEV manages all operations and activities in compliance with applicable environmental laws, regulations and licences. NEV provides sustainable solutions in the water recycling industry. All projects are executed in a manner that is sensitive to both the client’s and the community’s environmental management objectives.

Environmental management objectives include:

- Complying with all relevant environmental, contractual, legal, licence and other requirements
- Minimising direct and indirect emissions to land, air and water
- Considering local environmental conditions and the community
- Ensuring our suppliers and contractors consider our environmental requirements
- Being prepared to respond to environmental incidents and to mitigate impacts

These environmental management objectives are met through:

- Identification of environmental aspects during HACCP workshops
- Evaluation of the potential impacts of these aspects on the environment
- Implementation of a management plan to mitigate or prevent those impacts
- Applying principles of hazard identification, risk assessment and risk control following the Risk Management Procedure
- Establishment of a monitoring and reporting program
- Continual review, upgrade and improvement of objectives and targets within the EMP

In order to maintain a high level of environmental awareness all workers, supervisors and managers work in accordance with formal environmental practices. All requirements for environmental responsibility are integrated into work practices and decision making, and every person, contractor and company operating on behalf of NEV is held accountable for their environmental performance.

NEV management and the NEV Environment Health and Safety Officer in particular shall ensure that all workers, contractors, suppliers and companies operating on NEV work sites are familiar with the Environmental policy.

6. Environmental Risk Assessment and Register

A specific environmental risk assessment (ERA) approach is to be undertaken to establish the environmental risks associated with this project. This is conducted by the Environment Health and Safety Officer, and approved by the CEO. The ERA will be conducted in accordance with the below procedure, which is in accordance with AS/NZS 4360:2004 Risk Management. The outcomes are recorded in the **Risk Assessment and Risk Register**.

7. Control and Monitoring Measures

Site maps are to be prepared and maintained for:

- Building layout
- Potable and recycled water infrastructure
- Sewerage infrastructure
- Storm water infrastructure
- Power lines
- Gas pipes
- Streams and drains



Bulk and hazardous substance storage

Control and monitoring measures are implemented to manage environmental risks of NEV projects, defined during the ERA process. These are recorded in the HACCP and ERA process and generally include the below items.

- Production of fit-for-purpose recycled water, utilising ultrafiltration membrane bioreactor technology for recycled water treatment and first-stage disinfection
- Online monitoring with alarms, and sewer bypass where available
- UV disinfection as a second-stage disinfection barrier
- On-line monitoring of UV disinfection process using UV photo-intensity monitoring
- The use of chlorination as a third-stage disinfection barrier
- The implementation of HACCP from design to commissioning
- Applying appropriate buffer zones to maintain sufficient distances from surface waters where irrigation of recycled water is carried out
- Proper signage of recycled water storage tanks and irrigation schemes in accordance with AS 1319 and PIC requirements
- Use of lilac-coloured pipe and plumbing fittings to indicate recycled water, in accordance with relevant plumbing codes
- Compliance with PIC requirements for backflow prevention and discharge from the greywater system to sewer
- The use of enclosures and submersible pumps to reduce noise
- The use of aerobic processes and odour scrubbing and venting to stacks, to mitigate the risk of odour generation
- The implementation of ongoing servicing, monitoring, third-party auditing and reporting systems to maintain consistent recycled water quality
- Community information and education programs where required, designed to assist residents, facility management and visitors to become familiar with the benefits and precautions associated with the recycled water scheme
- Management of the irrigation scheme based on flow monitoring, site and soil assessment

8. Environmental Monitoring

Water quality monitoring

An **Integrated Water Cycle Management** plan has been prepared to sustainably manage water and wastewater at the Narara Site.

Detailed risk assessments have been prepared from source to the customer connection points; sewage management and recycled water. The irrigation scheme has been conceived after completing a Land Capability Assessment, specific to this site, to ensure sustainable irrigation and management of the water cycle. A low rate of irrigation is to be used to minimise the possibility of recycled nutrients entering waterways.

The process design does not involve discharge of water or waste products into the reservoir or streams.

Periodic sampling to monitor source water quality will be included as part of the ongoing management of the Narara Dam reservoir. This will likely include sampling at various locations and depths around the reservoir. The sampling program will be detailed in the **Reservoir Management Plan**.

Soil Monitoring

Soil capacity assessment was carried out as part of the **Integrated Water Cycle Management Plan**. This concluded that all the soils tested are suitable for long-term irrigation of effluent provided the nutrient deficiencies are addressed and the soil organic carbon content is maintained.



As recommended in this report, soils used for irrigation disposal will be retested for nutrients, pH and organic carbon after 3 years of effluent irrigation.

Waste Management

The Environment Health and Safety Officer will conduct and document periodic audits to ensure compliance with the site's waste management policies and procedures.

The audit will ensure waste materials are recycled or reused where practical, including:

- Paper and board
- Metals
- Oils
- Plastics
- Plastic wrap
- Wood
- Fluorescent light tubes
- Batteries
- Timber pallets

Other Environmental Monitoring

Environmental odour impacts will be assessed as recommended in the ***Odour Impact Assessment Report***.

Environmental noise impacts will be assessed as recommended in the ***Noise Impact Assessment Report*** and the ***Noise and Vibration Management Plan***.

Site Inspection

Site inspections are to be conducted regularly and documented.

Inspections are to include:

- Waste disposal and recycling facilities
- All bulk and chemical storage areas are sealed and banded to prevent leaching of products onto the soil or waterways
- Erosion and sediment control
- Inspections to assess if there is scope for additional energy and water consumption efficiencies through improved energy and water use practices
- Noting actual and potential situations, considering the full range of operating conditions, including possible incidents, start-up and shut-down operations, observed changes in environmental conditions and potential emergency situations such as fire, explosion and spillage of hazardous materials.

Audit

The Environment Health and Safety Officer will conduct and document periodic environmental audits to ensure compliance with the environmental policies and procedures.

The Environment Health and Safety Officer will be responsible for the development and implementation of the Environmental Audit Schedule.

The applicable Australian Standard, AS/NZS ISO14010:1996 titled '*Guidelines for environmental auditing - General principles*' defines an environmental audit as a:

“systematic, documented verification process of objectively obtaining and evaluating evidence to determine whether specified environmental activities, events, conditions, management systems or information about these matters conform to audit criteria and communicating the results of this process”



Audit criteria will be determined from the nominated environmental legislation, approvals, policies, standards, codes of practice, guidelines, Project Environmental Management Plans (Project EMP), Contractor's Environmental Management Plans (Contractor's EMP) and procedures.

The audit criteria will provide the basis against which the auditor compares collected audit evidence.

The audit will include whether all environmental incidents are investigated and reported and that environmental audit reports are correctly documented.

The Environment Health and Safety Officer will ensure all workers are trained in emergency response in the event of an environmental incident.

Having completed the collection of evidence, the audit observations should be reviewed and collated to determine if any environmental management activities do not conform to the audit criteria. Adverse or non-conforming activities requiring corrective action should be the subject of a Corrective Action Request (CAR) and be documented in a clear, concise manner and supported by audit evidence.

Minor items that need improvement, but do not constitute a clear breach of environmental standards, may be the subject of an "audit observation". It would be expected that the contractor would respond to an observation by remedying their practices.

Environmental Incident Investigation and Reporting

This procedure applies to the management of environmental incidents occurring on or extending off site. Incidents include complaints from people external to the site.

It is important that NEV workers are able to:

- Identify what is an environmental incident
- Take appropriate immediate action to control an incident
- Know the reporting requirements

The following hierarchy applies in the immediate response to an incident:

- Ensure health and safety first
- Shut off the source, if possible
- Contain contaminants
- Report
- Clean up

Incident management procedures and response should be appropriate to:

- The site
- Scale of the environmental incident
- Resources available
- Geographical location and sensitivity of receiving environment

9. Resources and Documents

The following documents are to be kept on file by the Environment Health and Safety Officer.

- Technical information on contaminants
e.g. Material Safety Data Sheets, ChemAlert database, environmental effects, site specific disposal options
- Site plans/maps showing relevant information
e.g. drainage, hazardous substances locations and quantities
- Contact information for emergency services and external specialists/resources
- Environmental Issues Register information

10. Procedures/ Work Instructions



The following documents are to be kept on file by the Environment Health and Safety Officer.

- Checklists (Action cards specific to an officer's role and responsibilities) shall be prepared that detail staff responsibilities, actions to be taken and notification requirements (Note: Ensure that checklists cover workers such as security, operating staff, line management, technical specialists, media liaison officer)
- Procedures shall be prepared that detail site-specific response actions

It is a requirement that a system be established to manage incidents in the longer term to ensure that appropriate follow-up action is completed with the aim of improving environmental performance.

For details of NEV's environmental incident response procedure refer to separate document: [Environmental Incident Procedure](#).