Operational Environment Management Plan

Northfleet Hydrogen Production Facility

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1 Introduction

1.1 Purpose the Plan

The purpose of Operational Environmental Management Plan (OEMP) is to set out the monitoring and mitigation required to prevent any land at the Northfleet Hydrogen Production Facility (HPF) from becoming contaminated.

1.2 Roles and Responsibilities

1.2.1 Developer

RES Ltd, on behalf of HYRO Energy Ltd will develop the Northfleet HPF as per the plans submitted to Gravesham Borough Council.

1.2.2 Asset Manager

The Asset Manager will be responsible for the overall management of the facility once operational and the contact information can be provided prior to the start of operations.

1.2.3 Operation and Maintenance Manager

A separate contract for Operation and Maintenance services is yet to be confirmed, and the contact information can be provided prior to the start of operations.

1.3 Project Contact Details

Name	**Role**	**Email**	**Contact**
Development: Northfleet Hydrogen Production Facility			
Craig Allison	Development Project Manager	craig.allison@res-group.com	07570 230727
tba	Asset Manager		
tba	O&M Manager		

2 Information & Implementation

2.1 Project Overview

The Northfleet Hydrogen Production Facility is to be located at Kimberly-Clark Northfleet Mill, Crete Hall Rd, Northfleet, Gravesend DA11 9AD. Developed on a brownfield site previously used for bulk storage of paper pulp, the facility will use the green hydrogen produced to fuel a new dual-fuelled boiler system, located inside the mill. This new boiler system can operate using hydrogen or natural gas to produce the steam and heat necessary for the paper manufacturing process at the mill and will replace the current boiler which solely uses natural gas. The project consists of proton exchange membrane electrolysers, hydrogen storage tanks and associated infrastructure.

For all activities on site, the objective is to ensure that safeguards are put in place to minimise any environmental risks in the operations of the project. This document aims to outline the best practice and avoid environmental impacts.

2.2 Operational Activities

The anticipated activities during the operational phase of the hydrogen production facility are as follows:

- Treatment of potable water into ultrapure water for use in electrolyser
- Production of hydrogen using Proton Exchange Membrane (PEM) electrolysis
- Storage and distribution of hydrogen to offtaker, Kimberly Clark (KC)
- Storage and distribution of potable water and wastewater
- Production of Nitrogen for purging and blanketing
- Stopping, starting and varying production of the electrolysers
- Maintenance of the electrolyser packages including electrical power conversion systems, water treatment, gas treatment and electrolyser stacks
- Maintenance of substation
- Maintenance of other electrical infrastructure, including transformers HV cables
- Maintenance of storage tanks and associated pipework
- Maintenance of flare stack
- Maintenance of access roads and other civil infrastructure

2.3 Pollution Risks

The project pose negligible risks of land or water contamination due to the release of pollutants onto the ground or into surface waters and groundwater. This includes pollutants such as chemicals, oils, or hazardous materials to be released during construction and operation activities. Factors such as storage, handling, and disposal practices have been evaluated to ensure there is no likelihood or extent of contamination and no potential impacts on soil, water quality, and ecosystem health.

The project facility will minimise the release of any harmful emissions, pollutants, or other hazardous substances into the atmosphere during its operation.

The hydrogen production facility will release fugitive hydrogen from the process to atmosphere from time to time. These mainly include streams for thermophysical analysis, which are continuous, periodic discharges for maintenance and purging, and emergency depressurisation of flammable inventories during process upset or abnormal conditions.

Northfleet Green Hydrogen demonstrates compliance with the UK Low Carbon Hydrogen Standard (LCHS), where producers must report an emissions intensity of less than 20 gCO2e/MJLHV of hydrogen produced.

3 Environmental Management

3.1 Site Access & Induction

A contractor access system shall be in force, to control entry of personnel to the site. All contractors/sub-contractors shall undergo a site induction to ensure they are aware of pollution prevention methods (including this OEMP), the steps required in the event of an on-site incident and risks to surface and ground waters at the site. The contractor access system shall be used to validate that the only personnel permitted on site have undergone the previously mentioned site induction.

3.2 Risk Assessment & Method Statements

When developing work methods, each party to whom this site OEMP applies will consider the predicted environmental impacts of their works and appropriate mitigation measures will be incorporated where required into their Risk Assessments and Method Statements (RAMS).

The method statements will be reviewed, to ensure that all reasonably foreseeable environmental impacts associated with that piece of work are appropriately mitigated.

3.3 Facility Monitoring

The implementation of clear internal auditing systems will ensure that the measures contained in the OEMP are being implemented on a day-to-day basis. As part of the OEMP, regular monitoring by way of visual inspection will be carried out, to check the status of installations on site are fit for purpose. These inspections shall include:

- The overall effectiveness of the OEMP compliance requirements.
- Assessment of the existing measures in place on site for wear and tear, fitness for purpose.
- Fault finding, defects and damage identification.
- Development of new mechanisms to monitor the targets and objectives, if required.

The results of the review will be used to update the OEMP if deemed necessary to either ensure targets are met or to ensure continual improvements in environmental performance.

3.4 Reporting

Details of any relevant monitoring results shall be provided to the manager of the facility as soon as the reporting obligations have been fulfilled.

- The facility manager's reports to the client shall include an update on any relevant environmental management and performance.

3.5 Training

Environmental awareness covering appropriate environmental topics will feature in the project induction for all workers.

Training may be provided in a variety of means (not necessarily classroom training), including briefings, toolbox talks and coaching. Other training may take the form of on-the-job training in specific elements or tasks or the provision of specific environmental skills as necessary. These and other means (such as posters, signs, site newsletter, competitions) may be used to promote environmental awareness.

The number of training items undertaken will depend upon facility staff's existing qualifications and the on-site duties they will be undertaking. Records should be maintained of all the training provided.

3.6 Environmental Incident & Emergency Response Procedures

The Project will take a proactive approach to minimising environmental impacts that could arise from any incidents. In the unlikely event of any incident occurring, the facility manager will deal with this in a professional and prompt manner in order to mitigate any associated environmental impacts.

All environmental incidents shall be reported to the facility manager or the Asset Manager's Control Centre as soon as reasonably practicable after they have occurred.

3.7 Chemical usage and Control

3.7.1 Use of Chemicals

The potable water on site is deemed to have minimal impact on the environment, due to the nature of potable mains water.

Hydrogen itself is deemed to have minimal impact on the environment and so environmental management is mainly concerned with ensuring that ignition sources are eliminated to prevent a resultant fire or explosion.

Chemical re-agents, or glycol mixtures used in the process and hydraulic oils in equipment: such fluids shall not be discharged to local drains and instead drip trays or bunds will be used to catch spills. Appropriate spill containment, and hazardous waste removal procedures shall be produced prior to the operation phase.

3.7.2 Pollution Control

Appropriate measures shall be undertaken in order to avoid incidents of an environmental nature. Spill response kits and other facilities shall be made available as outlined in task specific RAMS to deal with any such incidents should they occur.

4 Site Waste Management Plan (SWMP)

The Site Waste Management Plan (SWMP) seeks to minimise the waste at site by reducing the quantity of imported materials, and waste created on site.

The SWMP will be further expanded by the contractor prior to the commencement of site works. All contractors will follow current best practice regarding waste management and minimisation. This is based on the waste hierarchy, which provides a framework for decision making considering environmental and monetary costs. The waste hierarchy is as follows:

1. Avoidance – avoid the production of waste wherever possible;
2. Reduction – reduce the quantity of waste generated;
3. Re-use – re-use of waste within the project, subject to waste management and permitting regimes;
4. Recover / recycle – where waste cannot be re-used then recovery options should be considered.

Disposal is the final option and will be avoided where possible. Waste that requires disposal shall be transported to an appropriately licensed facility.

4.1 Identified Waste Streams

The most common waste streams envisaged during facility operation are set out in the table below:

Material	**Proposed means of management**	
Water	a	Via effluent treatment plant to the existing sewerage network
Hydrogen	a	Via vents/and or flare stack to atmosphere
Metals (redundant equipment)	a	Off-site prefabrication to minimise site derived waste
	b	Refurbishment of redundant equipment where appropriate
	c	Via approved waste haulier to metals processing plant
Polymer electrolyte (redundant equipment)	a	Off-site prefabrication to minimise site derived waste
	b	Via approved waste haulier to processing plant
Oils	a	Via approved waste haulier to local final disposal options
Paper/Card	a	Recycle and re-use within the site wherever possible
	b	Via approved waste haulier to local final disposal options
Other general waste	a	Via approved waste haulier to local final disposal options

4.2 Storage of Waste

A wastewater buffer (break) tank is to be provided, to temporarily store wastewater from the process, which is deemed to be of minimal risk.

Special waste facilities will be located for the duration of the facility works for the disposal of materials such as lubricant containers, aerosols, empty oil containers, oily rags and used filters etc. All waste facilities will be appropriately labelled, and wastes segregated.

4.3 Transfer of Waste

Only authorised waste carriers will be employed to remove waste from the hydrogen production facility. Contractors will ensure that carriers have the required documentation. Waste carriers must provide their waste carriers licence number to allow a validity check to be carried out and copies of these will be held on site by the relevant contractor.

Before removal of any waste from site the facility manager will confirm that all relevant documentation required is in place and is valid. Dependant on the waste classification Waste Transfer Notes or Consignment Notes will be required and kept on site by the relevant Contractor.

5 Pollution Prevention Plan

The objectives of this Pollution Prevention Plan (PPP) are to ensure that measures are in place for all activities of Northfleet Hydrogen Production Facility. The key objectives of the PPP are to:

- Identify all pollutant sources and sensitive receptors.
- Identify, construct and implement any special procedures or control measures to protect the environment.
- Implement a management plan to include waste management and incident response.
- Continually monitor and review the environmental impact of the work and continually update the management plan as necessary.

The table below outlines the initial sources of pollution anticipated for the Northfleet facility.

Item	Potential Pollutant	Pollutant Release Scenario	Mitigation measures
5.1	Waste	Incorrect Waste Management	Refer to Section 4 • Designated Waste facilities on site • Specific references within toolbox talks and site • Induction • RAMS to have sections on waste control • Use of licenced waste company to be utilised for offsite disposal.
5.2	COSHH Materials	Failure during ordering and on-site delivery	Spill kits to be provided on site for addressing any spills.
		Failure of storage facilities	Suitable bunded facilities to be utilised
		Inadequate use and disposal of oils and chemicals	CoSHH Assessment mitigation measures to be implemented and disposal in accordance with section 4
		Leaks and spills from operations vehicles	Spill kits to be provided on site for addressing any spills
		Incorrect management of materials	CoSHH Assessment mitigation measures to be implemented and disposal in accordance with section 4
5.3	Noise & vibration	Electrolysers; pressure let-down; Instrumentation air	Section 5.3
5.4	Waste water	Off-specification water	Section 5.4
5.5	Hydrogen	Fugitive release	Section 5.5

5.1 Storage of chemicals

The following will be stored in bulk on the facility:

- Potable Water
- Wastewater
- Hydrogen

A small amount of chemical re-agents will be used that will be subject to CoSHH assessment and stored appropriately to manage the risks identified

5.2 COSHH Materials

The inventory of chemicals kept or used on site will be completed before operation and will be reviewed at regular intervals. Full compliance with COSHH via up to date COSHH Register will be maintained.

As part of all work streams specific risk assessments will be prepared

All hazardous materials shall be stored in suitable bunded and vented security cage/container prior to use. Used containers shall be controlled and disposed of safely as set down in the relevant COSHH assessment and with reference to the current DSEAR Regs.

5.3 Noise

Please refer to report Acoustic Assessment for Northfleet Green Hydrogen Development as submitted in the planning application (20250251).

5.4 Wastewater

The wastewater generated on-site is deemed to have minimal impact on the environment, primarily due to the nature of the process. However, there is the potential for raised temperature or raised pH wastewater to be discharged by the electrolysers. In this case, a wastewater buffer (break) tank is to be provided, to ensure wastewater within specification is directed to the existing southern water sewerage network and effluent treatment plant on the KC site, with no direct release to the environment.

5.5 Hydrogen

Fugitive emissions are to be minimised by application of recommended good design and operating practices, these include:

- Flanges are to be minimised on all low and high pressure hydrogen applications.
- Suitable equipment and piping materials have been specified as part of the project so to minimise failures resulting in the potential for leaks.
- Leak testing will be undertaken during commissioning activities so to account for hydrogens small molecule size and “searching” abilities.
- Equipment shall be maintained and repaired in line with the manufacturer’s recommendations.

- During normal operation, releases to atmosphere will be minimised and discharged unignited. Where significantly hazardous events occur, the large quantities of hydrogen stored in the plant will be flared to minimise environmental impacts.