Engreen Environmental Consultants Ltd.

Report Title:	**Non-technical Summary**
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Environment Agency

Main Contributors:
R Wheeler (Geopura)
David Green (Engreen)

Authorised for issue by:

David Green
MA, C Eng, FIChemE

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1 Introduction

1.1 General

1.1.1 Summary

This document provides a non-technical summary in support of the Environmental Permit variation application for the Geopura and Water Electrolysis Installation at High Marnham.

1.1.2 Installation Information

The following details are provided for the applicant.

Company Name	Geopura
Company Registration number	11855286
Site Name	High Marnham Hydrogen
Site Address	High Marnham Power Station
Grid Reference (centre of site)	SK 80923 70852
Permit Reference	
Schedule 1 Activities	S 4.2 Part A(1) (a) (i)

1.2 Permitting Requirements

1.2.1 General

The facility is required to apply for an Environmental Permit (EP) in order to comply with the Environmental Permitting (England and Wales) Regulations SI 2010/675, as variously amended.

1.2.2 Nature of Application

This is an application for a new Chemicals Installation permit.

1.3 Sector Guidance Documents

- Environment Agency Sector Guidance, “” (The Inorganic Chemicals Sector (EPR 4.03)), March 2009;
- Environment Agency guidance, “How to comply with your Environmental Permit”, (EPR 1.00), version 5, August 2012.

2 Process Information

2.1 Electrolysis Descriptions

2.1.1 General

The process is the electrolysis of water to create hydrogen gas product and oxygen gas by-product. The desired product is the hydrogen and the oxygen by-product is allowed to disperse harmlessly into the atmosphere.

2.1.2 Process Steps

The process steps involved are:

- Water purification
- Water softening
- Electrolysis
- Hydrogen export

2.1.3 Location and Layout

The installation is located on a very small area of a disused power station. The installation equipment requires very little space and will occupy approximately the same volume as 8 isotainers.

2.1.4 Monitoring

The electrolysis system comes as a packaged unit with integrated control panel and condition monitoring to assure optimal performance.

The RO unit has integral pressure monitoring to ensure backwashing is carried out efficiently to maintain filtration performance.

2.1.5 Releases

There is no requirement for monitoring of releases to air.

Releases to water will be sampled approximately monthly and analysed to confirm conformance to predicted release rates.

3 Data

3.1 Raw Materials and Wastes

3.1.1 Raw Materials

Material	Use	Environmental	Quantity
Potassium hydroxide	Reaction promoter	Damaging to aquatic and plant life, corrosive.	None stored on site.
Lubricant/Hydraulic Oil	Compressor	Damaging to aquatic life, persistent in ground.	None stored on site. These are readily available materials that will be delivered on an “as-needed” basis.
Ion exchange cartridge	Ion exchange regeneration	None	N/A
Nitrogen	Purging lines prior to maintenance	None – inert gas used in small quantities.	N/A

3.1.2 Wastes for Recovery

The contents of the electrolysis baths are checked regularly to ensure that the optimum conductivity is maintained with potassium hydroxide being added as and when necessary. On an occasional basis, for which the preliminary estimate as once every 18-24 months, – the contents of the bath are collected and sent for regeneration.

Hydraulic oil will be sent for recovery with initial estimates of 1000 kg/yr.

3.1.3 Wastes for Disposal

Other than “general waste” such as from operator amenity bins there are no wastes sent for disposal.

3.2 Emissions and Control

3.2.1 Air

Very low levels of nitrogen and residual hydrogen are released along with by-product oxygen. None has any environmental significance when released to air.

3.2.2 Sewer

There is no process release to sewer. The collected RO elutriate will discharged via the existing discharge pipes to river along with clean rainwater run-off.

3.2.3 Land/Waste

There are no direct emissions to land.

4 Amenity Risk

4.1 Air Impact Assessment

There are no relevant releases to air to consider.

4.2 Water Impacts

An assessment of water impacts concluded that the EA's criteria for insignificant impact are met with a healthy safety margin.

4.3 Odour

No odorous chemicals are used or produced.

4.4 Noise

An assessment of noise impacts concluded that the there is no expectation of significant noise impacts beyond the installation.

5 Management

5.1 EMS

The installation will operate to an EMS generally in line with the principles of ISO 14001.