Non-Technical Summary

Report Ref: ITM - EP001 - 009

Submitted to:

Environment Agency

In Support of Permit Application Ref:

EPR/HP3640QD/A001 & EPR/AP3225SE/P001

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1. Non-Technical Summary

1.1 Introduction

See Report Ref: ITM-EP001-007 – Installation Information

This document is the Non-Technical Summary for the Environmental Permit application for ITM Power (Trading) Ltd, located in Sheffield, England. The National Grid Reference for the centre of the site is SK 39894 90515. ITM Power (Trading) Ltd operates a hydrogen electrolyser manufacturing facility which is located off Shepcote Lane in Sheffield. The main activity undertaken at the facility is the manufacture of hydrogen electrolysers.

The facility is required to apply for an Environmental Permit (EP) in order to ensure compliance with the Environmental Permitting (England and Wales) Regulations 2016, SI 2016/1154, as amended.

Table 1.1 below details the permittable activities at the site:

Table 1.1 – EPR Permittable Activities

EPR Schedule 1 Ref	Description	ITM Process
S4.2 A(1)(c)	Unless falling within any other Section, any manufacturing activity (other than the application of a glaze or vitreous enamel) involving the use of, or the use or recovery of, any compound of any of the following elements— (i)antimony, (ii)arsenic, (iii)beryllium, (iv)gallium, (v)indium, (vi)lead, (vii)palladium, (viii)platinum, (ix)selenium, (x)tellurium,	The process using platinum-based electroplating solution for coating metal sinters.
S4.2 A(1)(c)	As above	Production of the catalyst coated membrane (CCM) using in-house formulated precious metal-based ink powders to print onto a non-metal substrate.
S4.2 A(1)(b)	Unless falling within any other Section, any manufacturing activity which is likely to result in the release into the air of any hydrogen halide (other than the manufacture of glass or the coating, plating or surface treatment of metal) or which is likely to result in the release into the air or water of any halogen or any of the compounds mentioned in paragraph (a)(vi) (other than the treatment of water).	The hydrochloric acid chemical milling process for removal of the metal oxide layer from Titanium.

1.2 Description of the Installation

See Report Ref: ITM-EP001-007 – Installation Information
See Report Ref: ITM-EP001-004 – Site Location Plan

ITM Power operates a hydrogen electrolysers manufacturing facility. The main activity undertaken at the facility is the manufacture of hydrogen electrolysers. The facility can operate up to 24 hours per day, 7 days a week and 52 weeks per year, although the main shift patterns comprise 6am-6pm (Mon-Fri) with optional weekend working during busy periods.

Ancillary services such as refrigeration units operate 24/7.

The basic process steps involved at the installation are:

- Manufacture platinum and iridium catalyst inks
- Manufacture catalyst ink-coated membranes (CCM's)
- Etch titanium sinters
- Platinum coating of titanium sinters
- Assemble a stack of the membranes and sinters to form an electrolyser stack
- Assemble the electrolyser stacks into a container to form a complete electrolyser
- Test the complete electrolyser

1.2.1 Emissions to Air

Table 1.2 below shows the point source releases to air from the Installation.

Table 1.2 – Point Source Emissions to Air		
Emission Point Reference	**Source**	**Nature of Release**
ETA1*	Acid Etch machine	Hydrochloric acid and sulphuric acid vapour
ETA1*	Acid Rinse tanks	Sulphuric acid vapour & mist
ETA2*	Tunnel Oven	Volatile Organic Compounds (VOC's) from solvents

* *The emissions point references are shown in the report ITM-EP001-004 Site Location Plan.*

Emissions for the permittable activities (all emissions listed above) have been tested as per the request of Environment Agency Area Regulator Officer Ralph Bolton. Emissions test results can be found in report ref: ITM-EP001-010.

1.2.2 Emissions to Water

Table 1.3 below shows the point source releases to water for the Installation.

Table 1.3 – Point Source Emissions to Water			
Emission Point Reference	**Type of Release**	**Discharge Description**	**Discharges to**
SW1*	Surface water	This is yard run off from roofs, factory roads and clean yards	Yorkshire Water combined sewer
FW1*	Foul water and trade effluent	This discharge point receives 2 distinct streams: 1. Discharge of the domestic foul sewage from the Installation 2. Trade effluent from the Installation**	Yorkshire Water combined sewer

** All trade effluent discharged into the foul sewer is covered by a trade effluent consent provided in report *ITM-EP001-011 Emissions to Water Management Plan*.

* *The emissions point references are shown in the report ITM-EP001-011 Emissions to Water Management Plan.*

1.2.3 Use of Water

Water used on site is supplied from mains water supply. Water usage on site from is follows:-

- Production of catalyst inks
- Production of catalyst-coated membranes
- Stack R&D activities
- Washing of components
- Domestic and production area cleaning
- Testing and validation of electrolysers

Mains water usage for the preceding 12 months was 4683m3.

Usage will inevitably fluctuate and will be significantly affected by the number of active operating days per year for the production of the catalyst inks and catalyst coated membranes, the stack assembly and the testing area.

1.2.4 Fugitive Emissions

The installation will undertake thorough infrastructure and planned preventative maintenance programmes that will be designed to ensure there is no loss of integrity to the systems in place to prevent fugitive emissions to air, land and to controlled waters.

1.2.5 Waste (Hazardous and non-hazardous)

The production of waste and non-hazardous wastes on site means that the installation is governed by both waste and hazardous waste regulations. Both liquid and solid hazardous waste is generated on site and these waste are listed in the table below:

Details of the waste streams and the recovery/disposal routes for the defined waste streams is discussed further in Report Ref ITM-EP001-007.

1.2.6 Energy

The table below presents existing data on energy use at the installation.

Table 1.6 – Energy use at the Installation	
Energy Source	**2022/23 Annual[1] usage (kWh)**
Electricity (delivered)	4,270,281
Mains Gas	97,221

Notes:
1. Annual: 01-05-2022 to 30-04-2023

The main energy users on site are as follows:

- Testing of electrolyser products
- Hot water systems
- Manufacturing equipment
- Refrigeration systems
- Lighting
- Office/domestic

1.3 Environmental Risk Assessments

See Report Ref: ITM - EP001 - 005 – Environmental Risk Assessment

The Environmental Risk Assessment has identified those processes and activities on site that have the potential to create an environmental impact on identified environmentally sensitive receptors, under normal, abnormal, and emergency (accident) scenarios.

The environmental risks scores are considered to be high, medium or low risk using the following risk classification:

≤ 6 – Low Risk – Insignificant	No further actions needed
≥7 ≤11 – Medium Risk	Whilst risks are acceptable, it's an area that will be reviewed periodically and any opportunities to decrease the risks will be implemented where feasible.
≥12 – High Risk - Significant	Where the residual risks are found to be significant (HIGH), a more detailed assessment will be undertaken, or further controls and mitigation measures considered in order to attempt to lower the risks to a more acceptable level.

Risk Matrix	1	2	3	4	5
1					
2					
3					
4					
5					

Where the residual risks are found to be significant a more detailed assessment will be undertaken, or improvements to mitigate the risks will be recommended.

The environmental risk assessment report has demonstrated that for the operations and their potential impacts, there is a low/insignificant to medium environmental risk associated with the activities outlined within the permit application.

Therefore, no further assessments or mitigation measures are considered to be necessary for these activities/impacts. The management controls and mitigation techniques required for continued control of risks and prevention of impacts from accidents are detailed within the application documents.

1.4 Environmental Management System

See Report Ref: ITM-EP001-008 – EMS Summary

During the permit determination period site management will ensure their bespoke Environmental Management System (EMS) is implemented to ensure all site operations are covered by the EMS. The EMS will be audited at regular intervals to ensure continued compliance, implementation and effectiveness.

Copies of relevant EMS documents have been provided with this permit application.

All staff will have clearly defined roles and responsibilities. Responsibility will be designated to management representatives for ensuring site operations are carried out in accordance with the Environmental Permit, to liaise with the Environment Agency as required and liaise with the public with regard to complaints, where relevant.

1.5 Site Condition

See Report Ref: ITM - EP001 - 003 – Site Condition Report

The site condition of the land to be included within the Permit has been assessed in line with current Environment Agency guidance. Site Management confirmed that there have been no recorded pollution incidents by ITM Power, nor any use of the land which may have led to ground contamination issues.

1.6 Technical Standards

See Report Ref: ITM-EP001-012 – BAT Technical Standards

See Report Ref: ITM-EP001-014 – BAT Assessment

The Best Available Technique requirements for the operations at the installation have been detailed in the report ITM-EP001-012 and the assessment of how the Installation has met the BAT requirements is detailed in report ITM-EP001-014.

Relevant Best Available Technique requirements have been met, where applicable.