Cyfoeth Naturiol Cymru
Natural Resources Wales

Natural Resources Wales permitting decisions

Vale Europe Limited (Clydach Nickel Refinery)
decision document

Contents

Variation

The variation number is: EPR-BL4567IZ/V009

The Operator is: Vale Europe Limited

The Installation is located at: Clydach Nickel Refinery, Clydach, Swansea, SA6 5QR

We have decided to issue the variation for Clydach Nickel Refinery operated by Vale Europe Limited.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the Operator's proposals.

Key issues of the decision

Receipt of application

The Application was accepted as duly made on 30/11/2022. This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination.

The Operator indicated on the application forms that they wished for the application to be treated as confidential. However, on discussing this with them, they withdrew this request via an email to us dated 28/03/2023.

Requests for information

Whilst determining the application we decided that we needed the following pieces of information from the Operator:

- A revised assessment of all emission parameters described in Table S3.2 of the permit under the proposed reduced flow volume scenario from the W1 emission point to the River Tawe; and
- An assessment of the impact of emissions of Sodium on the River Tawe from the onsite Effluent Treatment Plant (ETP), which includes a comparison of expected discharge concentrations against background sodium concentrations in the River Tawe and takes into consideration the impact of plume effects from the emission point.

We issued a Schedule 5 Notice for Information to the Operator on 05/05/2023 and received a response, which we deemed to be satisfactory, on 17/05/2023.

We also made an informal request for further information and received a response to this, which we also deemed to be satisfactory, on 08/06/2023. This was in relation to the storage of new dosing chemicals which are to be used in the ETP and the provision of additional information in respect of the emergency waste water storage tanks.

Proposed changes

Vale Europe Ltd operates a nickel refinery producing approximately 40,000 tonnes per annum of nickel pellets, powders and coated products using the ‘nickel carbonyl’

process. This variation involves the adaptation of existing site infrastructure to reduce the amount of water needed for plant cooling purposes. A new closed-loop system will be installed allowing waste water from the on-site ETP to be re-circulated into the cooling water circuit for re-use. This will result in a net reduction of around 80% in the flow of treated effluent from the ETP into the River Tawe via the W1 emission point. Despite this, as the ETP receives rain water from the site's external rain water drainage system, the Operator has requested that, with the exception of the emission limit value (ELV) for temperature, ELVs set in the permit remain the same to allow for times of higher discharge volumes during periods of heavy rainfall.

The changes involve the use of new dosing chemicals in the ETP; namely, sodium hydroxide, sulphuric acid, sulphur dioxide and nickel sulphate. Sodium hydroxide, sulphuric acid and sulphur dioxide are used in liquid form and are stored in specified locations in bunded tanks. Nickel sulphate is a solid and is stored on hard standing in the warehouse. The ETP has two emergency waste water storage tanks which are able to retain and store raw effluent in the event of an emergency.

Once the new system is commissioned the Operator will apply to discontinue the abstraction permissions from the River Tawe and Swansea Canal. This does not form part of this application and is outside the scope of the Environmental Permitting (England and Wales) Regulations 2016 (EPR). It will be subject to separate requests for approval at a later stage under a different licensing regime.

Consultation

There was no requirement to carry out a consultation as part of this normal variation. The decision was taken in accordance with RGN 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.

Operator

We are satisfied that the Operator is the person who will have control over the operation of the facility after the issue of the variation. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator.

Legislation

The variation will be issued under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an installation as described by the Industrial Emissions Directive (IED); and
- subject to aspects of the Well-Being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016 which also have to be addressed.

NRW is satisfied that this decision is compatible with its general purpose of pursuing the sustainable management of natural resources in relation to Wales and applying the principles of sustainable management of natural resources.

All applicable European directives have been considered in the determination of the application.

Environment Management System

The Operator has stated in the application that following the variation they will have in place an Environmental Management System (EMS) that will meet the requirements for an EMS in our guidance "*How to comply with your environmental permit guidance*". The Operator submitted a summary of the EMS with their application which we consider satisfactory.

There is no known reason to consider that the Operator will not have the management systems to enable it to comply with the permit conditions following this permit variation. The decision was taken in accordance with RGN 5 on Operator Competence.

The site

The new waste water re-circulation infrastructure will utilise the existing site ETP to discharge waste water to the River Tawe via the existing emission point W1 and no changes to the installation boundary are proposed. Therefore no change to the existing site plan is needed.

Biodiversity, Heritage, Landscape and Nature Conservation

The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitats, namely the Crymlyn Bog

Special Area of Conservation (SAC) and Ramsar and the Glais Moraine Site of Special Scientific Interest (SSSI).

In respect of the Crymlyn Bog SAC, Habitats Regulations Assessment (HRA) is not required because there is no conceivable impact pathway to this site by virtue of the scale or location or nature of the project.

In respect of the Glais Moraine SSSI, this site is designated for geological features only, and therefore we consider that the proposal is not likely to damage the features of this site.

Environmental Risk Assessment

Noise, Odour and Fugitive Emissions

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent, or where not practicable, to minimise the effects of noise, odour and fugitive emissions.

Water

The changes involve a net reduction of flow of around 80% to the River Tawe from the on-site ETP. The changes will result in a slight increase in the temperature of the effluent released at W1, but, in the context of the significantly reduced flow volume, we consider this to be a net benefit to the River. The changes will also involve the use of new chemicals that will result in the release of sulphate and sodium in the treated ETP discharge for the first time. We have risk-assessed these changes and summaries of our assessments are described below. Apart from the temperature parameter, the Operator has not requested any changes to existing pollutant parameters contained in Table 3.2 of the permit.

During the determination of the application, we asked the Operator to carry out an assessment of all pollutants currently emitted from the W1 emission point using the EA guidance Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk), which NRW follows. The Operator provided a comparison of

the ‘before’ and ‘after’ (reduced flow) emission scenarios. After applying the four tests described in the guidance on the ‘after’ scenario (reduced flow), the Predicted Environmental Concentrations (PEC) of Cadmium and Mercury in the Tawe failed Test 4b. All other PECs passed Test 4b. However, given that the Predicted Concentrations of all pollutants, including Cadmium and Mercury, will decrease significantly under the reduced flow scenario, we consider that this shows a clear reduction in impact and do not require the Operator to carry out detailed modelling of Cadmium and Mercury.

Temperature

Prior to this variation application, the permit allowed the temperature of the discharge at W1 to be no greater than 20ºC higher than the temperature of water abstracted from the Swansea Canal in any given month. The changes proposed by the Operator will result in an average increase of 2ºC in the temperature of the W1 discharge. The Operator has completed detailed modelling of the discharge plume and concluded that it will extend a maximum of 1.25m from the discharge point and will not reach the opposite bank of the River. The modelling report concludes that the impact on the Tawe will be negligible, and, in the context of the significant overall reduction in average flow, we agree with this conclusion.

We have set new ELVs for temperature and these are described in detail below (see ‘The permit conditions’ below). We have set these limits based on NRW’s own analysis of the temperature of the water in the River Tawe, taken on a monthly basis during the years 2021 and 2022 at two monitoring sites located approximately 1000m and 10m upstream and downstream of the W1 outfall.

Sulphate

The Operator supplied an assessment of the impact of the new emission of sulphate which followed the assessment methods set out in the Environment Agency’s (EA) guidance Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk), which NRW follows. The maximum theoretical concentration of Sulphate was tested against the screening test methodology outlined in the EA guidance which concluded that sulphate emissions screened out as insignificant.

Sodium

We asked the Operator to conduct an assessment of the impact of sodium emissions on the River Tawe. In the absence of a Maximum Allowable Concentration and annual average Environmental Quality Standard (EQS) for sodium, the Operator compared the worse-case scenario concentration of sodium content in the W1 effluent with the EQS for potable (tap) water (200mg/litre). This concluded that the risk from sodium emissions to the River Tawe is negligible and there was no requirement for detailed modelling. We agree with these conclusions and consider that the risk from the new, lower concentrations of currently permitted pollutants, and the new emission of sodium, is negligible.

Water Framework Directive Compliance Assessment

A full Water Framework Directive (WFD) Compliance Assessment has been completed. The conclusions of this assessment are summarised below. The stretch of the River Tawe at Clydach is currently at WFD 'moderate' status, due to elevated concentrations of nickel. During the determination, we consulted with NRW's Environment Teams on this. They informed us that elevated nickel concentrations have been attributed, in part, via an NRW investigation, to this site's W1 emission point. The Operator's assessment of the relative change in the PC for nickel has shown that nickel concentrations in the river will reduce as a result of this project. We therefore consider that the project represents no risk of causing deterioration of the 'moderate' status of the River Tawe and is in line with the requirements of the WFD.

Further, emissions to the River Tawe made via W1 will be controlled by the permit ELVs, and permit conditions, which control handling, treatment and release of site effluent. These limits and conditions were assessed as part of the original permit application, subsequent permit variation applications and the comprehensive review of the permit undertaken in 2017 to bring it in line with the requirements of the Non-Ferrous Metals Industries BREF, published in 2016. The conditions, ELVs and monitoring requirements set out in the permit therefore represent Best Available Techniques (BAT) for these activities, and BAT is defined as Best Practice under the Environmental Permitting (England and Wales) Regulations 2016. In addition, under the 'after' scenario, the PEC for nickel passes all four H1 tests. We therefore consider that these measures will have no adverse effect on the WFD status of the River Tawe.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent pollution surface water.

The permit conditions

Incorporating the application

We have specified that the Operator must operate the permit in accordance with descriptions in the application.

These descriptions are specified in the Operating Techniques table in the permit.

We have set new Emission Limit Values (ELV) for temperature for the W1 discharge point as follows:

Limit (incl. unit): 25(ºC) above adjacent temperature of the River Tawe, to be monitored continuously.

Improvement conditions

Based on the information on the application, we consider that we need to impose improvement conditions. These are as follows.

IC12 The Operator shall agree in writing with Natural Resources Wales the location of the River Tawe temperature monitoring point. Within three months of 27/09/2023.

IC13 The Operator shall install and commission a temperature monitoring device at the location agreed upon in IC12. Within six months of the date of completion of IC12.

OPRA

The OPRA score at permit issue remains unchanged at 225.