

Technical Note

Project: Coed Darcy

Subject: North Site Reservoir Baseline Ground Conditions Summary

Client:	St. Modwen	Version:	B
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I Introduction

I.1 Overview

North Site Reservoir (NSR) is located in the northern area of the former BP Llandarcy Oil Refinery, with its primary purpose to provide a source of fire fighting water during the operational years of the refinery.

The NSR is regulated by the Reservoir Act (1975) and a formal programme of discontinuance has been commenced in consultation with Natural Resources Wales (NRW).

I.2 Proposals

Following completion of drawdown works, it is proposed to re-form the existing shallow valley and reinstate a central stream, which will flow into a reduced waterbody at the western end of the valley. The waterbody will be designed such that its capacity remains permanently below that of a designated reservoir. The existing earth dam, located at the western end of the NSR will be removed and re-formed, and soils retained within the footprint of the NSR.

In addition, inputs from the former refinery drainage will ultimately be severed. The outflow from the reconfigured landform will be via an existing culvert which flows through the adjacent railway embankments, via the Tal-y-wedu outfall and into Crymlyn Bog, once the necessary approvals are in place.

I.3 Purpose of Technical Note

This technical note has been prepared on behalf of St. Modwen to support the Environmental Impact Assessment (EIA) screening process and provides an overview of existing soil and water quality data associated with the NSR, providing a baseline from which comparisons can be made with data collected as part of future development works. It also outlines the documents to be prepared and submitted as part of a future planning application.

2 Summary of Existing Data

2.1 Basal Sediments

2.1.1 Previous Investigation, Remediation and Validation Works (2009 – 2012)

Celtic Technologies Ltd (Celtic) carried out investigation works in October 2009 on behalf of St. Modwen to assess the composition of sediment and sludge at the base of the NSR. Environmental samples from 48 locations were scheduled for laboratory analysis, with the results recording total petroleum hydrocarbon (TPH) concentrations ranging from 20,000mg/kg to 92,000mg/kg. It was estimated by Celtic that there was approximately 45,000m³ of sediment and sludge at the base of the NSR.

Celtic also carried out remedial works in East Bay between 2010 and 2011 on behalf of St. Modwen. East Bay was dewatered and TPH-impacted materials excavated and removed. Following the removal of TPH impacted materials, 41 environmental samples were collected and scheduled for laboratory analysis. Laboratory analytical data showed there were no exceedances of the adopted human health assessment criteria for a recreational end use for materials present at the surface.

Hydrock undertook sludge removal works between June 2011 and December 2012 on behalf of St. Modwen. Approximately 62,000m³ of hydrocarbon-impacted sludge was removed via dredging, and 950 litres of free phase hydrocarbons were recovered from the base of the NSR.

On completion of dredging and removal of free-phase hydrocarbons, Atkins carried out a visual and olfactory assessment of 315 samples recovered from the base of the NSR, using criteria set out in the Section 106 Agreement, where 0 is defined as 'no staining and no odour', and 5 as 'visible product and an overwhelming odour'. A total of 279 samples were considered to represent a 'pass', scoring 2 or better, 18 samples scored 3 and a further 18 recorded a score of 4 or greater. Samples assigned a 3 or 4 were recorded as a 'fail' and the relevant locations were re-dredged, with the exception of a small number of locations where obstructions were present which prevented completion of dredging. Limited laboratory analysis was undertaken because the NSR was to remain a waterbody at the time.

2.1.2 Recent Investigation Works (2022)

PJA carried out a limited sampling exercise in May and June 2022 on behalf of St. Modwen in accessible areas of the NSR following partial drawdown. The aim of the sampling exercise was to assess the chemical quality of the sediments and to understand the impact exposure to oxygen had on contaminant concentrations. A total of 40 samples underwent laboratory analysis for a broad range of determinands appropriate for the former operational oil refinery.

Laboratory results were screened against available Suitable For Use Levels (S4ULs) and Category 4 Screening Levels (C4SLs) for a public open space end use. Limited, marginal exceedances of the S4UL were recorded for arsenic and dibenzo(a,h)anthracene. Of the 40 samples analysed, 18 marginal exceedances were recorded of the respective S4UL for aliphatic and aromatic TPH fractions. Asbestos fibres were recorded in ten samples and quantified in three of the samples at a concentration of <0.001%.

Further sampling will be carried out on the base of the NSR once safe access is possible to establish the chemical quality of sediments not previously sampled.

2.2 Surface Water Quality

Surface water sampling is undertaken by PJA on behalf of St. Modwen of various discharges to the NSR (including a series of inlets containing surface runoff from the adjacent M4 motorway), surface water within the footprint of the NSR and of the current surface water discharge from the wider site.

The current available dataset indicates concentrations of inorganic nitrogen, total and dissolved metals, PAH, and TPH which may require mitigation prior to eventual discharge into Crymlyn Bog. However, it should be noted that the initial assessment above does not take into account the effect of attenuation of contaminant concentrations which would be anticipated along the approximately 1km distance to Crymlyn Bog. It should also be noted that some of the elevated sources originate off-site and are not associated with the former refinery. Where required, SuDS features will be included as the re-design of the valley to promote natural attenuation and reduce contaminant concentrations before discharge to Crymlyn Bog.

Surface water sampling is ongoing to enable any trends in contaminant concentrations to be identified, and to inform the design of measures that may be required to improve water quality.

3 Pre-Application Advice

Pre-application advice from Neath Port Talbot (NPT) Council on 8th July 2022 provided the following recommendations on ground conditions:

“The site is designated as a Minerals Safeguarding Area in the Adopted NPT LDP, therefore consideration needs to be given in any formal planning application to demonstrate that the proposals are compatible, having regard to Policy M1 criteria.

Having regard to the nature of ground conditions and past activities on the site and adjacent land, a minimum desk-top contamination assessment report must be submitted with any formal application for the proposals, and include specific proposals for the management of known or

potential contamination risk(s), including remediation of any material that is proposed to be translocated within the site, as described.”

4 Planning System Proposals

In accordance with the pre-application advice received from NPT Council, a Phase 1 Geo-environmental Desk Study will be completed and submitted with the planning application. The desk study will also provide consideration of the proposals in relation to potential loss or sterilisation of the Minerals Safeguarding Area using a qualitative approach.

In addition we would propose to provide the following information with the planning application:

- An assessment of the chemical quality of soils within the footprint of the NSR in the context of the proposed end use;
- An assessment of the chemical quality of soils in the NSR earth dam in the context of the proposed end use;
- Dependent on the chemical quality of soils, proposals for the management of potentially unacceptable contaminant concentrations taking into account the proposed end use together with an associated validation plan;
- An assessment of the chemical quality of surface water inflows to the NSR and of surface water within the footprint of the NSR in the context of the intended future discharge to Crymlyn Bog;
- Dependent on the chemical quality of surface water, details of the proposed SuDS treatment train and any additional mitigation measures considered necessary to ensure no unacceptable risks to Crymlyn Bog, together with proposals for ongoing water quality monitoring.

Validation reporting will be carried out on completion of any necessary remediation.

5 Conclusion

It is considered that a suitable and robust framework exists under the planning process to ensure that appropriate ground conditions assessments are undertaken and the necessary mitigation implemented, as required. On this basis it is not considered necessary to undertake EIA for ground conditions.