

Compliance Assessment Report CAR_NRW0041970

Permit being assessed: AP3990LR.

For: St Modwen Developments Ltd, held by St Modwen Developments Limited

At: Llancoed House, Llandarcy, N P T, SA10 6HJ.

Type of assessment carried out: Report/Data Review, Reason: Routine.

On 13/06/2023.

Parts of permit assessed: Closure & Aftercare Plan Review

NRW Lead Officer: Sally Wakeford.

Report sent to: Peter Britland, Commercial Manager on 13/06/2023.

1. Summary of our findings (full details in section 4)

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
C2 - General Management - Management system and operating procedures	Action only (X)	

Result types are explained in more detail in the 'Important Information' section below.

Total number of non-compliances recorded	Total non-compliance score
0	0

How we use the non-compliance score to calculate your annual fee is explained in the 'Important Information' section below.

2. What action is required?

Criteria	Action needed	Complete by
C2	Provide timescale for completion of updated IP1 and IP2 reports	30/06/2023

Action criteria codes are listed in the 'Important information' section below.

3. What will happen next?

Any non-compliance we have identified and recorded on this form is an offence. It can result in criminal prosecution and/or suspension or revocation of your permit.

At this time, we do not intend to take any further action.

This statement does not stop us from taking additional enforcement action if further relevant information comes to light or offences continue.

4. Details of our assessment

This Compliance Assessment Report is compiled from comments made by a number of NRW Officers on the Closure and Aftercare Plan and Stability, Gas and Hydrogeological Risk Assessments submitted to NRW on 05 April 2023 for permit condition 2.4.1 and

Improvement conditions IP1 and IP2.

Hydrogeology Comments:

1. Although the site has benefitted from an environmental permit since 1977, we would remind you that as the landowner there are still liabilities for the pre-permit and permitted activities; you may wish to consider and re-establish the risk drivers for this work (to manage permitted material post 1977) and what you need to achieve.
 - a. Section 1.3 of the main IP report states *"This therefore relates to the condition of the facility pre-1977, which available lines of evidence would strongly indicate was worse than it is now in light of the remediation works since 2008. It is therefore understood that the surrender of the permit if not the same as satisfying all contaminated land requirements and does not allow the redevelopment of the Tip for public open space. This is the rationale for the separate Restoration Implementation Plan to be approved via Planning"*.
2. 'Betterment' of condition – NRW need an understanding of baseline conditions, apportionment of waste for management (pre-permit vs permit) and reasonable performance metrics / objectives to define 'betterment'
 - a. e.g., If you think 90% of the contamination came before 1977 and only 10% is the responsibility under the permit, NRW need to be provided evidence for this.
 - b. It would be useful to be provided with some cross sections of the landfill showing expected capacity, waste volumes etc.
3. **Reminder of risk drivers;** 1) permitted waste and 2) pre-permit waste which as the landowner you are liable for. The presence of this residual contamination is resulting in a pollution incident and this needs to be addressed outside, but alongside, the permitted waste. The Groundwater Regulations and Prevent & Limit still applies for the pre-permitted waste.
4. NRW need to be provided with more information to be able to understand the **pumping regime** and any anthropogenic influences on conditions. Is the site considered to be, in its current condition, at steady state conditions? The data presented in the 2020 – 2022 period, supported by the narrative, suggest that pumping activities are still on-going and are influencing groundwater elevations. This is a fundamental consideration within the conceptual understanding of the Site and the subsequent assessment of contaminant fate and transport and risk to receptors. Considerations such as *is it ongoing, where is it occurring, when is it due to cease?* This has profound impacts on the hydrogeological regime (as evident by the latest graph of groundwater elevation). NRW need to be provided with information on steady state conditions if they exist.
5. NRW need to be provided with a better understanding of the surface water and groundwater interactions / continuity, and shallow and deeper groundwater interactions & continuity. With regard to the latter, the report indicates that the deeper groundwater is not anticipated to be in direct continuity with the shallow groundwater, however the Atkins report suggests there is likely to be some hydraulic interaction between the two water bodies.
6. **Extended Conceptual Model:** Catchment modelling is beneficial to understand the wider water balance and the expected flows to and from the Site, but the dynamics at the Site are unique due to the history of the site and the nature of the material and are likely to be much more heterogenous than the surrounding catchment. As such please provide evidence on the relevance of the wider conditions to a site specific

model.

7. **NAPL assessment** there needs to be detailed assessment of this. There are limited to references to NAPL throughout the report, even though it is evident that is still observed at the Site in a number of wells. In order to effectively undertake a Controlled Waters Risk assessment at a site with residual NAPL, it is fundamental that this is assessed and presented. Although no information has been provided on where and when NAPL has been observed in the well network, Table 3 identified nine wells which have recorded concentrations of five CoC above their solubility limits, which is indicative of NAPL presence. What was the predicted mass starting out, and therefore what estimated % has been recovered, i.e. what does the 1.8m litres recovered mean in the context of the Site, has 5% been recovered of 95%? What has rebound assessment shown? What is the estimated remaining volume of NAPL and how quickly is this migrating (estimates using volumes recovered from trenches etc). which wells has this been found in at what thickness? Have any wells reached asymptotic recovery? What is the transmissivity calculated to be?
8. This has been mentioned before but to reiterate, the previous Atkins 2013 Hydrogeological Risk Assessment was **not** accepted by NRW; therefore, you should be filling the gaps and uncertainties with site specific data and building on the conceptual understanding.
9. **Choice of modelling tool** – Given the complexities of the subsurface and the large variability in data, we question whether the Remedial Targets Methodology is the most appropriate tool for the assessment of risk at the Site. Have other modelling tools been considered to enable a more representative assessment? We request clarification over whether the current model is looking at both landfill and bog sediments, i.e., is the source within the landfill, but the receptor 10-50m into the bog materials? If so, how is the vast different in nature of the materials accounted for?
10. **Data presentation** – There is an absence of trend analysis graphs for contaminant concentrations over time to allow an assessment of temporal trends to be undertaken. Whilst contour plots provide a snapshot of information for that time period, they are difficult to make comparisons between (especially with varying sample points between figures) and the temporal aspect is lost.

Permit

Under the Permit, until a steady state of all the potential contaminants on site can be demonstrated then, the site still will require permitting and management to get to the required steady state. It cannot be demonstrated to be at this point due to the fact that not all contaminants of concern have been included in the Annual monitoring - it was noted in the 2013 EAW response to the submitted HRA that:

- “The sampling suite should be suitable for the contamination of concern present in the waste mass, but should also include general landfill determinants, e.g. ammoniacal nitrogen and chloride.
- Vanadium was deposited in areas of the landfill and subsequently should be sampled and analysed. A suite of metals, total and dissolved, should also be included in the sampling suite”

Solvents and PFAS compounds should already have been included in the list of contaminants to sample for but it is only now suggested as part of the understanding of data gaps– it is suggested that there should be further monitoring for PFAS and solvents in

another new set of groundwater investigations and then the HRA should / could be amended. If this is the case then we are of the understanding you have **not adequately characterised the site and the HRA is incomplete for contaminants of concern**. It is also noted that dioxins should be considered with the other contaminants and that PFAS compounds is a broad term and needs more definition as to what PFAS compounds are likely to have been on site and deposited in the waste mass.

We are aware that no comment has been made on the monitoring data in recent years, namely that from Phil Jones Associates Ltd (PJA) from 2018 to present however no comment received from NRW is not an acceptance of these reports. There are three periods of monitoring which have been undertaken:

- i. URS from 1999 to 2005,
- ii. Atkins Ltd (Atkins) from 2008 – 2013, and
- iii. Phil Jones Associates Ltd (PJA) from 2018 to present

Comments specific to Contaminated Land

Crymlyn Tip Coed Darcy Improvement Programme Requirements: IP1 Assessments & IP2 Closure and Aftercare Management Plan St Modwen Developments Ltd

R1870/22/5246 – Draft April 2023 contains in Appendix E – 2022 Factual Site Investigation Report

1. In Section 3.2 of the 2022 report, it states that 11 groundwater monitoring boreholes were constructed to investigate ground conditions of the periphery of the site - in order to update the HRA. No HRA that has been agreed (see NRW correspondence from 2013) - the information supplied must inform a HRA for approval by NRW. Soil samples were only taken from EN BH 4 & 5, which is the northern periphery and the previous statement should have been more specific about the coverage of the perimeter being limited for groundwater and soils to the north only.
2. It is also stated that the boreholes were surveyed in and that levels and presence of NAPL have been recorded - there has been no other monitoring of the 11 boreholes other than ENBH 4 & 5 for contaminants and seems contrast to the objectives of the report and there is no sampling for groundwater quality included in the report.
3. Has this or will this groundwater level data be provided in the Annual Monitoring for 2022 to be able to show trends and cross sections? Given the considerable drought conditions in summer 2022 and any onsite pumping, well development needs to be recorded.
4. In Appendix C (chemical testing) we note that that PFAS compounds have not been sampled for in the soils, only in one stockpile and that this is not comprehensive enough to understand the spread of PFAS compounds on site and it needs further assessment before material can be considered for reuse on the site as it is Priority Hazardous Substance.
5. The lack of information does not help to understand, what the current water quality is, for those missing contaminants and soils. Although this is mentioned in the future work on site as part of a gap analysis - this information is required as part of the work to agree on a HRA and then inform which contaminants require a risk-based approach. There is no offsite sampling to understand how far off site is being impacted.
6. It would be helpful to have a cross section of all the new and old boreholes so that it

is clear where the contamination and groundwater head lie within the waste mass and in comparison, to outside of the waste, both up and down gradient.

7. This feeds into the comments on the annual monitoring – NRW have no record of the 2022 Annual Monitoring Report being submitted. Please submit the 2022 annual monitoring as soon as possible.
8. In section 4.3.7 Peripheral Trench completion report, in Appendix G - a summary visual report shows significant staining in some areas, though no sampling appears to have been undertaken.
9. There has been no quantification of the potential oil mass that could have been on site - if 1.8 million litres of oil were removed, has it been estimated how much more could be left on site?
10. In section 4.3.9 2011 – 2022 On-going Oil Recovery. It is unclear how long the groundwater requires to recover from any oil recovery work undertaken across the site. Given the graphs plotted, there is still a high degree of variability across the site and seasons.

It is noted in the Hydrock Technical Notes of Hydrock Lower Tip Works 2014/2015- dated 12/04/22 that the excavation could not go as deep as planned as there was groundwater seeping into the site and the stability of the ash bund was at risk - “Similarly, the ash bund material on the northern boundary of the site could not be excavated due to rapid water ingress during excavation” Waste was determined to have been deeper than 6.5mbgl – Please provide information on how this equates to the base of the bund, the perimeter of the bog and hydraulic connectivity.

Stability Risk Assessment for the proposed restoration design

Crymlyn Tip Coed Darcy Stability Assessment. St Modwen Developments Ltd R1870/23/5287 – Rev 0B March 2023

The recent 2022 Ground Investigation provided new information on the Ash Bund material’s engineering characteristics, which was the area modelled in the SRA due to it having the steepest slopes of the tip.

Long-term settlement is predicted in areas where the regraded profile has increased thickness and hence increased loading of the underlying compressible strata. Settlements up to 0.6m is predicted – this is quite high and likely to render the area unsuitable for most structures - is this an issue for its future use?

Comments:

1. The slope stability analyses carried out concludes the tip slopes will be stable after the proposed reprofiling of the tip. However, the models for the stability analyses have not included the proposed cut-off wall that will be formed in the Ash Bund or considered the scenario of a raised groundwater level that may be caused by the partly confining effect of the cut-off wall. The analyses need to be repeated for these potential destabilising effects unless it can be demonstrated they can be screened out.

Proposed restoration design and CQA Plan comments

Exec summary: Para 10 states ‘There is no recommendation for impermeable liners or

drainage layers'. The change from the initial design for an impermeable cap is explained as due to landfill gas concerns. Does the gas permeability of the reprofiling/restoration soils therefore need to be specified to avoid low gas permeability clay soils? If an impermeable capping liner is desirable, could gas emissions be controlled in other ways as with other landfill sites?

Exec summary: Para 10: A significant amount of material will be imported to carry out the initial tip profile regrading (33,780 m³ of net fill). It is not explained why this material is being imported.

Comments:

1. The type of cut-off wall and the proposed technique in forming it is not stated and should be included in the CQA Plan. Due to the proximity of the adjacent Crymlyn Bog to it would be advisable to have full details submitted of the proposed technique and corresponding construction method statements to evaluate if the pollution mitigation measures are acceptable.
2. Exec summary: Para 7 states: 'the 2022 GI assessed the quality and quantity of historically treated soil stockpiles to determine suitability for re-use as re-profiling, capping and restoration materials'. This relates to the chemical composition only. The geotechnical properties are to be determined once all the material sources (particularly the restoration soils) have been identified. The CQA Plan cannot be approved until the engineering specification for all the soils is complete.
3. There is no surface water management plan for the proposed reprofiled tip. A perimeter drain, for example, may be required to control surface water drainage from the new slopes.

Other comments

1. Aftercare: A 24-month aftercare monitoring period is proposed. For the settlement aspect it would be advisable to have it written as 'a *minimum* 24 months'. Reason: settlement is likely to be long-term due to the presence of peat layers below the tip and it may be beneficial to continue the annual topographic surveys.

Landfill Gas Assessment

Englobe report R1870/23/5284 Landfill Gas Assessment.

This IP1 Gas Assessment provides an initial assessment of the current gas regime based upon historical data and additional data collected by Englobe and GGS.

The current monitoring network is comprised of 4 No. perimeter and offsite locations and 8 No. in-waste locations. The current monitoring network is heavily weighted towards the site's central and eastern areas, and large areas of both the site area itself and the site perimeter contain no routinely monitored locations at all.

Furthermore, a section of the last Annual Report details that due to the age of the boreholes, a number of headworks are damaged, and the boreholes therefore cannot be monitored for gas. This is to be addressed by the proposals contained in section 2.6 and Table 1, and in Addendum A of report.

We agree that further scrutiny and careful monitoring of borehole flow rates from a *fit-for-purpose monitoring network is required*, and will be critical to justifying an acceptable argument in support of permit surrender once an appropriate period of data collection has been executed (section 2.1 of report)

Site drawings and figures are contained in Addendum A.

Whilst we broadly agree with proposals contained in Section 3 Conclusions and Recommendations of report, the focus at this stage needs to be on developing the new monitoring infrastructure that needs to be installed, along with the capping. Placement of an engineered cap can influence ground gas regime and movement e.g. increase the potential for lateral migration. This therefore needs to be considered in the design, along with a suitable period of monitoring during the aftercare phase.

Outside of Permit considerations

1. Besides the permit requirements you need to meet the “prevent and limit” criteria of the Groundwater Regs. There are requirements of the Habitat Regulations, and the need to ensure that the site does not meet the definition of Contaminated Land.
2. The Llandarcy site was bought by St Modwen’s, with prior knowledge of the land use, the landfill permit, its potential contamination and offsite impacts.
3. Apportionment between the 1977 permit and the pre 1977 waste deposit is outstanding. In the IP1 and 1P2 report, in the summary it is stated “Due to the age of the facility, it is impossible to determine its pre-permit condition and establish a definitive baseline for surrender, but substantive available sources of evidence would indicate that the site and the adjacent receptors were demonstrably in a worse condition pre-1977 than is the case in 2023.” **Please provide these substantial sources of the condition of the site in 1977.**
4. The site was bought with knowledge and St Modwen’s are the responsible party to deal with any land and groundwater impacted by past activities on the site under the Contaminated Land Regulations and the Groundwater Regulations – so although delineation of impact within the lifetime of the permit is difficult, these other regulations are open to NRW to use to ensure that this site no longer poses a risk to the environment or controlled waters. There has been no acknowledgement that St Modwen’s will deal with the issues besides the permit requirements, and we welcome a plan on how to deal with these in conjunction and concurrently with the permit requirements.
5. 2006 Rap works within the S106 are a Planning Obligation deed associated with when the site was to be left as park land. Some of the objectives duplicate the permit requirement and some have been superseded.

Summary:

NRW do not accept the Closure and Aftercare Plan in its current form.

At the present time, steady state cannot be demonstrated on site due to the fact that not all contaminants of concern have been included in the Annual Monitoring, and pumping regime is influencing groundwater elevations.

NRW need an understanding of baseline conditions, apportionment of waste for management (pre-permit vs permit) and reasonable performance metrics / objectives to

define 'betterment'.

Whilst Crymlyn Tip does not need to comply with the requirements of the Landfill Directive having ceased accepting waste prior to the Landfill Directive coming into legislation, the site still has to satisfy the requirements of the Groundwater Regulations and Prevent & Limit, both permitted and pre-permitted wastes.

NAPL assessment required.

The site has not been adequately characterised and the Hydrogeological Risk Assessment is incomplete for contaminants of concern.

Although mentioned in the future work on site as part of a gap analysis – information on the current groundwater quality is required as part of the work to agree on a HRA and then inform which contaminants require a risk-based approach.

Please submit the 2022 annual monitoring as soon as possible

Following the Landfill Gas Assessment there has been a fundamental change in the proposed restoration design from an engineered impermeable cap to more permeable media. There has not been an analysis of how this may affect contaminants leaving the tip area.

Slope stability analyses concludes the tip slopes will be stable after the proposed reprofiling of the tip. However, the models for the stability analyses have not included the cut-off wall that will formed in the Ash Bund or the scenario of a raised groundwater level by the partly confining effect of the cut-off wall. The analyses need to be repeated for these potential destabilising effects unless it can be demonstrated they can be screened out.

The CQA Plan cannot be approved until the engineering specification for all the reprofiling and restoration soils is complete.

The focus at this stage needs to be on developing the new gas monitoring infrastructure that needs to be installed, along with the capping. Capping needs to be considered in the design, along with a suitable period of monitoring during the aftercare phase.

The aftercare monitoring referred to in the Executive Summary and Section 10 infers that on agreeing the IP2 Plan and after 24 months of monitoring the permit may be ready for surrender. This is the minimum period detailed in the 5.02 surrender guidance, and after that period the operator would need to assess the data against all relevant criteria before considering making a Surrender application, along with a surrender report.

Surrender and aftercare terms are used somewhat interchangeably in the documents. From the 5.02 guidance glossary, a Closure and Aftercare plan is 'a document that sets out how you will close your site and manage it in the aftercare phase.'

Surrender of a permit cannot be pre-determined.

END

If you have any queries about this report, or to discuss completion of any actions, please contact the NRW Officer named above.

Important information

Legal status of this report

Your permit is issued to you under the Environmental Permitting Regulations. You have a responsibility to comply with the conditions of your permit and prevent pollution/harm of the environment. You must also ensure that you comply with any other relevant legislation that may apply to your site's operations.

This report explains the findings of our assessment and any action you are required to take. We categorise non-compliance using our guidance for assessing non-compliance at regulated sites.

When we find potential non-compliance/s we will normally give you advice on how to maintain compliance.

To correct non-compliance, we may:

- require you to take specific actions
- issue a notice
- review the conditions of your permit.

Any advice and guidance we give will be without prejudice to any other enforcement response that we consider may be required.

Assessment results and non-compliance categories (used in section 1):

Assessment result	Description
Assessed (A)	Assessed or assessed in part, no evidence of non-compliance found
Action only (X)	Action only relating to the activity assessment
Ongoing (O)	Ongoing non-compliance, not scored

Non-compliance category	Description	Score
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	60
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property	31
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property	4
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property	0.1

How we use assessment scores

The number and severity of non-compliances recorded in a year will affect your annual subsistence fee the following year. A non-compliance factor is added to your site's Operator

Performance Risk Appraisal (OPRA) score when we calculate your fee to reflect the additional resource we use to assess permit compliance.

What are suspended scores?

In line with our guidance, we may suspend scores for up to six months to allow time for remedial action to be taken. Suspended scores will be re-instated if the action is not completed.

Full list of Industry and Waste action criteria (used in section 1 and 2):**A: Permitted activities**

- A1 Specified by permit

B: Infrastructure

- B1 Infrastructure – Engineering for prevention and control of emissions
- B2 Infrastructure – Closure and decommissioning
- B3 Infrastructure – Site drainage engineering (clean and foul)
- B4 Infrastructure – Containment of stored materials
- B5 Infrastructure – Plant and equipment

C: General management

- C1 General management – Staff competency/training
- C2 General management – Management system and operating procedures
- C3 General management – Materials acceptance
- C4 General management – Storage, handling, labelling and segregation

D: Incident management

- D1 Incident management – Site security
- D2 Incident management – Accidents, emergency and incident planning

E: Emissions

- E1 Emissions – Air
- E2 Emissions – Land and groundwater
- E3 Emissions – Surface water
- E4 Emissions – Sewer
- E5 Emissions – Waste

F: Amenity

- F1 Amenity – Odour
- F2 Amenity – Noise
- F3 Amenity – Dust/fibres/particulates and litter
- F4 Amenity – Pests/birds and scavengers
- F5 Amenity – Deposits on road

G: Monitoring and records, maintenance and reporting

- G1 Monitoring and records, maintenance and reporting – Monitoring of emissions and environment
- G2 Monitoring and records, maintenance and reporting – Records of activity, site diary/journal/events
- G3 Monitoring and records, maintenance and reporting – Maintenance records
- G4 Monitoring and records, maintenance and reporting – Reporting and notification to Natural Resources Wales

H: Resources efficiency

- H1 Resource efficiency – Efficient use of raw materials
- H2 Resource efficiency – Energy efficiency

Enforcement response

Any permit condition non-compliance is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice

You should make sure that anyone named in this report knows that the information it contains will be processed by Natural Resources Wales to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s).

We may also use and/or disclose the report in connection with:

- offering or providing you with our literature or services relating to environmental matters
- consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- carrying out statistical analysis, research and development on environmental issues
- providing public register information to enquirers
- investigating possible breaches of environmental law
- assessing customer service satisfaction and improving our service
- Freedom of Information Act or Environmental Information Regulations requests.

We may also pass it on to our agents or representatives to do these things on our behalf.

Disclosure of information – this report will be available to view on-line

If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?

If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

If you are unable to resolve the issue with the lead officer or their line manager you should contact our Customer Contact team on 0300 065 3000 (Monday to Friday 08:00 – 18:00), or email enquiries@naturalresourceswales.gov.uk for details of how to raise your dispute further through our Complaints and Commendations procedure.

If you are dissatisfied with our response, you can contact the Public Services Ombudsman for Wales by phone on 0300 7900203 or by email at ask@ombudsman.wales

Welsh Language Standards

We are committed to establishing Natural Resources Wales as a naturally bilingual organisation. We will provide compliance reports in your preferred language.