

Application SCR evaluation template

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|---------------------------------------|---|
| Name of activity, address and NGR | <p>Dow Chemical Company Limited</p> <p>Dow Birch Vale Station Road Birch Vale High Peak Derbyshire SK22 1BR</p> <p>NGR: 402190, 386980</p> |
| Document reference of application SCR | <p><u>NPS 07/12/2020</u></p> <p>Documents submitted in original permit application:</p> <ul style="list-style-type: none"> • <i>Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002:</i> • <i>Phase 1b & 2 Site Condition Report, Hyperlast, August 2003:</i> <p>Following permit issue, the applicant submitted:</p> <ul style="list-style-type: none"> • <i>First Phase Reporting of the Hyperlast Site Protection and Monitoring Programme, Hyperlast, 2006*</i> (included in Appendix B of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1</i>, submitted as part of the surrender application): <p>*The applicant submitted the appendices to the above SPMP report at duly making of the surrender application. The appendices to this document are compiled here:</p> <p>Please note, the permit number at issue (April 2004) was EPR/BL98011X prior to permit transfer in January 2016, when it changed to EPR/JP3032RN.</p> <p><u>GWCL comments 24/05/2022</u></p> <p>Final Site Condition Report signed off by GWCL</p> <p>Surrender application documentation:</p> <ul style="list-style-type: none"> • Site Condition Report, Dow Birch Vale Site, Dow Chemical Company Ltd, Project number: 60602784, 60602784-ACM-RP-EN-001-3, Aecom, 30th November 2021 • Memo, Response to EA – Re-assessment of risks from potential spillages of Thorcat, Aecom, 4th May 2022 (Draft) <p>Saved onto DMS with date - 27052022</p> |
| Date and version of application SCR | <p><u>GWCL comments 24/05/2022</u></p> <p>SSCR, v3, 30th November 2021 –</p> <p>(Saved onto DMS with date – 27052022)</p> |

1.0 Site details

Has the applicant provided the following information as required by the application SCR template?

Site plans showing site layout, drainage, surfacing, receptors, sources of emissions/releases and monitoring points

NPS 07/12/2020

Please refer to the figures included in *Phase 1b & 2 Site Condition Report, Hyperlast, August 2003*. Also, relevant site plans are included in the following sections of the surrender application:

- Appendix A – Figures included in *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1*;
- Appendix G – Figures included in *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 2*.

See *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 2*:

GWCL comments 24/05/2022

Yes

2.0 Condition of the land at permit issue

To be completed by GWCL officers
(Receptor)

Has the applicant provided the following information as required by the application SCR template?

- Environmental setting including geology, hydrogeology and surface waters
- Pollution history including:
 - pollution incidents that may have affected land
 - historical land-uses and associated contaminants
 - visual/olfactory evidence of existing contamination
 - evidence of damage to existing pollution prevention measures
- Evidence of historic contamination (i.e. historical site investigation, assessment, remediation and verification reports (where available))
- Has the applicant chosen to collect baseline reference data?

NPS comments 07/12/2020

Please refer to the following documents which were submitted at the permit application stage:

- *Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002*; and
- *Phase 1b & 2 Site Condition Report, Hyperlast, August 2003*.

Also, relevant information was included in the surrender application, see:

- Section 2. 'Condition of Land at Permit Issue' of *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1*; and
- Appendix B – *First Phase Reporting of the Site Protection and Monitoring Programme for Hyperlast Limited, June 2006* of *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1*.

GWCL comments 24/05/2022

- Yes
- Yes
- Yes
- Yes
 - *Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002*;
 - *PHASE 1b & 2 Site Condition Report, Hyperlast, August 2003*;

| 3.0 Permitted activities (Source) | |
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| Has the applicant provided the following information as required by the application SCR template? | Response (Specify what information is needed from the applicant, if any) |
| a) Permitted activities b) Non-permitted activities undertaken at the site | |
| <u>NPS comments 07/12/2020</u> Please refer to the following documents which were submitted at the permit application stage: <ul style="list-style-type: none"> • <i>Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002; and</i> • <i>Phase 1b & 2 Site Condition Report, Hyperlast, August 2003.</i> Also, relevant information was included in the surrender application, see: <ul style="list-style-type: none"> • Section 3. Permitted Activities of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1.</i> | |
| <u>GWCL comments 24/05/2022</u> a) Yes b) Yes | |

| 3.0(a) Environmental Risk Assessment (Source) |
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| The H1 environmental risk assessment should identify elements that could impact on land and waters, cross- referenced back to documents and plans provided as part of the wider permit application. |
| <u>NPS comments 07/12/2020</u> Please refer to the following documents which were submitted at the permit application stage: <ul style="list-style-type: none"> • <i>Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002; and</i> • <i>Phase 1b & 2 Site Condition Report, Hyperlast, August 2003.</i> Also, relevant information was included in the surrender application, see: <ul style="list-style-type: none"> • Section 3. Permitted Activities of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1 .</i> |

| 3.0(b) Will the pollution prevention measures protect land and groundwater? (Conceptual model) | |
|---|---|
| Are the activities likely to result in pollution of land? | |
| <u>NPS comments 07/12/2020</u> Please refer to the following documents which were submitted at the permit application stage: <ul style="list-style-type: none"> • <i>Phase 1a Site Condition Report for IPPC Permit Application, URS, July 2002; and</i> • <i>Phase 1b & 2 Site Condition Report, Hyperlast, August 2003.</i> Also, relevant information was included in the surrender application, see: <ul style="list-style-type: none"> • Section 3. Permitted Activities of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1; and</i> • Appendix B – <i>First Phase Reporting of the Site Protection and Monitoring Programme for Hyperlast Limited, June 2006 of Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1.</i> | |
| For dangerous and/or hazardous substances only, are the pollution prevention measures for the relevant activities to a standard that is likely to prevent pollution of land? | <u>NPS comments 07/12/2020</u> Details included in SCR report |

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| Application SCR decision summary | Tick relevant decision |
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| Sufficient information has been supplied to describe the condition of the site at permit issue | <p>See <i>'Permit Handover Document for Hyperlast (BL98011X)'</i>, which has attached the Application Site Report from Feb 2004. This site report was completed at the time of the original permit determination.</p> |
| Information is missing- the following information must be obtained from the applicant. | |
| Pollution of land and water is unlikely; or | |
| Pollution of land and water is likely | |
| Historical contamination is present- advise operator that collection of background data may be appropriate | |
| Date and name of reviewer: | J Watkins - Feb 2004 |

Operational phase SCR evaluation template

Sections 4.0 to 7.0 may be completed annually in line with normal record checks.

| 4.0 Changes to the activities (Source) | |
|--|---|
| Have there been any changes to the following during the operation of the site? | Response (Specify what information is needed from the applicant, if any) |
| a) Activity boundaries b) Permitted activities c) "Dangerous substances" used or produced | |
| <u>NPS comments 07/12/2020</u> See Section 4. Changes to the Activity of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1</i> , submitted with surrender application. <u>GWCL comments 24/05/2022</u> Since approval of the first permit for the site, a number of changes have occurred at the site and these are listed below: <ul style="list-style-type: none">• Cessation of the production of organic compounds containing oxygen, such as alcohols, aldehydes, ketones, carboxylic acids, esters, ethers, peroxides, phenols, epoxy resins. This was the subject of a permit variation | |

| 5.0 Measures taken to protect land To be completed by EM/PPC officers (Pathway) |
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| Has the applicant provided evidence from records collated during the lifetime of the permit, to show that the pollution prevention measures have worked? |
| <u>NPS comments 07/12/2020</u> See Section 5. Measures Taken to Protect the Land During Operation of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1</i> , submitted with surrender application. |

| 6.0 Pollution incidents that may have impacted on land and their remediation To be completed by EM/PPC officers (Sources) |
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| Has the applicant provided evidence to show that any pollution incidents which have taken place during the life of the permit and which may have impacted on land or water have been investigated and remediated (where necessary)? |
| <u>NPS comments 07/12/2020</u> See Section 6. Pollution Incidents – Impacts and their Remediation of <i>Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1</i> , submitted with surrender application. <u>GWCL comments 24/05/2022</u> Yes Mercury in drainage system and groundwater monitoring results have been discussed in detail in Response to EA – Re-assessment of risks from potential spillages of Thorcat, Aecom, 4th May 2022 |

7.0 Soil gas and water quality monitoring (where relevant)

Where soil gas and/or water quality monitoring has been undertaken, does this demonstrate that there has been no change in the condition of the land? Has any change that has occurred been investigated and remediated?

NPS comments 07/12/2020

See Section 7. SPMP Groundwater Monitoring Results of *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1*, submitted with surrender application.

GWCL comments 24/05/2022

Mercury detected in groundwater in 2008. Drainage repairs and mercury management plan implemented.

Mercury in drainage has been reported in detail in Response to EA – Re-assessment of risks from potential spillages of Thorcat, Aecom, 4th May 2022

Surrender SCR Evaluation Template

If you haven't already completed previous sections 4.0 to 7.0, do so now before assessing the surrender.

8.0 Decommissioning and removal of pollution risk

To be completed by EM/PPC officers

Has the applicant demonstrated that decommissioning works have been undertaken and that all pollution risks associated with the site have been removed? Has any contamination of land that has occurred during these activities been investigated and remediated?

NPS and PPC comments 07/12/2020

See Section 8. Decommissioning and Removal of Pollution Risk, included in *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 1*, submitted with surrender application.

See Appendix G – Environmental Site Assessment to Support Permit Surrender, Dow Hyperlast Works, AECOM, December 2019, included in *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 2*.

Area (Gill Mainwaring) has confirmed that there have been no operations associated with the permitted activities since 2014 and no evidence of any additional contamination from residual (non-permitted) activities on site since 2014. A CAR form dated 13/02/2014, ref 0200830 (saved on edrm under permit ref BL9801IX) indicated that decommissioning of plant and equipment had already taken place when all permitted operation ceased in 2013.

Also, see CAR form dated 12/10/2020 confirming that the activities prescribed by the permit are no longer carried out on site:

GWCL comments 24/05/2022

- See Section 9 of Site Condition Report, Dow Birch Vale Site, Dow Chemical Company Ltd, Project number: 60602784, 60602784-ACM-RP-EN-001-3, Aecom, 30th November 2021

9.0 Reference data and remediation (where relevant)

To be completed by GWCL officers

Has the applicant provided details of any surrender reference data that they have collected and any remediation that they have undertaken?

(Reference data for soils must meet the requirements of policy 307_03 Chemical test data on contaminated soils – quantification requirements). If the surrender reference data shows that the condition of the land has changed as a result of the permitted activities, the applicant will need to undertake remediation to return the condition of the land back to that at permit issue. You should not require remediation of historic contamination or contamination arising from non-permitted activities as part of the permit surrender.

GWCL comments 24/05/2022

- Yes, Site Condition Report, Dow Birch Vale Site, Dow Chemical Company Ltd, Project number: 60602784, 60602784-ACM-RP-EN-001-3, Aecom, 30th November 2021

10.0a Statement of site condition

To be completed by EM/PPC officers

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

NPS comments 07/12/2020

See Appendix G – Environmental Site Assessment to Support Permit Surrender, Dow Hyperlast Works, AECOM, December 2019, included in *Site Condition Report, Dow – Birch Vale Site, Project number: 60602784, Part 2.*

10.0b Statement of site condition

To be completed by GWCL officers

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

GWCL comments 24/05/2022

- Yes, Site Condition Report, Dow Birch Vale Site, Dow Chemical Company Ltd, Project number: 60602784, 60602784-ACM-RP-EN-001-3, Aecom, 30th November 2021
- Memo, Response to EA – Re-assessment of risks from potential spillages of Thorcat, Aecom, 4th May 2022 (Draft)

See Appendix 1 below for timeline and full details of GWCL comments in response to:

- The Application
- Schedule 5 no.1
- Schedule 5 No.2
- Request for Information 1
- Request for Information 2 and Schedule 5#3

| Surrender SCR decision summary To be completed by GWCL officers and returned to NPS | Tick relevant decision |
|--|--|
| Sufficient information has been supplied to show that pollution risk has been removed and that the site is in a satisfactory state – accept the application to surrender the permit; or | X In order to satisfy the requirements of EPR surrender the memo will need to be incorporated into the surrender SCR. |
| Insufficient information has been supplied to show that pollution risk has been removed or that the site is in a satisfactory state – do not accept the application to surrender the permit. The following information must to be obtained from the applicant before the permit is determined: | |
| Date and name of reviewer | Sarah Budworth GWCL 24 th May 2022 |

APPENDIX 1

Application Review

GWCL comments received on 29/01/2022

Further Information

- 1) Submission of Design SPMP dated August 2005 referenced in section 2.0 Condition of Land at Permit Issue within the surrender site condition report dated 20th January 2020.
- 2) Submission of SPMP reports from 2008 – 2018.
- 3) Submission of plan detailing groundwater contours to ascertain direction of groundwater flow if this is not included within the SPMP reports requested in point 2 above.
- 4) Submission of EA correspondence confirming agreement of Design SPMP and First Phase Reporting of SPMP and proposed monitoring plan. We currently have limited access to hard copies of files held at our office due to CORVID. However, if no correspondence is available we will request access to our office to obtain hard copies of files for the site.
- 5) Submission of borehole logs for all locations used to establish baseline and surrender reference data. Copies of boreholes logs are included within Appendix A in the 'Assessment to Support Permit Surrender' prepared by AECOM (Ref: 60602784) dated 22nd January 2020 presented in Appendix G in the surrender SCR and Appendix D1/1 within the First Phase Reporting of the SPMP dated 8th June 2006. However, the borehole logs for the 'MW' monitoring wells and 'BH' monitoring wells have not been included.
- 6) Submission of following reports referenced in section 1.3 within the Phase 1a report prepared by URS Ltd dated July 2002.
 - Environmental Site Assessment. Kemira Chemicals. Birch Vale. Prepared by Furgo Environmental Ltd. Ref: 58061-1. Dated: May 1995.
 - Environmental Site Assessment. Hyperlast Ltd. Birchvale. Prepared by ENSR. Ref: 20144-1. Date: 15th April 1998.

Appendix G2/1 within the First Phase reporting of the SPMP dated 8th June 2006 presents the groundwater baseline reference data for each zoned area within the site which includes data from both of the reports listed above. Please ensure copies of all the analytical results are included within the reports.

- 7) Submission of drainage plan showing sumps, interceptors and culvert (including construction details if know and invert levels) which historically discharged into the lagoons located adjacent to the western boundary of the site.
- 8) Submission of information to demonstrate that all drains / sumps / interceptors have been cleaned and any resulting waste disposed of appropriately.
- 9) Submission of evidence to demonstrate that the site drainage systems including sumps and interceptors were inspected / maintained during the life of the permit. Please submit any relevant procedures in place along with details of any CCTV surveys undertaken during the life of the permit and a summary of any defects identified and repair work undertaken.
- 10) Submission of further information regarding works completed to seal the culvert located within the western part of the site to demonstrate this is not acting as a

pathway for the migration of any contaminated groundwater off site. This should include evidence to demonstrate that potentially contaminated groundwater associated with the permit activities cannot ingress into the culvert.

We understand from the information presented that works were undertaken to seal the culvert in 1984 and 1986 to prevent discharge from the site to former settling lagoons located adjacent to the western site boundary and River Sett which were used by the former print works that occupied the site and that a geo-physical survey was completed in 1995 to determine the exact location of the culvert. However, it is unclear what works were undertaken to seal the culvert and whether the sealing works have been inspected following completion to assess these are still fit for purpose.

- 11) Submission of additional information to support that pollution prevention measures (bunds, surfacing and tanks) were adequately inspected and maintained during the life of the permit. Examples of inspection / maintenance work should be submitted from the following systems listed in section 5.2.1 within the surrender site condition report.
- 12) Submission of historical maps to identify any potential sources of pollution associated with impact referred to be associated with historical uses of the site such as at boreholes MW16, MW17 and MW23.
- 13) Update of Figure 2 to include:
 - Descriptions of each zone as detailed in Table 4 in section 2.7.2 in the surrender SCR.
 - Potential sources of pollution including
 - ASTs (detailed in Table 23 within the surrender site condition report) including a key to identify contents / capacities. Please address the following points when providing this information.
 - Include details of the chemicals stored i.e Tank C350 is reported to store alcohol. Is this ethyl hexanol?
 - Many of the tanks listed also state distillates – please can you provide an indication of the chemicals present in the distillate.
 - The 2000 litre oil storage tank referenced in section 4.2 in the Phase 1a report does not appear to be listed.
 - Waste Product storage areas including location areas for the following:
 - Storage of solvents generated from cleaning including acetone, pyridine, toluene, and IPA stored in 205 litres drums at the rear of the production plant referenced in section 3.10 in the Phase 1a report dated July 2002.
 - Storage of waste oil in IBCs from vacuum pumps referenced in section 3.10 in the Phase 1a report dated July 2002.
 - Storage of methylene chloride in IBCs generated from cleaning operations referenced in section 3.10 on Phase 1a report dated July 2002 and location of any AST / drums of methylene chloride stored prior to use.
 - Chlorinated paraffin (referenced in section 4.3 within the Phase 1a report dated July 2002.

- Storage area for catalysts used on site given it is reported some of these were mercury based.
 - Storage of amines.
- Colour coding of boreholes to identify where soil and groundwater samples have been recovered to establish baseline and surrender reference data.
- 14) Provide a list of tanks / storage areas which were unbunded at permit issue and works undertaken to bund any bulk storage tanks / storage areas during the life of the permit. The Phase 1a report makes reference to several bulk storage tanks and waste storage areas not being appropriately bunded.
 - 15) Confirm whether off loading areas had adequate pollution prevention measures in place to prevent impact to soil / groundwater from any minor / significant spillages during the life of the permit.
 - 16) Submission of all infrastructure monitoring reports for the lifetime of the permit. We note examples of Infrastructure Monitoring reports have been provided for 2006 and 2009. However, to enable us to assess whether pollution prevention measures have remained fit for purpose during the life of the permit as set out within the Design SPMP we require all the infrastructure monitoring reports for the site to be submitted.

Other comments

Having reviewed the information presented within the First Phase Reporting of the SPMP dated 8th June 2006 to date it appears that insufficient soil and groundwater baseline reference data was established for the site given baseline does not appear to have been established in all areas identified to pose a potential pollution risk to soil and groundwater.

Soil baseline reference data is limited to soil samples recovered from five locations (Zone A (WS103, WS104, WS105), Zone H (WS102) and Zone G (WS101)) and whilst a greater number of groundwater samples were recovered (twelve in total) it appears these may not have been adequate to characterise groundwater conditions beneath the site.

Having reviewed the Phase 1a report prepared by URS dated July 2020 we consider that additional soil / groundwater baseline reference data should have been established where defects / or lack of pollution prevention measures were identified.

These include Zone F where the bunding associated with the 'Raw Material Tank Farm' referenced as 'C2' on Figure 2 within the Phase 1a report was stated to be 'questionable' along with several filling points observed to be located outside of the bund and several other ASTs were reported to be unbunded as reported in section 3.6 in the report.

We note areas of potential concern were summarized in section 5.2 within the Phase 1a report which included the solvent store, drum storage areas, boiler house and culvert. Having reviewed the baseline reference data presented we note no baseline was established within Zone I where the former solvent store was located and finished product area and baseline reference data was not established for a number of the drum stores on site or the off-loading areas in Zones B and F.

Having reviewed the suite of analysis we note this was limited to the following substances as listed within section 4.1.1 in the Phase 1b and 2 Site Condition Report prepared by Hyperlast Ltd dated 26th August 2003:

- Mercury
- Methylene Chloride
- Epoxides
- 2-Ethyl Hexanol
- Phthalates
- Amines
- Standard ICRL suite of VOCs and SVOCs.

Having reviewed the results presented in Appendix D2/1 within the First Phase reporting of the SPMP dated 8th June 2006 this does not appear to have included analysis for VOCs and SVOCs. In addition, section 4.3 within the Phase 1a report prepared by URS dated July 2002 stated that the 'proposed ground investigation should comprise a wide analytical suite to encompass the variety of chemicals on site'. Given over 200 substances were reported to be used on site (as listed within Appendix B in the Phase 1a report) the proposed suite of analysis should have included a suite for VOCs / SVOCs including Tentatively Identified Compounds (TICs) given it is likely that relevant methods were not available to identify all relevant substances on site and analysis for PAHs and TPH.

We note previous site investigations completed in 1995 and 1998 included analysis for PAH, DRO and BTEX and the groundwater results from these investigations have been included within the baseline for the relevant zones as presented in Appendix G2/1 in the First Phase reporting of the SPMP dated 8th June 2006. However, the later site investigation works presented within the First Phase Reporting of the SPMP did not include analysis for PAHs and hydrocarbons even though hydrocarbons were used / stored on site and visual / olfactory evidence of hydrocarbon impact was recorded on borehole logs for WS101 – WS106 presented in Appendix D1/1 within the First Phase reporting of the SPMP.

We note the Phase 1b and 2 Site Condition Report dated 26th August 2003 prepared by Hyperlast Ltd stated that hydrocarbons were not used on site and the impact identified within groundwater monitoring wells at MW21, MW18, MW16 and MW22 was not attributable to the site. However, this statement appears to be incorrect given the following was reported in the Phase 1a report produced by URS dated July 2002.

- Section 3.8 reports that spills / staining were evident outside of the boiler house / transformer which were reported to be from spillages of oils.
- Section 3.2 reports that in Zone B two of the boilers are fuelled by oil and reports there is an internal diesel store on site along with the storage of small quantities of various oils.
- Section 4.2 (Zone B) reports that an AST containing ~2000litres of oil is present on site.
- Section 3.1 reports that waste oil from the vacuum pumps is stored in IBCs.

We note groundwater samples recovered in 2019 for surrender reference data presented in the 'Dow Hyperlast Works' Environmental Site Assessment to Support Permit Surrender Ref: 60602784' dated 22nd January 2020 included analysis for PAH, DRO and BTEX at locations analysed for these contaminants of concern at baseline. However, other locations have not included analysis for

these substances of concern. In addition, the baseline and surrender reference data for DROs, PAHs and BTEX has not been included within the surrender site condition report (Tables 11 – 17 Soil) and (Tables 27-33 Groundwater).

Based on the above information we consider that further soil and groundwater reference data will be required to demonstrate that the site is in a satisfactory state given the baseline established did not appear to target all areas of potential concern or include relevant suites of analysis and surrender reference data is limited to locations sampled at baseline.

We will provide a formal response detailing any additional soil / groundwater reference data required following a review of the additional information requested in points 1- 16 above which will also include the recovery of surface water samples from culvert sump manholes CV1, CV2 and CV3 to demonstrate that the site is in a satisfactory state to be surrendered.

Schedule 5 Notice No. 1
sent to operator - 25/02/2021
response received from operator – 23/03/2021

GWCL comments 18/05/2021 on the above response:

We have reviewed the additional information provided within the response to the Schedule 5 notice dated 23rd March 2021 along with supporting documents to support surrender of the permit.

Having reviewed the information we ask that the surrender site condition report (SSCR) is updated as detailed below and any missing information included or appended to the report.

Following receipt of the updated SSCR we will assess whether adequate information has been provided to demonstrate that all pollution risks have been removed from site and the site is in a satisfactory state.

- 1) Section 2.6 'Summary of Site Condition Report'. Inclusion of reports referenced within this section.
 - a. Phase 1a (Site Condition Permit) report prepared for IPPC application prepared by URS dated July 2002). Please can you also include the Furgo 1995 report and ENSR report dated 1998 which are referenced in the Phase 1a report.

We understand the Furgo 1993 also referenced in the Phase 1a report has been lost. However, please include boreholes logs MW1 – MW15 if these are available given some of these boreholes were used to establish baseline reference data for the site. Having reviewed the response to action 5 within the schedule 5 notice in relation to providing borehole logs the information referenced does not include the borehole logs for boreholes MW1 – MW15 which are inferred to have been installed in 1993.
 - b. Design SPMP dated August 2005.
 - c. First Phase Reporting of SPMP dated June 2006.

Whilst a copy of the First Phase Reporting of the SPMP was included within Appendix B within the SSCR the Appendices were submitted at a later date. Please include a complete copy of the First Phase Reporting of the SPMP.

2) Section 3. Permitted Activities.

- a. Inclusion of further information in relation to the use of Thorcat 535 (mercury catalyst) within the text under Table 21 'Substances of Potential Environmental Significance' given section 5.10 within the 'Review of Pollution Risk Management' dated March 2021 reports that the use of thorcat was phased out by 2010.

3) Section 5. Measures taken to protect land.

- a. Update of Table 23 'Summary of Above Ground Storage Tanks' to incorporate any missing information from Table 2 'Key Storage Areas in Figure 1' and Table 3 'List of Above Ground Tanks' detailed within the report 'Review of Pollution Risk Management' dated 16th March 2021.
- b. Inclusion of relevant information documented within the report 'Review of Pollution Risk Management' dated 16th March 2021 provided to address actions 11, 13 and 14 in the schedule 5 notice.
- c. Inclusion of 'Infrastructure Monitoring reports 2004 – 2009 provided within the response to action 16 within the response to the schedule 5 notice and details of systems used from 2009 onwards to document the inspection / maintenance of pollution prevention measures on site until site closure.
- d. Update of section 5.1.6 'Site Drainage / Interceptors' to include:
 - A summary of the drainage systems present on site including reference to relevant site drainage plans (section 3.5 within the Phase 1a report prepared by URS dated July 2002 provided a detailed overview of the drainage systems on site. However, it is unclear whether this information was current at permit issue in 2004).
 - Information provided within the response to actions 7, 8 and 9 in the schedule 5 notice.
 - Historical overview of discharges via the culvert and works undertaken to seal the culvert to demonstrate this is not acting as a preferential pathway and inclusion of information provided within the response to action 10 in the schedule 5 notice.
 - Evidence to demonstrate that any sumps / interceptors on site were fit for purpose during the life of the permit to demonstrate no potential impact to soil and groundwater has occurred during the life of the permit.

- A summary of the incident relating to the presence of mercury within the trade effluent drains along with details of the sections of drains repaired in 2008 and whether any impact has potentially occurred to soil and groundwater in relation to the use of thorcat during the operational life of the permit.

We note the response to action 8 within the schedule 5 notice reports that drainage surveys have been completed in 2003, 2008 and 2019 which have included jet washing to facilitate the surveys. Providing adequate information can be provided to demonstrate that no impact has occurred to soil / groundwater from sumps / interceptors and the incident relating to the presence of mercury within the trade effluent drains we do not consider that any further works are required to assess the integrity of the drains.

4) Section 6. Pollution Incidents

- a. Update of section 6.2 to include details of pollution incidents listed in Table 1 'Summary of Site Activities over the Permit Lifetime Linked to Material Storage and Containment' such as loss of methylene chloride and presence of mercury within trade effluents drains given these incidents are not documented within this section.

5) Section 7. SPMP Groundwater Monitoring Results.

- a. Update of section 7 to include the following.
 - i. Inclusion of SPMP Groundwater Monitoring reports referenced within the response to action 2 within the Schedule 5 notice.
 - ii. Summary of groundwater monitoring undertaken during the life of the permit and inclusion of information provided within the response to action 4 within the Schedule 5 notice, notably that the SPMP monitoring rounds included a greater number of monitoring wells and wider analytical suite than proposed for the SPMP as detailed within Tables 1 and 2 provided within the response to action 4.
 - iii. Update of Table 26 'Summary of SPMP Groundwater Monitoring' to include all SPMP reports, boreholes monitored and analytical suites. Table 26 does not include the monitoring data from the 2010 SPMP or include the AECOM boreholes from 2017 (MW303 and MW401-MW413).
 - iv. Update of sections 7.2.1 – 7.2.7 'Summary of SPMP Groundwater Monitoring in Zones A – H' to include data from

all relevant analytical suites which relate to substances used, stored or released during the life of the permit.

- v. Inclusion of excel spreadsheet(s) documenting all groundwater monitoring data for each borehole collated by zone and inclusion of time series plots to identify any increasing / decreasing trends of relevant contaminants of concern during the life of the permit.
- vi. Interpretation of monitoring data, notably to discuss any increasing / decreasing trends.

As discussed previously the Phase 1a report prepared by URS dated July 2002 reported that over 200 substances were used on site. However, for the purposes of the report only chemicals with an annual usage in excess of 20 tonnes were investigated which equated to almost 60 substances. However, it was recommended that the analytical suite was widened to capture the variety of substances on site.

The Phase 1b and 2 Site Condition report prepared by Hyperlast dated 2003 reported that analysis would be limited to the following substances.

- Mercury
- Methylene Chloride
- Epoxides
- 2-Ethyl Hexanol
- Phthalates
- Amines
- VOCs and SVOCs.

However, the design SPMP dated 2005 did not include VOCs or SVOCs. Whilst we acknowledge that the letter from the Environment Agency dated 17th July 2006 confirmed acceptance of the SPMP monitoring programme we consider that additional substances should have been included within the analytical suite as previously recommended by URS in the Phase 1a report dated July 2002 given over 200 substances were originally used on site and not just limited to the substances listed in section 2.7 within the SSCR.

As a minimum we consider VOCs, SVOCs, PAHs, TPHs should have been included as determinands within the SPMP monitoring programme. As documented above the groundwater monitoring undertaken during the life of the permit included a greater number of monitoring wells and wider analytical suite than proposed for the SPMP and therefore we ask that data for substances used, stored or released during the life of the permit are included within section 7.0.

6) Section 8. 'Decommissioning and Removal of Pollution Risk'.

- a. Inclusion of any relevant documentation such as duty of care notes and hazardous waste notes to confirm potentially polluting materials have been removed from site.
- b. Inclusion of all decommissioning plans for the site.

7) Section 9. 'Reference Data and Remediation'.

- a. Inclusion of excel spreadsheet(s) documenting all groundwater monitoring data including the results of the 2019 groundwater monitoring data for each borehole collated by zone including data for relevant determinands not included within the original baseline and data from any other monitoring locations to demonstrate that the site is in a satisfactory state to be surrendered.
- b. Inclusion of excel spreadsheet(s) documenting all relevant soil data including data for each borehole collated by zone including data for relevant determinands not included within the original baseline and data from any other monitoring locations to demonstrate that the site is in a satisfactory state to be surrendered.

Where relevant we ask that relevant data / supplementary boreholes are included within the responses to a. and b. above from the 'Supplementary Environmental Site Assessment' report dated 7th February 2018' given this report includes additional soil / groundwater data to support that the site is in a satisfactory state to be surrendered.

- c. Inclusion of updated interpretation of comparison of surrender reference data with baseline reference data.

Where soil baseline reference data is not available we recommend a comparison is made to local background concentrations and supporting evidence included to justify why any increases are not related to the permitted activities.

- 8) Update of Figure 2 'Combined 2006 and 2019 Investigatory Locations' included within the SSCR to include details of potential pollution sources on site and relevant boreholes from 'Figure 2 – Exploratory Hole Location Plan' from the 'Supplementary Environmental Site Assessment' report dated 7th February 2018' where any additional boreholes are used to demonstrate that the site is in a satisfactory state to be surrendered.

Whilst we note it is stated in the response to action 13 in the schedule 5 notice that the information requested cannot be added due to limited space we ask as a minimum that the areas numbered 1 – 13 on Figure 1: Site Storage Locations in 2002 in the 'Review of Pollution Risk Management Over the Lifetime of the Environmental Permit' are added to Figure 2 to enable us to ascertain the location of potential pollution sources within relevant zones and assess that relevant potential pollution sources have been targeted.

- 9) We ask that boreholes are decommissioned in line with relevant guidance to prevent these acting as preferential pathways when these are no longer required for monitoring purposes.

Schedule 5 Notice No. 2

sent to operator - 03/06/2021

response received from operator – 14/07/2021

GWCL comments 26/08/2021 on the above response:

To enable us to fully assess that the site meets the EPR surrender test we will require section 6.0 (Pollution Incidents) within the surrender site condition report to be updated to include the additional information detailed below to demonstrate that leakage from the trade effluent drains has not resulted in the deterioration of soil and groundwater during the life of the permit.

- 1) Summary of findings of actions documented within the Mercury Management Plan and reference to any reports produced to document the findings of the actions and inclusion of any reports within an Appendix within the surrender site condition report.
- 2) Inclusion of further information to confirm whether mercury or any other polluting substances were present within the trade effluent.
- 3) Provision of drainage plan highlighting defects recorded in the trade effluent system following completion of the CCTV survey in 2008 to ascertain where impact may have occurred to soil and groundwater.
- 4) Review of existing soil and groundwater data to ascertain whether adequate information is available to demonstrate that the condition of the soil and groundwater has not deteriorated as a result of leakage of trade effluent where it has been identified that mercury or any other polluting substances were present between the date of issue of the permit in April 2004 until the completion of drainage repairs in November 2008.

Based on the information provided within the surrender site condition report we understand that Thorcat 535, a phenolic mercury compound was added to blends of raw materials to catalyse reactions with isocyanates to form urethanes.

It is reported within Section 6 (Pollution Incidents) that between 2005 – 2007 variable mercury levels and occasional high results of mercury were recorded in the trade effluent disposed to sewer and that a mercury management plan was put in place which included changes to storing and handling procedures for Thorcat 535.

Having reviewed the Mercury Management Plan provided within Appendix F this documented actions that would be taken which included producing a mercury map and a conceptual site model to determine which actions would have an immediate or effective impact on the environment along with sampling and testing of specific effluent streams including groundwater and samples from surface water drains along with CCTV surveys of relevant drainage systems. Whilst we are aware that some of these actions were completed it is unclear whether a report was produced documenting the findings of all of the actions. It would be beneficial to see any report(s) produced in relation to this incident if any are available to further understand whether this incident potentially impacted soil and groundwater.

The Mercury Management Plan reported that surveys of the trade effluent and site wide drainage system was completed in 2008 which identified several areas of severe damage and collapse and that major repair work was undertaken and completed in November 2008. It is reported that the repair work included the installation of a PE liner in the entire trade effluent system.

Whilst we note the Mercury Management Plan reported that the ingress of contaminated groundwater may be a source of the mercury in the trade effluent it is unclear whether mercury may have been present in the trade effluent and therefore potentially impacted soil and groundwater via leakage from defective drains.

Given the results of the 2003 drainage survey are not available and severe damage was recorded to the drains in 2008 we consider that leakage from the trade effluent drains may have caused a deterioration in the condition of the soil and groundwater during the life of the permit (i.e. between the date of the issue of the permit in April 2004 up until drain repairs were completed in November 2008) as a result of the potential presence of mercury and other polluting substances that may have been present in the trade effluent as a result of the site's activities.

Request for information 1

Sent to operator - 26/08/2021

response received from operator on 30/11/2021

GWCL comments 02/03/2022 on the above response:

We have now reviewed the updated Site Condition Report, Dow Birch Vale, 60602784-ACM-RP-EN-001-3, Revision 2, 30th November 2021. In response to points 1 to 4 that we previously raised I note the following:

Thorcat535 loss from damaged effluent drains

- 1) The Mercury Management Plan has been presented in Appendix F.

Groundwater data of mercury monitoring has been included in this appendix.

Groundwater sampling results for mercury from MW23 presented from 2008 to 2019 for the Laboratory Source Area. MW23 is approximately 25m downgradient of the location of cracks noted in the effluent drain from the laboratory. Mercury only detected above the LOD in 2008.

Groundwater sampling results for mercury from BH202 presented from 2008 to 2019 on the north-eastern corner of the Filled Systems Building adjacent to upgradient end of broken drain. Mercury only detected above the LOD in 2008.

Groundwater sampling results for mercury from BH203 beside the effluent sump presented from 2008 to 2019. Mercury only detected above the LOD in 2008.

Groundwater sampling results for mercury from MW402, MW403 and MW404 presented for 2017. These monitoring wells are located down gradient of the Filled Systems Building at approximately 40 to 80m downgradient of the cracks noted in the effluent drain outside the Filled Systems Building. No mercury above LOD was detected.

- 2) Section 6.3.1 identifies two sources of mercury to effluent:
 - Wash water from laboratory
 - Tracking of mercury from floors in the Filled Systems Building and disposal via floor wash water to drain
- 3) A drainage plan showing approximate location of cracks in drains has been presented in Figure 1 Appendix F.
- 4) Soil and Groundwater data have been presented in Chapters 7 and 8. None of the soil sampling was carried out to specifically investigate residual impact of loss of effluent containing Thorcat535 phenyl mercury to ground. There do not appear to have been any soil samples taken in proximity to locations where cracks in drains were found. Groundwater data has been collected from boreholes which are at least 25m downgradient from broken drain sections, with the exception of BH202 which is located adjacent to the effluent drain from the Filled Systems, however it is up groundwater gradient of the location where the drain was found to be broken and therefore once the leak was stopped BH202 is likely to be up groundwater gradient of residual impacts in soils.

We also requested and were provided with a copy of the Material Safety Data Sheet for Thorcat535. The chemical characteristics of Thorcat535 suggest that it was likely to have initially been detected in groundwater sampling downgradient of broken drains due to mobilisation by the cleaning agents that it was mixed with in the effluent.

The chemical characteristics of Thorcat535 indicate that it is likely to sorb to soil and in the absence of a solvent is unlikely to produce a groundwater plume, therefore the use of long-term groundwater monitoring from downgradient of the location of the repaired effluent drains is insufficient to demonstrate that a soil source of mercury is not present where loss from drains occurred.

The laboratory and the Filled Systems building were noted to be the most likely sources of mercury in effluent drains. No soil sampling has been carried out in proximity to the locations where broken pipework was noted in the effluent drains from either of these facilities.

Based on the information received. The soil and groundwater data that has been submitted to support the case for satisfactory state of land is considered to be insufficient to prove that a soil

source of phenylmercury does not exist around the location where loss to ground occurred prior to the drainage repair works.
Soil data specific to investigating mercury content of soil associated with damaged drainage runs from the laboratory, filled systems building and to the effluent sump is required.

2 Ethyl Hexanol loss in Area C

Section 6.3.2 discusses free phase 2 ethyl hexanol found during groundwater monitoring in MW16 and detections in groundwater around Area C associated with effluent drains and contaminated surface water drains.

Section 8.2.2 groundwater monitoring shows elevated concentrations of 2 ethyl hexanol decreasing over time. However, Total Organic Carbon in groundwater was still elevated to the end of monitoring in 2014. The report does not state what the TOC baseline was for groundwater in Area C.

Please provide an assessment of what the reason for the elevated Total Organic Carbon in groundwater in Area C relates to and whether TOC is significantly different to baseline in this Area.

Response to Request for Information 2 (Followed up with Schedule 5#3 due to delay in operator response) Sent to operator – 02/03/2022 response received from operator on - 06/05/2022

GWCL comments on the above response:

Based on the information received in the Memo Response, 4th May 2022, I am satisfied that the query relating to potential loss of Thorcat535 from cracks in drainage relating to permitted activities on site has now been addressed due to the following new evidence:

- The laboratory building and activities are outside the EPR permit boundary and therefore any loss from drains in this area is not relevant to the permit surrender.
- Additional scrutiny of the drainage survey for the Filled Systems building found only 1 crack which was full circumference of the drain, therefore loss of effluent in the drain is likely to have been very limited.
- Soil data from WS101 and WS101A has been presented from close proximity to the Filled Systems drainage run which has not shown any mercury impact below the depth of the drainage system.
- Scrutiny of groundwater quality and elevation data showed that during the 2008 detection of mercury in groundwater in BH202 and in the effluent discharge, that groundwater levels were above the level of the adjacent drain, suggesting that groundwater ingress to the effluent drain was more likely to have been occurring rather than effluent egress, due to the positive pressure of the groundwater head outside the drains.

Based on this additional evidence, when considered with the information contained in the Surrender Site Condition Report 30th November 2021, the site appears to meet the requirements for Satisfactory State for surrender.