

Compliance Assessment Report

Report ID:
CAR_NRW0031658

This form will report compliance with your permit as determined by an NRW officer

Site	Barry Silicon Plant	Permit Ref	BR9685IX		
Operator/Permit holder	Dow Corning Ltd				
Regime	Installations				
Date of assessment	23/03/2017	Time in	10:00	Out	17:00
Assessment type	Report/Data Review				
Parts of the permit assessed	Emissions, wastes, procedures				
Lead officer's name	Leakey, Antony				
Accompanied by					
Recipient's name/position	Judith Sartor/ Environmental Specialist	Date issued	22/05/2017		

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations or the licence under the Water Resources Act 1991 as amended by the Water Act 2003. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
C2 - General Management - Management system and operating procedures	C3	1.1.1
E1 - Emissions - Air	C3	3.1.2
	C3	3.1.2

KEY: See Section 5 for breach categories, suspended scores will be indicated as such.

A = Assessed or assessed in part (no evidence of non-compliance), **X** = Action only,

O = Ongoing non-compliance, not scored.

Number of breaches recorded	3	Total compliance score (see section 5 for scoring scheme)	12
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If the Number of breaches recorded is greater than zero, please see Section 3 for our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (eg. Maintenance, training, combustion plant, etc)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued inc.
- Details of advice given
- Any other areas of concern
- Any actions requested
- Any examples of good practice
- A reference to photos taken

Dow Corning Limited Site Visit Report

Site visit – 23/3/17

Fugitive dust sources – temporary waste inventory on the old landfill area has continued to reduce and now stands at 3,500 tonnes.

Construction of a second waste storage area is not now considered to be necessary and the modifications proposed to allow direct loading of other waste streams for disposal or shipment for recovery and reduction in DPR production means that future arisings will be managed within the existing "ALAMO" infrastructure.

The construction waste accumulated on the old landfill area is suitable for use in the landfill remediation profiling as long as tramp plastics are removed.

ERU optimisation

Larger capacity ID fan is to be installed during the September 2017 shutdown in order to increase throughput by reducing residence time further. It is unclear what impact this improvement will have on ERU availability (70% during 2016). A replacement boiler is also being installed. This will be a direct replacement as there is insufficient time to review the current design for potential improvements.

W957 Hydrogen Plant CO breach

The improved design heat exchanger will be installed during the September 2017 shutdown.

TFS Green List Waste Export

The former Annex VII "Green list" waste RG6000 Gum (unfilled) is now consigned to landfill or energy recovery.

River Cadoxton Abstraction

Rigorous cost-benefit assessment is considered to be necessary. Some screen options are potentially acceptable (notably the Goflo, but note that we do not endorse any manufacturer however this type of screen may be the best solution in this case) but detailed installation and maintenance details and costs are required.

Improvement Programme Ref. IP33

W930 catalyst loading vent A120 inspection for dust release is accepted and this condition is considered to be closed. Spot checks may be undertaken at future site inspections in order to verify that no dust emissions are occurring.

W410 vent A78 temperature

Internal inspections have identified that this parameter is regularly above the upper limit for minimising xylene releases. Characterisation of the xylene losses is required. Corrective action will involve control modifications to limit kettle boil up rate when condenser set point is not achieved.

ACTION: Dow Corning to characterise xylene releases from vent A78 and confirm when corrective actions completed.

W810 tank farm chlorosilane leak

The leak occurred on 6 December 2016 and was not investigated by NRW at the time as it was initially considered to be of a minor nature.

While on site on 23/3/17 the opportunity was taken to visit the scene and review the Dow Corning investigation.

The primary cause was mechanical/corrosion failure due to inadequate design control and failure to maintain and inspect temporary nitrogen purge connections. These issues appear to have been largely addressed and lessons shared with sister sites. There may be a need to consider a review of materials of construction selection

The underlying cause was failure to follow the hazardous materials isolation procedure drafted for the job. The procedure was not as clear as it could be regarding what isolation was required. The incident arose during preparation for maintenance. A low boiling point chlorosilane line was being blown clear to allow re-jointing at a leaking flange. The plant operators failed to ensure that a column top product feed to the storage sphere, where the work was taking place, was put into recycle in order to prevent chlorosilane entering the line to be worked on. The line was being blown through from both ends. When the nitrogen connection near the storage sphere failed nitrogen and chlorosilane were released together from the open end (½" NB). The 5 barg nitrogen pressure formed an aerosol of chlorosilanes and light hydrocarbons (C5-C7) which travelled vertically upwards before dropping 100-200 metres away within the plant boundary.

The training and procedural issues associated with the preparation for maintenance aspects appear to have been largely addressed.

The total loss of inventory is claimed to be 140 kg based upon plant level change measurements. This was not verified on site, although is consistent with estimates based upon process conditions. The release was potentially limited because operators put themselves at risk in order to deal with the issue.

Calculations suggest that the loss rate may have been limited by the two phase flow regime due to the nitrogen and chlorosilane/hydrocarbon mixture venting together, i.e. potential loss could have been higher under different circumstances.

The Dow Corning investigation does not appear to have identified the scale of the risk associated with the potential for ignition of the flammable aerosol (the ignition risk was identified but the potential consequences not examined further). An initial review while on site suggested that had the wind direction been in the prevailing direction at the time of the incident an ignition source would probably have been encountered. The consequences of ignition are uncertain.

ACTION: Dow Corning to examine the ignition probability and potential consequences in more detail and report at the next site meeting and discuss with HSE under COMAH regime if appropriate.

Modelling of potential off-site ground level concentrations of hydrogen chloride and chlorosilanes

should be undertaken assuming that water sprays were not deployed or were ineffective.

ACTION: Dow Corning to examine and report maximum ground level pollutant concentrations for an unabated fully dispersed plume arising from this incident and discuss at next site meeting.

Release point A34 Methanol mass flow limit

The mass flow rate ELV was exceeded on 4 April 2017 due to an abnormally long period of plant idling causing higher temperatures and carry over of methanol vapour to the abatement systems. Procedures and training had not allowed for these circumstances.

Initial assessment suggests that the impact of the additional 115 kg of methanol release compared to typical site non-methane VOC releases of 26 tonnes/year and the breach of permit condition 3.1.2 is considered to be minor and category 3. The inadequate procedures and training are similarly considered to be minor breaches of permit management condition 1.1.1.

Further clarification is required relating to the process design and operation:

- Why was the MEVA system on recycle, is this standard practice during shut downs and why had the temperature rise issue not been identified before?
- What was the implication of the ERU KO pot level rise and why was it necessary to direct vents to atmosphere? Is there insufficient pump out/drainage capacity from the KO pot?
- Has an impact assessment of the increased releases been undertaken?

ACTION: Dow Corning to provide an update on corrective action progress at next site meeting.

Release Point A41 ERU dioxin emissions

The annual dioxin testing on 7 March 2017 showed a result of 0.14 g ITEQ/m³ compared to the permitted ELV of 0.1 ng/m³. Retesting reported results well within the permit emission limit and consistent with historic monitoring results:

20 April 2017 – 0.028 ng/m³ dioxin ITEQ

2 May 2017 – 0.014 ng/m³ dioxin ITEQ

Assume the worst-case that the elevated value was correct and had been the emission level for a year (since the last test) annual emissions of dioxin/furans would have been approximately 0.01 g. This is around a seventh of the typical annual dioxin emissions from Aberthaw power station and the Viridor energy from waste plant in Cardiff.

On this basis the potential worst-case impact of the additional releases are considered to be negligible given that releases from sources such as Trident Park (Viridor EfW) have been subject to satisfactory human health risk assessments and the breach of permit condition 3.1.2 is considered to be minor and category 3.

ACTION: Dow Corning to provide an update on investigation outcome and corrective action progress at next site meeting.

Monitoring returns and notification review

The SPMP report has been reviewed and the deferred high priority defect repairs are noted. Completion of these tasks should be progressed unless risk assessment suggests continued

deferral is justified.

ACTION: Dow Corning to provide an update and confirm work program at next site meeting.

Dow Corning should note that annual submission of an SPMP report is no longer a permit requirement and only 5 yearly groundwater and 10 yearly soil monitoring is needed (subject to site-specific risks that may require shorter monitoring periods) in accordance with permit condition 3.1.4. However, provision of the SPMP reports does facilitate compliance assessment of land emissions aspects of permit condition 3.1.1.

Monitoring data has been reviewed and no breach of permit conditions was identified. It is noted that "Agreed limit" is stated in the ELV column for siloxanes, future reports should state the numerical value of the ELV or that "no limit applies".

ACTION: Dow Corning to include ELV or no limit in reporting forms for future siloxane submissions.

END

EPR Compliance Assessment Report

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Site	Barry Silicon Plant	Permit Ref	BR9685IX
Operator/Permit holder	Dow Corning Ltd	Date	23/03/2017

Section 3 – Enforcement Response

You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	CCS Category	Action required/advised	Due Date
See Section 1 above			
E1	C3	Follow up investigation findings at next site visit.	30/06/2017
E1	C3	Update SOPs, alarms and install new plant	01/09/2017
C2	C3	Updates SOPs, alarms and install new plant	01/09/2017

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (eg. 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 its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this report should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within fifteen working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.

Welsh Language

If you would like this form in Welsh please contact your Regulatory Officer.