

Compliance Assessment Report

Report ID:
CAR_NRW0032203

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	22/06/2017	Time in	10:00	Out	17:00	
Assessment type	Audit					
Parts of the permit assessed	Emissions, management, engineering					
Lead officer's name	Leakey, Antony					
Accompanied by						
Recipient's name/position	Judith Sartor/ Environmental Specialist	Date issued	26/09/2017			

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
B1 - Infrastructure - Engineering for prevention and control of emissions	A	
B5 - Infrastructure - Plant and equipment	C3	1.1.1
C2 - General Management - Management system and operating procedures	C3	1.1.1
E1 - Emissions - Air	C3	3.1.1
	C4	2.3.1
E2 - Emissions - Land and groundwater	A	
E3 - Emissions - Surface water	A	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	A	

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	4	Total compliance score (see section 5 for scoring scheme)	12.1
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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 - 22/6/17

ERU expansion

A second ERU is planned for installation around 2021-23 in order to achieve VOC emissions reductions anticipated to be required by IED. Careful consideration should be given to BAT AELs likely to be applicable in the future. 20 mg C/m³ is a potentially relevant AEL.

River Cadoxton Abstraction

Detailed cost estimates are being prepared. If CBA shows that best practice screening is not viable then alternative measures will need to be considered.

Implementation of best practice measures may be deferred until the next time the plant is scheduled for upgrading.

W410 vent A78 temperature

Control modifications to limit kettle boil up rate when condenser set point is not achieved are progressing.

Characterisation of the xylene losses associated with the higher operating temperature suggests that no significant impact will have occurred and the failure to control the vent temperature as described in the operating techniques is an insignificant category 4 breach of permit condition 2.3.1.

The intention to investigate the benefits of a larger condenser on the plant are noted and will be followed up at a future site meeting.

W810 tank farm chlorosilane leak

Dow Corning has now examined the ignition probability and potential consequences in more detail and have found that the LFL is likely to be reached within 1-2 metres of the release. The likelihood of escalation even if more rapid action were not taken to isolate the release is considered to be very low.

Modelling of potential off-site ground level concentrations of hydrogen chloride and chlorosilanes were also undertaken assuming that water sprays were not deployed or were ineffective. Only minor effects were predicted off site, although at a range of up to approximately 1 km. Actual duration of release was very short (<7 minutes) and water curtains are expected to have contained the release within the site boundary. Given that isolation could be achieved within a relatively short timescale even if BA had been used under more controlled incident response approach, NRW considers that worst case impact would be expected to be limited to minor short term exposure to discomfort. The release is therefore considered to be a category 3 breach of permit condition 3.1.1. The associated management system failures relating to management of mechanical integrity of the nitrogen connections, provision and implementation of isolation

procedures are also considered to be a category 3 breach of permit condition 1.1.1.

The remaining follow up of corrective actions will now be taken forward under the COMAH regime by HSE.

Release point A34 Methanol mass flow limit

Further details were provided relating to the MEVA system operation. The event was associated with a longer than normal period of recycle and the potential for temperature rise had not been identified. The SOP has been updated to require an accumulator inventory refresh to purge the system of hotter methanol.

The recirculation pump is oversized to provide a non-routine feed of methanol for another duty and so generates a relatively large temperature rise during the low MEVA column wetting flow which is usually provided by the cool methanol feed directly from the bulk storage at the Navigator terminal.

The ERU KO pot level rise was caused by the excessive carry over of methanol from the hot running MEVA unit and draining can only be achieved during ERU shut down for safety reasons. Hence it was necessary to direct vents to atmosphere.

A vent flow alarm and control valve are to be implemented to limit venting rates during abnormal operating periods. Installation of a cooler is also proposed during H1 2019.

It was noted that the MEVA column wetting rate during normal operation may be sub-optimal as it relies solely on the methanol feed rate to the MeCl plant. It may be possible to reduce routine vent losses by introducing a recirculation flow from the accumulator to improve the mass transfer capability of the MEVA column.

ACTION: Dow Corning to consider the benefits of reviewing the MEVA column wetting rate and provide an update at next site meeting.

Release Point A41 ERU dioxin emissions

Detailed investigation of ERU operation during the period of high dioxin release has identified non-operation of the soot blower as the main potential cause of the elevated emission. The ERU soot blower is operated 3-5 times per week to clean the main fire tube in order to maintain heat transfer performance. Operation of the blower had not previously been identified as a key dioxin formation control.

A concurrent increase in vent butane concentration from 1-2% may also have contributed to increased soot accumulation during the period of soot blower breakdown. It is thought that soot accumulation may have resulted in increased levels of dioxin formation in the fire tube section due to changes to temperature profiles and possibly catalytic activity associated with the accumulated soot particles. The presence of copper can also influence dioxin formation, although this aspect has not been investigated.

As the soot blower had not previously been identified as an environmentally critical plant item no spares were held and operation was allowed to continue when it broke down. This has now been rectified and a full spare is available and the blower is listed as environmentally critical.

While the apparently critical role of the soot blower in controlling dioxin emissions was not entirely foreseeable, the maintenance of incineration system cleanliness is known to be a factor. Therefore, the failure to maintain the soot blower in operation is considered to be a category 3 low impact breach of permit condition 1.1.1.

The classification of the breach has been determined upon examination of the number and duration of previous soot blower outage periods during operation. No previous periods have matched the duration of the recent period resulting in the elevated dioxin release and most longer

than typical duration periods (1-7 days) are associated with outage periods, when significant process venting would not be taking place.

High priority defect repairs

An update on the defect repair work program was provided. Significant works are being undertaken and a review of key items will be undertaken at a future site visit.

D4/D5 emissions to air

Measured emissions are higher than originally predicted when risk assessments were first undertaken for these materials. 2016 releases were 27 and 7.5 tonnes for D4 and D5 respectively. The short lifetime of the materials in the atmosphere is noted and the main contribution to pollution impacts will be secondary particles of silica over a regional scale and, therefore of limited impact. There are no significant photochemical ozone impacts associated with these materials.

Monitoring returns and notification review

Monitoring data has been reviewed and no breach of permit conditions was identified.

The annual monitoring review report is noted. It is recommended that in future reports where trends are upward or highly variable potential causes are considered and control limits reviewed if necessary.

The high chloromethane daily mass release measurement issue is noted and the **RCI actions will be followed up at the next site inspection.**

The loss of effluent from W952 effluent sump notified on 19/917 will be investigated at the next site inspection.

END

EPR Compliance Assessment Report

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Operator/Permit holder	Dow Corning Ltd	Date	22/06/2017

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			
B5	C3	Spare soot blower procured and plant identified as environmentally critical. COMPLETE.	26/09/2017
E1	C3	Nitrogen purge assembly engineering controls improved and temporary SOP process reviewed. COMPLETE.	26/09/2017
C2	C3	Nitrogen purge assembly engineering controls improved. Temporary SOP and emergency response reviewed and updated. COMPLETED	26/09/2017
E1	C4	Improve process temperature control - COMPLETED	26/09/2017

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.