

Compliance Assessment Report

Report ID:
CAR_NRW0033251

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

Site	Barry Silicone Plant	Permit Ref	BR9685IX		
Operator/Permit holder	Dow Silicones UK Limited				
Regime	Installations				
Date of assessment	07/02/2018	Time in	10:00	Out	17:00
Assessment type	Report/Data Review				
Parts of the permit assessed	Emissions, noise, abatement				
Lead officer's name	Leakey, Antony				
Accompanied by					
Recipient's name/position	Judith Sartor/ Environmental Specialist	Date issued	25/04/2018		

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	C3	1.1.1
C2 - General Management - Management system and operating procedures	C3	1.1.1
E1 - Emissions - Air	A	
E3 - Emissions - Surface water	A	
E5 - Emissions - Waste	A	
F2 - Amenity - Noise	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	2	Total compliance score (see section 5 for scoring scheme)	8
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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 Silicones UK Ltd Site Visit Report - 7/2/18

W922 MeH cyclics process scrubber HCl release

During plant start up on 3/12/17 Draeger tube testing of the vent indicated elevated HCl emissions at over 20 ppm, approximately double the 10 mg/m³ ELV. Feed rates were reduced but re-testing still gave elevated results up to 15 ppm and the plant was shut down for investigation.

It was found that chlorine, rather than HCl tubes were used for the testing, so the results cannot be relied upon, although the result for chlorine is unexplained.

ACTION: Dow Silicones to consider chlorine result and update at next site meeting.

The scrubber packing was found to have formed a channel down the centre of the column. This was partly due to insufficient packing levels being maintained and due to excessive gelling enabling the packing to cement together to form a stable channel. High nitrogen purge flow during start up may also have contributed to the gas channelling.

Procedures have been implemented to ensure that the correct packing fill level is maintained after shutdowns and stocks of the correct type, size and material grade of packing have been obtained.

The excessive gelling was due to carry over of siloxanes as a fridge unit was not operational. An interlock requiring the fridge to be operational before the plant can start up has been implemented. Consideration should be given to other plants that may require interlocking of separation units (fridges, knock out vessels and scrubbers with by-pass arrangements) to prevent overloading of abatement.

The packing size (25 mm Pall rings) is appropriate to the column diameter (<0.3 m). The operating point of the scrubber column relative to the flood point is not known and may contribute to disturbance of the packing during start up.

ACTION: Dow Silicones to consider W992 scrubber operating point during high purge flows and the need for other plant interlocks on site and update at next site meeting.

The scale of the release is unknown but expected to be minor due to the high solubility of HCl and the scrubber water spray is expected to be effective even without an efficient packed bed, so no breach of permit condition 3.1.1 is considered to have occurred on this occasion.

The associated management system failures relating to management of Draeger tube testing procedures, interlocking of environmentally critical plant and implementation of scrubber maintenance procedures are a category 3 breach of permit condition 1.1.1.

W941 pressure relief impact assessment

The main distillation process pressure relief arrangements and associated air quality impact assessment were reviewed to understand any implications for the Welsh Air Quality in Major Incidents service operated by NRW, Public Health Wales and Public Health England.

In the unlikely event of column pressure rising above design a main PRV is provided that is sized on worst case fire engulfment. This venting is unabated to ensure reliability in case of gel blockage; however, the potential off-site impact is significant (ERPG-3 exceeded at 300 m), but very unlikely.

To mitigate the impact associated with this main venting rate a lower pressure and vent rate PRV is also provided to address all scenarios other than fire engulfment. This vent is also unabated, but the predicted air quality impact remains below ERPG-2 and the likely duration of an incident would allow shelter-in-place advice to be adopted by the emergency services.

This impact assessment data was not available in either the PPC (now EPR) application or the COMAH safety report for the Barry site. The information is now available on the NRW inspection file (3) and Dow Silicones should consider making the information readily available in their emergency response information files.

Note that the modelling work has not been assessed in detail and consideration should be given to the benefits of updating the assessments using the latest modelling packages.

During inspection of the PRV and venting location at the top of the distillation plant it was noted that the vent line liquid disengagement arrangements might result in liquid entrainment. Any implications for venting rate and off-site impact should be reviewed.

ACTION: Dow Silicones to consider the above points and provide an update at next site meeting.

W949 ERU excess methyl chloride feed

On 15/10/17 the MeCl venting rate to the ERU was allowed to exceed the internal procedural limit of 180 kg/hour for 14 hours. A key fridge unit was not available to condense MeCl in the site start up nitrogen purge streams and the estimated venting rate was 300-600 kg/h.

ERU release Draeger tube readings were taken but not recorded in the shift log and the MeCl vent flow readings were not believed by the plant operators, as requests were made to check the flow meter. The flow meter reading was then disregarded when declared to be accurate.

Indicative emission levels were 15-20 ppm HCl and 8 ppm chlorine.

Normal start up procedure uses a lime tanker to capture acid species emissions associated with high nitrogen purge rates but was not available on this occasion and may have contributed to the confusion in managing ERU feeds. The incoming day shift quickly recognised the procedural failure and took rapid action to reduce venting rate. This suggests that there are training and experience gaps for some process operators.

Process data recorded during the event show that the ERU caustic chlorine abatement scrubber pH dropped to 6.2 for a period of approximately 8 hours. It is likely that the chlorine release was in the region of 10-50 mg/m³, i.e. up to 5 times the ELV.

The water scrubber process data indicates that HCl absorption capacity is likely to have been sufficient to cope with the additional loading, particularly as the caustic scrubber pH only dropped

to a pH of 6.2, perhaps indicating that some HCl absorption was occurring there.

Air quality impact assessment for estimated level of chlorine releases suggests that chlorine ground level concentrations were still well below the short term environmental assessment level (<10%) and any off-site impact will have been minor.

The release is unlikely to have affected the annual average significantly and therefore is not considered to be a breach of permit condition 3.1.1. The associated management system failures relating to training and implementation of procedures are considered to be a category 3 breach of permit condition 1.1.1 due to the potential for a longer period of operation over more than one shift.

A review of interlocks and layers of protection for environmentally critical processes and plant is to be undertaken. The provision of CEMs on the ERU vent is also to be considered. This may become a requirement in the WGT Bref.

W204 compounding process vent

New dust extraction plant is to be installed along with additional peroxide storage. This will add a new release point.

The impact is expected to be negligible and a permit variation ahead of proposed changes is not considered to be necessary. However, recent interest in the associated planning application will require the changes to be incorporated into the permit reasonably quickly.

It is suggested that an update for the original PPC application is drafted for review and a minor technical variation application submitted if appropriate.

W952 chemical sewer manhole testing

280 manhole structures have now been water head tested. 9 of 70 capped outlets failed leak tests due to joint failures. Next checks will test high level caps. Genesis plant area is being prioritised. Borehole sample data in the region of the failures is to be checked for evidence of groundwater contamination.

ACTION: Dow Corning to provide an update at next site meeting.

Noise complaints update

No significant noise sources have been identified that require further abatement. However, the monitoring work does suggest some areas that might result in improvements through simple measures. Equipment and materials handling by fork lift truck and other means may be improved if personnel are trained in quiet handling techniques, particularly for activities taking place during the night. Actuator air venting may also be a noticeable noise source at night and fitting of silencing vents on some actuators near sensitive locations may reduce effects during periods when residential windows are open.

ACTION: Dow Silicones to consider the above points and provide an update at next site meeting.

River Cadoxton Abstraction – Eel Regulation Compliance

Cost-benefit assessment shows that best practice screening and alternative measures are not viable. The next stage is consideration of alternative measures implementation by other means, including habitat improvements in the affected river catchment.

The Environment Agency guidance for alternative measures implementation by other means identifies a cost for improvements of £30,000 for an abstraction rate of less than 30,000 m³/day affecting less than 30 km of catchment above the tidal range.

An outline scope and costing of habitat improvement works will be developed by NRW and provided to Dow Silicones to support approval of the capital release to the Rivers Trust overseeing implementation of the works. This work is likely to take time and so the current exemption notice is extended until the end of 2018.

W410 vent A78 temperature

Control modifications to limit kettle boil up rate are complete. Further plant optimisation is taking place to reduce nitrogen purge rate. Elimination of the xylene associated with the raw material is not currently feasible.

W949 ERU residence time trials – IC34

A revised date for completion needs to be agreed, including discussion on optimisation of methyl chloride venting and DPR recovery rates.

ACTION: Dow Corning to provide a revised completion date at next site meeting.

LDAR

A review is to be undertaken with Dow personnel in the US where operational sites do use LDAR. This will enable potential benefits for the Barry site to be understood.

ACTION: Dow Corning to provide an update at next site meeting.

W941 reboiler failure

Detailed analysis of the corrosion mechanism has not yet been undertaken. It was noted that the corroded reboiler was being sent off for inspection at the time of the site visit.

ACTION: Dow Corning to provide an update when details are available.

Monitoring returns and notification review

It is agreed that annual reporting, including the annual performance report under condition 4.2.2 can be submitted by 31 March following the reporting year.

The annual monitoring review report for 2017 shows some parameters with upward trends that are stated to be “in control”. More commentary should be included in future reports to explain any trends and justify any increasing emissions.

A high final effluent methanol release was reported on 5 March 2018, potentially due to extremely cold weather conditions and associated plant shut downs. **Details of the release and causes will be followed up at the next site visit.**

High suspended solids released from the surface water system (W1) in March 2018 was related to the heavy snow fall event at the start of the month flushing solids from the site surface drainage system. The bulk of the water was treated through the site waste water treatment plant. There was no breach of the permit emission limit.

The elevated chlorine result of 21.858 mg/m³ from ERU release point A41 for 23 October 2017 was due to a period of caustic scrubber supply shortage. The annual average chlorine release remained well below the emission limit value. **Details of the caustic supply issue and causes will be followed up at the next site visit.**

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

END

EPR Compliance Assessment Report

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Site	Barry Silicone Plant	Permit Ref	BR9685IX
Operator/Permit holder	Dow Silicones UK Limited	Date	07/02/2018

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			
C2	C3	A review of interlocks and layers of protection for environmentally critical processes and plant is to be undertaken.	16/05/2018
B1	C3	Dow Silicones to consider W992 scrubber operating point during high purge flows and the need for other plant interlocks on site and update at next site meeting.	16/05/2018

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.