

Compliance Assessment Report CAR_NRW0044531

Permit being assessed: BR9685IX.

For: Barry Silicone Plant, **held by:** Dow Silicones UK Limited

At: Cardiff Road, Barry, Vale of Glamorgan, CF63 2YL.

Type of assessment: Audit,

Reason: Routine.

On: 21/05/2024 between 09:00 and 16:00.

Parts of permit assessed: Energy, Raw Materials, Waste .

NRW Lead Officer: Geraint Harris.

Report sent to: Jude Sartor, Environmental Specialist , on 12/06/2024.

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

Part of permitted activity assessed (compliance criteria)	Assessment result	Permit condition
IR3A - Installations - Emissions and monitoring - Emissions to water, air or land	Assessed (A)	
IR4B - Installations - Information - Reporting	Assessed (A)	
IR3E - Installations - Emissions and monitoring - Monitoring	Assessed (A)	
IR1C - Installations - Management - Energy Efficiency	Assessed (A)	
IR1D - Installations - Management - Efficient use of raw materials	Action only (X)	
IR1E - Installations - Management - Avoidance, recovery and disposal of wastes produced by the activities	Assessed (A)	
IR3B - Installations - Emissions and monitoring - Emissions of substances not controlled by emission limits	Action only (X)	

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

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

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

2. What action is required?

Criteria	Action needed	Complete by
IR1D	Rectify this loss of nitrogen	21/08/2024
IR3B	An additional ad hoc inspection of the Bondstrand chem sewer drainage pipework is recommended to ensure that deterioration of some lower grade sections is not accelerating and to investigate if there has been any ground/groundwater contamination in the area.	21/08/2024

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

3. What will happen next?

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

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

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

4. Details of our assessment

Dow Silicones

EPR/BR9685IX

Q1 2024 Monitoring Returns

The Q1 monitoring returns were submitted on time. All results were found to be compliant. This report has been accepted.

Q4 2023 Annual Reporting

Action 2 of CAR Form CAR_NRW0043591 required Dow to resubmit their Q4 monitoring return with the maximum values for PM, CO, Oxides of Nitrogen and Dioxins and furans for emission point A41. This has now been received and the action considered complete.

Annual Performance Report (P.C 4.2)

NRW received Dow's performance report, required under permit condition 4.2.2, by the required deadline. The report includes details of Dow's performance during 2023. SPC charts have been provided for all analytical monitoring carried out for releases to air and water. The SPC charts reflect the monitoring return data provided throughout 2023. Production was slightly lower in 2023 versus 2022, this is reflected in the quantity of waste produced which is lower than previous years. This report has been accepted.

Q1-2024 Landfill Groundwater Sampling Results

The Q1 groundwater sampling results were submitted to NRW. The results show no significant Copper or TMS concentrations or fluctuations during the quarter.

ERU Update

It was thought best to answer action 1 of CAR Form CAR_NRW0043591 during the next site meeting. Consequently, the response to this action was provided during a site visit that took place on the 21st of May 2024. Dow provided an update on the work being undertaken to control the particulate emissions from the ERU. These emissions have been compliant to date throughout 2024. Since the previous CAR Form was issued (CAR_NRW0042477), Dow have continued their investigations and utilised the information from the new FBR final vent analyser, within the CRU, as well as the research being undertaken at lab scale in Midland, USA. In the previous car form, it was mentioned Dow were planning on investigating the CRU reactor bed change out frequency/maintenance. Consequently, Dow have identified certain hydrocarbon-based substances within their process which appear to affect the reactivity of their catalyst. This catalyst converts hydrosilanes into useful chlorosilanes. Any unconverted chlorosilanes end up being combusted in the energy recovery unit (ERU) which results in the formation of silica powder that fouls the ERU and ultimately results in high PM emissions. Consequently, Dow are investigating how they can limit the reduction in catalyst reactivity going forward.

Action: Dow to provide an update in the next compliance meeting.

HCL Release From W953 Wash Bay

Progress on the actions stipulated within Dow's root cause investigation for the release of HCL from the W953 Wash Bay was provided by Dow's RCI Facilitator / Responsible Care Director. During the presentation she described how the incident came about and how changes to the bundle dismantling process had changed over the years. Previous operations had involved the use of handheld disc cutters to cut up the tube bundles, however, given the obvious safety concerns with operators utilising such devices, it was decided larger more remote methods would be more appropriate. Therefore, an excavator fitted with shears was utilised, however, due to the large size of the shears, more of the unquench material was exposed to the atmosphere than previous, which resulted in unquenched material being released onto the hardstanding and reacting with moisture in the air. During this discussion it was clear that Dow are fully aware of the hazardous involved with this process and it was made clear that the relevant procedural changes have been put in place to avoid a similar incident happening during the next bundle disposal operation. No further actions are being considered.

Outstanding Actions

The following actions are still outstanding. Please provide a response by the next compliance meeting.

Action 3: Please provide details on your process for reviewing emissions sources to check for unaccounted vents/release points. **Due 19th April.**

Action 4: This new vent was found on this occasion because of preparation for the Bref review, but these come around very infrequently. Does Dow look at this aspect when undertaking periodic PHRs, re-HazOps, delta-HazOps and other process/plant technical reviews? **Due 19th April.**

Energy Efficiency

Dow have a permit condition (1.2) requiring them to take appropriate measures to ensure that energy is used efficiently within their activities. This condition also requires Dow to review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities and to take

any further appropriate measures identified by this review.

Operators will satisfy the requirements of this permit condition if they meet either:

- The basic energy requirements stipulated in the How to Comply with Your Environmental Permit and are a participant to a Climate Change Agreement (CCA); or
- The basic energy requirements and energy supply techniques stipulated in the How to Comply with Your Environmental Permit.

These basic energy requirements are listed on pages 54 to 55 of the How to Comply with Your Environmental Permit guidance. The information required under this permit condition is considered by Dow to be proprietary information and there has been a long-standing confidential agreement between Dow and NRW that this information is kept off the public register. However, there is still a requirement for Dow to satisfy permit condition 1.2 in its entirety. Consequently, the information required to satisfy this condition was presented on the 21st of May 2024. Although Dow silicones and Dow CHP have separate permits their integration means when reviewing and discussing energy efficiency it is easier to discuss both sites as one. During the presentation Dow presented numerous trends on energy use and were able to explain these trends and demonstrate a good understanding of their energy fluctuations over the past years. Dow also demonstrated awareness of the pinch analysis methodology for reducing energy consumption of processes by calculating feasible energy targets (or minimum energy consumption) and achieving them by optimizing heat recovery systems, energy supply methods and process operating conditions. Dow have also participated in the phase 1 and 2 Energy Savings Opportunity Scheme (ESOS) audits, which are a mandatory energy assessment scheme set up by the UK government in response to the EU's 2012 Energy Efficiency Directive. Dow explained that senior management commitment and awareness of energy efficiency is demonstrated through their routine Vents Process & Cost Efficiency (PACE). During the meeting Dow made it clear that since they are a high energy user, energy efficiency is at the forefront of their operational decisions. Upon conclusion of their presentation, it was clear that Dow are satisfying the requirements of permit condition 1.2.

Efficient use of Raw Materials

Much like their energy efficiency permit condition, Dow have a confidential agreement with NRW with regards to relating their raw material usage to the tonnage of finished products. However, this was shared in person through a series of presentations on the 21st of May at the Dow Silicones offices. Instead of a 4-year review Dow maintain an ongoing live analysis of their raw material usage. Dow demonstrated good awareness of the raw material usage for each individual process on their site and explained that fluctuations are discussed during their routine PACE meetings.

Due to the size of operations at the Barry site, Dow utilise a significant volume of different raw materials. Dow already have a system in place where waste HCL from Cabot is fed back into their operations, replacing the need for virgin material. Furthermore, Dow utilise a number of heat exchange systems to ensure steam/heat is recovered for use on site. Dow are looking to re-instate their river water abstraction system (Eel Regs compliant) which will reduce their reliance on the Biglis Well and towns water. Other areas that were discussed was the use of treated effluent for different onsite processes including the lime slacker. However, these are not imminent projects. One area that doesn't represent efficient use of raw materials was noticed during the latest COMAH Competent Authority Inspection Report (24/04/2024). During this inspection it was noticed that the nitrogen purge flow meter (FI 222) into 3601 vent was found to be off scale with the ball valve fully open and the needle valve badly corroded. The senior operator confirmed that a maintenance note had been raised to rectify this. The relevant P&ID does not show an orifice plate is installed in the nitrogen supply to limit maximum flow. This represents a waste of nitrogen if the flow rate is significantly higher than the

design rate.

Action: Dow to provide an update on rectifying this waste of Nitrogen at the next compliance meeting.

Avoidance, Recovery and Disposal of Wastes Produced by The Activities

Dow's Waste Manager gave a presentation on Dow's strategy for handling waste. Due to the size of the operations at Barry, Dow generate significant volumes of waste. Dow's annual report shows that they are clearly aware and in control of the different types and quantities of waste they produce. Where possible Dow strive to reduce the volume of waste entering landfills through recycling, recovery and energy recovery. In the past Dow have had a zero to landfill policy, however, it was found that some of the waste had a determinantal effect on the receiving incinerators and so as it stands some waste has to enter a landfill. However, the volume of waste entering landfill has reduced year on year. Dow have a dedicated team in charge of waste at their site and waste is recorded within their Pi system. This team are fully aware of the disposal and recovery options both locally and internationally and are continuously looking for recovery-based outlets for their waste. Dow also maintain an excellent duty of care policy for waste. Waste quantities for each department are discussed in the routine PACE meetings and so fluctuations are quickly and easily identifiable.

From 6th of April 2024, all workplaces in Wales must comply with new recycling legislation, designed to improve the quality and quantity of recycling. Dow explained how they are compliant with these regulations and were able to show examples during my walk across the site.

Drainage Inspection

The most recent COMAH competent authority inspection report, undertaken on the 24th of April, states "Drainage inspection by CCTV report has been undertaken across most of the network, with limited gaps at the valve pits and adjoining pipes in W712 loading bay/pump area, and the frequency for some sections is quite low (>10 years). Some erosion of Bondstrand lining is indicated in one section and manhole C812 close to W809 spill pond had a full circumferential pipe fracture defect recorded in 2013. A patch repair was carried out in 2016 and follow up inspection is required to ensure that no ground/groundwater contamination has occurred. This aspect will be followed up as an EPR16 matter."

An additional ad hoc inspection of the Bondstrand chem sewer drainage pipework is recommended to ensure that deterioration of some lower grade sections is not accelerating.

Action: Please undertake a follow up inspection to ascertain if there has been any ground/groundwater contamination in the immediate area. Dow to provide an update at the next compliance meeting in August.

End.

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

Important information

Legal status of this report

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

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

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

To correct non-compliance, we may:

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

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

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

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

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

How we use assessment scores

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

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

If your assessment result in Section 1 is suspended, what does this mean?

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

Full list of Industry compliance criteria (used in section 1 and 2):

1. Management

- IR1A – General management
- IR1B – Finance (only applicable to Landfill)
- IR1C – Energy efficiency
- IR1D - Efficient use of raw materials
- IR1E - Avoidance, recovery and disposal of wastes produced by the activities
- IR1F - Multiple operator installations

2. Operations

- IR2A – Permitted activities
- IR2B – The site
- IR2C – Operating techniques
- IR2D – Technical requirements
- IR2E – Improvement programme
- IR2F – Pre-operational conditions
- IR2G – Landfill engineering (only applicable to Landfill)
- IR2H – Waste acceptance (only applicable to Landfill)
- IR2I – Leachate levels (only applicable to Landfill)
- IR2J – Closure and aftercare (only applicable to Landfill)
- IR2K – Landfill gas management (only applicable to Landfill)

3. Emission and Monitoring

- IR3A – Emissions to water, air or land
- IR3B – Emissions of substances not controlled by emission limits
- IR3C – Odour
- IR3D – Noise and vibration
- IR3E – Monitoring
- IR3F – Pests
- IR3G – Air quality management plans
- IR3H – Monitoring for the purposes of the Industrial Emissions Directive (this heading includes Large Combustion Plants)
- IR3I – Fire

4. Information

- IR4A – Records
- IR4B – Reporting
- IR4C – Notification

Enforcement response

Any non-compliance with a permit condition is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or

suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice

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

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

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

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

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

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

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

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

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

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

Welsh Language Standards

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