

Compliance Assessment Report CAR_NRW0043591

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: Report/Data Review,

Reason: Routine.

On: 31/12/2023.

Parts of permit assessed: Monitoring Returns.

NRW Lead Officer: Geraint Harris.

Report sent to: Jude Sartor, Environmental Specialist , on 23/02/2024.

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

| Part of permitted activity assessed (compliance criteria) | Assessment result | Permit condition |
|---|-------------------|-------------------------|
| IR3A - Emissions and monitoring - Emissions to water, air or land | C3 Minor | Permit Condition 3.2.1 |
| IR3A - Emissions and monitoring - Emissions to water, air or land | C3 Minor | Permit Condition 3.2.1 |
| IR3A - Emissions and monitoring - Emissions to water, air or land | C4 No impact | Permit Condition 3.1.2 |
| IR1A - Management - General management | C3 Minor | Permit Condition 1.1.1. |
| IR4B - Information - Reporting | Assessed (A) | |
| IR1C - Management - Energy Efficiency | Assessed (A) | |
| IR1D - Management - Efficient use of raw materials | Assessed (A) | |
| IR1E - Management - Avoidance, recovery and disposal of wastes produced by the activities | Assessed (A) | |
| IR3E - Emissions and monitoring - Monitoring | Assessed (A) | |

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

| Total non-compliances recorded | Total non-compliance score |
|--------------------------------|----------------------------|
| 4 | 12.1 |

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 |
|----------|---|-------------------|
| IR3A | Please resubmit your Q4 monitoring return with the maximum values for PM, CO, Oxides of Nitrogen and Dioxins and furans for emission point A41. | 19/04/2024 |
| IR3A | Action 1: During 2023 it looks like the elevated PM emissions occurred when the CRU tripped. NRW would like to know the following: • How often did the CRU trip throughout 2023? • Since it looks like the CRU tripping is related to elevated PM what is Dow's plan to remain within the PM ELV going forward? • Do Dow intend to carry out any additional PM monitoring in 2024? | 19/04/2024 |
| IR3A | Ensure this vent is analysed and reported at the same frequency as similar vents i.e. quarterly and that the mass emissions are added to the total annual mass emissions reported from the site. Dow can then apply to vary it into the permit at the next available opportunity. | Already completed |
| IR1A | Action 3: Please provide details on your process for reviewing emissions sources to check for unaccounted vents/release points. 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? | 19/04/2024 |

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.

You are non-compliant with your permit.

At this time, we are issuing you with a warning for the non-compliance recorded above. Warnings may influence future enforcement response for continued or further non-compliance.

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

Q3 and Q4 Returns

The Q3 returns have been reviewed and found to be compliant with the permit.

The Q4 returns were found to be within the permitted emission limits except for particulate matter for emission point A41 (ERU) please see section titled ERU below.

2023 Annual Reporting

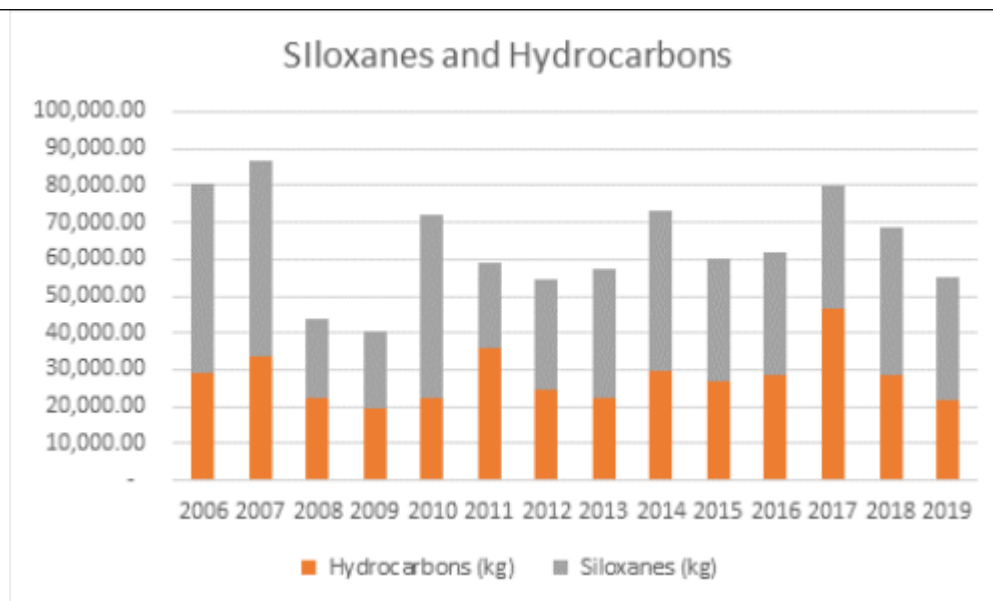
Dow experienced lower production in 2023 which has led to lower production dependant wastes. The only hazardous waste which was higher in 2023 vs 2022 was solvent siloxane. Increases in non-hazardous waste were bio-sludge, which was increased during the site turnaround to ensure the health of the biomass, scrap metal due to demolition and cardboard due to the use of kegs of gum sourced from the US due to a planned outage of the gum unit in Barry. The use of water increased in 2023 when compared with 2022 and 2021 and was the 7th lowest in the previous 15 years. Energy usage increased in 2023 when compared with both 2022 and 2021. However, the 2023 usage was still the third lowest in the previous 15 years. No specific usage data was provided with this report as previously agreed with the operator. A review of such data will be undertaken in 2024.

Schedule 5's**A65 - No sample to taken as required by permit 09/01/2024.**

Dow reported that for emission point A65 the unit only ran for 9 days in October and 15 days in December. When attempting to sample in December it was identified that the required scaffold access platform had been removed to allow for the statutory inspection of the vessel during the site shutdown. As soon as it was identified that the scaffold access was required the request was made but was not in place before the unit was shut down again due to lack of feeds. The unit started back up during the nightshift of the 6th of January and the sample was taken on the morning of 8th of January once the process was fully operational.

Dow are currently designing a way of creating a permanent access platform whilst still being able to access required manways and pipework. This will prevent the need for temporary scaffold, which may get removed or altered. Emission point A65 does not have an individual emission limit but instead falls within the current 'bubble' permit limit of 150,000 Kg for hydrocarbons (including siloxanes and Silanes). Based on previous years emission quantities (Graph 1) this limit is nowhere near being exceeded and so it is extremely unlikely that the missed monitoring would have missed a permit exceedance. Furthermore, Dow was able to rearrange the monitoring within 8 days of the end of the quarter which showed typically low levels of Siloxanes, therefore this is not considered a breach of the permit.

Graph 1



Energy Recovery Unit (ERU) High Particulate Matter

The incident involving the ERU is detailed in CAR Form CAR_NRW0040390 and involves elevated particulate matter (PM) emissions. Dow are required to monitor PM emissions once annually but remain within their 10mg/Nm3 limit all year round. In order to ascertain the root cause of for the elevated PM, Dow have undertaken additional process related sampling. This sampling has been undertaken inhouse and the results are displayed below.

Full hourly sampled data

| Report | SM ID | Date of sample | Time of sample | Particulates result | Comment |
|--------------|---------|----------------|----------------|---------------------|--|
| ERU-22022023 | 2386656 | 22/02/2023 | 14:15-15:15 | 17.69 | Phoenix running, and CRU tripped overnight |
| EMT-05529 | 2388873 | 01/03/2023 | 11:08-12:08 | 1.98 | |
| ERU-16032023 | 2392843 | 16/03/2023 | 13:42-14:42 | 1.07 | |
| EMT-05769 | 2398360 | 05/04/2023 | 11:03-12:03 | 0.19 | |
| EMT-06223 | 2423640 | 14/06/2023 | 09:45-10:45 | 3.11 | |
| EMT-06409 | 2433536 | 05/07/2023 | 13:39-14:39 | 1.7 | |
| ERU-19072023 | 2427773 | 19/07/2023 | 13:58-14:58 | 1.11 | |
| EMT-06644 | 2442117 | 08/08/2023 | 11:22-12:22 | 2.03 | |
| ERU-16082023 | 2435948 | 16/08/2023 | 10:13-11:13 | 1.94 | |
| EMT- | 2446787 | 06/09/2023 | 11:10- | 1.87 | |

| | | | | | |
|--------------|---------|------------|-------------|--------|--|
| 06840 | | | 12:10 | | |
| ERU-14092023 | 2444164 | 14/09/2023 | 13:47-14:47 | 6.98 | |
| EMT-07427 | 2462425 | 27/10/2023 | 12:10-13:10 | 8.41 | |
| EMT-07570 | 2462426 | 07/11/2023 | 12:50-13:50 | 0.36 | |
| ERU-23112023 | 2462427 | 23/11/2023 | 11:22-12:22 | 27.063 | Phoenix running, SiH4 in vent stream and CRU tripped overnight |
| ERU-13122023 | 2468069 | 13/12/2023 | 11:33-14:47 | 0.49 | |

Any monitoring in excess of what is required by the permit is not recorded on CCS, though you would record your assessment on a CAR form. We will enter one non-compliance for each limit value that is breached during a quarter, regardless of reporting period. If data is submitted at six monthly or annual intervals, we should assess it as if it was submitted quarterly. We consolidate scores for each quarter, so there could be two non-compliances for six monthly data, and four for annual data. Where a non-compliance with a permit/licence condition has previously been identified, and a permit holder is actively trying to address the issue, it may be appropriate to suspend subsequent scores. Suspended scores do not count towards calculating the compliance band or subsistence charges for a site. Each non-compliance must still be recorded on CARS with an explanation of why the score is suspended. We may also suspend scores if the permit holder has agreed a voluntary improvement plan with us. We only suspend scores for a maximum of six months under a voluntary improvement plan. Unless there is a statutory notice in place, the suspension of scores is at our own discretion. It is not a right and we are not obliged to suspend scores.

The initial noncompliance occurred in February 2022 (Q1). Since there was a plan in place to bring the site back into compliance and analysis had demonstrated that the air quality standard was not breached, NRW suspended the additional scores for a maximum of 6 months (end of Q3 2022). Therefore, in 2022 there were no additional non-compliances scores related to this incident. However, in CAR form CAR_NRW0040776, the following was stated “any exceedances going forward will need to be reviewed and additional scores applied. For example, if the testing undertaken on the 31st of Oct, 4th Nov and 8th December 2022 all exceeded the permit ELV a consolidated score of 1 x CAT 3 would have to be applied due to this being outside the 6 month window”. In this instance the monitoring undertaken on the 31st of Oct, 4th Nov and 8th December 2022 were all compliant. However, the inhouse testing, undertaken in 2023, used as part of Dow’s investigatory work to try to identify the causes of high PM, resulted in ELV exceedances on the 22/02/2023 and 23/11/2023. These samples were taken when the CRU had tripped off overnight and Dow were keen to sample to understand the effect this had on the PM emissions.

NRW appreciate all the work being undertaken to try to improve their understanding of high particulate emissions from the ERU. However, with the suspension period finished and the ERU still experiencing intermittent elevated PM emissions we have to score ongoing noncompliance in line with our noncompliance guidelines. The limit is 10mg/Nm3 and should be complied with all year round. **Consequently, two category 3 noncompliance scores are being issued against permit condition 3.1.2. once for quarter one and once for quarter four of 2023.** PM emissions were lower in 2023 than the initial incident. During the initial investigation and the subsequent modelling of the elevated particulate matter the air quality standard related to particulate matter was not breached, therefore these lower 2023 exceedances are considered no higher than a Category

3 noncompliance.

Action 1: During 2023 it looks like the elevated PM emissions occurred when the CRU tripped. NRW would like to know the following (**Due 19th April**):

- How often did the CRU trip throughout 2023?
- Since it looks like the CRU tripping is related to elevated PM what is Dow's plan to remain within the PM ELV going forward?
- Do Dow intend to carry out any additional PM monitoring in 2024?

Action 2: Please resubmit your Q4 monitoring return with the maximum values for PM, CO, Oxides of Nitrogen and Dioxins and furans for emission point A41. **Due 19th April.**

Tank 225

During 2023 Dow identified a new emission point from the outlet of Scrubber 227 on the vent of Tank 225 within W705. This emission point was discovered during Dow's preparatory work for the upcoming Common Waste Gas BREF. This hasn't been newly installed, instead it was just missed during previous assessments and variations. NRW's guidance on how to assess and score noncompliance at regulated sites states that if an operator adds a new emission point which is discharging a polluting material and neither emission point nor parameter is specified in the permit, the non-compliances should be scored under both:

- Emissions to air, water and land (for the emission point) and
- Emissions of substances not controlled by emission limits (for the parameter).

However, Dow identified the emissions from this vent to be VOC's (Siloxanes) which has an annual mass limit 150,000kg from the sites vents. Therefore, the emissions of substances not controlled by emission limits does not apply. Dow have tested this new emission point twice and have recorded the following results:

- 11th July 2023 – 99237 mg/m³ - 90g/hr
- 1st September 2023 – 3481 mg/m³ – 3g/hr

Although these sample concentrations are high, the vent flowrate for both sample is very low with the largest being 90g/hr. Work is being undertaken by Dow to establish the different running conditions for these two samples. Additionally, Dow have undertaken a H1 assessment for this release point, which resulted in an 'insignificant' determination for both the short term and long term EAL (assuming the EAL for Toluene, as there is not one for siloxane). The annual mass emissions from the unauthorised/uncharacterised vent will not result in the total annual mass emission limit (150,000kg) being exceeded under the worst-case conditions. **Consequently, a category 4 noncompliance (Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property) is being issued against permit condition 3.1.2.**

Where we identify a noncompliance, we must investigate a root cause. NRW's guidance on how to assess and score noncompliance at regulated sites states if the operator adds an extra emission point or fails to notify us of an emission point at the application stage, also score as root cause under operating techniques, and/or general management. For this incident a noncompliance is being issued against the general management condition for having an EMS that failed to account for all emission points within the site boundary. **Consequently, a category 3 noncompliance is being issued against permit condition 1.1.1.** However, it is still important to understand why it was missed and if there is any risk of any other vents being missed.

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.**

Dow have reported within their Schedule 5 Notification that a new purpose-built sample point is being designed and installed to make sampling this tank easier in the future and allow a flow measurement to be taken at the same time. Due to low impact of this emission on both the environment and the total VOC annual emission, NRW recommend that this vent is analysed and reported at the same frequency as similar vents i.e. quarterly. Dow can then apply to vary it into the permit at the next available opportunity.

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.