

Industry & Waste Regulation Team
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Date: 31st January 2021

Subject: Solutia UK Ltd, Newport Chemical Complex – EPR Permit Number: BR9715IB
Permit Condition 4.2.2 – Annual Activity Performance Review

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to NRW by 31st January (or other date agreed in writing by NRW) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;*
- (b) the annual production / treatment data set out in schedule 4 table S4.2;*
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule*

As such the following should serve as interpretive commentary on the annual Permit forms submitted for the preceding years performance

Table S4.1 - Reporting of Monitoring Data

Emissions to Air

Throughout 2020, Boiler 16 (main duty boiler) continued to operate in CHP configuration in conjunction with the Gas Turbine unit. The unit operated without significant outage for the year, and also benefitted from operation of a Condensing Economizer (heat recovery) unit throughout the majority of the year. This serves to improve the overall efficiency of the CHP unit by using waste heat for pre-heating boiler feed-water. The statutory emissions tests were all within the NO_x and CO emissions limits, although a Notification was submitted for a failure of a water injection device, which temporarily resulted in slightly elevated NO_x emissions. Boiler 14 (the back-up unit) did not operate for more than 14 days, and so was not required to be monitored

Chloromethane emissions from the Dequest operation was comparable to previous years, with the spot samples continuing to be somewhat variable due to the range of grades being manufactured. HCl emission were also typically low consistent with previous years

Benzene is released from the Benzene storages via conservation vents. As vapour return is utilized when filling, the main cause of releases to atmosphere are breathing losses i.e. when the temperature fluctuates (day & night) a quantity of benzene vapour is released. Emissions are comparable with previous years. One difference is that the Benzene day-tank was taken out of service (currently mothballed) part

way through the year (~Q3), meaning that emissions from this release point are proportionally lower due to reduced operating time

Emissions from the Therminol Pyrolysis Furnaces are subject to a Permit Improvement Item for NO_x, due to elevated emissions having been observed. This continued to be the case throughout 2020, however the first phase of burner upgrades was completed on the TH2 plant, meaning that the emissions went from a non-compliant position (i.e. >200mg/Nm³) down to a measured concentration of 55.7mg/Nm³ as part of a larger upgrade project. The next phases of upgrades to the x2 TH3 Pyrolysis Furnaces are scheduled to take place in the latter part of 2021. The benzene emissions from these Pyrolysis furnaces were found to be typically low, and the smaller Biphenyl & Santowax furnaces on TH3 were similarly compliant with the NO_x limits for the year

In addition to the above point source releases, a Notification was submitted for a release of some 28.5kg of material from the 'crude polyphenol' storage tank. This being captured within the annual emissions data for reporting to the Pollution Inventory

Emissions to Water

Emissions to water were reported on a quarterly basis for the permit listed parameters. In contrast to the x4 Notifications for PCP in effluent in 2019, there were no breaches of any emission to water limits. That said, a Notification was submitted near the end of 2020 due to Surface Water being discharged via 'W2' during the 'cease discharge' period - this was as a result of heavy rainfall, and the need to prevent site flooding. There were similarly no exceedances to any emission limit during this period

With regard to PCP emissions specifically, the improvement mentioned above is largely considered to be due to the Reed Bed Treatment System which operated throughout the year. Regular testing of this new facility indicated PCP contaminant concentrations in the area were reducing over time, although a reduction in treatment efficiency was noted near the end of 2020, which will hopefully be addressed in the 01/2021 maintenance visit

COD discharges remained comparable with previous year, within limit(s) but higher than historically due to the bio-treatment plant being mothballed in 2017 alongside the cessation of the Santicizer process. Other parameters remained within specification with no appreciable change in trends noted

Greater Crested Newts

GCN's (Greater Crested Newts) reporting was done in 2018, and survey reporting is on a 5year cycle. As such, there is nothing additional to report presently

Table S4.2 – Annual Production / Treatment

Production of Chemicals

Production tonnage was reported in the annual Permit Returns, and for 2020 amounted to 93243 tonnes. This is comparable to previous year(s), but slightly reduced due to the (limited) impact of; Brexit preparations and Covid. Production tonnage is used in a range of metrics to help better evaluate ongoing environmental performance

Table S4.3 – Performance Parameters

Effluent COD

The P1 Returns form shows ongoing COD emissions expressed as kg/t. This is broadly comparable to recent years (albeit a slight increase), and there is an observable step-change increase in 2017 corresponding to the mothballing of the Bio-Treatment Plant that year

Effluent Toxicity

Effluent Toxicity (NOEC) has not been monitored or reported since 2015 following the end of an agreed toxicity monitoring campaign in 2014. This showed that with both; the Formose Plant, and the Bio-Treatment plant operating (treating formaldehyde & phenol respectively), the toxicity level was deemed insignificant

VOC

As per the other metrics, VOC kg/t is similarly tracked over time, and the results are comparable over the measurement period. An additional decimal place has been quoted since 2015, which gives a number for comparison rather than a <0.1 kg/t stated previously

PCOP

PCOP (Photochemical Ozone Creation Potential) shows a general longer term declining trend, but with relatively consistent values in recent years

Table S4.4 – Reporting Forms

Air

Refer to 'Table S4.1 – Reporting of Monitoring Data' 'Emissions to Air' section(s) above

Air (Annual Releases)

Oxides of Nitrogen are quoted using the established methodology and is within the 20000 kg annual emission limit. Refer also to the 'Emissions to Air' section above which outlines the issues relating to NO_x - As reported previously, some NO_x emissions issues have been resolved in recent years (i.e. CHP, TH2 Pyrolysis furnace, and the smaller Therminol furnaces). The TH3 Pyrolysis furnaces are scheduled to commence burner upgrades in 2021, as per the respective Permit Improvement Condition

Oxides of Sulphur are not reported, but justification is given on the A2 report form i.e. 'Effectively zero since final burning of HFO in 2012'. Kerosene (with < 0.1% Sulphur) has historically been retained on site as a back-up fuel, however there is currently no stock of kerosene on site

Chloromethane is well within the annual limit and utilizes a rolling average of monitored concentrations. This approach is being applied to help accommodate; historical over-reporting prior to more recent MCertified methods being employed by external monitoring contractor, and also the wide variability in the spot test results

The Benzene figure quoted comprises 'breathing' emissions from the bulk storages. There were no Notifiable releases during the year. The total was within the 800kg annual limit

Water (Combined W1 + W2)

Refer to 'Table S4.1 – Reporting of Monitoring Data' 'Emissions to Water' section(s) above

Waste Return

The main waste arising from the site is Santotar, which continued to be dispatched off-site for subsequent use as Cemfuel®. Total waste tonnage and the waste t/t metric are comparable with previous years

Water Usage

All water to site is via a single metered supply. For 2020 there was a notable increase in usage compared to 2019. This is being attributed to; draining down & refilling of the site Cooling-Water system, and additional feed-water requirements during uncharacteristically hot summer months i.e. placing additional cooling load requirement on the system

Energy

The main site boiler continued to operate in Combined Heat & Power configuration throughout the year - as such all of the (Eastman) net electricity requirements were met via a combination of the; Gas Turbine & Wind Turbines. A waste heat recovery unit also operated throughout the year, which served to capture & utilise an appreciable amount of waste heat energy. That said, the energy metrics have been adversely affected by a reduced site tonnage which serves to bring down the overall efficiency due to baseline energy effect - But this is nonetheless lower than it otherwise would have been without the contribution energy efficiency projects & initiatives implemented throughout the year

Performance Indicators

All of the metrics listed on P1 have been detailed in the preceding sections, the exception being CHP thermal efficiency. This is 58.5% as stated on the CHP QA Certificate. Performance against this metric is still being developed

Signed:



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