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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 2022, Boiler 16 (main duty boiler) continued to operate predominantly in CHP configuration in conjunction with the Gas Turbine unit, with Back-up Boiler 14 being utilized as & when required. All emissions tests were within the respective NO_x & CO emission limits, and the Condensing Economizer (waste heat recovery unit) continued to operate throughout the majority of the year

Chloromethane emissions from the Dequest operation were comparable to previous years, with the spot samples continuing to be somewhat non-consistent. An alternative (mass balance) method has been trialled for the 2022 calendar period and has yielded a likely more representative mass release result for the period, which can be reported going forward if deemed suitable. The HCl emissions test was also within specification as per previous years

Benzene is released from the Benzene storage(s) 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. The Benzene-day-tank has not been in use for any part of the 2022 (currently mothballed), and so the bulk storage is the only point source emission. This in conjunction with no spillage / release events being Notified, means Benzene emissions for the period are comparable to previous, and within the Permitted limit

Emissions from the Therminol Pyrolysis Furnaces have been subject to a Permit Improvement Item for NOx due to elevated emissions having been observed in preceding years. At the time of this report, all x3 of the Therminol Pyrolysis furnaces have now undergone burner & control system upgrades, meaning emissions of these processes are now well within the revised NOx emission limit. Benzene emissions from these furnaces was typically low, and the smaller Biphenyl & Santowax furnaces on TH3 were similarly compliant with the NOx limits throughout the year

Emissions to Water

Emissions to water were reported on a quarterly basis for the permit listed parameters. There was a Notification submitted mid-year in relation to a leak on a section of subterranean fire-main, which consequently led to Hg being mobilised to the effluent system and hence the elevated levels being observed over a 2-week period. In addition, there was also a Notifications submitted for; i) bubbles being observed near the effluent pipeline prior to that section of pipeline being renewed, and ii) pumping of surface water during the 'cease discharge' to prevent localised flooding during a period of heavy rainfall. These events aside, all other permitted parameters were within specification throughout 2022

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, but a survey report should be available later this year

Table S4.2 – Annual Production / Treatment

Production of Chemicals

Production tonnage was reported in the annual Permit Returns, and for 2022 amounted to 87544 tonnes. This was slightly down compared to previous years, and featured a (somewhat unusual) full site shutdown in September to renew a section of the site effluent pipeline

Table S4.3 – Performance Parameters

Effluent COD

The P1 Returns form shows ongoing COD emissions expressed as kg/t. This is reduction, compared to previous years, but as expected with the reduced production seen in the year. As mentioned in previous reports, the observable step-change increase in 2017 corresponds to the mothballing of the Bio-Treatment Plant that year, in line with cessation of the Santicizer operation

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 with some of 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 annual emission limit. Refer also to the 'Emissions to Air' section above which outlines the issues relating to NO_x. Notably all NO_x concentration issues have now been resolved upon completion of recent upgrades on the Therminol Pyrolysis furnaces in the latter part of 2022 as per Permit Improvement Condition item IC35

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 has been 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. As mentioned in 'Emissions to Air' section above, an alternative mass balance method has been trialled, and confirmation is sought on suitability of this method going forward

The Benzene figure quoted comprises 'breathing' emissions from the bulk storages. There were no Notifiable releases during the year, and the total was within the 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®. There was a very slight increase noted in the site t/t waste metric, due to ongoing efforts to minimize any accumulation of waste inventory

Water Usage

All water to site is via a single metered supply. For 2022 there was comparable consumption compared to the previous year, especially when factoring in reduced production throughput for the year. As per previous reports, hot weather is known to impact consumption as this can necessitate additional water for temperature control purposes. Likewise, site shutdown(s) such as that in 09/2022 can similarly use appreciable volumes of water to refill the Cooling Water system prior to restarting production

Energy

Despite a number of minor outages, the main site boiler continued to operate in Combined Heat & Power configuration throughout most of the year - as such all of the (Eastman) net electricity requirements were met via a combination of the on-site Gas & Wind Turbines. The Condensing Economizer waste heat recovery unit also operated well throughout the year, which served to capture & utilise an appreciable

amount of waste heat energy. The on-site Energy Management Group continues to progress energy efficiency improvement projects which should further contribute to a betterment of the energy efficiency metrics in-line with corporate & site energy & CO2 targets

Although there was a reduction in total energy use for the period, the CO2 per tonne of product metric (and indeed energy per tonne) was marginally more than previous years due to reduced production for the year and the associated baseload effects

Performance Indicators

All of the metrics listed on P1 have been detailed in the preceding sections. Thermal efficiency for the CHP has not been quoted as yet, as this is derived from the CHP QA scheme verified annual submission, which (at the time of this report) has yet to be completed for the preceding year

Signed:



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* A subsidiary of Eastman Chemical Company