

Environment Agency permitting decisions

Variation

We have decided to issue the variation for Ellesmere Port Transformer Oil Regeneration Plant operated by Electrical Oil Services Limited.

The variation number is EPR/ZP3538MQ/V003.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Description of the changes introduced by the
- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising responses

Description of the changes introduced by the variation

This is a substantial variation.

This variation authorises the following.

- Operation of a plant to remove polychlorinated biphenyls (PCBs) from oils.
- An amendment to monitoring parameters, emission limit values (ELVs) and monitoring techniques for emissions from the main stack A1.
- Addition of a new emission point to sewer at emission point S1.
- Addition of two improvement conditions requiring monitoring of emissions to air.

- An amendment to improvement condition IC8 requiring the operator to produce a site containment plan with a timescale for its implementation.

Key issues of the decision

Polychlorinated biphenyls (PCB) Plant

The new PCB plant is designed to treat a maximum of 25,000 litres of used transformer oil (UTO) contaminated with PCBs over a 24 hour period. The reactor capacity is 2,500 litres.

The PCB reduction process (known as CPD) uses two reagents, polyethylene glycol and solid potassium hydroxide. The glycol is stored in 200 litre steel drums and the potassium hydroxide in 15kg bags. Material Safety Data Sheets for each reagent are included within the application.

CPD was chosen as the preferred PCB reduction process because known alternatives operate at higher temperatures (150°C to 330°C) at which the oil begins to volatilise and become potentially flammable. Although potassium hydroxide is a reactive chemical, it poses a lower risk when heated to lower temperatures (100°C to 120°C) and when there is minimal water present as within the CPD reaction.

The oil is preheated within intermediate storage tanks with a capacity of 15,000 litres. Oil heating is done by thermal transfer with oil circulating within the reactor walls. Safety thermostats monitor and control the heating temperature of the oil.

PCBs will be heated within a steel batch reactor and then stirred and mixed with the chemical reagent. When the chemical dechlorination has taken place, the mixture of oil, spent reagent and by products are delivered to the settling tanks which have a capacity of 2,500 litres each, for the gravity separation of the reagent. At the end of the separation phase, the oil is pumped and delivered to a storage tank. Rigid stainless steel hoses provide connections between the tanks.

The reactor is fitted with an inspection window and safety level gauges.

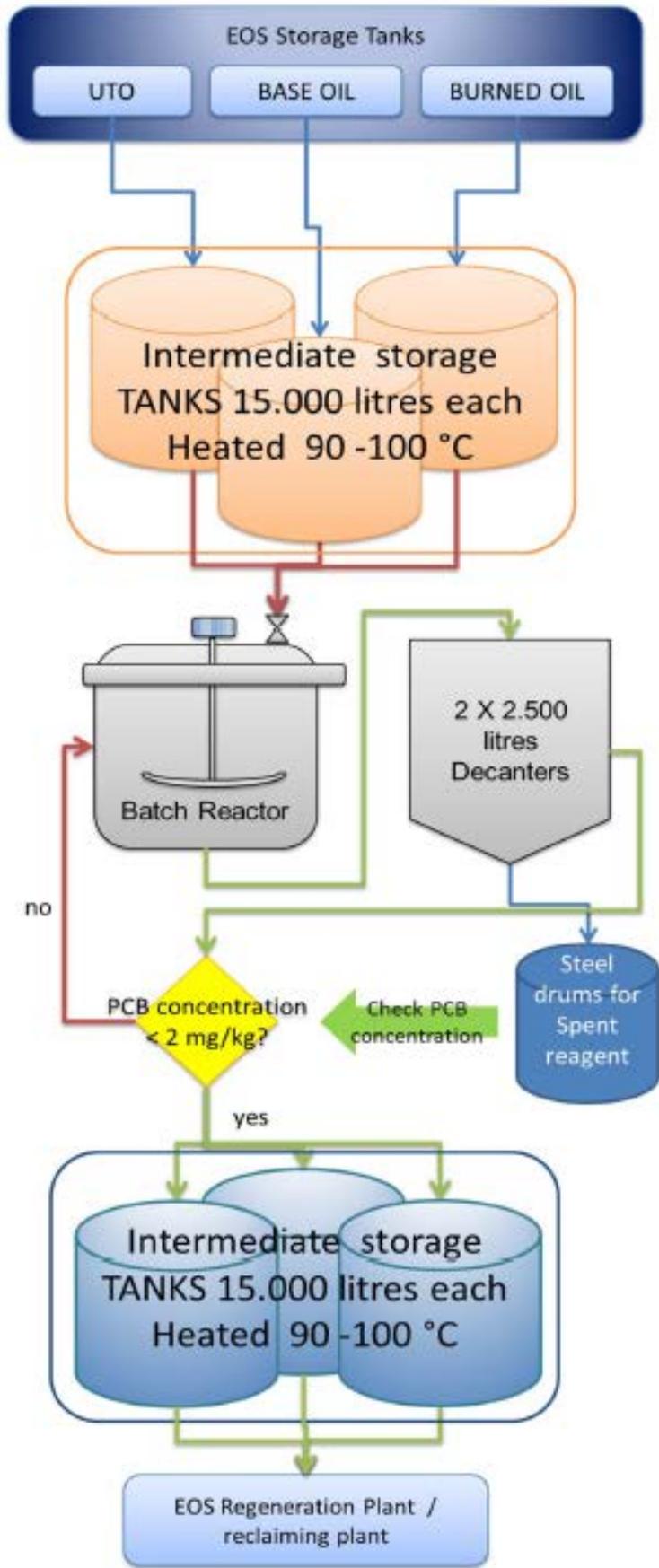
There is an activated charcoal filter for the treatment of emissions from the process.

All processing and storage vessels will be located within bunded areas. Containment pans below the tanks contain level sensors.

A new emission point to air from the PCB removal plant exhaust referenced emission point A6 has been added to the permit. The operator will carry out monitoring of the discharge to atmosphere during commissioning and monitoring for the first three months of operation. This will then reduce to an annual requirement. IC9 specifies that an environmental impact assessment on PCB emissions shall be carried out and an appropriate ELV and monitoring regime proposed.

The application outlines how steps have been taken to ensure that the monitoring and sampling arrangements are in line with our M1 and M2 guidance.

A schematic of the process taken from the permit application is shown below.



Emissions to air

The operator proposed a number of changes to monitoring parameters and associated ELVs within the variation application. These relate to existing emission point A1 from the main stack. The process emitting to the main stack is the use of bauxite (aluminium oxide) columns to remove impurities from oil. The oil percolates through the columns before degassing. Following two passes through the columns, regeneration is undertaken by thermal treatment. This results in the production of a number of pollutants which are passed through a scrubbing system prior to emission to atmosphere.

Dioxins and furans (PCDD/Fs)

The applicant requested an amendment to the ELV for dioxins and furans from 0.1ng/m³ to 1ng/m³ from emission point A1. The application stated that this request had been put in as a result of a number of exceedances of the ELV on site.

Our approach is to ensure an appropriate emission limit is set that is achievable by the plant which will have no impact to the environment (more particularly accumulation in soil).

The operator submitted a human health risk assessment (HHRA) with the application to assess the risk associated with an amendment to the limit. Our Air Quality Modelling and Assessment Unit (AQMAU) has checked of the HHRA and conducted a screening assessment based on the data presented and additional conservative assumptions to determine the environmental risk. We agree with the applicant's conclusion that the process contributions (PCs) are likely to be less than 1% of the Tolerable Daily Intake (TDI).

A desktop mapping study was undertaken and a total of 13 sensitive receptors were identified in the vicinity of the plant. These were located at various distances and directions from the facility. Through dispersion modelling using ADMS-5, it was determined that Receptor R4 at Croft Court, would experience the highest impacts associated with the PCDD/Fs emissions from the plant. Consequently the results set out within the Environmental Risk Assessment for the Ellesmere Port Transformer Oil Regeneration Plant were for Receptor 4 as a worst-case.

Daily intake rates (I) were calculated for 9 exposure scenarios in accordance with the methodology outlined within United States (US) Environmental Protection Agency (EPA) guidance "Human Health Risk Assessment Protocol (HHRAP) for Hazardous Waste Combustion Facilities". Table 10 within the application provides a summary of total PCDD/Fs I for each exposure.

Table 10 Daily PCDD/F Intake at Receptor R4

Scenario	Existing ELV 0.1ng/m ³		Proposed ELV 1ng/m ³	
	I (pg/kg/day)	Proportion TDI _{ORAL} (%)	I (pg/kg/day)	Proportion TDI _{ORAL} (%)
Farmer	0.000001	0.000	0.000014	0.001
Farmer child	0.000002	0.000	0.000021	0.001
Resident	0.000000	0.000	0.000001	0.000
Resident child	0.000000	0.000	0.000002	0.000
Fisher	0.000069	0.003	0.000685	0.034
Fisher child	0.000048	0.001	0.000483	0.024
Farmer infant	0.000042	0.000	0.000415	0.021
Resident infant	0.000002	0.000	0.000021	0.001
Fisher infant	0.001996	0.100	0.019964	0.998

As indicated in Table 10, the predicted intake for PCDD/Fs is less than the TDI of 2pg/kg/day for all exposure scenarios at Receptor R4. The maximum predicted proportion of the TDI is 0.998% of the TDI for the fisher infant scenario using the proposed ELV.

A worst case assessment has been undertaken which included the use of maximum predicted concentrations at Receptor R4, assuming that PCDD/Fs were constantly released at the maximum permitted during the operational period and assuming that only fish from the River Mersey were consumed within the fisher scenario. Actual impacts are therefore likely to be lower.

Our Air Quality Modelling and Assessment Unit (AQMAU) has checked of the HHRA and conducted a screening assessment based on the data presented and additional conservative assumptions to determine the environmental risk. We agree with the applicant's conclusion that the process contributions (PCs) are likely to be less than 1% of the Tolerable Daily Intake (TDI).

The impacts can therefore be considered insignificant and the ELV for PCDD/Fs has been amended to 1ng/m³.

Total Volatile Organic Compounds

The operator proposed to amend the parameters for monitoring from A1 from total volatile organic compounds (VOCs) to benzene. An ELV of 75mg/m³ is specified for total VOCs expressed as carbon. However, oil mist is released from the stack as a result of the treatment process which potentially interferes with the monitoring process.

Table 1 - benzene H1 assessment results

Substance	Proposed ELV (mg/m ³)	Predicted PC (µg/m ³)	% PC of EAL (%)	Predicted PEC (µg/m ³)	% PEC of EAL (%)
C ₆ H ₆	100	0.66	13.19	1.23	24.51
C ₆ H ₆	200	1.32	26.38	1.89	37.70
C ₆ H ₆	300	1.98	39.58	2.54	50.90

Table 1 above shows that although an ELV of 300mg/m³ results in a process contribution that cannot be screened out as insignificant, when the background is taken into account, there is adequate headroom to indicate that an exceedence of the environmental assessment level (EAL) is unlikely.

The requirement for monitoring of total VOCs has been replaced with a requirement for monitoring of a specific VOC compound, benzene. A study into the components of the emission from stack A1 showed that benzene made up a high proportion of the total composition. Benzene also has an associated EAL and both of these factors indicate that it will act as a sufficient indicator for the other species of VOC.

An improvement condition requiring the monitoring of oil mist from A1 and proposals for any process improvements to reduce emission of this substance has been added to the permit.

Hydrogen chloride (HCl), hydrogen fluoride (HF) and metals monitoring

Monitoring for HF, HCl and metals has been carried out for stack A1 since permit issue. Historical monitoring submitted with the variation application indicates that emissions of these substances have been consistently below the associated ELVs between 2008 and 2013 as shown in table 2 below. We have confirmed that the 2015 monitoring results were also below the relevant ELVs for these substances.

Table 2 – historical monitoring results

Parameter	ELV (mg/m ³)	Monitoring Result (mg/m ³)						
		2007	2008	2009	2010	2011	2012	2013
Heavy Metals	0.5	2.6	0.05	0.42	0.272	0.087	0.043	0.158
Cd and Tl	0.05	0.01	<0.01	<0.005	0.003	<0.001	<0.0001	<0.005
Hg	0.05	0.11	<0.01	<0.005	<0.005	<0.001	0.0009	<0.005
HCl	60	0.1	0.1	0.2	1.6	0.3	<0.5	0.6
HF	4	<0.1	<0.4	0.1	0.11	0.2	<0.1	0.05

We have removed the monitoring requirements and associated ELVs from the permit for HCl, HF and metals. We consider that the remaining ELVs within the permit will provide a high level of protection for human health and the environment.

Emissions to sewer

There is no change to the volume of effluent being discharged to the sewer therefore the composition of the effluent has not being considered in any further detail.

Secondary containment

The operator applied for an amendment to improvement condition 1 (IC1) contained in the permit. The operator proposed that IC1 is amended to specify that the containment on site could consist of tertiary rather than secondary containment. Having reviewed the proposal, we have amended IC1 to specify the following:

A scheme to provide remote containment for the bulk storage tanks shown in Schedule 7 of the permit shall be submitted to the Environment Agency for approval.

The scheme shall include the following;

- Justification for the capacity of the remote containment system provided. This shall include the volume of the inventory stored within the primary containment, plus the allowance made for rainwater, cooling water, firefighting agents (foam) and firefighting water. The method for calculating the capacity of containment shall be carried out in accordance with section 2.9 of sector guidance note S5.06 and the relevant requirements of sections 4.3 – 4.5 of CIRIA C736.
- The design of each element of the remote containment system.
- A schedule of works including a timescale for construction of each element of the remote containment system.

On approval, the scheme shall be installed in accordance with the approved schedule of works.

The amended improvement condition is referenced IC8 and is required to be completed within 12 months of the issue of variation ZP3538MQ/V003.

Annex 1: decision checklist

This document should be read in conjunction with the application, supporting information and permit/notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
Receipt of submission		
Confidential information	<p>A claim for commercial or industrial confidentiality has not been made.</p> <p>Although a number of the application documents were marked as confidential, the applicant confirmed at the duly making stage that these documents were not confidential. These documents have therefore been added to the public register.</p>	✓
Consultation		
Scope of consultation	<p>The consultation requirements were identified and implemented. The decision was taken in accordance with Regulatory Guidance Note (RGN) 6 High Profile Sites, our Public Participation Statement and our Working Together Agreements.</p> <p>For this application we consulted the following bodies:</p> <ul style="list-style-type: none"> • Public Health England • Food Standards Agency • Cheshire West and Chester Council – Environmental Protection • Health and Safety Executive • Director of Public Health 	✓
Responses to consultation and web publicising	<p>The web publicising and consultation responses (Annex 2) were taken into account in the decision.</p> <p>The decision was taken in accordance with our guidance.</p>	✓
Operator		
Control of the facility	<p>We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with EPR RGN 1 Understanding the meaning of operator.</p>	✓
European Directives		
Applicable	All applicable European directives have been considered	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
directives	in the determination of the application.	
The site		
Extent of the site of the facility	<p>The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility.</p> <p>A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary.</p>	✓
Site condition report	There is no change to the installation boundary as a result of this variation.	✓
Biodiversity, Heritage, Landscape and Nature Conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat .</p> <p>An assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that the application will not affect the sites.</p> <p>We have not formally consulted on the application. The decision was taken in accordance with our guidance.</p>	✓
Environmental Risk Assessment and operating techniques		
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>See key emissions section for additional information.</p>	✓
Operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes. See key issues section above for key operating techniques proposed by the operator.</p> <p>See key issues section for further information.</p> <p>We consider that the emission limits included in the installation permit reflect the best available techniques (BAT) for the sector.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	The proposed techniques/ emission levels for priorities for control are in line with the benchmark levels contained in the Sector Guidance Note S5.6 for the storage and treatment of hazardous waste and we consider them to represent appropriate techniques for the facility. The permit conditions ensure compliance with relevant BREFs and BAT Conclusions.	
The permit conditions		
Updating permit conditions during consolidation	We have updated previous permit conditions to those in the new generic permit template as part of permit consolidation. The operator has agreed that the new conditions are acceptable.	✓
Waste types	No additional permitted waste types will be accepted onto the installation as a result of the variation.	✓
Improvement conditions	Based on the information on the application, we consider that we need to impose improvement conditions. See key issues section for further information.	✓
Incorporating the application	We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process. These descriptions are specified in the Operating Techniques table in the permit.	✓
Emission limits	We have decided that emission limits should be set for the parameters listed in the permit. See key issues section for further information. It is considered that the ELVs/ equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.	✓
Monitoring	We have decided that monitoring should be carried out	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>	
Reporting	<p>We have specified reporting in the permit.</p> <p>i) to ensure emissions are within ELVs and equivalent parameters, ii) that the installation is being operated in an efficient manner.</p>	✓
Operator Competence		
Environment management system	<p>There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with our guidance on operator competence.</p>	✓

Annex 2: Consultation and web publicising responses

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

Response received on 15/04/2016 from
Public Health England
Brief summary of issues raised
<p><i>General</i></p> <p>In general terms, we recommend that the EA conduct detailed review of the H1 assessment and modelling undertaken. The H1 assessment is undertaken on monitoring results from 2012. These seem low in comparison to the emissions survey undertaken in 2014, which indicated a number of exceedances of Environmental Assessment Levels (EALs). The Environmental Risk Assessment is dated September 2014 and the monitoring results referred to are dated up to 2013. The EA may wish to obtain more recent monitoring results from the operator to corroborate those used in the risk assessments.</p> <p><i>VOCs</i></p> <p>It is understood that the operator wants to remove the total VOC ELV (as they are unable to meet it) and replace it with a single ELV for benzene. The operator indicates that exceedances of total VOCs is due to interference from oil mist. It is recommended that the EA seek to understand why there are emissions of oil mist and how this can be controlled before determining whether the removal of the Total VOC ELV is appropriate.</p> <p><i>Dioxins and Furans</i></p> <p>It is understood that the operator wants to increase the dioxins and furans ELV (as there have been exceedances over time) from 0.1ng/m³ to 1ng/m³ and has undertaken a Human Health Risk Assessment (HHRA) to attempt to justify this increase. We note that the HHRA is based on monitoring and meteorological data from 2008 to 2012. We note that the origin of the Health Criteria Values used in the HHRA is not included within the report.</p> <p>We would recommend that the EA establish why there have been repeat exceedances of the ELV for dioxins and furans. The ELV of 0.1ng/m³ is set by the Industrial Emissions Directive and is set to control levels of harmful chemicals in the environment. We are therefore of the opinion that the HHRA provided is not sufficient justification for the increase in ELV at the site.</p> <p><i>Removal of PCBs</i></p> <p>We understand that this activity falls under the existing permit. The application states that the PCB removal plant includes activated charcoal filters for the extraction of emissions and that the proposed plant exceeds BAT. We recommend that the EA satisfy itself that the proposed plant is BAT and that emissions can be adequately controlled by the proposed activated charcoal filters.</p>
Summary of actions taken or show how this has been covered

General

We have confirmed that the most recent 2015 monitoring results were also below the relevant ELVs for these substances.

VOCs

We have specified an improvement condition within the permit requiring the operator to monitor oil mist on a monthly basis for the first three months from emission point A1 following the issue of this variation. The operator is also required to carry out a risk assessment using these results and if required, based on the conclusion of the risk assessment, propose additional abatement measures for the oil mist.

Dioxins and Furans

The applicant requested an amendment to the emission limit value (ELV) for dioxins and furans from 0.1ng/m³ to 1ng/m³ from emission point A1. The application stated that this request had been put in as a result of a number of exceedances of the ELV on site.

Our approach is to ensure an appropriate emission limit is set that is achievable by the plant which will have no impact to the environment (more particularly accumulation in soil).

The operator submitted a human health risk assessment (HHRA) with the application to assess the risk associated with an amendment to the limit. Our Air Quality Modelling and Assessment team has carried out checks of the HHRA based on the data presented and using the AQMAU Screening Tool and the Environment Agency HHRA Tool, using conservative assumptions. We agree with the applicant's conclusion that the process contributions (PCs) are likely to be less than 1% of the Tolerable Daily Intake (TDI).

See key issues section for additional information.

Removal of PCBs

We consider the proposed activated charcoal filters to be BAT. We have specified an improvement condition within the permit requiring the operator to monitor PCBs on a monthly basis for the first three months following the PCB plant commissioning to demonstrate emission levels. The operator is also required to carry out a risk assessment using these results. An ELV may be set for emissions of PCBs from emission point A6 following the completion of the improvement condition if deemed necessary by the Environment Agency.

Response received from
Food Standards Agency
Brief summary of issues raised
No response received
Summary of actions taken or show how this has been covered
No action required

Response received from
Cheshire West and Chester Council – Environmental Protection

Brief summary of issues raised
No response received
Summary of actions taken or show how this has been covered
No action required

Response received from
Health and Safety Executive
Brief summary of issues raised
No response received
Summary of actions taken or show how this has been covered
No action required

Response received from
Director of Public Health
Brief summary of issues raised
No response received
Summary of actions taken or show how this has been covered
No action required