

SCR evaluation

Name of activity, address and NGR	Resin Plant Stallingborough. Arkema Coatings Resins Limited, Laporte Road, Stallingborough, North East Lincolnshire, DN41 8DR. The NGR of the centre of the site is TA 213 151. Environmental Permit Surrender Reference is EPR/PP3135FV/S004.
Document reference, date and version of application SCR	'Laporte Road, Stallingborough – Ground Condition Report, Arkema Coatings Resins Limited. Ref: 70013935-10447(5)' (January 2016).

1.0 Site details

Has the applicant provided the following information as required by the application SCR template?

Site plans showing site layout, drainage, surfacing, receptors, sources of emissions/releases and monitoring points.

The Operator provided a Site Condition Report (SCR) at the time the original application was made. Drawings were provided by the Operator and reviewed and accepted by the Environment Agency at the original application stage.

2.0 Condition of the land at permit issue

Has the applicant provided the following information as required by the application SCR template?

- Environmental setting including geology, hydrogeology and surface waters.
- Pollution history including:
 - pollution incidents that may have affected land
 - historical land-uses and associated contaminants
 - visual/olfactory evidence of existing contamination
 - evidence of damage to existing pollution prevention measures.
- Evidence of historic contamination (i.e. historical site investigation, assessment, remediation and verification reports (where available).
- Has the applicant chosen to collect baseline reference data?

A Conceptual Site Model (CSM) was provided in the original application site report. The site is located at Laporte Road, Stallingborough, North East Lincolnshire adjacent to North Beck Drain and approximately 300m south-west of the Humber Estuary. The installation covers an area of approximately 33,380m² and is located near Immingham Docks approximately 3km north of the A180 truck road with Grimsby approximately 6km south-east of the site. The site lies adjacent to the River Humber and the site surrounds are industrial, predominantly chemical industry, with the nearest residential development located at Immingham approximately 2km west of the site.

Historically, the site was undeveloped until the 1950s when a chemical works was developed in the south-west of the site. The site has been used as a chemical/resin works since 1965. The site was developed further in the late 1960s and resin manufacture commenced on site in 1967. Originally, only about a third of the current operational area was developed. Since then, other areas of the site have been added, particularly the addition of extra reactors and blenders between 1973 and 1976, addition of further blending operations in 1991 and 1995, and addition of a drum filling building in 1984.

The underlying geology of the site is likely to comprise:

Made Ground: of varying thickness across the site and is comprised of reworked natural materials with asphalt, tarmac, plastics and concrete fragments.

Superficial Deposits: comprising Tidal Flat Deposits/Marine and Estuarine Alluvium comprising silts and clays. These are classified as unproductive strata.

Flamborough Chalk Formation: comprising a well bedded white flint free chalk with common seams of marl. The formation is in the region of 160m to 265m thick.

2.0 Condition of the land at permit issue

Has the applicant provided the following information as required by the application SCR template?

The Chalk is classified as a major aquifer with a low vulnerability that is capable of supporting large abstractions for potable water. There is also the risk of saline intrusion due to historical over abstraction. The site is outside of a source protection zone 3 and groundwater beneath the site is classed as of poor chemical quality. North Beck Drain is located along the eastern site boundary and flows into the River Humber about 300m north-east of the site. The site is within a nitrate vulnerable zone but is outside of a source protection zone, drinking water protected area, and groundwater and surface water safeguard zones.

Potential exists for the following to be historical sources of contamination:

- resin manufacturing plant – processes included solvent recovery, thermal oxidation, heat generation, effluent treatment plant
- reactor building housing five reactors for producing base resin
- polyester mixing building for cold mixing of base resin
- gelcoat production for cold mixing of base resin
- drum filling building for drumming off of coating resins
- waste, raw material, produce and fuel storage areas
- underground and above ground storage tanks
- engineering workshops.

No targeted intrusive investigations were undertaken to support the original permit application as it was deemed unnecessary at the time of issuing the original permit (to Cray Valley Limited). However, some samples were taken from the site for other reasons and tested in 1996 and 2001 as follows:

- 1996: three soil samples taken around the old USTs following removal. Xylene and white spirit was detected.
- 2001: three boreholes near the reactor building. Nickel and mineral oil was detected. Solvents weren't tested for.

3.0 Permitted activities

Has the applicant provided the following information as required by the application SCR template?

Response (Specify what information is needed from the applicant, if any)

- a) Permitted activities.
- b) Non-permitted activities undertaken at the site.

The site manufactured two main types of resins (unsaturated polyester resins and oil modified resins). The Environment Agency determined that the Installation comprised:

- Section 4.1 A1 (a)(viii) - producing polyester resins
- Section 4.1 A1 (a)(viii) - producing polyester resins incorporating toluene di-isocyanate
- Section 5.4 A1 (a)(i) - Aerobic treatment of waste waters.

Directly Associated Activities at the site included reprocessing, storage and handling of waste materials, operation of combustion units <20MWth input and the operation of abatement systems.

3.0(a) Environmental Risk Assessment

The H1 environmental risk assessment should identify elements that could impact on land and waters, cross-referenced back to documents and plans provided as part of the wider permit application.

The Environment Agency reviewed the Operator's environmental risk assessment (H1) at the time of the original permit determination and accepted the H1 as satisfactory. An Improvement Programme was set within the original permit to ensure that the identified required improvements were undertaken over specified timescales at the installation.

3.0(b) Will the pollution prevention measures protect land and groundwater?

Are the activities likely to result in pollution of land?

It was concluded that there was little likelihood of pollution arising from the installation's operation provided that it was operated and maintained correctly. There were no direct discharges of hazardous substances or non-hazardous pollutants to groundwater from the site. To ensure the continued effectiveness of pollution

prevention measures to protect the land the Operator was required to implement and operate under a Site Protection and Monitoring Programme (SPMP) which was in place for the site from January 2006.

For dangerous and/or hazardous substances only, are the pollution prevention measures for the relevant activities to a standard that is likely to prevent pollution of land?

Key contaminants of concern – dibutylethanolamine, Statsafe 3000, Nutromex N&P 102, petroleum hydrocarbons, xylene and trimethyl benzene in soil and dissolved phase contamination in shallow underlying groundwater including petroleum hydrocarbons, ethylbenzene, xylenes, naphthalene, phenol and dimethylphenol.

Application SCR decision summary	Tick relevant decision
Sufficient information has been supplied to describe the condition of the site at permit issue	Yes.
Pollution of land and water is unlikely	Yes.
Date and name of reviewer:	Liz Ebbs (NPS) – 01/12/2016.

Operational phase SCR evaluation template

4.0 Changes to the activities	
Have there been any changes to the following during the operation of the site?	Response (Specify what information is needed from the applicant, if any)
a) Activity boundaries b) Permitted activities c) "Hazardous pollutants" used or produced.	<p>There have been no changes in the permitted activities during the lifetime of the permit. Whilst the site has expanded since the 1960's this has been undertaken pre-permit and no expansion of the site boundary occurred under the IPPC or EPR permitting regimes. The Environment Agency determined that the Installation comprised:</p> <ul style="list-style-type: none"> ➤ Section 4.1 A1 (a)(viii) - producing polyester resins ➤ Section 4.1 A1 (a)(viii) - producing polyester resins incorporating toluene di-isocyanate ➤ Section 5.4 A1 (a)(i) - Aerobic treatment of waste waters. <p>Directly Associated Activities at the site included reprocessing, storage and handling of waste materials, operation of combustion units <20MWth input and the operation of abatement systems.</p> <p>The main hazardous pollutants used were dibutylethanolamine, Statsafe 3000, Nutromex N&P 102, petroleum hydrocarbons, xylene and trimethyl benzene in soil and dissolved phase contamination in shallow underlying groundwater including petroleum hydrocarbons, ethylbenzene, xylenes, naphthalene, phenol and dimethylphenol.</p>
5.0 Measures taken to protect land	
Has the applicant provided evidence from records collated during the lifetime of the permit, to show that the pollution prevention measures have worked?	
<p>Appropriate management systems and structures were in place with sufficient financial, technical and manpower resources to ensure compliance with the permit conditions. The Stallingborough site had its own Site Protection and Condition Report. A programme of infrastructure monitoring was implemented comprising a checklist of inspections and testing devised in the SPMP. Additional infrastructure changes and improvements were implemented at the site during the life of the permit and included:</p> <ul style="list-style-type: none"> ➤ on review of the tertiary containment additional bunds and kerbing were installed along the eastern and southern boundaries to prevent fire water run-off from exiting the site or entering the unmade ground in the event of a major emergency ➤ phased installation of High Level protection devices on storage tanks to prevent overfills and release to the environment and were inspected annually as part of a planned preventative maintenance programme ➤ storm water run-off and waste water generated from cleaning activities was discharged into one of three interceptor pits present on site. From the interceptor the water was pumped to the site's treatment plant ➤ a comprehensive spillage containment and handling procedure ➤ a site wide pipeline inspection in May 2012 with all issues raised being addressed and repairs completed. 	
6.0 Pollution incidents that may have impacted on land and their remediation	
Has the applicant provided evidence to show that any pollution incidents which have taken place during the life of the permit and which may have impacted on land or water have been investigated and remediated (where necessary)?	
<p>Since 2006, the site has continued to manufacture resins and operate with the same environmental management protocol. Whilst leakages and maintenance issues have been noted, the management of these incidents were completed to minimise the risk to the environment. In addition, improvements/upgrades were continued to be implemented. The following gives an outline of the most recent spillages of hazardous liquids on site that were recorded since the permit Application in 2006. All of these spillages were contained on site and none resulted in impacts to the soil and groundwater of the site.</p> <p>2015: release of base resin in Gelcoats when IBC was punctured with a fork lift truck (FLT).</p>	

2013:

- buffer tank overfilled in the treatment plant.
- failure of pump seal released hot oil.
- O ring gasket failed and resin exited the Gaff pot causing a spillage. PART A Notification.
- Reactor Three Product Leak due to blocked valve being removed and not replaced.

2012:

- overfill of road tanker with resin.
- spillage occurred whilst filling an IBC which was left unattended by a gelcoat operator.
- overfill into the wrong tank
- retaining bolt on the cuno filter stripped the nut of its thread causing a spillage.
- spillage from IBC left steaming under the hot box for far too long.
- overflow from road tanker which was already full but production commenced loading a batch of resin.

2011:

- failure of buffer tank pump resulted in a large spillage from within the Effluent Treatment Plant bund.
- resin spillage whilst commissioning the system.
- overflow whilst offloading a road tanker.
- white spirit released from an open line which had been mistakenly identified as redundant.

From the list of incidents during the life of the permit it is clear that there were multiple spills to bunds and drainage.

7.0 Soil gas and water quality monitoring (where relevant)

Where soil gas and/or water quality monitoring has been undertaken, does this demonstrate that there has been no change in the condition of the land? Has any change that has occurred been investigated and remediated?

No soil and groundwater monitoring and/or testing was carried out for the original application. The original Cray Valley Ltd SPMP along with the Application SCR concluded that no reference monitoring data was required, hence no ground water and soil monitoring baseline data was obtained.

A Phase II report states that the contaminants of concern in the soil were petroleum hydrocarbons, ethylbenzene and xylene. The report provided information on the general ground conditions across the site and targeted ten former Underground Storage Tanks (USTs); an area of a spillage of Styrene in 2000; and a waste storage area. Due to the current high standard of the site management, it was concluded that the majority of the impact to soil and groundwater was likely to have occurred prior to 2006. Generally, the concentrations recorded above the laboratory detection limits in the soils are also present to some degree in the groundwater (more accurately soil pore water) inferring an active linkage between the soils and the soil pore water at the site. The report also noted that hydrocarbons recorded up gradient indicated groundwater entering the site could be impacted.

A ground investigation was completed in August 2010 but it does not provide an absolute baseline on its own as it was undertaken approximately four years after the permit was granted. The contamination of soils with organic contaminants demonstrates impact resulting from site operations. Groundwater beneath the site shows significant xylene, and potentially petroleum hydrocarbon impacts although the petroleum hydrocarbon concentrations may be present as a result of the elevated xylene concentrations. Locally, groundwater quality beneath the site is therefore considered to be significantly degraded and also represents a potential risk to groundwater quality off site to the north-west.

In the 2015 CSM, the associated risks are reduced based on the removal of primary sources and the reduction in some contaminant concentrations. Upon comparison of the 2010 with the 2015 data, overall contaminant concentrations are reduced or recorded within a similar order of magnitude.

Surrender SCR Evaluation Template

8.0 Decommissioning and removal of pollution risk

Has the applicant demonstrated that decommissioning works have been undertaken and that all pollution risks associated with the site have been removed? Has any contamination of land that has occurred during these activities been investigated and remediated?

The following reports were submitted by the Operator as part of the surrender application:

- 'Laporte Road, Stallingborough – Ground Condition Report, Arkema Coatings Resins Limited. Ref: 70013935-10447(5)' (January 2016).
- Site Protection and Condition Report - Arkema Coatings Resins Limited, Stallingborough. Ref: ARK/004/JC dated 24 August 2016.

The permitted activities have ceased and the site has been decommissioned and demolished as of October 2015 (demolition to slab level and retention of the current slab). This has served to remove the risk of new contamination incidents from the permitted boundary and to reduce the mobility and mass of contamination present at the site.

Works have included:

- running down raw material and finished goods stock to the lowest practical levels to minimise disposal or sold or transported to other Arkema facilities, or recycled by licenced facilities
- vessels, IBCs, pipelines and associated equipment cleaned and isolated prior to demolition
- assets cleaned, re-used or reclaimed
- systems, monitoring pipework, cabling and supports not required removed using cold cutting methods
- raw material and finished product tanks and pipelines cleaned internally
- tanks and steelwork cut into foundry size pieces and removed as scrap metal
- site structures down to slab level
- concrete hardstanding not broken in any area to ensure soil and groundwater remains protected
- internal areas of the site affected by the demolition cleared and cleaned prior to demolition
- some residual solvents from tank washing sold as second grade materials
- residual process effluent streams either treated on site by the effluent treatment plant (remaining discharges will only be surface/storm water and domestic sewage via the drainage system)
- all asbestos containing material was identified and disposed of in full compliance with regulations by licenced contractors.

Remedial activities have been completed at the site and included:

- removal of sources such as tanks and process equipment
- survey and replacement of the site drainage where faults were identified
- no discharges to the effluent treatment plant from Polynt Composites UK
- maintenance of site surfacing.

There is no shared usage equipment between Polynt Composites UK and Arkema. Part of the site will remain operational as the Polynt Composites UK operation with all remaining equipment used for cold blending of imported resins. The permitted Arkema activities have ceased and part of the site will be sold to the neighbouring property for a continued use. Concrete hardstanding has not been broken out in any area to ensure pollution prevention for the continued operation of Polynt Composite facilities under their separate environmental permit.

9.0 Reference data and remediation (where relevant)

Has the applicant provided details of any surrender reference data that they have collected and any remediation that they have undertaken?

Baseline data for soil, groundwater or land gas was not required by the original SPMP. There were known significant spills, leaks or losses during the lifetime of the permit. As such a site investigation was required in relation to the permit surrender.

The only area where historical pre-permit sampling results could be directly compared was at the location of BH5 and BH6 which is the same location the soil samples were taken from in 1996 following the removal of the USTs. The results show xylene contamination concentration in soil has reduced in 2010 when compared to the 1996 results in the area of the old USTs. These results suggests that the land in the compared areas has not deteriorated as a result of the permitted activities since 2006 and that polluting substances were more

than likely already in, or under the land, and any contamination of soil or groundwater was has occurred prior to 2006.

Sampling and testing undertaken for the 2016 intrusive investigation indicated that whilst contaminant impacts have been recorded in soil pore water above the water quality standards, an overall reduction in concentrations is apparent. The presence of a clay dominated geology beneath the site potentially restricts water movement and hence migration of any identified contamination.

10.0a and 10b Statement of site condition

Has the applicant provided a statement, backed up with evidence, confirming that the permitted activities have ceased, decommissioning works are complete and that pollution risk has been removed and that the land and waters at the site are in a satisfactory state?

The overall, the subsurface conditions have generally not deteriorated during the lifetime of the permit and no further works are recommended to facilitate the surrender of the permit.

The Ground Condition Report has been reviewed by the groundwater and contaminated land technical specialist and the Environment Agency consider that we can accept the conclusions made in the report. This decision was made based on the following:

- all process equipment and tanks have been removed
- the drainage system has been repaired and cleaned
- there has only been minor increase in groundwater contamination for one determinand that could be attributed to the permitted activities
- the groundwater sensitivity of the site is low due to the underlying clayey drift deposits
- any remedial activity would not be worthwhile as the likelihood of recontamination from the ongoing activities would be high.

With the exception of monitored natural attenuation, further remedial activities are not practical at this time due to the continued use and evidence of contamination beyond the permit boundary. As the site has operated for over 50 years as a chemical works there is a high likelihood of contamination from historical sources. Monitored natural attenuation is also unlikely to be of significant benefit as potentially contaminating activities (using the same chemicals) are still underway at the wider site and the affected area appears to extend beyond that of the permit boundary.

A number of contaminant concentrations have been shown to have reduced between the dates of the two site investigation works. In addition, it would be very difficult to remediate any contamination that could be attributed to the remaining permitted activities still in operation on the site for other processes. The risks to the deeper groundwater in the Chalk are low as the site is underlain by Alluvial and Glacial Clays. The shallow groundwater encountered is really a pore water and as such there is no continuous shallow groundwater table.

The site would be best remediated during any future redevelopment under the planning regime.

The Environment Agency confirms that the permitted Resin Plant Stallingborough installation has been returned to a satisfactory state.

Surrender SCR decision summary	Tick relevant decision
Sufficient information has been supplied to show that pollution risk has been removed and that the site is in a satisfactory state – accept the application to surrender the permit.	✓
Date and name of reviewers: Liz Ebbs (NPS) – 01/12/2016 Jim Branson (GWCL) – 07/12/2016 Adam Pawson (Area) – 13/12/2016	



SITE NORTH

- Area 1 Warm Rooms 1 through 3
- Area 2 Warm Room 4 & Steelwork
- Area 3 Diesel Tank
- Area 4 Heat Generator 3
- Area 5 Water Treatment building
- Area 6 Solvent Recovery & Cooling Tower
- Area 7 Oil Storage and bund
- Area 8 Solvent storage & bund
- Area 9 Malaic Anhydride Storage & bund
- Area 10 Phallic Anhydride Storage & bund
- Area 11 Reactor Building, Heat Gen 1 & 2 plus Tox Plant & Blenders
- Area 12 Technical Block
- Area 13 Holding Tanks 8 through 12 plus PT 13 & PT 14 including bund

KEY

- █ General Demolition
- █ Asset (Recoverable)
- █ Switch Gear

