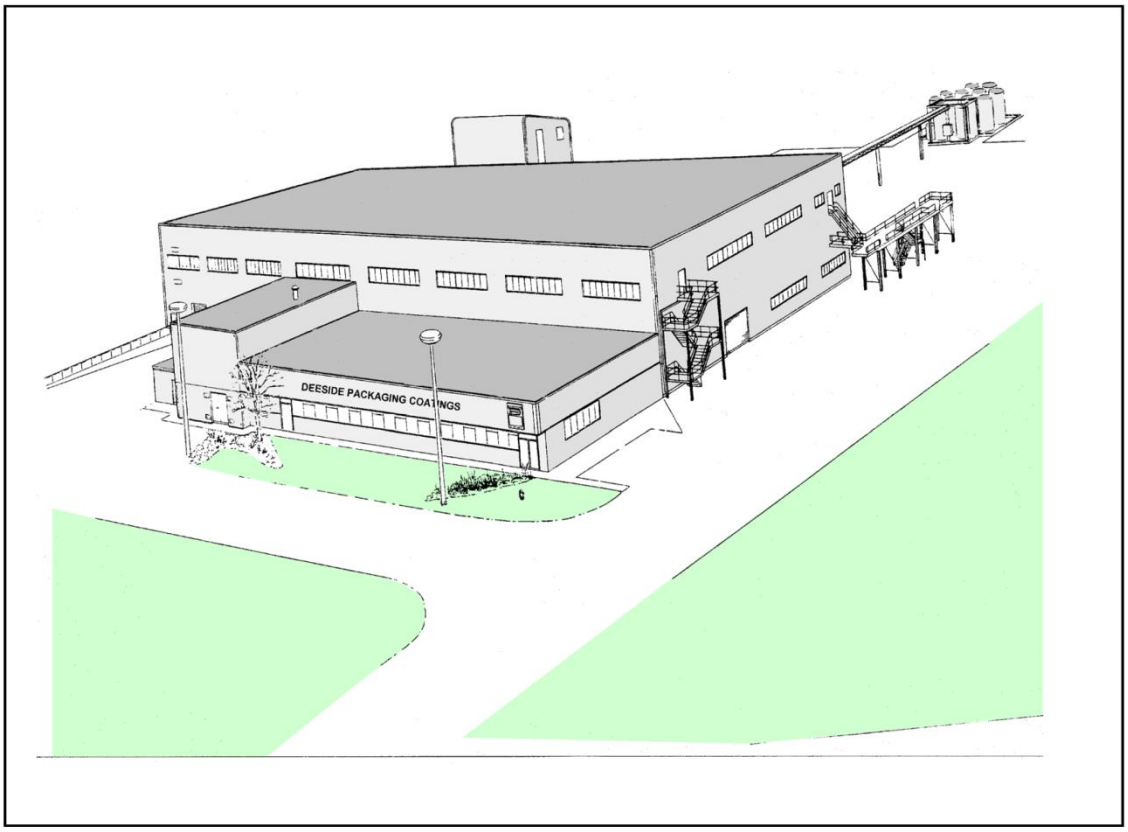
PPC APPLICATION – BU 7545 IM

VALSPAR PACKAGING COATINGS

DEESIDE



November 2016

GENERAL NOTES

Project No: 60121

Title: Valspar Packaging Coatings Deeside PPC Permit Application

Client: Valspar, Deeside Industrial Park

Issue Date: 07th November 2016

Authorised by: _____ Project Author Date: _____

Authorised by: _____ Project QA Rep Date: _____

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work.

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INTRODUCTION

Deeside Packaging Coatings is part of The Valspar Corporation based in Minneapolis, USA. Valspar serves the global market for rigid containers and closures with high performance coating systems. Coating applications primarily involve two-piece beer and beverage cans, two-piece and three piece food cans, and glass container closures.

The Deeside Packaging Coatings facility occupies a 9-acre site on the Deeside Industrial Park, 7 km NW of Chester and comprises factory, laboratory and office accommodation. The site is bordered on all four sides by neighbouring industrial premises, namely Henrob (Joining Solutions), Iceland Frozen Foods, Farralls Industrial warehousing and Distribution a BP Service Station and two vacant general industrial units.

Deeside Packaging Coatings

Deeside Packaging Coatings as part of the Organic Chemicals sector is regulated by Natural Resources Wales as a Part A (1) process under the Environmental Permitting (England and Wales) Regulations 2010 SI 2010/ (as amended). The Deeside facility was previously regulated by the EA under Integrated Pollution and Control (IPC) and Air Pollution Control (APC) by the Local Authority (Flintshire County Council). The PPC regulations have a requirement for a site report to be produced for the installation that proposes a baseline condition for the land quality of the site. This report was produced to fulfill the requirements of the PPC regulations and to provide supporting information for the application for a permit to operate (hereafter known as the IPPC application).

SCOPE OF THE APPLICATION

There is one Part A process taking place on site – Section 4.1 (a) (ii)

‘Producing organic chemicals such as organic compounds containing oxygen, (for example alcohols, aldehydes, ketones, carboxylic acids, esters, ethers, peroxides, phenol, epoxy resins)’.

There is also a Part B process – Section 6.5 (a) (i)

‘Manufacturing or formulating printing ink or any other coating material containing, or involving the use of, an organic solvent, where the carrying out of the activity is likely to involve the use of 100 tonnes or more of organic solvents in any period of 12 months’

Resin from the Part A process is used in the Part B process on-site.

PROCESS DESCRIPTION SUMMARY

Manufacturing onsite can be divided into two distinct processes with associated ancillary activities; resin and coating manufacture.

Resin Plant

Warm Epoxy resin (60 - 80°C) is transferred from the heated bulk tanks to a heated weigh tank. This is transferred to the reactor under gravity. Phosphonium Iodide/Bromide catalyst is added to the reactor along with Bis-A in 1T, 0.5T or 25kg bags. The mixture is heated until an exothermic reaction begins which is controlled using cooling water. After a period of time the batch is tested for Epoxy Equivalent Weight (EEW) and once within specification the batch is diluted with various solvents. Depending on what product is required the diluted epoxy upgrade is either modified by one of two routes. Solvent-based epoxies are formed by the addition of carboxylic acid and an amine catalyst at temperature. Additional solvents are added for dilution purposes before being transferred to let down tanks or drums/IBCs.

Water based epoxies are formed by modifying the epoxy upgrade with various vinyl monomers. Peroxide and/or AZDN catalyst is added to the monomer mix and then added to the reactor at temperature. Water-cooling and feed rate control the heat of reaction. Once the reaction is complete the batch is dropped into let down tanks or pumped to a let down tank. The water-based epoxies then go through an inversion process where water and an amine solution is added and mixed to form a quaternary salt. Hot and cold RO water is then added over a period of time to form an emulsion. Following this the emulsion is filtered and transferred to bulk storage or filtered into totes.

Coatings Plant

Lacquers and coatings containing organic solvents are manufactured in the coatings plant. Raw materials are supplied to the coatings plant in bulk form and in smaller barrels and dry raw materials are delivered in bags. The raw materials are stored both within the warehouse and also externally in the yard. Liquid raw materials are fed into mixing vessels via a central manifold, enabling quantities to air to be controlled and emissions contained. Displacement of air from the tanks is controlled via nitrogen blanketing.

For the manufacture of water and solvent based lacquers the resin, organic solvent and water are mixed together. The particle size is reduced via a grinding mill, let down into vessels with more organic solvents, tested, adjusted to specification and filled into drums, totes or road tankers. For water and solvent based PVC free lacquers the resins, organic solvents and water are mixed, tested, adjusted and filled into drums, totes or bulk tankers.

Site Report

A detailed site investigation has taken place to determine land contamination resulting from operations at the site and form the basis of a baseline of contamination going forward. In addition to this investigation an intrusive Phase II investigation was carried out at the site in 1998 as part of the acquisition of the site by Deeside Packaging Coatings. This study focused on a number of soakaways which were present on the site and highlighted one area where elevated levels of Xylene were present 61 ppm. The soakaways are no longer used on the site but have been replaced by a series of interceptor tanks which hold all surface water run-off and potential contamination run-off from the yard. The risk of contamination is controlled onsite by both physical measures (i.e. bunding and containment) and management techniques (i.e. procedures and training). The entire yard

area comprises of a concrete hard standing and acts as a secondary containment area thus any spills will either accumulate on the yard or enter the onsite interceptors. A number of cracks were identified in the yard area and perimeter kerbing which could create a pathway to the ground and groundwater. These were repaired as part of the sites environmental improvement plan. The condition is monitored and any repairs carried out according to a planned maintenance schedule.

Raw Material and Finished Goods Storage

Liquid raw materials with the potential to cause ground and groundwater contamination are stored in bulk vessels at; one of three bulk storage locations, on a purpose build open storage area in the yard, on the yard in front of the workshop or inside the warehouse. The bulk storage areas are fully bunded to contain any spills that might occur... The yard acts as secondary containment if any spills take place and the internal flooring in the warehouse is solid and prevents any downward movement of spills.

Deliveries of raw materials are supervised (coupling) and high-level alarms warn of potential overfilling. In such an event the delivery is automatically stopped. Tankers are filled on the area of concrete hard standing which drains to an interceptor in the event of a spill. Tanker overfilling is very unlikely as checks are in place to ensure that tanker capacity is sufficient to take the load. Finished products (liquids) are stored in IBCs and drums on an area of concrete hard standing draining to an interceptor and one metre from the grass verge.

Emissions to Atmosphere

Point Sources - There are a number of point source emissions to atmosphere on site including 20 from bulk storage areas (free venting displacement), 5 from tanker filling pipes, 34 from the resin plant (including the reactor scrubber, the ethyl acrylate scrubber, 2 local area extraction systems removing fugitive emissions from the area and a dust filter), 5 from the coatings plant (including 1 venting from the fixed vessels, 3 local area extraction system removing fugitive emissions from the area and 1 filtering dust from emissions), 1 from a gas fired boiler and 1 from an extraction unit in the laboratory.

Emissions monitoring from the resin plant was initially carried out on a monthly basis to establish a baseline for VOC emissions. Subsequently monitoring has been carried out quarterly and there have been no occasions in the last 3 years that the permitted limit for VOCs been exceeded in the resin plant. The ethyl acrylate scrubber is fully operational and emissions monitoring is carried out quarterly. Monitoring of emissions from the coatings plant is carried out quarterly. At present emissions from the coatings plant undergo no form of abatement. Emissions released during filling of bulk storage tanks and tankers are not captured but vent freely to the atmosphere. These emissions are considered insignificant when compared to overall solvent usage however the quantity of VOC emissions is calculated annually.

Air dispersion modelling was originally not considered to be necessary due to the estimated low quantity of emissions to air when compared to overall solvent throughput and the fact that the site is not in an Air Quality Management Zone. However a full program of

dispersion modelling has been carried out during 2015 and 2016 to meet the requirements of the Odour Management plan. Results are contained in Appendix P.

Fugitive Emissions – Sources of fugitive VOC emissions include; Flanges/ Pumps/ Valves & Seals/ Storage Tanks/ Tanker Connections/ Sample Points/ Filling and Emptying Raw Materials Containers and Collection & Disposal of Liquid Waste/Accidental Spills.

A routine mechanical integrity inspection and repair programme of all pipework and vessels, intended to identify the potential for leaks is undertaken.

Solvent Emissions Reductions

The facility recognises that a small quantity of VOCs are released to atmosphere from its operations. However, due to the efficiency of the production process (99.82% in 2015) the quantity of fugitive releases are a very small percentage, 0.1%, of the total throughput (solid and liquid waste make up the majority of losses). A mass balance calculation is routinely carried out and demonstrates that the site is in full compliance with the Solvent Emissions Directive with total solvent emissions of 0.83% of solvent input in 2014 and 0.53% in 2015 Due to the constraints i.e. predetermined 'recipes', for products and Food and Drug Administration controls on the nature of coatings used in the food and drinks sector there are no formal plans to drive further reductions.

Odour

There have been occasional odour complaints from adjacent businesses on Deeside Industrial Park or from third parties via the local authority (Flintshire County Council). The site has however been proactive and installed a scrubber to remove ethyl acrylate from resin plant emissions. This material can be sensed at very small concentrations and although subjective it does not smell pleasant hence the installation of the scrubber.

Waste Management & Minimisation

The site keeps records on all the types of waste that it produces and disposes of waste via licensed waste carriers who are audited. General solid waste is stored onsite in a compactor and liquid waste is stored in metal 205 l drums painted yellow as well as IBCs. All waste is stored on an area of concrete hard standing thus any spills will be either cleaned using spill kits or diverted in one of three on site interceptors.

Waste streams are segregated where possible for recycling and recovery purposes and several initiatives have been implemented to conserve resources e.g. use of seaweed floor cleaner, use of spray balls to clean vessels in the paint plant and re-use of washings in the resin and coatings plants for cleaning purposes. The facility has a good understanding of where its waste streams arise from having carried out a systematic waste audit and identifying all sources of waste and reasons why it has been generated. The waste register is routinely reviewed to identify further opportunities for waste minimisation.

Groundwater

There are no point source emissions to groundwater either directly or indirectly from any process at Valspar. There are no List I substances used or generated onsite. List II substances are used and stored on site include;

-
- Xylene
- Biocides (used in the cooling tower)

The storage, use and disposal of the above mentioned substances are strictly controlled. All List II substances are stored in designated above ground bunded storage areas with no associated underground pipe work. As such if spills or leaks do occur it is unlikely that they will migrate downwards in the ground potentially contaminating the ground or groundwater.

Energy

The site has a formal energy policy and a process to systematically monitor energy use with the aim of reducing consumption. A detailed energy audit has been carried out onsite and all economically viable improvements have been implemented. . Energy use is monitored i.e. electricity, gas and diesel and in 20015 was measured at 4981 MWh equating to the release of 1610 tonnes of CO2 being discharged to the environment.

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Noise

Noise generated by onsite activities is not considered to be an environmental concern as no noise nuisance complaints have ever been received by the site or the local authority (Flintshire County Council) relating to the sites activities. There are no residential areas within a kilometre. As the site is located on an industrial estate other sources of noise contribute more to noise levels than the site, specifically the roads around the facility. Using Figure 2.2 ‘Key Components of a Noise Assessment’ located in the H3 Guidance and based on the information outlined above, further noise control measures are considered to be unnecessary at this time.

No vibration issues are associated with site activities.

Environmental Management

The site is certified to ISO 14001 thus it is considered to have good control of its environmental aspects and impacts. Third parties regularly audit the facilities EMS via surveillance visits to ensure its continued effectiveness. The site runs annual refresher training on the IPPC permit, environmental procedures and objectives/targets. An accidental spill is simulated annually to test the sites emergency response procedures and revisions are made as required.

SECTION A – APPLICANT DETAILS

Name of Installation

VALSPAR PACKAGING COATINGS DEESIDE

Registered Office

Which relates to the Authorised Process carried out at the premises occupied by the Operator at

VALSPAR PACKAGING COATINGS DEESIDE
PARKWAY
DEESIDE INDUSTRIAL PARK
DEESIDE
FLINTSHIRE
CH5 2NN

Site Contact

Dudley Pritchard – Site Manager

Telephone: 01244 837 337
Fax: 01244 280 875

SECTION B – THE APPLICATION

Activities that bring the installation under the PPC Regulations

The installation undertakes the following activity described in Part A(1) of Schedule 1 to Environmental Permitting (England and Wales) Regulations 2010 SI 2010/675 as amended.

There is one Part A process taking place on site – Section 4.1 (a) (ii)

'Producing organic chemicals such as organic compounds containing oxygen, (for example alcohols, aldehydes, ketones, carboxylic acids, esters, ethers, peroxides, phenol, epoxy resins)'.

The Part A process is carried out in the Resin Plant. The process carried out in the Resin Plant is summarised in section 3.1.2. Further details are provided in Appendix L.

There is also a Part B process – Section 6.5 Part B (a) (i)

'Manufacturing or formulating printing ink or any other coating material containing, or involving the use of, an organic solvent, where the carrying out of the activity is likely to involve the use of 100 tonnes or more of organic solvents in any period of 12 months'

The Part B process is carried out in the Coatings Plant. The process carried out in the Coatings Plant is summarised in section 3.1.3. Further details are provided in Appendix M.

See Appendix I for details of the previous Flintshire County Council authorisation for the Coatings Plant – PP0016.

In the preparation of this PPC application the following documents have been referenced as primary sources of information.

- NRW Additional guidance for: The Production of Large Organic Chemicals (EPR 4.01) September 2014.
- Reference Document on the Best Available Techniques in the Large Volume Organic Chemical Industry – March 2009.

PPC Installation Boundary

The installation boundary is shown in red in Figure 2.2 in Section 2. The installation boundary is consistent with the site perimeter in this instance.

It was agreed with the local EA inspector that the boundary of the installation should include all activities taking place within the site boundary with no exceptions.

IPC Permit History

The site submitted an application under the Integrated Pollution Control Regulations in 1994 received its first authorisation in the same year. In 1999 the facility received a second authorisation due to a change in the process (a variation would have taken longer to secure).

Prior to the issue of the PPC Permit in May 2007 there was one variation to the permit documented in the table below and a second variation was submitted to the EA in February 2006. (Full details of this variation are provided in Appendix J).

The site is currently regulated from the North West region of Natural Resources Wales via the Buckley office in North Wales.

No prosecutions, improvement notices or enforcement actions have been received in the last three years.

Description	Ref Number	Issued	Effective Date	Type of change made or comments
Authorisation 1	AK 2181	02/94	08/02/94	
Variation Section 10	BC6314	25/11/98	30/11/98	ISR reporting
Variation Section 10	BV6455	12/01/04	20/01/04	Minor variation carried out following 4 year review
Authorisation 2	BE 7443	25/5/99	01/06/ 1999	Should have been a variation for a change in site ownership/name but an authorisation was issued as it was quicker to obtain than a variation.
Variation Section 10	BV 6463	12/01 04	20/01/ 2004	Minor variation following 4 year review.

Table 1 - IPC licence variation history

1.0 SITE REPORT

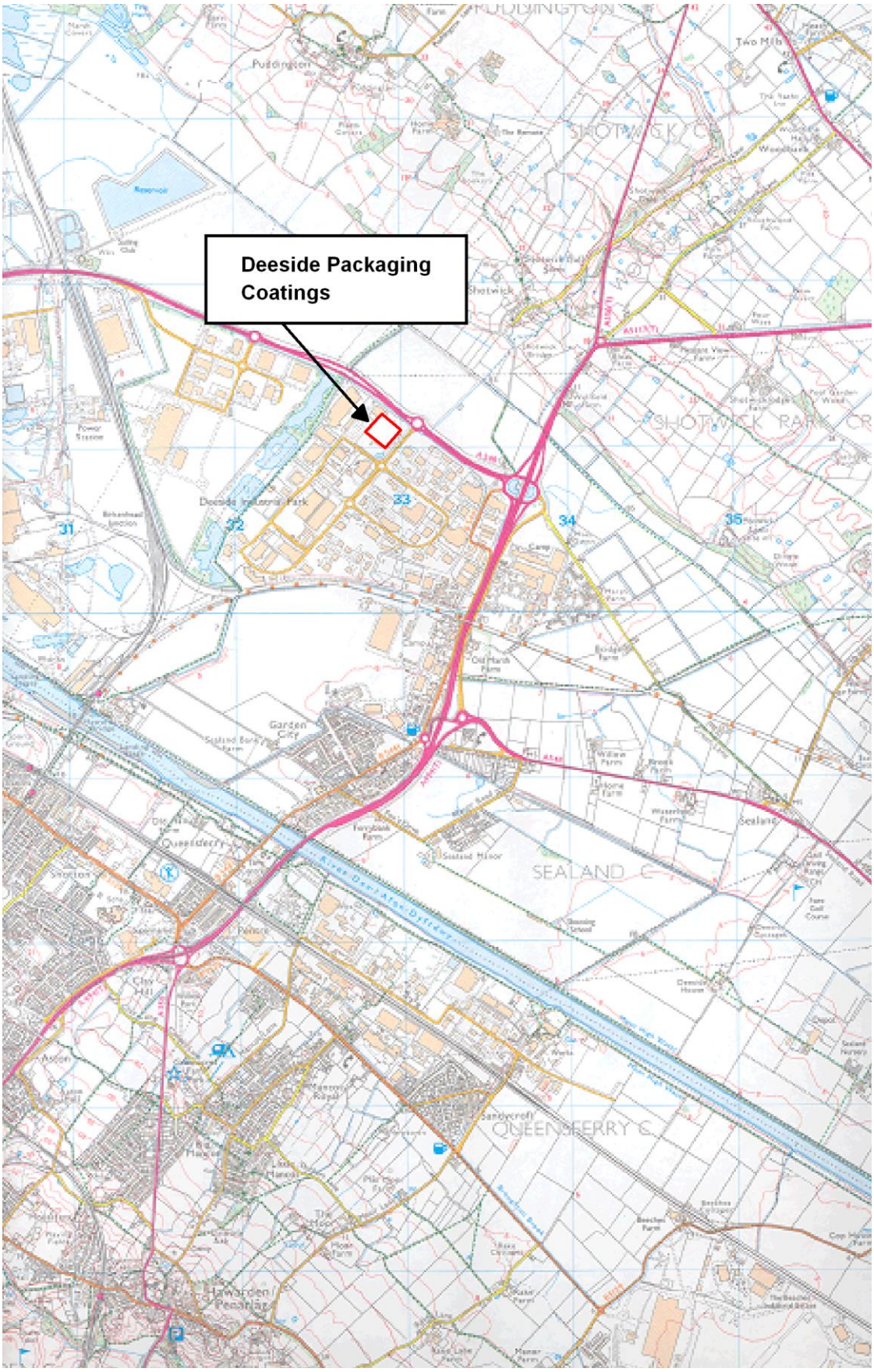
The site report highlighting areas of potential contamination onsite is located in **Appendix A.**

2.0 SITE MAPS

2.1 SITE LOCATION

Figure 2.1a Site Location Map

Figure 2.1b Site Location Map (1:25000)



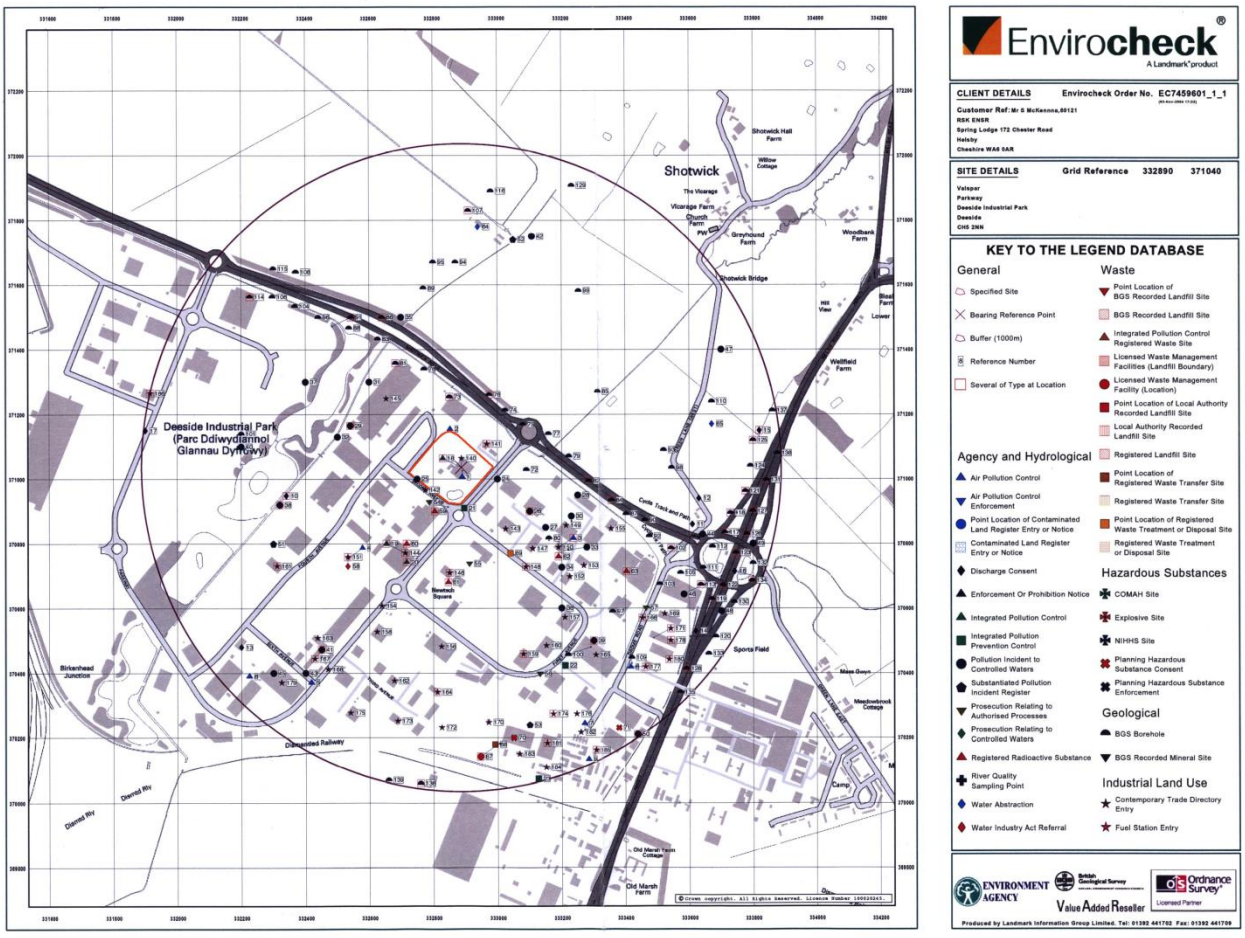
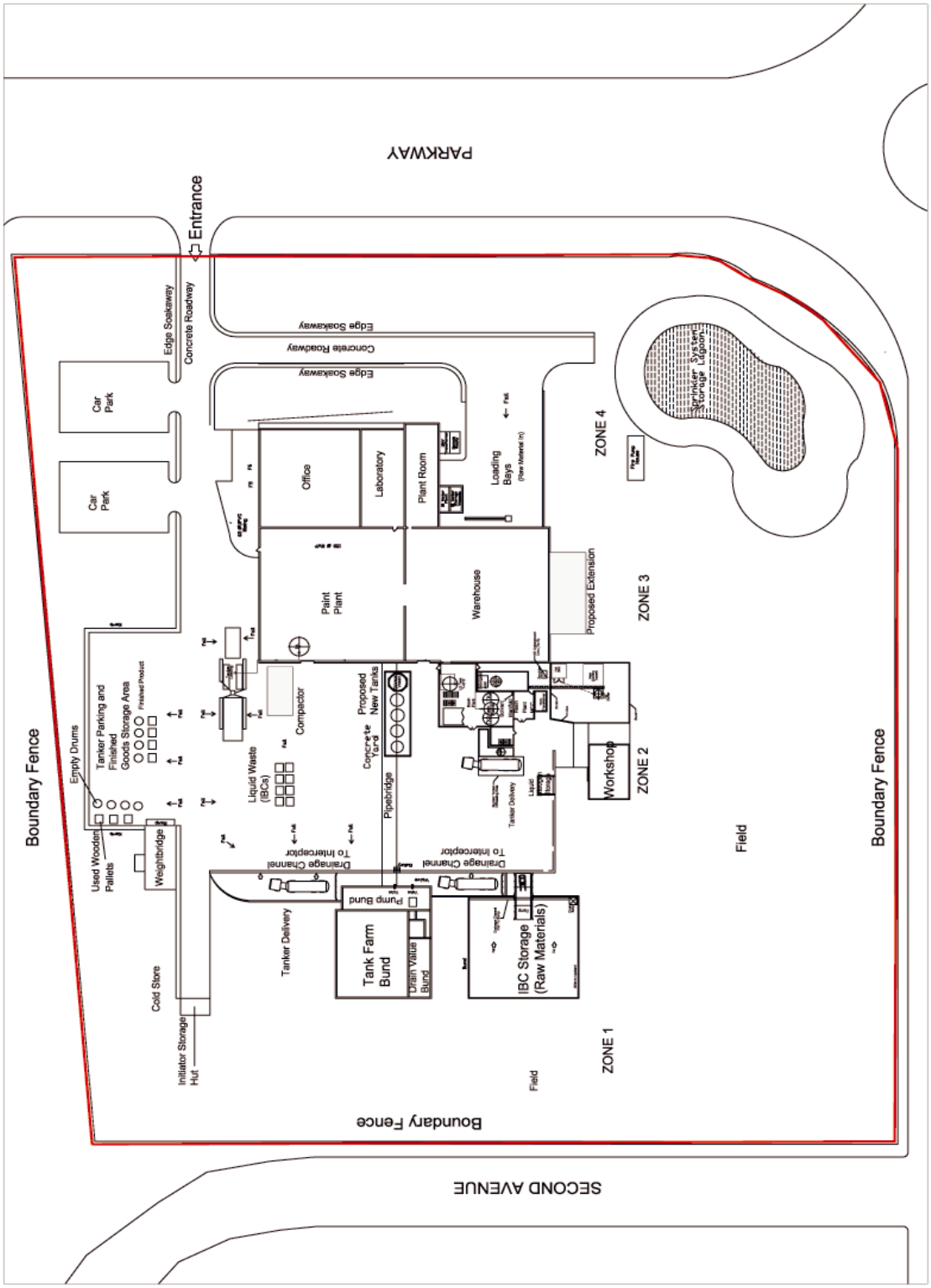
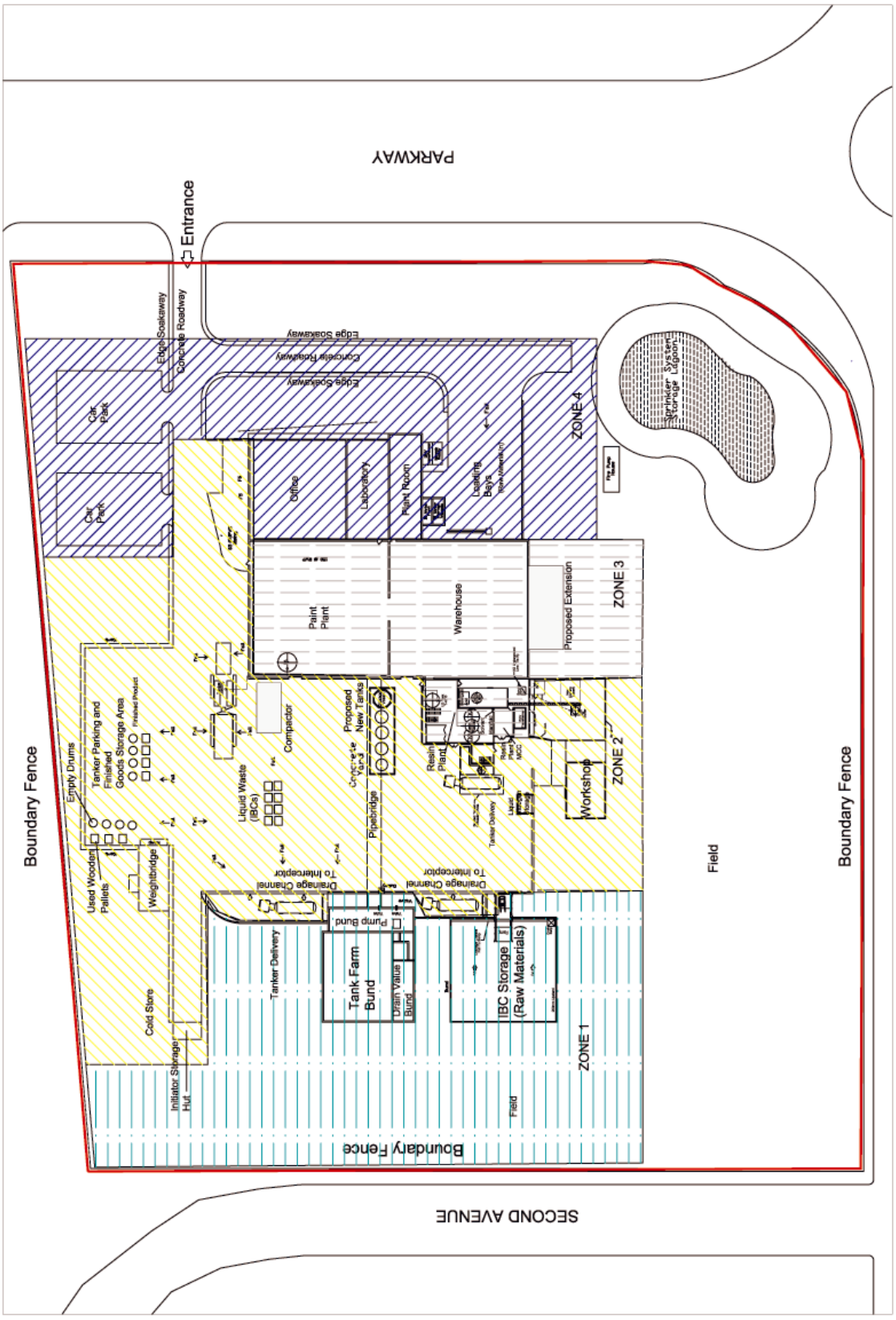


Figure 2.1c Site Location Map (1:2500)

2.2 PPC BOUNDARY (HIGHLIGHTED IN RED)



2.3 PROCESSES & ACTIVITIES (SITE ZONING MAP)



3.0 TECHNIQUES

3.1 PROCESS DESCRIPTION

An illustration of the site layout and processes is found in Appendix C and is explained in more detail in this section accompanied with several schematics.

3.1.1 Raw Materials Delivery

Raw materials are brought onto the site in bulk tanker, IBCs, 205 l drums as well as 1 tonne bags, 25kg, 50 kg bags and 1-25 kg containers.

Bulk raw materials are or will be deposited in one of three storage areas; the main tank farm, ethyl acrylate tank and a bulk storage area adjacent to the resin plant.

- A key is required from site before filling can commence.
- Accurate knowledge of tank contents via DCS control panel so overfilling not possible.
- Supervised delivery (coupling and disconnection process).
- Filling only can commence if vehicle is earthed (electrostatic charges).
- High-level alarm with automatic cut off and gauge for visual contents.

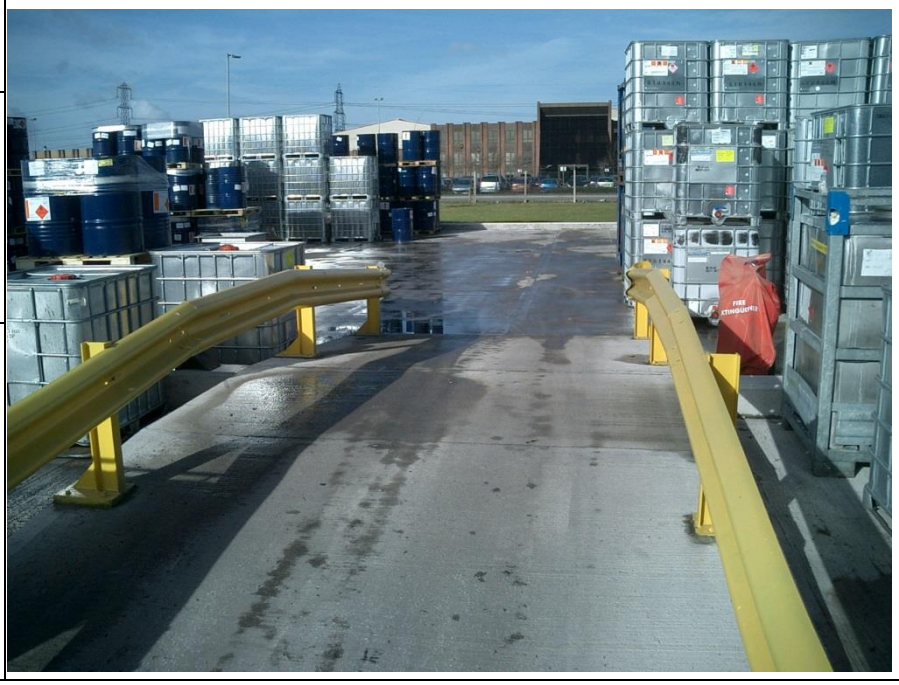
Client Name:	**Site Location:**	**Project No.**
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 1	**Date:** 20/01/2006
Direction Photo Taken: Looking West	
Description: Main raw material bulk storage area (bulk tanker delivery) and above ground pipe work to manufacturing area	

IBCs/Drums

IBCs are stored in a purpose built area adjacent to the main tank farm. This area comprises a concrete hard standing and is set within a bunded area. IBCs are also stored on an area of concrete hard standing located adjacent to the maintenance workshop.

Client Name:	**Site Location:**	**Project No.**
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 2	**Date:** 20/01/2006	
Direction Photo Taken: Looking west		
Description: IBC & Drum raw materials storage area		

Solid Raw Materials

One tonne bags of powder along with 25 & 50 kg bags and 1-25 kg containers are stored in the warehouse at ground floor and first floor level.

Client Name:	Site Location:	Project No.
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 3	Date: 20/01/2006

Direction Photo Taken:

Looking North

Description:

Transfer of bulk raw material to manufacturing process via above ground pipes.

3.1.2 Resin Plant

A schematic overleaf summarises the process taking place in the resin plant and is explained in summary below.

Epoxy Upgrade

- Warm Epoxy resin (60 - 80°C) is transferred from the heated bulk tanks to a heated weigh tank (see Photograph 3 above). This is transferred to the reactor under gravity.
- The agitator is switched on as well as the heating to the bottom zone to keep the temp above 45°C.
- Phosphonium Iodide/Bromide catalyst is added to the reactor via the manway which has previously wetted out in solvent.
- Bis-A in 1T, 0.5T or 25kg bags is added to the reactor via the manway.
- Note: Nitrogen inerting is taking place with slow mixing.
- Other modifiers maybe added here also via the manway.
- Diluent solvent is added via bulk lines or pumped via the weigh booth.
- Heating is applied to approx. 121 - 125°C with mixing and nitrogen inertion.

- The heating rate is monitored at 121 - 125°C. Heating is turned off to allow the exotherm to proceed to 165 - 185°C.
- Cooling is applied during the exotherm to control the heat of reaction.
- Depending on the product being made, the heat of reaction may also be removed by refluxing solvent.
- Once the temp has peaked between 165 - 185°C the batch is held for approximately 30 minutes then tested for Epoxy Equivalent Weight (EEW).
- Once within specification the batch is diluted with various solvents either from bulk lines direct to the reactor via meters and/or via the monomer weigh tank.
- Depending on the product being made the diluted epoxy upgrade is either modified further by one of two routes:

Solvent Based Epoxies

- The diluted epoxy is modified by the addition of a Carboxylic acid and amine catalyst. This is reacted at 140 - 155°C.
- The batch is tested for EEW and Acid Value (AV).
- When in specification it is fully diluted with various solvents, cooled and transferred to a let down tank or filled off into drums or totes via filter bags.

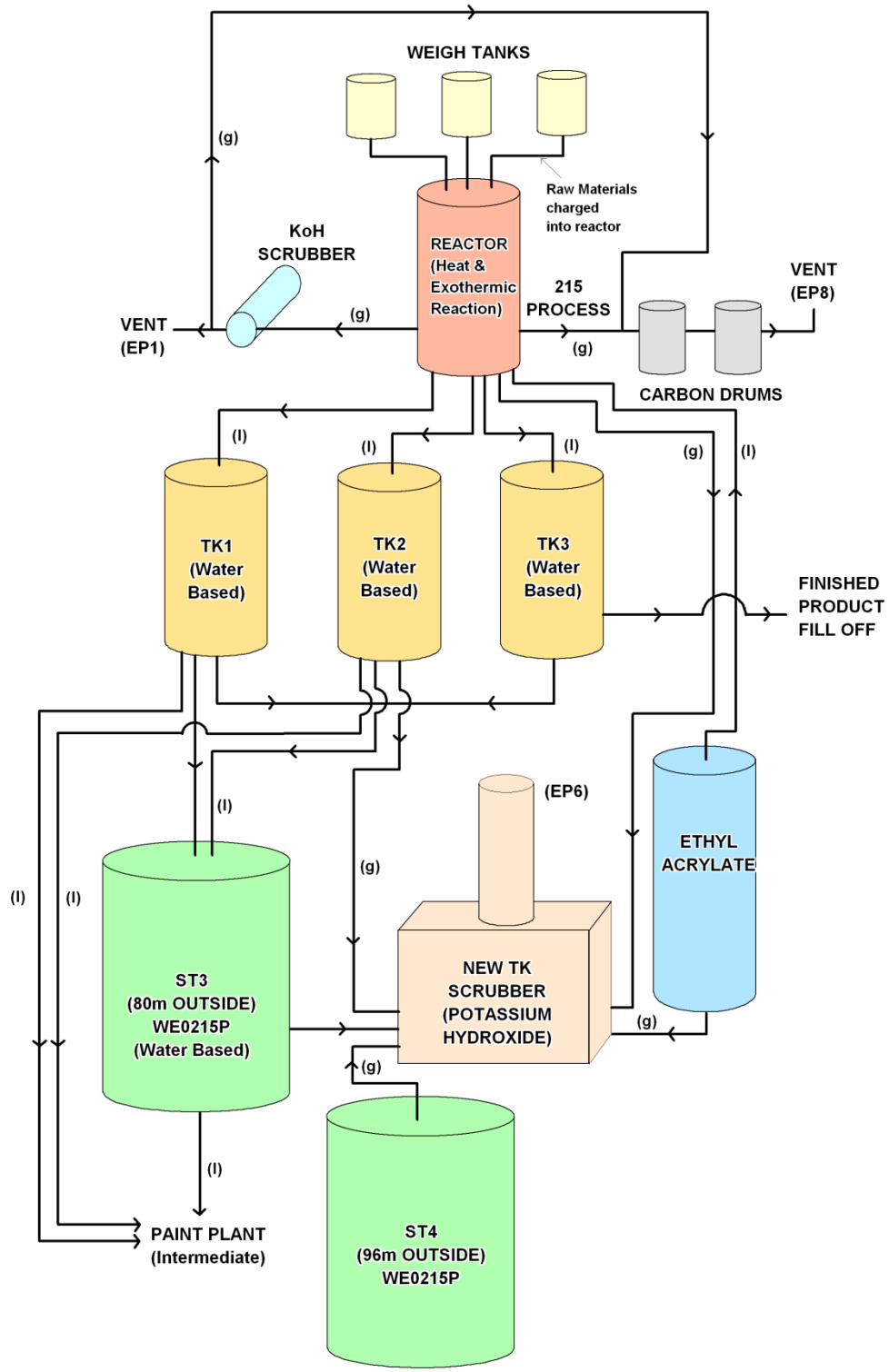
Water-Based Epoxies

- The epoxy upgrade is modified with various vinyl monomers.
- The vinyl monomers are mixed together in the monomer weigh tank.
- The monomers are added to the weigh tank either from bulk lines or drums (via weigh booth).
- The peroxide and/or AZDN catalyst is added to the monomer mix and then added to the reactor over 60 – 120mins. Water-cooling and feed rate control the heat of reaction.
- Once complete the batch is dropped into let down tanks TK1 + 2 or pumped to let down tank TK3 at approx. 110°C.

Inversion

- Water and amine solution is then added to the let down tank. This is mixed to form a quaternary salt.
- Hot or cold Di water is then added over a 30 – 60 minute period to form an emulsion (endothermic reaction).
- Following this the emulsion is filtered and transferred to bulk storage or filtered into totes or drums.

Figure 3.1 – Resin Plant Process Flow



Reactor Vessel Cleaning

Currently there are five resins manufactured regularly in the resin plant reactor namely; WE0215P, WE0912P, WE0461P SE0635P and SE0624P. A mini boil using approximately 1750 kg solvent is required between batches of WE0215P and a full wash (10 tonnes) is required between batches of WE0215P and WE0461P and before SE0635P and SE0624P. The number of full washes is kept to a minimum through forward planning of reactor activities.

Fresh solvent is charged to the reactor for the miniboil wash, heated to reflux temperature and then cooled below 100°C before recirculating through spray balls after which it is returned to a storage tank. The wash is then added to the following batch of resin to eliminate waste.

Wash solvent for the reactor is held in bulk in the tank farm and comprises a mixture of alcohols, ketones and hydrocarbons. The wash solvent is pumped directly from bulk to the reactor where it is heated under reflux before cooling and return to bulk. The reflux is carried out using the reactor condenser / vapour scrubber giving an enclosed system and preventing solvent emissions. The wash solvent is used until it loses effectiveness at which time it is collected by a specialist waste management company for energy recovery disposal.

Build up of insoluble debris on the reactor walls is removed approximately every 2-3 months as it interferes with the temperature transfer inside the reactor. Pelargonic (nonanoic) acid held in bulk is pumped into the reactor and heated for 6-8 hours under reflux. The acid is then cooled and returned to bulk. The acid eventually becomes depleted and is replaced every 8-10 years. There are no emissions to atmosphere from this process.

3.1.3 Coatings Plant

Coatings Plant

Lacquers and coatings containing organic solvents are manufactured in the coatings plant.

- Raw materials are supplied to the coatings plant in bulk form and in smaller barrels and dry raw materials are delivered in bags.
- The raw materials are stored both within the warehouse and also externally in the yard.
- Liquid raw materials are fed into mixing vessels via a central manifold, enabling quantities to air to be controlled and emissions contained.
- Displacement of air from the tanks is controlled via nitrogen blanketing.
- For the manufacture of water and solvent based lacquers the resin, organic solvent and water are mixed together.

- The particle size is reduced via a grinding mill, let down into vessels with more organic solvents, tested, adjusted to specification and filled into drums, totes or road tankers.
- For water and solvent based PVC free lacquers the resins, organic solvents and water are mixed, tested, adjusted and filled into drums, totes or bulk tankers.

Change Pans

A range of change pans are used at Deeside Packaging Coatings ranging in size from 200-2000 litres. They are used to make small batches which comprise a relatively small proportion of the total production at the facility. After each batch the pans are cleaned as follows:

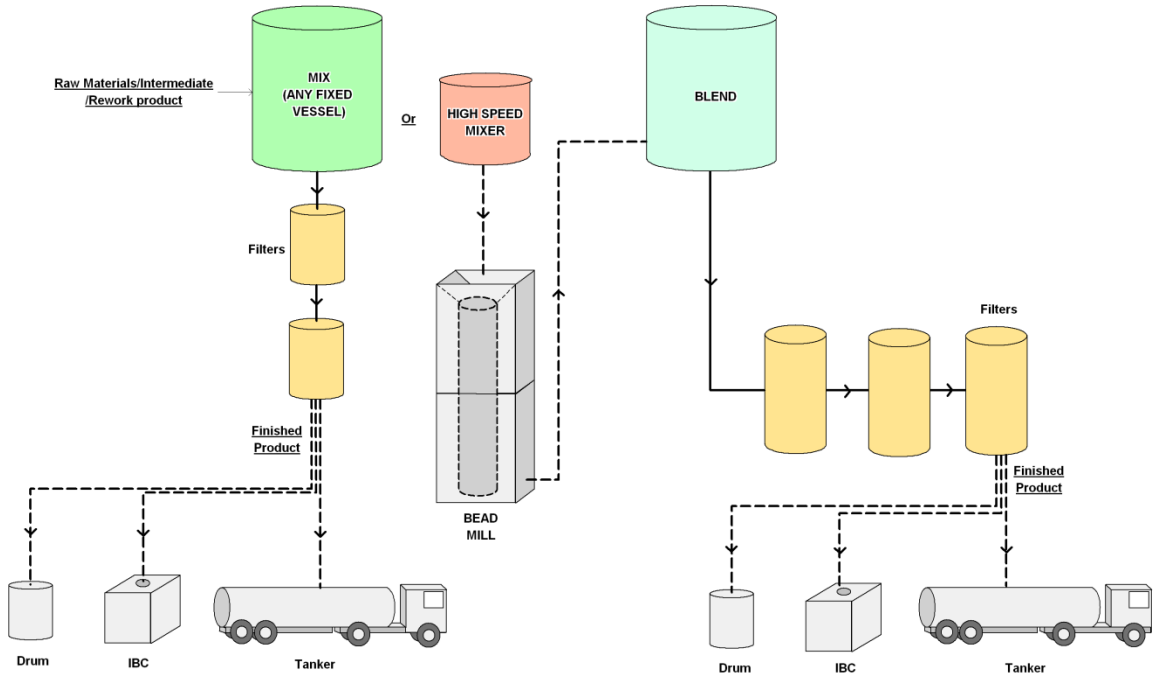
- Solvent is decanted into the change pan ensuring ground leads are attached beforehand.
- The solvent is run down the inside wall of the pan to prevent splash filling and the associated static hazard.
- The agitator is switched on to stir the solvent and remove the majority of the residues.
- The agitator is removed and the remaining residue cleaned using a natural bristle brush.
- The pan is given a final flush with 20 litres of fresh methyl ethyl ketone (MEK) taken from bulk storage.

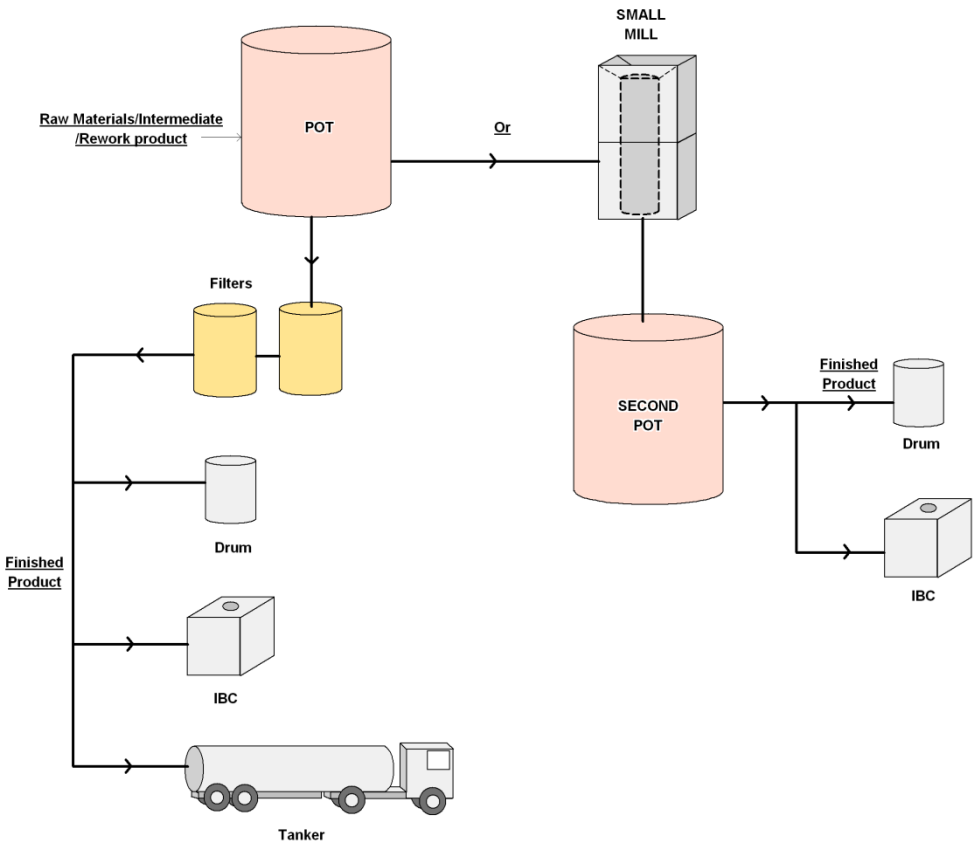
Fixed Tanks

There are 17 fixed vessels in the paint plant used for the manufacture of water and solvent based products.

- The fixed vessels are held under a nitrogen atmosphere for safety reasons i.e. to prevent ignition from static during charging and for environmental reasons i.e. helps reduce displacement of VOCs to atmosphere.
- Depending on the size of the tank, 4-6 drums of wash solvent are pumped in via internally fitted spray balls and the vessel cleaned by agitation before returning the solvent to the original drums.
- The vessels are maintained under a constant nitrogen blanket at two inches water gauge pressure so apart from displacement losses on charging the solvent there are no further emissions to atmosphere from the cleaning process.
- Use of solvent is kept to a minimum as solvent washings are added to the next batch wherever possible or stored and used in the next vessel-washing event.

Figure 3.2 - Paint Plant Process Flow





Floor Cleaning

Slips, trips and falls compromise a significant proportion of the accidents which happen in the typical workplace. Valspar place great emphasis on keeping the factory floor clean and uncluttered to prevent such accidents. The factory is divided into the coatings plant and warehouse upper and lower floors. The floor in one of these areas is cleaned every shift covering the entire floor over four shifts. Floors are cleaned using a seaweed based floor cleaner/degreaser. This produces no solvent emissions. The soiled cleaning fluid is disposed of in drums by a specialist waste disposal contractor.

Warehouse

The warehouse is a two storey building located adjacent to both the resin plant and coatings plant.

- A loading area is used to transfer raw materials from vehicles into the warehouse.
- The ground floor is used to store finished product, BIS-A as well as other raw materials stacked on metal racking.
- A lift allows raw materials to be moved from the ground to the first floor.
- The first floor is used to store powders, raw materials that require protection from external ambient conditions, retains and intermediates.

The blending operation that was transferred from the Machen site in South Wales to the Deeside facility was sold to a customer in 2010.

3.1.4 Finished Product

Finished product is transferred from mixing/blending vessel directly to bulk tankers or into IBCs/drums. IBCs and drums are stored in the yard on an area of concrete hard standing and also in a designated area within the warehouse. Finished product is not stored in bulk onsite with the exception of tankers waiting to be picked up and taken to customers.

Client Name:	**Site Location:**	**Project No.**
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 4	**Date:** 20/01/2006	
Direction Photo Taken: Looking north west		
Description: Finished product storage area (IBCs & Drums)		

3.1.5 Ancillary Activities

RO Plant

Mains water is filtered and organic scavenged before being de mineralised in a Reverse Osmosis treatment plant.

Maintenance Workshop

The workshop is used to repair equipment.

Cooling Tower

Towns water comes into the cooling tower and is used in cooling coils and jackets on the reactor and think tanks in the resin plant.

Plant Room (Compressors & Gas fired boiler)

A compressor provides compressed air for use in the plant. Condensate from the compressor is passed through a 'scavenger' unit to remove hydrocarbon content before being discharged to the interceptor and foul sewer.

Natural gas is piped into the boiler to create hot water which supplies heating onsite and which is also used in the process.

Nitrogen

. A membrane nitrogen generating plant is also located in the plant room to supply nitrogen for purging pipe work and creating a nitrogen blanket during reactions. A liquid nitrogen tank is also located onsite as emergency backup.

Chiller

A glycol/water mix is used in the chiller to remove heat from the mills in the paint plant.

Fork Lift Charging Bay

A forklift truck battery charging area is located next to the maintenance workshop.

Sub Station

Electricity is supplied to the site via two sub stations owned by the energy company. One is located in a secured building and the other in a secure fenced area.

3.2 EMISSIONS AND ABATEMENT

3.2.1 Air

There are currently a number of point source emissions to atmosphere onsite. A site plan in the Appendix C illustrates the locations of the majority of the emission points. A full list is provided in Appendix C. The main current emission points are identified below.

Resin Plant (currently regulated)

A1 Resin Plant - Reactor scrubber vent
A2 Resin Plant - Reactor dust filter vent
A3 Resin Plant - Ethyl Acrylate scrubber
A38 Resin Plant – Filter Local Exhaust Ventilation
A40 Resin Plant – General Ventilation
A41 Resin Plant – Control Room and Laboratory Forced Ventilation Extraction system

Bulk Storage Areas

Displacement vents to atmosphere (no abatement)

- A8 to A24 from 17 tanks in main tank farm (T701-T717)
- Free venting tanks ST5-ST7, A26 to A27 in bulk storage area adjacent to the Coatings Plant.
- Free venting nonanoic (pelargonic) acid tank T106, A25
- Free venting miniboil solvent wash tank T104, A42

Coatings Plant (formerly Part B process)

A5 Coatings Plant - Displacement emissions from all vessels (no abatement)
A6 Coatings Plant - Dust emissions from LEV and Mixing Vessel 17(particulate abatement)
A31 to A35 Tanker filling points (no abatement)

A7 & A39 Coatings Plant - Fugitive emissions displaced from manufacturing area (no abatement)
A37 Coatings Plant – SA1 & BP16 Filling point LEV

Plant Room

A36 Combustion products from Gas fired boiler emissions (no abatement)

Laboratory

Extraction vent (no abatement)

Warehouse

A43 Warehouse General Ventilation West
A44 Warehouse General Ventilation South

Emissions monitoring from the resin plant was initially carried out on a monthly basis to establish VOC emissions. An emission limit of 2 kg / hr Total Class B VOCs (as Carbon) has been set by the EA. On no occasion within the last three years has the permitted limit for VOCs been exceeded in the resin plant. Monitoring of emissions has also been carried out on the ethyl acrylate scrubber and an emission limit of 2kg /hr of Total Class B VOC's. Monitoring of all three Resin plant main emission points has been carried out quarterly since issue of the PPC Permit in 2007.

Monitoring of emissions from the coatings plant is carried out on a quarterly basis against an emission limit of 2 kg/hr of Total Class B VOCs (as Carbon). At present emissions from the coatings plant undergo no form of abatement. In the last 3 years there have been no occasions recorded when the emission limit of 2 kg/hr was exceeded.

Emissions released during filling of bulk storage tanks and tankers are not captured but vent freely to the atmosphere. Based on analysis of the emissions monitoring emissions from the coatings plant were calculated to be 3630kg in 2015. In 2015, 6152kg of VOCs (as total carbon) were released from the resin plant (reactor & let down tanks). Calculations of vapour displaced using the vapour pressure of the contents demonstrate that approximately 250kg of VOC per year are released from the main tank farm (17 vessels). The total VOC emissions from the site in 2015 were calculated to be 38919kg which represent 0.63% of the total solvent throughput of 6177 mt.

For the original PPC permit air dispersion modelling was originally not considered to be necessary due to the estimated low quantity of emissions to air when compared to overall solvent throughput. However a full program of dispersion modelling has been carried out during 2015 and 2016 to meet the requirements of the Odour Management plan. Results are contained in Appendix P

Monitoring of emissions to air is carried out by an external MCerts qualified contractor for the purposes of reporting data to NRW

3.2.2 Surface Water and Sewer

The only discharge directly to surface water is rainwater which falls on the roofs of the facility buildings. The rainwater is discharged into the Shotwick Brook and finally into the River Dee. See Figure 6 overleaf for site drainage map.

In 2015 2585 mt of wastewater was discharged from the site into the public sewer through the Welsh Water metered discharge point. All this water was rain water collected in the bunded areas of the site. Discharges to the sewer from the site also originate from the onsite domestic toilets and kitchen. Discharges from the interceptor to sewer only take place after the contents of the tank has been analysed by internal Valspar staff in order to detect any potential contaminants which may have been washed off the yard area during periods of rainfall. Equipment used internally to analyse interceptor contents is calibrated on an annual basis using an external third party.

The 2015 monitoring results identified no occasions when contaminants in the interceptor were found to be above the permitted thresholds requiring the contents to be tanked offsite for disposal as hazardous waste. Sources of elevated levels of contaminants in the interceptor tank could be spills in the yard washed down by rainwater. On occasion waste containers have also leaked out residues onto the yard surface.

The results of internal and external monitoring are found in Appendix B. On a monthly basis Welsh Water carry out independent monitoring of discharges to the public sewer. Several graphs in the Appendix B compare internal monitoring results with those of Welsh Water and indicate a close correlation.

The monitoring results included in Appendix B indicate that the facility has a high level of control over releases to the foul sewer. This is confirmed by the Welsh Water results and lack or prosecutions.

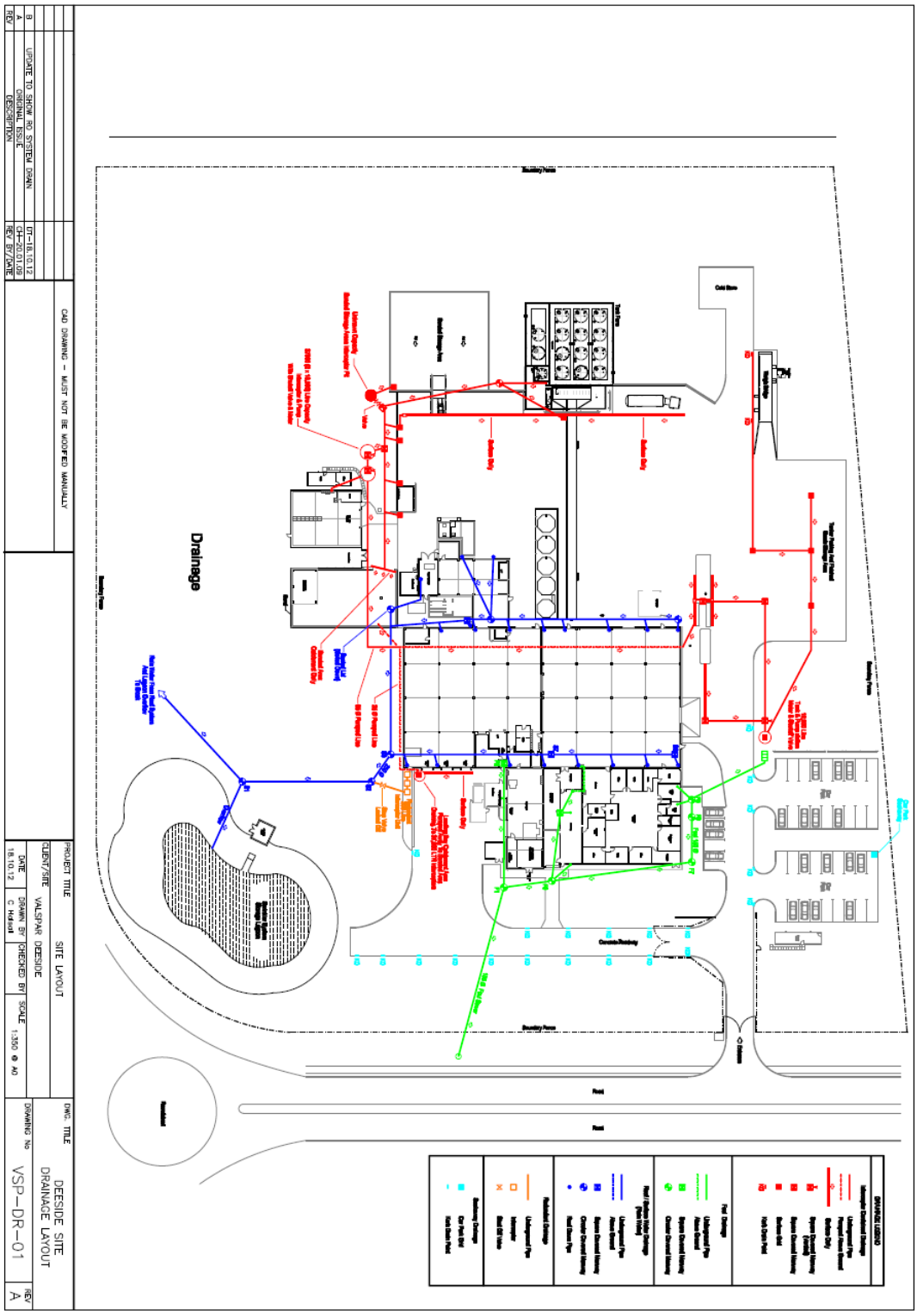


Figure 6 – Site Drainage Map

3.2.3 Groundwater

There are no point source emissions to groundwater either directly or indirectly from any process at Valspar.

There are **no** List I substances used or generated onsite.

List II substances are used on site include;

- Xylene
- Biocides (used in the cooling tower)

The storage, use and disposal of the above mentioned substances are strictly controlled. All List II substances are stored in designated above ground bunded storage areas with no associated underground pipe work. As such if spills or leaks do occur it is unlikely that they will migrate downwards in the ground potentially contaminating the groundwater.

Procedures are also in place to control deliveries of raw materials (including the List II substances) as well as the movement of the materials around the site to prevent spills and quickly deal with any that do occur. This approach helps ensure that liquid spills do not migrate into the ground via any cracks present in the yards concrete surface. A form is used on all occasions where accidental spills occur to record the details of the incident and to investigate the root cause so that the incident is not repeated (form HSE –031).

As such management controls are in place there is a low probability of either direct or indirect discharge (as defined in the Groundwater Regulations) List II substances to groundwater from the site.

3.2.4 Fugitive Emissions to Air

Fugitive VOC emissions can potentially arise from the following sources;

- Flanges/Pumps/Valves & Seals/Tanker Connections/ Sample Points/ Filling and Emptying Raw Materials Containers / Collection & Disposal of Liquid Waste/Accidental Spills

Measures to control fugitive emissions;

- Finished product is slowly bottom filled into tankers over a period of 3-4 hours to minimise VOCs releases.
- Accidental spills are kept to a minimum through a combination of operator training and procedures which control the handling of materials onsite.
- All operators are required to place lids on containers where solvents are stored (raw materials, finished product & waste) when not in use.
- Drums and IBCs of liquid waste are securely fastened to prevent fugitive emissions during storage.

- Seaweed based product is used for floor cleaning instead of solvent based products which releases VOCs.
- A bulk storage system for ethyl acrylate has been installed instead of IBCs/drums where fugitive emissions are released. The bulk storage tank is connected to a scrubber which removes ethyl acrylate from the emissions.
- At the design stage the number of required valves and flanges are considered so that a conscious effort is made to keep these to the absolute minimum for the required purpose. This approach reduces the potential for releases of fugitive VOC emissions.

A routine mechanical integrity inspection and repair programme of all pipework and vessels, intended to identify the potential for leaks is undertaken.

Mass Emissions

Due to the efficiency of the production process (99.82% in 2015) the quantity of fugitive releases are a very small percentage 0.1% of the total throughput (solid and liquid waste make up the majority of losses). A mass balance calculation is routinely carried out and demonstrates that the site is in full compliance with the Solvent Emissions Directive with total solvent emissions of 0.83% of solvent input in 2014 and 0.63% in 2015.

3.2.5 Fugitive Emissions to Water, Sewer and Groundwater

Surface Water and Public Sewer

Only rainwater from the building roofs discharges to surface waters. As the drainpipes from the roof are enclosed and there are no internal open surface water drains it is not likely that any fugitive emissions to surface water will contain any polluting substances.

The only possible scenario where fugitive emissions could enter the surface water or public sewer system would involve the movement of any existing contaminants in the ground into the drainage systems via any broken/cracked underground pipes. Elevated levels of Xylene were identified onsite during a Phase II investigation in 1998.

Groundwater

Groundwater is protected onsite from potentially contaminating fugitive emissions by a combination of management controls and physical barriers.

- Delivery of raw materials to bunded, aboveground storage areas is supervised (see photograph in Appendix D).
- Spill kits are made available to employees so that any spills that might occur can quickly be dealt with before they can migrate into the groundwater (see photograph in Appendix D).
- A concrete surface in the yard area forms a barrier to the downward movement of contaminants. This surface represents BAT in terms of hard standing (see photograph in Appendix D).

- FLT drivers are trained on how to move materials around the site to avoid accidents and to deal with any spills that do occur.
- Liquid raw materials/product are stored at least a metre from grassy areas to help prevent spills entering ground (see photograph in Appendix D).

;

- All joints in kerbs around the yard area are sealed.
- The concrete hard standing surface is routinely inspected for formation of cracks and repairs are timeously completed
- Integrity testing of underground tanks (interceptors) is routinely carried out to establish whether there are any cracks which could allow contaminated materials to escape leading to pollution of the groundwater. Any cracks identified are timeously repaired. To date no damage has been identified.

3.2.6 Odour (Refer to Odour Management Plan)

Processes taking place onsite that could generate odour include;

1. Raw Material Delivery – displacement of vapour from bulk storage vessels.
2. Resin Plant - charging, reaction and let down
3. Paint plant – charging, blending/mixing and let down
4. Filling of bulk tankers/IBCs and drums with finished product.

To date Valspar have received 3 complaints with regard to odours emanating from its facilities. The facility understands that odour releases could create a nuisance and as such it has invested in an ethyl acrylate scrubber system. In 2015 and 2016 the site has carried out extensive study and produced an odour management plan in line with the requirements of additional guidance H4 for Odour Management

3.2.7 Solvent Emissions

Point Sources (vents, stacks) – see Appendix C for a full list of release points.

- A1 Resin Reactor Scrubber from reactor vessel in resin plant – the scrubber is irrigated with potassium hydroxide which absorbs solvent and acrylate vapours as they pass through.
- A3 EA Tank and TK Scrubber from let down tanks and the ethyl acrylate bulk storage tank. The scrubber is irrigated with potassium hydroxide which removes solvent and acrylate vapours from releases to atmosphere.
- One DCE Dust Filter, A2 releasing emissions drawn from dust collection points around the reactor.
- Two vents in the resin plant – one LEV from product filtration point, A38 and one general area ventilation exhaust, A39 capturing fugitive emissions
- Four vents in the coatings plant – one vent, A5, releasing displacement emissions from all fixed vessels, two general area ventilation exhausts, A35 and A36 capturing fugitive emissions and one LEV from product filling points, A37.
- Three general area ventilation exhausts two in the coatings plant, A
- Tank farm/bulk storage tank release vents A7 to 29 & A41. All vents freely displace solvents emissions to atmosphere during delivery.
- Tanker fill points x 5 A30 to A34
- Laboratory – extraction vent

Fugitive Sources

See section 3.2.4 for sources of fugitive emissions and measures currently in place to minimise releases of VOC emissions to the atmosphere.

3.2.8 BAT for PPC Installation

BAT for activities taking place at Deeside Packaging Coatings was taken from 'Guidance For Large Volume Organic Chemicals S4.01.

The table 2 below outlines;

- The indicative BAT for the process/activity taking place within the PPC boundary
- What the site is currently doing in each area
- GAP between what is and should be happening
- Justification to site approach and/or confirmation of future actions required

Table 2 - BAT for Activities taking place at Deeside Packaging Coatings

Indicative Bat Raw Materials Selection

BAT	SITE	GAP	JUSTIFICATION
The Operator should have procedures for the regular review of new developments in raw materials and the implementation of any suitable ones with an improved environmental profile.	Site has limited influence on process raw material choice as this is a function of the Tournus or US technical facilities in order to meet customer products requirements. Site can decide what non-process specific raw materials it uses and it does i.e. seaweed based floor cleaner.	Although it is not easy for the site to change raw materials used in the production process there are lines of communication to the technical centres where issues such as odour can be highlighted and if possible changes made. Although occasional raw material substitutions take place there is currently no formal procedure to systematically assess materials used on site and investigate alternatives which have less environmental impact.	Food and Drug Administration (FDA) approval is required for internal dry film thus it is not possible to use alternative materials without going through an intensive research and development process. Legislation also impacts the raw materials which can and cannot be used.
The Operator should have quality-assurance procedures for controlling the content of raw materials.	The site carries out quality control on a number of liquid raw materials stored in bulk. The procedure, which requires the sampling, is found in the sites quality management system (ISO 9001 certified). By adopting this approach out of specification raw materials are identified before they are used thus helping to reduce the number of 'bad	Quality control for assurance purposes is not carried out on solid raw materials and a number of liquid raw materials.	Tests on raw materials are carried out when finished products have historically failed therefore only critical raw materials are tested or those new raw materials brought onsite for the first time. Tested are not required where another Valspar site has identified that a raw material is out of spec.

	batches'.		
The Operator should complete any longer - term studies needed into the less polluting options and should make any material substitutions identified	See Row 1 Above	See Row 1 Above	See Row 1 Above

INDICATIVE BAT REQUIREMENTS FOR WASTE MINIMISATION AUDITS

BAT	SITE	GAP	JUSTIFICATION
The Operator should carry out a waste minimisation audit at least every 4 years. If an audit; has not been carried out in the 2 years prior to submission of the application and the details made known at the time of the application, then the first audit shall take place within 2 years of the issue of the Permit. The methodology used and an action plan for reducing the use of raw materials should be submitted to the Regulator within 2 months of completion of the audit.	A waste audit is carried out annually and a waste minimisation programme is in place An annual mass balance is carried out and indicates a material efficiency for the site of >99.8%	N/A.	

INDICATIVE BAT REQUIREMENTS FOR MINIMISATION OF WATER USE

BAT	SITE	GAP	JUSTIFICATION
The Operator should carry out a regular review of water use (water efficiency audit) at least every 4 years.	The site monitors how much water is used and carries out annual analysis of water usage efficiency to identify opportunities for water usage reduction.	N/A	
The Operator should produce flow diagrams and water mass balances for the activities.	Site has a water flow diagram and a mass balance.	N/A	.
Water-efficiency objectives should be established by comparison with the benchmarks above.	Water efficiency measures are in place i.e. use of spray ball cleaning and re-use of wash water in the coatings plant.	N/A	
Water pinch techniques should be used in the more complex situations, particularly on chemical plant, to identify the opportunities for maximising reuse and minimising use of water.	Water efficiency measures are in place i.e. use of spray ball cleaning and re-use of wash water in the coatings plant.	N/A	
Water used in cleaning and washing down should be minimised by: • vacuuming, scraping or mopping in preference to hosing down • evaluating the scope for reusing wash water • trigger controls on all hoses, hand lances and washing equipment	Hosing down of floors does not occur as specific equipment designed to clean floors is used. The site re-uses wash water to reduce liquid waste and fresh water used. Trigger controls are used on all hoses to minimise water consumption.	N/A	
Fresh water consumption should be directly measured and recorded regularly - ideally on a daily basis.	De-ionised water is measured and recorded weekly. Process water consumption is measured at time of use and recorded daily. Total site fresh water consumption is recorded monthly.	Water used in toilets and kitchens is currently not recorded.	The volume of water used for domestic purposes is too small to justify direct measurement.

INDICATIVE BAT REQUIREMENTS FOR WASTE HANDLING

BAT	SITE	GAP	JUSTIFICATION
A system should be maintained to record the quantity, nature, origin and, where relevant, the destination, frequency of collection, mode of transport and treatment method of any waste that is disposed of or recovered.	The site operates a system to record the nature, quantity, destination, frequency of collection, mode of transport, and treatment of any waste that is disposed of or recovered. Origin of solvent based and water based liquid waste collected in IBCs is known.	The site does not know the exact makeup of the solvent and water based liquid waste collected in 205 litre drums around the site.	The site is aware of the sources of waste collected in the 205 litre drums and already assess efficiency improvements opportunities i.e. Solvents used to clean equipment and number of samples taken.
Wherever practicable, waste should be segregated and the disposal route identified. This should be as close to the point of production as possible.	Liquid waste is segregated into solvent and water based. Solid waste is segregated into metals, wood, office paper, toner cartridges, electrical goods, hazardous and general.	N/A	Additional waste segregation is not likely as outlets for the waste streams are difficult to locate.
Records should be maintained of any waste sent off-site (Duty of Care).	A record of all waste sent off site is maintained.	N/A	
All appropriate steps to prevent emissions (for example, liquids, dust, VOCs and odour) from Storage or handling should be taken.	All liquid waste drums are capped with a funnel (closable top), dust emissions are collected during charging process with a self-contained bel-tyne unit. After drums are filled with liquid waste they are capped. General waste is stored in an enclosed compactor skip to prevent it escaping.		

INDICATIVE BAT REQUIREMENTS FOR NOISE AND VIBRATION

BAT	SITE	GAP	JUSTIFICATION
The Operator should employ basic good practice measures for the control of noise, including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise	Night time HGV movements are not encouraged. 10 mph speed limit onsite. Motors and pumps included in maintenance programme.	N/A	
The Operator should also employ such other noise control techniques to ensure that the noise from the installation does not give rise to reasonable cause for annoyance	No noise nuisance complaints have ever been received by either the site of the local authority for site activities.	N/A	
Noise surveys, measurement, investigation (which can involve detailed assessment of sound power levels for individual items of plant) or modeling may be necessary for either new or existing installations depending upon the potential for noise problems.	A survey was carried out internally to assess noise at the site perimeter. This non-scientific approach revealed that there no obvious sources of noise which were perceived to cause annoyance.	N/A	There is no residential housing within 1km of the site and the facility is located on an industrial estate where other neighbouring companies also contribute to the areas overall noise levels.
Creeping Noise	Activities on the site could expand in the future thus periodic perimeter noise surveys will take place to monitor any creeping noise issues as they arise.	N/A	

INDICATIVE BAT FOR FUGITIVE VOC EMISSIONS

BAT	SITE	GAP	JUSTIFICATION
When transferring volatile liquids, the following techniques should be employed – subsurface filling via filling pipes extended to the bottom of the container, the use of vapour balance lines that transfer the vapour from the container being filled to the one being emptied, or an enclosed system with extraction to suitable abatement plant.	Raw materials delivered to the tank farm are bottom filled as is finished product transferred into road tankers (slowly over a 3-4hour period to minimise solvent releases). Ethyl Acrylate tankers employ a vapour balance line to minimise discharge to the scrubber system.	No vapour balance lines are used when raw materials are being transferred into the bulk tank farm. No form of abatement is used in the tank farm.	Considering the low quantities of VOC displaced annually from the tank farm (~722kg in 2015) the expense of VOC abatement equipment is not considered to justify the environmental gains.
Vent systems should be chosen to minimise breathing emissions (for example pressure/ vacuum valves) and, where relevant, should be fitted with knockout pots and appropriate abatement equipment.	All bulk solvent tanks utilise pressure/vacuum valves. No knockout pots are used or considered to be required.	Pressure relief is not used on all storage tanks	The tanks without pressure relief valves contain materials with very low vapour pressure and therefore do not justify the added complexity
Maintenance of bulk storage temperatures as low as practicable, taking into account changes due to solar heating etc.	The bulk storage tanks are silver in colour which helps to reflect the suns energy thus reducing internal temperate and associated volatility of contents.	N/A	N/A
The following techniques should be used (together or in any combination) to reduce losses from storage tanks at atmospheric pressure: – Paint tank with low solar absorbency – Temperature control – Tank insulation – Inventory management – Floating roof tanks – Bladder roof tanks – Pressure/vacuum valves, where tanks are designed to withstand pressure fluctuations, Specific release treatment (such as adsorption condensation)	Other than the silver coating of the tanks in the bulk tank farm no measures are in place to reduce losses at atmospheric pressure.	No temperature control (Except for the two epoxy storage tanks and Methacrylic Acid tank), tank insulation, floating roofs or bladder roofs.	The quantity of VOC releases to atmosphere is insignificant when compared to the quantity of raw materials delivered to the tank farm annually.

INDICATIVE BAT FOR FUGITIVE EMISSIONS TO WATER

BAT	SITE	GAP	JUSTIFICATION
With regard to **subsurface structure**, the Operator should: • establish and record the routing of all installation drains and subsurface pipe work • identify all subsurface sumps and storage vessels • engineer systems to minimise leakages from pipes and ensure swift detection if they do occur, particularly where hazardous (i.e. listed) substances are involved • provide, in particular, secondary containment and/or leakage detection for such subsurface pipework, sumps and storage vessels • establish an inspection and maintenance programme for all subsurface structures, e.g. pressure tests, leak tests, material thickness checks or CCTV	The site has carried out a full drainage survey to establish the routes of all drains (no other subsurface pipework or subsurface vessels). The location of the three subsurface interceptor tanks is known and recorded on a site map. Routine integrity inspections of the interceptors are carried out. The site drainage survey using CCTV in 2006 identified two leaks in the underground drains which were repaired. Subsequent inspections have not revealed any problems.	N/A.	
For **surfacing**, the Operator should: • describe the design and condition of the surfacing of all operational areas (Relevant information may include as appropriate: capacities; thicknesses; falls; material; permeability; strength/ reinforcement; resistance to chemical attack; inspection and maintenance procedures; and quality assurance procedures). • have an inspection and maintenance programme of impervious surfaces and containment kerbs • justify where operational	The yard area is covered with a concrete surface. Three different falls in the yard direct any spills towards the drains/interceptors. Routine inspections of the yard and containment kerbs take place and have occasionally revealed cracks which have been repaired. The site does have an impervious surface, does have spill containment kerbs, does have sealed construction joints and is connected to a sealed drainage system.	N/A	

BAT	SITE	GAP	JUSTIFICATION
areas have not been equipped with: – an impervious surface – spill containment kerbs – sealed construction joints – connection to a sealed drainage system			
Bunds should: • be impermeable and resistant to the stored materials • have no outlet (that is, no drains or taps) and drain to a blind collection point • have pipework routed within bunded areas with no penetration of contained surfaces • be designed to catch leaks from tanks or fittings • have a capacity greater than 110 percent of the largest tank or 25 percent of the total tankage • be subject to regular visual inspection and any contents pumped out or otherwise removed under manual control after checking for contamination • where not frequently inspected, be fitted with a high-level probe and an alarm as appropriate • have fill points within the bund where possible or otherwise provide adequate containment • have a routine programmed inspection of bunds (normally visual, but extending to water testing where structural integrity is in doubt)	The new bulk tank bund is designed to be impermeable and resistant to the materials stored within. In general bunded areas are designed to collect leaks from tanks and fittings (see GAP) All three bulk storage areas are bunded to a capacity exceeding 110% of the largest tank and 25% of the total tankage within. All bunded areas are visually inspected at least monthly and often more frequently. The contents of bunded areas are analysed for contamination prior to being pumped to the yard and into the interceptors.	The main bulk tank farm is impermeable however there is currently no lining resistant to the acids that are stored. Several outlets are present in the bunded areas.	The concrete construction of the main tank farm is sufficiently acid resistant for the length of time that any spillage would be present. Outlets are not considered to be a problem as any releases would be captured in one of the interceptors.
All sumps should:	Two sumps are located	The sump within the	The sump in the main

BAT	SITE	GAP	JUSTIFICATION
• be impermeable and resistant to stored materials • be subject to at least 6-monthly visual inspection and any contents pumped out or otherwise removed after checking for contamination	onsite. The sump in the new extended raw material storage area should be impermeable to the materials stored. Sumps are visually inspected on at least a monthly basis. Any build up in the sumps are checked for contamination before being emptied.	main tank farm is impermeable to most of the liquids stored in the farm with the exception of acids.	tank farm is sufficiently acid resistant for the length of time that any spillage would be present.
Storage areas and containers should be designed and operated to minimise the risk of releases to the environment. In particular: • Storage areas should be located away from watercourses and sensitive boundaries, for example, adjacent to areas of public use, and should be protected against vandalism. • Storage areas should be clearly marked and signed plus containers should be clearly labeled. • The maximum storage capacity of storage areas should be stated and not exceeded. The maximum storage period for containers should be specified. • Appropriate storage facilities should be provided for special requirements such as for substances that are flammable, sensitive to heat or light and the like; also incompatible waste types should be kept separate. • Containers should be stored with lids, caps and valves secured and in place. This also applies to emptied containers.	Ram materials are stored at least 1 m from grassy areas, in the centre of the site away from the boundary and the site is fenced off to keep intruders out. Entrance to the site is controlled through an automatic gate that is permanently closed .CCTV is also in use and employees are instructed to challenge strangers onsite. Storage areas are clearly marked and containers are all clearly labeled. The maximum storage capacity of each storage area is stated and regularly reviewed. All containers of raw materials and finished products have use by dates. Several raw materials are stored in a temperature controlled environment to prevent it exploding. All flammable raw materials are stored in appropriate facilities. Incompatible wastes such as acids and alkalis are stored separately. Containers are stored with lids, caps and valves	N/A Signs are currently on the ground rather than vertically signposted, hence could be hidden by containers. N/A N/A N/A	Signs on the ground are outside the demarcated storage area and should therefore never be obscured.

BAT	SITE	GAP	JUSTIFICATION
• Storage containers, drums and the like should be inspected at least once a week.	secured in place. Storage areas are visually inspected on an informal basis. The entire yard area drains into interceptors.	 N/A	

INDICATIVE BAT FOR ODOUR EMISSIONS

BAT	SITE	GAP	JUSTIFICATION
Where odour can be contained, for example within buildings, the Operator should maintain the containment and manage the operations to prevent its release at all times.			
Where odour releases are expected to be acknowledged in the Permit, (i.e. contained and treated prior to discharge or discharged for atmospheric dispersion): • For existing installations, the releases should be modeled to demonstrate the odour impact at sensitive receptors. The target should be to minimise the frequency of exposure to ground level concentrations that are likely to cause annoyance. • For new installations, or for significant changes, the releases should be modeled and it is expected that the Operator will achieve the highest level of protection that is achievable with BAT from the outset. • Where there is no history of odour problems then modeling may not be required although it should be remembered that	Odour releases have not been a nuisance to either local businesses or to the nearest residential housing i.e. no nuisance complaints have been received directly to the site or to the local authority. Odour modelling has been carried out and indicates that there are certain weather conditions when odour can be detected outside the boundary The site is located more than 2 km from the nearest sensitive receptor i.e. SSSI – River Dee. An ethyl acrylate scrubber system has also been installed which is designed to remove this odour generating material from releases to the atmosphere in the resin plant.	There is no abatement on the coating plant emission point, A5	The potential to reduce odour detection outside the boundary using additional abatement equipment will be thoroughly evaluated within 6 months of submission of the permit variation application.

BAT	SITE	GAP	JUSTIFICATION
there can still be an underlying level of annoyance without complaints being made			
Where odour generating activities take place in the open, (or potentially odorous materials are stored outside) a high level of management control and use of best practice will be expected.	Odour generating ethyl acrylate is stored in a closed system with a scrubber designed to remove ethyl acrylate from gaseous emissions.	N/A	N/A
Where an installation releases odors but has a low environmental impact by virtue of its remoteness from sensitive receptors, it is expected that the Operator will work towards achieving the standards described in this Note, but the timescales allowed to achieve this might be adjusted according to the perceived risk.	Odour modelling has been carried out and indicates that there are certain weather conditions when odour can be detected outside the boundary The site will aim to reduce odour detection outside the boundary	There is no abatement on the coating plant emission point, A5	The potential to reduce odour detection outside the boundary using additional abatement equipment will be thoroughly evaluated within 6 months of submission of the permit variation application.

INDICATIVE BAT REQUIREMENTS FOR BASIC ENERGY REQUIREMENTS

BAT	SITE	GAP	JUSTIFICATION
Operating, maintenance and housekeeping measures should be in place i.e. air conditioning, process refrigeration and cooling systems (leaks, seals, temperature control, evaporator/condenser maintenance) • operation of motors and drives • compressed gas systems (leaks, procedures for use) • steam distribution systems (leaks, traps, insulation) • space heating and hot-water systems • lubrication to avoid high-friction losses	Routine maintenance is carried out on a wide range of equipment to ensure optimum operation and therefore energy efficiency e.g. cold store, motors and pumps, gas-fired boiler, compressed air network. Lubrication is carried out when identified as an issue during maintenance. There are no steam distribution systems.	N/A	N/A

BAT	SITE	GAP	JUSTIFICATION
• boiler maintenance e.g. optimising excess air • other maintenance relevant to the activities within the installation			
Basic, low cost, physical techniques should be in place to avoid gross inefficiencies. These should include insulation, containment methods, (such as seals and self-closing doors), and avoidance of unnecessary discharge of heated water or air (e.g. by fitting simple control systems such as timers and sensors).	High speed roller doors are located in the warehouse and main coatings plant entrance Although water is used to cool reactions in the resin plant it does not reach a temperature where energy can be recovered. Lighting sensors are installed in the first floor of the warehouse. Low energy use bulbs are used in this area as well.		
Energy-efficient building services should be in place to deliver the requirements of the Building Services section of the guidance note H2 Energy efficiency for IPPC.	Initiatives to save energy include the installation of movement sensors at several locations to trigger lighting. Modern high efficiency heating and ventilation systems have been installed in the admin and laboratory areas. Space heating in offices is timer controlled.	There is no energy recovery from process cooling or building climate controls.	It has been decided that it is not viable to recover heat from process cooling water as the temperature of the water is not hot enough.
Energy management techniques should be in place, according to the requirements of Section 2.3 noting, in particular, the need for monitoring of energy flows and targeting of areas for reductions	An energy survey was carried out and economically viable improvements were implemented.	See Site comment.	.
An energy efficiency plan should be provided	The site has an energy management policy with plans to upgrade equipment when due for replacement.		

3.3 RAW MATERIALS

3.3.1 Selection

Several hundred raw materials are used in the manufacturing process in varying degrees of quantity and frequency. The Deeside facility only uses materials that have been approved by the Valspar Technical departments based in Europe and the United States. See Table 3 below for a list of the generic raw materials used. (See Appendix K for a detailed list).

Materials Supply

Based on;

- Technical departments requirements (customer influenced)
- Food and Drugs Administration (FDA)
- Historic use

Lists of approved substances are made available by Corporate. The facility is provided with a list of ingredients to use in products and this cannot easily be changed. The Deeside facility has limited influence on the central Technical Department thus the process of substituting raw materials is not one which can happen easily or quickly.

The technical department occasionally changes the products it approves for use e.g. Naphthalene (reclassified as R40 hence substitute required! - Aromatic 150 & 200s). Customers have requested the substitution as well as the suppliers as a result of changing legislation. The Valspar corporate technical departments list of approved substances is based on FDA approved substances, extensive trials and pack tests which can take several years to reach a conclusion.

On the basis of these circumstances the Deeside facility is not currently in a position to substitute existing raw materials with alternates. However, the facility recognises that some of its raw materials have a potential risk to the environment and as such formal channels of communication are open with the technical departments in the US and France to explore possible opportunities to substitute raw materials. It should be noted however that new raw material trials can take several years to fully satisfy the FDA/customer requirements.

Examples of the raw materials the facility has substituted to date include;

- Move from using solvent based MEK to a seaweed based floor cleaner in 2004 thus reducing solvent emissions.

3.3.2 Storage

Raw materials are stored at several locations around the site in bulk storage vessels, IBCs, 205 litre drums or smaller metal containers, 1 tonne bags, 0.5 tonnes bags and 25kg bags. Storage areas are located in the yard area at various locations as well as inside the warehouse on two levels.

Materials stored outside in the yard are clearly signposted and are located away from the main routes taken by vehicles. Raw materials are delivered to the warehouse via an access point on the east side of the building (reduced traffic in the yard). Delivered materials

include powders and liquid raw materials. The raw materials stored in the warehouse are clearly signposted and are stored away from each other if there is a risk of explosion/reaction. Spill kits are located in the warehouse in the event of an accidental release, there are no internal drains in the warehouse and the flooring is in good condition.

Raw materials are used on a FIFO basis to minimise the possibility to exceed the recommended 'shelf life'. In addition routine inventory counting is performed to identify slow moving materials that are approaching the end of their 'shelf life' so that action can be taken to minimise the need for disposal as waste (use and discounted sale to customers, transfer for use at other Valspar site, return to supplier etc.) The storage areas are clearly signposted indicating the identity of materials and where possible are located as close to the point of use as possible to minimise travel time duration thus the risk of accidental spillages.

3.3.3 Use And Fate

Table 3 overleaf detail the quantities of the generic groups of raw materials used, the hazard potential and the maximum stock at any one time. The raw materials where possible, are purchased on a 'just in time' basis to minimise the quantity of raw materials stored onsite. This approach reduces the risk of a loss of containment happening which could have an environmental impact.

Table 4 includes data on the 20 products made on a regular basis and which account for 88 % of the total throughput (the sample chosen clearly shows the efficiency trend for products manufactured at the facility). The table details the fate of each group of raw materials i.e. percentage leaving the site in finished product, total loss for each product (waste), loss per batch and loss attributed to solid waste. Loss per batch comprises solid waste, liquid waste and gaseous waste i.e. point source and fugitive emissions. Whilst the waste audit quantifies each form of waste it is currently not possible to breakdown the loss per batch into solid, liquid and gaseous components.).

As indicated in Table 4 the production process is known to be very efficient. Data on all batches of raw materials is gathered at weigh in before manufacturing as are finished product quantities afterwards. Differences in raw materials going in and finished product coming out are recorded. If the finished batch is within a threshold of 98%-102% of the weight of raw materials inputted then the product is accepted and no further investigation is required (figures over 100% can be attributed to recovery of residues or calibration/scales/meters/temperature issues). The majority of batches are within this threshold indicating that the production process is very efficient however on occasion the process is less efficient and the underlying reasons are investigated with the aim of preventing a reoccurrence. Material losses in the production process are known to occur at the following stages;

- Residual coating in resin plant reactor after let down (residue has to be washed off)
- Residual coating in the resin plant let down tanks after filling off or transfer to paint plant.

- Residual coating in the coatings plant vessels after filling off to tankers/IBCs/drums.
- Semi finished products accumulating in filters (coatings plant)

Code	Generic Group		Max Quantity Stored	Risk
AK	Resin		113360 kg	H226,H411
CA	Antifoam and defoamers		2195 kg	H226,
CB	Waxes		66900 kg	H226,H225, H411
CC	Inorganic chemicals		63 kg	
CD	Viscosity control agents		0 kg	
CE	Catalysts		6920 kg	H226, H225, H242, H301,H330,H370,H400,H410,H411
CL	Plasticizers		129 kg	
CM	Miscellaneous		37400 kg	H226, H331
CP	Mildewcides and fungicides		0	
CS	Anti skins		0	
CT	Stabilizers		5671 kg	
CW	Soaps and surfactants		1654 kg	H226, H411
MA	Acids/Anhydrides		1500 kg	
MB	Amines		20 kg	
ML	Alcohols - includes phenol type		41000 kg	H411
MM	Miscellaneous			
MQ	Monomers acrylic		78655 kg	H225, H226, H400
MT	Monomers Vinyl		3720 kg	H226
RB	Resins -	Melamine	45847 kg	
RE		Epoxy	185376 kg	H411
RK		Solid Polyester	8075 kg	
RT		Solid Vinyl	83536 kg	
SB		Melamine	47667 kg	H226, H411
SD		Phenolic	37143 kg	H226
SE		Various	57809 kg	H225, H226
SQ		Acrylic	40172 kg	H226, H411
SU		Urea	5700 kg	H226
TC	Solvents -	Alcohols and Glycols	44374 kg	H225, H226, H400
TE	Solvents -	Esters and Ethers	216145 kg	H226
TK		Ketones	55193 kg	H225 H226

Code	Generic Group		Max Quantity Stored	Risk
TM		Miscellaneous	40000 kg	
TP		Aliphatic	5439 kg	H226, H411
TR		Aromatic	71446 kg	H226, H411
TS		Blends	6500kg	H226
WA	Resin -	Alkyd	10832 kg	
WQ		Emulsion Acrylic	25000 kg	

Table 3 – Generic Raw Materials used, maximum quantity stored and risk phrases

Product	Average % yield	2015 volume Kgs	Total Loss Kgs	Loss per batch (Kg)
WE0215P	99.5%	4415941.9	20975	fs
4000W56R/21BDIL	99.7%	2523366.5	6398	89
4000W56R/11HB	99.8%	2041486	4108	52
32S02AD03	99.7%	1845789	6167	31
4800A07R	99.9%	1711265	1170	8
4000W56R/13DIL	99.8%	1290997	3148	81
28Q07AE	99.8%	1091056	2710	23
28Q07AD	99.8%	842798	1444	13
32S02AD/RFU	99.8%	766016	1808	22
32S02AD	99.8%	721284.5	1720	21
4504A03S/2T	99.5%	538543	2625	109
11Q23EY	99.7%	516329	1775	48
WE0912P	99.5%	473010	2481	86
TS0176M	105.7%	454831	-24585	-96
4504A03S/2PD	99.7%	441256	1447	63
28Q46AB	99.4%	396534	2333	97
33Q03EC	99.3%	371328	2477	103
4820A15R/5	100.7%	357145	-2374	-53
11Q28EG	99.5%	354916	1666	76

Table 4 - Efficiency of most frequently made products

3.3.4 Water Use

Mains water is used for a number of applications including; raw material for product, cooling water, cleaning, cooling tower, boiler and domestic i.e. canteen/toilets. Figure 4 overleaf illustrates the flow of water onto and off the site.

A significant proportion of the water used (~17%) leaves the site in product as on average water makes up 17.9% of all finished product. In 2015 the 17.9% accounted for 2956 m^3 against a total usage of 16,962 m^3. The difference between the water coming onsite and that leaving in product (14006 m^3) is accounted for mainly by the filtrate water from the Reverse Osmosis water purification plant together with vessel cleaning, cooling water, cooling tower make-up and canteen/toilets,

In order to gain accurate information on the fate of water used onsite the facility carried out a water audit This information identified all points of release and allowed actions be taken to minimise water consumption.

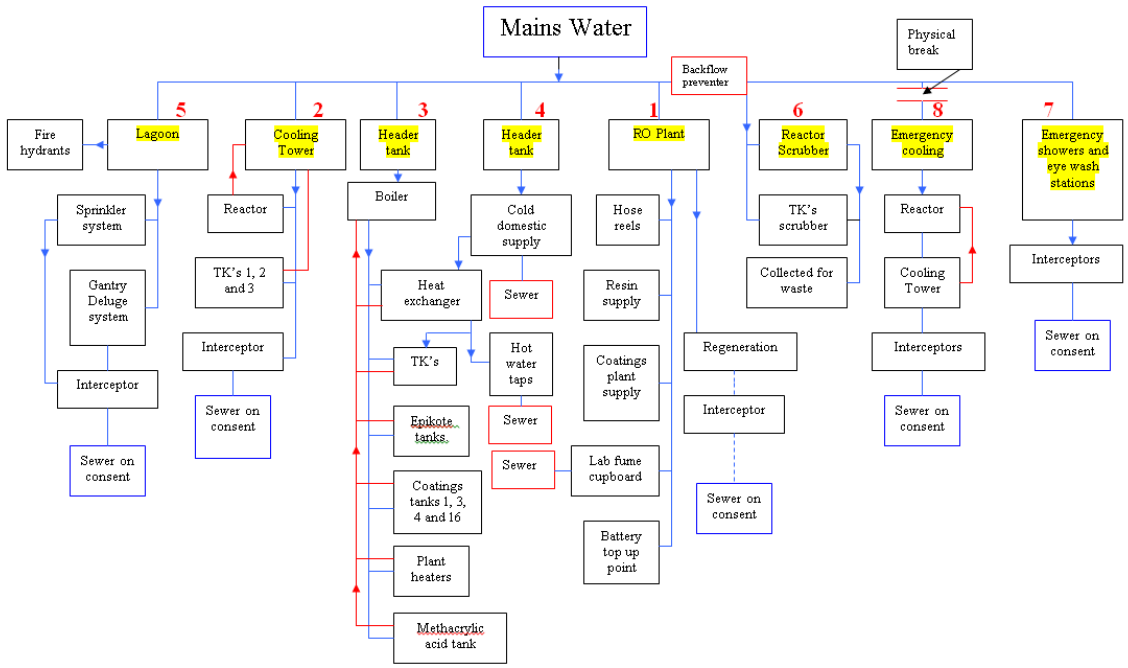


Figure 4 – Water Flow Diagram

Water Conservation Measures To Date

- Use of spray balls in coatings plant to conserve water use during cleaning (old process involved hosing down the vessels).
- Re-use of blend tank wash water as raw material in the subsequent batch.
- Water conservation controllers on urinals.

3.4 WASTE MANAGEMENT AND MINIMISATION

3.4.1 Waste Streams

Solid Hazardous Waste generated onsite includes;

- Filter drained candle filters
- Filter Bags
- MOPS
- Fluorescent tubes – stored in a metal cabinet and removed by licensed carriers.
- Paper cloths/rags
- 205 litre Metal Drums (used to contain resin – incineration)
- IBCs (re-used)
- Raw material (contaminated and/or out of date)
- Sanitary Towels
- Printer cartridges (toner) – recycled
- Used raw material FIBC's (incineration and heat recovery)

The site is registered as a producer of hazardous waste (CAJ239 Expiry 16/8/2017).

Non Hazardous Waste

- Plastic and paper bags
- Cardboard layer pads
- Metals
- Domestic Kitchen waste
- 205 litre Metal Drums (used to contain solvent – back for re-use)
- Filters from LEV
- Wooden Pallets
- Office paper
- Grass cuttings/leaves

Some known sources of waste generation include;

- Residues that cannot be removed from drums;
- Reject batches that cannot be reworked;

- Contaminated solvent that has been used to clean the stock tanks and contaminated water;
- Filters and floor cleaning materials;
- Samples and sampling containers;
- Packaging from raw materials;

Liquid waste generated from activities within the PPC boundary includes;

- IBCs/205 litre Drums of Waste Solvent/water based solvent (e.g. samples, filter changes)
- Water based product waste (non-hazardous)
- Cooling tower blow down discharge (onto yard then interceptor)
- Solution from reactor and EA tank scrubbers
- Off Specification Product – 'bad batches'
- MEK from the cleaning of small vessels (pots)
- Contaminated Solvents
- Contaminated water in the interceptor tank that does not meet the required limits before discharge to the public sewer

Table 5 – Summary of the wastes types transferred from the site, classification, quantity and fate (2005)

Waste Type	Classification	Quantity	Fate
General Waste (Compactor)	Non hazardous	96. 34 t	Landfill
Waste Solvent	Hazardous	390.834 t	Energy Recovery (Chem Fuel)
Reject Batches	Hazardous & Non Hazardous	101.417 t	Energy Recovery (Chem Fuel)
Waste Water (interceptor and process)	Hazardous	96.7 t	Offsite treatment by waste disposal contractor
Drums (empty)	Non hazardous	3517	Re-use
IBCs (empty)	Non hazardous	341	Re-use
Scrap Steel	Non Hazardous	5.42 t	Re-use
Florescent Tubes	Hazardous	80 units	Recovery
Batteries	Hazardous	50 kg	Recovery

3.4.2 Sources Of Waste

A comprehensive and detailed waste audit was carried out by the site and identified all sources of waste as described below.

Off Specification Batches

The site has carried out considerable work on minimising the cause of production problems such that in 2015 the facility produced Zero kg of liquid waste having not made any reject batches compared with 208,417 kg from 12 reject batches in 2005.

An effective near miss reporting and investigation process is in place to identify causes and preventive actions for potential reject batches.

Batch Efficiency – Liquid Waste

A spreadsheet has been developed detailing the % efficiency of the 20 products made most frequently in 2015 (see Table 4 in Section 3.3). The 20 products represent 88% of total finished product made in 2015. Table 4 in Section 3.3 indicates that product efficiency ranges from 99.3% - 103.7% (+/- 1-2%) thus the manufacturing process is considered to be very efficient. However, small quantities of liquid/solid and gaseous waste is generated from the production process and regular reviews are carried out to identify opportunities to further increase efficiency.

Liquid Waste Sources

- Contaminated lacquer collected during filter changes;
- Samples of product taken during the process and from finished batches for quality control purposes;
- Bad batches where product does not meet the required specification.

The frequency of filter changes is dependent on the quality of intermediate coming from the resin plant which in turn is dependent on the effectiveness of the vessel washing system. Actions have already been implemented to maximise the efficiency of vessel washing between batches to help assure quality of intermediate and minimise the number of filter changes required in the coatings plant and thus the quantity of liquid waste produced.

As a result of analysing the opportunities for waste minimisation the quantity of liquid that is disposed as a result of filter changes has been minimised. At each filter change the liquid contents of the filter is minimised by purging back into the product using nitrogen. Any product remaining in the filter housing is collected and also recycled back into the batch.

Vessel Washing

A spray ball solvent washing system to clean vessels between batches was introduced in the coatings plant in 2007. This system, combined with recycling of the resultant wash

solvent back into the following batch has virtually eliminated waste being generated as a result of equipment vessel.

A number of other improvements have been introduced. These include;

- Coatings Plant - Cleaning out of small pots using MEK – currently pots are cleaned twice with fresh solvent and both washes are disposed of thereafter. In future it may be possible to set aside the second solvent wash as it is relatively clean and use it for the first wash next time around. By employing this technique only half as much fresh solvent is required.

- Coatings Plant - Concentrate made in one tank is sent through mills to a second tank. Once the product is finished it is drawn off and the two vessels are cleaned with solvent. This solvent is added into the batch to eliminate waste from equipment cleaning.

Filter Changes

Filter changes are required in the coatings plant when they become blocked with solids. The filter housing contains approximately 10-15 litres, which was historically with the filter and disposed of. AS a result of a waste minimisation project the liquid contents of the filter at each filter change is minimised by purging back into the product using nitrogen. Any product remaining in the filter housing is collected and also recycled back into the batch.

Gaseous Waste

Generated from activities within the PPC boundary including;

Point Sources;

- Main Tank farm – 17 release vents
- VOCs – One emission point in Paint Plant from 17 vessels (A5)
- VOCs - Resin reactor scrubber (A1)
- VOCs – From 3 Let down tanks and Ethyl Acrylate Tank (A2)
- Dust/VOCs – Resin Plant (A3)
- Dust – Coatings Plant via DCE Unit (A6)
- Boiler emissions (gas-fired)
- FLT (diesel)
- Laboratory - 2 x Ovens via extraction vent
- Tanker filling points (EP12-16)

Fugitive Sources;

- Small pot manufacturing area (coatings plant)
- Flanges, seals, joints
- IBC and Drum emptying and filling

3.4.3 Handling Arrangements

Liquid Waste – All waste is handled to ensure compliance with COSHH regulations. Liquid chemical waste from the manufacture and cleaning operations is separated into hazardous and non-hazardous. Drums are placed in dedicated areas around the manufacturing area. Acids are also separated and stored in a plastic drum.

All operators have received training through standard operating procedures (SOP's) in the handling, labelling and segregation of all waste to comply with the Hazardous Waste Regulations 2005 and to ensure compliance with COSHH regulations

Liquid waste is also collected, labelled appropriately and stored in IBC's, this typically is from tank washings and off spec material that cannot be reworked.

Drums that are full are sealed tight with the bungs and then capped prior to storage. Operators collect the drums with forklift trucks and move them to storage on the yard and place them in dedicated areas. All operators have had recognised certified forklift truck training. Once there are sufficient drums a collection is arranged with a certified waste contractor.

All waste contractors used are reputable waste licensed companies and carriers. Contractors used have had duty of care audits conducted by Deeside HSE.

Once it has been established what the waste is, waste contractors will supply the required labels for the drums which are placed on the drums by the warehouse operators prior to loading for transport.

Solid Waste – non-hazardous solid waste from raw material packaging is placed in a $27m^3$ skip compactor sited outside the main production building. All operators have completed training through SOP's to comply with the Hazardous Waste Regulations 2005.

Batteries, fluorescent tubes, filters, electrical equipment, contaminated rags, building materials, chemicals and scrap metal are segregated and disposed of individually. Signage on the compactor indicates the waste types permitted to be disposed of and which materials should not be disposed of to the compactor.

3.4.4 Waste Management

SHE Manager -	responsible for holding waste carriers certificates of registration.
Plant Managers –	responsible for control of waste i.e. contacting waste carriers for collections, ensuring that operators segregate waste.

Warehouse Supervisor – responsible for holding waste management documentation i.e. waste transfer notes.

Operators – responsible for disposing of waste in appropriate containers around site.

Management Of Waste Contractors

Certificates of Registration - are held in the SHE department. An internal electronic action management system, KMI, is used to prompt the company to request certificates as the expiry date approaches.

Waste Management and Disposal Facilities

- Veolia – remove general compacted waste.
- Greenaway – remove drummed liquid waste (used as Chem. Fuel)
- /Veolia – collect solvent waste (used as Chem Fuel)
- Tradpak – collect waste IBCs and clean for re-use.
- Tradpak – collect empty drums for re-use
- Veolia – solvent based product/raw material waste.
- Greenaway/Biffa – Waste filters

Waste Audits

Waste audits are carried out every two years with the most recent being Greenaway and PHS in 2015

Waste Storage Areas

Locations

- General waste - compactor skip in yard
- Liquid solvent and water based waste stored in middle of yard in a designated area
- Waste water is stored in IBC's in a designated area of the yard.
- 'Bad Batches' are stored in the yard in a designated area
- Empty drums and IBCs are stored in the middle of the yard in a designated area.
- Fluorescent tubes are stored in a purpose made metal box at the maintenance workshop.

Containment

- Waste containers are supplied by registered waste carriers thus should not have any leaks where waste could escape.
- The yard area is fully kerbed and sealed and acts as secondary containment in the event of waste escaping from a skip/container.

Drains

- The yard area drains into an interceptor thus any liquid waste spills are captured. The contents of the interceptor are monitored on a daily basis and if permitted limits are exceeded the liquid will be tanked off site for disposal.

Waste Minimisation Committee

A waste minimisation committee meets to discuss opportunities to reduce waste every six months. A typical agenda for the meeting can be found in Appendix E and includes; waste disposed of, recycled waste, water use, energy use and graphs for waste/cost. The committee is chaired by the SHE Manager and is also attended by the plant managers and others including members of the engineering team. The facility reviews objectives and sets targets to minimise waste and reduce environmental impact as well as waste disposal costs annually. Areas targeted in particular include the re-use of equipment cleaning materials and a reduction in the quantity of bad batches produced.

3.5 GROUNDWATER

Emissions of List I and II substances to groundwater are addressed in section 3.2.3 of this application.

3.6 ENERGY

A detailed analysis of energy use has been carried out and an energy efficiency plan has been implemented.

Information on energy use and equivalent CO2 releases to atmosphere is captured and analysed on a monthly basis. A number of existing energy saving measures have also been outlined, Further energy efficiency improvements are made whenever the expenditure is economically justified. Whenever equipment is due for replacement the most energy efficient alternative is used.

3.6.1 Energy Consumption

Energy figures for 2015 have been taken as the baseline year. As can be seen in table 3.6.1 below the main sources of energy use onsite are electricity and natural gas with a small amount of diesel fuel.

Electricity Use

Electricity is used to power a wide range of equipment including; motors, pumps, chiller, cooling tower, compressors, de ionising plant, reactor heater.
Natural Gas – is used to fire the boiler to generate hot water to heat the facility and for ovens used for testing purpose in the laboratory.

Diesel – is used to power a forklift truck.

Energy Source	Consumption (as delivered) MW	Consumption (at primary source) MWh	% of Total Usage
Electricity	2763.526	6201.28	**72**
Gas (mains)	2217.156	N/A	**26**
Diesel	137.213	N/A	**2**
Total	5117.895		**100%**

Table 6 – Site Energy Consumption (2015)

3.6.2 Emissions Benchmarking

Energy Source	Emissions of CO2 to the environment (tonnes)
Electricity (public supply)	**1054**
Gas	**421**
Diesel	**35**
TOTAL	**1510**

Table 7 – Carbon Dioxide Emissions Associated with Energy Consumption.

The following factors have been used in deriving the estimates of CO2 in Table 2 above.

- Electricity = 0.17 Kg CO2 per kWh
- Gas = 0.19 Kg CO2 per kWh
- Diesel = 0.26 Kg CO2 per kWh

These factors have been taken from the EA 'Horizontal Guidance Note IPPC H2 – Energy Efficiency' & from DEFRA publication "Environmental Reporting Guidelines for Company Reporting on Greenhouse Gas Emissions" revised guidelines March 2001 (Diesel).

3.6.3 Specific Energy Consumption (SEC)

Specific Energy Consumption (SEC) has been calculated for the installation as a whole. In 2004 the facility used 5,226 MWh and produced 22,658 t of product giving a SEC of 0.231. In 2016 the facility used 5118 MWh and produced 24,267 mt of product giving a SEC of .211

SEC Unit	2006 Mean	Range	Unit	Source
Installation	0.211		MWh/ tonne product	

Table 8 - SEC data for 2016

3.6.4 Company Energy Policy

The facility has a formal policy on reducing energy consumption based on optimising production processes and replacing equipment with the highest efficiency alternatives available when economically justifiable. The company, routinely measures energy use and has implemented a number of energy saving measures including variable speed drives, soft starts, high efficiency motors, etc.

3.6.5 Climate Change Agreement (CCA)

The company is not part of a CCA. An assessment was carried out to determine whether a CCA should be entered into and it was concluded that no additional benefits would be gained due to limited ability to drive further economically viable savings against a defined improvement plan timescale

3.6.6 Energy Conservation Initiatives

- High speed roller doors are in place to reduce heat loss on the two main vehicle entrances to the building. At the entrance to the Warehouse and entrance to the Coatings Plant.
- Installation of motors with variable speed drives which reduce energy consumption.

- Use of movement detectors to control lighting in the warehouse area and external areas.
- Installation of an energy efficient air compressor.
- Optimisation of mixing requirements to minimise the running time of agitators and pumps.

Operating and Maintenance

The facility uses a computerised maintenance management system to manage the maintenance of plant and equipment. It is recognised that regular maintenance has a positive effect of energy reduction as equipment should run more efficiently.

Basic Physical Measures

Building Services - roller doors are in place and are used to reduce heat loss particularly in the winter. There are two high speed roller doors on the entrances that have frequent vehicle access requirements at the Warehouse and Coatings Plant. There are also two manual roller doors at low usage vehicle entrances to the Resin and Coatings Plant.

Energy Saving Initiatives

- Energy Survey

  An energy audit was carried out in the summer of 2006 to determine where energy savings could be made.

- Purchasing Policy

  The company actively assesses the energy consumption of all new equipment purchases. Where all other factors are equal i.e. functionality, quality & price, the preference will be to purchase the most energy efficient equipment.

- Thermal Heat Survey

  A thermal heat survey was carried out to establish ‘hotspot’ areas and where appropriate additional insulation was installed.

- Cooling water

  Water is used in the resin plant to remove heat from the reactor and subsequently released to air through evaporative cooling in a forced draft cooling tower. The low temperature and intermittent operation make it unviable to recover the heat for re-

use. However a variable speed fan has been installed to match the air flow to the precise cooling requirements and therefore minimise the electrical energy required.

Management Techniques

The company has an energy policy and sets objectives and targets on an annual basis. Consumption is routinely analysed on a monthly and annual basis to determine whether the objectives have been met and to identify any emerging trends.

Employee Awareness

Employees are trained in the most energy efficient methods of operating the process and why it is important

Energy and ISO 14001

The facility has a formal policy on reducing energy consumption based on optimising production processes and replacing equipment with the highest efficiency alternatives available when economically justifiable. The company, routinely measures energy use and has implemented a number of energy saving measures including variable speed drives, soft starts, high efficiency motors, etc.

Monitoring and Targeting

Monitoring is carried out on the following areas: -

- Diesel usage
- Annual CO2 emission (Gas / Electric / Diesel)
- Weekly meter readings for Paint and Resin Plant (Main meter, Compressor, DI unit, and Nitrogen)
- Electric readings monthly
- Gas readings monthly

These details are recorded electronically and are discussed at the monthly SHE committee meeting. There are local meters for the larger consumers that are used to identify changes in performance and drive preventive maintenance.

3.6.7 Further Energy Efficiency Techniques

Section 2.7.3 of the Sector Guidance requires the Operator to identify which of the following techniques are applicable to the activities within the installation and the extent to which they are implemented.

Motors & Drives

- Use of agitators has been optimised to maximise batch efficiency.
- Variable speed motors and soft starters are used as extensively as possible for optimal energy efficiency.

Heat Recovery

- Water is used regularly in the resin plant to take heat from the reactor. The heated water is passed through a cooling tower. The low temperature and intermittent operation make it unviable to recover the heat for re-use. However a variable speed fan has been installed to match the air flow to the precise cooling requirements and therefore minimise the electrical energy required

Water Minimisation

- The facility minimises water use by using spray balls to clean vessels in the paint plant. This technique uses less water than using a hose which was the previous preferred method. In addition wherever possible wash water is retained and used as an ingredient in the next batch of product.

Low-energy technology

- All tanks where heat is applied are lagged to prevent heat from escaping.

Optimised design and layout

- Any modifications or extension to the site are designed with energy conservation considerations e.g. layout, insulation etc.

Process control and instrumentation

- Temperatures within the reactor are strictly controlled for quality control purposes thus it will be difficult to reduce temperatures or the time that heat is applied. If the batch is not heated properly it could be off spec and become waste.
- Space heating within the office is on a timer.

Specification of equipment

- New equipment is selected with consideration to energy efficiency.
- The company actively assesses the energy consumption of new equipment purchased. Where all other factors are equal i.e. functionality, quality & price, the preference is to purchase the most energy efficient equipment.

3.6.8 Energy Supply Techniques

Combined Heat and Power (CHP)

There are currently no plans to install CHP on site.

Recovery of Energy from Waste

There are no plans to recovery energy from waste.

Use of Less Polluting Fuel

There are no plans to change sources of fuel as currently only a small fraction of energy consumption is attributed to diesel oil.

3.7 ACCIDENTS AND THEIR CONSEQUENCES

For the site as a whole, an analysis of potential accident and emergency situations has taken place. This assessment addressed all possible hazards from the plant and considered:

- Raw material delivery & transfer on site
- Manufacturing (Resin Plant)
- Manufacturing (Coatings Plant)
- Transfer and Storage of finished product
- Risk of spills
- Fire
- Trespassers/Vandalism
- Interceptors
- Waste Storage

Summarised in table 9 overleaf are;

- The key environmental hazards posed by the activity on site
- An assessment of the risk of an accident taking place (Low/Med/High)
- An assessment of the possible consequences of an accident (Low/Med/High)
- Appropriate mitigating control measures taken to reduce the risk of an accident
- Risk rating after control taken into consideration

The overall risk of an accident has been calculated as the product of consequence and probability using the matrix overleaf.

		SEVERITY OF CONSEQUENCE					
		Minor	Noticeable	Significant	Severe	Major	Catastrophic
LIKELIHOOD	Extremely Unlikely	1	2	3	4	5	6
	Very Unlikely	2	4	6	8	10	12
	Unlikely	3	6	9	12	15	18
	Somewhat Unlikely	4	8	12	16	20	24
	Fairly Probable	5	10	15	20	25	30
	Probable	6	12	18	24	30	36

Risk Rating After Controls

1-6	Low
8-10	Med 1
12-18	Med 2
20-36	High

3.7.1 Raw Material Delivery and Transfer On Site

Water

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DELIVERY AND TRANSPORTATION OF BULK RAW MATERIALS	Loss of containment of hazardous liquids e.g. solvents, epoxy resins	Pollution of controlled water		Key required from site before filling can commence. Accurate knowledge of tank contents via Tank Master control panel so overfilling not possible. Supervised delivery (coupling and disconnection process). Liquid residue collected after filling and emptied into a drum. Filling only can commence if vehicle earthed (electrostatic charges).	

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
	2	2	4	Delivery drivers fully trained on spill response. High level alarm with automatic cut off and gauge for visual contents. Bunded bulk storage areas capable of holding more than 110% of largest vessel. Rainwater pumped to interceptor to maintain bund capacity. Secondary bund for inlet valves to contain any spills that might occur. Yard area bunded to three interceptors. Yard area kerbed. Gradient of yard towards drains leading to interceptors. Containers stored at least one metre from kerbing. Pipes from the tank farm to main building are above ground (leaks identifiable). FLT drivers fully trained. Speed limit of 10 mph. Yard in good condition with only one adverse camber which drivers are fully aware of. Cracks in the yard concrete surface are in the process of being repaired. Potentially reactive material stored apart. Containers stacked to maximum of four high. Drums/IBCs stored a minimum of 1 meter from grass verges.	Low
DELIVERY AND TRANSPORTATION OF RAW MATERIALS IN IBCS & DRUMS	Loss of containment of hazardous liquids e.g. solvents, resins, acids, acrylates.	Pollution of controlled water		The majority of materials are offloaded in the warehouse. Any spill of powder would be collected and disposed of as waste.	
	2	2	4	Any residual powder spilled on the yard and washed off the yard by rainwater is collected in the onsite interceptors. Containers inspected on delivery and those containers which are leaking powder are either rejected or accepted and steps taken to ensure material is not lost e.g. taped up or	Low

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DELIVERY OF SOLID RAW MATERIALS (UP TO ONE TONNE CONTAINERS)	Loss of containment e.g. Ti02, PVC, vinyl, Bis A, EpiKote. 2	Pollution of controlled water 1	2	bagged.	Low

Air

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DELIVERY OF POWDER RAW MATERIAL (SOLIDS)	Loss of containment 2	Air pollution 2	4	Containers inspected on delivery and those containers which are leaking powder are either rejected or accepted and steps taken to ensure material is not lost e.g. taped up or bagged.	Low
DELIVERY OF BULK RAW MATERIAL (LIQUIDS)	Displacement of gases to air during filling (High) 6	Air pollution (contribution to photochemical smog and odour) 2	12	Gases displaced from the Ethyl Acrylate is back vented. Control measures above applicable to Water also relevant in event of a spill.	Med 2

Land

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DELIVERY OF SOLID AND LIQUID RAW MATERIAL	Loss of containment 2	Land contamination 1	2	Concrete hard standing and kerbing. Spills response procedure. Driver training. One metre space left between container and grass verge.	Low

3.7.2 Manufacturing (Resin Plant)

Water

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
TRANSFER OF BULK RAW MATERIAL FROM STORAGE TANKS TO WEIGH TANKS	Loss of containment from aboveground pipe work 2	Potential Pollution of Groundwater 3	6	The area below has a concrete hard standing thus downward movement of any leaks from pipes is prevented. The cracks in the hard standing will be repaired as part of the improvement plan.	Low
RAW MATERIALS INTO WEIGH TANKS AND IN/OUT OF REACTOR	Loss of containment during filling process 2	Water pollution 3	6	No internal drains. SOPs to control filling process combined with training. Pre-designated quantities of raw materials. Pre-checks of vessels (e.g. shutting valves).	Low
MANUFACT-URE PROCESS	Loss of containment	Potential Ground Water Pollution	6	Main reactor pressure tested (leaks identified). Addition and reaction processes always supervised.	Low

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
	2	3		Release valve and bursting disc allows spill out from the reactor to move to a dump tank. Removed from reactor via pipe or tote. Tote filling supervised. Pipes to bunded storage tanks and paint plant above ground. Spill response training. Yard area of concrete hard standing. Three interceptors in yard area if any material does manage to escape from resin plant.	

Air

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
RAW MATERIAL INTO WEIGH TANKS AND RESIN IN/OUT OF REACTOR	Releases to atmosphere 6	Air pollution (smog and odour) 3	18	Weigh tanks are charged and displaced air pushed out. Emissions to air are controlled by a scrubber system to reduce VOC content, which is serviced and maintained regularly. Tote filling occurs occasionally and fugitive emissions are released during the operation. Full totes are sealed with a cap and moved to a storage area. Resins are normally piped to bulk tanks from the reactor. The main resin bulk tanks are vented back to the caustic scrubber. Fugitive emissions will be discharged to air from the tanks.	Med 1

Land

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
RAW MATERIAL INTO WEIGH TANKS AND RESIN IN/OUT OF REACTOR	Loss of containment 2	Land contamination 2	4	Concrete hard standing generally in a good state of repair. Spill response kit and disposal of materials as waste. Every batch is controlled using a list of instructions on a batch ticket. Employees trained on standard operating procedures including FLT drivers. Pre-designated quantities of raw materials. Pre-checks of vessels (visual and vacuum testing) hence the probability of spills is reduced.	Low

3.7.3 Manufacturing (Paint Plant)

Air

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
RAW MATERIAL FED INTO 1 OF 17 FIXED TANKS AND 8 MOBILE MIXING VESSELS 'POTS'	Displaced emissions to atmosphere containing VOC's and dust 6	Air pollution i.e. smog and dust nuisance 2	12	Local exhaust ventilation. The contents of IBC's /Drums are pumped directly into tanks thus liquid is not exposed to the air. Bulk transfer of raw material and intermediates enclosed. Mobile Beltyne unit (self-contained dust extraction unit) to capture dust before release to atmosphere. Standard operating procedure in place Operators trained.	Med 1
FINISHED PRODUCT INTO TANKERS/	Emissions containing VOC's to atmosphere 6	Air pollution i.e. smog		Tankers slowly bottom filled to reduce displacement of emissions. Operators trained.	

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DRUMS/ AND IBC'S		2	12	Filling of IBCs takes place with no controls present. Lids put on all containers as soon as filling completed.	Med 2
WASHING OF MIXING / BLENDING VESSELS	Emissions containing VOC to atmosphere 6	Air pollution - smog 2	12	Solvent containing washing material is applied using 'spray balls' instead of a hose thus less material is required.	Med 2
ADDING POWDERS TO BP17 VESSEL AND MOBILE MIXING VESSELS 'POTS'	Dust generated to atmosphere 6	Air Pollution – dust nuisance 2	12	DCE extraction unit captures dust from BP 17 and pots prior to release to atmosphere. DCE serviced and maintained.	Low

WATER

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk Rating After Controls
LIQUID RAW MATERIALIN TO FIXED VESSELS AND MOBILE MIXING VESSELS FINISHED PRODUCT INTO DRUMS/ IBCS AND TANKERS	Loss of containment during filling process 2	Controlled water pollution and ground contamination 3	6	No internal drains. Internal concrete flooring in very good condition with no cracks present. SOPs to control filling process combined with training. Pre-designated quantities of raw materials. (Batch ticket) Pre-checks of vessels (e.g. shutting valves). Addition processes always supervised. Charging from stock tank via pipe to drums or tote. Spill response training. Yard area of concrete hard standing. Interceptors in yard area if any material does manage to escape from resin plant.	Low

Land

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Rating	Control Measures	Risk rating after controls
RAW MATERIAL INTO FIXED VESSELS AND MOBILE MIXING VESSELS	Loss of containment 2	Land contamination 3	6	No internal drains. Concreted paint plant Spill response kit and disposal of materials as waste. Trained employees including FLT drivers. Pre-designated quantities of raw materials. (Batch ticket) Pre-checks of vessels.	Low
FINISHED PRODUCT INTO TANKERS/IBCS/ DRUMS	Loss of containment 2	Land contamination 3	6	Drums / IBC's are of an approved standard SOP in place. Employee's trained on spill awareness and spill prevention. Spill response kits. Trained fork lift drivers.	Low

3.7.4 Transfer & Storage of Finished Product

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
MOVEMENT OF FINISHED PRODUCT AROUND SITE IN TANKERS (HAZARDOUS – 60% OF TOTAL)	Loss of containment 2	Pollution of controlled water, land contamination and emissions 4	8	Offloading point on tankers locked immediately after being filled. Stored on yard area on concrete hard standing at least 1 meter from grassy areas.	Low
MOVEMENT OF FINISHED PRODUCT AND	Loss of containment	Pollution of controlled water, land contamination and		Stored on yard area on designated areas on concrete hard standing at least 1 meter	

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
DRUMS IN IBCS AND DRUMS - HAZARDOUS	2	emissions 4	8	from grassy areas. Stored inside where there are no drains and solid flooring. Only trained FLT drivers move containers onsite to prevent spills. Drums banded securely on pallets. Finished product into new containers thus of sound integrity.	Low

3.7.5 Interceptors (Land & Water)

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
HOLDING TANK FOR YARD RUN OFF	Loss of containment 3	Land Contamination and controlled water pollution 3	9	An integrity testing program to identify and repair tank walls as appropriate.	Med 2

3.7.6 Trespassers/Vandalism

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
UNPLANNED RELEASE OF LIQUID RAW MATERIAL (SPILLS)	It is possible that actions of an intruder could lead to a spill of liquid raw materials 2	Could lead to pollution of controlled ground water and/or land contamination 3	6	There is a warehouse at the site entrance. Staff control entry using an electric gate. Strangers walking around the site would be identified by employees working there. The site has security cameras which act as a deterrent. Movement detecting lights are also in operation at night. Valves in the tank farm are kept locked. The main access gates are locked whenever there is no employee presence on site. Employees are instructed to challenge unfamiliar visitor onsite.	Low

3.7.7 Fire

Activity	Hazard (probability of occurrence)	Consequence (rating)	Risk Score	Control Measures	Risk rating after controls
REACTOR	Run away reaction leading to an explosion/fire 2	Toxic fumes released to atmosphere and potentially hazardous run-off 5	10	The resin reactor is controlled by an industry standard batch distributed control system. The system has built in detection of abnormal reaction conditions and automatic corrective action logic. The site has an automatic alarm system with automatic smoke/heat detectors and fire alarm call points located throughout the site. The system is tested and weekly records are kept in the service logbook. All production and inside warehousing are protected by a foam sprinkler system (foam storage tank located in the warehouse). Portable fire fighting appliances are located throughout the building and all units are on a 12-month service contract by an external firm. Employees are trained on basic fire fighting theory and fire fighting practice. This training in undertaken on an annual basis. The fire protection system is foam based which reduces the quantity of water run-off. The foam is also biodegradable.	Med 1
DELIVERY/ STORAGE/ HANDLING SOLVENTS WITH STATIC POTENTIAL	Static spark 2	Spark could lead to a fire spreading through the plant creating air polluting toxic fumes 5	10	Sop's in place requiring employee's to attach earth clamps. Employee's trained on SOP and static awareness. Earth clamps are on a regular maintenance check to ensure sound integrity. Nitrogen blanket in resin and paint plants.	Med 1

				Anti static waste bags. Ban on static generating items e.g. lighter, mobile phones, and cameras. Antistatic clothing/footwear. Sharing of knowledge on fires from other Valspar plants. Delivery vehicles grounded when offloading to bulk tanks (pumps interlocked not to function if earth continuity not effective).	
'HOT' WORK BEING CARRIED OUT ON THE PLANT	Spark 2	A fire could spread to the rest of the plant creating air polluting toxic fumes 5	10	Risk assessment carried out. Hot work is only done under controlled conditions i.e. Hot work permit PRO-HSE – 017 – Permit to work. Authorised people issue Hot work permits. Procedure in place Zoned areas. Employees are trained on basic fire fighting theory and fire fighting practice. Training undertaken on an annual basis.	Med 1

3.7.8 Waste Storage (Water & Land)

Activity	Hazard (probability of occurrence)	Consequence (consequence rating)	Risk Score	Control Measures	Risk rating after controls
STORAGE AND COLLECTION OF WASTE	Loss of containment 3	Water pollution and or ground contamination 3	9	Waste receptacles are stored on hard standing. Lids fastened on drums and labelled as waste (painted yellow). PRO-HSE – 013 Waste Management Programme in place. All employees are trained on waste Management. Waste containers (compactor/skips) supplied by registered waste carriers.	Low

Air

Activity	Hazard (probability of occurrence)	Consequence (consequence rating)	Risk Score	Control Measures	Risk rating after controls
STORAGE AND COLLECTION OF WASTE	Loss of containment 3	Air pollution 3	9	Employees place caps on drums hence ensuring that fugitive emissions are not released. SOP in place. Employees trained on SOP and Waste Management.	Low

Table 9 - Accidents and their Environmental Consequences

3.8 NOISE AND VIBRATION

Introduction

This section requires the operator to describe the main sources of noise and vibration; the nearest noise sensitive locations and relevant environmental noise measurement surveys which have been undertaken; the proposed techniques and measures for the control of noise. Environment Agency Technical Guidance Note H3 Horizontal Guidance for Noise, Part 1 Regulation and Permitting, published in April 2001 and Part 2 Noise Assessment and Control, published October 2001, offer guidance on IPPC requirements for environmental noise control.

3.8.1 Sources Of Noise

There are a number of noise sources on site. These are outlined below in Table 10.

Noise Source	Nature of Noise	Contribution to Overall Noise Emissions
Bead Mills x 5 (30 gallon) - Paint Plant	Continuous low pitch sound. Used daily from 1 to 5 mills, typically 8 to 10 hr use per mill.	Medium
Bead Mills x 2 (5 gallon)- Paint Plant	Low pitch continuous sound when in use. Used very occasionally typically for approx. 12hrs.	Low/Medium
Plant room - Pulsair electric compressor	Continual running 24/7 (with back up)	Low
Reverse Osmosis Water area plant room	Intermittent over a 24 hour period	Med

Noise Source	Nature of Noise	Contribution to Overall Noise Emissions
Tank mixers – Paint Plant (1-17 units)	Low pitch continuous sound. Almost 24/7 from 1 to several running together, typically 12hrs per tank.	Medium
Fork lift trucks – one diesel, rest electric	Horns – Intermittent. Used 24/7 - Horn used through openings and turning corners. Also cause intermittent 'banging' noise when moving over rough surfaces and depositing loads.	Low
Cooling Tower Fan - Yard	Cooling fan - Intermittent on thermostat (Only used when cooling required by reactor, several times per day every day)	Medium/High
Reactor stirrer	Continuous 'whirring' sound from motor Used 24/7, typically 15 to 20hrs per 24hr	Low
Deliveries - Yard	Approx. 20 HGV movements a day – intermittent engine noise and reversing horn.	Low/Medium
Compactor - yard	Used about 6 times a day for 10 minutes duration. Continuous when in operation.	Low
Construction Activities	Intermittent high pitched machine tools e.g. grinding/sawing.	Low/Medium

Table 10 - Noise generated within PPC installation

3.8.2 Noise Receptors

As the company operates on an industrial estate, the closest noise receptors are the industrial units surrounding the site. The nearest residential housing is located approximately 750 m from the facility hence noise should have dissipated over this distance (it would be difficult to attribute the noise to Valspar as many other industrial units are also sources of noise).

3.8.3 Noise Survey

A qualitative survey was completed to ascertain the noise levels externally around the boundary of the Deeside site. The survey was carried out at 09.15 November 16 2005 during normal working operations. The survey comprised a walk of the site perimeter stopping at a series of points to listen and to make notes on the types of noises emanating from onsite activities. There was a gentle wind was from the north during the survey and it was a bright sunny day.

It is anticipated that noise and vibration from the site will not be harmful to human health or the environment, cause offence to any human senses or impair or interfere with amenities and other legitimate use of the environment for the following reasons;

- No external noise complaints have been received directly by the site or received by the local authority (Flintshire County Council) from a third party. This latter statement was confirmed by a telephone call to the council 12/12/2005 and a conversation with Mr. Phil Foster, Environmental Health Officer.
- The nearest residential housing is located approximately 750 m from the facility thus noise nuisance is not an issue;
- The facility is located on an industrial estate where other companies generate noise (e.g. vehicle movements and pumps) thus there are no nearby sensitive receptors which could be affected by noise pollution;
- The site is flanked to the southeast by the busy Parkway dual carriageway where there are frequent movements of heavy goods vehicles and to the northeast by the busy A548 where traffic entering and leaving the Deeside Industrial park passes by.
- It is evident from walking the site that the loudest source of noise on the site is the cooling tower fan. The cooling tower will be on demand hence it will only operate when required and not on a continuous basis.
- Delivery vehicles are encouraged to arrive during daylight hours thus not causing a disturbance during the night.

3.8.4 Measures To Prevent & Minimise Noise

Roller doors are installed throughout in the Paint and Resin plants to contain any noise generated internally.

A speed restriction of 10 mph is imposed on FLT and HGV drivers. This measure helps to minimise noise and vibration levels.

Preventive maintenance and servicing is carried out on all equipment to ensure that noise levels do not exceed normally expected levels. The majority of this work is carried out by external contractors e.g. extraction/LEV carried out by Engineered Ventilation Solutions (EVS), however pumps are maintained by in-house personnel.

A computerised maintenance management system (CPPM) is used to schedule preventive maintenance on a daily basis to ensure equipment is working according to specification. .

3.8.5 Vibration

Sources of vibration within the PPC boundary could include;

- Movement of vehicles around the site – these include Heavy Goods Vehicles delivering raw materials and collecting finished products as well as fork lift trucks moving and depositing items around the site. There is a speed limit on site of 10 mph which helps to ensure that noise levels are kept down. Deliveries and collections of goods is not encouraged during the night however this practice does occasionally occur.
- Mixers – there are a number of mixers in both the resin and paint plants which have the potential to cause vibration when they are in use. It is difficult to prevent the mixers causing a rocking motion on the vessels during the mixing process however several new blades have recently been installed which are designed to reduce vibrations.
- The cooling tower fan has the potential to cause vibration however it is securely fixed and serviced frequently to ensure that it remains vibration free.

In summary it is considered unlikely that vibration from the site will be sufficient to cause structural and/or environmental harm. In this instance, the risk is considered to be insignificant and therefore no further action is required with regard to vibration.

Conclusion
Using Figure 2.2 ‘Key Components of a Noise Assessment’ located in the H3 Guidance and based on the information outlined above, further noise control measures are considered to be unnecessary at this time.

3.9 EMISSIONS MONITORING

3.9.1 Monitoring And Measurement Of Waste

Accurate data on waste disposal quantities is recorded for solid and liquid, hazardous and non-hazardous waste streams. The facility uses this information to track progress towards meeting waste minimisation targets and also to submit data to the Environment Agency as required.

3.9.2 Monitoring And Reporting Of Emissions To Water (Sewer)

Emissions to water from the facility are via a foul sewer. Run-off from the yard area is directed into interceptors and following testing to ensure conditions outlined in the effluent discharge consent are adhered to, the contents are pumped to the foul sewer. If authorisation conditions are exceeded then the contents do not go to the foul sewer but are tanked off site as hazardous waste.

As previously mentioned the facility regularly carries out monitoring of the interceptor contents and a record of results is held electronically and in hard copy. The water company (Welsh Water) also come on site each month and take samples for testing (COD, Suspended Solids and pH). The results of internal and external monitoring for 2015 are found in Appendix B. The graphs show that the contents of the interceptor exceeded permitted COD and pH levels on a few occasions, when the wastewater would not have been discharged into the foul sewer. The similarity in internal and external monitoring results confirms the validity of the internal monitoring.

3.9.3 Monitoring And Reporting Of Emissions To Surface Water And Groundwater

Other than rainwater the facility does not release any discharge to surface water or groundwater. As such the facility does not monitor its releases to surface water i.e. rainwater from building roofs and it does not anticipate that monitoring will be required in the future.

3.9.4 Monitoring And Reporting Of Emissions To Air

Point Sources – Emissions monitoring from the from the three main process release points on the resin plant A1, A2 and A3 and the two main process release points on the coatings plant A5 and A6 is carried out quarterly by MCERTs certified contractors Results of the monitoring are submitted to the EA as required by the sites IPPC authorisation.. Monitoring results have indicated that permitted emissions limits have been exceeded on only one measurement in the last three years. On the 30/9/2015 the Ethyl Acrylate concentration on point A5 was reported as being high. Analysis of the activities in progress at the time could not explain why the result was obtained. Repeat monitoring under the same operating conditions failed to replicate the abnormal result.

Fugitive Sources – The site has a comprehensive computerised planned preventive maintenance programme to assure the mechanical integrity of the equipment and identify and resolve areas for potential fugitive emissions before they occur. Routine employee occupational health exposure monitoring is also used as a method to identify sources of fugitive release from routine activities.

3.9.5 Environmental Monitoring Beyond The Installation

Due to the nature and levels of emissions from the site outlined in the Emissions Benchmarking section and in the Site Report accompanying this permit application, it is not felt necessary to undertake further environmental monitoring beyond the installation.

3.10 DECOMMISIONING

3.10.1 Design And Build

New Buildings

The site follows the requirements of the CDM regulations to ensure that the design of new installations facilitates decommissioning and demolishing at the end of useful life in a way that minimises the impact on the environment.

3.10.2 Site Report

As a component of the company's PPC permit application, a site report has been produced. This report has identified a number of areas where the potential for pollution exists. The effective management of these areas during decommissioning therefore forms the basis of the company's site closure plan.

3.10.3 Operation

Contamination of the groundwater and ground will be prevented throughout the lifetime operation of the PPC installation by the measures summarised below;

- The entire yard area has concrete hard standing which drains into onsite interceptors. Any spills on the surface will be prevented from migrating downwards by the concrete surface (all cracks in the concrete surface and joints between kerbs will be repaired as part of the environmental improvement plan).
- There are no existing or planned underground raw material or waste storage tanks and no underground pipes transporting raw materials to the manufacturing areas.
- The bulk storage vessels are located in bunded areas thus any spills will be contained.
- Potentially hazardous materials are kept in bunded areas e.g. IBCs acid/alkali.
- Spill kits are positioned at key locations around the site so that any spills that occur can be quickly dealt with.
- A drainage survey is routinely undertaken and any required remedial action is expedited.
- Vessels containing raw material/finished product, are stored at least a metre away from the kerbed areas of vegetation.
- The internal flooring areas are in a good state of repair and will prevent any downward movement of potentially hazardous material (there are no internal drains).

- Areas of secondary containment and underground interceptor tanks are subject to an integrity inspection programme to ensure that they are fit for purpose.
- All operators/FLT drivers are trained to minimise the risk of accidental spills and how to clean them quickly if they do occur.
- Diesel fuel is stored in a self-contained double skinned tank.
- Only waste carriers registered with the EA are used thus the containers supplied to hold waste should contain waste securely.

3.10.4 Site Closure Plan

The site has a fully detailed site closure plan document DEE-MAN-010Table 11 overleaf outlines in broad detail the key activities that are detailed in the site closure plan.

Step	Actions	Result
1	Initial discussion with the Environment Agency (EA) concerning possible use of site after vacation by Valspar	Suitable use of land determined
2	Discussions with the EA regarding surrender of PPC permit and site requirements	Permit surrender strategy determined
3	Evaluation of site condition based on original site report, invasive sampling and pollution incident record	Condition of land determined
4	Intrusive survey (if applicable) to confirm condition of site	Confirmation of land condition
5	Discussions with the EA and potential buyer with regard to degree of remediation necessary	Remediation strategy determined
6	Remove and make safe all potentially hazardous materials/structures on site using appropriate licensed contractors and ensuring maximum recycling and re-use of materials from the site whilst also giving due regard to the local environment	Remove manufacturing and business operations
7	Remediation of any contaminated land (if applicable)	Site returned to acceptable condition as defined by EA
8	Hand over site to new owner	Site closed and sold

Table 11 - Site Closure Plan Key Activities

3.11 ENVIRONMENTAL MANAGEMENT

Valspar recognises that good management is a key element in the safe and efficient operation of the regulated process and thus the achievement of the aims of IPPC. As such the site has been certified to the international environmental management standard ISO 14001 since 1998. Moody International Certification awarded certification (certificate number 1455 – see Appendix E) and have since carried out biannual surveillance audits to assess continual improvement of the management system.

Environmental Policy

The Valspar, Deeside Environmental Policy has been drawn up to comply with the requirements of BS EN ISO 14001: 1996 Environmental Management Systems in light of the Valspar Corporate Environmental Policy.

The policy is reviewed annually by the Site Manager as part of the Environmental Management Review process. This will ensure that it continues to reflect the activities, products and services of the Site and their environmental aspects and impacts.

The Policy is publicly available on request and is displayed in the Site's reception area.

Objectives and Targets

Compliance with all relevant legislation regulations and stated Site Policy is fundamental to meeting the requirements of this EMS. Objectives and subsequent targets are set, having considered the environmental aspects register and with regard to the financial, operational and business requirements of the Site.

The objectives and related targets are consistent with the Environmental Policy and quantify, where practicable, the commitment to continual improvement in environmental performance and to the prevention of pollution over a defined period of time.

These objectives and targets are documented on an Environmental Objectives and Target form. Progress towards achieving the objectives and targets is reviewed at least bi-annually and recorded on the Environmental Objectives and Target form.

A key element to the successful implementation of the EMS is the creation and use of Environmental Management Programmes. When objectives and targets have been decided a programme of actions is developed, indicating how the targets will be achieved in a particular time-period and personnel responsible for overseeing and implementing the Site's environmental policy. Separate programmes are established in respect of the environmental management of projects relating to new developments, products, processes or services where the modifications have an impact on the environmental aspects.

The programmes are recorded on the Environmental Objectives and Target form and distributed to those personnel with responsibilities and to the Review team.

The Review team meet monthly. They discuss the progress of the relevant programmes. The Site Manager or SHE Manager chairs the meeting. Minutes of actions required to deliver the programme are kept.

Structure and Responsibility

The successful implementation of the EMS calls for full commitment of all employees of the Site. Responsibilities for the continual improvement programmes can fall on operational personnel as well as personnel from other functions within the site. This commitment begins at the highest level of site management and accordingly the Site's Environmental Policy has been approved by the Site Manager who will ensure that the EMS is implemented. The Site has identified key positions where personnel have, or may have, a significant impact on the environment as a consequence of their activities. These are represented in the Organisation Chart - Valspar, Deeside. Furthermore all personnel within the Site appreciate that directly or indirectly they can have an effect on the environment by their actions and decisions.

Environmental Responsibilities for Key Personnel

The following key personnel are responsible for the following specific activities with regard to the EMS.

Site Manager

Responsible for approving the Environmental Policy, and for ensuring sufficient funds and personnel are assigned to the EMS. He has overall responsibility for the environmental performance of the Site and for ensuring continual environmental improvement. He is the emergency coordinator in the event of an emergency and responsible for emergency planning and training of personnel in emergency procedures. As he has overall responsibility and accountability for purchasing, he ensures the sourcing and acquisition of raw materials conforms to the overall principals of the EMS.

Maintenance Manager

The Manager has responsibility for ensuring that the Preventive Maintenance Programme is effectively implemented and ensuring Contractors comply with the Site's environmental policy. He has responsibility for ensuring the environmental engineering systems are functioning. He is involved in accident & incident reporting and investigations.

Quality Assurance Manager

The Quality Assurance Manager has the responsibility for ensuring the test methods and equipment used for quality and environmental control are verified and checked. He is responsible for product quality in line with the requirements of EMS.

Business Director Europe

The Business Director Europe has responsibility for commercial aspects of the products and he liaises with customers and distributors on new products.

Plant Managers

The Plant Managers are responsible for the safety and environmental control procedures at plant level and for supervision of Production Operators. Specific duties include the co-ordination of training of operatives, and to ensure health, safety and environmental standards are not compromised. They are responsible for reporting data and taking appropriate action based on that data, and reports to the Environmental Agency, Local Authority, Welsh Water and The Valspar (UK) Corporation Limited Corporation. They are responsible for environmental training, site procedures and waste disposal. They are responsible for maintaining systems for ensuring conformance with Health & Safety legislation.

Senior Process Operators

The Senior Process Operator is responsible for ensuring that all operating procedures are accurately followed to avoid accidental environmental impacts. Responsibilities also include the discharge of liquids from underground tanks to sewer once approval to discharge has been given based on sample analysis.

Warehouse Supervisor

The Warehouse Supervisor is responsible for ensuring safe storage and handling of all raw materials and finished products. He is also responsible for arranging transport and ensuring that materials are delivered off-site conforming to current regulatory requirements. His duties also include the discharges of liquids from bunds to underground tanks.

Safety Health and Environmental (SHE) Manager

The SHE Manager, for the purposes of ISO 14001 known as the Environmental Manager, is the Site's representative for ensuring the EMS requirements are established, implemented and maintained in accordance with the standard. The SHE Manager has responsibility for reporting on the performance of the EMS for review, as a basis for improvement of the EMS. He also ensures Corporate, Division and UK legal requirements are met.

Sees to the daily SHE requirements on Site. Ensures that the SHE and Waste Meetings are scheduled, documented, followed up and distributed. Ensures that all SHE items are highlighted and addressed. Reports as per RIDDOR requirements all incidents that fall within this category and ensures that NRW are informed where required. The SHE Manager communicates with the relevant authorities (HSE Executive, NRW and local Council). Works closely with the Plant Managers, SPOs and HODs to ensure a good safety health and environmental culture is developed. All SHE training is highlighted with the relevant Managers and training arranged and followed up. Ensure that IPPC

requirements and improvement programmes are maintained. Attends regular update seminars on all aspects of SHE.

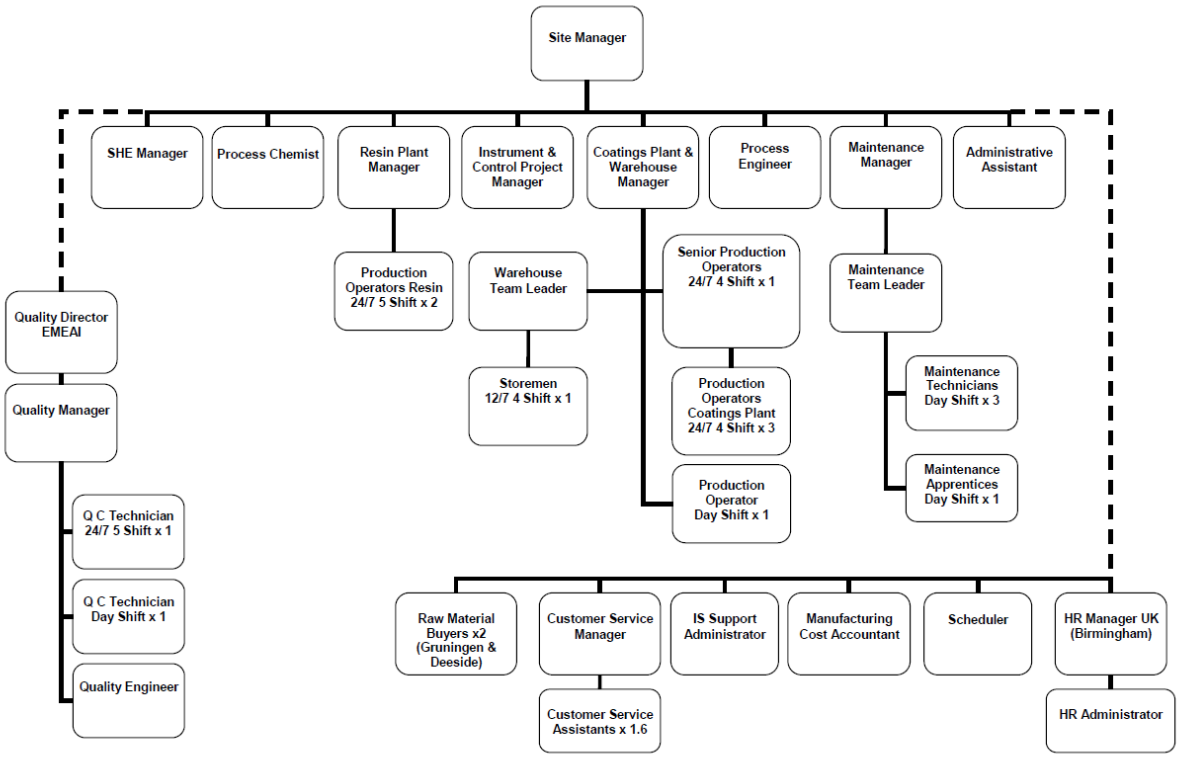


Figure 5 - Organisational Chart Deeside Site

Training, Awareness & Competence

The Site provides appropriate training to all personnel whose responsibilities could have a significant direct or indirect impact on the environment.

All members of staff are provided with Safety Health & Environmental Training on starting at Valspar, Deeside. They are trained whenever they are exposed to new or increased risk, e.g.

(a) transferred or given new responsibilities,
(b) new or modified work equipment,
(c) introduction of new technology or process.

Induction training is carried out by a Departmental Manager and a 'Training Checklist' is completed (Section 3.04.03, Blue Book) for all new starters. These records are held on their personal file whilst training records are held with the Departmental Managers. Training is conducted using in-house facilities and at external establishments as necessary. A Training Needs Analysis schedule has been drawn up identifying the level of awareness that is required for each function within the Site in respect of:

- The importance of conformance with the environmental policy and procedures and with the EMS.
- The significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy, procedures and with the requirements of the EMS. This includes emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures, such that personnel performing the tasks, which could cause significant environmental impacts, are competent on the basis of the appropriate education, training and experience.

Records of this training are held with the SHE Manager in the general training file.

Document Control

Changes to the manual are reviewed and approved by the Environmental Manager, and applied using the system for amendments. Users access the electronic version of the manual; such access is limited to read-only for all personnel except the Environmental Manager.

Procedures, manuals and other documents relevant to the system are available to all who are required to use them.

When a revision occurs, a new version of the electronic manual is placed in the computerised document management system and the older version deleted. The Environmental Manager maintains an archive of hardcopies. Release of the system manual or procedures to external bodies will be at the discretion of the Site Manager or Environmental Manager. Documentation is reviewed by the Environmental Manager at an interval not exceeding 1 year.

EMS Audit

The facility is audited by an external certification body (Moody International) twice a year. Also as required by the ISO 14001 standard an internal auditing program is in operation where all areas are audited at least once over a twelve -month period (the audit schedule is tracked using an electronic action tracking system). The site receives a third party corporate compliance audit as well. Records are held for all internal and external audits and any non-conformances are recorded in the electronic action tracking system. Non-conformance reports and associated actions are reviewed periodically for follow up and closure.

The aims of the audits are two-fold:

- To ascertain that the Site's activities are continuing to comply with the EMS requirements.

- To determine the effectiveness of the system in fulfilling the Site's policy, leading to continual improvement in environmental performance.

Monitoring of the operation of the system is carried out at regular intervals to ensure conformance to the management programme, in accordance with documented procedures. The Environmental Manager will arrange for audits to be carried out as defined in the frequency matrix and the technique used for the audits is based upon those detailed under the Quality System.

During auditing, emphasis is directed towards environmental performance and progress towards targets and objectives. Also to be considered are organisational structure, administrative and operational procedures, work areas, environmental monitoring equipment, operations and processes, documentation and records. It is incumbent upon those undertaking the audits to offer constructive suggestions for improvements based on their findings.

In addition, Environmental Record Audits are carried out monthly according to a set schedule as documented in the EMS and reported at the Health, Safety & Environmental meeting.

EMS Documentation

This manual is the top level of the documentation necessary for the standard, and states WHAT the site is doing to support BS EN ISO 14001: 1996 in practice. The next level of documentation is procedures, which document HOW the intentions are carried out.

The third level of documentation is that of Operating Instructions, Batch Sheets, and other written work instructions, which provide detailed operative level information for performing and carrying out workplace activities.

Finally there is the level of Records, which are discussed in Section 4.5.3

Objectives of Environmental Procedures Manual

1. Provide a reference for the policies and procedures used in the company to assess and audit the levels of environmental control being achieved.

2. Provide evidence that the policies and procedures to ensure environmental objectives are met and have been thought out and documented in order to help those who must execute them.

3. Provide a control document to record the evolution of the company environmental policy that becomes necessary due to the changing business environment.

4. Help identify training requirements that need to be fulfilled in order to generate suitably qualified personnel to carry out the policies and procedures contained within the manual.

5. Provide assurance that compliance with legal requirements for environmental control are being met or exceeded.

Emergency Response

Procedures are in place to prevent spills/accidental releases and to respond if they do occur. Operators have experience of dealing with small spills (<3 litres) which occasionally occur. The facility routinely simulates a major incident to validate that response is in line with the plan. The outcome of the incident simulation is recorded and actions to address any shortcomings are tracked to completion in the electronic action tracking system.
Communication

All environmental communications, both external and internal, are routed via the Plant Managers and a record of each is held. In all cases replies/responses made and recorded. The response to any communication is honest, professional and constructive.

Environmental incidents are reported on an incident report form [DEE-FOR-155] as per the Accident and Incident Reporting Procedure DEE-PRO-025 and reported to the Site Manager. These are discussed at the morning meeting.

'Exception reporting' is a requirement of The Valspar Corporation if a potential compliance deficiency or other liability occurs. In such cases the Divisional President, the Manufacturing Director and the Corporate Director of Environmental Affairs are informed as per the requirements of the Accident and Incident Reporting Procedure DEE-PRO-025.

Non Conformance & Corrective & Preventive Action

For non-conformances actions are initiated using Non Conformance Form, also known as the Accident and Incident Report form DEE-FOR-155. The master copy of this form is retained in the electronic document management system. The incident is investigated, and the necessary corrective and preventive action implemented. All incidents are discussed at the daily morning meeting.

Details of the non-conformance and the appropriate corrective and preventive actions are documented and records retained by the SHE Manager. Controls are put in place to avoid repetition of the non-conformance and recording any changes to written procedures resulting from the corrective and preventive action are implemented.

4.0 IMPACT ON THE ENVIRONMENT

Environmental Setting

The Deeside Packaging Coatings facility occupies a 9-acre site on the Deeside Industrial Park, 7 km NW of Chester and comprises factory, laboratory and office accommodation. The National Grid reference for the site is given as 332890 371040. The site is bordered on all four sides by neighbouring industrial premises, namely Henrob (Joining Solutions), Iceland Frozen Foods, Sigma Coatings, Farralls Industrial warehousing and Distribution, a BP Service Station and two vacant general industrial units. The industrial park extends to the south, east and west while to the north is an area of flat agricultural land.

The nearest residential housing is located approximately 750 m to the north east of the site.

The site and immediate surrounding land use is illustrated in Figures 2.1a and 2.1b in Section 2.

Sensitive Land Uses

Shotwick Brook is the nearest surface water located approximately 100m to the north of the site. The brook flows into the River Dee which is located approximately 2 km to the south of the site.

Statutory Designations

There are several Sites of Special Scientific Interest (SSSI) approximately 2.5 kilometres from the site. The first SSSI is located along the River Dee corridor approximately 2.5 km south of the site. The second SSSI is located approximately 2.5 km to the north west of the site and is Inner Marsh Farm. Just beyond is the River Dee estuary.

Potential Impacts to Air

The facility releases emissions to atmosphere from a number of point sources as well as fugitive emissions from a number of sources including; valves, seals, flanges, pipe work, accidental spills and filling/emptying liquid raw material containers. Data submitted to the EA on emissions to air demonstrate that total VOC emissions from the site in 2015 were calculated to be 38919kg which represent 0.53% of the total solvent throughput of 6177 mt. Employee exposure monitoring results were used to demonstrate that displacement losses from routine filling and operational activities account for 28306kg of VOC through the general building ventilation and localised employee protection LEV systems. Approximately 3630kg was released from the coatings plant process vents, 6161kg was released from the resin plant process vents (reactor & let down tanks) and approximately 250kg of VOC was released from the main tank farm (17 vessels).

Based on the employee exposure monitoring results the total emissions to air from point source and fugitive releases is conservatively calculated to be 0.46% of total solvent throughput. As this is distributed across multiple locations in the plant the significant additional investment in abatement technology is not considered to be justified. The one

investment which may be required is the installation of an abatement system to remove solvent emissions from the coatings plant vent, A5. A decision will be made on whether abatement is required once the odour characterisation and dispersion assessment has been completed.

Odour releases from onsite activities have on resulted in a complaint from businesses on the industrial park or from members of the public via the regulatory authorities (Flintshire County Council/NRW) on three occasions. The facility has invested in a scrubber system to remove ethyl acrylate and acrylic acid from releases to air as these materials have very low odour thresholds.

Potential Impacts to Water

No discharges directly to controlled water take place on site. The only discharge to surface water drains is rainwater from building roofs.

Discharges to the foul sewer network comprise run off from the yard area via releases from the onsite interceptor following monitoring. If following monitoring the contents are found to exceed permits levels of contaminants the interceptor will be emptied into a tanker and taken for disposal. Welsh Water also monitor releases periodically

The entire yard area comprises a concrete hard standing and kerbing which acts as an area of secondary containment. Raw materials, waste or finished product stored on the yard area will accumulate on the yard or enter an interceptor in the event of a spill. Regular inspections of the yard surfaces, kerbs and bunds are carried out to identify any damage that may lead to loss of containment so that remedial work can be carried out to ensure that potential pathways to the ground and groundwater are eliminated.

Potential Impacts to Land

The potential exists for raw materials, liquid waste and finished product to escape onto the yard area and migrate downwards into the ground via cracks. As mentioned before regular inspections of the yard surfaces, kerbs and bunds are carried out to identify any damage that may lead to loss of containment so that remedial work can be carried out. Material which has the potential to migrate is stored no closer than 1 meter from grass verges. No soakaways are present on site as these were replaced with three interceptor tanks.

Potential Noise Impacts

The facility has yet to receive any complaints for noise originating from onsite activities. There are no residential areas within 1 km of the site.

A non-scientific noise survey was carried out at the site boundary which revealed that the only noticeable noise source was from the fan in the cooling tower. Road noise from the routes surrounding the site is clearly more noticeable than sources of noise from the site thus it is concluded that noise impacts are not considered significant.

Using Figure 2.2 'Key Components of a Noise Assessment' located in the H3 Guidance and based on the information outlined above, further noise control measures are considered to be unnecessary at this time.

The Natural Habitats Directive

European Sites

The River Dee corridor, the River Dee Estuary and the Deeside and Buckley Newt Sites are the only sites designated within 10km of Deeside Packaging Coatings under 'the Habitats Regulations' (The Conservation (Natural Habitats, etc., Regulations, 1992). These sites can theoretically be impacted by the operation of Deeside Packaging Coatings through;

- Point source and fugitive VOC & odour emissions.
- Point source emissions from gas fired boiler (NOx. SO_2).

The facility is not located in an air quality management zone thus the releases of VOCs, odour, NOx and SO_2 (from clean burning gas) in current quantities (below permitted thresholds) are not considered to have an adverse effect on protected sites. As such dispersion modelling to assess potential impacts of releases to atmosphere is not thought to be necessary.

Other designated sites – such as the River Mersey and Halkyn Mountain – are located just beyond 10km from the site.

Discharge to Controlled Waters

Only rainwater from building roofs enters the surface water drain thus the protected River Dee is not considered to be at risk.

For this site an assessment under the Habitats Regulations is not considered necessary for discharges to the foul sewer since the total quantity of water discharged per annum is low (2585 mt in 2015) and the batch discharge to sewer is primarily rain water and is only carried out after the contents of the interceptor have been analysed to confirm that the contents are within the discharge consent conditions. In addition the impact of final discharge from the Sewage Treatment Works will have to be assessed itself under the Habitats Regulations during the RoC process.

H1 Assessment

See Appendix N for a printout of the preliminary H1 assessment for the installation.

5.0 ADDITIONAL INFORMATION

Environmental Improvement Plan 2016-2017

Environmental Issue	Department or Area	Improvement Objective	Driver	Indicative Date (from permit being granted)
Emissions and Abatement	Coatings Plant	• Determine the potential to reduce the probability for odour to be detected outside the boundary limits. Implement additional controls where justifiable.	Odour Complaints/ Odour Management Plan	Within 12 months.

RESPONSIBILITIES

The Site Manager (also responsible for Health, Safety and Environment) is responsible for ensuring that all the environmental improvements highlighted above are carried out on time.

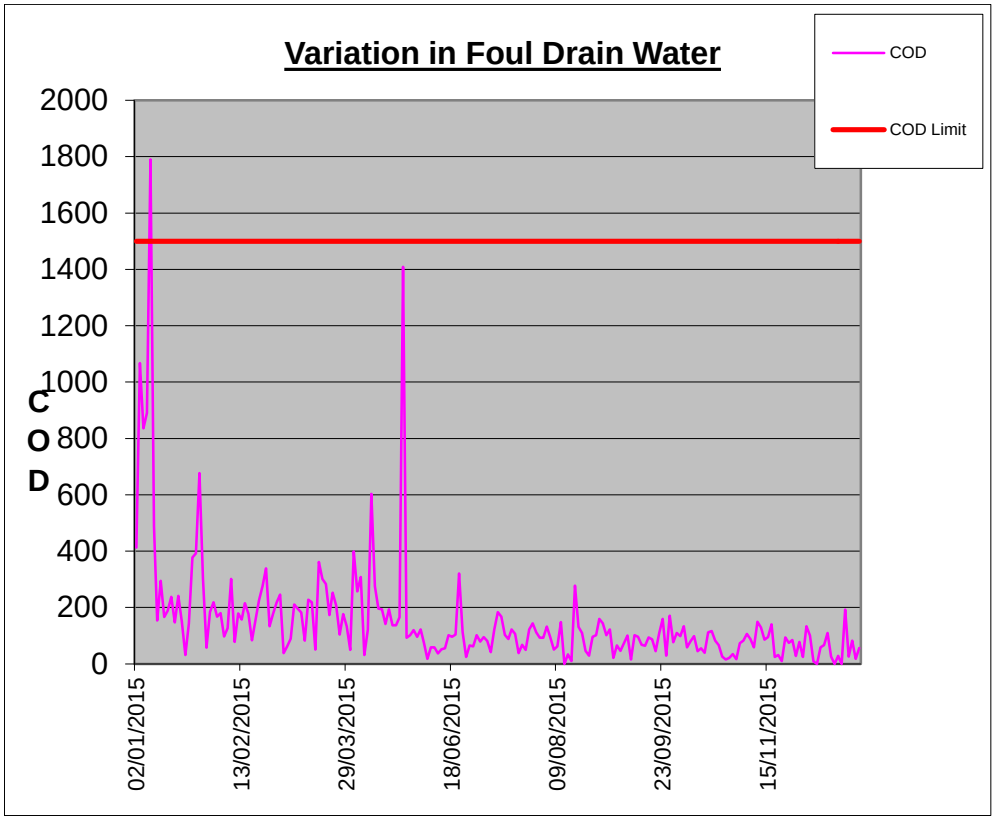
Individuals who will assist implement the initiatives include;

- SHE Manager
- Maintenance Manager
- Plant Managers

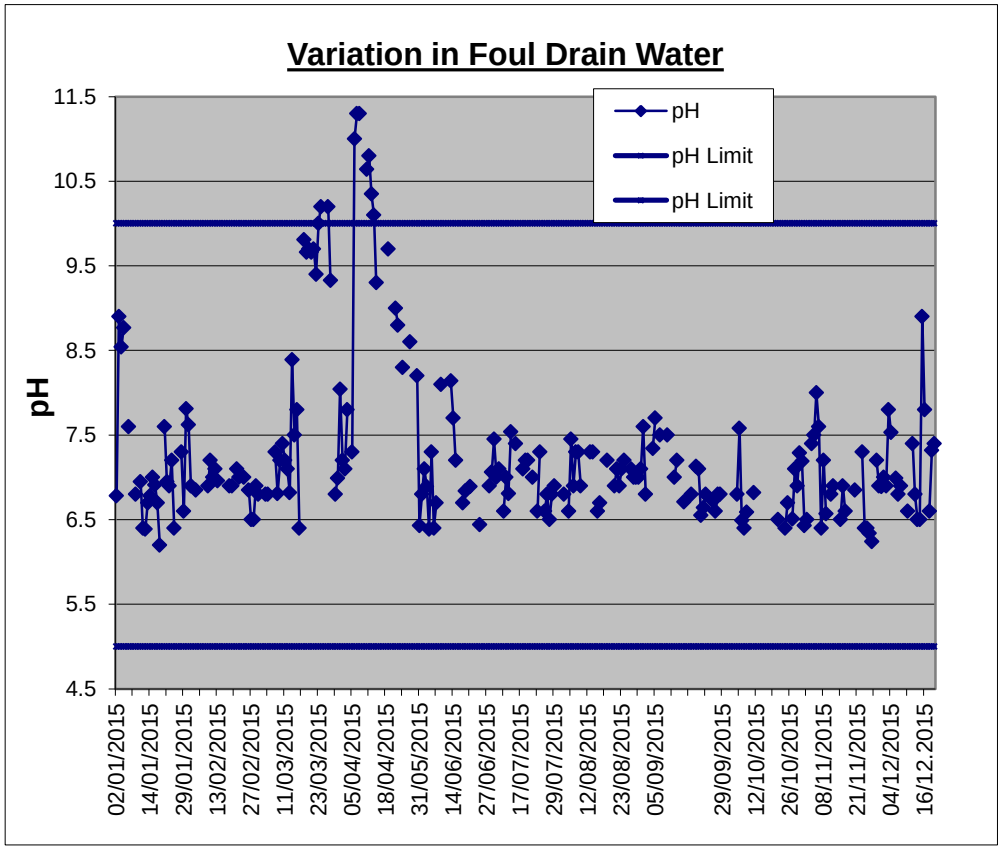
APPENDICES

APPENDIX A Site Report

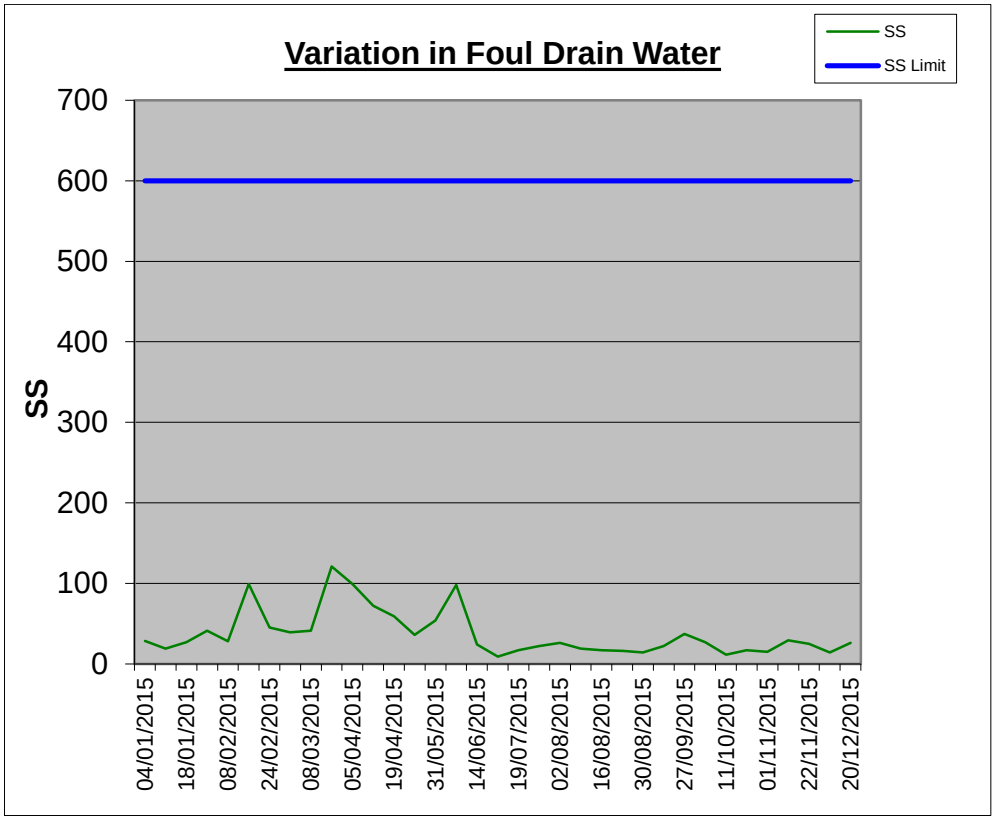
APPENDIX B - 2015 Waste Water Monitoring Charts (Internal and Welsh Water)



Graph 1 - Internal COD results



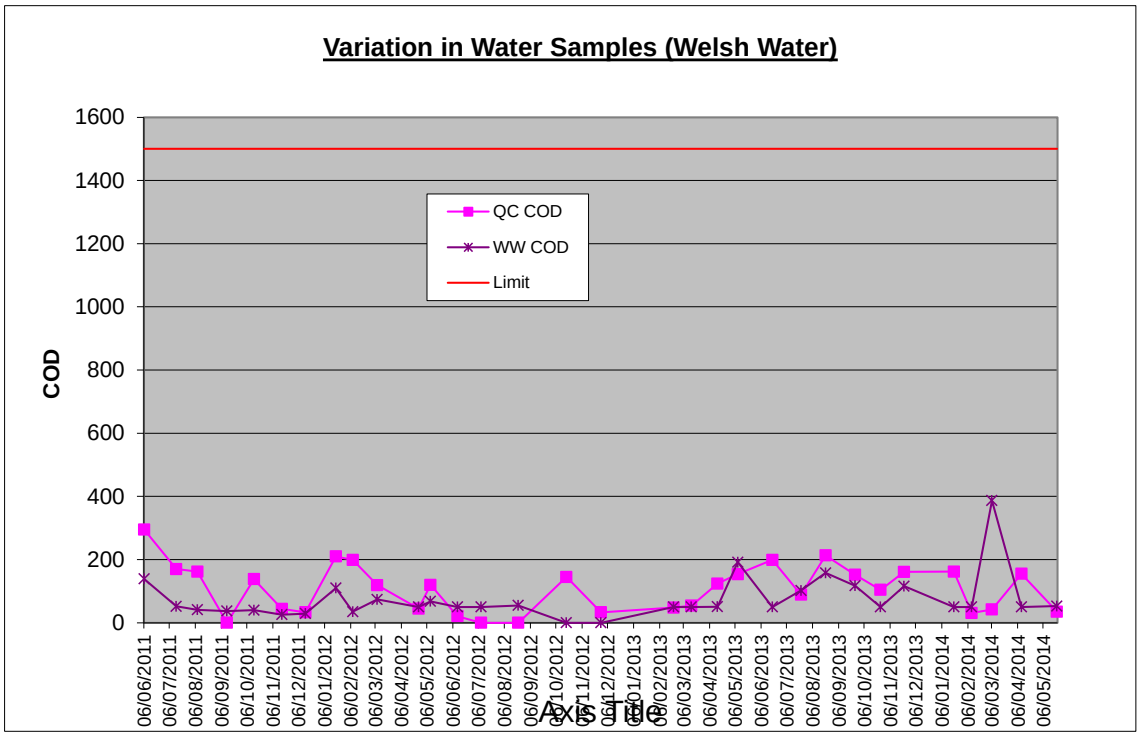
Graph 2 – Internal Monitoring Results (pH)



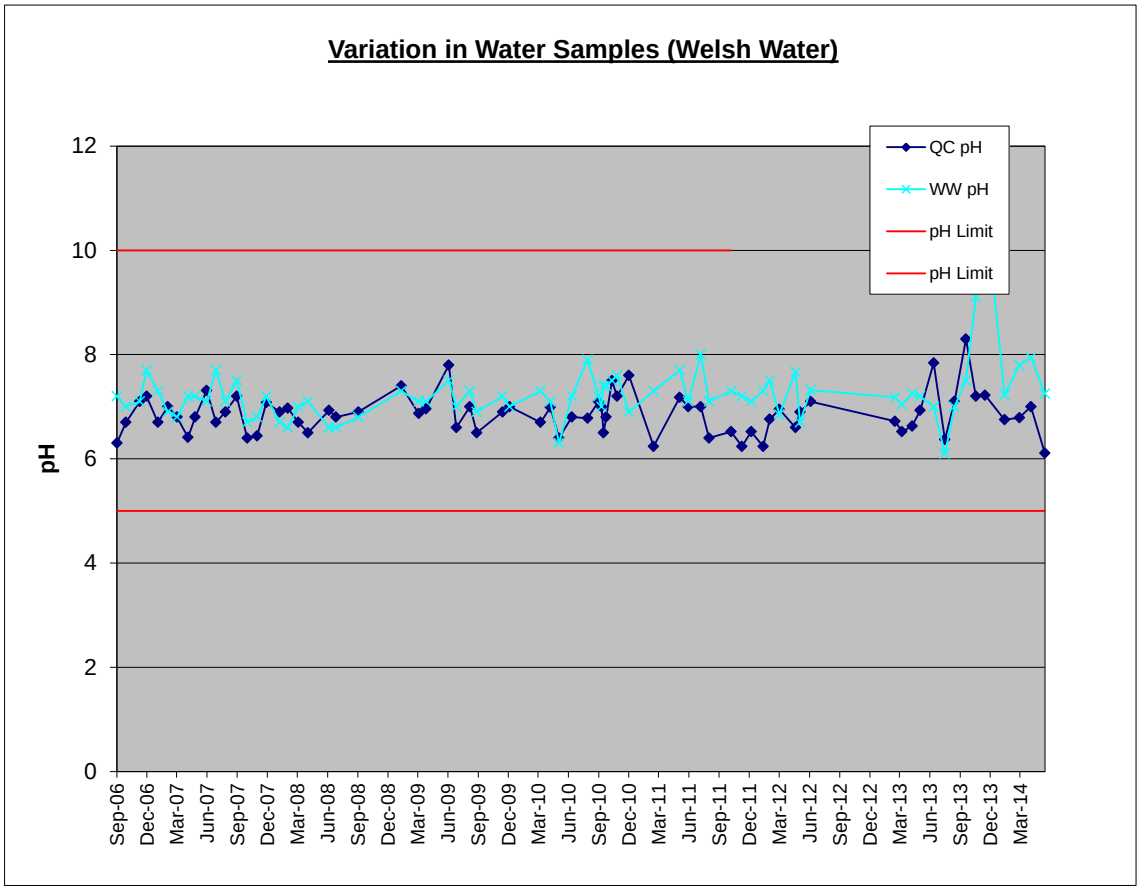
Graph 3 – Internal Monitoring Results SS

Date	Time	Appearan	Odour	pH 6.0-9	S.G. 0.996-1.0	C.O.D. <1500mg
02/01/2015	**00:00**	CLEAR	NONE	6.8	0.999	412
03/01/2015	**00:00**	CLOUDY	NONE	8.9	0.999	1067
04/01/2015	**00:00**	CLEAR	NONE	8.5	0.999	836
04/01/2015	**Composite**	CLOUDY	NONE	8.8	0.999	890
05/01/2015	**No sample**					
06/01/2014	**18:30**	DIRTY	SLIGHT	7.6	1.000	1790
07/01/2015	**Composite**					
08/01/2015	**No sample**					
09/01/2015	**20:10**	CLOUDY	NONE	6.8	0.999	488
10/01/2015	**No sample**					
11/01/2015	**23:50**	CLEAR	NONE	7.0	1.000	154
11/01/2015	**Composite**	clear	SLIGHT	6.4	1.000	295
12/01/2105	**19:00**	CLOUDY	SLIGHT	6.4	0.999	166
13/01/2015	**19:00**	CLOUDY	SLIGHT	6.7	0.999	189
14/01/2015	**19:00**	CLOUDY	SLIGHT	6.8	0.999	238
15/01/2015	**19:10**	CLOUDY	SLIGHT	7.0	1.000	147
17/01/2015	**21:20**	CLOUDY	SLIGHT	6.9	1.000	241
18/01/2015	**Composite**	CLOUDY	SLIGHT	6.7	1.000	149
18/01/2015	**19:35**	CLEAR	NONE	6.2	1.000	31
19/01/2015	**No sample**					
20/01/2015	**21:40**	CLEAR	NONE	7.6	0.999	143
21/01/2015	**19:00**	CLEAR	NONE	7.0	0.999	377
22/01/2015	**Composite**	CLOUDY	NONE	6.9	0.999	392
23/01/2015	**19:00**	DIRTY	NONE	7.2	1.000	677
25/01/2015	**Composite**	DIRTY	SLIGHT	6.4	1.000	302

Table 12 - Sample Daily Record of Waste Water Monitoring (red = over limit)



Graph 4- Internal Vs Welsh Water Monitoring Results (COD)



Graph 5- Internal Vs Welsh Water pH Monitoring Result

APPENDIX C - POINT SOURCE EMISSIONS

Point Source Emissions to Air

Main release points are shown on the drawing VLP-PL-EMP01.

Emission point references (i.e. A1) are list in the table below.

Note also:

- A4 (EP8 has been removed)
- 3 Free Venting tanks are A26-A28
- Main Tank Farm contains tanks A8-A24 & A45
- ST1 and ST2 are A26 & A27

List of emission points – current and disused

Release Point	Source	Contents
A1	Resin Plant – Reactor Scrubber Vent	Solvent Vapours
A2	Resin Plant – Reactor Dust Filter Vent	Dust/Solvents
A3	Resin Plant – Ethyl Acrylate Scrubber, TK's and resin storage.	Solvent Vapours
A4	Removed	
A5	Coatings Plant – Displacement from vessels (no extraction)	Solvent Vapours
A6	Coatings Plant DCE Unit - Dust emissions	Dusts
A7	Building ventilation system extracts fugitive emissions from workplace in Coatings Plant West	Solvent Vapours
A8	Main Tank Farm – Tank 1 (T-701)	2-(2-Ethoxyethoxy)ethanol (Ethyl-di-glycol)
A9	Main Tank Farm – Tank 2 (T-702)	2-(2-Ethoxyethoxy)ethanol (Ethyl-di-glycol)
A10	Main Tank Farm – Tank 3 (T-703)	Hydrocarbons, C9, aromatics (Aromatic Solvent 100)
A11	Main Tank Farm – Tank 4 (T-704)	Xylene
A12	Main Tank Farm – Tank 5 (T-705)	Liquid Epoxy Resin
A13	Main Tank Farm – Tank 6 (T-706)	Glycol Ether Acetate (Dowanol PMA)
A14	Main Tank Farm – Tank 7 (T-707)	MEK
A15	Main Tank Farm – Tank 8 (T-708)	Propylene Glycol

Release Point	Source	Contents
A16	Main Tank Farm – Tank 9 (T-709)	n-Butanol
A17	Main Tank Farm – Tank 10 (T-710)	2-butoxyethanol (Butyl Glycol Ether)
A18	Main Tank Farm – Tank 11 (T-711)	Methacrylic Acid
A19	Main Tank Farm – Tank 12 (T-712)	DMEA
A20	Main Tank Farm – Tank 13 (T-713)	MEK
A21	Main Tank Farm – Tank 14 (T-714)	(MEK/Xylene/2-butoxyethanol (Butyl Glycol Ether) Wash Solvents
A22	Main Tank Farm – Tank 15 (T-715)	Liquid Epoxy Resin
A23	Main Tank Farm – Tank 16 (T-716)	Hydrocarbons, C10, aromatics <1% naphthalene (Aromatic 150)
A24	Main Tank Farm – Tank 17 (T-717)	2- Butoxy Ethyl Acetate (Butyl Glycol Acetate)
A25	Pelargonic Acid Tank, Adjacent to Dump Tank	Nonanoic Acid (Pelargonic Acid)
A26	ST1 Coatings Plant – internal tank, external vent	Intermediate Resins
A27	ST2 Coatings Plant – internal tank, external vent	Intermediate Resins
A28	ST5 Resin Bulk Storage Area	Polyester Resin & Solvent
A29	ST6 Resin Bulk Storage Area	Polyester Resin & Solvent
A30	ST7 Resin Bulk Storage Area	Melamine Formaldehyde Resin
A31-35	Tanker Filling Points	Solvent Vapours
A36	Boilerhouse	Combustion Products
A37	Coatings Plant – Extraction on Product Filling	Solvent & Water Vapours
A38	Resin Plant – Extraction on Product Filtration	Solvent & Water Vapours
A39	Building Ventilation system extracts fugitive emissions from workplace in Coatings Plant East	Solvent Vapours
A40	Building Ventilation system extracts fugitive emissions from workplace in Resin Plant West	Solvent Vapours
A41	Resin Plant Control Room and Laboratory Forced Ventilation Extraction system	Laboratory Chemicals Vapour
A42	Resin Plant – Miniboil solvent wash tank	(2-(2-Ethoxyethoxy)ethanol (Ethyl-di-glycol) /n-Butanol) Wash Solvents
A43	Warehouse General Ventilation West	Fugitive VOC emissions
A44	Warehouse General Ventilation South	Fugitive VOC emissions
A45	Main Tank Farm – Tank 11	Methacrylic Acid
EP 4 (Note 1)	Cooling Water Tower	Water Vapour
EP 7 (Note 1)	Cooling Water Flash Vent	Water Vapour

Note 1 – EP4 and EP7 are included in IPC authorisations as emission points. However there are no current monitoring requirements.

APPENDIX D – PHOTOLOG

(Photos 1-4 in main text)

PHOTOLOG

Client Name:	Site Location:	Project No.
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 5	Date: 20/01/2006

Direction Photo Taken:

Looking West

Description:

Main raw material bulk storage area indicating the secondary containment bund

Client Name:	Site Location:	Project No.
Deeside Packaging Coatings	Deeside Industrial Park	60121

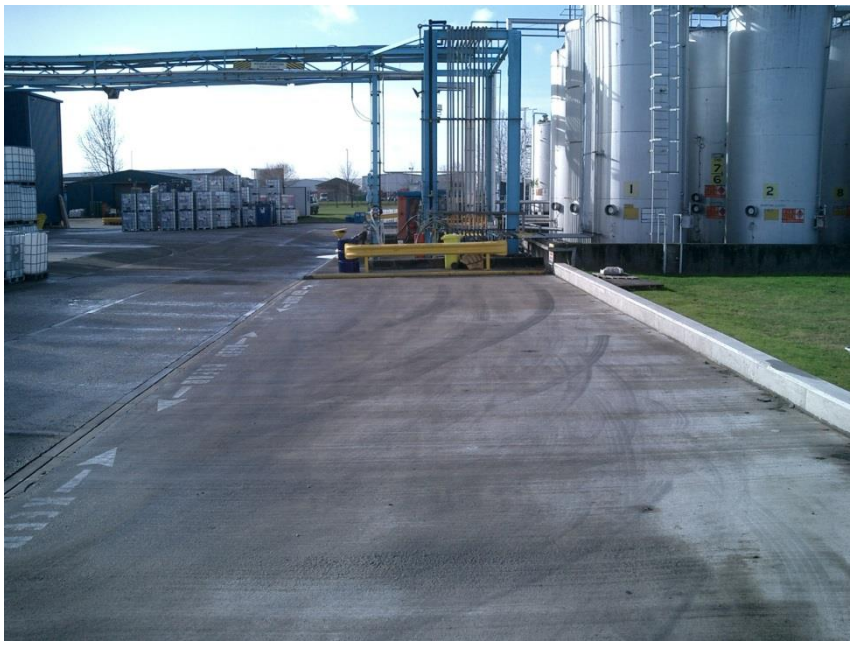
Photo No. 6	Date: 20/01/2006

Direction Photo Taken:

Looking South

Description:

Spill Kit (yellow bin) behind crash barrier at main tank farm



Client Name:	Site Location:	Project No.
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 7	Date: 20/01/2006

Direction Photo Taken:

Looking South

Description:

Yard area comprising concrete hard standing. Fall towards drain leading to interceptor.

Client Name:	Site Location:	Project No.
Deeside Packaging Coatings	Deeside Industrial Park	60121

Photo No. 8	Date: 20/01/2006

Direction Photo Taken:

Looking North

Description:

Finished product in IBCs stored 1m from kerbing and grass verge

APPENDIX E Waste Minimization Committee - Meeting Agenda

1. Waste disposed of: -
    - Sludge waste (Special and Controlled)
    - Dump waste (Special and Controlled)
    - Non-Hazardous Waste – compactable and non-compactable
    - Metal Disposed
2. Recycled Waste: -
    - Solvents sent to a recycling company
    - Paper waste
3. Water consumption: -
4. Electricity usage: -
5. Diesel usage: -
6. Control of broken pallets: -
7. Control of contaminated Pails and Drums: -
8. Compressed Air
9. Bunds
10. Open pots of Solvent
11. Previous items
12. New Items
13. Graphs - Breakdown of resources, waste and cost

APPENDIX F - Deeside Packaging Coatings ISO 14001 Certificate

Certificate of Registration

Intertek

This is to certify that the environmental management system of

Valspar (UK) Corporation Ltd

Parkway
Deeside Industrial Park
Deeside
Flintshire
CH5 2NN

has been assessed and registered by Intertek as conforming to the requirements of:

ISO 14001:2004

The environmental management system is applicable to the management of the environmental aspects related to:

Manufacture of paints, varnishes, similar coatings and resins

Certificate Number:	1455
Issue Date:	29th February 2016
Original Issue Date:	10th March 1998
Certificate Expiry Date:	14th September 2018

UKAS MANAGEMENT SYSTEMS
014

Authorised Signature: Calin Moldovean – President, Business Assurance
Intertek Certification Limited, 10A Victory Park, Victory Road,
Derby DE24 8ZF

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organisation maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.

The certificate remains the property of Intertek, to whom it must be returned upon request.

CT ISO 14001:2004 UKAS EN A4 (2.29 Jun 13

Appendix G - Deeside Packaging Coatings BS EN ISO 9001:2000 Certificate

Lloyd's Register LRQA

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

The Valspar Corporation (UK) Ltd
Parkway, Deeside Industrial Park,
Deeside, Clwyd
United Kingdom

has been approved by Lloyd's Register Quality Assurance
to the following Quality Management System Standard:

ISO 9001:2008

The Quality Management System is applicable to:

Manufacture of coatings and coating intermediates.

Approval
Certificate No: LRQ 4005328

Original Approval: 28 July 2009

Current Certificate: 28 July 2015

Certificate Expiry: 27 July 2018

Issued by: Lloyd's Register Quality Assurance Limited

UKAS MANAGEMENT SYSTEMS 001

1 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES, United Kingdom

APPENDIX H
CERTIFICATE OF INCORPORATION

THE COMPANIES ACT 1985

Company No. **3049772**

The Registrar of Companies for England and Wales hereby certifies that

THE VALSPAR (UK) CORPORATION, LIMITED

was incorporated under the **Companies Act 1985**

as a limited company on the **25th April 1995**

Given at Companies House, Cardiff the **30th May 2001**

MRS J. BURTON
for the Registrar of Companies

Companies House
for the record

APPENDIX I – Part B Authorisation – PP0016 - Flintshire County Council

APPENDIX J – Details of IPC Variation (Current)

Summary

A minor variation under IPC was obtained for a project to upgrade the Resin Plant.

This upgrade involved the removal of the following equipment.

- Original cooling tower;
- Existing caustic scrubber system (known as Blending Tanks (TK1 & TK2) Scrubber Vent or TK scrubber) – was “old” EP6;
- Redundant phenol tanks (2 No.) and phenolic resin tank (BS18-20) and associated pipework.

The following is a summary of the main new equipment installed.

- Installation of a 40 tonne capacity letdown tank – TK3;
- Installation of an 80 tonne capacity storage tank for intermediate product – ST3;
- Installation of a 40 tonne capacity finished product vessel – SA1;
- Installation of a new scrubber system (EA scrubber) to replace the existing TK scrubber. Scrubber specifically designed to improve the abatement of ethyl acrylate. To replace the existing scrubber identified as release point EP6;
- Installation of a 96m^3 resin storage tank – ST4.
- Installation of a new cooling tower;
- Installation of a new bulk storage tank for ethyl acrylate;
- Installation of raw material storage tanks – ST5-7;
- Installation of a new bunded area for tanks ST3-7.

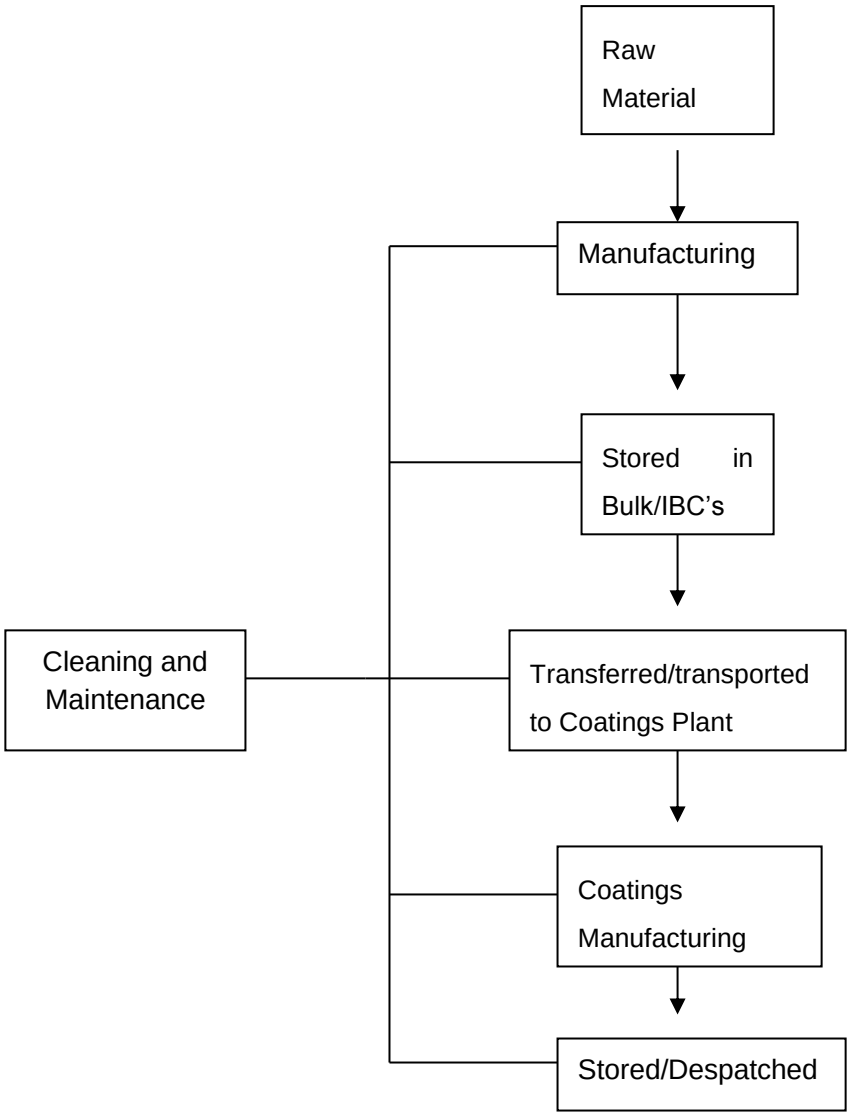
The project also involved minor modifications to other facilities in the Resin Plant such as motor/stirrer upgrades, additional bunded concrete storage pad for raw materials etc.

Further information on the project to upgrade the Resin plant is given in the attached.

APPENDIX K – Details of Raw Materials used on-site

APPENDIX L – Process Details – Resin Plant

Resin Plant



Process Description – Resin Plant

Valspar produce a range of resins on a batch basis in one reactor (12te). The resin plant is operated primarily to manufacture acrylated epoxy emulsions for the adjacent coatings plant, where they are converted into lacquers for the beer, beverage and food can manufacturing industries.

The reactor is also capable of producing Polyester resins for in-house usage in some lacquers.

The resin plant can produce 17,500 tonnes per annum of acrylated epoxy at full capacity and is operated continuously, 24hrs per day either 5, 6, or 7 days per week depending on customer requirements.

Bulk raw materials and solvents are stored in a series of bunded tanks (mainly 40te capacity) located in the Main Tank Farm area; bulk Ethyl Acrylate (40te storage capacity located in the Resin Plant) vents via a scrubber system (A3), all other tanks are freely vented to atmosphere and all have their own tanker offloading/delivery transfer pump sited outside the main bund in a smaller bunded area.

All tanks in the tank farm are at atmospheric pressure. Two tanks for warm epoxy storage are maintained at elevated temperatures (60-70^{o}C).

The resin plant consists of three weigh tanks positioned on an upper gantry, an epoxy weigh tank of 6700ltrs freely vented, a DMEA tank of 2500ltrs and monomer weigh tank of 3700ltrs both vented to the Reactor scrubber system (A1). Three reducing tanks (TKs) are used for the inversion step and letdown. Product from the reactor is fed into these tanks. These tanks consist of two of 30m^3 and one of 40m^3 and are positioned on the ground floor and are all vented through the EA scrubber system (A3).

The reactor, a 12te pressure / vacuum vessel, is situated on the first floor of the building and is furnished with a fractionation column and a shell and tube condenser. The vacuum pump is dry rotary lobe. The reactor is fitted with an 8", 20 psi relief valve and bursting disc set at 30psi which relieves through to a freely vented dump tank situated outside the building in an emergency. Normal operating conditions vary – up to 190^{o}C. Typical batch times range between 12 and 22 hours depending on the product. The reactor is nitrogen blanketed.

Vapours vented from the fractionation column and the condenser pass through the reactor scrubber system (A1).

A weighing station is present on the top floor. This has local extraction that is vented through the resin plant DCE dust filer (A2)

Two filter systems for filtering the product are used on the ground floor with associated housing transfer pumps. This is fitted with a local exhaust ventilation system for use when changing filters and filling containers locally, emission point A3.

All products produced on the Resin Plant are produced in accordance with a Batch Ticket which specifies the raw materials to be used, the quantities, the process addition sequence and process timings. These Batch Tickets contain commercially confidential information but are available for inspection on-site if required. The Batch Ticket system is also the batch tracking system for the site.

The types of resin are as follows:

Acrylated Epoxy Resin

The process is carried out in two stages, a batch reaction followed by thinning of the resin with water in the reducing tank.

The acrylated epoxy resins are produced by initially advancing epoxy resin in the reactor. In this first stage of the production epoxy resin is charged to the reactor from bulk storage. The resin reacts additively with a Phenylol alkane (Bisphenol A) and acrylic monomers

resulting in an epoxy resin. Styrene, carboxylate and phosphonium catalyst are also added at elevated temperature.

The reaction mixture is then diluted in a second stage by the addition of amine and hot water. This addition of hot water to the resulting resin in the reducing tank reduces the viscosity and solids concentration to the required specification.

Finished resin is filtered to either drum, IBC or bulk storage tanks.

Polyester Resin

The process is carried out in two stages, a batch reaction followed by thinning with organic solvents.

The preparation of the resin is by esterification of an organic acid with a glycol and, since the reaction is reversible, water is removed as it is formed using a number of methods, e.g. high temperature, nitrogen sparge, agitation and vacuum.

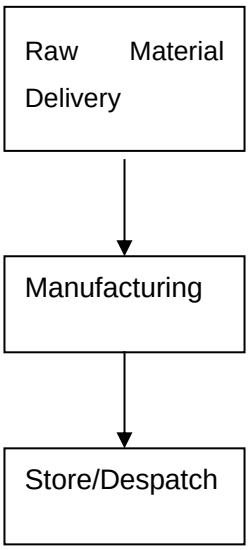
Product is filtered into drums.

There are no reaction by-products/wastes from these reactions other than filtration bags, which are thoroughly drained of liquor and disposed of through approved waste contractors. Drainings are returned to plant or disposed of through approved contractors.

The resin reactor, once all the product has been transferred, is solvent washed. The technical department have completed work to enable the solvent wash to be used in subsequent batches.

APPENDIX M – Process Details – Coatings Plant

Coatings Plant



Process Description – Coatings Plant

In the Coatings Plant resins produced in the Resin Plant are used to produce a variety of different water and solvent based coatings.

Resins are stored in bulk storage vessels (ST1/ST2 – internal – 40te, ST3/4 – external – 80/96te) or IBCs.

Other raw materials are stored in bulk storage (main tank farm – mainly 40te) or in IBCs, drums or bags depending on the ingredient.

There are 17 mixing vessels in the Paint Plant ranging in capacity from 6 to 40te. There are 4 high-speed shear mixing tanks for dispersion and 13 blending tanks. All tanks are vented to a single displacement vent – A5. All tanks are nitrogen blanketed. The general workplace is ventilated by two LEV systems which remove any fugitive emissions.

There is also a small manufacturing area where there is a range of pots (capacity varying between 200kg and 2000kg) for small batch sizes of various products and intermediates.

Ingredients are mixed as necessary in the mixing vessels and pots to produce the required products. All processes are carried out at atmospheric pressure and at ambient temperature although heat input from high-speed mixers can raise the temperature of some batches to approximately 50^{o}C.

The contents of the mixing vessels/pots are then:

- Either fed directly into a blend tank from where they are adjusted to specification (viscosity/solids) by adding solvent/water as necessary and then filtered and packaged;

- Or are fed from the high-speed mix vessel through a grinder/mill (to reduce the particle size) into a letdown tank (blending vessel) from where they are adjusted to specification (viscosity/solids) by adding solvent/water as necessary and then filtered and packaged.

All products produced on the Coatings Plant are produced in accordance with a Batch Ticket which specifies the raw materials to be used, the quantities, the process addition sequence and process timings. These Batch Tickets contain commercially confidential information but are available for inspection on-site if required. The Batch Ticket system is also the batch tracking system for the site.

The duration of individual batches varies between 0.5 hour and 58 hours depending on the product and the number of ingredients to be added and the number of mixing steps required.

The number of blending vessels in operation at any time is variable (typically up to 6 batches are in progress at any one time).

Operations in the Coatings Plant are 24/7.

Waste streams from the Coatings Plant are summarised below:

- Air emissions from displacement vents from the 17 vessels A1;
- Air emissions from the LEV extraction systems;
- Air emissions from the DCE unit, A6.
- There are no routine water emissions from the process activities.
- Aqueous waste is generated from cleaning operations. Any water that cannot be recycled is disposed of via a licensed waste contractor.
- Filter media (cartridges/bags etc.) are sent for disposal via a licensed waste contractor.
- Small quantities of waste samples are also generated.

APPENDIX N – H1 Assessment

Basis of H1 Input Data

Air Emissions

Air emissions data is only available for the following locations:

- A1 Resin Reactor Scrubber.
- A2 Resin reactor DCE dust filter
- A3 EA Tank & TK Scrubber
- A5 Coatings plant – Displacement from vessels (no extraction)
- A6 Coatings Plant DCE Dust Filter
- A limited amount of emissions data is also available for the new LEV systems in the Coatings plant A37 and resin plant A38.

A1, A2 and A5 are the main emission points from site.

Monitoring of emissions from the two main resin plant emission points (A1 & A3) was carried out in December 2004 by an independent monitoring company.

The emissions throughout the production of a typical product (WE0251P) were monitored from both the reactor scrubber (A1) and TK scrubber (A3). The total quantity of VOCs (speciated) were calculated throughout the production process. The batch time in the reactor was 21 hours and during this period the vent A1 was monitored. The emissions from A3 were monitored for 4 hours whilst processing was undertaken.

As can be anticipated from a batch production process there was significant variability in the emissions data as the batch progressed.

For the purposes of the preliminary H1 assessment the data from the monitoring report has been used in the following manner.

The maximum value across the monitoring period for each species has been used. This gives a very much “worst case” scenario.

Data from the report is tabulated below.

A1

- Velocity = 3.5 m/s
- Ave. Flow Volume = 400 m^3/hr (369 m^3/hr @ ntp)

A3

- Velocity 1.8 m/s
- Ave Flow Volume = 114 m^3/hr (110 m^3/hr @ ntp)

A1	Maximum Concentration detected (mg/m^3)
Toluene	213.9
Xylene	668.5
MEK	534.8
N-butanol	22.0
Butyl glycol	13.4
Styrene	32.1
Methyl acrylate	0.98
Ethyl acrylate	<0.89
Methyl methacrylate	<1.19
Ethyl methacrylate	<1.19
Acrylic acid	<1.19
Methacrylic acid	<1.19

A3	Maximum Concentration detected (mg/m^3)
Toluene	202.3
Xylene	3.71
MEK	39.2
N-butanol	42.9
Butyl glycol	<0.43
Styrene	<0.43
Methyl acrylate	<0.43
Ethyl acrylate	245.3
Methyl methacrylate	<0.69
Ethyl methacrylate	<0.69
Acrylic acid	<0.69
Methacrylic acid	<0.69

Water Emissions

There are only two release points offsite.

- Uncontaminated surface water from roof drainage is collected and routed directly offsite.
- Surface water, process effluents and domestic effluent is collected in an interceptor and then tested prior to batch discharge offsite to ensure that it is within the discharge consent parameters. If not in specification it is collected and removed offsite as a waste stream and sent to a licensed waste contractor for disposal.

  The total flow discharged for 2015 was 2585 mt.

  Analytical results for COD and Suspended Solids (see Appendix B) show an average COD of 149 mg/litre and Suspended Solids of 37 mg/litre. On this basis a total of 385kg of COD and 96 kg of Suspended Solids would have been discharged to the sewer system in 2015 which is then routed to a local treatment works prior to discharge into the River Dee.

  On this basis further assessment of the impact of water emissions from site is considered inappropriate at this stage.

APPENDIX O – Solvents Emissions Directive

Solvent Emissions Directive (SED)

The SED was adopted by the European Commission on 11th March 1999. Its aim is to reduce emissions of volatile organic compounds (VOC) from specified industrial processes. In order to achieve this in the UK, the Directive is being implemented through the Environmental Protection Act 1990 and the Pollution Prevention Control Regulations 2000 and the Solvent Emissions (England and Wales) Regulations 2004.

It is only those Directive Installations, as defined in Annex I and IIA of the SED that are subject to the requirements of the Directive.

In order to reduce VOC emissions from Directive Installations,
Two compliance options are available, these are:

(i) meeting emission BAT limit values in waste gases and fugitive emission limit values; or
(ii) meeting total emission limit values

In addition, the Directive requires that, where an operator is using a substance or preparation which contains VOC and the nature or amount of VOC means that the substance or preparation is assigned one, or more, of the risk phrases R45, R46, R49, R60 R61.

a) that substance or preparation must be changed so that the risk phrases no longer apply (e.g. by substituting the VOC), and/or
b) emissions of VOC in question are controlled.

Additional requirements may also apply to the use of halogenated VOC assigned risk phrase R40.

Valspar carry out the manufacture of coatings and handle solvent in excess of 100 tonnes per annum. Solvent usage on site is recorded and tracked through the Batch Ticket system and solvent usage and emissions are calculated on an annual basis. The total “loss” of solvents is reported to the Environment Agency annually.

Valspar has developed a solvent management plan to meet the requirements of the SED to the current and future operations and demonstrates that emissions are comfortably below the target total emission limits of 3% of solvent consumption.

Valspar do not use any VOCs with the risk phrases R40, R45, R46, R49, R60 or R61.

Valspar regularly review the use of VOCs on-site and aim to reduce their usage where practicable and to abate any emissions that do occur. Implemented improvements include recycling wash solvent into following batches of product and replacement of a solvent used for floor cleaning with a seaweed-based product.

The replacement of VOCs in the manufacturing process is not always straightforward due to the regulatory approval requirements that are necessary from authorities such as the Food & Drug Administration. However Valspar continue to research alternatives wherever possible. This is particularly driven by customer’s preference for water based products wherever possible.

APPENDIX P – Dispersion Modelling

DISPERSION MODELLING

Dispersion modelling was undertaken in order to provide further assessment of potential odour impacts associated with emissions from the various point sources at the facility.

Dispersion modelling was undertaken using ADMS 5 (v5.0.0), which is developed by Cambridge Environmental Research Consultants (CERC) Ltd. ADMS 5 is a short-range dispersion modelling software package that simulates a wide range of buoyant and passive releases to atmosphere. It is a new generation model utilising boundary layer height and Monin-Obukhov length to describe the atmospheric boundary layer and a skewed Gaussian concentration distribution to calculate dispersion under convective conditions.

The model utilises hourly meteorological data to define conditions for plume rise, transport and diffusion. It estimates the concentration for each source and receptor combination for each hour of input meteorology, and calculates user-selected long-term and short-term averages.

Modelling Scenarios

The scenarios considered in the modelling assessment are summarised in Table AII.1.

Table AII.1 Dispersion Modelling Scenarios

Parameter	Modelled As	
	Short Term	Long Term
VOCs	1-hour mean	-

Odour Sources

Potential odour sources are detailed in the main report text. These are summarised in Table AII.2. Process conditions were derived through review of the 2013 quarterly stack emissions monitoring undertaken by REC.

Table AII.2 Sources

Condition	Unit	A1	A2	A3	A5
Stack location	NGR	332855.3, 371035.5	332852.9, 371032.6	332861.8, 371029.2	332902.2, 371030.5
Stack diameter	m	0.36	0.20	0.20	0.46
Stack height	m	9.0	6.0	9.0	10.0
Flue gas efflux velocity	m/s	0.001	4.85	3.25	0.82
Exhaust gas flow rate	Nm3/hr	439	518	347	465
Temperature	˚C	15	16	17	17

Emission point A1 discharges horizontally. As such, an efflux velocity of 0.001m/s was utilised to represent the restricted dispersion potential of any releases.

Emissions

Emission rates were determined from the 2013 quarterly stack emissions monitoring undertaken by REC. The quantity of each species emitted during each exercise was determined and the maximum identified for use in the assessment. These are summarised in Table AII.3.

Table AII.3 Emission Rates

Species	Emission Rate (g/s)			
	A1	A2	A3	A5
VOC(a)	0.000000	2.293597	0.034218	0.992539
Ethyl Acrylate(b)	0.000574	0.000671	0.006995	0.001018
Methyl Acrylate(b)	0.000574	0.000671	0.000166	0.001018

NOTE: (a) Obtained from quarter 3 monitoring results
(b) Obtained from quarter 2 monitoring results
VOC emissions were speciated based on emissions monitoring results included within the Environmental Permit Application for the facility. These are summarised in Table AII.4.

Table AII.4 VOC Composition by Species

Species	Odour Threshold Value (µg/m3)	Concentration Detected (mg/m3)	Concentration Detected as Carbon (mg/m3)	Proportion of VOC Emission (%)
Toluene	1,000	213.9	1,497.3	16.0
Xylene	78	668.5	5,348.0	57.3
MEK	870	534.8	2,139.2	22.9
N-butanol	90	22.0	88.0	0.9
Styrene	70	32.1	256.8	2.8

As shown in Table AII.4, xylene represented 57.3% of the total VOC emission and has the second lowest odour threshold value. The most significant potential for impacts was therefore associated with this species. This was considered throughout the report where necessary.

Assessment Extents

Ambient concentrations were predicted over the area NGR: 332615, 370795 to 333120, 371300. One Cartesian grid with a resolution of 5.05m was used within the model to provide data suitable for plotting within the Surfer software package.

Terrain Data

Inclusion of terrain data is recommended within the ADMS 5 user guide[3] if the gradient within a modelling area varies by more than 10% (1 in 10). Assessment of changes in elevation throughout the modelling extents using Google Earth indicated the assessment area was generally flat. As such, terrain data was not included within the model.

Meteorological Data

Meteorological data used in this assessment was taken from Hawarden meteorological station over the period 1st January 2010 to 31st December 2010 (inclusive). Hawarden meteorological station is located at NGR: 334586, 364102, which is approximately 7km south-east of the proposed development. DEFRA guidance LAQM.TG(09)[4] recommends meteorological stations within 30km of an assessment area as being suitable for detailed modelling.

All meteorological data used in the assessment was provided in a pre-processed format by Atmospheric Dispersion Modelling (ADM) Ltd.

3 ADMS 5 User Guide, CERC, 2013.

4 Local Air Quality Management Technical Guidance LAQM.TG(09), Department for Environment, Food and Rural Affairs, 2009.

Dispersion Modelling Results

Figures 6 to 12 show predicted odour levels as a result of ethyl acrylate, methyl acrylate and VOC as xylene emissions from the facility. Concentrations greater than 1ouE/m3 indicate odours may be detectable at that location. However, an odour at a strength of 1ouE/m3 is in reality so weak that it would not normally be detected outside the controlled environment of an odour laboratory by the majority of people (that is individuals with odour sensitivity in the "normal" range - approximately 96% of the population1). As an odour becomes more concentrated, then it gradually becomes more apparent. Some guidance as to concentrations when this occurs can be derived from laboratory measurements of intensity. The following guideline values have been stated by DEFRA2 to provide some context for discussion about exposure to odours:

1 Code of Practice on Odour Nuisance from Sewage Treatment Works, DEFRA, 2006.

2 Odour Guidance for Local Authorities, DEFRA, 2010.

- 1ouE/m3 is the point of detection;
- 5ouE/m3 is a faint odour; and,
- 10ouE/m3 is a distinct odour.

As shown in Figure 6, there are no locations beyond the facility boundary with predicted odour concentrations as a result of ethyl acrylate emissions greater than 1ouE/m3. As such, the modelling results indicate emissions of this species should not be detectable at off-site locations.

As shown in Figure 7, there are no locations beyond the facility boundary with predicted odour concentrations as a result of methyl acrylate emissions greater than 1ouE/m3. As such, the modelling results indicate emissions of this species should not be detectable at off-site locations.

As shown in Figure 8, the maximum odour concentration beyond the facility boundary is approximately 4ouE/m3. This indicates odour as a result of xylene emissions may be detectable at off-site locations during some meteorological conditions. Figures 9 to 11 show odour concentrations from the individual emission points. These indicate that A2 is the only emission point that causes odour concentrations over 1ouE/m3 at off-site locations when considered in isolation. The modelling is based on the worst-case monitoring results for 2013. These include the Q3 value for A2 which is significantly than other surveys. The second most significant emission point is A5, which recorded consistently high VOC concentrations during all monitoring exercises.

Based on the dispersion modelling results, emissions of ethyl acrylate and methyl acrylate are considered unlikely to cause significant odour impacts beyond the site boundary. Emissions of VOCs have been identified as the most significant issue, with releases from A2 of most importance.

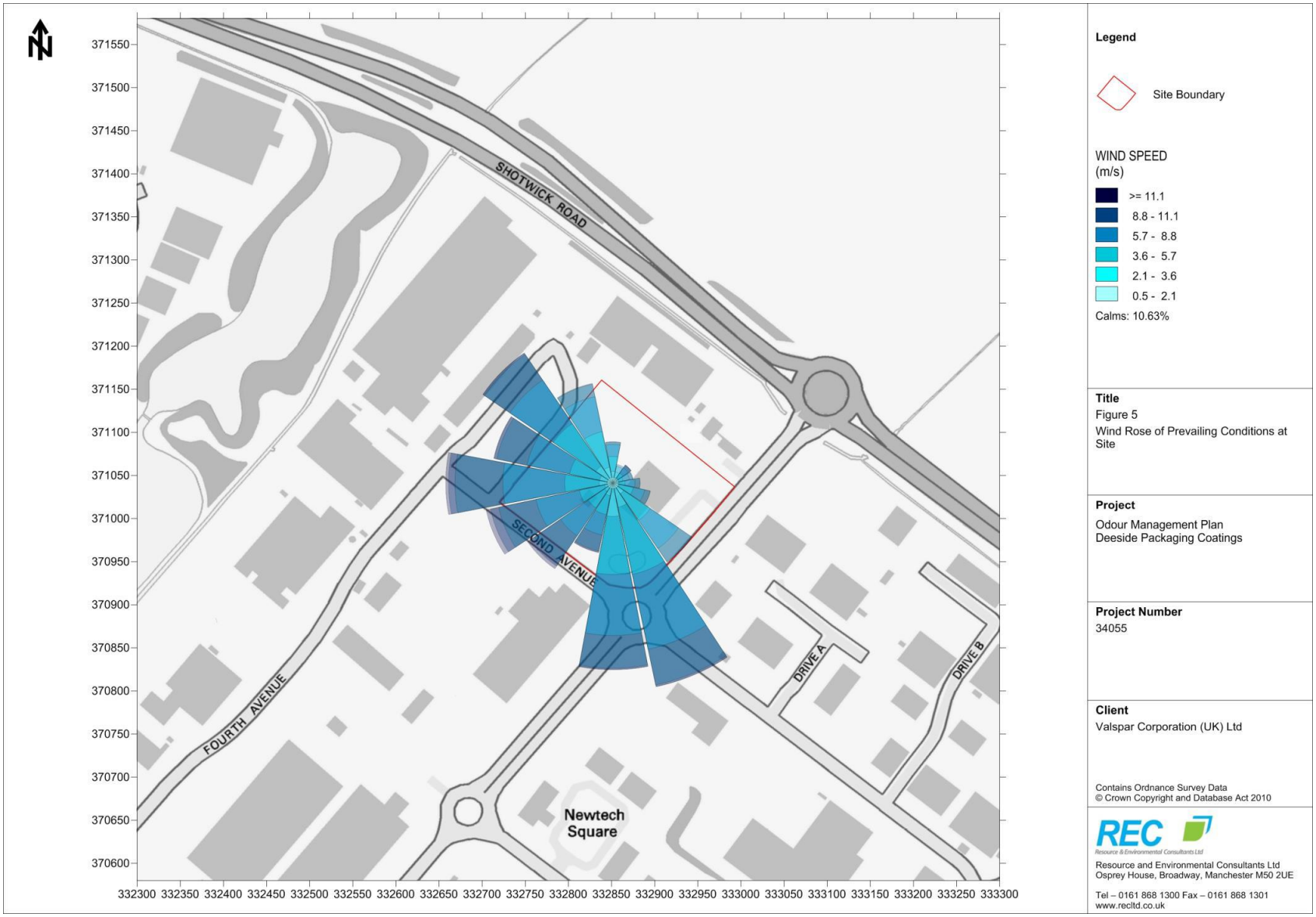
It should be noted that the dispersion modelling assessment has been undertaken based on a number of assumptions. These can be summarised as follows:

- Emissions are constantly at the maximum recorded during the four emissions monitoring exercises undertaken in 2013
- VOC emissions consist only of the speciated compounds detailed in the Environmental Permit Application for the facility and,

- The composition of VOC emissions from all stacks is the same as those detailed in the Environmental Permit Application for the facility.

The exact results should therefore be viewed with caution. However, due to the worst-case nature of the assessment, it is considered the following conclusions can be drawn:

- Emissions of ethyl acrylate and methyl acrylate are unlikely to cause odour impacts and the abatement systems in place for these substances are considered appropriate and,
- Emissions of VOCs may cause odour impacts during certain meteorological conditions.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SHOTWICK ROAD
SECOND AVENUE
FOURTH AVENUE
DRIVE A
DRIVE B
Newtech Square
Legend
Site Boundary
WIND SPEED (m/s)
>= 11.1
8.8 - 11.1
5.7 - 8.8
3.6 - 5.7
2.1 - 3.6
0.5 - 2.1
Calms: 10.63%
Title
Figure 5
Wind Rose of Prevailing Conditions at Site
Project
Odour Management Plan
Deeside Packaging Coatings
Project Number
34055
Client
Valspar Corporation (UK) Ltd
Contains Ordnance Survey Data
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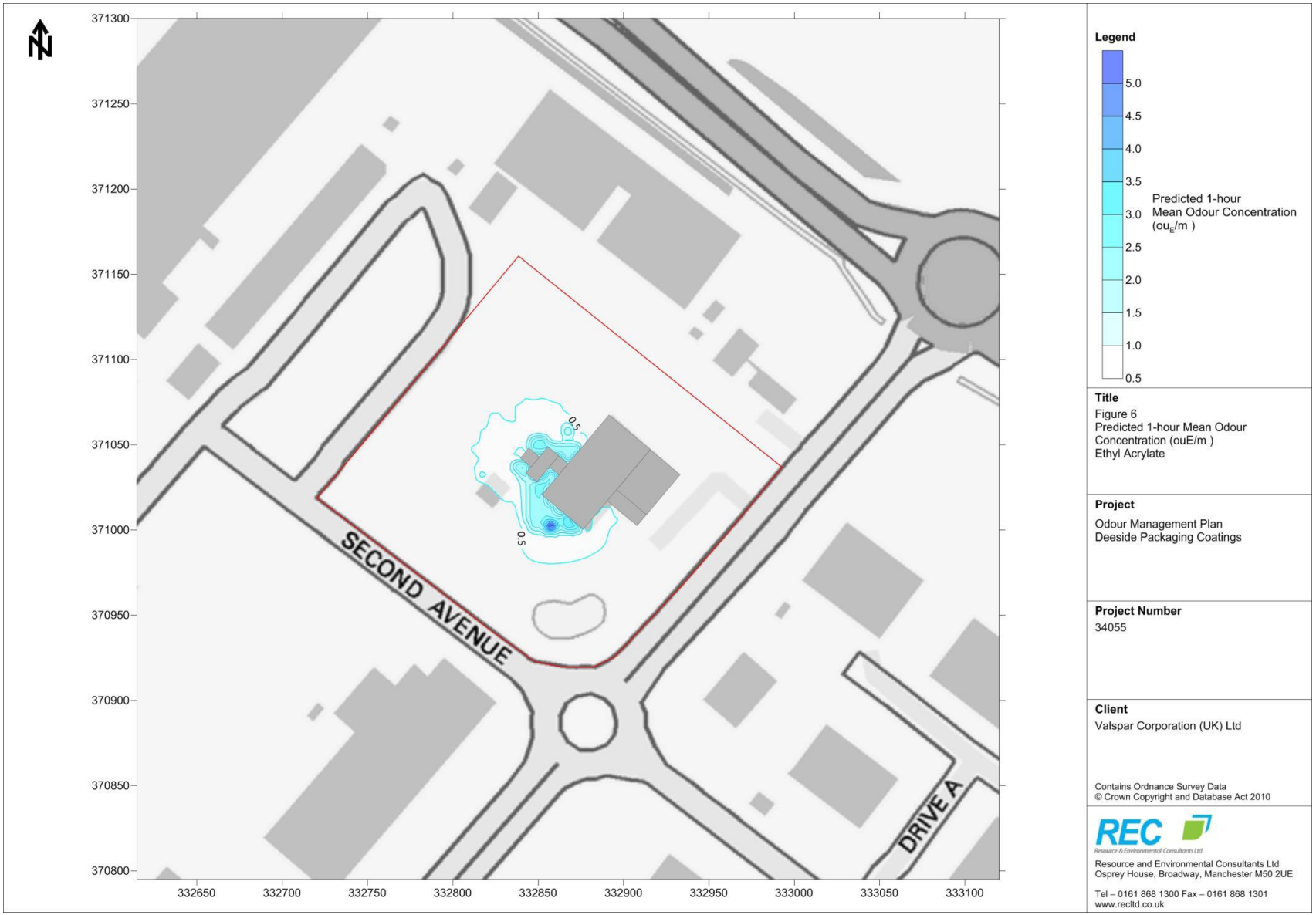
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Predicted 1-hour Mean Odour Concentration (ou$_E$/m)
Title
Figure 6
Predicted 1-hour Mean Odour Concentration (ouE/m)
Ethyl Acrylate
Project
Odour Management Plan
Deeside Packaging Coatings
Project Number
34055
Client
Valspar Corporation (UK) Ltd
Contains Ordnance Survey Data
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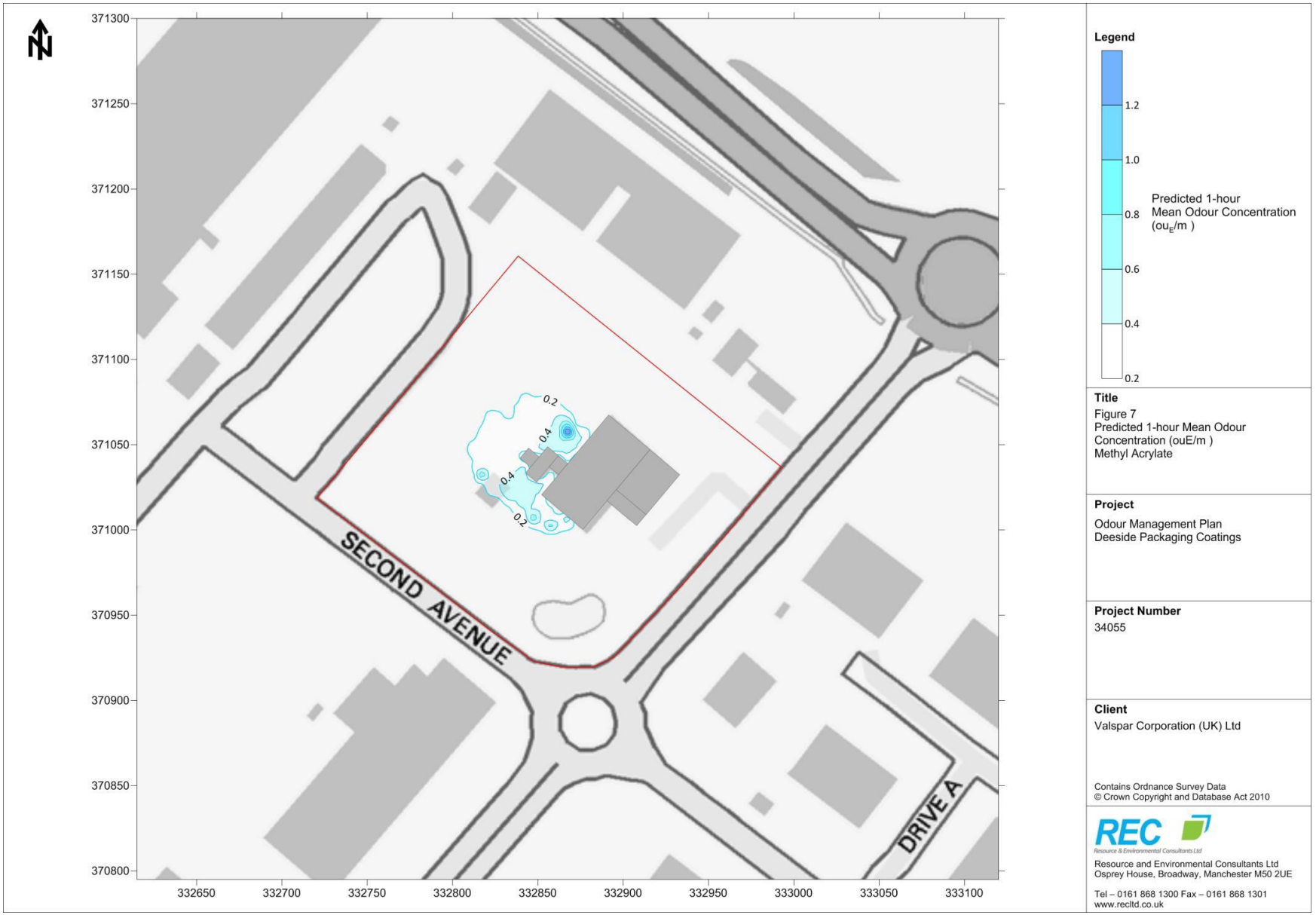
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DRIVE A
Legend
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Predicted 1-hour
Mean Odour Concentration
(ouE/m)
Title
Figure 7
Predicted 1-hour Mean Odour
Concentration (ouE/m)
Methyl Acrylate
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Odour Management Plan
Deeside Packaging Coatings
Project Number
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Client
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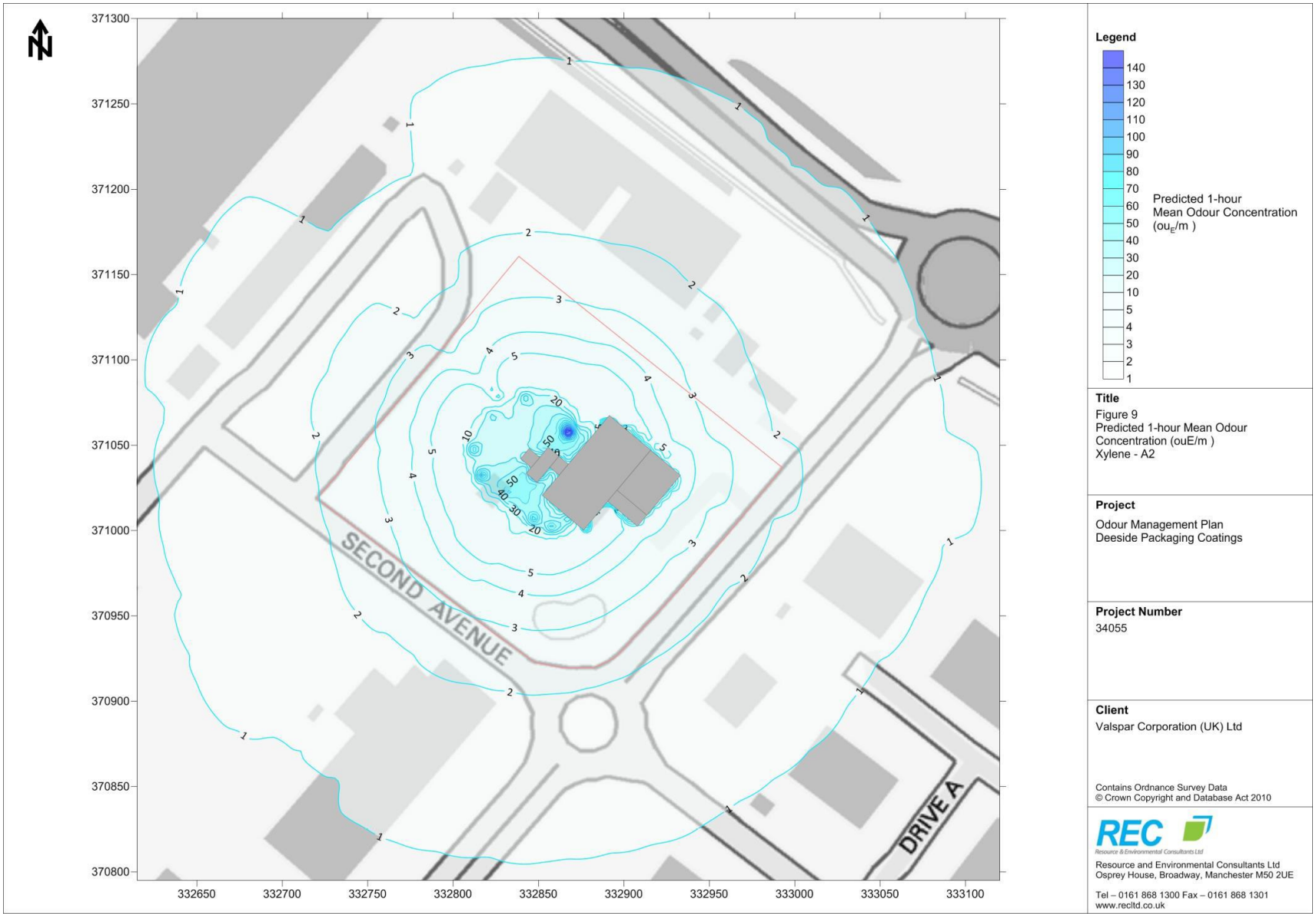
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Predicted 1-hour
Mean Odour Concentration
(ou$_E$/m)
Title
Figure 9
Predicted 1-hour Mean Odour
Concentration (ouE/m)
Xylene - A2
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Project Number
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Contains Ordnance Survey Data
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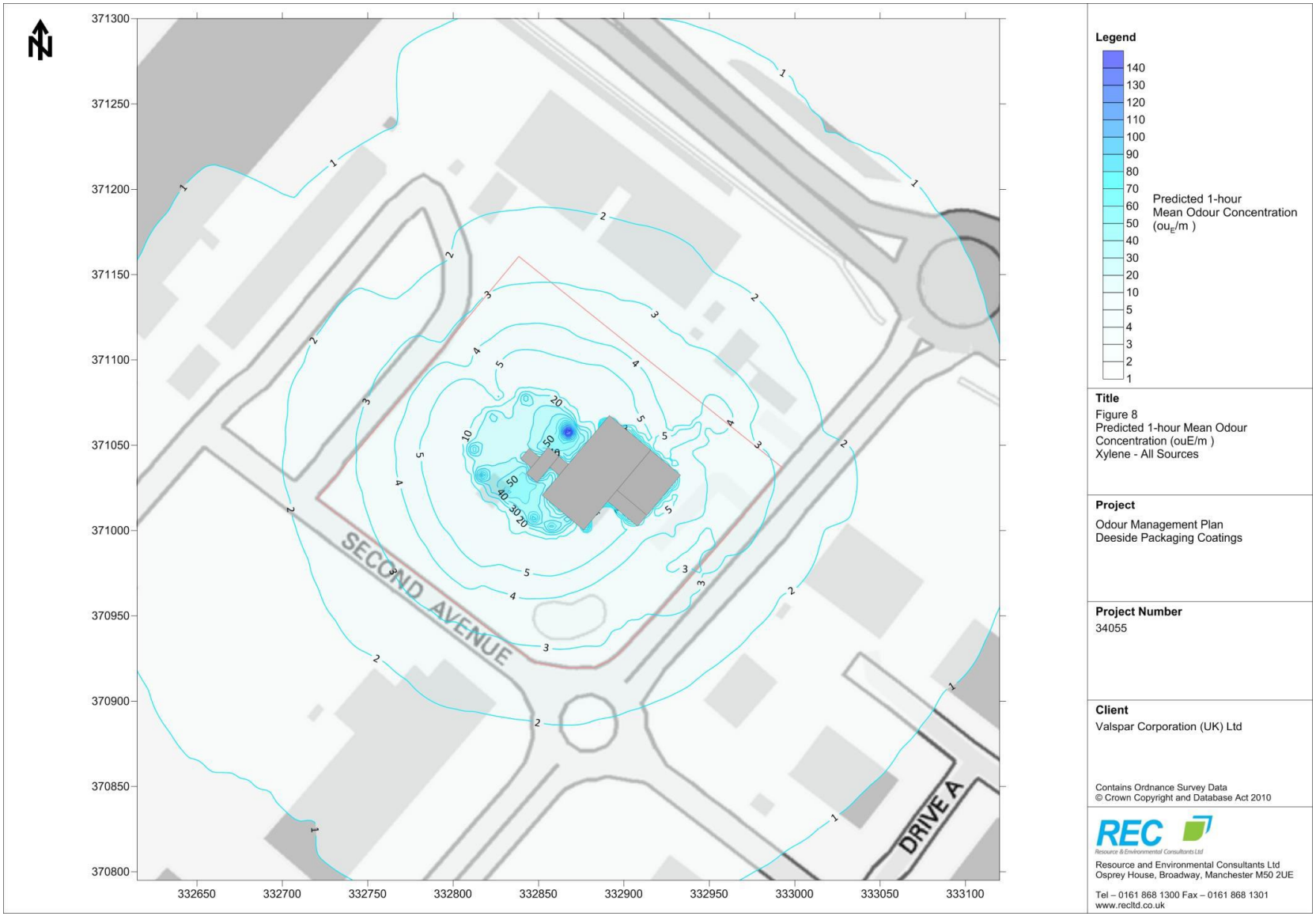
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1
Predicted 1-hour Mean Odour Concentration (ou_E/m)
Title
Figure 8
Predicted 1-hour Mean Odour Concentration (ouE/m)
Xylene - All Sources
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Odour Management Plan
Deeside Packaging Coatings
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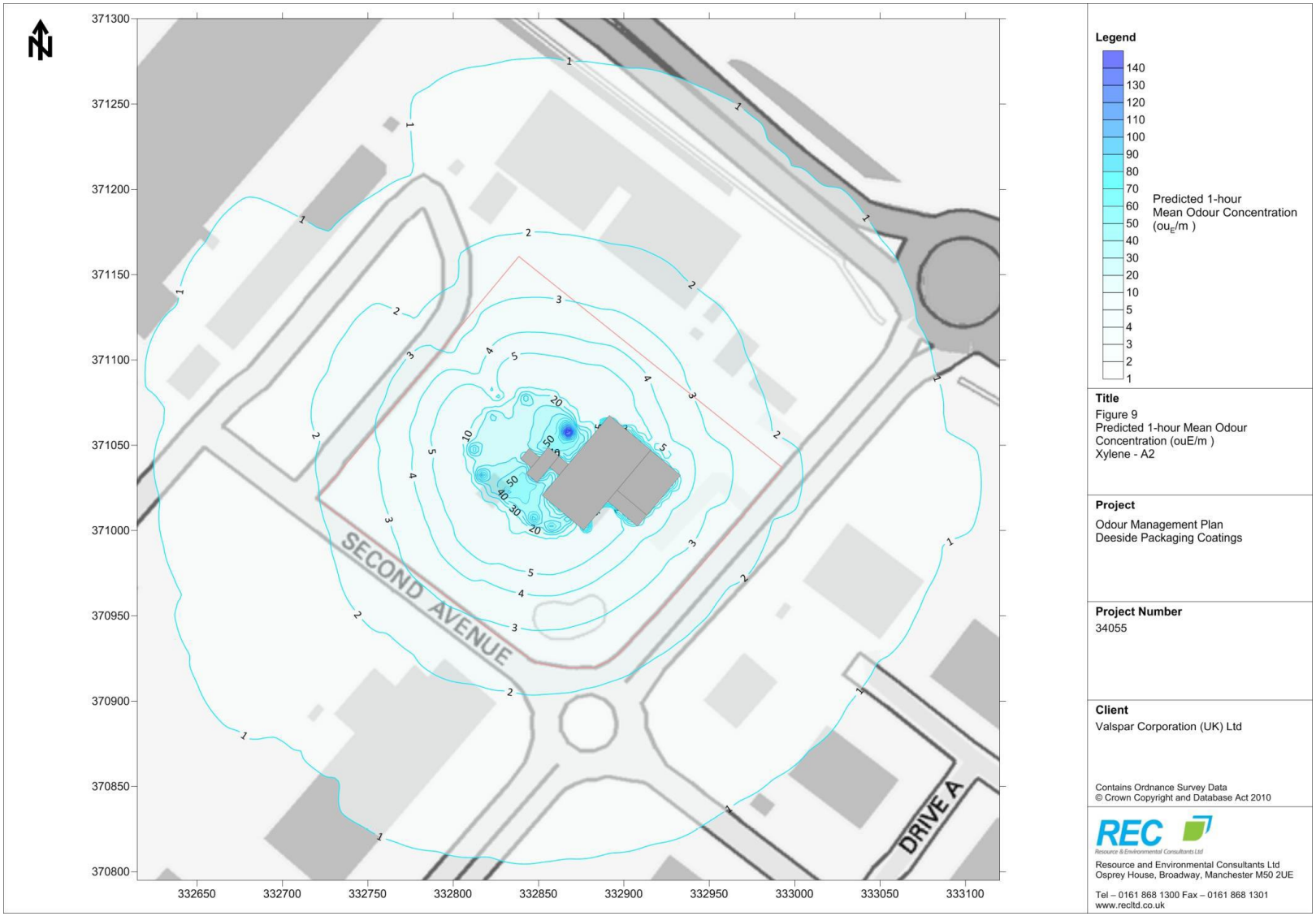
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SECOND AVENUE
DRIVE A
Legend
140
130
120
110
100
90
80
70
60
50
40
30
20
10
5
4
3
2
1
Predicted 1-hour
Mean Odour Concentration
(ou$_E$/m)
Title
Figure 9
Predicted 1-hour Mean Odour Concentration (ouE/m)
Xylene - A2
Project
Odour Management Plan
Deeside Packaging Coatings
Project Number
34055
Client
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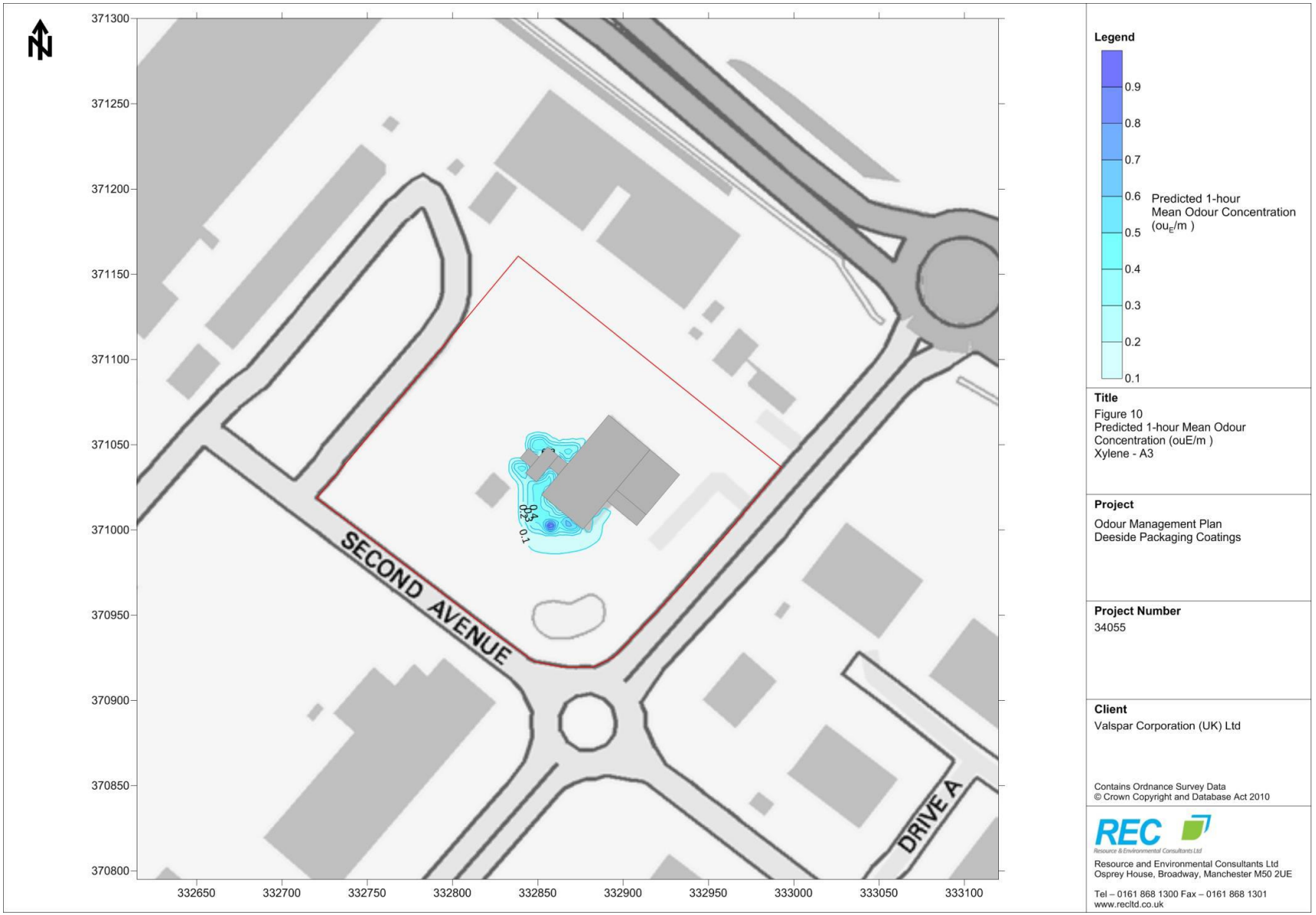
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333000
333050
333100
SECOND AVENUE
DRIVE A
0.4
0.3
0.2
0.1
Legend
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
Predicted 1-hour Mean Odour Concentration (ouE/m)
Title
Figure 10
Predicted 1-hour Mean Odour Concentration (ouE/m)
Xylene - A3
Project
Odour Management Plan
Deeside Packaging Coatings
Project Number
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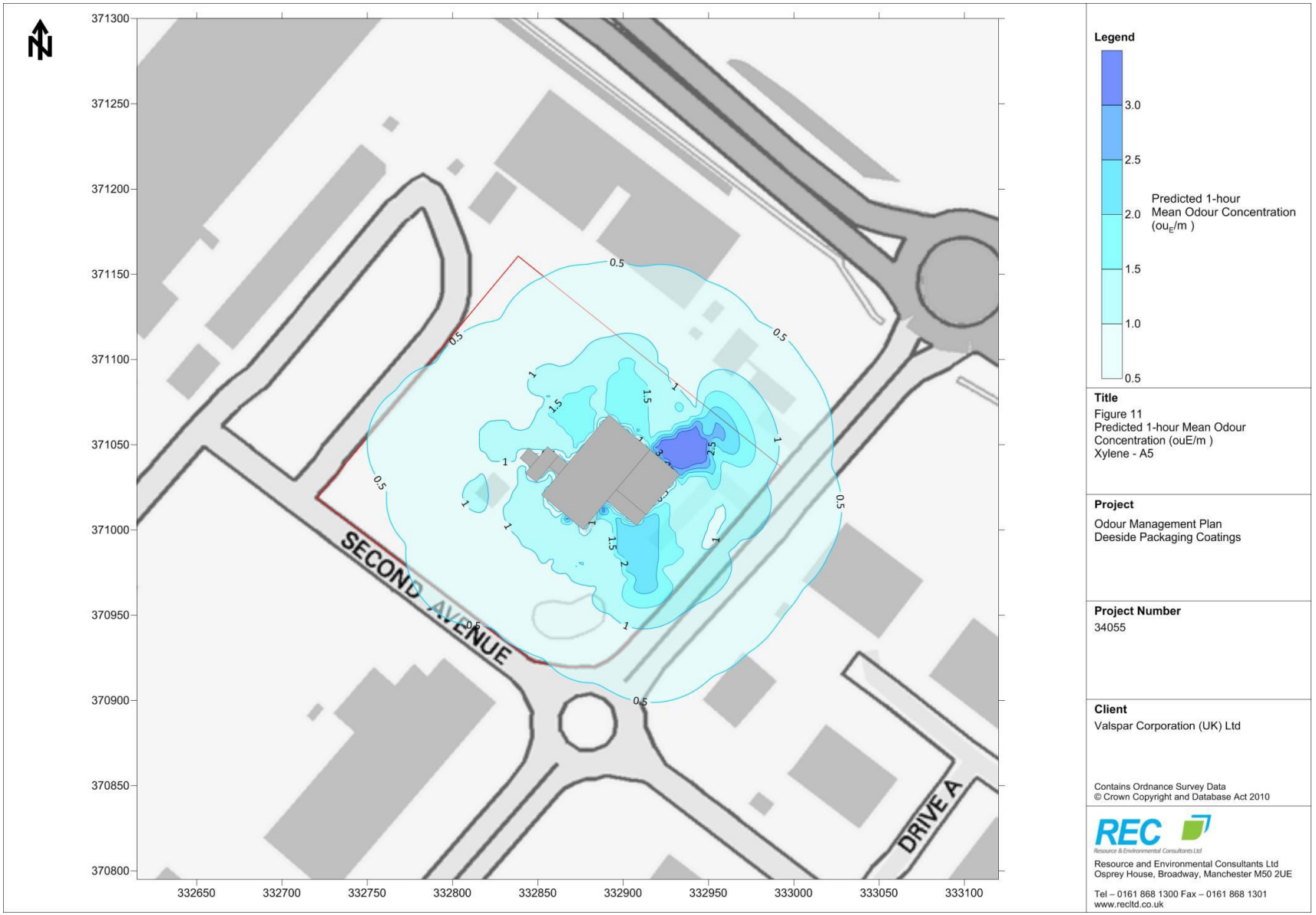
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332750
332800
332850
332900
332950
333000
333050
333100
SECOND AVENUE
DRIVE A
0.5
1
1.5
2
Legend
3.0
2.5
2.0
1.5
1.0
0.5
Predicted 1-hour Mean Odour Concentration (ou$_E$/m)
Title
Figure 11
Predicted 1-hour Mean Odour Concentration (ouE/m)
Xylene - A5
Project
Odour Management Plan
Deeside Packaging Coatings
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