Determination of an Application for a PPC Permit under the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No.1973)

Decision document recording the decision-making process

Note: all references to the "PPC Regulations" are to the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No.1973), as amended.

Administrative details

Duly made application date	06/03/06
Permit number (the "Permit")	QP3139LG
Applicant (the "Applicant")	Notedome Limited
Address/location of installation (the "Installation")	Coventry Di-isocyanate 34 & 52, Herald Way Binley Industrial Estate Coventry West Midlands CV3 2RQ
Name of Authorising Officer	R. Holland

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INTRODUCTION

Purpose of this document

The decision document explains how the applicant's application has been determined and why the specific conditions in the permit have been imposed. It is a record of the decision-making process to show how all relevant factors have been taken into account.

The permit contains many conditions taken from our standard non-landfill PPC permit template (version 3). We developed these conditions in consultation with industry having regard to the legal requirements of the PPC regulations and other relevant legislation. This decision document does not include an explanation for these standard conditions. Where they are imposed we have considered the application and accepted the details are sufficient and satisfactory to control that aspect of the operation. This decision document does however, provide an explanation for the use of alternate conditions where our permit template allows for two or more options. Emission and monitoring compliance levels and any additional conditions that have been imposed in order to take installation-specific factors into account are explained

Summary of the decision

We have decided to grant a permit for the operator, subject to the conditions in the permit. Where the permit includes standard conditions (see above), these have been considered to be appropriate for the installation, in particular in ensuring that all appropriate measures will be taken against pollution and that no significant pollution will be caused. We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that all appropriate measures will be taken against pollution and that no significant pollution will be caused.

PART A: GENERAL ISSUES

A1 Administration

This section includes administrative information relating to the application and information about the applicant and the installation.

The application was duly made on 06/03/06.

The operator has not made a claim for commercial confidentiality. We have not received any information in relation to this application that appears to be confidential in relation to any party.

The application was advertised and consulted in accordance with the regulations. Details of the advertising and consultation are on the public register. Any responses received are summarised in Annex 1. We have taken these into consideration as described in Annex 1 when determining the application.

The requirements of PPD do not apply to this application.

A2 Description of the installation

A brief description of the installation is in the introductory note to the permit.

A3 Operator competence

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the installation after the grant of the permit. We are satisfied that they will be able to operate the installation so as to comply with the conditions we have included in the permit.

A4 Requirements for SWMAs

The operator has replied to application question B7.1 stating that the installation does not contain an SWMA and we agree with this assessment.

A5 EPOPRA profile

We are satisfied that the EPOPRA profile submitted with the application remains accurate following the determination of the application.

The EPOPRA score at the time of determination is 76.

The EPOPRA score will be used as the basis for subsistence and other charging. In accordance with our EPOPRA Scheme however, the operator's EPOPRA profile for the installation may change over time.

PART B: THE INSTALLATION AND ITS MANAGEMENT

B1 General management

Permit condition 1.1

Based upon the information submitted in the application, we are not fully satisfied that appropriate management systems and management structures are in place for this installation and that sufficient financial, technical and manpower resources are available to the operator to ensure compliance with all the permit conditions.

The response to questions B2.3.1-B2.3.8 of the application pro-forma indicates that the ISO 9001 Quality Management System (QMS) is the principle mechanism for managing the installation. The following main areas of management are covered by the QMS:

- Operation and maintenance – All formulations are held within a database, with a work instruction specified for each one. The preventative maintenance schedule is also covered by the QMS.
- Staff training and competence
- Incidents and complaints

However, the EPOPRA submission indicates that, amongst other areas, the following management controls are not in place:

- Operation and maintenance
  - Preventative maintenance does not cover static items (e.g retaining walls, bunds)
  - Preventative maintenance systems do not include auditing environmental performance
- Staff training and competence
  - Training needs assessment has not been carried out and training does not include the environmental effects that may be caused by the plant under an individual operator's control
  - Potential risks from contractor activities are not assessed
- Incidents and complaints
  - Written procedures are not in place to investigate incidents and near misses

For this reason an improvement condition (IC2) has been included in the permit requiring the operator to review their management system and identify any improvements that can be made.

B2 Accidents that may cause pollution

Permit Condition 1.2

Based upon the information submitted in the application, we are satisfied that appropriate measures are in place to ensure that accidents that may cause pollution are minimised.

B3 Energy efficiency

Permit condition 1.3

Based upon the information submitted in the application, we are satisfied that appropriate measures are in place to ensure that energy is used efficiently.

The operator is required to report the following with respect to energy usage under condition 4.2.1/2 and Schedule 5:

- Gas consumption (MWh/year)
- Annual specific energy consumption (MWh energy input / tonne product)

Reporting these parameters will allow the Agency to identify any deterioration in the energy efficiency of the installation compared to the original application.

B4 Efficient use of raw materials

Permit condition 1.4

Based upon the information submitted in the application we are satisfied that the appropriate measures are in place to ensure the efficient use of raw materials and water.

The operator is required to report the following with respect to raw material usage under condition 4.2.1/2 and Schedule 5 Table S5.3 “Performance parameters”:

- Total raw material usage (tonnes/year)
- Water usage (m^3/year)

These reporting requirements have been included because it will allow the Agency to identify any significant changes in the operation of the installation compared with the original application.

B5 Avoidance, recovery and disposal of wastes produced by the activities

Permit condition 1.5

Based on the information submitted in the application we are satisfied that the appropriate measures are in place such that waste production will be avoided as far as possible, and where waste is produced it will be recovered unless technically and economically impossible. We are satisfied that the operator’s justification for their proposed waste disposal option shows that such waste that does arise from the installation that can not be recovered will be disposed of using a disposal method that avoids or reduces any impact on the environment.

B6 Site security

Permit condition 1.6

Based upon the information submitted in the application, we are satisfied that appropriate infrastructure and procedures are in place to ensure that site remains secure.

B7 Multiple operator installations

Permit condition 1.7

This is not a multi-operator installation.

B8 The permitted activities

Permit condition 2.1

We have determined that the installation comprises the following activities listed in Part 1 of Schedule 1 to the PPC Regulations and the following directly associated activities.

Listed activities

- 4.1 A(1) (d) - Any activity involving the use in any period of 12 months of one tonne or more of toluene di-isocyanate or other di-isocyanate of comparable volatility or, where partly polymerised, the use of partly polymerised di-isocyanates or prepolymers containing one tonne or more of those monomers, if the activity may result in a release into the air which contains such a di-isocyanate monomer.

The activities comprise a single installation because there is a technical connection between the activities, with surface water run-off from the installation being managed in a large bunded area and allowed to evaporate. The installation also includes the storage and handling of raw materials, including loading and unloading.

B9 The site

Permit condition 2.2

The operator has provided a plan which we consider is satisfactory, showing the site of the installation and its extent. A plan is included in the permit at Schedule 2, and the operator is required to carry on the permitted activities within the site boundary.

PART C: OPERATIONS AND RELEASES

C1 Operating techniques

Permit condition 2.3/table S1.2

We have specified that the applicant must operate his installation in accordance with the following descriptions in his application

Table 1: Specified operating techniques

Description	Parts Omitted	Justification
Sections B2.1 & B2.2 of the application, and appended Documents 002 and 003.	None	Process and abatement controls are included therein.
Section B2.10 of the application	Monitoring method for VOC (as total carbon)	Monitoring techniques are included therein. The operator uses a contractor to undertake monitoring of emissions of VOC. The method provided for this in the application was removed from the Agency guidance document M2 in May 2003.

C2 Off-site conditions

Permit condition 2.4

Based on the information submitted in the application, we consider that it is not necessary to impose any off-site conditions.

C3 Improvement conditions

Permit condition 2.5

Based in the information in the application we consider that we need to set improvement conditions. These are listed in Annex 2- justifications for these is provided at the relevant section of the decision document.

C4 Pre-operation conditions

Permit condition 2.6

Based on the information on the application, we consider that we do not need to impose any pre-operational conditions.

C5 Closure and decommissioning

Permit condition 2.7

Based upon the information submitted in the application we are not fully satisfied that the appropriate measures are in place for the closure and decommissioning of the installation.

The response to question B2.11.2 of the application pro-forma indicates that there is no site closure plan for the installation. The operator recognised this in Section B9 of the application and proposed to develop a closure plan as

part of the improvement programme. This has been captured within the permit via an improvement condition (IC3).

C6 Site protection and monitoring programme

Permit condition 2.8

C6.1 Introduction

The Applicant has provided an Application Site Report (ASR), the main elements of which are:

- A description of the environmental setting and sensitivity of the site;
- A review of the pollution history of the site, including historic land use;
- An assessment of the potential for future contamination at the site, based on potentially polluting products stored and/or used at the site, and the environmental setting of the location.

The applicant has assessed the environmental sensitivity of the site with reference to the geological, hydrogeological and hydrological setting of the site, and adjacent land uses, including the presence of ecological receptors. The applicant has reviewed the historical development of the site, including the pollution history of the site. The applicant has also assessed the potential for pollution associated with the recent land use of the site, identifying potentially polluting substances used and stored at the site, and assessing the effectiveness of the pollution prevention measures installed at the site, which are designed to minimise the potential environmental impacts of the substances.

The Agency has assessed the applicant's site report using the ASR checklist ref: (QP3139LG ASR Checklist) which accompanies this document.

C6.2 Site Location and Environmental Setting

The installation is located in Coventry's Binley Industrial Estate, and is surrounded by small and medium sized industries. The nearest residential area is located 80m to the northwest and Herald Way Marsh, a Site of Special Scientific Interest (SSSI), is located 260m to the southwest. The surrounding topography is low lying, with drainage to the northwest.

The site is located on made ground, principally derived from mining spoil. Underlying the made ground are intermittent drift deposits, the Baginton Sand and Gravel, which represent a minor aquifer with intermediate permeability. The drift geology is underlain by the solid geology of the Mercia Mudstone Group, a non-aquifer. The Envirocheck report indicates that there are no abstractions or source protection zones within 500m.

The application indicates that the site was involved with a substantiated pollution incident in August 2001, when there was a fire at the installation. The Agency investigation indicated that fire water and chemicals entered the storm water drains outside the installation and entered the Herald Way Marsh SSSI,

where the storm drains are discharged. However, the discharge of fire water took place under controlled conditions following Agency testing to ensure there would be no impact on the SSSI.

The operator has since made improvements to surface water management to reduce the risk of impact on the environment due to fire. This includes ceasing the (non PPC) activity using organic solvents involved in the fire and the following features associated with making the site operational again:

- A sprinkler system has been installed.
- Access to the drainage system for surface water run-off has been sealed off. Instead, surface water flows downslope in a northwesterly direction and is captured by a site bund installed for this purpose and to capture fire water. Routine surface water run-off is allowed to evaporate, so there is no discharge.
- Unit 52 (main production building) and Unit 32 (materials store) have been bunded.

The only remaining connection to the pre-existing drainage system is believed to be the run-off from the roofs.

As part of the re-establishment of the site, the one metre strips of soil that border Unit 34 & 52 were removed to a depth of one metre and replaced with fresh material. Prior to refilling the areas soil samples at five different locations were taken and analysed. The results indicate that for the suite of substances analysed, most were below the detection limit, and any other values above the detection limit are still low. The ASR concludes that it is unlikely that significant contamination of the underlying soils or groundwater is present due to the fire.

C6.3 Assessment of Pollution Prevention Measures

C6.3.1 Potentially Polluting Substances

The main potentially polluting substances identified in the ASR for the site are as follows:

<u>Isocyanates and products stored in the bunded Unit 34</u>

- 2,4 & 2,6-toluene di-isocyanate (TDI) - Very Toxic
- Dipenylmethan-4,4'-di-isocyanate (MDI) - Very Toxic
- Polyurethane pre polymers (product) - Non Harmful, Harmful and Toxic

<u>Materials stored in the bunded Unit 52</u>

- Polyester polyols - Not Harmful
- Polytetramethylene ether glycol (PTMEG) - Not Harmful

- Methylene bis orthochloroanaline (MOCA) - Toxic
- Phthalate plasticizers - Toxic, Marine Pollutant
- Mercuric phenyl ester - Toxic, Harmful to the Environment
- Polyurethane bonding agent

C6.3.2 Areas Assessed as 'Reasonable Possibility'

The ASR has considered pollution potential across the installation. No areas were assessed as presenting a reasonable possibility of pollution in Table D2 of the ASR. The Agency agrees with this assessment.

C6.3.3 Areas not assessed by Applicant

The Agency has not identified any areas not assessed by the applicant.

C6.4 Permit Conditions Relating to the ASR

To ensure the continued effectiveness of pollution prevention measures to protect the land we are requiring the operator to implement and operate a Site Protection and Monitoring Programme, the design of which must be reported to the Agency within two months from the date of permit issue.

In particular, the SPMP should address the following:

1. Inspection, maintenance and repair of seals to prevent access of surface water run-off to the pre-existing drainage system that underlies the site.

Given that the Agency accepts the operator's assessment of 'little likelihood of pollution' it is not considered necessary to collect reference data.

C7 Emissions to water, air or land

Permit condition 3.1

C7.1 Techniques

The operator is a manufacturer of cast polyurethane prepolymers and systems. The main process is a poly-isocyanate reaction, involving the reaction of stoichiometric excess of a di-isocyanate with a diol or triol resulting in a prepolymer with terminal NCO groups.

The following two appendices to the application describe the techniques used and make a comparison with indicative BAT:

- Document 002 – chemistry and formulations associated with producing isocyanate based prepolymers and polyol and polyol/amine blended curatives
- Document 003 – details of plant design.

We have reviewed the techniques used by the operator and compared these with the relevant guidance note[1] in the table below. It should be noted that the chemical activity does not include the following techniques:

- Bulk storage
- Plant systems - pumps, blowers
- Separation
- Purification

Table 2: Review of techniques used compared with guidance

Techniques identified in guidance		Techniques used by operator
2.4.1 Selection of raw materials		The main isocyanate types used are 2,4/2,6 Toluene di-isocyanate (TDI) and Diphenylmethan-4,4-di-isocyanate (MDI). Smaller quantities of aliphatic isocyanates are also used. The main polyol types used are polytetrametylene ether glycol (PTMEG), polpropylene glycol (PPG) polyadipate esters and polycaprolactone esters. Key points from Document 003: ▪ Raw materials selected on basis of customer preference or ability to process different types of materials. ▪ Where the consequences of raw materials deviating from the Certificate of Analysis are potential releases to the environment, or off-specification product, additional in-house analysis is employed particularly in respect to moisture content and OH value.
2.1.1 Storage and handling of raw materials, products and wastes	Goods receiving and handling	Key points from Document 003: ▪ Most raw materials are solid when delivered, in 200 and 1000 litre containers, and so the potential for unplanned emissions is low. Where possible raw material delivery trucks are unloaded in the bunded area to the rear of the factory building. ▪ Spill kits are held on-site to contain smaller spillages. ▪ Raw materials are loaded into one of four gas-fired ovens to be melted down. There are separate ovens for isocyanates and polyols. The ovens are fitted with catch trays to retain any losses of the melted raw materials. Separate, clearly marked ovens are used for the different raw material types so that optimum melt conditions are employed. This reduces the likelihood of overheating the materials are minimises emissions to air. The ovens are fitted with a second thermostat to prevent overheating, should the first thermostat fail; this minimises unnecessary emissions to air.

[1] IPPC Sector Guidance Note IPPC S4.02 for Speciality Organic Chemicals

Techniques identified in guidance		Techniques used by operator
2.1.1 Storage and handling of raw materials, products and wastes	Loading of reactors / blending vessels	Key points from Document 002: ▪ Products are all isocyanate 'rich', i.e. stoichiometric excess. Isocyanates are loaded into the reactor first so addition of polyols does not result in a point of stoichiometry, which would result in gel formation. Key points from Document 003: ▪ Raw materials are loaded into the vessels at one of the three loading stations, with a forth being introduced to serve the eighth reactor. Each station can hold four drums. The dip pipes are raised and lowered using an electric motor, removing the need for physical contact. The dip pipe is lowered into the drum. A vacuum is applied to the vessel to be loaded and the material is drawn through a steel reinforced chemical suction hose. The isocyanates and polyols are loaded using separate feed lines. ▪ Each station can serve more than one reactor. To prevent the loading of material into the incorrect reactor the vacuum supply to the reactor vessels is mutually exclusive. Vacuum loading prevents spillage via outlet valve as the vacuum cannot be maintained if this is left open. LEV extraction is applied to minimise fugitive emissions. ▪ Product unloading is similar to the loading method described above. ▪ Off specification product may either be sold under concession or reworked. Where this is not possible it is disposed of via a licensed contractor, and such circumstances are investigated to identify any corrective actions. Residue in reactor vessels is minimised by draining overnight and having the discharge point to the drum lower than the discharge point from the reactor vessel to maximise yield and drainage. Residues of isocyanates in empty drums are neutralised by washing with a water / ammonia / soap mixture. The wash water is sent for disposal via an appropriate contractor. Following decontamination, empty drums are crushed and recycled. The drums are kept in skip located in a 150mm deep pit, to collect any spillages that might occur. Containers that cannot be decontaminated are disposed of via a licensed contractor. Solvent used for cleaning reactors (N-methylpyrrolidone) is re-used until saturated and then sent for recovery.
2.1.2 Plant systems and equipment	2.1.2.1 Ventilation systems (LEV)	Key points from Document 003: ▪ The LEV system vents via a 15m stack. ▪ The system is designed and certified against LEV requirements. Upgrades to the system were planned for 2006 to improve efficiency in some areas following issues identified during LEV testing.

Techniques identified in guidance		Techniques used by operator
2.1.2 Plant systems and equipment	2.1.2.2 Over-pressure protection systems	Key points from Document 003: ▪ The process is carried out at atmospheric pressure and no pressure is generated as a consequence of the reaction. ▪ Low pressure is used to assist unloading (< 1 bar). Each reactor vessel has an independent pressure regulator and pressure relief valve. ▪ The only scenario that could generate pressure is if large amounts of water enter the vessel during reaction. To prevent this checks are carried out to determine the water content of raw materials. The compressed air system is also fitted with a two stage filtration system to prevent condensate entering the vessel, and control procedures are in place to check the status of filters and the condensate reservoir. If water were to enter the reaction vessel it would result in the generation of a gel or foam (depending on the quantity of water). Any product that could be released would by contained by bunding and gel to form an inert solid.
2.1.2 Plant systems and equipment	2.1.2.3 Vacuum systems / pumps	Key points from Document 003: ▪ The vacuum loading and unloading system described above currently uses three pumps and a fourth will be added when the eighth reactor is installed. ▪ Each unit is fitted with two in-line catchpots filled with fibrous filter material. Any vapours condense on this material prior to entering the pumps.
2.1.2 Plant systems and equipment	2.1.2.5 Gas fans, blowers and compressors	Key points from Document 003: ▪ There is one gas burner for each of the four ovens used to melt the raw materials. The burners are maintained twice a year to ensure efficiency, minimise emissions and reliability. ▪ The compressor feeds an internal reservoir, which is inspected annually and regularly emptied in-line as part of the maintenance programme. In-line filters, pressure reducers and pressure relief valves ensure that plant is supplied with the correct pressure.
2.1.2 Plant systems and equipment	2.1.2.6 Agitator systems	Key points from Document 003: ▪ Each reaction vessel is fitted with an agitator driven by an electric motor. The agitators are top mounted and fitted with seals where they enter the vessels. This arrangement means that the product is not in direct contact with the seal. ▪ Any wear on the seal, and so potential for fugitive emissions, would be identified by a reduction in the efficiency of vacuum loading.
2.1.2 Plant systems and equipment	2.1.2.7 Valves	Key points from Document 003: ▪ All valves used are 90° ball valves. They are either manually operated or by solenoid / pneumatic means. The default position is closed, so on loss of power or air they close automatically. ▪ All valves that could potentially result in emissions should they fail are backed up by a second (and some cases a third) in-series valve.

Techniques identified in guidance		Techniques used by operator
2.1.2 Plant systems and equipment	2.1.2.8 Heat exchangers and cooling systems	Key points from Document 003: ▪ The reactors use an indirect closed loop cooling system, with water pumped around water jackets and cooling achieved via a heat exchanger. ▪ Consideration is given above to water entering a reaction vessel. Likewise, if material enters the cooling system it would expand to form a foam or gel and would effectively be self sealing. ▪ Techniques to minimise the possibility of water from the cooling system entering the vessel include consideration of plant design during purchasing and selection of only spiral cooling systems; no internal cooling coils are used; vessels are made from stainless steel, and the reactor walls are 10mm thick.
2.1.2 Plant systems and equipment	2.1.2.9 Purging facilities	Key points from Document 003: ▪ A comment vent valve is used to release the vacuum or residual pressure after unloading. Emissions from these valves are fed directly to the LEV and so the stack.
2.1.3 Reaction stage 2.1.3.1 Process design and plant selection for the Reaction stage	Physical chemistry of the desired reaction and potential side-reactions	Key points from Document 002: ▪ The poly-isocyanate reactions, involving the reaction of stoichiometric excess of a di-isocyanate with a diol or triol resulting in a prepolymer with terminal NCO groups. ▪ The reactions are exothermic. Temperature control techniques are used to maintain the quality of the product and are not required to prevent a runaway reaction. The two methods used to control temperature are staged addition of polyol and indirect cooling (described above). Reaction temperature is also measured. ▪ Minimising and controlling the water content of raw materials is fundamental to ensuring that an undesired side reaction does not take place, changing the batch into a gel or foam. This has been discussed previously in this table above under raw materials. It is also clear from Document 002 that the reactions undertaken are relatively simple and do not require the use of catalysts or organic solvents. The Agency considers that the operator understands the physical chemistry of the desired reactions and the potential side-reactions.

Techniques identified in guidance		Techniques used by operator
2.1.3 Reaction stage 2.1.3.1 Process design and plant selection for the Reaction stage	Reactor system	Key points from Document 003: ▪ All products are made by batch process and there is no continuous production. The application justifies this on the basis that the number of products (c. 150) does not make this feasible. ▪ Raw materials, many of them solid at room temperature, are heated/melted in gas ovens overnight at 40-110°C and then loaded according to documented procedures into one of five isocyanate reactors. An additional reactor is to be installed for isocyanates based products. Loading is achieved using one of three (with a fourth for the new reactor) purpose built loading mechanisms that lower suction-dip pipes into the drums, that are first placed on weighing scales. The reactors are all stainless steel, pressure / vacuum rated and have stirrers controlled by inverters. Reactor volumes are: 1. 5,250 litres – aromatic isocyanates 2. 1,100 litres – aromatic isocyanates 3. 3,500 litres – aromatic isocyanates 4. 2,000 litres – aromatic isocyanates 5. 800 litres – aliphatic isocyanates 6. 5,250 litres – aromatic isocyanates (to be installed) Externally, the reactors have coil or limpet jackets for temperature control. Once the reaction is compete the material is unloaded into 25kg or 200-225kg steel drums via a secondary arm on the loading mechanism The application has not discussed the potential for using alternative or novel reaction techniques. This approach is considered proportionate for this installation given the relative simplicity of the reactions undertaken.
2.1.3 Reaction stage 2.1.3.1 Process design and plant selection for the Reaction stage	Raw material efficiencies, waste generation and minimisation of releases.	Key points from Document 002: ▪ The reaction creates no pressure, no by-products and no downstream separation or secondary processes are involved. The yield is 100%. ▪ The reaction produces no process effluent. Key points from Document 003: ▪ Releases to air only arise at then end of the batch, when the valves and opened for unloading. The air is extracted to the LEV system and primarily consists of CO_2 with traces of the raw materials. The Agency considers that the operator has maximised raw material efficiencies and minimised releases.

Techniques identified in guidance		Techniques used by operator
2.1.3 Reaction stage 2.1.3.1 Process design and plant selection for the Reaction stage	Maximise process yields and minimise losses / emissions by optimised process control and management procedures	Document 002 appended to the application describes in detail the quality management database used by the operator, which is the primary management control used. Key points include: ▪ All formulations are held within the database. When a product is to be manufactured, the operator is required to enter certain minimum requirements: a unique batch number, the reactor to be used and the weight of product to be used. The operator can then print off a production sheet. ▪ The maximum capacity for each reactor is also stored within the database and will not allow a production sheet to be printed if the planned production volume exceeds the capacity of the reactor. ▪ All calculations are carried out by the database to minimise human error.
2.1.6 Design of a new product		There are c. 150 formulations undertaken by the operator. The response to question B2.1.2 in the application pro-forma states that a multi product protocol (MPP) is not required. The Agency considers this appropriate given that additional raw materials are infrequently introduced to the process.
2.2.1 Point source releases to air		There are five point source releases to air, being the LEV system (A1) and the exhaust gases from the four ovens burning natural gas (A2-A5). These are described in more detail in Section C7.2.
2.2.2 Point source releases to water / sewer		There are no process discharges to controlled water or sewer from the installation. Surface water run-off from yard areas is captured in a large bund and allowed to evaporate, and so is not associated with a release to controlled water. This system was instigated after a fire in 2001 (see Document 009, appended to the application) that resulted in fire-water entering a SSSI. Bunding was extended to include most of the site boundaries as well as the production facility. The process that caused the fire, involving organic solvents, is no longer undertaken at the installation. Roof water run-off is discharged at eight points, into a drainage system underlying that site that pre-dates reconstruction following the fire in August 2001. The operator does not know the fate of water discharge into this system. For this reason an improvement condition (IC1) has been included in the permit requiring the operator to investigate the fate of these discharges and identify any emission points.

To summarise, the key techniques used to minimise emissions are:

- Process chemistry
- Raw material quality
- Quality management database

C7.2 Emissions to air

C7.2.1 Summary of emissions to air

There are five release points to air (A1-A5), which are summarised in Table 3, where we have reviewed emissions as follows:

- Substances
- Operator's estimated and measured releases
- Indicative benchmark values
- Existing IPC emission limit values (ELVs)

Table 3: Review of emissions to air via release points A1-A5

Release Point	Substance(s)	Emissions	Indicative Benchmark	IPC ELV
A1 – LEV	Isocyanates (as total NCO groups, Class A VOC)	Avg: 0.002 mg/m^3 Max: 0.003 mg/m^3 Hourly mass release: 15.8 mg (@ 2.2 m^3/s) Batch mass release[a]: 4 mg	0.1 mg/m^3 [e] 100 g/h	0.1 mg/m^3
	VOC (as total carbon)	Avg: <1.0 mg/m^3 Max: 4.6 mg/m^3 Hourly mass release: <7.9 mg (@ 2.2 m^3/s) Batch mass release[a]: <2 mg	75 mg/m^3 [f] Class B VOC	None
A2 – Exhaust from oven A2 used to melt raw materials (not used for isocyanates)	VOC (as total carbon)	Avg: 7.4 mg/m^3 Max: 16 mg/m^3 Hourly mass release: <2.93 g (@ 0.11 m^3/s) Batch mass release[a]: 0.73 g	75 mg/m^3 [f] Class B VOC	None
	Natural gas combustion products	Not measured	None < 5 MW[d]	None
A3 - Exhaust from oven A3 used to melt raw materials (not used for isocyanates)	VOC (as total carbon)	Avg: 2.6 mg/m^3 Max: 8.2 mg/m^3 Hourly mass release: 2.62 mg (@ 0.28 m^3/s) Batch mass release[a]: 0.66 g	75 mg/m^3 [f] Class B VOC	None
	Natural gas combustion products	Not measured	None < 5 MW[d]	None
A4 - Exhaust from oven A4 used to melt raw materials (not used for isocyanates)	VOC (as total carbon)	Avg: 2.09 mg/m^3 Max: 4.2 mg/m^3 Hourly mass release: 0.74 g (@ 0.098 m^3/s) Batch mass release[a]: 0.18 g	75 mg/m^3 [f] Class B VOC	None

Release Point	Substance(s)	Emissions	Indicative Benchmark	IPC ELV
	Natural gas combustion products	Not measured	None < 5 MW[d]	None
A5 - Exhaust from oven A5 used to melt raw materials (including isocyanates)	Isocyanates (as total NCO groups, Class A VOC)	Avg: 0.002[b] mg/m^3 Max: 0.003[b] mg/m^3 Hourly mass release[b]: 2.1 g Batch mass release[a]: 0.52 mg	0.1 mg/m^3 [e] 100 g/h	0.1 mg/m^3
	VOC (as total carbon)	Avg: 4.03[c] mg/m^3 Max: 16[c] mg/m^3 Hourly mass release[c]: 2.1 g Batch mass release[a]: 0.52 mg	75 mg/m^3 [f] Class B VOC	None
	Natural gas combustion products	Not measured	None < 5 MW[d]	None

Note a Assuming 4 batches per day

Note b Actual values obtained when isocyanates was melted in Oven A2

Note c New oven fitted in 2005. Supplier and construction as per other ovens, so average data calculated using the other ovens as reference.

Note d Total thermal input capacity at the installation is < 5MW, and is therefore below the level of regulatory significance.

Note e Process Guidance Note 6/29 (04) Secretary of State's Guidance for Di-isocyanate Processes

Note f Sector Guidance Note IPPC S4.02 Guidance for the Speciality Organic Chemicals Sector

C7.2.2 Environmental impact from emissions to air

We have also reviewed the operator's assessment of the environmental impact of emissions to air from the installation. The operator did not use the H1 methodology and justified this on the basis that emissions to air are very low and below benchmarks.

Using the information provide in the application it was possible to test the validity of this statement by entering the data into the H1 software tool. The exercise confirmed the operators assessment that emissions are insignificant. It should be noted that because the gas burners have an aggregated thermal input capacity of < 5 MW they are considered below the level typically of regulatory concern. The results are presented in the table below.

Table 4: Impact of emissions to air via release points A1-A5

Substance	Long Term				Short Term			
	EAL µg/m³	PC µg/m³	PC as % EAL	PC > 1% EAL?	EAL µg/m³	PC µg/m³	PC as % EAL	PC > 10% EAL?
Isocyanates (as total NCO groups)	0.201	0.000652	0.326%	No	7.00	0.0258	0.368%	No
VOC (as total carbon)	1,910[a]	0.671	0.0352%	No	8,000	66.0	0.825%	No

Note a EAL for toluene used as a proxy for VOC

The assessment above is based on actual emissions rather than the proposed ELVs. However, given the very low level of significance it is considered unlikely that emissions at the ELV would be much greater.

We accept the operator's proposals for BAT relating to the environmentally insignificant emissions.

C7.2.3 ELVs

The emission concentrations and mass release rates are below the relevant benchmarks and the impact has been assessed as insignificant. It is therefore considered appropriate to transpose the existing IPC ELVs for isocyanate into the PPC permit, as it is the use of this substance that makes the process a listed activity. ELVs and monitoring for VOCs have not been requested.

C7.2.3 Improvement conditions associated with emissions to air

No improvement conditions have been identified.

C7.3 Emissions to water

C7.3.1 Summary of emissions to water

As identified in Table 2 there are no process emissions to controlled water.

Surface water run-off from yard areas is captured in a large bund and allowed to evaporate, and so is not associated with a release to controlled water. This system was instigated after a fire in 2001 (see Document 009, appended to the application) that resulted in fire-water entering a SSSI. Bunding was extended to include most of the site boundaries as well as the production facility. The process that caused the fire, involving organic solvents, is no longer undertaken at the installation.

Roof water run-off is discharged at eight points, into a drainage system underlying the site that pre-dates reconstruction following the fire in August 2001. The operator does not know the fate of water discharge into this system. Whilst the Agency considers the risk to the environment as a result of this missing information to be minimal an improvement condition (IC1) has

been included in the permit requiring the operator to investigate the fate of these discharges and identify any emission points.

No ELVs are proposed for releases to water.

C7.4 Emissions to sewer

There no emissions to sewer.

C7.5 Emissions to land

There are no discharges to land (e.g. soakaway) described in the application.

C8 Fugitive emissions of substances

Permit condition 3.3

Based upon the information we are satisfied that the appropriate measures are in place to prevent fugitive emissions.

C9 Conditions relating to odour

Permit condition 3.4

Based upon the information in the application we are satisfied that the appropriate measures are in place to prevent annoyance from odour.

C10 Noise and vibration

Permit condition 3.5

Based upon the information in the application we are satisfied that the appropriate measures are in place to prevent annoyance from odour.

C11 Monitoring

Permit condition 3.6

We have decided that monitoring should be carried out for the parameters listed in tables S4.1-S4.3 in schedule 4 using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to control emissions to air.

The operator uses an appropriate contractor to undertake annual monitoring of emissions to air and the application indicates that they are accredited to MCERTS.

Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

C13 Reporting

We have required reporting as specified in Schedule 5, as outlined below, included in the permit for the following reasons:

- To demonstrate compliance with ELVs and other permit conditions

- To confirm that the performance of the plant has not deteriorated compared with that described in the application.

The operator is therefore required to report the information listed below.

- Reporting Form Air 1
  A1 - Isocyanates (as total NCO groups)
  A5 - Isocyanates (as total NCO groups)

- Reporting Form Water Usage 1
  Mains water consumption - m^3/year
  Specific water consumption per tonne of product - m^3/unit output

- Reporting Form Energy 1
  Electricity usage - MWh/year
  Natural gas usage - tonnes/year
  Specific energy consumption per tonne of product – MWh/unit output

- Reporting Form Performance 1
  Total raw materials used – tonnes/year
  Di-isocyanate released to air per tonne product - Di-isocyanate kg/t

C14 Miscellaneous

No issues identified.

PART D: OTHER LEGAL REQUIREMENTS

Industry Specific

D1 Relevant Secretary of State Directions

There are no Secretary of State Directions made under the Pollution Prevention and Control (England and Wales) Regulations 2000, as amended, which are relevant to the determination of this Application.

D2 Regulation 12A – implementation of the Solvent Emissions Directive (SED) (1999/13/EC)

The Installation does not include any activity listed in Annex I of the Directive or activity which, whilst listed in Annex I, is above the relevant threshold in Annex IIA, so no provisions of the SED apply.

Air

D3 Environment Act 1995 – Section 81 (National Air Quality Strategy)

In determining the conditions for this Permit, the Agency has had regard to the National Air Quality Strategy. The Agency considers that it has taken its decision in compliance with the NAQS, and that there are no additional conditions that should be included in this Permit.

Water

D4 Groundwater Regulations 1998

The installation does not permit the direct discharge of List 1 substances to groundwater.

The operation of the installation will not cause the disposal of a List 1 or List II substance or other activity that might lead to an indirect discharge of such a substance.

D5 Water Framework Directive Regulations 2003

Consideration has been to whether any additional requirements should be imposed in terms of the Agency's duty under regulation 3 to secure the objectives of the Water Framework Directive through *(inter alia)* PPC permits, but it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

Waste

D6 Waste Management Licensing Regulations (WMLR 1994) - (pursuit of the relevant objectives where there is the disposal or recovery of waste)

The installation includes no activities for the disposal or recovery of waste.

D7 Waste Oils Directive

The installation does not contain waste disposal or recovery activities involving waste oils to which the Directive applies.

D8 Hazardous Waste Directive

The installation does not contain hazardous waste disposal or recovery activities to which the Directive applies.

Conservation

D9 The Conservation (Natural Habitats etc) Regulations 1994

The proposed installation would not be likely to have “a significant effect on a European site” as there are no such sites within 10km of the installation.

D10 Countryside and Rights of Way Act 2000 (CROW 2000)

There is no AONB which could be affected by the Installation.

D11 Section 28G Wildlife and Countryside Act 1981 (WCA 1981) duty concerning SSSIs

Consideration has been given as to whether any additional requirements should be imposed in terms of the Agency's duty under Section 28G WCA 1981 (as amended by Schedule 9 of CROW 2000) to take reasonable steps to further the conservation and enhancement of the SSSI but it is felt that existing requirements are sufficient in this regard and no other appropriate requirements have been identified.

The following SSSIs are located within 2km of the installation:

- Herald Way Marsh (0.3 km) - wetland communities
- Ryton & Brandon Gravel Pits (1.1 km) - geological not ecological designation
- Brandon Marsh (1.3 km) - open water and surrounding fen
- Combe Pool (1.5 km) - landscape designed by Capability Brown

Based on the impact assessment discussed in Section C7 of this document a CROW Appendix 4 pro-forma was produced. In summary, emissions to air are considered insignificant and there are no process emissions to controlled waters.

D12 Section 28 I WCA 1981 duty to consult English Nature/CCW

The advice received from EN, following its consultation as required under s28 I WCA 1981 (as amended by Schedule 9 CROW 2000), has been taken into account when deciding to grant the Permit, and in determining its conditions. It is felt that existing requirements are sufficient in this regard and no other appropriate requirements have been identified.

D13 Environment Act 1995 – Section 7 (Pursuit of Conservation Objectives)

Consideration has been given to whether any additional requirements should be imposed in terms of the Agency's duty to have regard to the various conservation objectives set out in s 7 EA 1995, but it is felt that existing requirements are sufficient in this regard and no other appropriate requirements have been identified.

General

D14 Environment Act 1995 – Section 4 (Pursuit of Sustainable Development)

By Section 4 of the EA 1995, the Agency has a duty to contribute towards achieving sustainable development as considered appropriate by Ministers and set out in guidance issued to it. The relevant statutory guidance issued to the Agency by the Secretary of State for Environment, Food and Rural Affairs is *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. It is noted that this document:

> "*provides guidance to the Agency on such matters as the formulation of approaches that the Agency should take to its work, decisions about priorities for the Agency and the allocation of resources. It is not directly applicable to individual regulatory decisions of the Agency*".

In respect of regulation of industrial pollution through the PPC Regulations, the Guidance refers in particular to the objective of setting permit conditions "*in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters…*". The Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 EA 1995 duty.

D15 PPC Regulations - Schedule 4, Part 2. para. 13 (EIA Directive information)

No information concerning any Environmental Impact Assessment for the installation was supplied by the Applicant in response to Question B5.1 in the PPC Application Form.

D16 Human Rights Act 1998 (HRA 1998)

The Agency has considered potential interference with Convention rights in reaching its decision and considers that its decision is compatible with its duties under the Human Rights Act 1998. The Agency does not accept that Convention rights are engaged in the present case.

ANNEX 1: CONSULTEE AND PUBLIC RESPONSES

Advertising and statutory consultation

Summary of responses to advertising and statutory consultation and the way in which we have taken these into account in the determination process:

Table 5: Inclusion of consultee responses in determination process

Brief summary of issues raised	Response received from	Summary of actions taken or show how this has been covered
The standard pro-forma for local authority consultee responses did not identify any complaints or issues in relation to noise, odour or nuisance.	Coventry City Council	No action required.
Recommends that an assessment tool, such as the Regulator's air dispersion screening tool (H1), should be used to identify any potentially "significant" emissions to air in the context of local air quality	Coventry Primary Care Trust	Section C7 of this document considers emissions from the installation using the H1 methodology. The results indicate that emissions to air are insignificant. The installation activities do not generate process effluent. No additional permit conditions are considered necessary with respect to these emissions.
Recommends that due to the close proximity of local housing, the Regulator confirm that no recent substantiated nuisance complaints about dust, odour or noise have been received about this installation.		No action required - see consultee response from Coventry City Council.
"Based on the information made available and provided that the Operator complies with the relevant parts of Technical Guidance Note IPPC S4.02 (Speciality Organic Chemicals), it is unlikely that there will be any unacceptable effects on the safety of the human food chain."	Food Standards Agency	No action required

ANNEX 2: IMPROVEMENT CONDITIONS

Table 6: Improvement conditions

Ref no	Condition	Date	Reason
IC1	The Operator shall investigate the fate of roof-water run-off entering the drainage system and this shall include, but not be limited to, consideration of: ▪ condition of the pre-existing drainage system underlying the installation ▪ connections to storm drains or foul sewer ▪ discharge to surface water features such as ditches, canals, streams or rivers ▪ identification of sensitive receptors in hydraulic continuity The results of the investigation shall be submitted to the Agency in writing and shall include details of any assumptions made and uncertainties in the data used.	01/03/07	Roof water run-off is discharged at eight points, into a drainage system underlying that site that pre-dates reconstruction following the fire in August 2001. The operator does not know the fate of water discharge into this system. It is important to not that the Agency considers the risk to the environment as a result of this missing information to be minimal.
IC2	A written report shall be submitted to the Agency for approval detailing the results of a review of the documented system of environmental management techniques, having regard to the Agency Guidance Note IPPC S4.02, Section 2.3. The review shall identify any improvements and missing management techniques along with a timetable for implementation. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report. The findings of the review shall be implemented by the operator from the date of approval in writing by the Agency.	01/09/07	The EPOPRA submission indicates that, amongst other issues, the following management controls are not in place: ▪ Operation and maintenance - Preventative maintenance does not cover static items (e.g retaining walls, bunds) ▪ Staff training and competence - Training needs assessment has not been carried out and training does not include the environmental effects that may be caused by the plant under an individual operator's control Potential risks from contractor activities are not assessed ▪ Incidents and complaints - Written procedures are not in place to investigate incidents and near misses
IC3	The Operator shall develop a written Site Closure Plan having regard to the requirements set out in Section 2.11 of the Agency Guidance Note IPPC S4.02. A written summary of the plan shall be submitted to the Agency for approval.	01/01/08	The response to question B2.11.2 of the application pro-forma indicates that there is no site closure plan for the installation. The operator recognised this in Section B9 of the application and proposed to develop a closure plan as part of the improvement programme.