



**ENVIRONMENT
AGENCY**

Permit with introductory note

Pollution Prevention and Control (England & Wales) Regulations 2000

Sully Polymerisation Plant

**Zeon Chemicals Europe Ltd.
Sully Moors road
Sully
Vale of Glamorgan
CF64 5ZE**

**Permit number
UP3836SS**

Sully Polymerisation Plant Permit Number UP3833SS

Introductory note

This introductory note does not form a part of the permit

The main features of the installation are as follows.

The installation is operated by Zeon Chemicals Europe Ltd a subsidiary of the Zeon Corporation, which is based in Japan.

It is located on the Sulley Moors road approximately 3km east of the town of Barry. It forms part of a large industrial complex and a number of other chemical producers are situated in the vicinity.

To the north the site is bordered by the River Cadoxton and a silicone manufacturing plant operated by Dow Corning.

To the northeast is a phenolic resin manufacturing plant operated by Hexion Chemicals and beyond this is a polyvinylchloride manufacturing plant operated by INEOS Vinyl Ltd. and the Sulley brook, which is approximately 200 m from the installation. To the east is a phenolic resin manufacturing plant operated by Hexion Chemicals. and to the south is a polystyrene manufacturing plant operated by Dow Chemicals and a bulk chemical storage facility operated by Vopak. To the west is warehousing and the river Cadoxton.

The installation produces approximately 15000 tonnes per year of butyl rubber and produces three main products butyl rubber in bale form, latex in liquid form and polyblack (butyl rubber with carbon black).

The main monomer raw ingredients acrylonitrile and butadiene are delivered by road tanker and stored in bulk storage tanks, the vented gases on discharge are either recycled back to the storage tanks or abated through wet scrubbers.

The monomers are delivered to one of eight reactors together with a soap solution and small quantities of ionic salts. Polymerisation is then either carried out at 30 to 50 °C or 9 to 12 °C depending on the polymer specification.

The reactions give out heat and are held in the reactors until conversion of between 80 and 95% of the monomer is achieved, depending on the grade of product required. The reactors are cooled by a refrigeration plant in which a methanol and water mixture or water is cooled by evaporation of ammonia and circulated to each reactor's cooling coils.

The reaction is stopped by dropping the charge onto a short stop additive in one of the eight blowdown vessels.

Residual monomers are removed batch wise under vacuum and subsequently further stripped to recover free monomer that is recycled back to the process.

The product from the polymerisation process is liquid latex. This is either sold or is coagulated to form solid rubber. Coagulation takes place when liquid latex is mixed with calcium chloride solution or acid and salt solution and pH adjustment which renders the soaps insoluble and the rubber particles coagulate to form rubber crumb. The pH is then adjusted between 9 and 10 and the soaps washed from the rubber.

The rubber crumb is dewatered and dried in a fluid bed drier followed by forming the rubber into bales. Polyblack is formed by adding carbon black before the coagulation stage.

Emissions of VOCs are controlled with the use of wet scrubbers and the use of a thermal oxidiser that abates vents from the polymerisation process.

There are no direct discharges of process effluent to sewer or controlled waters. However process effluent is treated in the effluent treatment plant before being discharged to Borden lagoon operated by Hexion Chemicals. The effluent plant consists of balance tanks, flocculation, DAF flotation and aeration, with sludge removal being carried out by a belt filter. Effluent sludge being disposed offsite.

The key environmental issues associated with the activities at the installation are: -

Control of fugitive VOC emissions: - a large plant containing numerous storage tanks, flanges, pumps, valves etc.

Control of point sources of VOC emissions: - ensure efficient use of abatement systems, to minimise environmental impact and prevent cause for annoyance from odour.

Waste minimisation: - to ensure efficient use of raw materials.

Control of point source emissions to water: - to ensure that the installation discharge does not compromise the lagoon discharge operated by Hexion Chemicals.

Accident prevention and control: - to reduce the risk of spillage etc.

Status Log of the permit

Detail	Date	Response Date
Application UP3833SS	Duly made 11/05/06	
Additional Information Received	12/06/06	11/07/06
Permit determined	DD/MM/YY	

Superseded or Partially Superseded Licences/Authorisations/Consents relating to this installation

Holder	Reference Number	Date of Issue	Fully or Partially Superseded
Zeon Chemicals Europe Ltd.	IPC permit A.8796	01/01/93	Fully superseded

End of Introductory Note

Permit

**Pollution Prevention and Control
(England and Wales) Regulations 2000**

Permit

Permit number
UP3836SS

The Environment Agency (the Agency) in exercise of its powers under Regulation 10 of the Pollution Prevention and Control (England and Wales) Regulations 2000 (SI 2000 No 1973) hereby authorises

Zeon Chemicals Europe Ltd. ("the operator"),

whose registered office is

**15 Bloomsbury Square
London
WC1A 2LP**

Company registration number 2343599

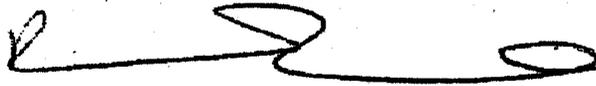
to operate an installation at

**Sully Polymerisation Plant
Sully moors Road
Sully
Vale of Glamorgan
CF64 5ZE**

to the extent authorised by and subject to the conditions of this permit.

Signed

Date

	12/12/06.
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B Price

Authorised to sign on behalf of the Agency

Conditions

1 Management

1.1 General management

1.1.1 The activities shall be managed and operated:

- (a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the operator as a result of complaints; and
- (b) by sufficient persons who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the activities.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

1.2 Accidents that may cause pollution

1.2.1 The operator shall:

- (a) maintain and implement an accident management plan;
- (b) review and record at least every 4 years or as soon as practicable after an accident, (whichever is the earlier) whether changes to the plan should be made;
- (c) make any appropriate changes to the plan identified by a review.

1.3 Energy efficiency

1.3.1 The operator shall:

- (a) take appropriate measures to ensure that energy is used efficiently in the activities;
- (b) review and record at least every 4 years whether there are suitable opportunities to improve the energy efficiency of the activities; and
- (c) take any further appropriate measures by a review.

1.4 Efficient use of raw materials

1.4.1 The operator shall:

- (a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;
- (b) maintain records of raw materials and water used in the activities;
- (c) review and record at least every 4 years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

- (d) take any appropriate further measures identified by a review.

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

1.5.1. The operator shall:

- (a) take appropriate measures to ensure that waste produced by the activities is avoided or reduced, or where waste is produced it is recovered wherever practicable or otherwise disposed of in a manner which minimises its impact on the environment;
- (b) review and record at least every 4 years whether changes to those measures should be made; and
- (c) take any further appropriate measures identified by a review.

1.6 Site security

1.6.1. Site security measures shall prevent unauthorised access to the site, as far as practicable.

2. Operations

2.1 Permitted activities

2.1.1 The operator is authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 2 to this permit.

2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1 table S1.2, unless otherwise agreed in writing by the Agency.

2.3.2 No raw materials or fuels listed in schedule 3 table S3.1 shall be used unless they comply with the specifications set out in that table.

2.3.3 During normal operation the thermal oxidiser shall have greater than 95% efficiency.

2.3.4 All activities leading to emissions that are normally treated by the thermal oxidiser shall be stopped during abnormal operation of the thermal oxidiser.

2.4 Off-site conditions

There are no off-site conditions under this section.

2.5 Improvement programme

- 2.5.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Agency.
- 2.5.2 Except in the case of an improvement which consists only of a submission to the Agency, the operator shall notify the Agency within 14 days of completion of each improvement.

2.6 Pre-operational conditions

There are no pre-operational conditions in this permit.

2.7 Closure and decommissioning

- 2.7.1 The operator shall maintain and operate the activities so as to prevent or where that is not practicable, to minimise, any pollution risk on closure and decommissioning.
- 2.7.2 The operator shall maintain a site closure plan which demonstrates how the activities can be decommissioned to avoid any pollution risk and return the site to a satisfactory state.
- 2.7.3 The operator shall carry out and record a review of the site closure plan at least every 4 years.
- 2.7.4 The site closure plan (or relevant part thereof) shall be implemented on final cessation or decommissioning of the activities or part thereof.

2.8 Site protection and monitoring programme

- 2.8.1 The operator shall, within 2 months of the issue of this permit, submit a site protection and monitoring programme.
- 2.8.2 The operator shall implement and maintain the site protection and monitoring programme and shall carry out and record a review of it at least every 4 years.

3. Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 4 tables S4.1, S4.2 and S4.3.
- 3.1.2 The limits given in schedule 4 shall not be exceeded.
- 3.1.3 Total annual emissions from the emission point(s) set out in tables schedule 4 S4.1, S4.2 and S4.3 of a substance listed in schedule 4 table S4.4 shall not exceed the relevant limit in table S4.4.

3.2 Transfers off-site

- 3.2.1 Records of all the wastes sent off site from the activities, for either disposal or recovery, shall be maintained.

3.3 Fugitive emissions of substances

- 3.3.1 Fugitive emissions of substances (excluding odour, noise and vibration) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including those specified in schedule 1 table S1.4, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.3.2 All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.4 Odour

- 3.4.1 Emissions from the activities shall be free from odour at levels likely to cause annoyance outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures, to prevent or where that is not practicable to minimise the odour.

3.5 Noise and vibration

- 3.5.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause annoyance outside the site, as perceived by an authorised officer of the Agency, unless the operator has used appropriate measures to prevent or where that is not practicable to minimise the noise and vibration.

3.6 Monitoring

- 3.6.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake monitoring for the parameters, at the locations and at not less than the frequencies specified in the following tables in schedule 4 to this permit:
- (a) point source emissions specified in tables S4.1, S4.2 and S4.3;
 - (b) process monitoring specified in table S4.5.
- 3.6.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.6.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme specified in condition 3.6.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Agency.
- 3.6.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 4 tables S4.1, S4.2 and S4.3 unless otherwise specified in that schedule.
- 3.6.5 Within 6 months of the issue of this permit (unless otherwise agreed in writing by the Agency) the site reference data identified in the site protection and monitoring programme shall be collected and submitted to the Agency.

4. Information

4.1 Records

4.1.1 All records required to be made by this permit shall:

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) the site protection and monitoring programme.

4.1.2 Any records required to be made by this permit shall be supplied to the Agency within 14 days where the records have been requested in writing by the Agency.

4.1.3 All records required to be held by this permit shall be held on the site and shall be available for inspection by the Agency at any reasonable time.

4.2 Reporting

4.2.1 A report or reports on the performance of the activities over the previous year shall be submitted to the Agency by 31 January (or other date agreed in writing by the Agency) each year. The report(s) shall include as a minimum:

- (a) a review of the results of the monitoring and assessment carried out in accordance with this permit against the relevant assumptions, parameters and results in the assessment of the impact of the emissions submitted with the application;
- (b) where the operator's management system encompasses annual improvement targets, a summary report of the previous year's progress against such targets;
- (c) the annual production /treatment data set out in schedule 5 table S5.2;
- (d) the performance parameters set out in schedule 5 table S5.3 using the forms specified in table S5.4 of that schedule; and
- (e) details of any contamination or decontamination of the site which has occurred.

4.2.2 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 5 table S5.1;

- (b) for the reporting periods specified in schedule 5 table S5.1 and using the forms specified in schedule 5 table S5.4 ; and
 - (c) giving the information from such results and assessments as may be required by the forms specified in those tables.
- 4.2.3 A summary report of the waste types and quantities accepted and removed from the site shall be made for each quarter. It shall be submitted to the Agency within one month of the end of the quarter and shall be in the format required by the Agency.
- 4.2.4 The operator shall, unless notice under this condition has been served within the preceding 4 years, submit to the Agency, within 6 months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.
- 4.2.5 All reports and notifications required by the permit shall be sent to the Agency using the contact details supplied in writing by the Agency
- 4.2.6 The results of reviews and any changes made to the site protection and monitoring programme shall be reported to the Agency, within 1 month of the review or change.

4.3 Notifications

- 4.3.1 The Agency shall be notified without delay following the detection of:
- (a) any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution;
 - (b) the breach of a limit specified in the permit;
 - (c) any significant adverse environmental effects.
- 4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 6 to this permit within the time period specified in that schedule.
- 4.3.3 Prior written notification shall be given to the Agency of the following events and in the specified timescales:
- (a) as soon as practicable prior to the permanent cessation of any of the activities;
 - (b) cessation of operation of part or all of the activities for a period likely to exceed 1 year; and
 - (c) resumption of the operation of part or all of the activities after a cessation notified under (b) above.
- 4.3.4 The Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.
- 4.3.5 Where the Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Agency when the relevant monitoring is to take place. The operator shall provide this information to the Agency at least 14 days before the date the monitoring is to be undertaken.
- 4.3.6 The Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

- (a) any change in the operator's trading name, registered name or registered office address;
- (b) any change to particulars of the operator's ultimate holding company (including details of an ultimate holding company where an operator has become a subsidiary); and
- (c) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Climate Change Agreement

4.3.10 Where the operator has entered into a climate change agreement with the Government, the Agency shall be notified within one month of:

- (a) a decision by the Secretary of State not to re-certify the agreement;
- (b) a decision by either the operator or the Secretary of State to terminate the agreement; and
- (c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 7 shall have the meaning given in that schedule.

Schedule 1 - Operations

Table S1.1 activities

Activity listed in Schedule 1 of the PPC Regulations	Description of specified activity	Limits of specified activity
S4.1A1(a)(ix)	Producing organic chemicals such as synthetic rubber	From receipt of raw materials to production, storage and despatch of final product, disposal of waste and emission of exhaust gases and effluent.
S5.3 A1(c)(ii)	Disposal of non-hazardous waste in a facility with a capacity of more than 50 tonnes per day, physico-chemical treatment.	From receipt and treatment of effluent, storage and disposal of sludge, to discharge of treated effluent to Borden lagoon.
Directly Associated Activity		
Monomer recovery and transfer system	Recovery of unreacted monomer for reuse	---
Refrigeration plant		---
Process water treatment	Water treatment plant	---

Table S1.2 Operating techniques

Description	Parts	Date Received
Application	Application section Nos., ZIA005, ZIA 006, ZIA007, ZIA008, ZIA 010, ZIA011, ZIA019,ZIA020	20/03/06
Schedule 4 Notice Request dated 12/06/06	Response to question 5,6,7,8,9,10,16,22 providing further details of process control.	11/07/06

Table S1.3 Improvement programme requirements

Reference	Requirement	Date
IP1	<p>The operator shall develop a plan to rationalise the storage and use of all IBC containers on site, where such containers are retained they shall be listed in IP7, in particular the storage of IBC containers shall consider but not be limited to the following areas:-</p> <p>Waste storage area Belt press area Compressor area Effluent area.</p> <p>The plan shall be implemented by the operator from the date of approval in writing from the Agency</p>	01/03/07
IP2	<p>The operator shall ensure that all drain covers are color coded to identify process effluent and uncontaminated water runoff and suitable personnel shall be trained in the color coding system, records of such training shall be maintained for Agency inspection. The operator shall notify the Agency in writing when the color coding of the drainage system is complete.</p>	31/03/07
IP3	<p>The operator shall investigate the potential to reduce the variability of the performance of the effluent treatment plant through the provision of increased holding capacity of the balance tank and optimisation of the flocculation process or any other means. A written report shall be submitted to the Agency detailing the findings and any proposals for implementation.</p> <p>The operator shall implement the proposals of the report from the date of approval in writing from the Agency.</p>	01/06/07
IP4	<p>The operator shall establish formal procedures for the inspection and maintenance programme to ensure the integrity of the installation infrastructure, for all pollution prevention measures, where not in place already. For example, inspections of hardstanding, underground storage tanks, bunds.</p> <p>The operator shall give written confirmation to the Agency referencing the appropriate procedures that this has been established.</p>	01/06/07
IP5	<p>The operator shall establish if the hardstanding across the site is resistant to substances stored and transported over it. And if all the bunds and subterranean tanks are resistant to substances stored within them.</p> <p>A written report of the findings shall be submitted to the Agency.</p> <p>The conclusions of the report and any deficiencies so identified shall be rectified by the operator from the date of approval in writing by the Agency.</p>	01/06/07
IP6	<p>A written procedure shall be submitted to the agency detailing the measures to be used so that monitoring and sampling equipment used to monitor emissions at emission point S1, shall have MCERTS certification in accordance with condition 3.6.3. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the procedure.</p> <p>The procedure shall be implemented by the operator from the date of approval in writing by the Agency</p>	01/06/07
IP7	<p>The operator shall carry out a monitoring exercise on emission points A17, A18, A19 and S1 over a six-month period to define the Zeon Super Composite (ZSC) plant emissions of substance B (as define in the submission for commercial confidentiality). A report shall be submitted in writing to the Agency detailing the emission values, environmental impact, plant capability and presenting a proposal for emission concentration limit values and for substance B for emission points A17, A18, A19 and S1 and annual mass limit at point S1. If appropriate the agency shall set emission limits for substance B at A17, A18, A19 and S1 and write to the operator to confirm the limits.</p>	01/08/07
IP8	<p>The operator shall implement the proposal presented in volume 2 of the application Z1A019 item 4, to return the acrylonitrile vapour displaced from the storage tanks on road tanker offloading back to the road tanker and shall notify the Agency in writing when this has been completed.</p>	30/09/07
IP9	<p>The operator shall conduct a full survey of the drainage systems on the installation. A written report shall be submitted to the Agency detailing the findings and present plans and</p>	30/09/07

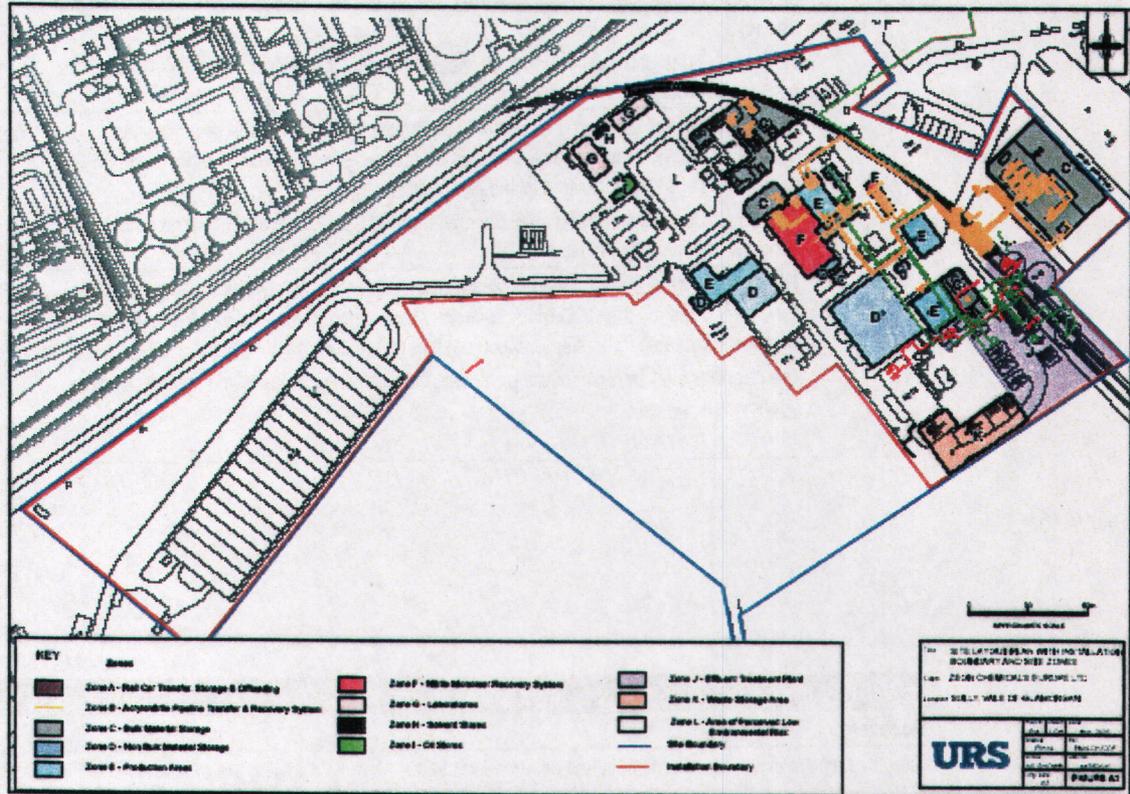
	timescales to rectify any faults identified this shall be implemented by the operator from the date of approval in writing from the Agency.	
IP10	The operator shall install bunding to comply with section 2.2.5 of the sector guidance note S4.01 for the TDM (tert dodecyl mercaptan) storage tank, the oleate tank.	30/09/07
IP11	A written plan shall be submitted to the Agency for approval detailing the results of a survey of hard-standing, kerbing and secondary containment for raw material, intermediate, product, fill points and waste storage areas and the measures to comply with the requirements of section 2.2.5 of TGN S 4.02. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval in writing by the Agency	30/09/07
IP12	The operator shall carry out the following:- a) A feasibility study which shall include but not be limited to the use of existing or additional buffer storage capacity such that no or minimal process gas is vented when the thermal oxidiser is shut down, or gas vented from emission point A1 (2" vent) during periods when the buffer pipe pressure exceeds the working limit. The study shall also include the use of this or other storage capacity to capture the vented gas from emission point A2 (6" vent) and the subsequent treatment of these gases at the thermal oxidiser. A written report shall be submitted to the Agency detailing the findings and present plans and timescales for their implementation. These plans shall be implemented by the operator from the date of approval in writing by the Agency. b) Install new butadiene compressors or other systems to reduce the loading on the thermal oxidiser as presented in volume 2 of the application ZIA019 item 7. A study shall be undertaken to establish the effect of this change has had on the frequency of venting from emission point A2. A written report shall be submitted to the Agency detailing the findings and any other conclusions regarding the minimisation of venting from emission point A2. The conclusions from the report shall be implemented by the operator from the date of approval in writing from the Agency. c) A feasibility study to determine the benefits of installing a kerosene scrubber or other recovery system to increase the recovery of butadiene and hence reduce the load on the thermal oxidiser. A written report shall be submitted to the Agency detailing the findings and present plans and timescales this shall be implemented by the operator from the date of approval in writing from the Agency. d) Submit plans to the Agency relating to the planned preventative maintenance regime used to ensure that the availability of the thermal oxidiser is maximised, these plans shall include the measures used to demonstrate the effectiveness of the systems used and to demonstrate that the availability is subject to continuous improvement. These plans shall be implemented by the operator from the date of approval in writing from the Agency. e) Record all instances of downtime on the thermal oxidiser and these shall be analysed to identify their root causes. Once identified a management system shall be used to ensure that the downtime is minimised and a system used to ensure continuous improvement. f) Record the process variables used to ensure effective operation of the thermal oxidiser. This data shall be used by a management system to demonstrate statistical process control measures or other measures are used to monitor the efficiency of the thermal oxidiser and provide data on abnormal interruptions to the operation of the thermal oxidiser such that their root cause can be identified and addressed. g) When the above is completed the operator shall undertake an assessment of the environmental impact of the short term effects of emissions associated with the non-availability of the thermal oxidiser and venting from emission point A2. A written report shall be submitted to the Agency detailing these findings.	31/12/07
IP13	The operator shall install a sandfilter or implement other suitable plans such that the effluent treatment plant will be capable of achieving the limits specified for suspended solids in table 4.3. The operator shall notify the agency in writing that suitable plans have been implemented.	31/12/07
IP14	The operator shall conduct a feasibility study into heat recovery from the thermal oxidiser, a written report shall be submitted to the Agency detailing the conclusions of the study and presenting a plan to implement those conclusions. The operator shall implement the plan from the date of approval in writing from the agency.	31/12/08

IP15	<p>The operator shall conduct a water audit to identify areas where water usage can be reduced and shall consider the use of rainwater and effluent to replace towns water usage at the installation. A written report of the findings and conclusions shall be submitted to the Agency.</p> <p>The conclusions of the report shall be implemented by the operator from the date of approval in writing by the Agency.</p>	31/12/08
IP16	<p>The operator shall conduct a waste audit to identify areas where the production of hazardous and non hazardous waste can be minimised written report of the findings and conclusions shall be submitted to the Agency.</p> <p>The conclusions of the report shall be implemented by the operator from the date of approval in writing by the Agency.</p>	31/12/08
IP17	<p>The operator shall undertake a feasibility study to identify suitable techniques to consistently reduce the COD of the effluent. A cost benefit analysis together with a proposed timetable for implementation shall be submitted to the Agency.</p> <p>The operator shall implement the proposals from the date of approval in writing from the Agency.</p>	01/06/08

Table S1.4 Appropriate measures for fugitive emissions

Measure	Dates
<p>A fugitive emission management plan shall be submitted to the Agency, detailing the measures to be used to control fugitive emissions of acrylonitrile and butadiene and shall be accordance with section 2.2.5 of TGN S4.01.</p> <p>The plan shall contain but not be limited to:-</p> <ul style="list-style-type: none"> • The use of the data provided in ZIA010 and ZIA011 presented in volume 2 of the application and shall include a quantitative estimate of all the current emission sources or generic types of emission. • The emissions of these quantified emissions shall be use to provide a prioritised schedule to reduce the total fugitive emissions. • Detail of the LDAR (leak detection and repair program) and contain measures to demonstrate the effectiveness of this system. • The use of boundary monitoring of acrylonitrile and butadiene to improve the capability for early detection of leaks. • The measures outlined in items 2 & 3 of ZIA019 presented in volume 2 of the application. • It shall be reviewed on an annual basis at the end of the calendar year and the reduction in fugitive emission reported to the Agency. The fugitive emission reductions shall be compared to the planned reductions in the plan. <p>The plan shall be implemented by the operator from the date of approval in writing by the Agency</p>	Plan dated 31/12/07

Schedule 2 - Site plan



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Schedule 3 - Waste types, raw materials and fuels

Table S3.1 Raw materials and fuels

Raw materials and fuel description

Specification

Schedule 4 – Emissions and monitoring

Table S4.1 Point source emissions to air – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (including unit)	Reference period	Monitoring frequency	Monitoring standard or method
A1 (see map ZSM001 , response to schedule 4 notice)	butadiene	2" vent pressure relief from monomer recovery located at N55 building	0.25 kg/hr	Flow measurement averaged over a quarter	continuous	Flow method measurement to be agreed with the Agency to an agreed standard
A2 see map ZSM001 , response to schedule 4 notice)	No parameters set	6" vent N55 building	–	–	–	Permanent sampling access not required
A3 see map ZSM001 , response to schedule 4 notice	butadiene	Polymerisation vac pump	0.2 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH1024
A3 see map ZSM001 , response to schedule 4 notice	acrylonitrile	Polymerisation vac pump	0.5 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A4 see map ZSM001 , response to schedule 4 notice	butadiene	8 Bottle vents N55 building (vents grouped together.)	0.1kg/hr for each bottle vent	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH1024
A5 see map ZSM001 , response to schedule 4 notice	acrylonitrile	N58 acrylonitrile storage tank	0.1 kg/hr	Spot sample over a one hour period	Quarterly Not required after IP1 implemented.	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A6 see map ZSM001 , response to schedule 4 notice	acrylonitrile	Blend tank scrubber	0.1 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A7 see map ZSM001 , response to schedule 4 notice	butadiene	N159 building Weigh tank, intermediate tank Coagulator vent	0.25 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH1024
A7 see map ZSM001 , response to schedule 4 notice	acrylonitrile	N159 building Weigh tank, intermediate tank Coagulator vent	0.6 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH 1604

A11 see map ZSM001 , response to schedule 4 notice	butadiene	N205 building Fluid bed drier exhaust	0.33 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH1024
A11 see map ZSM001 , response to schedule 4 notice	acrylonitrile	N205 building Fluid bed drier exhaust	0.5 kg/hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A12 see map ZSM001 , response to schedule 4 notice	butadiene	N205 building Drier exhaust	0.40 kg /hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH1024
A12 see map ZSM001 , response to schedule 4 notice	acrylonitrile	N205 building Drier exhaust	1.25 kg /hr	Spot sample over a one hour period	Quarterly	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A13 see map ZSM001 , response to schedule 4 notice	No parameters set	N160 building Polyblack drier exhaust	--	--	--	Permanent sampling access not required
A14 see map ZSM001 , response to schedule 4 notice	No parameters set	N99 building Polyblack blend tank exhaust	--	--	--	Permanent sampling access not required
A15 see map ZSM001 , response to schedule 4 notice	No parameters set	N99 building Polyblack coagulator exhaust	--	--	--	Permanent sampling access not required
A16 see map ZSM001 , response to schedule 4 notice	butadiene	Thermal Oxidiser exhaust stack	0.1kg/hr limit does not apply during emergency shutdown of the thermal oxidiser.	Spot sample over a one hour period	Annually	BS EN 13649:2002 with subsequent analysis to NIOSH1024

A16 see map ZSM001 , response to schedule 4 notice	acrylonitrile	Thermal Oxidiser exhaust stack	0.1kg/hr	Spot sample over a one hour period	Annually	BS EN 13649:2002 with subsequent analysis to NIOSH 1604
A17 see map ZSM001 , response to schedule 4 notice	Substance B defined in CIC submission	ZSC mixer exhaust vent	--	Spot sample over a one hour period	Quarterly	As agreed with the Agency.
A18 see map ZSM001 , response to schedule 4 notice	Substance B defined in CIC submission	ZSC mixer scrubber stack	--	Spot sample over a one hour period	Quarterly	As agreed with the Agency.
A19 see map ZSM001 , response to schedule 4 notice	Substance B defined in CIC submission	ZSC mixer scrubber stack	--	Spot sample over a one hour period	Quarterly	As agreed with the Agency.
A20 see map ZSM001 , response to schedule 4 notice	No parameters set	Location U167 Belt press exhaust	--	--	--	Permanent sampling access not required
A21 see map ZSM001 , response to schedule 4 notice	No parameters set	N54 location methanol road tanker offloading	--	--	--	Permanent sampling access not required
A22 see map ZSM001 , response to schedule 4 notice	No parameters set	N54 location Fugitive ammonia emission from refrigeration plant	--	--	--	Permanent sampling access not required
A23 see map ZSM001 , response to schedule 4 notice	No parameters set	N71 building Latex stock tank fugitive emissions	--	--	--	Permanent sampling access not required

Table S4.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (Incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
---	none					

Table S4.3 Point source emissions to sewer, effluent treatment plant or other transfers off-site- emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. Unit)	Reference period	Monitoring frequency	Monitoring standard or method
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S1 discharge to Borden lagoon (ST1425 6816)	Total suspended solids	Site effluent treatment plant	30 mg/ml effective after completion of IP5 table 1.3 , The 95th percentile of all samples taken over the period of one calendar month shall not exceed this value.	24-hr flow proportional sample	Daily	BS EN 872
S1 discharge to Borden lagoon (ST1425 6816)	Total suspended solids	Site effluent treatment plant	50 mg/ml effective after completion of IP5 table 1.3 ,	Max	Daily	BS EN 872
S1 discharge to Borden lagoon (ST1425 6816)	acrylonitrile	Site effluent treatment plant	3.0 mg/ml The 95th percentile of all samples taken over the period of one calendar month shall not exceed this value.	24-hr flow proportional sample	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	acrylonitrile	Site effluent treatment plant	5.0 mg/ml	Max	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	COD	Site effluent treatment plant	1400 mg/ml The 95th percentile of all samples taken over the period of one calendar month shall not exceed this value.	24-hr flow proportional sample	Daily	BS ISO 15705:2002
S1 discharge to Borden lagoon (ST1425 6816)	COD	Site effluent treatment plant	1800 mg/ml	Max	Daily	BS ISO 15705:2002

S1 discharge to Borden lagoon (ST1425 6816)	methanol	Site effluent treatment plant	3.0 mg/ml The 95th percentile of all samples taken over the period of one calendar month shall not exceed this value.	24-hr flow proportional sample	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	methanol	Site effluent treatment plant	5.0 mg/ml	Max	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	Material B as defined in CIC submission	Site effluent treatment plant	-	24-hr flow proportional sample	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	Material B as defined in CIC submission	Site effluent treatment plant	-	Max	Daily	SCA blue Book method 170
S1 discharge to Borden lagoon (ST1425 6816)	pH	Site effluent treatment plant	10	Max	Daily	BS6068-2.50
S1 discharge to Borden lagoon (ST1425 6816)	pH	Site effluent treatment plant	6	Min	Daily	BS6068-2.50

Table S4.4 Annual limits

Substance	Medium	Limit (including unit)
butadiene	Air	1750 kg in a year
acrylonitrile	Air	2500 kg in a year
acrylonitrile	Water	542 kg in a year
methanol	Water	536 kg in a year
Substance B as defined in CIC submission	Water	See IP 15 in table S1.3

Table S4.5 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Monitoring frequency	Monitoring standard or method	Other specifications
Thermal Oxidiser	Process control variables as defined in response to question 8a, 8b of the schedule 4 notice and the variables defined by the operator in IP2 f.	continuous	Not applicable	
A1	butadiene	daily	As agreed in writing with the Agency.	any mass of butadiene vented and the duration of venting to be reported to the Agency quarterly
A2	butadiene	daily	As agreed in writing with the Agency.	any mass of butadiene vented and the duration of venting to be reported to the Agency quarterly
A11	Particulate matter	daily	As agreed in writing with the agency	Any visible emission of particulate to be reported to the Agency
A13	Particulate matter	daily	As agreed in writing with the agency	Any visible emission of particulate to be reported to the Agency

Schedule 5 - Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S5.1 Reporting of monitoring data

Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air Parameters as required by condition 3.6.1.	A1, A3, A4, A5,A6,A7, A11,A12, A16,A17,A18,A19	All Quarterly, except A16 annually	01/03/07
Emissions to water Parameters as required by condition 3.6.1	S1	Quarterly	01/03/07
monthly kg of butadiene vented	A1	Quarterly	01/03/07
monthly kg of butadiene vented	A2	Quarterly	01/03/07
Total monthly time vented	A1	Quarterly	01/03/07
Total monthly time vented	A2	Quarterly	01/03/07

Table S5.2: Annual production/treatment

Parameter	Units
Nitrile rubber (bale form)	tonnes
Polyblack	tonnes
Latex	tonnes
ZSC composite	tonnes

Table S5.3 Performance parameters

Parameter	Frequency of assessment	Units
Water usage	Annually	Tonnes / tonnes of product
Energy usage	Annually	MWs
Waste	Annually	Tonnes / tonnes of product
Fugitive release of butadiene	Annually	kg
Fugitive release of acrylonitrile	Annually	kg
Thermal oxidiser availability	Annually	%
kg butadiene vented at A1	Annually	kg
kg butadiene vented at A2	Annually	kg
butadiene to product	Annually	%
acrylonitrile to product	Annually	%

Table S5.4 Reporting forms

Media/parameter	Reporting format	Date of form
Air	Form air 1 or other form as agreed in writing by the Agency	01/08/06
Water	Form water 1 or other form as agreed in writing by the Agency	01/08/06
Other performance indicators	Form performance 1 or other form as agreed in writing by the Agency	01/08/06
A1 and A2 butadiene vented	Form vent 1 or other form as agreed in writing by the Agency	01/08/06

Schedule 6 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the PPC Regulations.

Part A

Permit Number	
Name of operator	
Location of Installation	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or fugitive emission which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* Authorised to sign on behalf of *Zeon Chemicals Europe Ltd.*

Schedule 7 - Interpretation

"*accident*" means an accident that may result in pollution.

"*annually*" means once every year.

"*application*" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 4 to the PPC Regulations.

"*authorised officer*" means any person authorised by the Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

"*emissions to land*", includes emissions to groundwater.

"*fugitive emission*" means an emission to air, water or land from the activities which is not controlled by an emission limit.

"*groundwater*" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"*land protection guidance*", means Agency guidance "H7 - Guidance on the protection of land under the PPC Regime: application site report and site protection monitoring programme".

"*MCERTS*" means the Environment Agency's Monitoring Certification Scheme.

"*notify without delay*" and "*notified without delay*" means that a telephone call can be used, whereas all other reports and notifications must be supplied in writing, either electronically or on paper.

"*PPC Regulations*" means the Pollution, Prevention and Control (England and Wales) Regulations SI 2000 No.1973 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"*quarter*" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

"*site protection and monitoring programme*" means a document which meets the requirements for site protection and monitoring programmes described in the Land Protection Guidance.

"*year*" means calendar year ending 31 December.

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

- (a) in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or
- (b) in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content

END OF PERMIT