

Environment Agency Permitting decisions

We have decided to vary the permit for Queensferry Mineral Fibre Works, Knauf Insulation Ltd. The PPC Permit has been varied to incorporate the changes requested in relation to the new binder application. At the same time a consolidated permit using the latest Environmental Permit Regulations (England and Wales) template has been issued. A review of the monitoring frequencies was also carried out.

The variation number is EA/EPR/BR9383ID/V003. The previous PPC permit numbers are BR9383ID and NP3835SW.

The operator is Knauf Insulation Ltd.

The facility is located at Chemistry Lane, Queensferry CH5 2DB.

The decision was effective from 12 February 2009.

Summary of the decision

We have decided to grant a variation to the permit for the operator, subject to the conditions in the permit. The previous Permits have been consolidated into an EPR permit and includes the variation application.

The Operator applied to replace the current phenol formaldehyde binder with a new "ecose binder". The contents of the binder are considered commercially confidential and this has been accepted by the Environment Agency. For the first 6 – 12 months the plant will be run alternating the use of the binders (until all customers make the switch). Two new bunded tanks will be installed to store the main ingredients of the new binder. The mixing will take place in the equipment currently used for the phenol formaldehyde binders. As the "ecose binder" does not contain any phenol or formaldehyde it is likely that the water systems in the scrubbers, washwater and product cooling will have to be treated with suitable biocides to limit bacterial growth.

The update of the permit to the EPR template has not added any requirements but generally removed conditions whilst still being based on the previous permits (BR9383ID / NP3835SW).

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

Main Features

A non-technical description of the installation is given in the Application, but the main features of the installation are as follows.

The activities covered by this permit are the manufacture of mineral wool insulation materials for use in structural, fire protection, thermal and acoustic insulation applications, as well as hydroponic growing media for the horticultural industry. The raw materials used in the furnace are:

- Coke (with a maximum sulphur content of 1% which is used as the fuel in the reducing melt furnace (cupola))
- Basalt, consisting of mainly calcium magnesium silicate and sodium aluminosilicate (though may contain significant iron and titanium bearing materials)
- Dolomite rock that consists mainly of calcium and magnesium carbonate, limestone and blast furnace slag from iron smelting (comprising calcium and aluminium silicates)

- Quartzite, comprising silica fused together by ferric oxide and calcium / magnesium silicates.
- Blast furnace slag together with steel slag

The raw materials above are stored in concrete bunkers and are loaded into the raw material handling conveyors and weighing plant by loaders. Delivery to site is in 20 to 25 tonne tipper lorries.

- Liquid oxygen. This is used to enrich the combustion (cupola) air fed to the furnace and generates temperatures greater than 2000⁰C to melt the stone and is stored in a pressure vessel which together with the vaporiser is sited within a lockable steel mesh fenced enclosure.
- Organic binders to bind the fibres together

The installation manufactures mineral wool (stonewool) from molten stone produced by melting blast furnace slag and natural stone together in a blast furnace, with an emergency by-pass stack. The stone, slag and coke are weighed out and fed into the furnace by long overhead conveyors. They are then weighed and blended to a discrete formulation and fed to the cupola. The heat for melting the stone is produced by burning the coke in a hot-blast furnace with oxygen enriched air. Prior to melting, the carboniferous rocks are thermally calcined and subsequent reactions between the resultant oxides and the basalt rock produce the required melt.

Molten stone flows from the cupola by means of water cooled troughs onto the forming spinner. This spinner has wheels which rotate at high speed (5000rpm). Stone melt is spun into stone wool fibre. The fibre is then projected by high-pressure air in towards the collection chamber. As the fibre is projected to the collection chamber, thermal setting resin is applied to the fibre. The furnace waste gases are filtered to remove dust then passed through an oxidiser burner.

The fibre is then collected on a moving grate which is under suction to allow the fibre to be laid down under controlled conditions into a thin blanket. The blanket is folded back upon itself on the forming belt to give the required weight, density and thickness per square metre. The waste gases are removed and passed through a wet scrubber.

The blanket passes into a heated oven for curing, allowing the stone wool to establish the required physical properties, for example for rolled products, resilience and for slab products, integrity.

After the stone wool is cured in the oven the product passes over a cooling zone that draws ambient air through the product to cool the stone wool. Oven waste gases are burnt in an oxidiser tube. The product is then trimmed by means of saws to product width requirement and is then cut to size, using cross cut sawing devices, which give the product the length requirement.

The stone wool products then pass into the packaging area where rolls are rolled and bagged and slabs are stacked and packaged ready for despatch to the customer.

Wastewater is recycled in the binder application and to be reused has to be filtered to remove stone wool.

As described above an organic binder is used to bind the fibres together. Historically this organic binder has been phenol formaldehyde based. This variation allows the Operator to use a new ecose binder which will eventually replace the phenol formaldehyde binder. It is expected that for approximately 12 months after the issue of the Permit both types of binder will be used alternately. Two new storage tanks have been installed in a bunded area to contain the ingredients of the new organic binder.

The standard variation is issued under regulation 20 of The Environmental Permitting (England and Wales) Regulations 2007 to vary the conditions of Permit BR9383ID issued under the Pollution Prevention and Control (England and Wales) Regulations 2000 to operate an installation.

Purpose of this document

This decision document:

- explains how the applicant's application has been determined;
- provides a record of the decision-making process;
- shows how all relevant factors have been taken into account; and
- justifies the specific conditions in the permit.

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

Structure of this document

- Key Issues of the decision;
- Annex 1 the decision check list;

KEY ISSUES OF THE DECISION

Details of Changes to Permit as a result of the variation

The new binder is recognised in the description of the sites activities. As for a period of time both binders will be used alternately the emission limit values have not been amended at this stage. It is expected that once the new ecosol binder is used in exclusivity the emissions of phenol and formaldehyde to air will reduce. At this time the emission limit values and monitoring requirements should be further reviewed.

A number of improvement conditions have been added as a result of the new binder. See below for more information.

Details of Changes to Permit as a result of the review

Appendix 2 shows details of how the PPC Permit conditions have been carried over into the EPR template. A number of site specific conditions have been included.

Emission Limit Values

The emission limit value for oxides of sulphur has been reduced from 1500 to 1350 mg/m³. The original PPC Permit required the Operator to reduce these emissions to 600mg/m³ in line with the BREF guidance. The Operator demonstrated that by reducing the oxides of sulphur there would be an increase in carbon dioxide. This was accepted by the Environment Agency. Permit condition 2.3.6 requires the Operator to review the emissions of oxides of sulphur every 24 months in line with BAT and Air Quality Standards and propose any improvements. Further reductions to the oxides of sulphur limit may be implemented following these two yearly reviews.

The annual emission of sulphur dioxide per tonne product has been reduced to 1.8 from 2.2 kg/te.

The flow rate to sewer has been increased from 2 to 2.5 m³ / hr. This has been agreed with DCWW and the trade effluent consent will also be updated.

Monitoring Frequencies

A number of the spot monitoring requirement frequencies have been reduced. In line with current Environment Agency guidance when monitoring is carried out it will be carried out in triplicate (defined in the interpretation section). This should therefore provide more accurate data and the number of samples taken in the year will generally actually increase. For instance going from 1 sample every 6 months to 3 samples every 12 months. This method should remove the uncertainty as to whether a single high / low result is as a result of experimental error or is in fact a true reading.

Emission Points

Emission point O has been removed from the Permit as the Operator has confirmed that this now discharges back into the building.

A number of additional emission points have been included in schedule 4 of this variation. These are not new emission points but the current template requires all emissions to be listed, there is no diminimus. These emission points were not included within the original application.

Environmental risk

The emissions for emission points C, D, F and G should improve as a result of the use of the new ecosol binder. This reduction will not be seen in full until the transfer to the new ecosol binder is complete.

When the ecosol binder is used exclusively monitoring requirements and emission limit values should be reviewed again.

Conservation

No further comments from the original application.

Groundwater

No further comments from the original application.

Air quality

No further comments from the original application. Except that the as part of the review the limits for oxides of sulphur have been reduced. When the new ecose binder is in use 100% of the time the emissions of phenol and formaldehyde should cease.

Operational techniques

As per previous applications and current Permit plus latest variation application. Also response to the improvement conditions within the previous permits and reference to minor operational changes.

Monitoring and compliance

There is no change to the monitoring and compliance sections as a result of the Variation applied for by the Operator. A number of changes have been made following the review of the PPC Permit (detailed above).

Operator

No change to the Operator as a result of the variation application.

The facility

No change to the facility as a result of the variation application.

Commercial and industrial confidentiality

The Operator applied for commercial confidentiality with respect to the ecose binder ingredients. This request was accepted by the Environment Agency on 16th September 2008. A notice was issued to the Operator confirming this agreement.

Improvement Conditions

A number of improvement conditions have been included in the variation. All the conditions included in the original PPC Permit have been considered "completed" and where appropriate the responses referred to in the Operating Techniques section.

22- The Operator has been required to assess the impact of the binder with respect to odour. A report summarising the findings is to be submitted to the Environment Agency.

23- The impact of the new binder on the scrubber on emission point C is to be reviewed to ensure it remains adequate. A timetable detailing any proposed changes shall be forwarded to the Environment Agency.

24- Improvement condition 17 required the Operator to assess the options for minimising the emissions from emission points C and D. Additional work is required on this so the improvement condition has been included again.

25- The emissions to air are expected to improve as a result of the new binder. Limited sampling has been carried out to date to demonstrate this. The Operator has been required to carry out two sets of monitoring on the relevant emission points whilst the new binder is being used. Prior to this monitoring being carried out the Operator must submit a monitoring protocol to the Environment Agency to demonstrate that the interference from the phenol formaldehyde binder has been minimised.

26- The Operator is permitted to discharge surface water via a number of different emission points to surface water. In practice this does not happen very often as the water is reused and ultimately discharged to sewer. Concerns were raised following the last round of surface

water monitoring as a number of the results were high. The Operator has therefore been required to carry out a review of what is causing the high results.

27- The Operator has been required to carry out a review of methods available to reduce the NO_x levels from emission point A.

28- When the phenol formaldehyde binder is no longer in use on site the Operator is likely to have to use a biocide to treat the water. The sewer conditions need reviewing when the Operator is clearer as to which biocide to use and the quantities likely to be used. The impact on the discharge to sewer needs assessing. The Operator is in discussion with DCWW as to whether the discharge consent needs reviewing.

29- A timetable detailing the proposed transfer from phenol formaldehyde binder to the ecose binder is to be submitted to the Environment Agency.

30- The Operator has been required to review the current practice of recirculating the washwater and the impact on the emissions to sewer and air. This has been included as this practice has been stated as having caused a number of emission limit value breaches in 2008.

Annex 1: decision checklist

Activity	Justification / Detail	Determination criteria met	
		No	Yes
Receipt of submission			
Application fee	The application fee is correct EP OPRA based charge for standard variation application.		✓
Commercial confidentiality	The operator has made a claim for commercial confidentiality which has been accepted. We consider that the inclusion of the relevant information on the public register would prejudice the applicant's commercial interests to an unreasonable degree. The reasons for this are given in the notice of determination for the claim. The decision was taken in accordance with Guidance on commercial confidentiality.		✓
Consultation			
Scope of consultation	No consultation was required for this application but Welsh Water were informed due to the use of biocide and potential impact on the trade effluent discharge.		✓
Operator			
Control of the facility	We are satisfied that the applicant is the person who will have control over the operation of the facility after the grant of the permit.		✓
The facility			
The regulated facility	The regulated facility is an installation which comprises of the following activity listed in Part 2 of Schedule 1 to the Environmental Permitting Regulations and the following directly associated activities. Listed activities: S3.4A(1)(b): Producing any fibre from any material Directly associated activities: Raw materials and waste handling.		✓
The site			
Extent of the site of the facility	N/A Variation Application		✓
Site condition report	N/A Variation application		✓
Environmental Risk Assessment and operating techniques			
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility and accept it as satisfactory but there are improvement conditions and further monitoring required to assess the changes.		✓
Operating techniques	Operating techniques remain as previously accepted in the PPC application but also include the variation application and further information requested.		✓
The permit conditions			
Use of conditions other than those from the template	The permit contains many conditions taken from our permit template. We developed these conditions in consultation with industry having regard to the relevant legislation. This decision document does not include an explanation for these usual conditions. Where such conditions are imposed we have considered the application and accepted the details are sufficient and satisfactory to control that aspect of the operation. Based upon the information submitted in the application, we are satisfied with the information provided within the application and that appropriate measures are in place to manage the use of the ecose binder. However this is all theoretical and		✓

Activity	Justification / Detail	Determination criteria met	
		No	Yes
	even though based on worst case scenario results improvement conditions have been used to review and control the operations in relation to odour and scrubber operation.		
Raw materials	We have specified the following limits and controls on the use of raw materials and fuels. The sulphur content of the coke is required to be less than 1% by weight (schedule 3). (As per original PPC application) The raw materials remain unchanged from the PPC Permit, the exception to this is the inclusion of the main two ingredients of the ecose binder. Two bunded tanks have been installed to store these materials.		✓
Waste Types	As per PPC application		
Pre-operational conditions	N/A		✓
Conditions where the consent of another person is needed	N/A		✓
Incorporating the application	We have specified that the applicant must operate his installation in accordance with the a number descriptions in his application. As specified in schedule 1 table S1.2.		✓
Emission limits	The emission limits as as agreed in the PPC Permit. The only exception to this is the oxides of sulphur which as been reduced from 1500 to 1350 mg/m³. When the ecose binder is in use 100% of the time the emission limits should be reviewed.		✓
Monitoring	Monitoring requirements are generally as in the PPC Permit. The only exceptions to this relate to spot monitoring for emission points A, C, F and G. A number of the frequencies have been reduced but the Operator is now required to carry out the monitoring in triplicate to provide more reliable results.		✓
Reporting	We have required reporting as specified in Schedule 5. The reporting is either quarterly, 6 monthly or annually dependent on the monitoring frequency.		✓
OPRA			
Opra Score	The Opra score is 69 (prior to CCS input) The Opra score has not changed from that set out in the application.		

Appendix 2

Current Permit	Variation	Comments
1.1.1	2.1.1, Schedule 1	
1.2.1	2.2.1, Schedule 1	
1.3.1	1.1.1	
1.4.1	2.4.1, Schedule 1	Improvement Programme
1.4.2	2.4.2	
1.5	Regulation 69 (6) EPR	Minor Operational Change
1.6	2.5.1	
1.7		Off site conditions
2.1	2.3, Schedule 1	
2.2.1	3, schedule 4	Air emissions
2.2.2.1- 3	3, schedule 4	Water emissions
2.2.2.4	3.1.3	
2.2.2.5	Table 4.2 schedule 4	
2.2.2.7 / 8		Sewer emissions
2.2.2.15	3.1.4	
2.2.3	3, schedule 4	
2.2.4	3.2	
2.2.5	3.2	
2.2.6	3.3	Odour
2.2.7	3.1	
2.2.8	2.3.2, Schedule 3	
2.3.1	1.1.3	
2.3.2 - 2.3.4	1.1.1. / 1.1.2	Training
2.3.5 - 2.3.6	1.1.1 / 1.1.2	Maintenance
2.3.7 – 2.3.8	1.1.1 / 1.1.2	Incidents & Complaints
2.4.1.1	1.4	
2.4.1.2	1.5.1 (waste) 1.4.1 (water)	Waste min / water use audits
2.4.1.3		Measure incoming water
2.5	Removed from EPR	Waste Storage
2.6	1.5	
2.7	1.3, schedule 5	Energy efficiency
2.8	1.2	
2.9.1	3.4	Noise
2.9.2	3.4.2	Specific to Knauf
2.10.1 - 11	3.1, 3.5, schedule 4	
2.10.12	Notes in schedule 4	Specific to Knauf
2.10.13	Notes in schedule 4	Specific to Knauf
2.11	Removed from EPR	Site closure
2.12	1.6	Multi Operator
2.13	Removed from EPR	
3	4.1	Records
4.1.1	4.2.1	
4.1.2	4.2.2	Reporting
4.1.3	4.2.2	

4.1.4	2.3.5	
4.1.5	Removed from EPR	EMS targets
4.1.6	4.2.4	
4.1.7	4.2.5	Specific to Knauf
4.1.8	4.2.6	Specific to Knauf
5	4.3	Notifications
6	4.4	Interpretation

