Response to EA Regulation 60 request for further information (11/02/14) – Narrative BATs

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
2	Reduce thermal energy consumption	Address each point in the BAT Conclusion (BATc) using an example in support - e.g. discuss applying CHP. Where you do not propose to use those techniques, provide a description as to why you are not implementing those technique/measures and justify how your proposed techniques provide an equivalent level of environmental protection.	Taking each bullet point of BATc2 in turn, the following additional information is provided. *I. improved and optimised systems to achieve smooth and stable processing, operating close to the process parameter set points by using* *i. process control optimisation including computer-based automatic control systems* All major processes are controlled by means of computer-based systems to ensure safe operation and to achieve the most efficient overall steel production, taking into account the integrated nature of Scunthorpe steelworks, the dependence of each process on the preceding processes and market demand for steel products. Energy consumption data are gathered automatically for the various processes around the site and compared with benchmark targets derived from best practice/best historical practice. Additionally, across Tata Steel Group, there is in place a state-of-the-art system, which is believed to be unique in the industry, that gathers required data to report energy consumption and CO_2 emissions for every major process site (globally). This system also compares the performance of each process on each site against a best practice performance and analyses the cause of deviations from best practice to identify improvement opportunities. *ii. modern, gravimetric solid fuel feed systems* With the exception of the sinter plant strands, all fuels used on site are presented in liquid or gaseous form. At the sinter plant, carbon (typically

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			in the form of coke breeze) is added to the raw mix in order to fuel the sintering process. Breeze is added to the raw mix via constant rate feeders, the process is closely monitored and the amount controlled in order to minimise the use of breeze, which is the sinter plants most expensive raw material. *iii. preheating, to the greatest extent possible, considering the existing process configuration.* Preheating is undertaken where viable; steel stock is preheated in reheating furnace recuperation zones, combustion air is preheated using recuperators and boiler feed water is preheated in the Central Power Station and Turbo Blower House. *II. recovering excess heat from processes, especially from their cooling zones* All the reheating furnaces on the site are fired with process-arising gases and include an un-fired recuperation zone to preheat the stock using the furnace exhaust gases, before the waste gases are passed to recuperators for further heat recovery by preheating combustion air. Steam and hot water pipes are lagged to minimise energy losses. *III. an optimised steam and heat management* Scunthorpe has a manned Energy Control Centre and dedicated Energy Operations Department responsible for collecting and distributing process-arising gases in the most efficient manner to ensure optimum energy consumption and optimum steam and heat management across the site. *IV. applying process integrated reuse of sensible heat as much as*

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			possible. Tata Steel applies process heat integration at various steps in the iron and steelmaking process. One comparable example to a combined heat and power operation is the use of excess medium pressure steam from the power plant, which is used to drive the coke oven gas exhausters in the coke oven by-product plants. The resulting low pressure steam from the exhausters is then used for stripping in the ammonia and benzole strippers. Thereby, the total (pressure and heat) energy of steam is utilised in a cascaded manner, optimising the utilisation according to the sensible heat and pressure levels required by the operations. Where viable, Tata Steel applies sensible heat recovery as much as possible (examples of this include the steel reheating furnaces and steam boilers mentioned in I iii above). The nature of the resulting low-grade heat streams from steelmaking operations have been studied. The low heat levels found in such streams means that heat recovery is either not possible due to thermodynamic limitations (i.e. temperature of cooling water is low to be of any use) or is not economically viable, with extensively long paybacks (i.e. the generation of electricity from low-grade heat furnace exhaust gases post-recuperation).
3	Reduce primary energy consumption	As above BATc2, address each point within the BATc such as discussing increasing pressure in the gas grid if there are energy losses in the flares.	Taking each bullet point of BATc3 in turn, the following additional information is provided. • *the use of gas holders for all by-product gases or other adequate systems for short term storage and pressure holding facilities* The site currently has one gas holder in operation for each of the works arising gases i.e. Blast Furnace Gas, Coke Oven Gas (for Dawes Lane Coke Ovens) and BOS Gas. A capital submission is being prepared for a replacement Coke Oven Gas holder to serve Appleby Coke Ovens, to

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			replace the one that was taken out of service recently. This facility will be required before any maintenance can be carried out on the Dawes Lane gas holder, and is phased in the unapproved capital plan for installation before 2016. • *increasing pressure in the gas grid if there are energy losses in the flares – in order to utilise more process gases with the resulting increase in the utilisation rate* Increasing pressure in the grid is only applicable to networks which operate at relatively high pressure. The Scunthorpe gas distribution networks operate at a maximum of only 200mb and all the consuming units are designed to operate at these low pressures. • *gas enrichment with process gases and different caloric values for different consumers* Mixed Enhanced Gas or MEG is produced by mixing Coke Oven Gas with Blast Furnace or BOS Gases and is used to fire the Mills reheating furnaces. A major capital investment scheme has also recently allowed MEG to be consumed at the Central Power Station, thereby reducing the volume of gas flared. This volume is also reduced by using the Central Power Station and Turbo Blower House to generate electricity. • *heating fire furnaces with process gas* All reheating furnaces on the Scunthorpe site use arising gases as fuel. A small volume of natural gas may be added to the Coke Oven Gas network by mixing it with Blast Furnace Gas in order to overcome any shortfalls in production. • *use of a computer-controlled caloric value control system*

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			A combination of PLCs, gas chromatographs and mass spectrometers are used to optimise the energy performance at the various consuming units. A 24 hour per day 365 days per year manned control room is used to optimise operation of the works gas distribution system by minimising the volume of gas flared and natural gas import. An expert system is currently being developed in order to further enhance this capability. • *recording and using coke and flue-gas temperatures* Temperature measurement by both automatic and manual means is a fundamental part of optimising the energy performance of gas consuming units. The methods used and temperatures taken are clearly dependent upon the type of plant concerned. In addition, the energy performance of each unit is monitored on a regular basis and a team of fuel engineers then works with the plant operations team to identify arising issues and apply the principle of continuous improvement in performance. • *adequate dimensioning of the capacity of the energy recovery installations for the process gases, in particular with regard to the variability of process gases.* The energy recovery systems are designed to maximise the level of recovery achieved. This, and the volume of gas flared, is monitored on a daily basis and improved where opportunities are identified.
4	Use of desulphurised / dedusted COG	As BATc2 address each point i.e. the dedusting of COG and demand from 3rd parties. Submission should also make	The initial response clearly states that COG is dedusted within the respective by-products plants. The aim of the steelworks' energy network is to use all arising process gases internally – this is generally the case, save for supply-demand imbalances caused by operational

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
		reference to what will happen when desulphurisation is undertaken. Clarify whether all BOS gas is dedusted prior to use.	issues when some gas may be flared. A third party agreement to deal with these occasions would be impractical. The desulphurisation of COG will not change the energy strategy of the works. All BOS gas is dedusted in the venturi scrubbers prior to collection and subsequent use.
5	Electrical energy consumption	Provide justification for improvements/rolling programme to demonstrate that high energy sources are being prioritised.	Taking each bullet point of BATc3 in turn, the following additional information is provided. *I. power management systems* A voltage optimisation programme was undertaken in 2008/09 to improve power management across the site. A number of key improvement areas have been initiated on rotating equipment. A programme of network transformer rationalisation is currently underway and a number of low-loaded units on multi-fed systems have already been identified and de-energised. A power monitoring system is in place as well as a dedicated team to manage the site electrical network & infrastructure. *II. grinding, pumping, ventilation and conveying equipment and other electricity-based equipment with high energy efficiency* Audits of such equipment have been carried out as part of a project to identify systems where variable speed drives would make significant energy efficiency improvements. A large number of such systems have now been upgraded with variable speed and frequency control and a number of these systems have also had their motors replaced with high efficiency versions. Tata Steel has had significant collaboration with motor suppliers to introduce new motor management, and practices to increase the uptake of higher efficiency motors are underway; this is underpinned by company policy which is currently being rolled out.

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			Energy reduction is an ongoing process and Tata Steel Scunthorpe has a dedicated Energy Optimisation Manager and team, supported by a central team of experts in Group Environment, to ensure that energy consumption is minimised across the site. Energy audits are a key tool in identifying further improvement opportunities and are undertaken in managed programme across the business.
8	Solid residue waste minimisation	Describe every solid residue waste providing a statement on their current fate (disposal, recovery or recycling), any revisions proposed and where disposal remains the only option, demonstrate why recovery or recycling are not possible.	A table of current solid residues and their fate is attached to this response (BAT8 – Fate of Solid Resides.doc). Decisions on recovery and recycling are made in accordance with the waste hierarchy and on an economical basis and as such can change periodically. It is noted from your compliance plan for 2014/15 that you would like to audit our waste management plans, this would be the ideal time to look in more detail at some of our decisions.
9	Recycling	Refer to comments in BATc8.	
10	Best operational and maintenance practices	Address hooding of transfer points Link to FEMP & EMS to be updated in line with this as well as the operating techniques.	Solid residues are treated in the same way as raw materials and the responses given in respect of BAT 11 (diffuse dust emissions from materials storage, handling and transport) apply equally to BAT 10.
11	Diffuse dust emissions	Provide a prioritised list of the planned improvements identified in the fugitive emissions management plan.	The prioritised list of planned improvements has been developed using a PM_{10} risk inventory and validated by observations and discussions with plant personnel. The current priority list is as follows: • DLCO stockyard areas 5, 7 and 'far North' • DLCO coke stacker area and breeze screening • Blast Furnace iron plating • BF4 junction house, BF5, CB2, T11 coke screen and S10A sinter drop

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			• OBP lime bunker and OPP lime hopper • OPP sinter lines and ES/RS stockyards • CHP coal beds • OBP ore beds • ACO coal and coke storage and vehicle movements • Coke movements from ACO to BFs
12	Waste water management	Provide a copy of the current site waste water flow diagram showing the emissions points and treatment facilities.	A copy of a diagram showing wastewater discharges to Bottesford and Brumby becks is attached (EFFMON_System_Map.pdf). As can be seen, the document is a pdf version of a CAD drawing that can be modified to include whatever relevant information is required. If the diagram is to be used in the permit then Tata Steel and the EA can decide on what information needs to be contained in the diagram and modify accordingly.
14	Continuous Emission Monitors (CEMs)	Under the 2nd part of BATc 14, justify the considerations for other (relevant point) emissions where you are currently not using continuous emission monitoring that would be deemed BAT given their mass flow and emissions characteristics. Correct (for example A58) and modify the summary table to ensure it represents continuous emission monitoring for both the 1st and then 2nd part requirements of BATc 14 to ensure clarity in the response.	In considering the use of continuous emissions monitoring for emissions not covered in part 1 of BAT14, reference is made to the pollution inventory for the pollutants in question to understand significant sources. Where orders of magnitude exist between mass emissions from sources included in part 1 then sources are considered insignificant for the purposes of considering continuous emissions monitoring. For dust, all significant sources are covered in the submitted table with the exception of coke oven underfiring, however these sources are currently monitored continuously using an obscuration meter (in line with permit requirements). For sulphur dioxide, the sinter plant primary emissions are complex in their make up, derived as they are from sulphur inputs in the raw materials as well as fuel combustion. For other sources of sulphur dioxide, where fuel combustion is the only source of emission, it is considered more accurate to measure emissions based on a mass

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			balance calculation. As the emission of sulphur is directly related to the sulphur input (i.e. no abatement exists) then there is no benefit to continuously monitoring emissions to assess abatement performance. Similarly for oxides of nitrogen, the sinter plant is an order of magnitude greater than all other sources (with the exception of coke oven underfiring), however the same argument on the benefits of monitoring continuously a source with no abatement technology is held. In addition, the information gained from quarterly spot samples from the underfiring stacks is sufficient to describe the emission adequately. The argument for not fitting continuous emissions monitoring on the West secondary vent system (A58) is made on the basis that it is only used when the East secondary vent (A57) is unavailable. The West secondary vent system includes a wet scrubber to remove dust and the cleaned waste gas is therefore saturated with moisture and may contain droplets, making conventional forms of continuous monitoring impracticable. Due to the infrequent operation of the system and the practical difficulties in monitoring, it was not proposed to install continuous emissions monitoring at this location, hence the 'BAT not achieved' comment in the table. If the EA do not agree with this argumentation then a project to understand the technical implications of monitoring dust in moisture and droplet-laden gas streams will be undertaken in the hope that a technique may be found to adequately monitor this insignificant source.
15	Process emissions – air Process emissions - water	Address emissions from coal handing plant A3 & A9. For waste water, specify the required procedure for sampling (e.g. random sample, qualified	Emissions from the sinter plant coal handling plant (sources A3 and A9) are not strictly covered in the BAT conclusions, however following discussions between the Environment Agency and Tata Steel it was decided that they shall be treated in the same way as coal grinding plants for coke ovens (BAT 42). As such, Tata Steel confirm that A3 and A9 will be subject to the BAT AEL of <20 mg/Nm^3. Each emission point

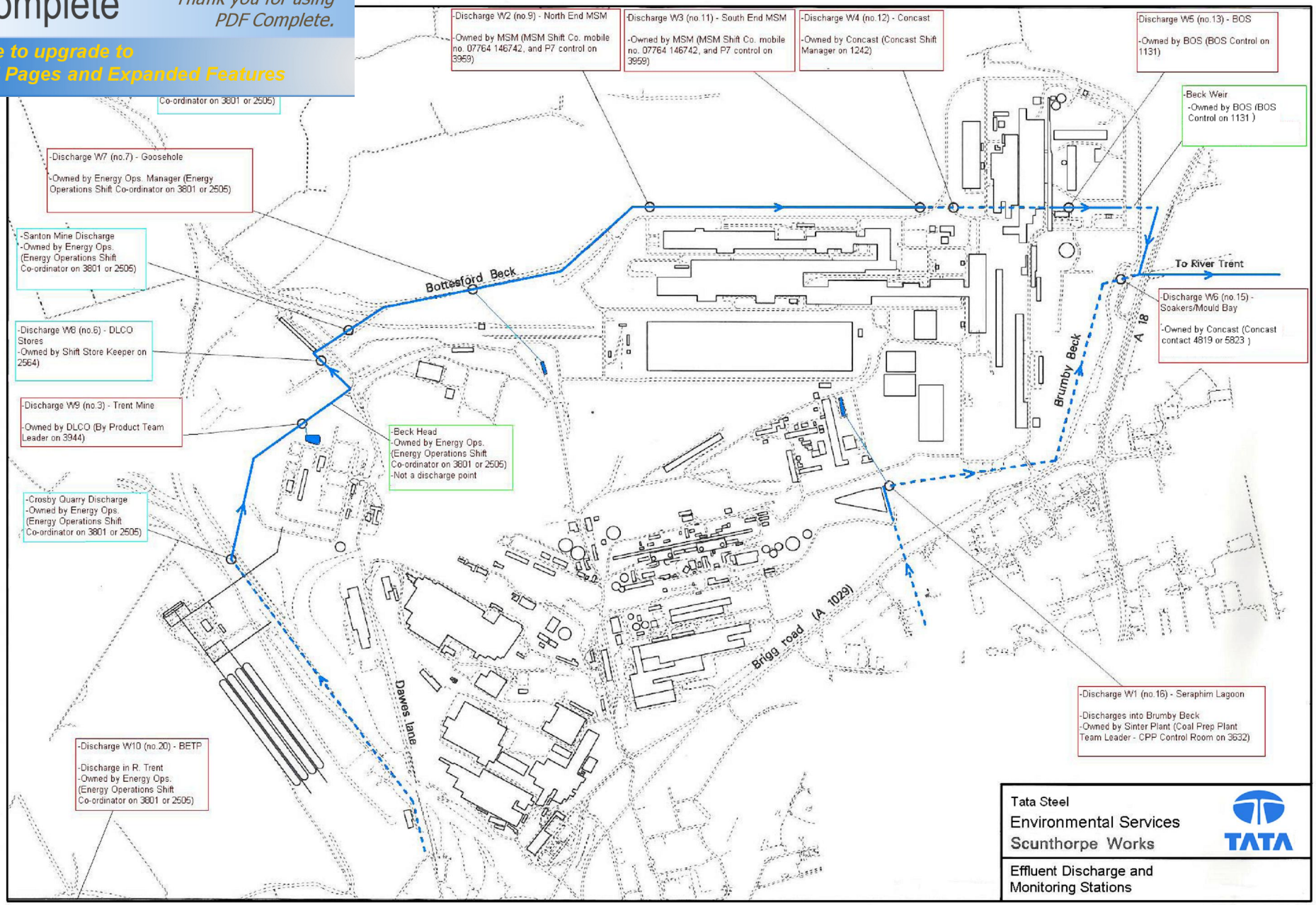
BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
		random sample or composite sample) for each sample point to comply with their relevant BAT-AEL needs. Several pollutants with BAT-AEL limits are not currently sampled to BATc 15 requirements or monitored or have limited datasets, specify these and how you propose to gain datasets of statistical confidence to state if specific derogations are not required.	employs a policing continuous emissions monitor, however compliance is checked by annual spot samples. A number of questions relating to waste water have been answered in a separate document (Snag list response (water).doc), which cover the list of pollutants with BAT-AELs which are not currently sampled as part of the existing permit. All samples will be qualified random samples in accordance with the requirements of the relevant BAT conclusions.
16	Diffuse emissions	Provide copy of your methodology for determining the order of magnitude of diffuse emissions sources at your site.	A spreadsheet of methodology, assumptions and calculations in arriving at an estimate of fugitive emissions for Scunthorpe works is attached to this response (Scunthorpe fugitive dust inventory 2013.xls). The estimate uses production levels combined with specific mass flows from each fugitive emission source to give an annual estimate of total emissions. Specific mass emissions are taken from previous research work within Tata Steel or from external literature sources. The methodology is by no means definitive, but represents Tata Steel's best estimate based on current knowledge. Estimates of significant sources highlighted in the methodology which are based on literature will be subject to further refinement in the coming years as part of the annual measurement programme of Tata Steel's Environmental Technology team.
17	Decommissioning	Confirm that the site condition report (SCR) & intrusive investigation results submitted at PPC permit application remains valid. Where this is not case provide an updated SCR.	Tata Steel confirms that the site condition report (SCR) submitted as part of the PPC permit application stage, and the subsequent design site protection and monitoring programme (SPMP) and periodic reviews, remains valid.

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
20	Dust from sinter	Explain why bag filter is not applicable.	The original submission clearly states why bag filters are not applicable. *Bag filters are not applicable in this context because the plant is already fitted with advanced electrostatic precipitators and there are severe space restrictions upon further downstream installations. Furthermore, installation of bag filters would be disproportionately costly compared to the environmental benefit.* A cost-benefit justification is also given in the original submission (not reproduced here).
24	Reduce dioxins / furans	Address each sub section of the BATc. For those techniques that are not proposed justify why you are not implementing those technique/measures described in the BATc and how your proposed techniques provide an equivalent level of environmental protection.	BAT conclusion 24 is achieved if '*one or a combination*' of the techniques stated are used. The justification for not implementing techniques beyond suppression by the addition of nitrogen compounds and avoiding significant inputs of PCDD/F and PCB is that, in using these techniques, BAT is already met.
60	Burden preparation	By what date will BAT be achieved?	The original submission states that "*to achieve BAT, further assessment of the use of water and/or foam suppression systems will be undertaken, particularly in relation to the coke screens and breeze stocking. Schemes will be implemented where appropriate to minimise dust emissions.*" Any schemes identified to meet the requirements of BAT will be installed by March 2016.
63	Release of BFG during charging	BAT not achieved for the Queen Mary furnace. Confirm that this BF will not be used until it is at BAT.	The original submission states that all discussions of BAT within the blast furnace section only relate to Queens Bess, Anne and Victoria. Queen Mary is not currently used and will not be used until it is upgraded to BAT.

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
69	Minimising slag treatment emissions	Justify why no odour reduction is required for minimising slag treatment emissions from all forms of slag treatment.	In the absence of specific permit limits, the reduction of odour would be driven by whether the odour was presenting a nuisance to the community. Since 2004 only two justified complaints associated with odour from the Blast Furnaces have been made; one in February 2006 could have been attributable to slag treatment, one in April 2007 was caused by a blast furnace bleeder release. The lack of complaints is justification for why odour reduction is not required.
75	BOF (Basic Oxygen Furnace) gas recovery	Provide best estimate of dust concentrations of BOS gas leaving the gas holder and justify why routine monitoring is not practicable at this point.	The measurement of dust concentrations in cleaned BOS gas is difficult to achieve owing to safety concerns when attempting to measure in a positively pressurised gas stream containing approximately 69% carbon monoxide. As in the case of blast furnace gas (see BAT 64), it is proposed to use dust emissions from combustion processes as a surrogate for measuring dust concentrations in the BOS gas itself. The BOS gas is never combusted in isolation, but rather as a component of mixed enhanced gas (MEG, with a controlled calorific value and Wobbe index), which is piped around the site and burned in various processes, particularly in the reheating furnaces of the three rolling mills. The composition of MEG is variable, but a typical mixture at the Anchor mixing station is 10 parts BOS gas to 1 part coke oven gas. Such a mixture, combusted with sufficient excess air to leave a waste gas oxygen content of 3% on a dry basis, requires 2.33 m^3 air per m^3 of MEG and gives 2.87 m^3 dry waste gas. If the residual dust concentration in the buffered BOS gas was at the BAT associated standard of 50 mg/Nm^3, this would give 50x0.909/2.87 = 16 mg/Nm^3 dust in the dry waste gas (at reference conditions of 3% oxygen). Dust in the COG, soot from incomplete combustion or scale drawn into the waste gas system could also contribute to dust emissions, so 16 mg/Nm^3 represents the lower bound of dust concentrations in the waste gas from MEG combustion that is equivalent to the BAT associated standard. Particulate concentrations in combustion systems firing MEG are not

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			currently measured and no comparison with the BAT-associated standard can be made at this time, even though the BAT techniques are applied. A surrogate measurement of particulate emissions in the waste gas stack of one of the reheat furnaces on site will be used to provide evidence that BAT 75 is satisfied. A result less than 16 mg/Nm³ will represent compliance.
78	Secondary dedusting BOF	Not meeting current limit in permit for West Secondary ventilation (A58). Justify not meeting the current limit based on frequency of use and significance of emissions from this release point. Cross ref to BATc14 above.	The West secondary ventilation system is served by a venturi wet scrubber for particulate abatement. The system used to have an ELV of 115 mg/m³ however this was reduced in line with the East secondary ventilation system (an electrostatic precipitator system) at a subsequent permit review, to 20 mg/m³. This level of performance is considered high for a wet scrubber system, and spot samples taken over the last 8 years have confirmed that a more achievable limit is 50 mg/m³ - four measurements have resulted in emissions below 20 mg/m³, three have been in the mid-20s and the highest one was 47 mg/m³. In order to achieve the greatest level of environmental protection, the use of the West secondary vent is now confined to periods when the East secondary vent is unavailable (for example during maintenance or breakdown) - this is typically 10% of the time. With the exception of maintenance periods, it is difficult to plan the use of the West secondary vent, therefore in order to satisfy the requirements of the permit it is sometimes required to swap systems for a period to gain an emission sample. There is no associated BAT-AEL for this type of equipment and therefore Tata Steel would like to propose a limit based on the achievable performance of the system, whilst understanding that the use of the system should continue to be minimised in favour of the East ventilation system. An ELV of <50 mg/m³ with a further requirement to inform the EA of the reason why the system was used would ensure a

BAT Conclusion (BATc) no.	Reference	Further information or justification required	Tata Steel response
			high level of environmental protection. Given the typical operation of the system (approximately 10% of the time) and the additional ELV headroom (30 mg/m^3) an impact assessment of the emission would almost certainly show a negligible impact on air quality. A full impact assessment has not been undertaken but can be if the EA request.
81	Waste water	Cross refer to BATc15 above and provide further information regarding releases of process water before dilution by non process waters and discharge from W4 and W6.	Routine sampling for pollutants with IED ELVs has been ongoing from W4 and W6 and no issues with any of the limits have been experienced, except for suspended solids, particularly during wet weather. The suspended solids ELV is achievable when considering the process effluent, however excursions during heavy rainfall can occur, as the settlement system becomes overloaded with storm water. If the limit is restricted to dry weather conditions (and hence dominated by process effluent) then this is achievable.



Snag list response (other than water)

EA Request / Description	Tata Steel Response
1 Modern regs permit template aspects;	
1.1 Installation description in the Introductory Notes: Requires updating, the non-technical description using permit application guidance criteria. Typical emphasis across multi-operational site to be on key plant – activities, processes, significant emission points, key abatement, key operational BAT; Interaction with other operators on site; aimed at a reasonably intelligent public audience. About 0.5 page per major plant, no longer that present.	Please see attached file (Introductory Note (Short).doc). This condenses the summary of activities on site to three pages, slightly shorter than the current permit.
1.2 We need large scale maps for these large plants (as boundaries are too wide on maps in permit) – Arc-GIS or equivalent. Initially request e-file of Tata's drawings or a PDF copy, A1 size for decent resolution. 1.3 Action on 1.2 if Tata cannot provide for EA and NRW to draw these using Arc-GIS and for Tata to approve 1.4 Resource: Rob Ellis for GIS ARC to A1 scale for definition, scope installation. As an EA Initiated Variation so we get an A1 size, use a background shade or define the edge as the boundary (equivalent to outer edge of a line), reduce down for permit and modify wording in condition 1.1.2.	A1 drawing submitted at snagging meeting, however some changes to boundary need to be made, for example to bring in stocks on Yarborough. A discussion between EA and Tata Steel drawing teams would be beneficial to understand why EA can't use Tata Steel files. **Outstanding action: Tata Steel to consult drawing department to re-draw permitted boundary taking into account any olivine stocks, etc. on Yarborough.**
1.5 Populate table S1.1 for Schedule 1 – Operations; Permitted IED reg listed activities should be known by NP. To be added to Table with "Description of specified activity and WFD Annex I and II operations" and "Limits of specified activity and waste types".	Action for EA?
1.6 Populate table S1.1 for Schedule 1 – Operations; Permitted DAA IED reg listed activities should be known by NP. To be added to Table with "Description of specified activity and WFD Annex I and II operations" and "Limits of specified activity and waste types".	Action for EA?
1.7 Populate Table S2.1 Raw materials and fuels for Schedule 2 – Waste types, raw materials and fuels; Table needs Tata's permitted "raw materials and fuels description" in column 1 and "Specification" in column 2.	Populated Table S2.1 attached (Table S2.1 Raw Materials and Fuels.doc). There is some confusion over what constitutes a raw material or a fuel, plus some discussion required about the level of detail needed in the 'specification' column. **Outstanding action: Tata Steel / EA to discuss what level of detail needs**

<table>
<tr><th>EA Request / Description</th><th>Tata Steel Response</th></tr>
<tr><td>Check Raw Materials in Table S1.3 (PT Draft permit) daily average monitoring requirement (to be consistent with Scunthorpe)

Example from Port Talbot;
Blended coal Blast furnaces, sinter plant, coke ovens
Maximum sulphur content 0.75% W/W
(NB Tata argument re. No limit on BF sulphur in steel and SO2 monitored)
(NB if CO Desulph installed implies limit will be removed)
NB Daily average (0600 – 0600)</td><td>to be in this table.</td></tr>
<tr><td>1.8 Populate Table S2.3 Permitted waste types and quantities for use in the XXX for Schedule 2 – Waste types, raw materials and fuels; Table needs any quantity constraints with Tata’s permitted “WFD Annex I and II operations as E waste codes” in column 1 and “Description” (EWC) in column 2 for specified plant areas.

• Populate the following table for Port Talbot/Scunthorpe for the permitters

Table S2.3 Permitted waste types and quantities for [Drafting Note: specify activity e.g. oil / water mixtures storage]
Maximum quantity — Drafting Note: specify any necessary restriction on quantities e.g. Tanks 1 and 2, waste hazardous properties H7, H14

Waste code | Description
13 05 07* | Oily water from oil/water separators</td><td>The instruction seems contradictory (e.g. should column 1 be maximum quantities of wastes or the EWC code, and if maximum quantities, is this as used per annum or stored on site at any one time?).

Table S2.3 Permitted waste types and quantities

Waste code(s) | Description
10 02 10 | Mill scales
10 02 11* | Wastes from cooling-water treatment (mill scales) containing oil
10 02 12 | Wastes from cooling-water treatment (mill scales) other than those mentioned in 10 02 11
17 04 05
19 01 02
19 10 01
19 12 02
16 01 17 | Steel scrap (various waste codes exist, depending on the source of the scrap)
15 01 07
17 02 02
19 12 05
20 01 02 | Glass (for use in BOS steelmaking as a slag addition) – (various waste codes exist, depending on the source of the glass)
10 02 01 | De-metalled slag</td></tr>
</table>

<table>
<tr><th>EA Request / Description</th><th>Tata Steel Response</th></tr>
<tr><td></td><td></td></tr>
<tr><td><u>H1 for screening out significance for both IED ELVs and Local Environment ELVs....</u>
No new tool to provide at present as not officially released for consultation, some beta versions around internally for NP. Could use the current one to start establishing any data gaps like flow data, point emission flow data, suitable substances datasets, missing substances, etc.....</td><td>For note, no action by Tata Steel?</td></tr>
<tr><td>Add landfill permits to other Part A Installations table to complete EPR installation table</td><td>Action for EA?</td></tr>
<tr><td>Multi Operator Site condition 2.12.2 to template condition 1.5,2, change Mngt condition 1.1.1 to cover contractors and permitted operators so keep current condition 2.12.2 on complaints for Scunthorpe.</td><td>Action for EA?</td></tr>
<tr><td>Master doc for Operating techniques like PT, taken from the PPC application so management of change, change of operation is managed for effectively and efficiently by Tata Steel Scunthorpe. Initially some work to pull this together and benefits later.</td><td>The operating techniques table has been updated with agreed changes since the last update (2008?).

<table>
<tr><th colspan="3">Table S1.2 Operating techniques</th></tr>
<tr><th>Description</th><th>Parts</th><th>Date Received</th></tr>
<tr><td>...</td><td></td><td></td></tr>
<tr><td>Application</td><td>Change in benzole loading system (top loading system removed).</td><td>30.10.08</td></tr>
<tr><td>Application</td><td>Parts 2.2 & 2.3
Change in olivine transportation method to site and storage location.</td><td>08.12.08</td></tr>
<tr><td>Operator submission regarding a change to operations 2.2 (raw materials including water) – use of BOC water in SPM process water stream.</td><td>Parts 2.3</td><td>26.01.09</td></tr>
</table>
</td></tr>
</table>

EA Request / Description	Tata Steel Response		
	Operator request for exemption – BF/BOS temporary slurry lagoon	Parts 2.5 and 2.6	02.06.09
	Application – BF/BOS Slurry drying lagoon	Parts	27.08.09
	Operator submission - Use of BOS Slag at OPP	Parts 2.6	
	Operators submission - request to allow Tata Steel to accept strong ammonical liquor from Koppers tar tanks (previously sent to BETP)	Parts	20.12.11
	Application - Change to CPS gas supplies	Parts 2.1 and 2.7.4	17.01.12
	Application – change of use of BOS secondary vent systems	Parts	13.02.12
	Application – change of BOS materials. Addition of Synslag to permit	Part 2.3	07.08.12
	Changes to associated activity – OMS Pad	Parts 2.5	27.09.12
	Operator submission regarding a change to operations at the Oily Millscale Pad (regarding storage and offsite treatment of millscale)	Parts 2.5 and 2.6	14.01.14
	Application - Decommissioning of ACO gasholder and	Part 2.3	17.02.14

EA Request / Description	Tata Steel Response
	proposed change of use for emergency storage of coke oven effluent.
We should review the contents of Tata's letter BL3838_0516 (26/08/2010). Corus had reviewed and analysed various periodic sampling data sets for reporting purposes under Improvement Requirement 39. They had been reviewing the frequencies of air emissions sampling as part of the improvement process above and to ensure resource is focussed on the important release points. Data has been reviewed for release points A15-20, A46, A47, A48, A70, A83, A301, A302 and A303.	Action for EA?
2 Scunthorpe OPP Queries:	
2.1 Continuous ELVs need to be added for NOx and SO2 for the main sinter stack. Confirmation that particulate, SO2 and NOx ELVs will just be daily averages, from main sinter stack.	We expect the permit to have limits for the main stack in line with the BAT conclusions.
2.2 Particulate continues. All of these will now be monitored on the main A1 Stack, so the requirements for particulates to be separately monitored on the A1/1 and A1/2 stack should be removed.	Agreed.
2.3 ELV's for the Sinter plant will need to be revised to those required by the BAT conclusions document.	Agreed.
2.4 We need to confirm which is the appropriate ELV for the A3/A9 stacks; our initial discussions were that BAT 42 was most relevant here. A3 and A9 coal preparation plant stacks, BAT 42 emission limits to apply.	Agreed (see Regulation 60 response).
2.5 We need to agree the start up and shutdown exclusions (if any) for the sinter plants. This is currently inconsistent. Discuss with Tata. SU / SD if not Normal Operating condition but we don't know the mass emissions or impact.	Please see attached document explaining the issues with abating particulate emissions following a sinter plant start-up (Dust emissions following sinter plant startup.doc). The document proposes a condition to set within the permit which allows start-up emissions to be adequately considered, however this is based upon knowledge of the current sinter plant abatement system. It is possible that this condition may need revising in light of the introduction of

EA Request / Description	Tata Steel Response
	lignite injection and the modifications made to bring normal operating emissions below the 40 mg/m³ limit. For example, it is not known whether a longer time period of stabilisation will be required in order to meet the daily mean of 40 mg/m³ rather than the hourly average of 115 mg/m³. Once improvements to the abatement system are completed, a study into its performance following start up will be undertaken with a view to refining the start-up exclusion condition.
3 Scunthorpe Blast Furnaces:	
3.1 BAT 59: We need to confirm whether emissions monitoring from these storage bunkers is required. There are ELV's in the BAT conclusions but there is no current monitoring requirement. This has been queried nationally. Dust displaced from pulverised coal storage, Tata to propose equivalent measure.	Tata have proposed in the Regulation 60 document to undertake some work to look at the practicalities of measuring the silo outlet. There are already some procedural measures in place to ensure that the filters are intact and not emitting particulate, however no physical measurements are taken to show compliance against a limit. Tata will investigate the use of 'policing' CEMs to show ongoing compliance. With the EA's involvement it is hoped that we will have something in place by 2016.
3.2 BAT 61: This is relevant to the A46/47 stacks, ELVs reduce from 20 – 15 mg/m³	Agreed.
3.3 BAT 64: We need to confirm whether cleaned BF gas needs to be monitor as this is difficult. This has been queried nationally. Cleaned BF gas limit of 10 mg/Nm³, Tata may propose equivalent measure here. See Chris Smith's (IED Project Board) ??? email.	Equivalent measure proposed in Regulation 60 submission.
3.4 Slag granulation, there is no requirement in the BAT conclusions to monitor this release point. We need to confirm whether this will be required or not as Tata will be building a new stack with a new platform. I've queried this with Roy and Dave. Slag granulator ELV to be retained. Any thoughts on the ELV that should be set here?	Agree that ELVs for granulator need to be retained. When sampling is conducted to the revised and agreed method then the current ELVs can be met.
4 Scunthorpe Energy Ops:	
4.1 LCPD ELV will finally need to be inserted into the permit. Care needs to be take here though as although the emissions when burning Works Arising	A bi-lateral discussion between Tata Steel and the EA is ongoing to set LCPD ELVs for the steel industry. Tata Steel has been gathering and assessing

EA Request / Description	Tata Steel Response
Gases are low, they cannot meet the limits for particulates when burning HFO. We can discuss this as part of our handover.	more recent short-term emissions data to cover a range of different operating conditions. A date of 9th May to report back to the EA with a full proposal for ELVs has been agreed between Richard Jackson (Tata Steel) and David Canham (EA).
4.2 Emission very low on WAG, cannot meet the LCP limits when on HFO. Dust is 50 mg/Nm³ Tata is often over 75 mg/Nm³ on HFO.	To note.
5 Scunthorpe BOS:	
5.1 BAT 75: IED Limit is <50mg/m3, current ELV is 115 particulate. Tata claim they can meet it as said "YES", is this fact? A54/55/56 Primary Gas Cleaning but several safety & technical issues to Monitor (CO Toxic gas under pressure). Linked to an old permit Improvement condition (5?). CEMs would need to be intrinsically safe?	Care must be taken here, as the BAT conclusion says that the 50mg/m³ limit applies to cleaned, buffered BOS gas, i.e. that which is collected and used around the site as fuel. As with BF gas, an equivalent measure to ensure this ELV is not breached has been proposed as part of the response to further questions for Regulation 60. ELVs (and measurement requirements) for unbuffered gas (i.e. emitted from the stack) need to be removed from the permit.
5.2 BAT 78 – IED set 20 mg/m3 particulate. A57 (8) currently not meeting AEL. A58 ? No CEM in place so annual extractive spot sample currently being used as required by permit BL3838IW. Limit likely to remain the same, wet scrubber currently being used. All other monitoring points at BOS currently meeting or will meet new AELs. Query Tata on do they have a Bag plant abatement or is it an ESP?	A57 is an electrostatic precipitator and does currently meet the ELV of 20 mg/m³. A58 is a venturi wet scrubber system, whilst there is no associated BAT-AEL for this equipment we have assumed that 20 mg/m³ will remain as the ELV. Currently no CEM on this stack as the high levels of moisture and possible water droplets mean that standard CEMs cannot be used. We will continue to monitor the market for possible CEMs, however would argue that, as the system is only used as redundancy for A57 then the requirement to install CEMs is less significant. A58 is typically used 10% of the time.
5.3 A69 – No particulates ELV? No known policing CEM or compliance CEM. Was set at 50 mg/m3 particulate but missing by mistake. Tata to clarify position and control.	A69 is currently mothballed.
5.4 A84: Has a Spot ELV, to confirm it has a policing CEM?	A84 has a policing CEM fitted.
5.5 A71, Is this a valid emission point and what abatement?	A71 was the BBM Billet Mill scarfer. This is no longer used and can be removed from the permit.
6 Scunthorpe Concast:	

EA Request / Description	Tata Steel Response
6.1 Emission point A69 slab scarfer. Not covered by IED. No emission limit in current permit for A69. Confirmation required of what it is, any historic monitoring data and a decision as to whether it needs to be included in the new permit. 3 other emission points at Concast with emission limits, same info required. Tata to clarify position and control.	A69 is currently mothballed.
7 Scunthorpe Steel Mills:	
7.1 Confirmation required re active emission points for inclusion in the new permit. A71-A77 rolling mills, A101-A125 still in permit from Bloom and Billet Mill, points at MSM and Heavy Plate Mill to be checked. I will follow this up with Chris Jackson and let you know the response.	Emission points A71 – A76 are no longer in use and can be removed from the permit. A77 (BBM No.5 Grinder) is now the property of Scunthorpe Rod Mill and, whilst being used infrequently, is still required in the permit. A101 – A125 are no longer in use and can be removed from the permit. Heavy Plate Mill (A129 – A131), Medium Section Mill (A127 and A137) and Rod Mill (A132 and A138) furnaces are still used and need to be retained.
8 Scunthorpe Coal Handling Plants:	
8.1 BAT 42, 43, 44 appear to be achieved except the measurement of visible emissions – see BAT 46. Tata to clarify position and control.	See 9.1 below.
9 Scunthorpe Coke Ovens:	
9.1 BAT 46 XI: Measurement of visible emissions: The BAT AELs, what do they really mean to be comparable with the BCRA methodology as used in current permits and in the BAT 46. We also have inconsistency across the permits for CO's. Should we have a Technical Working party on this or be using the COMA: Coke Oven Managers Association?	Tata Steel have contacted SSI (operators of Redcar and South Bank Coke Ovens) and Hargreaves (operators of Monckton Coke Ovens) to instigate a cross-sector review of the BCRA methodology and it's relevance to the BAT-AELs contained in BAT46. A unified methodology for demonstrating compliance (or otherwise) with the BAT-AEL will be proposed before 2016.
9.2 BAT 49: Particulates measurement at both DLCO and ACO are not at MCert stds and also IED ELV not achievable. Tata to clarify position and control.	Work is ongoing to install particulate CEMs on the underfiring stack at Dawes Lane. Whilst this monitor will be used to assess compliance with an obscuration standard in line with the current permit, it has been chosen to allow particulate concentration to be recorded for the revised permit. It is expected (subject to capital investment) that equipment serving the underfiring stacks at Appleby will be converted before 2016. Tata Steel have applied for a derogation against the 20 mg/m^3 limit for particulate from

EA Request / Description	Tata Steel Response
	underfiring.

Summary snag list of knowledge gaps or issues captured from several meetings over Q2 -Q3 2013.

Tata Steel Scunthorpe BL3838IW PPC permit review to be transposed to a draft IED template permit during Q4 2013.

Decisions and queries arising from a series of internal and Tata Steel meetings over Q2 - 3: 2013 year	What has to be done?	Tata Steel Response
2 Water emissions; emission points of most concern are W1, W7 and W10, and then diffuse pollution from land surface water runoff.		
General: Agreement to use H1 tool, new version should have been release for Q2 2013 but still not available. Even so, this requires QA/QC data to be used in it and then Flow data for Point sources (Tata) and receiving surface waters (BB & BB) Flow rates (EA).	EA to enquire on H1 tool status.	Agreed that H1 tool should be used, and Neil Haines has attempted to gain information required to effectively run the tool from Kate Wray at the Environment Agency. Once the information Neil requires is available then the H1 tool can be used.
General: Biological Oxygen Demand for 5 days (BOD_5) (mg/ l)	Tata to confirm this is their Standard method or BOD_1?	Confirm that BOD_5 is the standard method.
W1: Is the Sinter Plant contributing any PROCESS water to W1 via Seraphim Lagoon? Surface drainage water would not attract IED ELVs.	Tata to confirm.	No process water from the sinter plant is discharged via W1, only surface run-off from the adjacent area.
W1 has a process Blast Furnace and BOS water sources. (IED limits apply from BF, None for BOS as BAT 82 II and VI must be used (De-watering of BOS gas treatment slurry and subsequent ETP to minimise metals)	Tata to check for proposed derogations?	Processes discharging via W1 are Blast Furnaces and BOS plant (but not Concast). The IED limit for suspended solids for W1 is expected to be 30 mg/l, which can be met therefore no derogation is required.
W1: If H1 is used to screen metals, use metal concentrations as a worse case 100% ionised form (Bio potential).	Tata to take account of assumption basis.	See comment on the general use of H1.
W1: Ammonia: Not thought to be in H1, classed as a "Sanitary substance" so if difficult, we continue with the modelling work anyway.	Tata to try in H1	See comment on the general use of H1.
W1: Iron; No data on IED limit Daily Avg <5mg/l?	Tata need to manage knowledge gap for Reg 60 Notice response.	Monthly sampling of iron from W1 has occurred over the last two years. Of the 24 samples were below the proposed 5 mg/l limit, therefore Tata Steel believe that the IED limit will be achievable.
W1: Cyanide CN^-, No data on IED limit Daily Avg <0.4mg/l? Some historic data that was 0.02mg/l	Tata need to manage knowledge gap for Reg 60 Notice response.	Historical measurements have been confirmed by recent sampling. Tata Steel believe that the IED limit will be achievable.

W1: Note current BOD set for local WQ protection.		
W1: See Note 2 below on targeting Toxic Heavy metals, not Total Metals.	Tata to check if ELV =1 is still BAT achievable in changing definitions.	Previous measurements have been re-calculated using the updated definition and the ELV of 1 mg/l can still be met.
W1: IED Qualified Random Sample as defined or a 24 - hour composite sample?	Tata will need to make argued proposals for agreement as this is a high mass, hi flow point.	The permit requires that W1 is sampled for some pollutants which can deteriorate over time (i.e. requiring rapid analysis following sampling). The collection of a 24h composite sample would not allow this analysis to take place. In addition, a sample from the outlet of Seraphim Lagoon is taken by opening a tap in the outlet pipe, therefore any move towards an automated composite sample would require some re-engineering of the outlet. Before any decision to move to sampling beyond the requirements of IED is made, Tata Steel would need to assess the benefit of more frequent monitoring (e.g. variability of discharge) against the increased cost of sampling and analysis.
W2: Reduce the SS 50mg/l limit to 30 if possible though a low flow point source. Local WQ and be consistent with other IED SS ELVs?	Tata to check current SS data and flows.	W2 has no process water discharges, only surface water run off. Suspended solids in the W2 discharge are generally within the 30 mg/l proposed limit, however excursions during heavy rainfall can occur, as the settlement system becomes overloaded with storm water. If the limit is restricted to dry weather conditions then this is achievable. However, there does not seem to be a reason why the limit should be changed to be consistent with other suspended solids limits for IED sources.
W2: Set up new Local WQ parameters to protect environment from process related effluents	Tata to check these fit in with normal protocols and achievable BAT limits.	As mentioned above, there are no process water discharges from W2, therefore local water quality parameters to protect the environment from process-related effluents are not required.
W3: Set Total Available Chlorine ELV 0.5 as new Local WQ ELV as a CEM in use. Tata to confirmed use of CEM and part of EFFMON system.	Tata to check these fit in with normal protocols and achievable BAT limits.	Chlorine monitoring is undertaken as part of the EFFMON system. Monitoring is undertaken to check the impact of any blowdown of the SRSM cooling water system. Historical measurements confirm that the new ELV is achievable.
W3: Set up new Local WQ parameters to protect environment from process related effluents	Tata to check these fit in with normal protocols and achievable BAT limits.	Measurements to assess the discharge against the proposed limit for TOC and existing limit for suspended solids have concluded that ELVs are achievable.

		The pH level at W3 varies between 8 and 10.5. Based on this historic analysis, it would not be practicable to meet the ELV set for other discharge points (5 to 9) without treatment. Acid dosing would be the only potential method, and due to the discharge being either culverted to the point of discharge or open channel (i.e no mixing) this treatment method may not be effective. High pH levels are due to historic ground conditions in this area of the site. Slag was used as backfill to create stable land for the building of the Anchor Project (SRSM, BOS Plant and Concast Plants). The four discharge points in question will contain a proportion of groundwater drainage from this part of the site. From 'kick testing' work carried out by the Environment Agency ecology experts, it has been concluded that pH input is not having an ecological impact on the Beck (ecology tested upstream of discharge points and downstream and no difference noted). In addition, the flows from these discharge points are low compared to other volume inputs into Bottesford Beck.
W4: Set up new Local WQ parameters to protect environment from process related effluents	Tata to check these fit in with normal protocols and achievable BAT limits.	Whilst W4 has some process effluent discharge, a major component of the discharge is from surface run-off, particularly during wet weather. The suspended solids ELV is achievable when considering the process effluent, however excursions during heavy rainfall can occur, as the settlement system becomes overloaded with storm water. If the limit is restricted to dry weather conditions then this is achievable. The pH level at W4 varies between 8.5 and 10.3. Based on this historic analysis, it would not be practicable to meet the ELV set for other discharge points (5 to 9) without treatment. Acid dosing would be the only potential method, and due to the discharge being either culverted to the point of discharge or open channel (i.e no mixing) this treatment method may not be effective. High pH levels are due to historic ground conditions in this area of the site. Slag was used as backfill to create stable land for the building of the Anchor Project (SRSM, BOS Plant and Concast Plants). The four discharge points in question will contain a proportion of groundwater drainage from this part of the site.

		From 'kick testing' work carried out by the Environment Agency ecology experts, it has been concluded that pH input is not having an ecological impact on the Beck (ecology tested upstream of discharge points and downstream and no difference noted). In addition, the flows from these discharge points are low compared to other volume inputs into Bottesford Beck.
W4: IED sets several new ELVs relating to Concast process waste waters on SS, Fe, Zn, Ni Cr, Total Hydrocarbons. Use of H1 tool to test significant emissions?	Tata to check for proposed derogations?	The proposed limits based on IED ELVs for concast process effluent are all achievable, based on historical measurements and taking the above section comment into account.
W5: Emergency surface water, storm conditions can overcome control systems. Do we set SS ELV at < twice background (B Beck) for local WQ protection?	EA to consider. Tata to consider as currently no greater than background.	Agreed.
W6: Similar to W4. Set up new Local WQ parameters to protect environment from process related effluents. Note that pH range extended to pH=10 as drainage from Slag made ground.	Tata to check these fit in with normal protocols and achievable BAT limits.	Whilst W6 has some process effluent discharge, a major component of the discharge is from surface run-off, particularly during wet weather. The suspended solids ELV is achievable when considering the process effluent, however excursions during heavy rainfall can occur, as the settlement system becomes overloaded with storm water. If the limit is restricted to dry weather conditions then this is achievable. The pH level at W6 varies between 8.2 and 10.0. Based on this historic analysis, it would not be practicable to meet the ELV set for other discharge points (5 to 9) without treatment. Acid dosing would be the only potential method, and due to the discharge being either culverted to the point of discharge or open channel (i.e no mixing) this treatment method may not be effective. High pH levels are due to historic ground conditions in this area of the site. Slag was used as backfill to create stable land for the building of the Anchor Project (SRSM, BOS Plant and Concast Plants). The four discharge points in question will contain a proportion of groundwater drainage from this part of the site. From 'kick testing' work carried out by the Environment Agency ecology experts, it has been concluded that pH input is not having an ecological impact on the Beck (ecology tested upstream of discharge

		points and downstream and no difference noted). In addition, the flows from these discharge points are low compared to other volume inputs into Bottesford Beck.
W6: IED sets several new ELVs relating to Concast process waste waters on SS, Fe, Zn, Ni Cr, Total Hydrocarbons. Use of H1 tool to test significant emissions?	Tata to check for proposed derogations?	Routine sampling for these new pollutants has been ongoing and no issues with any of the IED ELVs have been found, except for suspended solids as detailed above.
W6: SS, Tata highlighted problems to achieve ELV=20 as combined Process with Car Park surface water runoff. IED ELV applies to process waters. Can be met during dry weather (Process only source), Tata asking for such conditional compliance. We need to see settlement abatement as no oil/water separator or local SUDs system.	Tata to meet limit and have abatement.	W6 employs an oil/water separation system (underflow weir). See section above on issues with suspended solids.
W7: Set up new Local WQ parameters to protect environment from former Redbourn Coke oven and Blast Furnace works process related contaminated ground drainage.	Tata to check these fit in with normal protocols and achievable BAT limits.	Until a decision on ammonia limits for W7 is made, the only new limits for compliance are TOC and Total Heavy Metals. Based on recent routine sampling, no issues in meeting the new ELVs is envisaged.
W7: Metals; Use of H1 tool to test significant emissions?	Tata to use.	See comment on the general use of H1.
W7: Flow ELV; Remove ELV, does not serve local WQ needs, cannot be controlled as pumping groundwater to maintain levels to avoid flooding the existing pump house. PI data can be calculated on calculated flow data.	EA to remove ELV.	Agreed.
W7: Flow; Does Tata really understand why it needs pumping? Does Tata understand the ground water hydrology and need external expert technical capability (Consultancy?)	Tata to justify why pumped as root cause, what happens if it takes natural variable levels.	W7 (Goosehole) has abatement for historically contaminated groundwater in the form of baskets of activated carbon which can absorb organics in the water. To ensure that this process is controlled, the amount of water presented to the baskets need to be controlled. By allowing Goosehole to flood, this control will be lost. In addition, an amount of Goosehole water is required to be pumped into the mines water system as make up water.
W7: Ammonia releases are an issue, some high over the recent years. ELV to TBD (under review, WQ modelling)	EA to determine if ELV required protecting local WQ.	Tata Steel will await the EAs determination.
W7: Phenols; Can these be screened out as insignificant with H1 tool using a worse case surrogate as toxic Monohydric Phenol (1-hydroxy-benzene).	Tata to use.	See comment on the general use of H1.

W8: Oil risk, change to ELV = 5 from none visible and consistent with other point emissions.	EA to add ELV.	Whilst there are no problems in meeting an ELV of 5 mg/l for oil, as discharge from W8 only happens in wet weather, there is a concern that as a sample cannot always be taken then missed samples will be recorded and hence be scored in the CCS system. The EA need to confirm that a sample will only be required when flow is experienced. The requirement to sample W8 was taken from the permit in the past owing to difficulties in obtaining samples.
W9: Set up new Local WQ parameters to protect environment from ground drainage. Current ELVs are protection from DLC Ovens contaminated land.	Tata to check these fit in with normal protocols and achievable BAT limits.	W9 does not provide any discharge from Dawes Lane Coke Ovens or associated contaminated land. Is this a typographical error? Surface water from a section of Dawes Lane does discharge via W9, however no issues beyond suspended solids breaches in heavy rainfall are expected.
W9: Flow ELV; Remove ELV, does not serve local WQ needs, cannot be controlled as pumping groundwater to maintain levels to avoid flooding the local Dawes Lane road Bridge area. PI data can be calculated on calculated flow data.	EA to remove ELV.	Agreed.
W9: Ammonia releases are an issue, some unusual data over the recent years. ELV to TBD (under review, WQ modelling).	EA to determine if ELV required protecting local WQ.	A review of ammonia measurements from W9 confirms that levels are typically less than 1 mg/l.
W9: Phenols; Can these be screened out as insignificant with H1 tool using a worse case surrogate as toxic Monohydric Phenol (1-hydroxy-benzene).	Tata to use.	See comment on the general use of H1.
W10: No Local WQ limits set, all driven by IED improvements. These are BOD, Nitrogen containing substances, Cyanides, Phenols Polycyclic Aromatic Hydrocarbons (PAHs) - specifies 6 species, sulphides, Thiocyanates.	Tata to check for proposed derogations?	Sampling and analysis for the full suite of pollutants has been undertaken. Whilst abatement is in place to ensure the vast majority are within specified limits, there are still some unknowns in the performance capability of the existing treatment plant. Consequently, a derogation argument for W10 has been submitted (see derogation document).
W10: Several items of data knowledge missing for IED	Tata to check for proposed derogations?	See comment above.

Permit TABLE 6.3.1 **Action Note: Tata to agree or modify these permit descriptions, proposed from the regulators knowledge to be factually correct and accurate, since permitted 10 years ago.**

Table 6.3.1: Emission points into water		
Emission Point Reference	Source	Receiving Water
W1	Process water and site drainage from the Seraphim Lagoon. (Change description to "Blast Furnace and BOS process water with local site drainage to and from the Seraphim Lagoon.") Tata Steel agree with the new description	Brumby Beck
W2	Site Drainage from MSM and BBM north end. (Change description to "Local site drainage from MSM and Rail SM north area.") Description should read "Local site drainage from SRSM North area"	Bottesford Beck
W3	MSM and BBM process water and site drainage from MSM and BBM middle and south ends and ore blending yard. (Change description to "MSM and Rail SM process water with local site drainage from MSM and Rail SM middle and south ends and ore blending area.") Description should read "SRSM process water with local site drainage from SRSM middle and south ends and ore blending area"	Bottesford Beck
W4	Concast process water and site drainage. Water softener unit and regeneration water. (Change description to "Concast process water and local site drainage with Concast water softener unit and regeneration waste water.") Tata Steel agree with the new description	Bottesford Beck
W5	BOS and Concast plant site drainage (Recycled surface water to BOS plant. Emergency discharge only. Tata Steel agree with the new description	Bottesford Beck
W6	Concast fourth caster process water and site drainage. Site drainage from the soaking pits, material off-loading area and the mould preparation bay. (Change description to "Concast fourth caster process water and site drainage. Site drainage from the soaking pits, material off-loading area and the Briquetting plant area.")	Bottesford Beck

	Description should read "Concast 4 process water and site drainage. Site drainage from the soaking pits, material off-loading area and the Briquetting plant area"	
W7	Site drainage from the area of the former Redbourn Site (Goosehole). (Change description to "Site drainage from the area of the former Redbourn Coke oven and Blast Furnace works to and from "Goosehole" (ground water lagoon).") Tata Steel would prefer the description to stay the same. The Redbourn site housed both iron and steelmaking facilities.	Bottesford Beck
W8	Site drainage from Dawes Lane Coke Oven stores. Tata Steel agree with the new description	Bottesford Beck
W9	Site Drainage from part of the Heavy Section Mill, the Structural Workshops and Bradken. (Change description to "Site drainage from part of the Rail Service Centre, Heavy Section Mill, the Structural Workshops, Dawes Lane Coke Ovens and local Iron Foundry facility areas.") Description should read "Site drainage from part of the Rail Service Centre, Heavy Section Mill, the Structural Workshops, Dawes Lane and local Iron Foundry facility areas"	Bottesford Beck
W10	Biologically treated effluent from the Coke Ovens & Koppers UK Ltd. (Change description to "Biological Effluent Treatment Plant (BETP) treated effluent from both Coke Ovens and a coke oven Tar processing facility.") Tata Steel agree with the new description	River Trent

PROPOSED CHANGES: Permitted point emissions to receiving surface waters, reviewed for Tata to comment. Should be no unnecessary extra burden on Tata to allow improvements in Local Environmental quality except those for IED, many are currently measured but not reported. Some ELVs (e.g. Flows removed).

Parameter & notes	W1 Brumby Beck	W2 Bottesford Beck	W3 Bottesford Beck	W4 Bottesford Beck	W5 Bottesford Beck	W6 Bottesford Beck	W7 Bottesford Beck	W8 Bottesford Beck	W9 Bottesford Beck	W10 River Trent
Sampling (2016 or sooner)	TBD: 24-hr comp?	Random (Spot)	Random (Spot)	TBD: Q. Random or 24-hr comp?	Random (Spot)	TBD: Qualified Random	TBD: Q. Random or 24-hr comp?	Random (Spot)	Random (Spot)	TBD: Random or 24-hr comp?
Flow (m^3/d) (Permitted MCert CEM) Daily mean	**18800**	(note: low flow)	(note: low flow)	(note: **medium** flow?)	**Note 4**	(note: **medium** flow?)	5000 Remove ELV, does not serve local WQ, cannot be controlled.	(note: low flow)	3,273 Remove ELV, does not serve local WQ, cannot be controlled.	**5000**
Total Organic Carbon (TOC) (mg/ l)	20 (Set new Local WQ ELV and **Note 2** to then apply)	20 (Set new Local WQ ELV and **Note 2** to then apply)	20 (Set new Local WQ ELV and **Note 2** to then apply)	20 (Set new Local WQ ELV and **Note 2** to then apply)		20 (Set new Local WQ ELV and **Note 2** to then apply)	20 (Set new Local WQ ELV and **Note 2** to then apply)		20 (Set new Local WQ ELV and **Note 2** to then apply)	Report & TBD See Note **1** from BAT 56. See **Note 5**
Biological Oxygen Demand for 5 days (BOD_5) (mg/ l)	20 **Note 2** to apply	20 (Set new Local WQ ELV and **Note 2** to apply)	20 **Note 2** to apply	20 **Note 2** to apply		20 **Note 2** to apply	20 **Note 2** to apply		20 **Note 2** to apply	100 (IED ELV <20 ~~220~~. See **Note 1** from BAT 56. See **Note 5**
Chemical Oxygen Demand for 5 days (COD) (mg/ l)	**NEW for IED – 2016 or sooner**									<220 (IED AEL. See **Note 1** from BAT 56.
Suspended Solids (mg/ l)	30 (no change, = IED BAT 67)	50; reduce to 30 (Local WQ & IED consistent)?	30	30 (reducing to 20, see IED BAT 81)	Do we set ELV based on no more than 2x background? Tata TBD See **Note 5**	50 ~~30~~ (reducing to 20, see IED BAT 81)	30		30	150

Comment [p1]: BATC 56 allows both

Comment [p2]: KW update: W10 current BOD limit = 100 mg/l reducing to 20 mg/l under IED. The 220 mg/l limit under IED is for COD.

Comment [p3]: KW update:: W6 current SS = 50 mg/l (not 30 mg/l) reducing to 20 mg/l under IED.

Parameter & notes	W1 Brumby Beck	W2 Bottesford Beck	W3 Bottesford Beck	W4 Bottesford Beck	W5 Bottesford Beck	W6 Bottesford Beck	W7 Bottesford Beck	W8 Bottesford Beck	W9 Bottesford Beck	W10 River Trent
pH (min) CEM - EFFMON	5.0	5.0 (Set new Local WQ ELV)	5.0 (Set new Local WQ ELV)	5.0 (Set new Local WQ ELV)		5.0 (Set new Local WQ ELV)	5.0		5.0	5.0
pH (max) CEM - EFFMON	9.0	9.0 (Set new Local WQ ELV)	9.0 (Set new Local WQ ELV)	9.0 (Set new Local WQ ELV)		10.0 (Set new Local WQ ELV)	9.0		9.0	9.0
Ammoniacal Nitrogen (as N) (mg/l)	Current = 4.0 ELV = 3.5 (Reviewed, Regional WQ modelling)						**Currently = No ELV** (Reviewed, Regional WQ modelling)		Currently not under review	200 (IED sets new ELV <15 -50 and criteria of N-substances)
Arsenic (mg/ l) NEW for IED – 2016 or sooner See Note 2	Set ELV						-			
Cadmium (mg/ l)	0.002 Set a mass limit?						-		-	
Chromium (mg/ l)	0.05			NEW: IED < 0.5 so ELV to set. See BAT 81.		NEW: IED < 0.5 so ELV to set. See BAT 81.	0.08			
Copper (mg/ l)	0.025						0.025			
Iron (mg/l) NEW for IED – 2016	NEW: IED < 5 ~~0.5~~ so ELV to set. See IED BAT 67			NEW: IED < 5 ~~0.5~~ so ELV to set. See BAT 81.		NEW: IED < 5 ~~0.5~~ so ELV to set. See BAT 81.				
Mercury (mg/ l)	0.0006 Set a mass limit?						-		-	
Nickel (mg/l)	0.10			NEW: IED < 0.5 so ELV to set. See BAT 81.		NEW: IED < 0.5 so ELV to set. See BAT 81.	0.1			

Comment [p4]: Under the WFD, ammonia within the Waterbody (WB) should meet Good Status as determined under the directive. The Bottesford Beck WB is classified as a Lowland and High alkalinity topology with a Total Ammonia 'good' target of 0.6mg/l as 90%ile.
To meet water body ammonia compliance, a MAC ammonia limit of 3.5mg/l is required as a minimum to achieve ammonia **good status** in the Bottesford Beck WB ("Good "at Holme Bridge). To achieve ammonia good status **immediately** downstream of W1 on the Brumby Beck (Emanuel Bridge), a MAC ammonia limit of 1mg/l is required. We propose this as a target limit moving towards BAT by trialling environmental measures to prevent and minimise.

Comment [p5]: KW Update: W1, W4 & W6 iron limit under IED is 5 mg/l, not 0.5 mg/l.

Parameter & notes	W1 Brumby Beck	W2 Bottesford Beck	W3 Bottesford Beck	W4 Bottesford Beck	W5 Bottesford Beck	W6 Bottesford Beck	W7 Bottesford Beck	W8 Bottesford Beck	W9 Bottesford Beck	W10 River Trent
Lead (mg/l)	0.08 (Local WQ ELV < IED <0.5)						0.08			
Zinc (mg/l)	0.7 (Local WQ ELV < IED < 2)			NEW: IED < 2 so ELV to set. See BAT 81.		NEW: IED < 2 so ELV to set. See BAT 81.	0.7			
NEW Total Heavy Metals (mg/l) See Note 2	1.0 Change as **Note 3** and achievable?						1 Change as **Note 3** and achievable?			Report TBD
Total Metals See Note 2	Report						Report			Report TBD
Visible Hydrocarbons in sample	Visible	Visible	Visible	Visible	Visible	Visible	Visible	Visible	Visible	Visible
Total Mineral Oil measured as Hydrocarbons (mg/ l)	5.0	5.0	5.0	5.0: EXISTING: IED < 5 so ELV tighter See BAT 81.		5.0: EXISTING: IED < 5 so ELV tighter See BAT 81.	5.0	5.0 (Change from non-visible)	5.0	5.0
Uncomplexed Cyanide (as easily release CN) (mg/l)	IED < 0.4 so ELV to set. See BAT 67) **Note 6** from BAT 67.						0.1		0.1	0.3 (IED ELV < 0.1. See BAT 56) **Note 6** from IED BAT 56.
Total Phenols (mg/l)							3		3	5 (mono-hydric) (IED ELV < 0.5, see IED BAT 56)

Individual Phenols (mg/l) **TBD = To Be Determined**							TBD		TBD	TBD
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/l)	(Specifies 6 species) NEW for IED - 2016									NEW: IED <0.05 so ELV to set. See IED BAT 56
Sulphides, easily released (mg/l) NEW for IED - 2016										NEW: IED <0.1 so ELV to set. See IED BAT 56. **Note 7** from IED BAT 56.
Thiocyanate (as CNS) (mg/l)										10.0 (reducing to < 4, see IED BAT 56)
Total Available Chlorine (mg/l) **Daily Mean EFFMON**	Report (EFFMON)		0.50 (Set new Local WQ ELV as a CEM in use	0.50		0.50				

NOTES:

Black text are existing permitted requirements to secure local Environmental quality, **Red** text are IED based or proposed improvements to secure local Environmental quality, effectively neutral change in sampling or monitoring burden as probably done already, but not permitted or reported.

1. IED BAT 56 (BETP) Footnote (1); In some cases, TOC is measured instead of COD (in order to avoid HgCl 2 used in the analysis for COD). The correlation between COD and TOC should be elaborated for each coke oven plant case by case. The COD/TOC ratio may vary approximately between two and four.

2. Biological Oxygen Demand for 5 days (BOD_5) (mg/ l) analysis to be reported on all samples determined to have a Total Organic Carbon (TOC) > 20mg/l.

3. **Total Metals** permitted currently as the sum of Cu, Cr, Pb, Ni, Zn and their compounds expressed as metal. We should revised this to be more targeted in our interest of toxic heavy metals as a suite and can be consistent with IED. Proposal to change to **Total Heavy Metals** as the sum of As, Cd, Cr, Cu, Hg, Ni, Pb, Zn and their compounds expressed as metal. [If we state Total Metals, then we mean the sum of all metals > Limit of detection and their compounds expressed as metal so we can determine the metal loading as a total].

4. Emergency Release point with no limits: Reporting for W5 only required when a release occurs to be added into Reporting requirements. Do we protect the local environment with a SS based on say max 2 x Background (e.g. Power station permits) in the receiving water.

5. W10 BOD monitoring twice / month (others monthly), necessary as part of the previous improvement condition (ref: 9.1.1.B43).

6. IED BAT 56 (BETP)) Footnote (3) or BAT 67 (B Furnaces) Footnote (1); This level is based on the use of the DIN 38405 D 13-2 or any other national or international standard that ensures the provision of data of an equivalent scientific quality.

7. IED BAT 56 (BETP) Footnote (2); This level is based on the use of the DIN 38405 D 27 or any other national or international standard that ensures the provision of data of an equivalent scientific quality.

Comment [p6]: PB to check

Changes to EPR and IED implementation

The latest information on the Industrial Emissions Directive (IED) found on our EA Web site.

http://www.environment-agency.gov.uk/business/145770.aspx

The Environmental Permitting (England and Wales) (Amendment) Regulations 2013 (SI 2013 No. 390) are now at:

http://www.legislation.gov.uk/search?title=&year=2013&number=390&type=uksi

They were made on 20 February 2013. They enter force in accordance with their regulation 2, for the most part from 27 February 2013. Their principal purpose is to transpose the industrial emissions Directive (2010/75/EU).

An unofficial consolidation of a substantial part of the Environmental Permitting (England and Wales) Regulations 2010 as amended by these Regulations will imminently be placed at;

http://www.defra.gov.uk/industrial-emissions/eu-international/industrial-emissions-directive .

Note: Please ensure you read the first page of that document in order to understand its status and content.

Summary of articles in the Industrial Emissions Directive

Common provisions

1 Subject matter
2 Scope
3 Definitions
4 Obligation to Hold Permit
5 Granting of Permit
6 General Binding Rules
7 Incidents and Accidents
8 Non-compliance
9 Emission of Greenhouse Gases

Provisions for activities listed in Annex I

10 Scope
11 General Principle Governing the basic obligations of the operator
12 Applications for Permits
13 BAT Reference documents and exchange of information
14 Permit Conditions
15 Emission Limit values, equivalent parameters and technical measures
16 Monitoring arrangements
17 General binding Rules for activities listed in Annex 1
18 Environmental Quality Standards
19 Developments in BAT
20 Changes by Operators to conditions
21 Reconsideration and updating of permit conditions by the competent authority
22 Site Closure
23 Environmental inspections
24 Access to information and public participation in the permit procedure
25 Access to justice
26 Trans-boundary Effects
27 Emerging techniques

Special provisions for Combustion Plants

28 Scope
29 Aggregation Rules
30 Emission limit values
31 Desulphurisation rate
32 Transitional National Plan
33 Limited life time derogation
34 Small isolated systems
35 District heating plants
36 Geological storage of CO_2
37 Malfunction or breakdown of the abatement equipment
38 Monitoring of emissions into the air
39 Compliance with Emission limit values
40 Multi-fuel firing combustion plant
41 Implementing rules

Special provisions for waste Incineration Plants and waste Co-incineration Plants

42 Scope
43 Definition of residue
44 Applications for permits
45 Permit conditions
46 Control of emissions
47 Breakdown
48 Monitoring of emissions
49 Compliance with emission limit values
50 Operating Conditions
51 Authorisation to change operating conditions
52 Delivery and reception of waste
53 Residues
54 Substantial change
55 Reporting and public information on waste incineration plants and waste co-incineration plants

Special provisions for Installations and Activities using Organic Solvents

56 Scope
57 Definitions
58 Substitution of hazardous substances
59 Control of emissions
60 Monitoring of emissions
61 Compliance with emission limits
62 Reporting on Compliance
63 Substantial changes to existing installations
64 Exchange of information on substitution of organic solvents
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Special Provisions for Installations producing Titanium Dioxide

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67 Prohibition of the disposal of waste
68 Control of emissions into water
69 Prevention and control of emissions into air
70 Monitoring of emissions

Committee, Transitional and Final Provisions

71 Competent Authorities
72 Reporting by member States
73 Review
74 Amendment of Annexes
75 Committee Procedure
76 Exercise of the delegation
77 Revocation of the delegation
78 Objections to delegated acts
79 Penalties
80 Transposition
81 Repeal
82 Transitional Provisions
83 Entry into force
84 Addresses

Annex I: **Categories of activities referred to in Article 10**
Annex II: **List of Polluting Substances**
Annex III: **Criteria for determining BAT**
Annex IV: **Public participation in decision making**
Annex V: **Technical provisions relating to combustion plants**
Annex VI: **Technical provisions relating to waste incineration**
Annex VII: **Technical provisions relating to installations and activities using organic solvents**
Annex VIII: **Technical provisions relating to installations producing TiO_2**
Annex X: **Correlation Table**

Table S2.1 Raw materials and fuels		
Raw materials and fuel description	**Specification**	**Storage Conditions**
Site-wide materials		
Coke Oven Gas (COG) for combustion	5000 (ACO) or 4500 (DLCO) mg /m^3 as the daily average (06:00 hours to 06:00 hours) of the hydrogen sulphide content of coke oven gas burned at the coke oven.	Gas holders
Blast Furnace Gas (BFG) for combustion	*If agreed, specification will be for particulate loading, measured as worse case scenario at Stoves.*	
Mixed Enhanced Gas (MEG) for combustion	*If agreed, specification will be for particulate loading in BOS gas, measured as worse case scenario at reheat furnaces.*	
Natural Gas for combustion		None
Diesel for standby equipment		Bunded storage tanks
Propane for burner ignition		Storage tanks
Power Station and Turbo Blower House		
Heavy Fuel Oil (HFO) for combustion	The maximum sulphur content shall be 1.0% of sulphur by weight/weight (dry).	Bunded storage tanks
Coal handling plant and Coke Ovens		
Coals for carbonisation	The maximum sulphur content of the blended coal shall be 0.75% of sulphur by weight/weight (dry). (daily average 06:00 – 06:00)	Stockpiles and silos at coal handling plant, service bunkers at coal blending plant
Crushed coke breeze for reduction in Blast Furnace		
Carbon fines for reduction in Blast Furnace		
Petroleum coke for reduction in Blast Furnace		
Oil for coal blend density control (not raw material or fuel, but reports to by-products)	Recovered oil used for this purpose must meet the end of waste protocol criteria.	Bunded storage tanks

Creosote oil for benzene removal (not raw material or fuel, but some element probably reports to by-products)	
Petroleum wash oil for benzene removal (not raw material or fuel, but some element probably reports to by-products)	
Caustic soda for ammonia removal (not raw material or fuel, but some element probably reports to by-products)	
Sulphuric acid for ammonium sulphate production	
Coals for blast furnace injection	Stockpiles
Crosby oil field gas	None
Ore Preparation and Sinter Plant	
Iron ore	Stockpiles, bunker and hopper systems
Limestone	
Olivine	
Burnt lime	
Dolomite	
Coke breeze	
Iron ore pellets	
Millscale	
Blast Furnace flue dust	
Blast Furnace hydrocyclone underflow	
Sinter Plant fines and spillage	
Metallic fines	
BOS debris	
Mag brick	
Skimmer fines	
Black sand	
Coal Preparation Plant	
Limestone chips	Stockpiles
Blast Furnaces	
Sinter	Stockpiles or directly charged from sinter plant
Rubble ore	Stockpiles, conveyor and hopper systems
Iron ore pellets	

Coke	
Coke nuts	
Waste oxide briquettes	
Granular coal	
Iron ore fines	
Basic Oxygen Steelmaking	
Scrap	Scrap bay
Hot metal	Torpedoes and ladles
Burnt lime	Silo
Dolomet	Alloy stores and bunker system
Dolomite	
Coke	Conveyor and bunker system
Synthetic slag	
Cover powder	Bagged in Mould bay
Waste oxide briquettes	Waste oxide briquette plant
Alloys, including but not limited to Ferro manganese, Silicon manganese, Ferro silicate, Aluminium, Bismuth, Carbon, Copper, Ferro boron, Ferro molybdenum, Ferro niobium, Lead, Ferro phosphorous, Sulphur, Ferrous sulphide, Tellurium and Magnesium.	Alloy stores, silos and bunker systems
Rolling Mills	
Slab, blooms and billet	Stockyards