

# Environment Agency permitting decisions

## Variation

We have decided to issue the variation for Isle of Wight Waste Recovery Park operated by Amey LG Limited.

The variation number is [EPR/QP3337AD/V002](#)

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 environmental protection is provided.

## Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

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

## Structure of this document

- Key issues
- Annex 1 the decision checklist
- Annex 2 the consultation and web publicising

## Key issues of the decision

### 1. Introduction

The site has three permits covering treatment of waste to produce refuse derived fuel (RDF) and waste transfer, discharge of surface water and gasification of waste. This variation is to consolidate the three permits into a single permit, to allow operation of a new waste treatment plant and a refurbishment of the gasification plant. There are now three separate charges- installation, waste activity and water discharge activity. The changes are as follows:

A new waste treatment building that will receive municipal and commercial waste and remove recyclable materials to produce RDF. There will also be provision to receive mixed recyclables and sort these into categories before transferring off site. The gasification plant will continue to gasify RDF. It will be refurbished by replacing the boiler and steam turbine. The stack will also be

replaced by an identical unit. The changes in the gasification plant will allow an increase in capacity from 4 tonnes per hour to 5 tonner per hour

The Applicant applied for the RDF plant to be a separate 5.4 A(1)(a)(ii) activity. This was on the basis that the purpose of the activity is to remove recyclables rather than pre-treatment for incineration. However if the main purpose is to recover recyclables then it is a recovery activity and not a disposal activity. We have therefore included this activity in the permit as a waste activity.

## 2. Air quality assessment

### 2.1. dispersion modelling

The Applicant assessed the emissions to air against the relevant air quality standards, and the potential impact upon local conservation and habitat sites and human health. These assessments predict the potential effects on local air quality from the Installation's stack emissions using the ADMS 5 dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used 5 years of meteorological data collected from the weather station at St Catherine's Point between 2010 and 2014. The Weather station is 10 km from the facility.

The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions.

- First, they assumed that the ELVs in the Permit would be the maximum permitted by Article 46(2) and Annex VI of the IED. These substances are:
  - Oxides of nitrogen (NO<sub>x</sub>), expressed as NO<sub>2</sub>
  - Total dust
  - Carbon monoxide (CO)
  - Sulphur dioxide (SO<sub>2</sub>)
  - Hydrogen chloride (HCl)
  - Hydrogen fluoride (HF)
  - Metals (Cadmium, Thallium, Mercury, Antimony, Arsenic, Lead, Chromium II and III, Cobalt, Copper, Manganese, Nickel and Vanadium)
  - Polychlorinated dibenzo-para-dioxins and polychlorinated dibenzo furans (referred to as dioxins and furans)
  - Gaseous and vaporous organic substances, expressed as Total Organic Carbon (TOC)
- It was assumed that the Installation operates continuously at the relevant long-term or short-term emission limit values, i.e. the maximum permitted emission rate (except for emissions of chromium VI).
- The Chromium VI emission was based on Environment Agency guidance on chromium VI levels in APC residues
- Third, the model also considered emissions of pollutants not covered by Annex VI of IED, specifically Polycyclic Aromatic Hydrocarbons (PAH) and PCBs. Emission rates used in the modelling have been drawn from data

in the Waste Incineration BREF and are considered further in section 5.2.5.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary.

The Applicant calculated the peak ground level concentrations.

The way in which the Applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by the Environment Agency's modelling specialists to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites.

Our review of the Applicant's assessment leads us to agree with the Applicant's conclusions. We have also audited the air quality and human health impact assessment and similarly agree that the conclusions drawn in the reports were acceptable.

The Applicant's modelling predictions are summarised in the following sections.

#### Assessment of Air Dispersion Modelling Outputs

The Applicant's modelling predicted peak ground level exposure to pollutants in ambient air. We have conservatively assumed that the maximum concentrations occur at the location of receptors.

Whilst we have used the Applicant's modelling predictions in the table below, we have made our own simple verification calculation of the percentage process contribution and predicted environmental concentration. These are the numbers shown in the tables below and so may be very slightly different to those shown in the Application. Any such minor discrepancies do not materially impact on our conclusions.

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$	% of EAL
NO <sub>2</sub>	40	1	9.4	1.67	4.18	11.1	27.7
	200	2	18.8	43.08	21.5	61.88	30.9
PM <sub>10</sub>	40	1	15.1	0.12	0.30	15.2	38.1
	50	3	15.1	0.43	0.86	15.53	31.1
PM <sub>2.5</sub>	25	1	9.8	0.12	0.48	9.92	39.7
SO <sub>2</sub>	266	4	13.4	94.96	35.7	108.36	40.7

	350	5	13.4	61.25	17.50	74.65	21.3
	125	6	13.4	3.68	2.9	17.08	13.7
HCl	750	7	0.8	40.76	5.4	41.6	5.54
HF	16	8	0.5	0.01	0.06	0.510	3.19
	160	7	1	2.72	1.7	3.72	2.3
CO	10000	9	206.2	6.9	0.07	213	2.1
	30000	10	206.2	33.96	0.11	240	0.8
TOC	5	1	0.76	0.12	2.40	0.880	17.60
PAH	0.00025	1	0.0000001	2E-08	0.008	0.0000001	0.05
PCBs	0.2	1	-	0.000060	0.03	-	-
	6	10	-	0.00038	0.006	-	-

TOC as benzene

PAH as benzo[a]pyrene

- 1 Annual Mean
- 2 99.79<sup>th</sup> %ile of 1-hour means
- 3 90.41<sup>st</sup> %ile of 24-hour means
- 4 99.9<sup>th</sup> ile of 15-min means
- 5 99.73<sup>rd</sup> %ile of 1-hour means
- 6 99.18<sup>th</sup> %ile of 24-hour means
- 7 1-hour average
- 8 Monthly average
- 9 Maximum daily running 8-hour mean
- 10 1-hour maximum

Pollutant	EQS / EAL		Back-ground	Process Contribution		Predicted Environmental Concentration	
	$\mu\text{g}/\text{m}^3$			$\mu\text{g}/\text{m}^3$	% of EAL	$\mu\text{g}/\text{m}^3$	% of EAL
Cd	0.005	1	0.00009	0.0002	4.0	0.00029	5.8
Hg	0.25	1	0.001	0.0004	0.16	0.00140	0.56
	7.5	2	0.002	0.02	0.27	0.02200	0.293
Sb	5	1	0.0008	0.0004	0.01	0.0012	0.02
	150	2	0.002	0.03	0.02	0.03200	0.021
Pb	0.25	1	0.005	0.0004	0.16	0.00540	2.16
Cu	10	1	0.002	0.0004	0.00	0.0024	0.024
	200	2	0.005	0.03	0.02	0.03500	0.018
Mn	0.15	1	0.002	0.0004	0.27	0.0024	1.60
	1500	2	0.004	0.03	0.002	0.03400	0.0023
V	5	1	0.0009	0.0004	0.01	0.0013	0.03

	1	3	0.002	0.03	3.00	0.03200	3.20
As	0.003	1	0.0006	0.0004	13.33	0.00100	33.3
Cr (II)(III)	5	1	0.001	0.0004	0.01	0.00140	0.028
	150	2	0.002	0.03	0.02	0.03200	0.0213
Cr (VI)	0.0002	1	0.00008	0.000009	4.50	0.00009	44.5
Ni	0.02	1	0.0007	0.0004	2.00	0.00110	5.5

- 1 Annual Mean  
2 1-hr Maximum  
3 24-hr Maximum

(i) Screening out emissions which are insignificant

From the tables above the following emissions can be screened out as insignificant in that the process contribution is < 1% of the long term EQS/EAL and <10% of the short term EAQ/EAL. These are:

- PM10, PM2.5, HCl, HF, CO, PAH, PCBs

Therefore we consider the Applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the Installation subject to the detailed audit referred to below.

(ii) Emissions unlikely to give rise to significant pollution

Also from the tables above all other emissions (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% (taking expected modelling uncertainties into account) of both the long term and short term EQS/EAL.

For these emissions, we have carefully scrutinised the Applicant's proposals to ensure that they are applying the Best Available Techniques to prevent and minimise emissions of these substances. This is reported in section 5 of this document.

(iii) Compassion with the existing permitted installation

The table below shows that the impacts from the new modelling are reduced from those predicted in the 2006 modelling report.

	2006 Dispersion modelling	Dispersion modelling for EPR/QP3337AD/V002
Maximum Annual mean PC for NO <sub>2</sub> (µg/m <sup>3</sup> )	2.93	1.67

2.2. Human Health risk assessment

For dioxins, furans and dioxin like PCBs, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over a period of time.

The human health risk assessment calculates the dose of dioxins and furans that would be received by local receptors if their food and water were sourced from the locality where the deposition of dioxins, furans and dioxin like PCBs is predicted to be the highest. This is then assessed against the Tolerable Daily Intake (TDI) levels established by the COT of 2 picograms I-TEQ / Kg bodyweight/ day.

The results of the Applicant’s assessment of dioxin intake are detailed in the table below. (the worst case results for each care shown). The results showed that the predicted daily intake of dioxins, furans and dioxin like PCBs at all receptors, resulting from emissions from the proposed facility, were significantly below the recommended TDI levels.

Receptor	adult	child
Farmer Northwest	0.079	0.12

Calculated maximum daily intake of dioxins by local receptors resulting from the operation of the proposed facility (I-TEQ/ kg-BW/day)

The FSA has reported that dietary studies have shown that estimated total dietary intakes of dioxins and dioxin-like PCBs from all sources by all age groups fell by around 50% between 1997 and 2001. and are expected to continue to fall. A report in 2012 showed that Dioxin and PCB levels in food have fallen slightly since 2001. In 2001, the average daily intake by adults in the UK from diet was 0.9 pg WHO-TEQ/kg bodyweight. The additional daily intake predicted by the modelling as shown in the table above is substantially below this figure.

In 2010, FSA studied the levels of chlorinated, brominated and mixed (chlorinated-brominated) dioxins and dioxin-like PCBs in fish, shellfish, meat and eggs consumed in UK. It asked COT to consider the results and to advise on whether the measured levels of these PXDDs, PXDFs and PXBs indicated a health concern (‘X’ means a halogen). COT issued a statement in December 2010 and concluded that “ The major contribution to the total dioxin toxic activity in the foods measured came from chlorinated compounds. Brominated compounds made a much smaller contribution, and mixed halogenated compounds contributed even less (1% or less of TDI). Measured levels of PXDDs, PXDFs and dioxin-like PXBs do not indicate a health concern”. COT recognised the lack of quantified TEFs for these compounds but said that “even if the TEFs for PXDDs, PXDFs and dioxin-like PXBs were up to four fold higher than assumed, their contribution to the total TEQ in the diet would still be small. Thus, further research on PXDDs, PXDFs and dioxin-like PXBs is not considered a priority.”

In the light of this statement, we assess the impact of chlorinated compounds as representing the impact of all chlorinated, brominated and mixed dioxins / furans and dioxin like PCBs.

### 2.3. Impact of abnormal operations

Article 50(4)(c) of IED requires that waste incineration and co-incineration plants shall operate an automatic system to prevent waste feed whenever any of the continuous emission monitors show that an emission limit value (ELV) is exceeded due to disturbances or failures of the purification devices. Notwithstanding this, Article 46(6) allows for the continued incineration and co-incineration of waste under such conditions provided that this period does not (in any circumstances) exceed 4 hours uninterrupted continuous operation or the cumulative period of operation does not exceed 60 hours in a calendar year. This is a recognition that the emissions during transient states (e.g. start-up and shut-down) are higher than during steady-state operation, and the overall environmental impact of continued operation with a limited exceedance of an ELV may be less than that of a partial shut-down and re-start.

For incineration plant, IED sets backstop limits for particulates, CO and TOC which must continue to be met at all times. The CO and TOC limits are the same as for normal operation, and are intended to ensure that good combustion conditions are maintained. The backstop limit for particulates is 150 mg/m<sup>3</sup> (as a half hourly average) which is five times the limit in normal operation.

Article 45(1)(f) requires that the permit shall specify the maximum permissible period of any technically unavoidable stoppages, disturbances, or failures of the purification devices or the measurement devices, during which the concentrations in the discharges into the air may exceed the prescribed emission limit values. In this case we have decided to set the time limit at 4 hours, which is the maximum period prescribed by Article 46(6) of the IED.

These abnormal operations are limited to no more than a period of 4 hours continuous operation and no more than 60 hour aggregated operation in any calendar year. This is less than 1% of total operating hours and so abnormal operating conditions are not expected to have any significant long term environmental impact unless the background conditions were already close to, or exceeding, an EQS. For the most part therefore consideration of abnormal operations is limited to consideration of its impact on short term EQSs.

In making an assessment of abnormal operations the following worst case scenario has been assumed:

- Dioxin emissions of 10 ng/m<sup>3</sup>, 100 times normal operation
- NO<sub>x</sub> emissions at 400mg/m<sup>3</sup> which is the same as the short term ELV

- Particulate emissions of 150 mg/m<sup>3</sup> , 5 times normal operation
- Metal emissions of 5 times those of normal operation
- SO<sub>2</sub> emissions of 268 mg/m<sup>3</sup>, 1.4 times normal operation
- HCl emissions of 457mg/m<sup>3</sup>, 7.7 times normal operation

This is a worst case scenario in that these abnormal conditions include a number of different equipment failures not all of which will necessarily result in an adverse impact on the environment (e.g. a failure of a monitoring instrument does not necessarily mean that the incinerator or abatement plant is malfunctioning). This analysis assumes that any failure of any equipment results in all the negative impacts set out above occurring simultaneously.

The result on the Applicant's short-term environmental impact is summarised in the table below.

Pollutant	EQS / EAL		Back-ground	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
	µg/m <sup>3</sup>			µg/m <sup>3</sup>	% of EAL	µg/m <sup>3</sup>	% of EAL
NO <sub>2</sub>	200	2	18.8	43.2	21.6	62	31.0
PM <sub>10</sub>	50	3	15.1	24.5	49.00	39.6	79.2
SO <sub>2</sub>	266	4	13.4	128.6	48.3	142	53.4
	350	5	13.4	83	23.71	96.4	27.5
HCl	750	6	0.8	313.5	41.8	314.3	41.91
HF	160	6	1	1.4	0.875	2.40	1.5
Hg	7.5	1	0.0021	0.11	1.47	0.11210	1.495
Sb	150	1	0.0016	1.1	0.73	1.10160	0.734
Cu	200	1	0.005	1.1	0.55	1.10500	0.553
Mn	1500	1	0.004	1.1	0.07	1.10400	0.0736
Cr (II)(III)	150	1	0.0019	1.1	0.73	1.10190	0.7346

From the table above the emissions of the following substances can still be considered insignificant, in that the PC is still <10% of the short-term EQS/EAL :

- HF and metals

Also from the table above emissions of the other substances (which were not screened out as insignificant) have been assessed as being unlikely to give rise to significant pollution in that the predicted environmental concentration is less than 100% of short term EQS/EAL.



We are therefore satisfied that it is not necessary to further constrain the conditions and duration of the periods of abnormal operation beyond those permitted under Chapter IV of the IED.

We have not assessed the impact of abnormal operations against long term EQSs for the reasons set out above. Except that if dioxin emissions were at 10 ng/m<sup>3</sup> for the maximum period of abnormal operation, this would result in an increase of approximately 70% in the TDI reported in section 5.3.3. In these circumstances the predicted intake would be 0.2 pg(I-TEQ/ kg-BW/day), which is 10% of the COT TDI. At this level, emissions of dioxins will still not pose a risk to human health.

#### 2.4. Impact on Habitats sites, SSSIs, non-statutory conservation sites etc.

##### 2.4.1. Sites Considered

The following Habitats (i.e. Special Areas of Conservation, Special Protection Areas and Ramsar) sites are located within 10Km of the Installation:

- Solent & Southampton Water SPA and Ramsar
- Briddlesford Copses SAC
- Isle of Wight Downs SAC
- South Wight Maritime SAC
- Solent Maritime SAC

The following Site of Special Scientific Interest is located within 2Km of the Installation:

- Parkhurst Forest

The following non-statutory local wildlife and conservation sites are located within 2Km of the Installation:

- Kitbridge Farm
- Noke Plantation
- Parkhurst Forest
- Parkhurst Forest: Noke Common
- Parkhurst Forest: Marks Corner
- Alvington Manor Chalk pit
- Rodge Brook Scrubs
- Alvington Manor Chalk Pit

##### 2.4.2. Habitats Assessment

The Applicant's Habitats assessment was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and

ecology technical services, who agreed with the assessment's conclusions, that there would be no likely significant effect on the interest features of the protected sites.

### NOx annual mean

Site	Critical level (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	PC (µg/m <sup>3</sup> )	PC as % of critical level	PEC (µg/m <sup>3</sup> )	PEC as % of critical level
Solent & Southampton Water SPA and Ramsar	30	16.8	0.15	0.5	16.95	56.5
Briddlesford Copses SAC		13.9	0.04	0.1	13.94	46.5
Isle of Wight Downs SAC		8.4	0.03	0.1	8.43	28.1
South Wight Maritime SAC		8.1	0.02	0.1	8.12	27.1
Solent Maritime SAC		20.6	0.011	0.04	20.61	68.7

### NOx daily mean

Site	Critical level (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	PC (µg/m <sup>3</sup> )	PC as % of critical level	PEC (µg/m <sup>3</sup> )	PEC as % of critical level
Solent & Southampton Water SPA and Ramsar	75	33.5	1.05	1.4	34.55	46.1
Briddlesford Copses SAC		27.8	0.58	0.8	28.38	37.8
Isle of Wight Downs SAC		16.8	0.4	0.5	17.20	22.9
South Wight Maritime SAC		16.2	0.31	0.4	16.51	22.0
Solent Maritime SAC		41.2	0.37	0.5	41.57	55.4

### SO<sub>2</sub> annual mean

Site	Critical level (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	PC (µg/m <sup>3</sup> )	PC as % of critical	PEC (µg/m <sup>3</sup> )	PEC as % of critical
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				level		level
<b>Solent &amp; Southampton Water SPA and Ramsar</b>	20	6.7	0.04	0.2	6.74	33.7
<b>Briddlesford Copses SAC</b>		6.7	0.011	0.1	6.71	33.6
<b>Isle of Wight Downs SAC</b>		6.7	0.007	0.0	6.71	33.5
<b>South Wight Maritime SAC</b>		6.7	0.006	0.0	6.71	33.5
<b>Solent Maritime SAC</b>		6.7	0.003	0.0	6.70	33.5

#### Hydrogen fluoride weekly mean

Site	Critical level ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	PC ( $\mu\text{g}/\text{m}^3$ )	PC as % of critical level	PEC ( $\mu\text{g}/\text{m}^3$ )	PEC as % of critical level
<b>Solent &amp; Southampton Water SPA and Ramsar</b>	0.5	0.5	0.0008	0.158	0.50	100.2
<b>Briddlesford Copses SAC</b>		0.5	0.0002	0.042	0.50	100.0
<b>Isle of Wight Downs SAC</b>		0.5	0.0002	0.032	0.50	100.0
<b>South Wight Maritime SAC</b>		0.5	0.0001	0.024	0.50	100.0
<b>Solent Maritime SAC</b>		0.5	0.0001	0.012	0.50	100.0

## Hydrogen fluoride daily mean

Site	Critical level ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	PC ( $\mu\text{g}/\text{m}^3$ )	PC as % of critical level	PEC ( $\mu\text{g}/\text{m}^3$ )	PEC as % of critical level
Solent & Southampton Water SPA and Ramsar	5	0.5	0.0008	0.016	0.50	10.0
Briddlesford Copses SAC		0.5	0.0002	0.004	0.50	10.0
Isle of Wight Downs SAC		0.5	0.0002	0.004	0.50	10.0
South Wight Maritime SAC		0.5	0.0001	0.002	0.50	10.0
Solent Maritime SAC		0.5	0.0001	0.002	0.50	10.0

## Acid deposition

Site	Critical load (keq/ha/yr)	Background (keq/ha/yr)	PC (keq/ha/yr)	PC as % of critical load	PEC (keq/ha/yr)	PEC as % of critical load
Solent & Southampton Water SPA and Ramsar	0.626	1.43	0.0078	1.2	1.44	229.7
Briddlesford Copses SAC	2.879	2.26	0.0045	0.2	2.26	78.7
Isle of Wight Downs SAC	1.382	1.01	0.0015	0.1	1.01	73.2
South Wight Maritime SAC	Not sensitive					
Solent Maritime SAC	0.626	1.02	0.0005	0.1	1.02	163.0

## Nitrogen deposition

Site	Critical load (kgN/ha/yr)	Background (kgN/ha/yr)	PC (kgN/ha/yr)	PC as % of critical load	PEC (kgN/ha/yr)	PEC as % of critical load
Solent & Southampton Water SPA and Ramsar	8	16.66	0.022	0.3	16.68	208.5
Briddlesford Copses SAC	10	27.72	0.0121	0.1	27.73	277.3
Isle of Wight Downs SAC	10	11.62	0.0042	0.04	11.62	116.2
South Wight Maritime SAC	Not sensitive					
Solent Maritime SAC	8	22.96	0.0016	0.02	22.96	287.0

### Summary

The final column shows whether the impact could give rise to likely significant effect. Where the process contribution (PC) is <1% of long term criteria or <10% of short term criteria the impact is insignificant.

The above tables show that the PC are <1% of the long term criteria and <10% of the short term criteria, and therefore insignificant, at all sites except for acid deposition at Solent & Southampton Water SPA and Ramsar. For the sites where the PC is insignificant we have concluded no likely significant effect.

The acid deposition at Solent & Southampton Water SPA and Ramsar is just above the insignificance criteria at 1.2% of the critical load and the background acid deposition already exceeds the critical load. However we are satisfied that there will be no likely significant because in reality the PC is likely to be below 1% of the critical load because:

- The applicant's assessment assumes that the plant will operate for the entire year without stopping (8760 hours). However it is expected that the plant will operate for about 8000 hours per year. This would reduce the PC to ~ 1.1% of the critical load.
- The applicants' assessment is based on the plant emitting substances at the emission limit value continuously. Actual emissions are almost certain to be below emission limits in practice, because any Operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken.

In addition our audit of the modelling showed that there would be no increase in impacts from the currently permitted plant.

### 2.4.3. SSSI Assessment

The Applicant's assessment of SSSIs was reviewed by the Environment Agency's technical specialists for modelling, air quality, conservation and ecology technical services, who agreed with the assessment's conclusions, that the proposal does not damage the special features of the SSSI.

Pollutant	EQS / EAL (µg/m <sup>3</sup> )	Back-ground (µg/m <sup>3</sup> )	Process Contribution (PC) (µg/m <sup>3</sup> )	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) (µg/m <sup>3</sup> )	PEC as % EQS / EAL
<b>Direct Impacts<sup>1</sup></b>						
NO <sub>x</sub> Annual	30	16.8	0.25	0.83	17.05	56.8
NO <sub>x</sub> Daily Mean	75	33.5	3.47	4.6	36.97	49.3
SO <sub>2</sub>	20	6.7	6.76	33.8	13.46	67.3
HF Weekly Mean	0.5	0.5	0.0014	0.272	0.50	100.3
HF Daily Mean	5	0.5	0.0013	0.026	0.501	10.02
<b>Deposition Impacts<sup>1</sup></b>						
N Deposition (kg N/ha/yr)	10	22.12	0.1112	1.11	22.23	222.3
Acidification (Keq/ha/yr)	2.18	1.19	0.027	1.2	1.22	55.8

(1) Direct impact units are µg/m<sup>3</sup> and deposition impact units are kg N/ha/yr or Keq/ha/yr.

The above tables show that the PC are <1% of the long term criteria and <10% of the short term criteria, and therefore insignificant except for acid and N deposition where the PC is slightly over the 1% insignificance criteria.

However acid and N deposition are also likely to be insignificant because:

- The Applicant's assessment assumes that the plant will operate for the entire year without stopping (8760 hours). However it is expected that the plant will operate for about 8000 hours per year. This would reduce the PC to even closer to 1.0% of the critical loads.
- The Applicants' assessment is based on the plant emitting substances at the emission limit value continuously. Actual emissions are almost certain to be below emission limits in practice, because any Operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly,

simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken.

In addition our audit of the modelling showed that there would be no increase in impacts from the currently permitted plant.

#### 2.4.4. Assessment of other conservation sites

Conservation sites are protected in law by legislation. The Habitats Directive provides the highest level of protection for SACs and SPAs, domestic legislation provides a lower but important level of protection for SSSIs. Finally the Environment Act provides more generalised protection for flora and fauna rather than for specifically named conservation designations. It is under the Environment Act that we assess other sites (such as local wildlife sites) which prevents us from permitting something that will result in significant pollution; and which offers levels of protection proportionate with other European and national legislation. However, it should not be assumed that because levels of protection are less stringent for these other sites, that they are not of considerable importance. Local sites link and support EU and national nature conservation sites together and hence help to maintain the UK's biodiversity resilience.

For SACs SPAs, Ramsars and SSSIs we consider the contribution PC and the background levels in making an assessment of impact. In assessing these other sites under the Environment Act we look at the impact from the Installation alone in order to determine whether it would cause significant pollution. This is a proportionate approach, in line with the levels of protection offered by the conservation legislation to protect these other sites (which are generally more numerous than Natura 2000 or SSSIs) whilst ensuring that we do not restrict development.

Critical levels and loads are set to protect the most vulnerable habitat types. Thresholds change in accordance with the levels of protection afforded by the legislation . Therefore the thresholds for SAC SPA and SSSI features are more stringent than those for other nature conservation sites.

Therefore we would generally conclude that the Installation is not causing significant pollution at these other sites if the PC is less than the relevant critical level or critical load, provided that the Applicant is using BAT to control emissions.

The Applicant's assessment shows that the PCs are below the critical levels or loads. We are satisfied that the Installation will not cause significant pollution at the sites. The Applicant is required to prevent, minimise and control emissions using BAT, this is considered further in Section 3.

### 3. BAT assessment

#### 3.1. boiler design

In accordance with our Technical Guidance Note, S5.01, the Applicant has confirmed that the boiler design will include the following features to minimise the potential for reformation of dioxins within the de-novo synthesis range:

- Rapid cooling of flue gas in the boiler
- Design to ensure high velocity and low residence time in the de novo range
- Compact boiler design to ensure rapid cooling of the flue gas.
- CFD modelling used to ensure no zones of stagnant gas and to ensure even distribution of flue gas through the heat transfer areas.
- Shot ball deposit cleaning used in the inlet section, 1st pass and the economiser section
- Shot ball cleaning during maintenance periods
- Good control of primary and secondary air control to limit deposits

#### 3.2. Abatement plant and emissions control

There are no changes to the proposed abatement plant. However we requested that the applicant reassess BAT measures for NO<sub>x</sub> control, because this variation allows throughput to increase from 4 tonnes per hour to 5 tonnes per hour.

The applicant considered the following:

- i. Whether emissions lower than 200 mg/m<sup>3</sup> could be achieved

The applicant stated that the Energos gasification system has inherently low NO<sub>x</sub> emissions due to efficiency of the syngas combustion process combined with staged combustion and flue gas recirculation and it should therefore be possible to achieve below 200 mg/m<sup>3</sup>. It was requested that this be reviewed through an improvement condition so that limits could be lowered if it is found that emissions are below 200 mg/m<sup>3</sup>. We have set IC 5 for this to be reviewed.

- ii. The use of NO<sub>x</sub> abatement (SNCR or SCR)

The applicant stated that the IED emission limit can be achieved without the use of secondary measures. Given that dispersion modelling showed an annual NO<sub>2</sub> PC of 4.2%, the additional costs, reduced efficiency, chemical use, increased global warming potential, ammonia emissions, and waste generation mean that the use of SNCR or SCR is not justified.

- iii. Use of a higher stack

The planning consent states that the stack height must not exceed 26m. This was set to ensure that there were no visual impacts on the nearby Park Hurst Forest SSSI.



## Conclusions

We are satisfied that the applicant has shown that the proposed control measures remain BAT. In addition to the applicant's justification, when we audited the air dispersion modelling, we found that there were no increases in impacts from the currently permitted plant.

### 4. Odour

Incoming RDF will be transported by conveyor for storage on site in the bunker. In the gasification building the air will be extracted from above the bunker and used within the gasification plant to minimise odours

The Applicant supplied an odour management plan (OMP) to cover operation of the waste reception and treatment building.

The key measures described in the OMP and application documents are:

- Wastes handled inside buildings.
- Building air will be extracted through a carbon filter.
- The carbon will be replaced when required. It is expected to be twice per year. Full details will be confirmed before commissioning.
- Fast closing doors will be kept closed except for when vehicles arrive or leave. The doors will take ~30 seconds to fully open or close.
- Operation of the doors will be checked routinely.
- Transfer from the treatment building to the gasification building will be via an enclosed conveyor.
- Waste storage times are minimised and wastes will be tracked through the process.
- The closest receptors are commercial. A map shows the location of commercial and residential receptors. The closest residential receptors are ~ 300m away.
- The prevailing wind is away from the nearest receptors.
- Full clean out of the tipping hall once per month.
- The amount of food waste transferred is small (5,000 t/yr).
- Food waste will be bulked up and transferred and not treated. It will be delivered from vehicles into covered bulk container / trailer via a dedicated chute.
- Monitoring of odour control measures to ensure effectiveness.
- If odour abatement is not effective odour sources will be isolated and neutralised.
- Odour neutralising spray will be used if abatement is not effective
- In the event of short gasification plant shut-down waste will be stored in the treatment building with odour control via the carbon filter.
- In the event of prolonged gasification plant shutdown then waste will be baled and transferred off site. Baled waste will not be stored on site
- If there is a prolonged shut down, any waste in the gasification bunker would be removed for disposal off-site.

## 5. Noise

The application contained a noise impact assessment which identified local noise-sensitive receptors, potential sources of noise at the proposed plant and noise attenuation measures. Measurements were taken of the prevailing ambient noise levels to produce a baseline noise survey and an assessment was carried out in accordance with BS 4142:2014 to compare the predicted plant rating noise levels with the established background levels.

The assessment showed that the predicted rating levels were between 4dB and 16 dB below the background during the day and between 1 and 14 dB below the background during the night.

Based upon the information in the application we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site.

## 6. Energy generation

The original plant was based on 1.7 MW from gasification of 38,000 tonnes per year. The variation included replacement of the boiler and steam turbine. We therefore checked as to whether energy generation is still BAT.

The BREF says that where a plant generates electricity only, it is BAT to recover 0.6 – 1.0 MWh/tonne of waste (based on LCV of 15.2 MJ/kg) for pre-treated wastes. Our technical guidance note, SGN EPR S5.01, states that where electricity only is generated, 5-9 MW of electricity should be recoverable per 100,000 tonnes/annum of waste (which equates to 0.4 – 0.72 MWh/tonne of waste).

The Installation will generate electricity only and has been specified to maximise electrical output with little or no use of waste heat. The Application shows 2.5 MW of electricity produced 44,000 tonnes per year of gasified waste, which represents 5.7 MW per 100,000 tonnes/yr of waste burned (0.45 MWh/tonne of waste). The Installation is therefore towards the bottom of the BAT range. The applicant stated that the electrical output from the plant is limited by the national grid connections between the Isle of Wight and mainland, and should this be upgraded, the plant electrical efficiency may be improved.

The plant has been designed to be CHP ready should a heat user be found. Permit conditions 1.2.2 and 1.2.3 ensure that this is the case and that CHP use is reviewed periodically.

## 6. Water discharge activity

This was consolidated into this permit. The current discharge permit had monitoring requirements for BOD, ammonia, pH and suspended solids. The discharge is for surface water run-off and goes via an interceptor. We have therefore not set any monitoring requirements in the consolidated permit. We have specified that it is uncontaminated water run-off in table S3.2 of the permit.

## Annex 1: decision checklist

This document should be read in conjunction with the application, supporting information and permit.

Aspect considered	Justification / Detail	Criteria met
<b>Yes</b>		
<b>Receipt of submission</b>		
Confidential information	A claim for commercial or industrial confidentiality has not been made.	✓
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on commercial confidentiality.	✓
<b>Consultation</b>		
Scope of consultation	<p>The consultation requirements were identified and implemented. The decision was taken in accordance with our Public Participation Statement and our Working Together Agreements.</p> <p>We consulted with :</p> <ul style="list-style-type: none"> <li>• Isle of Wight Council</li> <li>• Food Standards Agency</li> <li>• Health and Safety Executive</li> <li>• Public Health England</li> <li>• Director of Public Health</li> <li>• Local fire service</li> </ul>	✓
Responses to consultation and web publicising	<p>The web publicising and consultation responses (Annex 2) were taken into account in the decision.</p> <p>The decision was taken in accordance with our guidance.</p>	✓
<b>Operator</b>		
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on what a legal operator is.	✓
<b>The facility</b>		

Aspect considered	Justification / Detail	Criteria met
		Yes
The regulated facility	The facility boundary has not changed as a result of this variation.	✓
<b>European Directives</b>		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
<b>The site</b>		
Extent of the site of the facility	<p>The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility.</p> <p>A plan is included in the permit and the operator is required to carry on the permitted activities within the site boundary. The site plan in schedule 7 of the permit shows the boundary of the whole facility (installation plus waste activities).</p>	✓
Site condition report	The facility boundary is not changing as a result of this variation so a site condition report is not required . However the applicant did still submit a site condition report that described the condition of the site.	✓
Biodiversity, Heritage, Landscape and Nature Conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>A full assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that operation of the facility will not affect the features of the sites. The impact assessment shows no increase in impacts from the current permitted site.</p> <p>An appendix 11 was sent to Natural England for information.</p>	✓
<b>Environmental Risk Assessment and operating techniques</b>		
EIA	In determining the application we have considered the Environmental Statement.	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>See key issues section for more details.</p>	✓
Operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes.</p> <p>See key issues section for more details.</p> <p>We approve the OMP in as far as it goes but set out below the ways in which we consider it will need to be reviewed.</p> <p>The applicant provided an OMP during the determination. Although we are generally satisfied with the proposed measures, we recognise that minor revisions may be needed to the plan as a result of plant commissioning. We have therefore made specific reference to the OMP in IC1 that requires submissions of a post commissioning report.</p> <p>We have approved the Fire Prevention Plan (FPP) submitted by the operator. The FPP is incorporated through table S1.2.</p>	✓
<b>The permit conditions</b>		
Updating permit conditions during consolidation.	<p>We have updated previous permit conditions to those in the new generic permit template as part of permit consolidation. The new conditions have the same meaning as those in the previous permits.</p> <p>The operator has agreed that the new conditions are acceptable.</p>	✓
Odour	See key issues section.	✓
Noise	See key issues section.	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
Raw materials	<p>We have specified limits and controls on the use of raw materials and fuels.</p> <p>The existing permit has a sulphur limit of 0.1% for the auxiliary fuel oil. We have kept this limit in the varied permit.</p>	✓
Waste types	<p>We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.</p> <p>We are satisfied that the operator can accept these wastes for the following reasons:</p> <ul style="list-style-type: none"> <li>(i) these wastes for receipt for mechanical treatment are non hazardous wastes suitable for treatment followed by gasification.</li> <li>(ii) these wastes are unlikely to contain harmful components that cannot be safely processed at the Installation.</li> </ul>	✓
Pre-operational conditions	<p>Based on the information in the application, we consider that we need to impose pre-operational conditions.</p> <ul style="list-style-type: none"> <li>• PO1 – this is set for the operator to confirm that the EMS has been updated to take account of this variation</li> <li>• PO2 – For a post commissioning report to be submitted</li> <li>• PO3 – To ensure that appropriate monitoring methods and locations will still be used after the changes brought in through this variation.</li> </ul>	✓
Improvement conditions	<p>Based on the information on the application, we consider that we need to impose improvement conditions.</p> <p>We have imposed improvement conditions to ensure that:</p> <ul style="list-style-type: none"> <li>• IC1 – To submit a report on the plant commissioning</li> <li>• IC2- To confirm the metals impact assessment for Cr(VI) with real operating data</li> <li>• IC3 – To submit a report on calibration and verification of monitoring equipment</li> <li>• IC4 – To submit a plan to ensure compliance with IED Articles 14(1)(b), 14(1)(e) and 16(2) of the</li> </ul>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>IED.</p> <ul style="list-style-type: none"> <li>IC5 – to review the NOx ELV against operational data.</li> </ul>	
Incorporating the application	<p>We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p>	✓
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>Emission limits are mostly unchanged from the current permit with the exception that we have made the following changes:</p> <ul style="list-style-type: none"> <li>The current permit contains daily average limits based on continuous monitoring which is correct for a co-incineration plant. In this variation application the applicant has stated that the plant should be an incineration plant. We agree with this and we have therefore in addition to the daily average limits also set half hourly average limits based on continuous monitoring.</li> <li>The limits for incineration plants are based on an oxygen reference of 11%</li> </ul>	✓
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These monitoring requirements have been imposed in order to check compliance with the emission limit values We made these decisions in accordance with guidance note M2.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>	✓



Aspect considered	Justification / Detail	Criteria met
		Yes
Reporting	<p>We have specified reporting in the permit.</p> <ul style="list-style-type: none"> <li>To report of emissions monitoring results</li> <li>To report other performance indicators – energy usage and generation and raw material and water usage</li> </ul>	✓
<b>Operator Competence</b>		
Environment management system	<p>There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with our guidance on what a competent operator is.</p>	✓
Technical competence	<p>Technical competency is required for activities permitted. The operator is a member of an agreed scheme that covers operation of the waste activities.</p>	✓
Relevant convictions	<p>The National Enforcement Database has been checked to ensure that all relevant convictions have been declared.</p> <p>No relevant convictions were found.</p>	✓
Financial provision	<p>There is no known reason to consider that the operator will not be financially able to comply with the permit conditions. The decision was taken in accordance with our guidance on what a competent operator is.</p>	✓

## Annex 2: Consultation and web publicising responses

Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

Response received from Public Health England (PHE)	
Brief summary of issues raised	Summary of actions taken or show how this has been covered
The abnormal operation assessment should include PM2.5	The EQS for PM2.5 is an annual average. There is no short term EQS. Abnormal operation is limited to 60 hours per year. Therefore any increase in particulate emissions for this period will no impact significantly on the annual average concentrations.
There appears to be an error in the PM10 abnormal operation calculation	We audited the applicants assessment. We agreed with the applicant's conclusion that abnormal operation would not lead to an exceedance of the EQS
In the health risk assessment the contribution to the TDI is 6%, but when combined with historic emissions is 5%. The US EPA model is not endorsed by the PHE	We audited the applicants assessment. We found that the applicant's assessment was conservative. Our findings were that the contribution to the TDI was likely to be less than 1%.
The operator should used best practice when undertaking construction	Impacts from construction are not within the scope of Environmental Permitting. The permit controls operation and emissions from operation of the installation.
An accident management plan should be submitted	The applicant provided an updated risk assessment which included accident risks.  The operator has an environmental management system (which will include accident risks) and pre-operational condition PO1 requires it to be updated as a result of this variation.
A final odour management plan was not submitted. The history of odour complaints should be investigated.	A draft odour management plan (OMP) was submitted. It was draft to allow for further detail, such as names or operators with specific responsibilities, to be added during commissioning. This is not unusual because an OMP is a live document

	that can be changed through the lifetime of the plant. We are satisfied that the measures in the OMP are capable of controlling odour to an acceptable level.
The development does not present any obvious cause for concern. A link to the PHE health report for incineration plants was provided.	No action was required.