Scottish Environment Protection Agency
Buidheann Dion Àrainneachd na h-Alba

IED-TG-03

Identifying a Substantial Change Variation

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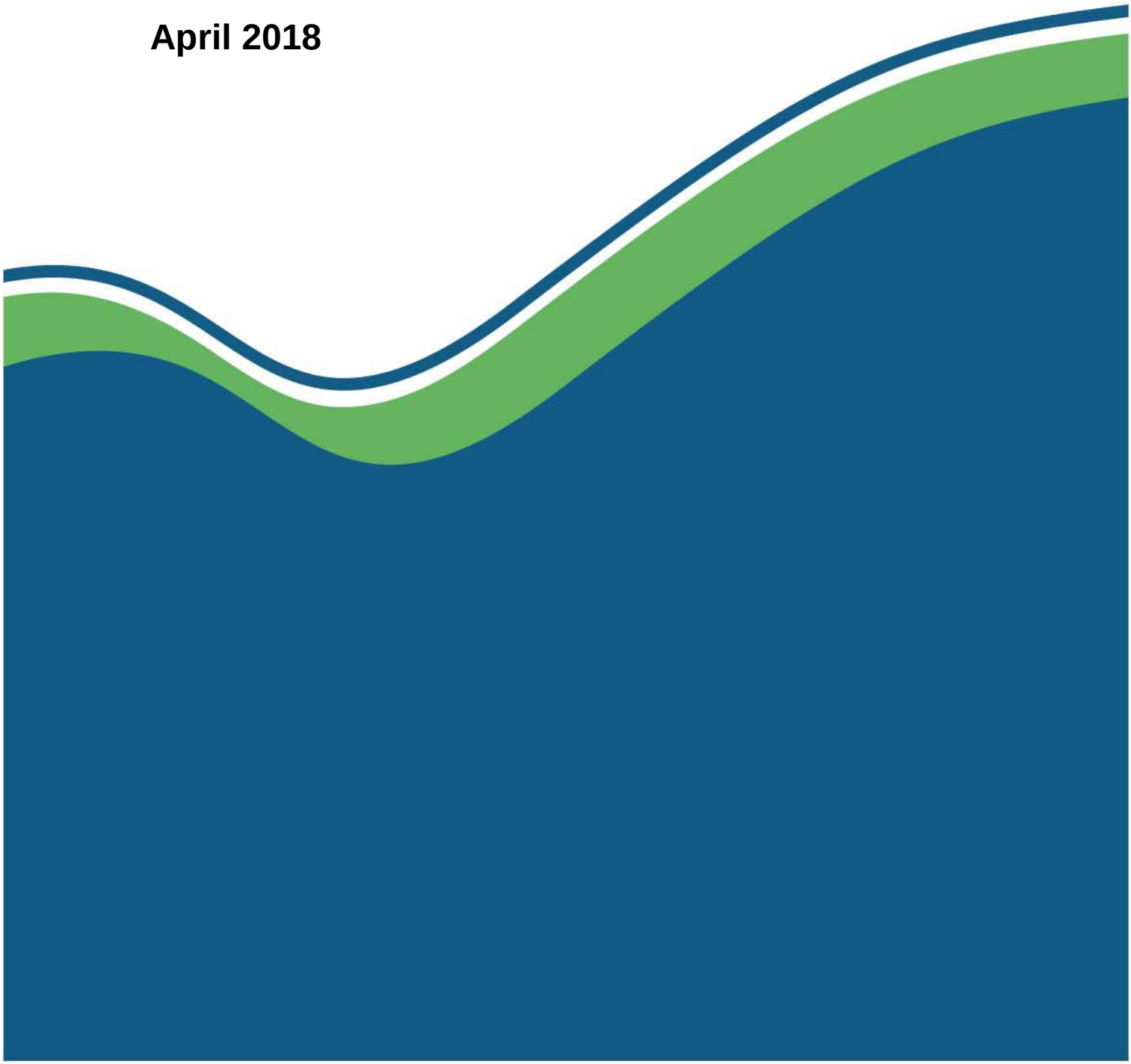

IED-TG-03 – IDENTIFYING A SUBSTANTIAL CHANGE VARIATION

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1.0 INTRODUCTION

This note provides advice for decisions on whether a proposed change in operation of the activity carried on under a PPC permit constitutes a substantial change.

Where a proposed change in operation is considered to be a substantial change, the requirements of Schedule 7(4) of the PPC 2012 Regulations (public and statutory consultation) will apply, along with a higher application fee.

It is theoretically possible for SEPA initiated variations to allow a substantial change and thus all such variations should be considered against this guidance.

2.0 WHAT IS A CHANGE IN OPERATION?

Regulation 2(1) of the PPC Regulations 2012 defines a *change in operation* as:

"*a change in the nature or functioning of an installation or mobile plant, or an extension of the installation or plant, which may have consequences for the environment*".

2.1 Change in the nature of an installation

A '*change in the nature of an installation*' is taken as a change made in the activities carried out at the installation.

However where the purpose of an installation is changed entirely, with one set of activities replacing a completely different set, SEPA would consider this to constitute a new installation, not a change in operation.

2.2 Change in the functioning of an installation

A '*change in the functioning of an installation*' relates to change in how those activities are carried out eg in procedures, control programs, process (eg order of addition of components), as well as the techniques used to carry out those activities.

2.3 An extension of an installation or plant

'*An extension*' covers physical extensions of capacity or size of the installation or plant.

3.0 WHAT IS A SUBSTANTIAL CHANGE IN OPERATION?

Regulation 2(1) of the PPC Regulations defines a *substantial change in operation* as:

"*a change in operation, which, in the opinion of SEPA, may have significant negative effects on human beings or the environment, or which in itself constitutes the carrying out of an activity described in Part 1 of Schedules 1 or 2 that exceeds any threshold capacity specified in those Schedules, and includes the –*

(a) carrying out of solvent emissions activity –

(i) at a small solvents installation, where there is a change of the nominal capacity leading to an increase in emissions of volatile organic compounds of more than 25 percent,

(ii) at any other solvents installation, where a change of the nominal capacity leads to an increase in emissions of volatile organic compounds of more than 10 percent,

and for that purpose –

"input" has the same meaning as in Part 4 of Schedule 2 (see the definition of "consumption"),

"nominal capacity" means the maximum mass input of organic solvents at the installation averaged over one day, if that installation is operated at its design output under conditions other than start up and shut down operations or relating to the maintenance of equipment, and

"small solvents installation" means a solvents installation –

(i) which falls within the lower threshold band of items 1, 3, 4, 5, 8, 10, 13, 16 or 17 of the table in Part 2 of Annex VII to the Industrial Emission Directive, or

(ii) for the activities which fall under one of the other items of that Part and which has a solvent consumption of less than 10 tonnes per year,

(b) extension of the rated thermal input of a combustion plant as defined in Article 3(25) of the Industrial Emission Directive by 50 megawatts or more,

(c) incineration or co-incineration for the first time of hazardous waste, and for that purpose "hazardous waste" has the meaning given in Section 5.1 of Part 1 of Schedule 1."

3.1 Who decides if the change is substantial?

It is for SEPA to determine if a proposed change is substantial or not.

The use of **'may'** means that possible or potential environmental impacts can be taken into account. It does not have to be certain that an impact will occur before it can be considered. However, potential impacts should not be too speculative.

The **'effects on human beings or the environment'** should be considered in relation to the scope of the PPC Regulations. Effects on the environment outwith the scope of PPC should not normally be considered.

3.2 Constitutes the carrying on of a listed activity

If the change in itself would constitute the carrying on of a listed activity in its own right then it should be considered to be a substantial change – ie if the increase in the capacity of the plant by itself would exceed the activity threshold.

eg a slaughterhouse requires a permit if it has a carcass production capacity greater than 50 tonnes per day. If an operator proposed to increase the capacity of their plant by 51 tonnes or more a day = substantial change.

Please note this does not apply to an activity described in Schedule 1 that does not specify a threshold – only the test of significant negative effect would be relevant to such activities.

3.3 Significant negative effect

To identify a significant negative effect on human beings or the environment:

- Consider the likely effect of **individual substances** released to **individual media**. If a potential significant negative effect on human beings or the environment can be identified then the change should be deemed to be substantial.
- Consider potential impact on the **environment as a whole**. Collectively, even small individual changes could have an overall significant negative effect. Similarly, if a mixture of substances is released then consideration of 'in combination' effects' should be made.
- Take into account that even where the **overall impact** of a proposal may be **positive**; there is the possibility of a **significant negative effects on any individual environmental media**. In such circumstances the proposed changed should be considered to be substantial.
- Assess effects in relation to the **impact** of the installation as **currently permitted**.
- Consider **extent** of any potential impact eg geographical area, population effected, the probability, magnitude, duration, frequency, or reversibility of any effect. Any **transboundary implications** or effects on **protected areas**, **species, or assets** of particular significance.
- Where an installation is subject to **repeated small incremental changes**, each change should be addressed on its own merits on the basis of this guidance. However, there may come a point where the aggregation of these small changes will have an overall significant negative effect. In such a case consideration should be given to requiring statutory/public participation of a variation application even although it does not in itself constitute a substantial change – Schedule 7, para 4.

3.4 Carrying out of a Solvent Emissions Activity

For solvent emissions activities, substantial change is more clearly defined with percentage limits on the increase in solvent emissions giving a threshold as to whether the change is substantial or not.

NOTE: a Schedule 2 solvent emissions activity can also be part or all of a Schedule 1 activity, or be a directly associated activity to a Schedule 1 activity,
- eg a coating operation has both a 6.4 Part B activity and a Schedule 2 solvent emissions activity listed on the permit for the same coating operation.
- eg a 6.4 and Schedule 2 coating operation which also has a Schedule 2 surface cleaning activity.

A Schedule 2 solvent emissions activity covers emissions to **all** media not just air even where a Part B installation is concerned.

Substantial change for solvent emissions activity is defined with percentage limits:

- For a **small solvents installation** → more than a 25% increase in solvent emissions due to the change in **nominal capacity**.
- For other solvents installations → more than a 10% increase in solvent emissions due to the change in **nominal capacity**.

Small solvents installation:

- Falls within the lower threshold band of activities 1, 3, 4, 5, 8, 10, 13, 16 or 17 of the table in Part 2 of Annex VII to IED (**not** the Table in Schedule 2 of PPC 2012).
- Or, for all the other activities in the table, has a solvent consumption of less than 10 tonnes per year.

	Activity – Table in Part 2 of Annex VII of IED	**Solvent consumption threshold in tonnes/year = total input of solvents into an installation per year, less any volatile organic compounds that are recovered for reuse**
1	Heatset web offset printing	15-25 >25
2	Publication rotogravure	>25
3	Other rotogravure, flexography, rotary screen printing, laminating or varnishing units (>15) Rotary screen printing on textile/cardboard (>30)	15-25 >25 >30
4	Surface cleaning using compounds specified in Article 59(5)	1-5 >5
5	Other surface cleaning	2-10 >10
6	Vehicle coating (<15) and vehicle refinishing (applies to original coating away from the manufacturing line)	0.5
7	Coil coating	>25
8	Other coating, including metal, plastic, textile, fabric, film and paper coating (>5)	5-15 >15
9	Winding wire coating	>5
10	Coating of wooden surfaces (>15)	15-25 >25
11	Dry cleaning	
12	Wood impregnation	>25
13	Coating of leather (>10)	10-25 >25 >10 for furnishing & particular leather goods used as small consumer goods like bags, belts, wallets, etc.
14	Footwear manufacture	>5
15	Wood & plastic lamination	>5
16	Adhesive coating (>5)	5-15 >15
17	Manufacture of coating mixture, varnishes, inks & adhesives (>100)	100-1000 >1000
18	Rubber conversion	>15
19	Vegetable oil & animal fat extraction and vegetable oil refining activities	>10
20	Manufacturing of pharmaceutical products	>50

Nominal capacity = the maximum mass **input** of organic solvents at the installation averaged over one day, if that installation is operated at its design output under conditions other than start up and shut down operations or relating to the maintenance of equipment.

Input = quantity or solvent used (pure or the quantity in mixtures) when carrying on an activity (including solvents recycled inside and outside the installation) and which are counted every time they are used to carry out the activity.

3.5 Extension of a Large Combustion Plant Activity

A substantial change in operation includes the extension of the rated thermal input of a combustion plant as defined bin Article 3(25) of IED by 50MW or more.

3.6 Incineration or Co-incineration Activity

Where an operator of an incineration or co-incineration plant for non-hazardous waste proposes a change in operation to include the incineration of co-incineration of hazardous waste for the first time, the change is regarded as substantial.

4.0 CRITERIA FOR ASSESSING SIGNIFICANCE

4.1 Extension of the Installation Boundary

The change should be assessed with regard to the potential impact on the geographical area. On its own, however, an extension to the boundary of the installation is unlikely to indicate a substantial change.

In most cases it will be the proposed use of the extended area which is the overriding factor in determining substantial change eg the boundary extension is required to extend the process, add a new activity, etc. These factors may trigger substantial change in themselves.

In other circumstances such as extending the boundary to install wetland treatment systems or swales, could be seen as a positive effect on the environment, and therefore should not normally be regarded as a substantial change.

Note: Schedule 7 Part 1 paragraph 2 requires site, and also baseline reports depending on the circumstances, for Part A installations if the proposed change results in additional land being included in the site irrespective of whether the change is considered substantial.

4.2 Changes to Ambient Pollutant Concentrations

This test considers the effects of releases against EU and UK Environmental Quality Standards (EQSs), and Environmental Assessment Levels (EALs). EALs are set out in Technical Guidance Note IPPC H1 on “Environmental Assessment and Appraisal of BAT” and include figures for air, water, and land. The EALs for land are defined in terms of deposition rates but will also be used in cases of direct release, for example, the spreading of sludge based on a knowledge of the composition of the sludge.

A change in concentration of a substance in the environment will not normally be regarded as substantial if both of the following criteria are met:

(i) it produces an additional impact of less than 2% of an EQS/EAL or equivalent (or the limit of detection if this is greater than 2% of an EQS/EAL); and

(ii) the additional impact combined with the background concentration is less than 70% of the EQS/EAL.

Conversely a change would normally be considered substantial if:

(i) it produces an additional impact of more than 10% of an EQS/EAL; or

(ii) the additional impact combined with the background concentration is greater than 70% of the EQS/EAL.

For releases to water, the assessment of an impact on an EQS/EAL should be undertaken at SEPA's nominated environmental monitoring point. For releases to atmosphere, the assessment should be at the point of maximum ground level concentration under poor but not extreme weather conditions (eg the worst year in 10) that is consistent with the receptor and time-averaging properties of the EQS/EAL being considered.

For cases falling between the two sets of criteria the overall impact of the change on an environmental medium should be considered when making the decision.

4.3 Releases of Substances to Groundwater

Any additional release which may lead to pollution of groundwater by List II substances will be considered a substantial change. The conclusions of any groundwater risk assessment should be taken into account. Changes which may lead to the entry of List I substances into groundwater are unlikely to be permitted.

4.4 Accumulation of Released Substances in the Environment

Some releases such as heavy metals or persistent organic compounds eg dioxins might lead to a build-up of polluting substances in the environment or bio-accumulation in the food chain. In many cases there is considerable uncertainty in assessing the build-up of pollutants in the environment or biota and it may be difficult to find appropriate criteria.

Under these circumstances, the decision should take into account the magnitude of the release, the potential for accumulation the likely receptors and the uncertainty in the assessment. However an increase in the release of substances whose half-life is greater than 30 days, water solubility is less than 1mg/litre or partition coefficient (log k octanol/water) is greater than 5 should be considered significant, and therefore potentially a substantial change.

4.5 Releases of “Special Substances” (The Precautionary Principle)

The precautionary principle should be applied where there are concerns as to the risks arising from the release of particular substances. In particular, any additional releases of the substances below into the environment, other than a trivial release, would be considered a substantial change.

- Nonylphenol
- Nonylphenol ethoxylate
- Octylphenol
- Ocylphenol ethoxylate

- Ethinyl oestradiol
- 17* oestradiol
- Oestrone
- Octa-, deca-, penta-, bromodiphenyl ether

4.6 Energy Efficiency and Releases of Greenhouse Gases

Energy efficiency is unlikely to be an issue that will give rise to considerations of substantial change particularly where the site is covered by a climate change agreement.

However, any increased release of greenhouse gases arising from an installation (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride) should be considered. The Government has set a target for reductions in greenhouse gas emissions to 42% below 1990 levels by 2020. In principle, emissions of these pollutants from industrial processes should be reducing with time.

The greenhouse potential of a range of gasses can be converted into CO_2-equivalent, using the global warming potential factors given in Annex H of UK technical guidance IPPC H1.

4.7 Releases of Substances that Deplete the Ozone Layer

Depletion of stratospheric ozone is caused by chemicals containing chlorine and bromine such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), carbon tetrachloride, 1,1,1-trichloroethane, halons and methyl bromide. International agreements will eventually lead to the phasing out of these substances, with some exemptions for essential uses.

Any change that has the potential to lead to additional releases greater than 100kg/year, expressed as CFC-11, should be considered substantial. This relates to any year, not just the first year after the change. For substances other than CFC-11, conversion factors are given in Regulation (EC) No 2037/2000 of the European Parliament and of the council on substances that deplete the ozone layer.

4.8 Releases of Substances Causing Low Level Ozone Formation

Ground level ozone forms as a result of the interaction between sunlight, hydrocarbons, and nitrogen species. The extent of ozone formation will depend on the air quality, the mixture of hydrocarbons, time of year or day. Ideally, detailed modelling would be undertaken however where this is unavailable you may be able to use the Photochemical Ozone Creation Potential (POCP) values.

Based on modelling undertaken by the Met Office, release rates likely to give rise to ground level ozone concentrations approximately equivalent to 20% of the Expert Panel Air Quality Standards (50ppb ozone as an 8-hour rolling average) have been calculated for representative substances in each category. These are given below:

If the change in the release rate is greater than that shown in the second column, then the change will normally be regarded as substantial. Where a mixture of hydrocarbons released, the proportional contribution of each hydrocarbon should be calculated for both the 20% criteria and the proportions summed.

POCP value	Change in release rate equivalent to 20% of EPAQS criteria (t/hr)
>100	3
<100-80	5
<80-75	7
<75-65	14
<65-60	26
<60-30	41
<30-14	55
<14 (Category B VOCs)	126

4.9 Effects of Releases on Visual Amenity

Visual amenity of the installation itself is not an issue for PPC. The effects of polluting emissions, however, are a PPC issue. For example, the appearance of any dispersed plume in air or water (eg dyes) will be relevant. An emission which causes offence to man's senses should be considered. Any interactive effects of the new or altered plume with other plumes should also be considered.

4.10 Odour Effects of Releases

Any increase in the release of odorous substances from individual or diffuse sources should be considered. Whether such changes are substantial will normally depend on effect in terms of increased exposure (duration, frequency and/or concentration) and any likely increase in offence to human senses. Where a proposal has the potential to increase odour complaints or interference with amenity it should be considered substantial.

4.11 Increased Likelihood or Consequences of Accidents

Any test for substantial change should take account of hazards and risks associated with foreseeable but unplanned events. Changes should consider in:

- the inherent hazardous nature of the substances (potential);
- the complexity and frequency of the operations;
- the probability/frequency of any harmful release occurring taking into account measures to control, and mitigate any release; and
- the consequences for human health and the environment once a substance(s) has been released.

If the proposed change would give rise to new hazards with potentially severe consequences, or for less severe consequences, an increased likelihood of occurrence, then the change is likely to be substantial.

4.12 Increases in Production of Waste

Proposals which lead to a significant increase in the waste disposal capacity required in a particular location will potentially constitute a substantial change. However, provided that waste can be properly disposed of or recovered and goes to an authorized facility, an increase in waste production is unlikely to be considered a

substantial change as it will be properly regulated and controlled so the net environmental impact is likely to be small in most cases.

Changes in waste production could also lead to increased accident hazards or risks, which should be considered as described above.

4.13 Heat

For a discharge into freshwaters, a substantial change can be defined with reference to the limits given in WAT-SG-85 – Applications of Standards to Thermal Discharges. Different limits apply to cyprinid and salmonid waters. Any proposed change with the potential to increase the temperature by more than 20% of the limit, or exceed 80% of the total allowable limit for any given water body should be considered substantial. Rapid changes in temperature should also be considered.

Substantial changes for coastal and brackish waters can be defined with reference to the guideline values in EU Directive (79/923/EEC) on the quality required of shellfish waters. Thus a substantial change would mean an incremental increase in water temperature due to change of 0.4^{o}C [20% of 2^{o}C] or if the increment is less than 0.4^{o}C, but the resulting temperature difference is greater than 2^{o}C, this should also be regarded as substantial.

For groundwater an increase of 2^{o}C (average 50m downstream) is considered substantial.

Additional requirements will arise in connection with natural heritage sites, where habitats and species are protected under the Conservation (Natural Habitats &c.) Regulations 1994. A change in mean temperature of more than 0.2^{o}C may require an "Appropriate Assessment" under these regulations. It will therefore also be regarded as a substantial change where a discharge takes place into an area protected for its natural heritage under these regulations.

4.14 Noise and Vibration

Consideration should be given to any change in noise/vibration characteristics or perceptibility (eg level, tone, frequency, impulsiveness, irregularity). Where a change to noise/vibration patterns or levels are likely to give rise to complaint (offence to human senses or interference with amenity) either through increased irritation of a sensitive receptor already affected or on a new receptor this would indicated that the change is likely to be substantial.

When determining whether complaints are likely the standards applied in BS4142:2014 - Methods for rating and assessing industrial and commercial sound may be used as a guide. The change should be determined at the appropriate noise sensitive receptor.

In general, the change is likely to be substantial if:

- a different sensitive receptor would be exposed to a noise levels which is likely to give reasonable cause for annoyance;
- an existing noise sensitive receptor is likely to experience a 5dB or more increase in the Rating Level; or

- the LA max is likely to exceed 60dB at the façade of a room regularly used for sleeping.

NOTE: noise and vibration may also affect non-human receptors and any potential impact particularly on a designated site should be considered.

4.15 Effects on designated/sensitive receptors

If a sensitive receptor is affected this may indicate that the proposed change is substantial. Sensitive or designated receptors may include Sites of Special Scientific Interest, land to which Nature Conservation Orders apply, Special Protected Areas, Special Areas of Conservation, Ramsar Sites, National Scenic Areas, World Heritage Sites, or Scheduled Ancient Monuments.

Special regard should be given to sites covered by the Conservation (Natural Habitats &c.) Regulations1994 (SPA, SAC and Ramsar Sites). Where the proposal "is likely to have a significant effect" on one of these sites an "Appropriate Assessment" of the implications for the site, in view of its conservation objectives, must be undertaken. SEPA's Natura 2000 Protocol, contained in Chapter 3 of the SEPA Natural Heritage Handbook, considers the meaning of "significant effect" for these purposes. Where it is necessary to undertake an Appropriate Assessment, this is likely to indicate that a substantial change is being proposed.

The SEPA guidance on applying the Habitats Regulations contains screening distance that should be used to determine whether the Habitats Regulations are relevant.

In general, installations beyond the screening distances from a European site are unlikely to have a significant effect. It is important, however, that these criteria are not used in isolation and without proper reference to the Habitats guidance. This states that judgement should be used in applying the criteria, and the distances extended if necessary depending on the nature of the installation, prevailing wind conditions, etc. Power stations, for example, may have potentially significant effects over a very long range (several hundred km).

4.16 Environmental Impact Assessment (Scotland) Regulations 2010

Where a Local Planning Authority (LPA) has required an Environmental Statement (ES) under these Regulations in respect of a change or extension, it must have determined that the change or extension may have "significant adverse effects on the environment". If the LPA's decision was based on criteria which are within the remit of the PPC Permit this would indicate that the proposal is likely to be substantial.