

13. ENVIRONMENTAL ASPECTS OF SAFETY REPORT ASSESSMENT

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1. INTRODUCTION

- 1.1 This guidance has been written to support environmental assessors (Environment Agency (EA), Scottish Environment Protection Agency (SEPA) and Natural Resources Wales (NRW)) who carry out assessment of Safety Reports. It has been updated to include aspects of the new regulations, COMAH 2015, and the Better Regulation Executive Review programme.
- 1.2 It is relevant to all types of safety report.
- 1.3 The environmental assessor must consider whether any new or revised safety report contains the minimum data and information (COMAH 2015 Regulation 9(1) and Schedule 3) and also whether the purposes of the safety report have been met (the demonstrations have been made as per COMAH 2015 Regulation 8). The focus will be on hazard analysis, risk assessment and demonstration that the necessary measures have been taken for the establishment.
- 1.4 When considering a revised safety report, environmental assessors should also determine whether there are any changes that might constitute a 'new permission' relevant to Habitats regulations or Countryside and Rights of Way Act. In England the regulator will need to decide whether consultation with nature conservation bodies is required under existing procedures. In Scotland, where appropriate, SEPA will consult Scottish Natural Heritage. In Wales the environmental regulatory functions have been amalgamated with the Welsh Conservation body to form Natural Resources Wales, and if required, there will be an internal consultation between the different functions within NRW.

2. ENVIRONMENTAL RISK ASSESSMENT

- 2.1 All environmental assessment must use the criteria and guidance set out in Appendix 13.1 '*Environmental Assessment Criteria and Guidance*'.
- 2.2 Environmental assessment must be recorded on the form SRAM 18 '*Environment Assessment Record*'.

- 2.3** The underlying factors of a major accident lie in aspects common to ‘human safety’ and the ‘environment’, be these mechanical, electrical and control, process safety or human factors. In the context of major accidents and their prevention, ‘environment’ is not treated as a separate discipline to ‘health and safety’. While the receptor has no bearing on the causes or the prevention of an accident, some events carry a significant, predominant or solely environmental hazard and risk. These must be addressed in the environmental assessment process.
- 2.4** Three components need to be present before a risk can be manifest, namely:
- a) Source (of hazard);
 - b) Pathway (between source and receptor); and
 - c) Receptor (of the hazard).
- 2.5** For COMAH purposes, environmental risk assessment combines these components to provide an indication of whether a Major Accident To The Environment (MATTE) is possible and to define the Establishment Impact Environ (EIE) – the zone around an establishment that may be impacted by any MATTEs.
- 2.6** Historically, MATTEs within the UK and Europe have occurred most frequently due to liquid releases (including contaminated fire fighting water) impacting upon land and water. Environmental regulators are expected to pay a proportionately greater amount of their time assessing all aspects relevant to liquid release scenarios. Conversely, incidents involving MATTE caused by aerial dispersion are considerably less frequent. Aerial pathways should not be overlooked in the safety report (and the EA, SEPA and NRW have a role in air quality monitoring for major incidents). However, if the potential for such a MATTE has been identified by an Operator then effort should be placed on assessing and inspecting measures for prevention and mitigation (as opposed to detailed assessment of whether extent and severity has been precisely predicted). Moreover, aerial dispersion is likely to be examined in detail by HSE predictive specialists whilst it is less likely that HSE will examine liquid run-off in detail.
- 2.7** Some of the information required to assess the impact on the environment may already have been prepared for environmental impact assessment or other authorisation procedures. It is permissible for the Operator to refer to this information. However, assessment is often made easier and more efficient when it is submitted as an appendix to the safety report, rather than by reference to information sent separately to the environmental regulators.
- 2.8** The descriptive and predictive aspects (criteria 13.1 – 13.6) are considered first to enable environmental regulators to identify the areas of COMAH activity with MATTE potential. Where the potential for a MATTE has been demonstrated, the likelihood of such a MATTE, and the Technical, MAPP & SMS and Emergency Planning criteria follow (13.7 onwards) so that this assessment can be focused on those parts of the establishment with MATTE potential. Where it has been demonstrated there are no potential MATTE scenarios, the Operator would not be expected to address the aspects covered by these criteria, insofar as they relate to the protection of the environment from the impact of a MA.

3. SRAM AND GUIDANCE SOURCES

- 3.1** Attention of assessors is drawn to the guidance contained in the SRAM - 'How to use the Criteria' under the heading of 'Use of the Criteria' concerning avoidance of duplicated assessment.
- 3.2** The environmental criteria include cross-references to other sections of the SRAM and COMAH regulations. These cross-references may be used by the environmental assessor if more depth of analysis is required (as is expected to occur during inspection activities). They can also be used to help achieve consistent team conclusions.
- 3.3** Further guidance to support safety report assessment can be found from various sources, including:
- L111 – 'Guidance on the COMAH Regulations 2015';
 - HSG 190 – 'Preparing Safety Reports';
 - COMAH guidance (HSE website - SRAGs, ALARP, Accident reports etc);
 - CA procedures (COMAH manuals, procedures, DGs, SPCs);
 - DEFRA MATTE guidance, as updated by CDOIF GUIDELINE – 'Environmental Risk Tolerability for COMAH Establishments';
 - Guidance on the Environmental Risk Assessment Aspects of COMAH Safety Reports (EA website);
 - Web based environmental GIS system (Easimap or MAGIC);
 - Environmental classification database (N-Class) and C&L database <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>;
 - eMARS - major accident database (eMARS homepage); and
 - Good practice guidance, codes and standards (e.g. CIRIA C736 & C598, Environmental Permitting Guidance, HSGs, industry codes, PSLG final report).

4. INSPECTION FOLLOWING SAFETY REPORT ASSESSMENT

- 4.1** It is intended that the table for the inspection phase (Appendix 13.2) will become the basis of an environmental inspection Delivery Guide (DG). It includes headings "Inspection / Verification Preparation" and "Detailed Inspection / Verification" to assist in deciding what work can be done in the office and what can be done on-site, so potentially reducing the burden on the COMAH Operator without reducing regulatory assurance.
- 4.2** The COMAH Competent Authorities (CA) have a duty to carry out inspections at COMAH establishments (COMAH 2015, Regulation 25), in particular to ensure:
- a) the Operator can demonstrate that it has taken appropriate measures, in connection with the various activities of the establishment, to prevent major accidents;

- b)** the Operator can demonstrate that it has provided appropriate means for limiting the consequences of major accidents;
- c)** the data and information contained in the safety report (or any other report submitted by the Operator) adequately reflects the conditions in the establishment; and
- d)** information is supplied to the public in accordance with Regulations 17 and 18.

4.3 If the safety report states that there are no MATTE scenarios and the environmental assessor concurs with this assessment, then an inspection should be carried out to verify this conclusion, as a matter of urgency and usually within the first year of the safety report submission. Where it is subsequently agreed that there are no MATTE scenarios, then the environmental regulator would have reduced / no COMAH inspection involvement until the next 5 year review (i.e. HSE would lead for inspection of the establishment). In such cases the environmental regulator would become involved in assessment or inspection at the establishment if there was a change that might introduce a potential MATTE. For example, this might be due to a modification of the establishment or a change in knowledge concerning the assessment of major accident hazards.

Appendix: 13.1 ‘Environmental Assessment Criteria and Guidance’

TECHNICAL CRITERION	GUIDANCE
DESCRIPTIVE ASPECTS	
<p>13.1 Identifying MA Scenarios</p> <p>The safety report should identify all Major Accident Scenarios that have potential for environmental impact and/or those that could be initiated by natural hazards or events.</p> <p>COMAH 2015 – Information Schedule 3 Paras 3, 4 and 5 Regulation 8e</p> <p>COMAH 2015 – Demonstration Regulation 8b</p>	<p><u>The Safety Report should contain information about:</u></p> <p>The Major Accident Scenarios (MAS) with potential environmental impact, including:</p> <ul style="list-style-type: none"> • the methodology used to identify which MASs have potential for environmental impact; and • how natural events may initiate a Major Accident (MA). <p>Such natural events can include earthquakes, floods, high tides, elevated groundwater levels, high winds, high rainfall, cold conditions and hot weather and also climate change impacts. NB The natural event may not cause a MATTE directly but could initiate a MA – safety or environment or both, also directly or indirectly.</p> <p>The contribution of the external factor to the MA could be as an initiating or exacerbating event. Factors for consideration under this criteria include: past accidents and historical evidence of other external events that might act as accident initiators or escalation factors such as flooding.</p> <p>The use of eMARS and other accident databases may identify recent sector specific events that could apply to the Establishment.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>An appropriate methodology has been used to identify the MA scenarios and those that could have an environmental impact. The methodology should take into account:</p> <ul style="list-style-type: none"> • source, pathway and receptor (SPR) trios; • the worst case failures; • domino and/or escalation effects of MAS; • the behaviour of substances under normal and abnormal conditions; and • the direct and indirect effects of a MAS (e.g. fire, firefighting water and explosions). <p>The weather conditions that could initiate a MA have been identified and there is a system to alert the Operator of these circumstances and the response the Operator plans to make if these circumstances happen.</p> <p>Benchmarks</p>

Appendix: 13.1 'Environmental Assessment Criteria and Guidance'

TECHNICAL CRITERION	GUIDANCE
	<p>CDOIF Guideline - Environmental Risk Tolerability for COMAH Establishments</p> <p>Greenleaves III – Environmental risk assessment guidance</p> <p>https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69450/pb13670-green-leaves-iii-1111071.pdf</p>
<p>13.2 Dangerous Substances</p> <p>The safety report should include a description of the dangerous substances that have a potential environmental impact.</p> <p>COMAH 2015 – Information Schedule 3, Para 4</p> <p>COMAH 2015 – Demonstration Regulation 8 a</p>	<p>The wider issue of dangerous substances inventory is assessed elsewhere under 'Descriptive' Assessment Criteria.</p> <p>The focus here for the environmental assessor is to determine if the safety report adequately describes dangerous substances which could have a <u>potential environmental impact</u>:</p> <p><u>The Safety Report should contain information about:</u></p> <p>Dangerous substances are those that:</p> <ul style="list-style-type: none"> • meet the criteria laid down in Schedule 1 Part 1 of the COMAH 15 Regulations; or • are listed in Schedule 1 Part 2 of the COMAH 15 Regulations. <p>Those to be identified are:</p> <ul style="list-style-type: none"> • all dangerous substances at or above lower tier or upper tier threshold quantities, either singly or in aggregate; and • other dangerous substances below these quantities, if they are capable directly or indirectly of being involved in a MA. <p>Any omission to describe a dangerous substance should be justified. The COMAH Regulations describe how to aggregate chemicals against the COMAH thresholds.</p> <p>The description should include:</p> <ul style="list-style-type: none"> • classification under CLP, chemical name, CAS number, and name according to IUPAC nomenclature; • quantities present (including the maximum quantity present or likely to be present); • physical and chemical characteristics and behaviour (normal and accident conditions); • toxicological characteristics and data (e.g. dose-response). <p>Indication of the hazards to the environment (both immediate and delayed), including:</p> <ul style="list-style-type: none"> • environmental harm criteria (e.g. LC50 data, critical loads); • negligible effect criteria (e.g. No Observed Effect Levels, Suggested No Adverse Response Levels); • other potentially harmful properties, for example, BOD/COD, blanketing/smothering or effects on potable water supplies

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	<p>may need to be considered;</p> <ul style="list-style-type: none"> • other information that may be required includes persistence, bio-concentration factor, bioaccumulation potential, solubility, and density. <p><u>The Safety Report should demonstrate that:</u></p> <p>All substances stored on the establishment and arising from foreseeable excursions have been identified. Operators are advised to give details of measures taken to identify such substances.</p> <p>Benchmarks</p> <p>L111 (third edition)</p>
<p>13.3 Potential Releases</p> <p>The safety report should include a description of the aspects of the establishment that could be a factor in the potential for releases to the environment.</p> <p>COMAH 2015 –Information Schedule 3, Paras 3 and 4</p> <p>COMAH 2015 – Demonstration Regulation 8 a</p>	<p>Environmental Assessors should check that the Operator has described the establishment and included any changes since the previous safety report submission.</p> <p><u>The Safety Report should contain information about:</u></p> <p>Location, inventory and conditions of substances dangerous to the environment (including non COMAH substances that may be released in the event of a MA), including:</p> <ul style="list-style-type: none"> • topography and drainage (e.g. general arrangement and purpose (e.g. foul water, firefighting water run-off) to include location of penstocks, barriers, valves etc); • location and capacity of sumps, interceptors, firefighting water lagoons, effluent treatment plant and any other barriers to off-establishment migration of polluting matter; • location of discharge points to watercourses/foul sewer/ effluent treatment plants/soakaways; and • overview of associated safety (or environmentally) critical control systems and equipment. <p>Plan(s), map(s) or diagram(s) that clearly set out information about the installations at the establishment may be better at conveying the information than simple descriptions.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>The information presented allows determination of the purpose, location and function of equipment within the establishment that has a bearing on MA prevention and control.</p>

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	<p>Benchmarks</p> <p>L111 (third edition)</p>
<p>13.4 Pathways and Receptors</p> <p>The safety report should identify and describe all environmental pathways and receptors that could, in the event of a Major Accident, be affected by dangerous substances present or anticipated to be present at the establishment.</p> <p>With respect to designated receptors, a description of their sensitivity should be included and other receptors should be referenced.</p> <p>COMAH 2015 –Information Schedule 3, Para 3 Regulation 8e</p> <p>COMAH 2015 – Demonstration Regulation 8a</p>	<p>Environmental Assessors should check all pathways and receptors have been identified, checking especially to ensure the Operator has included any changes since the previous safety report.</p> <p>The area over which pathways and receptors should be identified depends on the nature of potential major accidents. It would be expected that a range of up to 10 km would be reasonable.</p> <p>Assessments for safety report reviews should focus on new or changed receptors and pathways for releases to air, land and water:</p> <ul style="list-style-type: none"> • designations; • conservation status; • land use; or • other changes relevant to potential MATTEs. <p><u>The Safety Report should contain information about:</u></p> <p>Relevant environmental receptors that could be impacted in the event of a major accident, such as:</p> <ul style="list-style-type: none"> • the presence of particular species; • designated areas (SAC, SPA, SSSI, AONB, Ramsar sites, National Parks, Local Authority nature classification schemes, scare habitats etc); • surface waters, including ditches, and their classification the direction and rate of flow, extent of flood plains and depths of flood and the tides and currents; • groundwater and aquifers and their classification; • if sewage treatment or effluent treatment plants outwith the establishment are used, the location(s) and discharge arrangements of such third party service providers; • drinking and industrial water abstraction points (ground and surface), and the extent of source protection zones; • amenity areas; • sites of architectural and historical importance; • soil and sediment;

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	<ul style="list-style-type: none"> • agricultural resources (including market gardens and allotments); and • Grade 1 (Grade A in Scotland) listed buildings (including each listed building and monument that may be vulnerable to the effects of a major accident). <p>Factors that could affect the behaviour of accidental releases in the environment should be described. These should include hydrology, meteorology, geology, hydrogeology, topography, geography and climate. Surveys may be needed to determine the nature of local ecosystems.</p> <p>For surface waters the description should include information on direction and rate of flow, tides, currents and flood plains and their variability with different weather conditions – i.e. those matters that might influence dispersion or accumulation in the aquatic environment.</p> <p>Where the establishment has been identified to be in or close to a flood plain, the safety report should contain flood zone mapping – this information is necessary in consideration of initiation of MAs and influence on pathways, escalation and emergency response (including dispersion of substances on- and off-establishment, and the ability to respond to an incident).</p> <p>Activities beyond the establishment boundary that may interact with the establishment should be identified. These may include neighbouring industrial facilities, water treatment plants connected by rivers or sewer systems, and upstream processes. Examples of interactions which should be considered include spills from the establishment causing damage to connected facilities, combinations of released substances that may react to produce an environmental hazard, and upstream processes transferring off-spec material leading to upsets on the establishment.</p> <p>Land use pattern should be considered (i.e. industry, agriculture, urban settlements, environmentally sensitive locations etc).</p> <p>If necessary (i.e. where there might be an implication for MATTEs), the history of the establishment and its environment should be described. Of particular importance would be prior land uses that influence land drainage.</p> <p>Consultation with the relevant conservation bodies such as English Nature, Scottish Natural Heritage, Natural Resources Wales, County Ecologists and Biodiversity Officers may help the Operator identify environmental features for these assessments. The Operator should keep records of any consultations made in the preparation and/or review of the safety report.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>The potential pathways to receptors have been identified.</p> <p>The nature of the receptor sensitivity has been identified and related to the potential MA hazards at the establishment, noting that the most sensitive features may not be the highest designated sites or features.</p>

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	<p>Benchmarks</p> <p>CDOIF Guideline - Environmental Risk Tolerability for COMAH Establishments https://www.sepa.org.uk/media/219154/cdoif_guideline_environmental_risk_assessment_v2.pdf</p> <p>Annex 3 to the CDOIF Guideline contains a list of relevant information sources for typical environmental receptors required for safety reports. DETR MATTE Guidance 1999</p>
PREDICTIVE ASPECTS	
<p>13.5 SPR Trios</p> <p>The safety report should provide full details of all source, pathway, and receptor trios for all Major Accident Scenarios.</p> <p>COMAH 2015 –Information Schedule 3, Paras 4 and 5</p> <p>COMAH 2015 – Demonstration Regulation 8b and 8e</p>	<p><u>The Safety Report should contain information about:</u></p> <p>Detail of and description of the linkage between source, pathway and receptor (SPR) trios.</p> <p>Source details should be defined for each accident scenario and should include the following:</p> <ul style="list-style-type: none"> • substance released; • size, rate/duration of release; • conditions of release (pressure, temperature, phase); • location, elevation, direction of release. <p>Potential releases should be identified, which should include a consideration of worst case failures (inventory and process) and the sensitivity of the receiving environment (number and types of sensitive sites). Sources should include both the initial release and anticipated actions of emergency responders, for example, use of water sprays and/or foam blanket for fire fighting or suppression of vapour.</p> <p>Pathways by which the substance reaches the environment should be identified. This information is usefully summarised by maps and plans indicating where aerial dispersion and deposition may impact sensitive receptors or where run-off of spilled substances and firefighting water could take place, it's pathways on and off the establishment and areas effected (i.e. to depict linkage between the establishment and the Establishment Impact Environ – EIE).</p> <p>The review of historical incidents within the industry sector or involving dangerous substances present at the establishment (e.g. via eMARS) may help show the range of MAS have been identified.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>Sufficient consideration has been given to characterisation of substance behaviour to enable the types of pathway to be evaluated.</p>

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	<p>Substance behaviour upon release has been identified, e.g. reactions with air/water/other substances, changes of phase, dispersion characteristics (dense or buoyant behaviour), etc.</p> <p>The pathways from the establishment to receptors have been identified.</p> <p>SPR Analysis should be identified for all major accident scenarios and the safety report should contain the SPR trios for all the major accident scenarios presented.</p>	
	<p>Benchmarks</p>	
	<p>CDOIF Guideline - Environmental Risk Tolerability for COMAH Establishments</p> <p>eMARS</p> <p>Lastfire</p>	<p>Green leaves III – Environmental risk assessment guidance - https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69450/pb13670-green-leaves-iii-1111071.pdf</p> <p>MATTE review – case studies HSL</p>
<p>13.6 Assessment of Environmental Consequences</p> <p>The safety report should include an assessment of the environmental consequences (extent, severity and duration) of potential Major Accidents.</p> <p>The safety report should provide details of methodology used to assess the potential for a MATTE, and for each scenario conclude whether a MATTE is possible.</p> <p>COMAH 2015 –Information Schedule2, Para 2b Schedule 3, Paras 5b and c</p> <p>COMAH 2015 – Demonstration Regulation 8a and e</p>	<p><u>The Safety Report should contain information about:</u></p> <p>An assessment of the environmental consequences, (including maps, images or, as appropriate, equivalent descriptions, showing areas which are likely to be affected), regarding:</p> <ul style="list-style-type: none"> • all factors that may determine the extent of environmental impact (e.g. ignition, detection, secondary containment failure, drains, emergency procedures, etc); • the resultant environmental concentrations for each member of the set of releases; • the effects in the environment determined from the predicted environmental concentrations and toxicity data (the severity of the MATTE); • the length, area or volume of the environment affected (the extent of the MATTE) a plan or map showing the impact may be a good way to show this information; • the criteria used to define harm for the extent and severity conclusions; • estimated duration of the defined harm period (this should be based on natural recovery periods, without mitigation). <p><u>The Safety Report should demonstrate that:</u></p> <p>The approach/methodology used by the Operator is appropriate (e.g. CDOIF methodology).</p> <p>The Operator has reached a conclusion regarding whether the effects might constitute a MATTE. Whilst all scenarios require</p>	

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	<p>consequence assessment to determine whether or not they present risk of MATTE, the detail presented for each accident scenario should be proportionate in the context of the risk posed by the establishment as a whole. For example, for many fire events there is greater risk of harm from fire fighting water run-off than aerial dispersion and thus more effort should be placed on quantifying impact from run-off. Firewater Management Plans can be used to show the water requirements, and can describe how fire fighting water and run-off are managed.</p> <p>For each MATTE scenario or each representative set, the extent of the consequential environment impact has been adequately assessed and described.</p> <p>It is not necessary that the release rate and resultant environmental concentration of every scenario is considered. It is acceptable if a representative set of releases is chosen to cover the range of releases possible – though worst case scenario consequences should be assessed.</p> <p>The resultant environmental concentrations for each member of the set of releases should be given.</p> <p>The Operator has used an appropriate method used to calculate release rates and the specific values of any variables, such as:</p> <ul style="list-style-type: none"> • toxicity relationships (e.g. dose-response relationships); • negligible effect criteria (e.g. No Observed Effect Levels); • Suggested No Adverse Response Levels. <p>[It should be noted that the LC50 threshold represents an impact of the severest nature. For risk assessment purposes a threshold of LC/2 or LC/3 provides a suitable indicative environmental harm threshold.]</p>
	Benchmarks
	CDOIF Guideline - Environmental Risk Tolerability for COMAH Establishments
<p>13.7 MATTE Probability</p> <p>The safety report should include conclusions on the probability of the Major Accident Scenarios that have the potential for a MATTE and the conditions under which they occur.</p>	<p><u>The Safety Report should contain information about:</u></p> <p>For each scenario that could result in a MATTE, the Operator should provide details of the probability of potential environmental major hazards and the circumstances and conditions under which they could occur.</p> <p>Risk may be assessed by:</p> <ul style="list-style-type: none"> • qualitative descriptions (e.g. low/medium/high risk); • simple relative scoring systems (e.g. 1-5, 1-100);

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<p>COMAH 2015 – Information Schedule 2, Para 2b and Schedule 3, Para 5</p> <p>COMAH 2015 – Demonstration Regulation 8 a</p>	<ul style="list-style-type: none"> quantitative modelling parameters (e.g. Environmental Harm Index). <p>Risk results should be summed over all events and scenarios to give the total risk to each environmental receptor from the establishment (this to be used when considering tolerability).</p> <p>Risk results may also be presented as individual scenario/event risk and such a breakdown is useful to identify the significant risk contributors (NB if this approach is used the tolerability criteria will need to suitably adjusted).</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>The Operator has used an appropriate method to determine the likelihoods (including reference to sources for any generic failure rate data used) and any assumptions or principles underlying the method are justified. The method should be proportionate to risk (the more likely and/or greater the impact the more detail is required), including the uncertainties associated with any risk conclusions.</p> <p>If risk matrices are used these should be realistic and conform to recognized ALARP regions.</p> <p>Benchmarks</p> <p>CDOIF Guideline - Environmental Risk Tolerability for COMAH Establishments Failure Rate and Event Data (Fred) for use within Risk Assessments</p>
TECHNICAL ASPECTS	
<p>13.8 MATTE Prevention and Mitigation</p> <p>The safety report should include a description of the arrangements to prevent and mitigate MATTEs. This should include all prevention, mitigation and procedural protection measures.</p> <p>The safety report should make the demonstration that the Operator has taken the necessary measures to prevent or mitigate the consequences of a Major</p>	<p><u>The Safety Report should contain information about:</u></p> <p>For each scenario that could result in a MATTE, the Operator should describe the preventative and mitigatory measures in place, and, from all the measures that could be taken, justify those measures not implemented.</p> <p>The safety report should draw conclusions on the tolerability of risk, the sufficiency of existing control measures and the need for further measures to ensure risk is reduced to ALARP.</p> <p>The use of bowtie diagrams can help differentiate the techniques used to prevent and control over mitigatory responses.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>Appropriate measures are in place:</p> <ul style="list-style-type: none"> to stop or reduce a spillage at source; to confine the spillage, the preference being for permanently engineered secondary containment systems fitted with an

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<p>Accident.</p> <p>COMAH 2015 – Information Schedule 2, Para 2c and Schedule 3, Paras 5 and 6</p> <p>COMAH 2015 – Demonstration Regulation 8a, b and c</p>	<p>isolation device but other mobilised resources may be considered (e.g. sandbags, drain seals etc);</p> <ul style="list-style-type: none"> • to recover and/or treat the spillage (e.g. pumps, chemicals for neutralising or absorbing the spillage); • for tertiary containment, effluent treatment, emergency shutdown and isolations systems (e.g. penstocks etc.); and • for off-establishment measures to be deployed by the Operator should dangerous substances leave the establishment (see also criterion 13.14). <p>Any deviations from good practice, where risk lies in the tolerable if ALARP zone, should be fully justified (e.g. by cost benefit analysis).</p> <p>Where a screening approach has been used, the Operator should determine all of the releases that could result in a MATTE and then ensure that for each event the specific precautions are detailed (i.e. the safety report should demonstrate that the necessary measures have been taken in relation to each potential MATTE).</p>			
<p>13.9 Containment</p> <p>The safety report should include technical details of design specification for primary, secondary and tertiary containment (including site drainage) along with each design standards used.</p> <p>The safety report should provide reference to all inspection procedures and methods for routine and periodic monitoring of containment systems.</p> <p>COMAH 2015 – Information Schedule 2, Para 2c and Schedule 3, Paras 6a and d</p> <p>COMAH 2015 – Demonstration Regulation 8c</p>	<p><u>The Safety Report should contain information about:</u></p> <p>The containment equipment used to prevent and if not practicable limit and mitigate the impact of a MATTE.</p> <p><u>The Safety report should demonstrate that:</u></p> <p>The Operator has designed, built, operates and maintains the containment equipment and processes on the establishment to recognised standards and practices.</p> <p>Where standards and practices have been used in the design, construction, operation and/or maintenance of the establishment and processes, they should be referenced. Where no design standards were used at the time of construction, or if the design standards at the time of construction were different than the current standards, the Operator should either describe how the design of the equipment compares to the latest standards or have a plan for undertaking such a comparison.</p> <hr/> <p>Benchmarks</p> <table border="0" data-bbox="546 1145 2125 1409"> <tr> <td data-bbox="546 1145 1335 1409"> <p>EMMUA 159 and EMMUA 231</p> <p>API 653</p> <p>CIRIA C736</p> <p>PSLG report</p> <p>BS 61508 and BS 61511</p> </td> <td data-bbox="1335 1145 2125 1409"> <p>AMN Guidance</p> <p>CA Secondary and tertiary Delivery Guide</p> <p>HSG 71 and HSG 176</p> <p>PPG 18 & 26</p> <p>EI secondary and tertiary guidance</p> </td> </tr> </table>		<p>EMMUA 159 and EMMUA 231</p> <p>API 653</p> <p>CIRIA C736</p> <p>PSLG report</p> <p>BS 61508 and BS 61511</p>	<p>AMN Guidance</p> <p>CA Secondary and tertiary Delivery Guide</p> <p>HSG 71 and HSG 176</p> <p>PPG 18 & 26</p> <p>EI secondary and tertiary guidance</p>
<p>EMMUA 159 and EMMUA 231</p> <p>API 653</p> <p>CIRIA C736</p> <p>PSLG report</p> <p>BS 61508 and BS 61511</p>	<p>AMN Guidance</p> <p>CA Secondary and tertiary Delivery Guide</p> <p>HSG 71 and HSG 176</p> <p>PPG 18 & 26</p> <p>EI secondary and tertiary guidance</p>			

Appendix: 13.1 ‘Environmental Assessment Criteria and Guidance’

TECHNICAL CRITERION	GUIDANCE	
SMS & MAPP ASPECTS		
<p>13.10 SMS</p> <p>The safety report should detail the environmental management elements within the safety management system (SMS) used on the establishment and provide information of audit systems and audit results. This should include how the SMS relates to the environment.</p> <p>COMAH 2015 – Information Schedule 2; also Schedule 3 paras 2 and 5c</p> <p>COMAH 2015 – Demonstration Regulation 8a</p>	<p>The wider issue of the safety management system is assessed elsewhere under ‘SMS / MAPP’ Assessment Criteria. The focus here for the environmental assessor is on the environmental aspect of the overall SMS.</p> <p><u>The Safety Report should contain information about:</u></p> <p>The Safety Management System (SMS) in terms of:</p> <ul style="list-style-type: none"> • organisation; • management of change; • monitoring performance; and • audit and review. <p>The other parts of the SMS should be covered elsewhere in different parts of the safety report.</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>The environmental aspects are taken into account in the SMS, and in particular:</p> <ul style="list-style-type: none"> • the identification and evaluation of major hazards; • the organisation and roles within the management of the Establishment; • the management of change; • in the monitoring of performance; and • audit and review of the SMS. <p>Suitable review and revision of the SMS is undertaken to deal with external changes brought about by changes to the law, chemical classification etc. It should also show the interactions with other management systems that may be in use on the site.</p>	
Benchmarks		
<p>HSG 65 and HSG 254 SMS guidance</p>	<p>Management of change guidance ISO 14001 and ISO 18001</p>	

Appendix: 13.1 ‘Environmental Assessment Criteria and Guidance’

TECHNICAL CRITERION	GUIDANCE
EMERGENCY PLANNING ASPECTS	
<p>13.11 Plans and equipment to limit Major Accident consequences</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the equipment available.</p> <p>COMAH 15 – Information – Schedule 3, para 6a</p> <p>COMAH 15 – Demonstration – Regulation 8 a and d</p> <p>COMAH 15 – Relevant – Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p><u>The Safety Report should contain information about:</u></p> <p>The minimum information to be included in the safety report includes:</p> <ul style="list-style-type: none"> • details of the area outwith the establishment likely to be affected by MAS (e.g. indicating the EIE), potentially impacted environmentally sensitive areas and drainage maps to help determine the pathways by which spillages might leave the establishment, and the pathways outwith the establishment to receptors; • details of the dangerous substances stored at or likely to be generated on the establishment covered by the COMAH Regulations and set out information for other hazardous materials held on the establishment, including: quantities, hazardous properties and the nature of the effects on people and the environment. <p>The Operator’s plans for the protection of vulnerable environs within the EIE. Examples of measures that may need to be taken include:</p> <ul style="list-style-type: none"> • monitoring/sampling arrangements (air, water, ground water and land); • equipment to contain toxic substances; • agents to soak up and/or neutralise contaminants; • earth moving equipment for the removal of contaminated soil and other material; • firefighting resources (equipment, foam and people); • booms and skimmers for spillages to water; • temporary storage arrangements (e.g. portable storage tanks) for the contaminated material, detection/protection systems; and • measures for groundwater remediation. <p>Technical devices for limiting the size of accidental releases, including, but not limited to:</p> <ul style="list-style-type: none"> • contaminated firefighting water retention; • inerting systems; • shut-off valves; • emergency catch pots or collection vessels; and • vapour screens.

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TECHNICAL CRITERION	GUIDANCE
	<p>Where third parties and/or contractors provide the response and/or remediation services, the safety report should describe the response times expected to be achieved and also the resources available to respond to incidents. Where an effluent treatment plant is used to mitigate impacts, the retention time(s) should be included in the safety report.</p> <p>The Safety Report should demonstrate that:</p> <p>There is sufficient and appropriate equipment, measures and controls available to protect and limit the damage to the environment from major accidents.</p> <p>Benchmarks</p> <p>Recommendations on the emergency preparedness for, response to and recovery from incidents. http://www.hse.gov.uk/comah/buncefield/miib-final-volume2b.pdf</p>
<p>13.12 Alert and Intervention</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the organisation of alert and intervention.</p> <p>COMAH 15 – Information Schedule 3, paragraph 6b</p> <p>COMAH 15 – Demonstration Regulation 8 a and d</p> <p>COMAH 15 – Relevant Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>The emergency response content is assessed elsewhere under 'Emergency Response Aspects' Assessment Criteria. The focus here for the environmental assessor is on the environmental aspects of emergency response.</p> <p>The Safety Report should contain information about:</p> <p>The criteria for:</p> <ul style="list-style-type: none"> • implementing the Internal Emergency Plan; and • alerting the authorities, emergency services and the public of a major accident, or potential major accident, identified elsewhere in the safety report. <p>The plans should include trigger thresholds associated with MASs to indicate when the plans should be implemented.</p> <p>The safety report should describe how the Internal Emergency Plan meets the objectives and requirements of Schedule 4 (Part 1 and 2) to provide early warning of an incident to the LA.</p> <p>The Operator should describe the information it supplied to the local authority and should describe the procedure used to write, review and consult on the Internal Emergency Plan.</p> <p>The Safety Report should demonstrate that:</p> <p>There are clear methods and criteria for communicating information about a MATTE or potential MATTE to the authorities, emergency services and public in the area.</p> <p>The Operator has training programmes for staff for the response to an establishment emergency and such training should include, where relevant, the nature of major accidents posing a threat to the environment and the particular steps to take in the event of such an accident.</p>

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TECHNICAL CRITERION	GUIDANCE
	<p>Benchmarks</p> <p>Recommendations on the emergency preparedness for, response to and recovery from incidents. http://www.hse.gov.uk/comah/buncefield/miib-final-volume2b.pdf</p>
<p>13.13 Mobilisable Resources</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the mobilisable resources, internal and/or external.</p> <p>COMAH 15 – Information – Schedule 3, paragraph 6c</p> <p>COMAH 15 – Demonstration – Regulation 8 a, b and d</p> <p>COMAH 15 – Relevant – Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>The focus here for the environmental assessor is on the mobilisable resources to protect and limit the damage to the environment from a major accident.</p> <p><u>The Safety Report should contain information about:</u></p> <p>Resources held on-site or available to the Operator from external sources.</p> <p>Where third parties and/or contractors provide these services, the safety report should describe the response times expected to be achieved and also the resources available to respond to incidents.</p> <p>The safety report should also describe any mutual aid arrangements to help if there is a major accident.</p> <p>Other points to consider, where necessary, include:</p> <ul style="list-style-type: none"> • the envisaged timescale over which temporary containment may be required; • the arrangements made to ensure that such facilities would not pose an unacceptable threat to health and the environment; and • suitable disposal arrangements. <p><u>The Safety Report should demonstrate that:</u></p> <p>There are sufficient mobilisable resources to protect and limit the damage to the environment from a major accident.</p> <p>Benchmarks</p> <p>Recommendations on the emergency preparedness for, response to and recovery from incidents. http://www.hse.gov.uk/comah/buncefield/miib-final-volume2b.pdf</p>
<p>13.14 Technical / Non-Technical Measures</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major</p>	<p>The focus here for the environmental assessor is on the technical and non-technical measures to reduce the impact upon the environment from a major accident.</p> <p><u>The Safety Report should contain information about:</u></p> <p>Technical and non-technical measures used to reduce the impact of the major accident both on- and off-establishment. These measures can include:</p> <ul style="list-style-type: none"> • the technical measures identified throughout the safety report;

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<p>Accident by describing any technical and non-technical measures relevant to reduce the impact of a Major Accident.</p> <p>COMAH 15 – Information Schedule 3, para 6d</p> <p>COMAH 15 – Demonstration Regulation 8a, b and d</p> <p>COMAH 15 – Relevant – Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<ul style="list-style-type: none"> • the systems used to respond to a major accident such as the Internal Emergency Plan; • the External Emergency Plan ; and • other such emergency response plans available to the Establishment which can include mutual aid arrangements. <p>Other points to consider, where necessary, include:</p> <ul style="list-style-type: none"> • the envisaged timescale over which temporary containment may be required; • the arrangements made to ensure that such facilities would not pose an unacceptable threat to health and the environment; and suitable disposal arrangements. <p><u>The Safety Report should demonstrate that:</u></p> <p>There are sufficient technical and non-technical measures and controls to protect and limit the damage to the environment from a major accident.</p> <p>Benchmarks</p> <p>Recommendations on the emergency preparedness for, response to and recovery from incidents. http://www.hse.gov.uk/comah/buncefield/miib-final-volume2b.pdf</p>
<p>13.15 Restoration and Clean-up</p> <p>The safety report should show that suitable and sufficient provisions have been made for restoration and clean-up of the environment following a Major Accident.</p> <p>COMAH 15 – Information Schedule 3, para 6d</p> <p>COMAH 15 – Demonstration Regulation 8d</p> <p>COMAH 15 – Relevant – Regulation 11(d), 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p><u>The Safety Report should contain information about:</u></p> <p>The measures in place to provide for environmental restoration works based on major accident scenarios, on and off-establishment (e.g. call-out arrangements with contractors).</p> <p><u>The Safety Report should demonstrate that:</u></p> <p>There is a clear restoration plan, based on the MATTE scenarios identified and other major accidents with potential for environmental impact. It should include, where needed:</p> <ul style="list-style-type: none"> • the envisaged timescale over which temporary containment may be required; • the arrangements made to ensure that such facilities would not pose an unacceptable threat to health and the environment; • suitable disposal arrangements; • whether it is anticipated that the environment can be restored and the measures and timescale of restoration, plus, if applicable whether complementary or compensatory arrangements will be necessary (ref. Environmental Damage Regulations); • detail of how restoration and clean-up will be financed (to ensure a demonstration that the anticipated costs can be met

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	either directly by the Operator or by other means, such as Environmental Liability Insurance).
	Benchmarks
	Environmental Liability Directive / Environmental Damage Regulations

Appendix 13.2 ‘Environmental Inspections Guidance’

The guidance in this appendix is provided to support inspection of COMAH establishments. It is not expected to be used during Safety Report assessment phase, though it could be used in some circumstances (e.g. detailed verification of matters if required prior to conclusion of assessment when considering whether there is a serious deficiency).

TECHNICAL CRITERION	INSPECTION GUIDANCE
DESCRIPTIVE ASPECTS	
<p>13.1 Identifying MA Scenarios The safety report should identify all Major Accident Scenarios that have potential for environmental impact and/or those that could be initiated by natural hazards or events.</p> <p>COMAH 2015 – Information Schedule 3 Paragraphs 3, 4 and 5</p> <p>COMAH 2015 – Demonstration Regulation 8b and 8e</p>	<p>Inspection should verify the procedures, methodology and conclusions of the SR and that the SR has identified all the potential environmental MAS for major hazard identification and evaluation (Annex 1; Schedule 2 Paragraph 2b) and the output from those procedures to ensure they are consistent with information presented in the SR.</p> <p>Inspection/Verification preparation</p> <p>Review the SR submission for MAS identification. There may be links within the SR to accident mitigation and response as well as management of change procedures.</p> <p>There may be benefits to following the accident thread from identification, to extent and severity assessments, thorough prevention methods and accident mitigation and response.</p> <p>Detailed Inspection/Verification</p> <p>Environmental regulators should consider the various factors related to source, pathway, receptors (SPR) trios as evident at the establishment and consider whether the Operator has been successful at identifying all MATTE scenarios. Factors to consider include:</p> <ul style="list-style-type: none"> • behaviour of released substances; • pathway analysis; • domino or escalation effects. <p>Pathways by which the substance reaches the environment should be verified. Operator should provide full details of all pathways.</p> <p>The methodology used to identify MATTEs should be reviewed together with the records of assessments for MATTE and sub MATTE to ensure that the Operator has carried out adequate assessments of the environmental risks posed by their establishment</p> <p>SPR analysis should be present for all major accident scenarios. The information presented in the SR should be verified against the information held by the Operator.</p> <p>Inspection should include examination of the methodology used to identify SPR trios - this should be clearly set out, and have</p>

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	<p>procedural documentation.</p> <p>Inspection of the establishment surrounding – to verify that all SPR trios within the EIE have been identified.</p>
<p>13.2 Dangerous Substances The safety report should include a description of the dangerous substances that have a potential environmental impact. COMAH 2015 – Information Schedule 3, Paragraph 4 COMAH 2015 – Demonstration Regulation 8 a</p>	<p>Inspection should aim to verify that the SR has correctly identified the dangerous substances stored and/or produced on the establishment.</p> <p>Inspection/Verification preparation</p> <p>Review the range of substances stored and/or made and/or generated in the event of a MA in the SR focusing on those substances that have environmental or potential environment impacts.</p> <p>Detailed Inspection/Verification</p> <p>Review the stock inventories and MSDS sheets and compare to the COMAH thresholds and aggregation rules.</p> <p>Check that the MSDS are current, still relevant and fit for purpose.</p>
<p>13.3 Potential Releases The safety report should include a description of the aspects of the establishment that could be a factor in the potential for releases to the environment. COMAH 2015 –Information Schedule 3, Paras 3 and 4 COMAH 2015 – Demonstration Regulation 8 a</p>	<p>Inspection should aim to verify that the SR has correctly described the establishment and in particular those aspects that relate to MATTEs. Inspection to include verification of description and any maps and plans of the establishment provided with the SR.</p> <p>Inspection/Verification preparation</p> <p>Review the descriptive aspects of the SR focusing on those aspects that have environmental or potential environment impacts.</p> <p>Detailed Inspection/Verification</p> <p>To verify information about items of plant such as:</p> <ul style="list-style-type: none"> • monitoring equipment, e.g. for toxic products in air, sewers, discharges to water; for fires or explosive atmospheres; • treatment plants (on or off- the establishment); • detection, shutdown; • location of pumps, valves, pipe work, penstocks and firewater lagoons; • establishment layout and drainage, capacity and condition of drains, etc including historical drains, boreholes and soakaways and features such as drains no longer used but could be not blocked off, and drainage links to outwith the establishment; • suitability, capacity and condition of treatment plant; • details relating to safety (or environment) critical valves, instruments, control loops and detection systems; • geographical/geological/hydro-geological features that may impede/facilitate pollutant escape.

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	Any audit should verify any management factors such as Operator response, control procedures, distances between sources and pathways, used to prevent, control and mitigate the circumstances that could lead to MATTE events.
<p>13.4 Pathways and Receptors The safety report should identify and describe all environmental pathways and receptors that could, in the event of a Major Accident, be affected by dangerous substances present or anticipated to be present at the establishment.</p> <p>With respect to designated receptors, a description of their sensitivity should be included and other receptors should be referenced.</p> <p>COMAH 2015 –Information Schedule 3, Para 3</p> <p>COMAH 2015 – Demonstration Regulation 8a and 8e</p>	<p>Inspection should aim to verify that the SR has correctly described all environmental pathways and receptors surrounding the establishment.</p> <p>Inspection/Verification preparation</p> <ul style="list-style-type: none"> • Collate available maps and plans and descriptions of environmental receptors and pathways outwith the establishment. • Review the SR and discuss the environmental features with the relevant conservation officer(s) • Carry out preliminary survey of the establishment’s surrounding – this may be on foot but also driving around the wider EIE - paying particular attention to the pathways for spills and firefighting water. • Identify whether any new features, which may change pathways surrounding the establishment have been introduced since the last SR was submitted and whether these are included as necessary in the revised SR. For example, new buildings or roads and their associated drainage. <p>Detailed Inspection/Verification</p> <p>In depth verification of presence and nature of pathways immediately adjacent to the establishment (i.e., the area immediately susceptible to liquid run-off). Environmental regulators to verify aspects of topography and hydrology and in particular drainage features and their form of construction (man-made and natural). Particular attention should be given to areas adjacent to low points on the establishment where run-off may leave the establishment and enter drainage features.</p> <p>Environmental regulators should review the consultations made by the Operator with any relevant conservation bodies as part of the verification of the environmental features around the establishment.</p>
PREDICTIVE ASPECTS	
<p>13.5 SPR Trios The safety report should provide full details of all source, pathway, and receptor trios for all Major Accident Scenarios.</p> <p>COMAH 2015 –Information Schedule 3, Paras 4 and 5</p>	<p>Inspection should examine the methodology used to identify SPR trios - this should be clearly set out, and have procedural documentation (see also criterion 13.1).</p> <p>Inspection/Verification preparation</p> <p>Review the SR for SPR trios. There may be links within the SR to accident mitigation and response as well as management of change procedures and the topic 13.1 above.</p> <p>The use of eMARS and other accident databases may identify recent sector specific events that could apply to the Establishment.</p>

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TECHNICAL CRITERION	INSPECTION GUIDANCE
<p>COMAH 2015 – Demonstration Regulation 8b and 8e</p>	<p>Detailed Inspection/Verification</p> <p>The methodology used to identify release scenarios should be reviewed and the SPR analysis should be present for all MASs verified.</p> <p>Operator should provide full details of all site pathways.</p> <p>Inspection of the establishment surrounding – to verify that all SPR trios within the EIE have been identified.</p>
<p>13.6 Assessment of Environmental Consequences</p> <p>The safety report should include an assessment of the environmental consequences (extent, severity and duration) of potential Major Accidents.</p> <p>The safety report should provide details of methodology used to assess the potential for a MATTE, and for each scenario conclude whether a MATTE is possible.</p> <p>COMAH 2015 –Information Schedule 2, Para 2b and Schedule 3, Paras 5b and c</p> <p>COMAH 2015 – Demonstration Regulation 8a, b and e</p>	<p>Inspection should verify detailed aspects of consequence assessment (potentially to include other specialists with specific knowledge of receptor sensitivities).</p> <p>Inspection/Verification preparation</p> <p>Review the SR information on the extent, severity and duration. There may be links within the SR to accident identification accident mitigation and response as well as management of change procedures.</p> <p>There may be benefits to following the accident thread from identification, to extent, severity and duration assessments, thorough prevention methods and accident mitigation and response.</p> <p>Detailed Inspection/Verification</p> <p>Environmental regulators should review the methods used to calculate release rates, consequences (including extent, severity, duration) of a MATTE or a representative set of MATTEs.</p> <p>The methodology used to identify MATTEs should be reviewed together with the records of assessments for MATTE and sub MATTE to ensure that the Operator has carried out adequate assessments of the environmental risks posed by its establishment.</p> <p>The assessments carried out by the Operator to determine the consequence of the environmental impact of the MATTEs identified by the Operator.</p>
<p>13.7 MATTE Probability</p> <p>The safety report should include conclusions on the probability of the Major Accident Scenarios that have the potential for a MATTE and the conditions under which</p>	<p>Environmental regulators should verify procedures to ensure for frequency assessment and decision making about tolerability of risk are embedded into procedures for all aspects of operation and modification of the establishment.</p> <p>Inspection/Verification preparation</p> <p>Review the risk matrix in the SR and the frequency assessment and the tolerability of risk etc.</p> <p>Request SMS procedures for identification and evaluation of Major Accident Hazards (e.g. as used for management of change) and</p>

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<p>they occur.</p> <p>COMAH 2015 – Information Schedule 2, Para 2b and Schedule 3, Para 5</p> <p>COMAH 2015 – Demonstration Regulation 8 a</p>	<p>review these, comparing with the SR.</p> <p>Detailed Inspection/Verification</p> <p>Environmental regulators should audit frequencies where identified and to follow this through to the final probability figure for MATTE risks.</p> <p>This to include further verification of failure rate suitability given actual conditions of the establishment. Any measure deviating from good practice, but reported to have a standard failure rate needs particular attention.</p> <p>Examples of risk matrix/frequency assessment in use (e.g. for Management of Change - MoC) should be audited and followed through to identify how the decision process was made.</p> <p>Inspection of full ALARP demonstration methodology with audit of example application should be carried out to ensure all assumptions have been fully justified and the outcome recommendations used to inform any necessary improvement within the establishment.</p> <p>Environmental regulators (with predictive support when required) should ensure all frequencies are realistic (with source documents referenced) and that the QRA outcomes have been used to guide measures for MAH prevention and mitigation.</p>
<p>TECHNICAL ASPECTS</p>	
<p>13.8 MATTE Prevention and Mitigation</p> <p>The safety report should include a description of the arrangements to prevent and mitigate MATTEs. This should include all prevention, mitigation and procedural protection measures.</p> <p>The safety report should make the demonstration that the Operator has taken the necessary measures to prevent or mitigate the consequences of a Major Accident.</p>	<p>Inspection should verify detailed aspects of risk assessment in order to identify Safety (and Environmentally) critical protection layers.</p> <p>Inspection/Verification preparation</p> <p>Review the SR for the measures used to prevent, control and mitigate the various MATTE related scenarios. There may be links to other assessment/inspection criteria (e.g. this can usefully be done at the same time an Operator is testing the emergency arrangements).</p> <p>Where a utility is relied upon to implement any measure defined in the SR it should be demonstrated to have suitable reliability, availability and survivability.</p> <p>Detailed Inspection/Verification</p> <p>Environmental regulators should verify that conditions (such as prevention methods, control measures and mitigatory actions including emergency response(s)) found on the establishment are as described in the SR.</p> <p>See Delivery Guides (DG) for specific inspection details.</p>

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<p>COMAH 2015 – Information Schedule 2, Para 2c and Schedule 3, Paras 5 and 6</p> <p>COMAH 2015 – Demonstration Regulation 8a, b and c</p>	
<p>13.9 Containment The safety report should include technical details of design specification for primary, secondary and tertiary containment (including site drainage) along with each design standards used.</p> <p>The safety report should provide reference to all inspection procedures and methods for routine and periodic monitoring of containment systems.</p> <p>COMAH 2015 – Information Schedule 2, Paras 2c and Schedule 3, Paras 6a and d</p> <p>COMAH 2015 – Demonstration Regulation 8c</p>	<p>There may be differing levels of interaction with other specialism within the Competent Authority. The environmental regulator should consider what other specialist resource may be required to support detailed inspection of technical measures.</p> <p>See Delivery Guides (DGs) for areas where environmental regulators lead or have a role in inspection (e.g. secondary and tertiary containment and Emergency Preparedness, including internal emergency plans). Inspection activity should be in accordance with the instructions in the DGs, with the aim to verifying that the Operator has taken the necessary measures.</p> <p>Inspection/Verification preparation</p> <p>The SR should describe locations where flammable substances could be present and how the equipment has been designed to take account of the risk.</p> <p>Review the standards available for design and construction of equipment.</p> <p>Where appropriate, review the CA scorecards for secondary and tertiary containment.</p> <p>Detailed Inspection/Verification</p> <p>Officers should verify that conditions, procedures, and systems in use on the establishment are as described in the SR. Verification of the standards used to design, build, operate and maintain the processes and equipment within the establishment to ensure that All Necessary Measures are in use.</p>
<p>SMS & MAPP ASPECTS</p>	
<p>13.10 SMS The safety report should detail the safety management system (SMS) used on the establishment and provide information of audit</p>	<p>The environmental inspection of MAPP & SMS should be coordinated with HSE Regulatory Inspector inspection activity and focus on procedures for control and mitigation of MATTEs.</p> <p>The aim of the inspection is to verify that the SMS described in the SR is in use in the Establishment to prevent and to control and mitigate MATTEs.</p>

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<p>systems and audit results. This should include how the SMS relates to the environment.</p> <p>COMAH 2015 – Information Schedule 2, also Schedule 3 paras 2 and 5c</p> <p>COMAH 2015 – Demonstration Regulation 8a</p>	<p>Inspection/Verification preparation</p> <p>Review the SR for the description of SMS in use at the establishment, and any demonstration related information in the SR.</p> <p>Detailed Inspection/Verification</p> <p>Environmental regulators should ensure all procedures are up-to-date, controlled documents and that the procedures in use do not deviate significantly from those described in the SR.</p> <p>Full criteria as to suitability of establishment staff using this procedure(s). The Operator will detail and demonstrate compliance with any other management system standards e.g. ISO 14001. Full details of how any actions from this external system will be fed into the risk register.</p> <p>The Operator should provide evidence that the change management system for both technical measures and procedures includes reference to environmental considerations during the change procedure.</p> <p>The Management of Change system in place should be capable of not only considering the changes made internally within the Establishment but should also consider external changes to the Establishment such as changes to the classification of a chemical, new information about the fate of chemical, new safety related information and changes to the law.</p> <p>Procedures should be in place for environmentally critical problem reporting and indicators such as environmental process safety performance safety indicators (PSPIs). The audit should review how such PSPIs are used, reviewed and audited in the SMS.</p> <p>There should be clear organisational structures of the control and management of MAH including MATTEs.</p>
<p>EMERGENCY PLANNING ASPECTS</p>	
<p>13.11 Plans and equipment to limit MA consequences</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the equipment available.</p> <p>COMAH 15 – Information – Schedule 3, para 6a</p>	<p>The internal plan and all supporting procedures should be inspected with reference to Delivery Guide.</p> <p>Inspection should verify detailed aspects of risk assessment (potentially to include other specialists with specific knowledge of receptor sensitivities) paying particular attention to the emergency response layers of protection identified for environmental protection.</p> <p>See Delivery Guides (DGs) for aspects that environmental regulators lead or have a role in Inspection (e.g. secondary and tertiary containment and Emergency Preparedness - internal plans). Inspection activity should be in accordance with the instructions in the DGs, with the aim of verifying that the Operator has taken all measures necessary and may need to be coordinated with the HSE inspector and/or CIM</p> <p>Inspection/Verification preparation</p>

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<p>COMAH 15 – Demonstration – Regulation 8 a and d</p> <p>COMAH 15 – Relevant – Regulation 11, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>Review the relevant DG, MATTE scenarios and the internal plan (if available and current).</p> <p>Detailed Inspection/Verification</p> <p>The internal plan and all supporting procedures should be inspected.</p> <p>Evidence should be provided of the consultation process with the EA/SEPA/NRW, and how comments are incorporated into the final version.</p> <p>Details of the criteria for escalation from internal plan to external plan should be evident and understood by those who may need to initiate the external plan.</p> <p>At inspection the Operator should provide evidence that the information supplied to the local authority was of sufficient detail and relevance, such that the plan for external emergencies should have clearly understood control points and alternative control points and rendezvous points. The emphasis at inspection should be on the existence of training matrices and that these identify training for individuals in all necessary areas of the emergency procedures relating to environmental protection.</p> <p>Detailed inspection of the Operator's emergency arrangements may usefully take place during on or off-site exercises and should be coordinated with work of HSE (see internal and external emergency plan delivery guides).</p> <p>The inspection should review/verify the arrangements in place for third party contractors to provide services such as monitoring, effluent removal and fire water disposal</p>
<p>13.12 Alert and Intervention</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the organisation of alert and intervention.</p> <p>COMAH 15 – Information Schedule 3, paragraph 6b</p> <p>COMAH 15 – Demonstration Regulation 8 a and d</p> <p>COMAH 15 – Relevant</p>	<p>See Delivery Guides (DGs) for aspects that areas where environmental regulators lead or have a role in inspection (e.g. secondary and tertiary containment and Emergency Preparedness - internal plans). Inspection activity should be in accordance with the instructions in the DGs, with the aim to verifying that the Operator has taken all measures necessary and may need to be coordinated with the HSE inspector and/or CIM.</p> <p>Inspection/Verification preparation</p> <p>Review the relevant DG, MATTE scenarios and the internal plan (if available and current).</p> <p>Detailed Inspection/Verification</p> <p>The internal plan and all supporting procedures should be inspected.</p> <p>Evidence should be provided of the consultation process with the EA/SEPA/NRW, as appropriate, and how comments are incorporated into the final version.</p> <p>Details of the criteria for escalation from internal plan to external plan should be evident and understood by those who may need</p>

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<p>Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>to initiate the external plan.</p> <p>At inspection we are looking for the company to provide evidence that the information supplied to the local authority was of sufficient detail and relevance, such that the plan for external emergencies should have clearly understood control points and alternative control points and rendezvous points. The Operator should have informed the local authority what measures it has in place to initiate mitigatory measures outwith the establishment, including clean-up and restoration.</p> <p>The emphasis at inspection should be on the existence of training matrices and that these identify training for individuals in all necessary areas of the emergency procedures relating to environmental protection. . Unique personal training records of establishment staff should be sampled to get a picture of the overall level of training and familiarisation with emergency procedures.</p> <p>Detailed inspection of the Operator's emergency arrangements may usefully take place during internal or external plan exercises and should be coordinated with work of HSE (see internal and external emergency plan delivery guides).</p> <p>The inspection should review/verify the arrangements in place for third party contractors to provide services such as monitoring, effluent removal and contaminated firefighting water disposal.</p>
<p>13.13 Mobilisable Resources The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing the mobilisable resources, internal and/or external.</p> <p>COMAH 15 – Information – Schedule 3, paragraph 6 c</p> <p>COMAH 15 – Demonstration – Regulation 8 a, b and d</p> <p>COMAH 15 – Relevant Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>Inspection should verify that the mobile resources available to protect and mitigate a MATTE in use and/or available at the Establishment are as described in the SR.</p> <p>See Delivery Guides (DGs) for aspects that Environmental regulators lead or have a role in Inspection (e.g. secondary and tertiary containment and Emergency Preparedness - internal plans). Inspection activity should be in accordance with the instructions in the DGs, with the aim of verifying that the Operator has taken all measures necessary and may need to be coordinated with the HSE inspector and/or CIM.</p> <p>Inspection/Verification preparation</p> <p>Review the relevant DG, MATTE scenarios and the internal plan (if available and current).</p> <p>Detailed Inspection/Verification</p> <p>The internal plan and all supporting procedures should be inspected.</p> <p>Detailed inspection of the Operator's prevention, control mitigatory measures including their emergency arrangements should be coordinated with work of HSE (see internal and external emergency plan delivery guides). For the emergency arrangements it may usefully take place during internal or external plan exercises.</p> <p>Inspection to sample emergency equipment and its inspection regimes. This should include fire pumps and monitors to ascertain firewater deliver rates/volumes. The Operator should provide information on the types of firefighting foam available and any</p>

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	<p>mutual aid agreements.</p> <p>The inspection should review/verify the arrangements in place for third party contractors to provide services such as monitoring, effluent removal and fire water disposal.</p> <p>Where effluent treatment plants are used to mitigate impacts, the retention times referred to the SR should be verified and reviewed. The monitoring arrangements available to the Establishment should be reviewed and compared the SR description(s).</p>
<p>13.14 Technical / Non-Technical Measures</p> <p>The safety report should detail measures of protection and mitigation to limit the consequences of a Major Accident by describing any technical and non-technical measures relevant to reduce the impact of a Major Accident.</p> <p>COMAH 15 – Information Schedule 3, para 6d</p> <p>COMAH 15 – Demonstration Regulation 8a, b and d</p> <p>COMAH 15 – Relevant Regulation 11, 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>Inspection should verify that the technical and no-technical measures available to protect and mitigate a MATTE in use and/or available at the Establishment are as described in the SR.</p> <p>See Delivery Guides (DGs) for areas where Environmental regulators lead or have a role in Inspection (e.g. secondary and tertiary containment and Emergency Preparedness - internal plans). Inspection activity should be in accordance with the instructions in the DGs, with the aim of verifying that the Operator has taken all measures necessary and may need to be coordinated with the HSE inspector and/or CIM.</p> <p>Inspection/Verification preparation</p> <p>Review the relevant DG, MATTE scenarios and the internal plan (if available and current).</p> <p>Detailed Inspection/Verification</p> <p>The internal plan and all supporting procedures should be inspected.</p> <p>Evidence should be provided of the consultation process with the COMAH emergency consultees and how comments are incorporated into the final version.</p> <p>At inspection the Operator should provide evidence that the information supplied to the local authority was of sufficient detail and relevance, such that the plan for external emergencies should have clearly understood control points and alternative control points and rendezvous points. The emphasis at inspection should be on the existence of training matrices and that these identify training for individuals in all necessary areas of the emergency procedures relating to environmental protection.</p> <p>Unique personal training records of establishment staff should be sampled to get a picture of the overall level of training and familiarisation with emergency procedures.</p> <p>Detailed inspection of the Operator's emergency arrangements may usefully take place during internal or external plan exercises and should be coordinated with work of HSE (see internal and external emergency plan delivery guides).</p> <p>Inspection to sample emergency equipment and its inspection regimes. This should include fire pumps and monitors to ascertain firewater deliver rates/volumes. The Operator should provide information on the types of firefighting foam available and any</p>

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	<p>mutual aid agreements.</p> <p>The inspection should review/verify the arrangements in place for third party contractors to provide services such as monitoring, effluent removal and firefighting water disposal.</p>
<p>13.15 Restoration and Clean-up The safety report should provide evidence that suitable and sufficient provisions have been made for restoration and clean-up of the environment following a Major Accident.</p> <p>COMAH 15 – Information Schedule 3, para 6d</p> <p>COMAH 15 – Demonstration Regulation 8d</p> <p>COMAH 15 – Relevant Regulation 11 (d), 12, 13(3) & Schedule 5 Parts 1 & 2</p>	<p>Inspection/Verification preparation Review the SR to see restoration plan along with criterion for any contractor to be used in the event of a MA.</p> <p>Detailed Inspection/Verification The internal plan and all supporting procedures should be inspected.</p> <p>The Operator should be asked to provide evidence of a suitable restoration plan along with criterion for any contractor to be used in the event of a MA.</p> <p>The detail verification should check that the Operator has sufficient understanding of the possible monitoring and testing required determining extent of polluted environs both natural and manmade (e.g. food production).</p> <p>The disposal, restoration and recovery arrangements in place following the identified MATTE scenarios.</p>
<p>Criterion 13.16 Inspection Assessment of natural events</p> <p>COMAH 15 – Information – Schedule 3 para 5(a)(iii)</p> <p>COMAH 15 - Demonstration - Regulation 8 b</p>	<p>Inspection/Verification preparation Review the SR to identify if any natural events could initiate a major accident and, if appropriate, how flood protection systems are used to prevent major accidents. Review whether the Operator has considered more frequent events due to climate change.</p> <p>Detailed Inspection/Verification SR to include consideration of:</p> <ul style="list-style-type: none"> • current flood protection systems and whether these have been projected to be suitable for future needs; • more frequent and severe storm events; and • colder and hotter weather conditions. <p>Where an Establishment is protected by flood defences, the Operator should be able to describe the conditions under which the defences will be over topped, how it is alerted of these circumstances and how it will respond if these circumstances happen. Flooding events may require a combination of high tide, high rainfall and high winds from a specific direction that can combine to become a storm surge.</p>

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	<p>Similarly during prolonged periods of cold or hot or windy weather could initiate a MA. The Operator should be able to describe the weather conditions which initiate a MA how it is alerted of these circumstances and how it will respond if these circumstances happen.</p> <p>SRs to include the implications climate change may have on assumptions within the predictive aspects section, such as frequencies of initiation and mechanisms for escalation of MASs.</p> <p>Reference should be to the DEFRA climate change documents Climate Change Adaptation Strategy (2008-11) Developing climate change adaptation action plans Climate adaptation: Risk, uncertainty and decision-making, UKCIP Technical Report</p>