

APPENDIX D
Wilton Site Procedures

EQUIPMENT STRATEGY - 8407

Title: Examination and Maintenance of Drainage.

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1. PURPOSE

This Equipment Strategy specifies the arrangements required for the inspection and maintenance of drainage to ensure their integrity and meet the needs of PSM.

This may include one or more of the following:

- An initial appraisal
- A scheduled examination
- A thorough examination
- A scheme of examination
- A fitness for purpose assessment
- Deferment of examination
- Dispensation from an examination
- Examination of repairs and modifications to drainage.

Any drainage deemed PSM critical shall refer to the requirements of S21A/S24A and WSP 1611.

It is applicable to the Examination of all drainage owned or operated by INVISTA at Nylon, Wilton

Extensive reference is made to ABB document "Examination of Drainage Systems - EUT.711.04A" which specifies the requirements and standard forms to be adopted.

2. PROCEDURES

PRINCIPLES

An examination is required to determine any change in the condition of the drainage and to use such information in determining whether the drainage:

- May continue in service up to the next planned examination.
- Requires repair or remedial works.
- Needs to be replaced.
- Requires a more frequent examination.
- Requires a less frequent examination

Periodic Examination shall be established. Examinations shall ensure the continued fitness for purpose of the Drainage by identifying defects and necessary maintenance and improvement works.

Personnel authorised to establish, oversee and carry out Examinations at various levels shall be properly qualified, trained and have suitable experience.

New installations on developed or previously undeveloped sites shall be designed to prevent "Significant Environmental Harm " by use of a pumped overground system or a system in which leakage can be detected.

The design and construction standards traditionally applied to Drainage would not now be acceptable for many types of Wastewater drains because of the risk of Significant Environmental Harm caused by leakage. It is unrealistic to expect Drainage constructed to these standards to perform consistently to a much higher standard. Schemes of Examination should recognise this and site improvement plans should be developed using Critical Drainage assessment as a basis for prioritisation. (Appendix 1)

Deferment of Examinations

Under normal circumstances, drainage shall be subjected to Examination at intervals stated in the Scheme of Examination. Where experience in service indicates that an Examination is not essential, then it may be postponed for up to 24 months, subject to the written approval.

See ABB document "Examination of Drainage - :EUT.711.04A" 4.4 and INS/71

Dispensation from Examination

In circumstances where it is judged unnecessary to carry out regular Examinations of drainage, then a dispensation may be granted . In such situations, a technical supporting case shall be written.

A review date for the dispensation shall be stated which in no case shall exceed 72 months. The review shall take into account previous Examination Reports and experience of the operating conditions.

See ABB document "Examination of Drainage - :EUT.711.04A" 4.5 and INS/91

Additional Examinations

If any drainage is likely to have been damaged through mal-operation, changed operating conditions or other incident, then consideration shall be given to the need for additional Examination for all or part of a drainage system.

Repairs

For all examinations, defects and associated repairs shall be incorporated into the maintenance system on SAP as equipment.

Defects and repairs that require rectification before the next scheduled / thorough examinations shall be recorded .

Such repairs shall also be recorded on the Plant Modification system.

See ABB document "Examination of Drainage - :EUT.711.04A" 4.8 and INS/90

Criteria for Critical Drainage

The following Drainage shall be classified as critical:

- Those where loss of containment could reasonably foreseeably cause an Unacceptable Situation. This includes Drainage with double containment and leakage monitoring.
- Wastewater Drainage that is located outside the Site boundary.

The following Drainage would not normally be classified as critical:

- Drainage leading to consented outfalls where leakage would be likely to travel to the same receiving water without contaminating the surrounding Ground or Groundwater.
- Stormwater Drainage unless infiltration of contaminated Groundwater is suspected which could affect another target.

Appendix 1 sets out detailed criteria and the procedure in a structured manner.

Existing Drainage

Layout / Location Drawings of all critical buried Drainage shall be compiled, and subsequently maintained, for each Area.

Each section of Drainage shall be given a unique reference .

New Drainage

All Drainage shall be given a unique reference.

An appropriate team (e.g. Hazards Study Team) shall classify and assess which Drainage is to be Critical.

TYPES OF EXAMINATION

Drainage shall undergo three forms of periodic Examination:

- a routine Examination.
- a scheduled Examination.
- a thorough Examination.

An Examination is required to establish information relating to any change in the condition of the Drainage and to use such information in determining whether the Drainage:

- may continue in service up to the next Examination.
- requires repair;
- requires to be replaced;
- requires to be examined more frequently;
- may be examined less frequently.

All Examination reports shall be held in the appropriate File.

Routine Examination

The Examination shall check that Wastewater or storm water is entering and passing through the Drainage system with no evidence of blockage, leakage, rubbish in channels or ditches or other problems such as settlement. There is no requirement to remove manhole or Drainage channel covers and the inspection is therefore limited.

On most plants this inspection will be accomplished by a normal tour of the plant area, but it is recognised that there may be unmanned areas where special arrangements will have to be made.

Drainage with leak detection monitoring shall be checked on a regular basis at intervals agreed in the registration process.

Any significant findings shall be reported to the Competent Civil Engineer.

Scheduled Examination

The purpose of a scheduled examination is to inspect the drainage system in order to identify serious defects, potentially serious defects or required maintenance activities, and to recommend priorities for remedial work or further investigation (e.g. thorough examination, pressure testing, CCTV survey etc.).

The physical condition of the Drainage should be examined and any damage, deterioration, debris or deposition recorded. Any evidence of soil or Drainage backfill in the flow should be noted as possible evidence of infiltration;

Scheduled examinations where specified should normally be undertaken at intervals not exceeding 36 months. Intervals may be adjusted based on evidence of routine examinations.

Not all Drainage will require a Scheduled Examination. It may be limited to specific Drainage where more frequent, but perhaps less detailed, formal examination is required.

See ABB document "Examination of Drainage - :EUT.711.04A" Appendix B.1.1 for Examination requirements and B.1.2 for reporting requirements.

Thorough Examination

The purpose of a thorough examination is to assess in detail the condition of the drainage system in order to identify defects that may affect the drainage containment or operational ability. A thorough examination may form part of a fitness for purpose assessment.

A thorough Examination shall be carried out at intervals not exceeding 72 months unless a deferment or dispensation is obtained.

See ABB document "Examination of Drainage - :EUT.711.04A" Appendix B.2.1 for Examination requirements and B.2.2 for reporting requirements.

SCHEME OF EXAMINATION

The purpose of a Scheme of Examination is to specify the minimum Examination to be carried out in order that an assessment whether, for the period up to the next Examination, the Drainage is fit to continue in service on its stated duty.

The following shall be included

- requirements for scheduled Examination,
- requirements for thorough Examination,.
- Examination intervals.

A system for planning and notifying the due date of examinations of drainage systems should exist.

Defects and associated repairs shall be incorporated into the maintenance SAP system. Repairs shall be signed off when complete

See ABB document "Examination of Drainage - :EUT.711.04A" Appendix B.3 for more details on purpose, examination preparation-3.1, requirements for scheduled examination form-3.2, requirements for thorough examination form -3.3, approval form-3.4 and amendments form - 3.5.

FITNESS FOR PURPOSE ASSESSMENT

A fitness for purpose assessment should normally review:

The as-built drawings.
 The original calculations.
 Any modifications to the original design.
 The surcharge loading on the drainage.
 The current use of the drainage (normal and abnormal operation).
 The results from an examination.
 The ground and groundwater conditions
 Consequences of leakage or structural failure.
 Location.

If the information available is insufficient to determine the fitness for purpose of the drainage system then further investigation work shall be carried out.

3 REFERENCES

British Standards

BSEN 1610 : Construction & Testing of Drains & Sewers

Standard Forms.

See ABB document "Examination of Drainage - :EUT.711.04A"

INS/70 Report of Examination of Registered Drainage (STD/F/00941)
 INS/71 Scheme of Examination of Registered Drainage (STD/F/00942)
 INS/72 Drainage Registration Sheet (STD/F/00943)
 INS/73 Drainage Registration Assessment Record (STD/F/00944)
 INS/74 Selection of Drainage for Registration - Assessment Summary (STD/F/00945)
 INS/75 Wastewater Data Sheet (STD/F/00946)

EC Directives

80/68/EC Protection of Groundwater
 76/464/EC Discharge of Dangerous Substances to the Aquatic Environment
 96/91 EC Integrated Prevention of Pollution and Control

UK Legislation

SI 472 Prescribed Processes and Substances Regulations 1991
 SI 3246 Control of Substances Hazardous to Health Regulations 2002

Environment Agency Website (NetRegs) www.environmentagency.gov.uk

Pollution of Surface Waters and Ground Water

WSP 1217 Prevention of Pollution to River

WSP 1710 Controlling Nylon Wilton Aqueous Effluents Flowing Directly to River Tees

WSP 1701 Managing of Site Drainage and Effluent Systems

Other Documents

Manual of Sewer Condition Classification (published by the Water Research Centre)

4 DEFINITIONS

For the purpose of this Procedure, the following definitions apply.

Drainage

Systems which convey Wastewater (including effluent) and storm water by gravity including trenches, channels, buried pipes, culverts, collection pits, sumps, chambers, gullies, manholes, ditches and land drains.

Examination

Examination means a careful and critical scrutiny of registered Drainage to assess its actual condition and whether it is fit for use for the period up to the next Examination. An Examination may be "routine", "scheduled" or "thorough".

Ground

Ground is any natural or imported fill material below the land surface.

Groundwater

Groundwater is all subsurface water contained in the Ground and geological formations.

Scheme of Examination

A Scheme of Examination defines the extent, nature, preparatory work and frequency of Examinations.

Significant Environmental Harm

Significant Environmental Harm means evident damage to plant or animal life or contamination of Ground, Groundwater or surface water to an extent that would impair the fitness of these media for beneficial use. (See Appendix 2)

Unacceptable Situation

An Unacceptable Situation is one in which there is a significant probability of serious harm to people or the environment. Within the above general definition the Responsible Civil Engineer or other appropriate persons are required to make the judgement based on the particular circumstances. At the Works discretion serious loss of production may be regarded as an Unacceptable Situation.

Wastewater

Liquid process effluent, spillages, washdown, overflows, cooling water, flows from toilets and shower facilities, canteens and offices.

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SELECTION OF DRAINAGE -CLASSED AS CRITICAL

Drainage shall be classed as Critical if leakage may cause an Unacceptable Situation.

An Unacceptable Situation may be one or more of the following:

- harm or serious nuisance to the public
- serious harm to people on site
- Significant Environmental Harm
- at the Works discretion, serious harm to the business

PROCEDURE FOR SELECTION OF DRAINAGE

Forms

Form INS/73 should be used to assist and record the selection process for each identified element of Drainage. Form INS/74 should be used to summarise the selection process for a Works/Site/Area.

To minimise effort the forms are structured such that the selection process may be halted once a requirement for Registration has been determined.

Step 1 - Identify Drainage (Form INS/74)

Ensure that a layout drawing is available showing all Drainage locations and routes on the Works/Site/Area. Identify and list all Drainage by item, line or section, as appropriate, on Form INS/74.

Step 2 - Location (Form INS/73 - Part 1)

Wastewater Drainage located outside the site boundary shall be registered.

Step 3 - Significant Environmental Harm (Form INS73 - Part 2)

Assess all Drainage whose failure would be likely to lead to Significant Environmental Harm.

A number of substances referred to as "Category 'A' chemicals" in this Procedure (see Appendix 2, 3.5) are known to result in a high hazard to human health and/or the environment and their release to Ground, Groundwater and/or surface water is strictly controlled by legislation. If the Drainage carries one or more Category 'A' chemicals then the Drainage shall be classed as Critical.

For other chemicals an assessment shall be made of the contamination potential and the likely consequences of release into the Ground, Groundwater or surface water. Potentially unacceptable consequences other than environmental damage such as noxious smells and/or

visible evidence of contamination e.g. colour, foaming, etc should be recognised. The decision to class as Critical shall be based on the above assessment.

APPENDIX 1 Page 2 of 3

Appendix 2 of this Procedure provides further detailed guidance and a methodology for assessing the likelihood of Significant Environmental Harm.

Step 4 - Damage to Adjacent Critical Structures or Services (Form INS/73-Part3)

Consider whether the failure of the Drainage could damage critical structures, services or storage facilities that would lead to an Unacceptable Situation. This assessment should take into account pipe size, depth and Ground conditions.

Step 5 - Serious Business Harm (Form INS/73 - Part 4)

In consultation with and at the discretion of the Works, register the Drainage if failure would cause serious business harm. Examples of serious business harm include:

- (a) significant loss of production
- (b) unacceptably high repair costs
- (c) high cost of a future clean-up of contaminated land

Step 6 - Registration (Form INS/73 - Part 5)

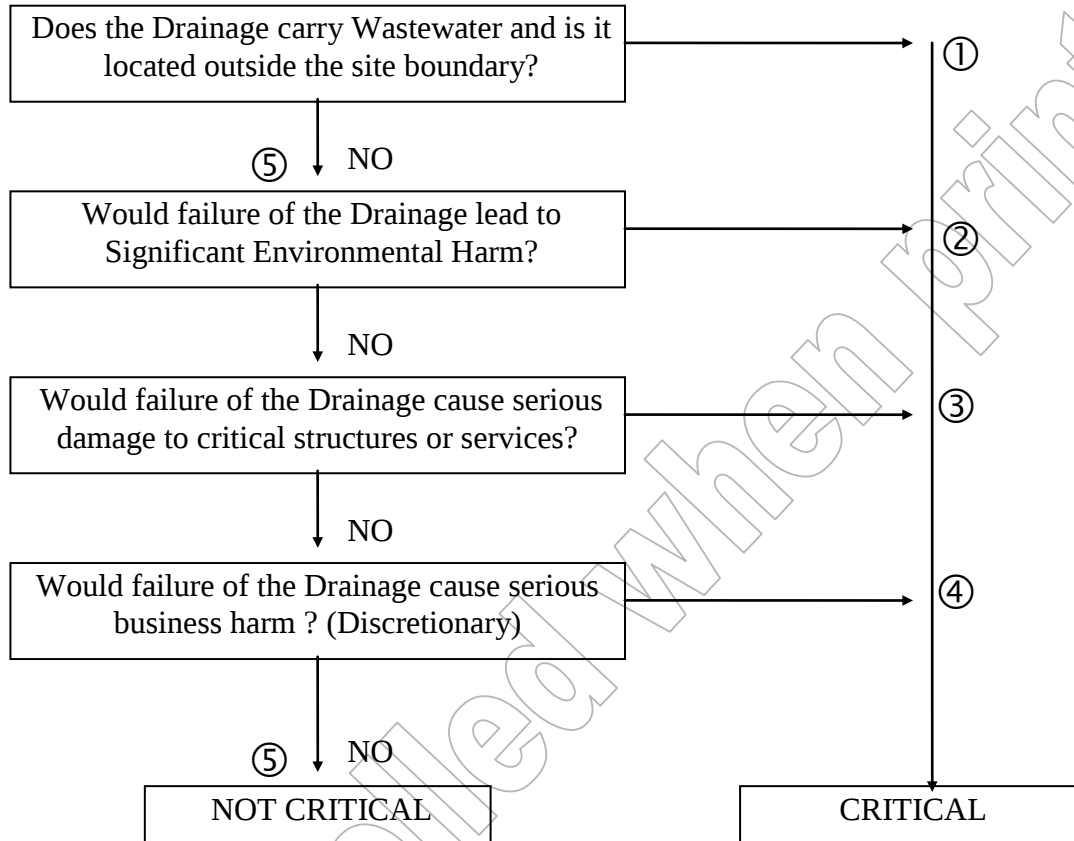
The decision whether or not to register the Drainage is stated, with reasons, and the form is signed by the Chairman of the Assessment Team and the Competent Civil Engineer.

Step 7 - Summarise Assessment (Form INS/74)

The assessment shall be summarised on Form INS/74 in conjunction with the decision tree shown in Figure 1. The summary shall be approved by the Competent Civil Engineer. The layout drawing shall be marked up with all Critical Drainage.

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1: DECISION TREE



APPENDIX 2 Page 1 of 1

REPORT OF EXAMINATION OF DRAINAGE CONDITION CATEGORIES

1. INTRODUCTION

Form INS/70 requires that visual defects are categorised V1, V2, V3 or V4 where the four condition categories have a meaning based on the descriptions contained within NEP 8405.

2. CONDITION CATEGORIES

Outline of Categories

The concept behind the four condition categories is:

- V1 Near 'perfect' condition.
- V2 No cause for concern or for any immediate action although some deterioration is evident.
- V3 Action required to arrest deterioration or correct existing defects. However this would not normally impair the drainage system fitness for purpose.
- V4 Defect identified, based on visual inspection, which is judged likely to impair the drainage system fitness for purpose or forms a safety risk. Early action required to investigate further or remedy fault. Integrity of drainage system in doubt.
- V5 Severe deterioration. Or the drainage has failed or is in immediate danger of failure. Immediate action required to remedy fault. Drainage integrity lost or unable to fulfil its service duty.

The prefix 'V' is to indicate that the classification has been made on the basis of a visual inspection.

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Record of Amendment

Rev.	Section	Details
New	All	Total re-write incorporating MBM Principles. Replaces NEP8407

WILTON SAFETY PROCEDURE	WSP 1719F	PAGE 1 OF 6
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Title	Issued	April 2007
Protection of Soil and Ground Water	Review	April 2010
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Record of Amendment

Rev	Section	Details
F	All	General update. DuPont references removed
		Appendix 1 removed and placed in WSP 1218
		Appendix 2 renumbered Appendix 1

WILTON SAFETY PROCEDURE	WSP 1719F	PAGE 3 OF 6
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1. PURPOSE

To ensure that INVISTA Nylon, Wilton Site takes precautions to prevent soil and ground water pollution.

2. SCOPE

The WSP applies to the Wilton Nylon Site.

3. REFERENCES

- 3.1. URS Site Report 24th May 1993. (Nylon)
- 3.2. Contaminated Land Exposure Assessment Model (CLEA) – Environment Agency + DEFRA
- 3.3. PPG2 Above ground oil storage tanks – Environment Agency.
- 3.4. 'Guidance for the Large Volume Organic Chemicals Sector' – IPPC S4.01.Section 2.2.5

4. DEFINITIONS

None

5. PRINCIPLES

- 5.1. The site shall take action to prevent soil and groundwater bearing in mind the propensity of the ground to allow mitigation of pollutants.
- 5.2. PPC requires that plants control fugitive emissions surface water and ground water – Appendix 2.

6. GEOLOGY

- 6.1. The Site is built on a sequence of unconsolidated drift deposits comprising: glacial boulder clay, silty clay, locally black laminated clay. These reach a depth of 7-14m and overlay the Redcar Mudstone formation (lower Jurassic).
Permeability: Very Low.

7. STATUS

- 7.1. Nylon. 43 boreholes were sunk around the Site in 1993. The resulting investigation revealed that there were two sites of localised contamination within limited likelihood of lateral or vertical migration (Ref: 3.1)

WILTON SAFETY PROCEDURE	WSP 1719F	PAGE 4 OF 6
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8. BOREHOLES

- 8.1. Nylon. 24 boreholes remain active on the Site. Samples of groundwater shall be taken at a maximum period of 6 months and analytical tests carried out in accordance with method W/EOH/37 in document NW/LAB/AM/007. Any deviation of bore hole results shall be investigated by the owning Area.

9. PLANT

- 9.1. All processing plant shall be located on a hard, impervious surface. Protected surfaces should be subject of regular inspection. Actions required following inspection shall be to a defined schedule. The plant shall prevent or reduce fugitive emissions to land and water through the application of measures outlined in the PPC Guidance (Appendix 1).

10. TANKS AND VESSELS

- 10.1. All storage tanks and vessels for liquids other than clean water shall be protected as defined in RASP study, bunded as per INVISTA Best Practice, and be in accordance with Environment Agency Guidance (Ref 3. 3)

11. INTERNAL TRANSPORT

- 11.1. All movements of liquids, other than clean water, around the Site shall be carried out in mobile drum bunds or bunded IBC's. Deminimis quantities: 200 litre drums.

12. BUNDS

- 12.1. All bunds, static and mobile shall be subject to a scheme of registration and subject to a scheme of inspection and maintenance. The maximum inspection period shall be one year. The actions required following inspections shall be followed up according to a firm schedule.
- 12.2. Bunds shall have no direct connection to the plant drainage system.
- 12.3. Plants shall have a routine inspection system to verify that tank leakage has not occurred and rainfall has not overly reduced the available bund volume. This system shall be recorded in the Plant Environment Dossier.
- 12.4. Plants shall have a system for analysing the contents of a bund before discharge and the details of any result shall be recorded. This system shall be recorded in the Plant Environment Dossier.
- 12.5. Bunds and Drains shall be subject of a scheme of inspection as defined in NEP 8410
- 12.6. Bunds shall be in compliance with the criteria outlined in the PPC Guidance (Appendix 1).

13. LOADING/UNLOADING OF TANKERS

- 13.1. All tankers shall be loaded/unloaded only in dedicated tanker loading bays, which have a protected drainage system. Loading/unloading operations shall be controlled by a INVISTA operator in accordance with the relevant Operating Instructions. All tankers shall be subject to RHYTHM (Remember How You Treat Hazardous Materials) checks.
- 13.2. Contained tanker unloading areas shall be treated as a bunds and registered.

14. DRUM HANDLING AND STORAGE

- 14.1. All full drums shall be stored in bunded, internal buildings or, temporarily, on protected areas of hardstanding or in registered mobile bunds.
- 14.2. All empty drums shall be recycled by an approved drum recycling company. Smaller drums shall be washed and recycled or disposed of via a registered waste contractor.

15. PIPEWORK

- 15.1. All newly installed process pipework shall be installed above ground and subject to 'critical pipe' analysis.
- 15.2. Existing underground pipes, other than water or gravity drains, shall be relocated above surface, or exposed in double contained trenches as new construction work and business resource permits. All as per INVISTA Best Practice.

16. STORAGE TANKS

- 16.1. All newly installed storage tanks shall be sited above ground. Existing pits double lined as business resource permits.

17. SPILLAGE REMEDIATION

- 17.1. Spill kits are located around the Site and in areas where spills are most likely to occur.
- 17.2. Each area will have a Spill kit inspection rota to ensure Spill kits are complete and ready for use.
- 17.3. Spills shall be addressed as per local plant instructions.

PPC Requirements from General Guidance.**Appendix 1 Page 1 of 1****2.3.4. Control of Fugitive Emissions to Surface Water, Sewer and Groundwater.**
(See also Section 2.3.1 of General Guidance).

Requirements for Applicants 2.3 (cont). BAT for Fugitive Emissions to Water is as follows:

The operator should describe the measures and procedures in place and proposed to prevent or reduce fugitive emissions to water and land. This should include, but is not limited to, the general measures described below and those in the **existing sector guidance**. The operator should justify where any of the measures are not employed.

General Techniques – Subsurface Structures.

- The sources, direction and destination of all installation drains should be established and recorded;
- The sources, direction and destination of all subsurface pipework should be established and recorded;
- All subsurface sumps and storage vessels should be identified;
- Systems should be engineered to ensure leakages from pipes etc, are minimised and where these occur, can be readily detected, particularly where hazardous (e.g. listed) substances are involved;
- In particular, secondary containment and/or leakage detection should be provided for such subsurface pipework, sumps and storage vessels;
- An inspection and maintenance programme should be established for all subsurface structures, e.g. pressure tests or (CCTV).

Surfacing.

- A description of the design, construction and condition of the surfacing of all operational areas should be provided;
- There should be an inspection and maintenance programme of all impervious surfaces and spill containment kerbs.

Bunds should be provided for all tanks containing liquids having a potential impact on the environment. Bunds should:

- Be impermeable and resistant to the stored materials;
- Have no outlet (i.e. no drains or taps) and drain to a blind collection point.
- Have pipework routed within bunded areas with no penetration of contained surfaces by pipes or ducts.
- Be designed to catch leaks from tanks, or fittings.
- Have a capacity of 110% of the largest tank or 25% of the total tankage, whichever is the greater.
- Be subject to regular visual inspection and any contents pumped out or otherwise removed under manual control after checking for contamination.
- Have fill points within the bund where possible or otherwise provide adequate containment.
- Have a routine programmed visual inspection of bunds including water testing where structural integrity is in doubt.

1. Relevant information may include as appropriate, capacities, thicknesses, falls, material, permeability, strength/reinforcement, resistance to chemical attack, inspection and maintenance procedures, and quality assurance procedures.
2. Further information on bund sizing and design can be found in Ref 3.5.