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SPALDING ENERGY EXPANSION

SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES

**Details Pursuant to Condition (27) of the 2015 Deemed Planning
Permission /**

SURFACE WATER DRAINAGE SCHEME

**Details Pursuant to Condition (45) of the 2015 Deemed Planning
Permission**

SPALDING ENERGY EXPANSION

SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES / SURFACE WATER DRAINAGE SCHEME
Details Pursuant to Condition 27 and Condition 45 of the 2015 Deemed Planning Permission

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1. INTRODUCTION

1.1 Background

On 11 November 2010, Consent under Section 36 of the Electricity Act 1989 was granted and a direction that deemed planning permission be granted under Section 90 of the Town and Country Planning Act 1990 was made (the Original Consent and the 2010 Deemed Planning Permission) for a generating station to be known as the Spalding Energy Expansion (SEE) at West Marsh Road, Spalding, Lincolnshire. On 30 October 2015, a variation to the Consent under Section 36C of the Electricity Act 1989 was granted and a direction that the Conditions of the 2010 Deemed Planning Permission be varied under Section 90(2ZA) of the Town and Country Planning Act 1990 was made (the Varied Consent and the 2015 Deemed Planning Permission).

Pursuant to the provisions of Condition 4(2) of the Varied Consent and Condition (53) of the 2015 Deemed Planning Permission, the gas turbine technology option selected for SEE comprises that set out at paragraph 2(a)(ii) of the Varied Consent, namely: *“one [Combined Cycle Gas Turbine] CCGT unit including a gas turbine, a heat recovery steam generator (HRSG), a steam turbine with a rated electrical output of up to 645 MW with Open Cycle Gas Turbine (OCGT) unit(s) and associated equipment with a total rated electrical output of less than 300 MW”*.

Spalding Energy Expansion Limited (SEEL) are undertaking the development of SEE in phases, of which the first phase entails the commencement of the development of the OCGT unit(s) and associated equipment with a total rated electrical output of less than 300 MW.

1.2 Purpose of this Document

Condition (27) of the 2015 Deemed Planning Permission provides that: *“Except for the Permitted Preliminary Works, the commencement of each phase of the Development shall not take place until there has been submitted to, approved in writing by, and deposited with the Council, in consultation with the Environment Agency, a scheme showing the method and working of drainage facilities on the Site associated with the specified phase of the Development. Such facilities shall be put in place in accordance with the approved scheme. The specified phase of the Development shall be completed in accordance with the approved scheme unless otherwise agreed in writing by the Council”*. The reason stated for imposing this Condition is: *“to ensure proper drainage of the Site and that proper containment facilities are built”*.

In terms of the scheme showing the method and working of drainage facilities, Condition (28) of the 2015 Deemed Planning Permission provides that: *“The scheme [...] shall include:*

- (i) measures to ensure that no leachate or any contaminated surface water from the Site associated with the specified phase of the Development shall be allowed at any time to enter directly or indirectly into any watercourse or underground strata or onto adjoining land;*
- (ii) provision to ensure that all existing drainage systems continue to operate and that riparian owners upstream and downstream of the Site associated with the specified phase of the Development are not adversely affected;*
- (iii) provision for trapped gullies in car parks, hardstandings and roadways;*
- (iv) measures to ensure that all foul sewage drains to an approved foul sewerage and / or sewage disposal system;*
- (v) provisions to distinguish between temporary and permanent parts of the works; and*
- (vi) Provision to ensure that there is no discharge of water from the Site associated with the specified phase of the Development until such a time as the permanent surface water drainage system is operational with provisions to contain any run-off from the Site associated with the specified phase of the Development”*.

Condition (45) of the 2015 Deemed Planning Permission provides that: *“The commencement of each phase of the Development shall not take place until a surface water drainage scheme for the Site associated with the specified phase of the Development, based on the information outlined in Chapter 12 of the Environmental Statement (March 2009) and Chapter 18 of the Variation*

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Application Environmental Statement Further Information Document (March 2015) and based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the Development, has been submitted to and approved in writing by the Council. The scheme shall be implemented in accordance with the approved details prior to the commissioning of the specified phase of the Development unless otherwise agreed in writing by the Council". The reason stated for imposing this Condition is: "to ensure there is no increase in the risk of flooding both at the Site and to third parties, as result of the Development".

This Document is submitted in order to satisfy the requirements imposed by these Conditions and discharge Condition (27) and Condition (45) to allow for the commencement of the first phase of development (e.g. the OCGT unit(s) and associated equipment with a total rated electrical output of less than 300 MW).

1.3 References

This Document is based upon the measures set out in the March 2009 Environmental Statement (the March 2009 ES), as supplemented by the April 2015 Environmental Statement Further Information Document (the April 2015 ES FID).

This Document also implements the guidance and principles from the following publications:

- The SuDS Manual (C753), CIRIA (2015) (replacing the SuDS Manual (C697), CIRIA (2007));
- Containment Systems for the Prevention of Pollution (C736), CIRIA (2014); and,
- Drainage of Development Sites – A Guide (X108), CIRIA (2004).

It should be noted that this is not an exhaustive list, and should not be taken as so.

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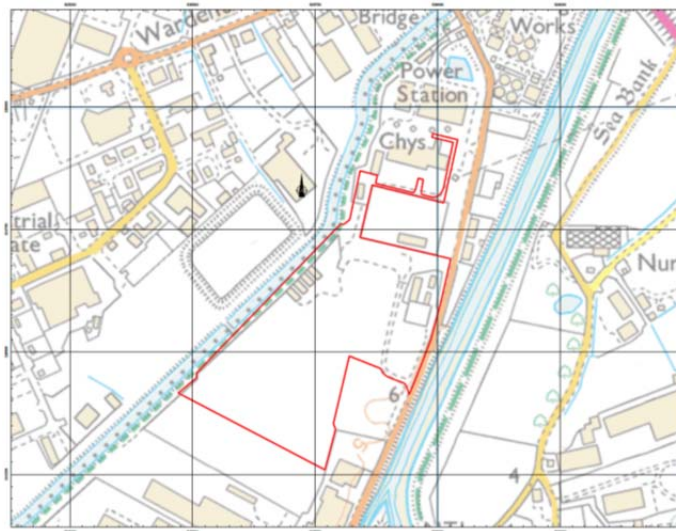
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2. RELEVANT BACKGROUND INFORMATION: THE SITE

The overall SEE site comprises the area of land edged red on Figure 61033586-02, Drawing Number 482302-15-01. The overall SEE site lies approximately 2 km to the north east of Spalding town centre. The Ordnance Survey (OS) Grid Reference of the centre of the overall SEE site is approximately 525950, 324950. The overall SEE site occupies a total area of approximately 14 ha.

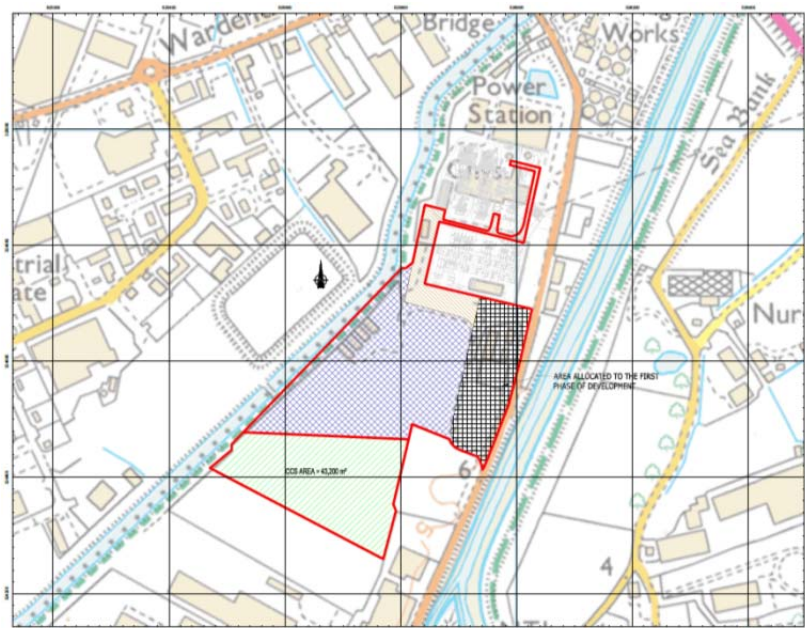
Insert 2.1 illustrates the location of the overall SEE site. The overall SEE site is bounded to the east by West Marsh Road and to the west by Vernatt's Drain.

INSERT 2.1: LOCATION OF THE OVERALL SEE SITE



Within this Document, 'the Site' refers to the areas of land associated with this specified phase of the Development. Within the overall SEE site, the Site is located in the north-east corner. Insert 2.2 illustrates the location of the Site.

INSERT 2.2: LOCATION OF THE SITE



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Within the surrounding area, the predominant land use is industrial, with some residential properties located further afield. In brief, the land uses comprise:

- To the north, the existing National Grid Spalding 400 kV substation and the existing Spalding CCGT generating station site, beyond which is a sewage treatment works operated by Anglian Water.
- To the north east, across West Marsh Road, the Gas Receiving Facility for the existing Spalding CCGT generating station, and some local authority offices.
- To the east, West Marsh Road and the River Welland which has associated flood defences. Further to the east, across the River Welland, agricultural land with occasional housing.
- To the south east, Springfields Shopping Centre and the Festival Gardens.
- To the south, undeveloped industrial land, with industrial buildings located beyond comprising a mixture of commercial buildings and vehicle parking.
- To the west, Vernatt's Drain which is a man-made drainage channel designed as a flood prevention measure (Vernatt's Drain also has associated flood defences). A public footpath runs along the eastern side of Vernatt's Drain, adjacent to the overall SEE site. Further to the west, vacant grassland and the Benner Road Industrial Estate comprising a mixture of industrial premises, including some associated with food storage, processing and distribution.
- To the north west, over Wardentree Lane, a factory, various warehouses and business space.

The wider surrounding area is predominantly rural, with the predominant land uses being agricultural or horticultural, or related to industrial food processing.

3. CONSTRUCTION: PREVENTION OF CONTAMINATION OF WATERCOURSES / SURFACE WATER DRAINAGE

3.1 General Measures / Standard Practices

General information on the prevention of contamination to watercourses, and associated preventative mitigation and monitoring measures, is provided in the Construction Environmental Management Plan (CEMP). The CEMP for the first phase of development has been separately submitted pursuant to Condition (14) of the Deemed Planning Permission.

3.1.1 Planning

Prior to physical construction activities / works for the first phase of development:

- Wherever appropriate, consultation will be undertaken with any relevant statutory authority;
- The works area and its surroundings will be walked to confirm the location of any known water resources, and allow those concerned to understand the potential effects of the construction works on those water resources;
- Based on any identified potential pollution pathways, information will be sought on any downstream 'at risk' receptors and allow relevant measures to be implemented to mitigate and manage the potential effects of the construction works on those receptors; and,
- The works area will be planned, with appropriate areas shown on an associated drawing(s) (e.g. materials storage, emergency spill kits).

3.1.2 Access

The works area will be fenced off, and any water resources will be clearly signed. *The Contractor* will prevent unnecessary entry of construction plant / equipment in to the area fenced off.

No construction plant / equipment will be used within a water course except under a relevant consent.

3.1.3 Temporary Construction Facilities

A temporary area will be required for office accommodation and car parking. In addition, a temporary laydown area will be required for the storage of construction plant / equipment. This area will be available for any fabrication required.

These areas will be located to the south of the works area for the duration of the construction period. The March 2009 ES noted that: (at paragraph 5.12) "*hardcore will be used to protect the temporary car parking area and site laydown*"; and, (at paragraph 5.13) "*the temporary car parking area will be covered with a Type 1 (gravel) surface to prevent hydrocarbon contamination*".

3.1.4 Construction Plant / Equipment and Materials

The Contractor will ensure that all construction plant / equipment is in good working condition.

As far as practicable, all construction plant / equipment and materials will be stored over 10 m from any water resources.

3.2 Specific Measures: Surface Water

The drainage system installed for construction will be designed and managed to comply with BS 6031:2009 (Code of Practice for Earthworks).

Pursuant to the provisions of Condition (28)(vi) of the 2015 Deemed Planning Permission, the drainage system installed for construction will include: "*provision to ensure that there is no discharge of water from the Site associated with the specified phase of the Development until such a time as the permanent surface water drainage system is operational with provisions to contain any run-off from the Site associated with the specified phase of the Development*".

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As such, no uncontrolled surface water run-off from the overall SEE site will be permitted during construction. In order to achieve this objective, if necessary a geotextile-lined containment bund could be installed along West Marsh Road on the perimeter of the overall SEE site. There will be no discharge of surface water run-off during the construction period. Any surface water (e.g. from dewatering activities) will be allowed to infiltrate naturally to the ground. The March 2009 ES noted that: *"This approach was used and worked effectively during construction of the existing [Spalding CCGT generating station]"*.

The provisions of Condition (29) of the 2015 Deemed Planning Permission require that: *"any surface water contaminated by hydrocarbons which are used during the construction of the Development shall be passed through oil / grit interceptor(s) prior to being discharged to any public sewer or watercourse or to any other surface water disposal system approved by the Environment Agency"*.

In order to meet the provisions of this Condition, contamination of surface water will be prevented at source through the use of drip trays, secondary containment and spill kits (or similar). Should any contamination occur, surface water will be captured and suitably treated onsite prior to being discharged. Further information is provided in the CEMP. The CEMP for the first phase of development has been separately submitted pursuant to Condition (14) of the Deemed Planning Permission.

3.3 Specific Measures: Materials (Oils / Chemicals / Liquids)

3.3.1 Materials Delivery

Prior to storage, *The Contractor* will check the correct measures for specific materials, and ensure that, where necessary / applicable, these measures are available (e.g. firefighting / spill kits / drip trays / sheeting).

Upon delivery, all materials loading / unloading will be supervised and will be carried out within designated areas. Emergency spill kits will be stored and clearly marked within all materials loading / unloading areas.

3.3.2 Materials Storage

There are a number of areas where oils, chemicals and / or liquids will be used in construction plant / equipment or will be stored.

All materials will be stored safely in designated materials storage areas to prevent unauthorised access / damage. Where materials are stock-piled, these will be covered to prevent damage.

Where necessary / applicable, materials will also be identified and assessed in compliance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH Regulations). Any such materials will be stored in accordance with any specific requirements (e.g. temperature) and in the correct locations.

All materials storage areas will be appropriately fenced and signed. In particular, any materials subject to the COSHH Regulations will be fenced and signed as such.

All containers and drums will be labelled so that all contents can be clearly identified. As far as practicable, all containers and drums will be stored with spaces between each other (this will make monitoring and inspection for leaks / spills easier).

Where valves and taps are fitted, these will be fitted with a lock, and will be locked shut when not in operation.

Wherever possible, materials will be stored on a 'like-with-like' basis to prevent wastage (e.g. of half-opened items). In addition, following use, all materials will be returned to the material storage area so that they can be re-used.

All practicable means of securing materials storage areas will be taken to prevent against any damage, vandalism, spillages, corrosion and leaks.

Pursuant to the provisions of Condition (30) of the 2015 Deemed Planning Permission: *"all facilities required for the storage of hydrocarbons, process chemicals or similar liquids which are used during the construction of the Development must be sited on impervious bases and*

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surrounded by impervious bund walls. The size of the bunded compounds shall be at least equivalent to the capacity of the largest tank plus 10 per cent. All filling points, vents and sight glasses must be located within the bund and there must be no drain through the bund floor of walls".

Pursuant to the provisions of Condition (31) of the 2015 Deemed Planning Permission: *"all bunded compound(s) referred to in Condition (30) containing acids, alkalis or sulphides in addition to being contained in suitable facilities shall have appropriate protective lining applied to the inner walls of the bunds"*

Pursuant to the provisions of Condition (32) of the 2015 Deemed Planning Permission: *"any storage facility to which Conditions (30) or (31) refer shall be completed in accordance with the requirements of those Conditions before being brought into use".*

The size and layout of each bunded area shall be determined following the recommendations and risk-based assessment approach in 'Containment Systems for the Prevention of Pollution' (C736) (CIRIA, 2014). As a minimum, all bunded areas will provide at least 110 per cent capacity of the material stored. All bunded areas will drain to blind sumps with accumulated rainwater periodically removed via an appropriate Registered Waste Carrier.

Drip trays will be used underneath all static construction plant / equipment, including generators. When emptying drip trays, care will be taken and any waste oil will be returned to a designated oil recycling facility / removed via an appropriate Registered Waste Carrier.

3.3.3 Refuelling Operations

All refuelling will be carried out within designated areas. Emergency spill kits will be stored and clearly marked within all refuelling areas.

The Contractor will supervise all refuelling operations, and will ensure that no valves or taps are left open unattended.

Refuelling operations will be carried out by appointed competent personnel only. The appointed construction personnel that carry out a refuelling operation will observe environmental precautions and, as necessary, emergency procedures.

As far as practicable, refuelling operations will be undertaken over 30 m from any water resources. If unavoidable, *The Contractor* will ensure that appropriate precautions are taken (e.g. absorbent pads / booms).

Any containers used during refuelling operations will be fitted with appropriate monitoring equipment.

Mobile bowsters may also be used for refuelling operations. All mobile bowsters will be stored in a secure area, either self-bunded or in a bunded area. All valves and taps will be fitted with a lock, and will be locked shut when not in operation. All mobile bowsters will also be fitted with an automatic cut out mechanism to prevent spillage.

3.3.4 Spillages / Leakages

The Contractor will check the emergency spill kits weekly and rectify any issues identified.

The Contractor will ensure that all construction personnel are trained in the use of the emergency spill kits. At all times, *The Contractor* will ensure that a trained person is present.

To prevent any materials (e.g. lubricants, liquids and oils) from entering a water resource, emergency spill kits will be located across the Site.

In the event of a spill / leak, the person who discovers it will take immediate action.

Spills / leaks will not be washed down with a hose or by any detergents.

3.3.5 Materials Removal / Disposal

The Contractor will ensure that an appropriate Registered Waste Carrier is employed to remove all waste materials, spillage and used spill kit materials and accumulated surface water collected from the secondary containment system(s) / interceptor(s).

4. OPERATION: PREVENTION OF CONTAMINATION OF WATERCOURSES / SURFACE WATER DRAINAGE

4.1 General Environmental Permitting

During operation, activities relating to the OCGT unit will be undertaken in accordance with an Environmental Permit issued under the Environmental Permitting (England and Wales) Regulations 2010.

Spalding Energy Expansion Limited already holds an Environmental Permit for the development permitted by the Original Consent and the 2010 Deemed Planning Permission (EPR/AP3732KC) which was issued in December 2010. An application to vary this Environmental Permit will be made in due course.

Other than those listed in the Environmental Permit, there will be no additional point source emissions to water. In the same way, the emission limit values listed in the Environmental Permit will not be exceeded.

In order to determine appropriate measures relating to the operation of the first phase / OCGT unit, the following methodology was applied:

- Identification of the pollution sources (e.g. any potential discharges / spillages);
- Identification of potential 'at risk' receptors;
- Identification of potential pollution pathways;
- Isolation of the pollution source and / or pollution pathways; and,
- Determination of effective mitigation and management measures.

Accordingly, this Section provides the concepts to be implemented during operation of the first phase / OCGT unit.

Figure 1 provides an indicative drainage layout for the OCGT unit. The following sub-sections provide further details of each of the drainage concepts.

Whilst it should be noted that the ultimate details will be determined during detailed design, the details on the drainage concepts provided in this Document represent the minimum measures that will be employed during operation. In some instances, additional measures may also be employed¹.

4.2 Concept: Surface Water

4.2.1 Rainwater

A surface water drainage system is required to adequately drain the Site, and prevent adverse ponding after rainfall events. Rainwater will be drained by gravity through the surface water drainage system from the Site to the River Welland where it will be discharged under the Environmental Permit.

The discharge into the River Welland will be sized to accommodate all surface water flows (e.g. from the overall SEE site comprising both the area covered by the Site and the area allocated to future generating station works).

In order to provide a sustainable surface water drainage system, a number of techniques have been identified to achieve the desired level of water treatment and attenuation. These techniques include: permeable paving and filter drains; an attenuation pond(s)²; and swales.

¹ For example, Figure 1 denotes both 'areas to be drained via filter drains to the attenuation pond' and 'areas at elevated risk of oil contamination drained via an oil interceptor to the attenuation pond'. However, Ramboll understands that ultimately all areas may be drained via an oil interceptor to the attenuation pond. This would be considered to represent an additional measure to those mentioned here.

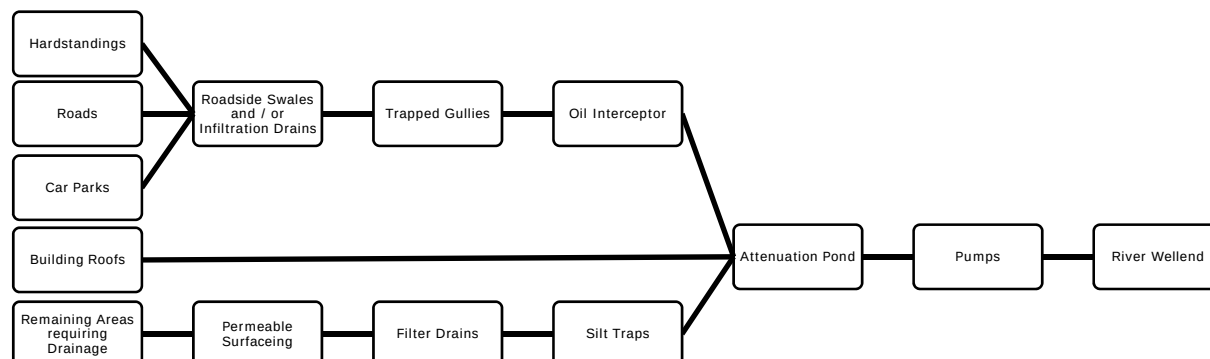
² The March 2009 ES and the April 2015 ES FID, and supporting references refer to a 'balancing pond'. In this Document, this is referred to as the 'attenuation pond'. Due to its required nature, this pond (or ponds) will provide more than just rainwater / stormwater attenuation. The additional requirements are described in full in the March 2009 ES and the April 2015 ES FID, and are summarised in this Document.

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Insert 4.1 provides an outline diagram of the surface water drainage system showing how these techniques will be used.

INSERT 4.1: OUTLINE SURFACE WATER DRAINAGE SYSTEM



With regards to attenuation, for the overall SEE site (e.g. comprising both the area covered by the Site and the area allocated to future generating station works), the March 2009 ES calculated a run-off rate of 1,284.8 l/s and an associated storm volume of 2,311 m³ (based on a 100 year return storm period plus 20 per cent). This was based on conservative estimate of 70 per cent impermeable surface area.

For the Site, re-calculation of the run-off rates and associated storm volume requirements is required. This will be undertaken during detailed design. In line with current practice and guidance, this re-calculation will estimate the required volumes of interception, attenuation, treatment and storage for the area covered by the Site. Based on the indicative layout shown in Figure 1, an example of the attenuation requirements is provided (for information) in Appendix A.

Roadside Swales / Trapped Gullies

Where practical, rainwater from all new road / hardstanding areas of the Site will be collected via roadside swales or infiltration drains. These swales / drains will then discharge, via trapped gullies, into the surface water drainage system.

The swales will assist in attenuating the water flow and offer some water quality treatment. The trapped gullies, in combination with the roadside swales, will be designed to minimise the ingress of sediment into the surface water drainage system.

Permeable Surfacing / Filter Drains

Rainwater from the remaining areas of the Site that require drainage will be collected via permeable surfacing and filter drains.

The permeable surfacing and filter drains will assist in attenuating the water flow and will be designed to minimise the ingress of sediment into the surface water drainage system.

Attenuation Pond

Once collected, the surface water will discharge by gravity into an attenuation pond(s).

The attenuation pond will provide both storm water treatment and flow attenuation, and will be designed to allow sediment to settle from the inlet to the outlet. Any re-animated sediment will be allowed to settle within the main attenuation pond area before it reaches the outlet. In addition, silt traps will be provided before the inlet to help prevent silting up of the pond.

As noted above, calculation of the final run-off rates and associated storm volume requirements will be undertaken during the detailed design. In line with current practice and guidance, the re-calculation will estimate the required volumes of attenuation, treatment and storage, taking due cognisance of the contributions of the other SUDS techniques provided upstream. The discharge flow from the attenuation pond will be limited to mimic the greenfield flow runoff rate. The flow from the attenuation pond will be pumped to the final discharge point into the River Wellend. In order

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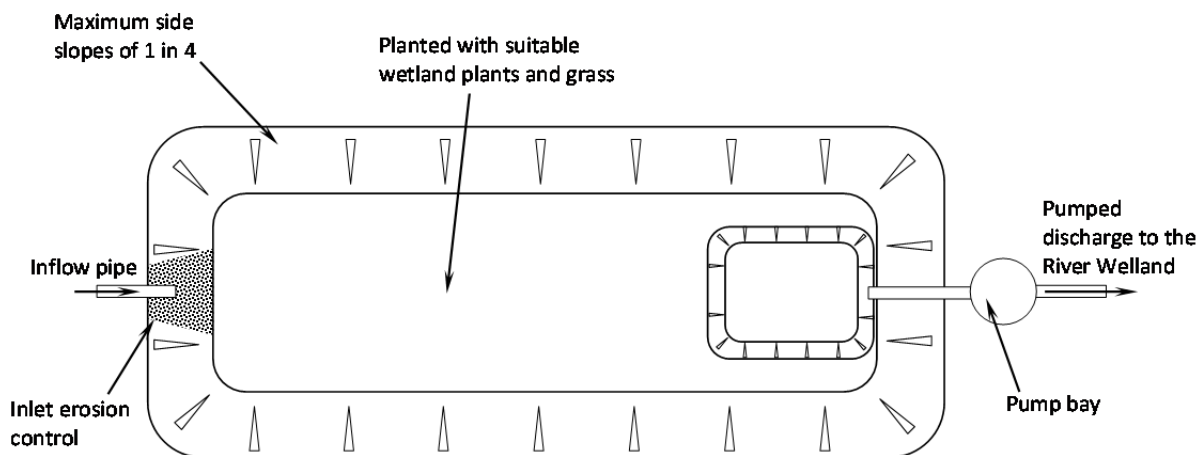
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to reduce the risk of flooding during extreme rainfall events the attenuation pond will be provided with an emergency overflow to the pump bay.

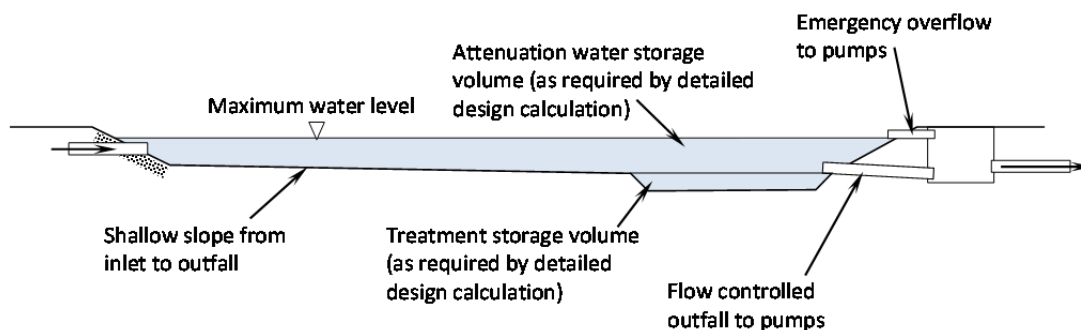
The attenuation pond will be planted with suitable vegetation to enhanced biodiversity and improve water quality. Regular maintenance of the attenuation pond and pumps will be required (e.g. to remove collected debris and silt).

Insert 4.2 provides a typical layout of an attenuation pond.

INSERT 4.2: TYPICAL LAYOUT OF AN ATTENUATION POND



Plan of typical Attenuation Pond



Section through typical Attenuation Pond

4.2.1.1 Potential for Rainwater Harvesting

The March 2009 ES identified that rainwater harvesting would be incorporated. For the first phase / OCGT unit, there is no viable use for any water collected from a rainwater harvesting system. Therefore, there will be no rainwater harvesting incorporated into the first phase.

4.2.2 Oily Water

Within the Site, there are a number of areas where the surface water has an elevated risk of contamination from oil. These areas include: hardstandings; roads; and, car parks.

Therefore, prior to water discharging from these areas into the attenuation pond, the water will be passed through a Class 1 Full Retention Oil Separator (as defined in BS EN 858: Separator Systems for Light Liquids).

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The Class 1 Full Retention Oil Separator will be fitted with an alarm to indicate when the oil coalesce requires emptying, and it will be sized to suit the associated water catchment area.

4.2.3 Fire Water

The attenuation pond outfall is pumped to the River Welland.

Should a fire result in contaminated runoff it will be possible to isolate the pumps and utilise the attenuation pond as a temporary storage area. Any contaminated water will then be removed from Site for appropriate treatment and disposal.

4.3 Concept: Process Water

The OCGT unit has a number of intermittent sources of process water, including: gas turbine drains; offline washing; and, cooling water drains. However, the gross quantity produced is small.

All these sources will discharge to blind sumps. These sumps will be periodically emptied into road tankers for suitable disposal as required. No process water will be discharge to sewer.

4.4 Concept: Foul Water

For the first phase / OCGT unit, the personnel facilities at the existing adjacent Spalding CCGT generating station will be used. Consequently, there will be no foul water produced or discharged.

4.5 Specific Measures: Materials (Oils / Chemicals / Liquids)

4.5.1 Materials Delivery

Prior to storage, *The Operator* will check the correct measures for specific materials, and ensure that, where necessary / applicable, these measures are available (e.g. firefighting / spill kits / drip trays / sheeting).

Upon delivery, all materials loading / unloading will be supervised and will be carried out within designated areas. Emergency spill kits will be stored and clearly marked within all materials loading / unloading areas.

4.5.2 Materials Storage

There are a number of areas where oils, chemicals and / or liquids will be used or will be stored.

All materials will be stored safely in designated materials storage areas to prevent unauthorised access / damage. Where materials are stock-piled, these will be covered to prevent damage.

Where necessary / applicable, materials will also be identified and assessed in compliance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH Regulations). Any such materials will be stored in accordance with any specific requirements (e.g. temperature) and in the correct locations.

All materials storage areas will be appropriately fenced and signed. In particular, any materials subject to the COSHH Regulations will be fenced and signed as such.

All containers and drums will be labelled so that all contents can be clearly identified. As far as practicable, all containers and drums will be stored with spaces between each other (this will make monitoring and inspection for leaks / spills easier).

Where valves and taps are fitted, these will be fitted with a lock, and will be locked shut when not in operation.

Wherever possible, materials will be stored on a 'like-with-like' basis to prevent wastage (e.g. of half-opened items). In addition, following use, all materials will be returned to the material storage area to that they can be re-used.

All practicable means of securing materials storage areas will be taken to prevent against any damage, vandalism, spillages, corrosion and leaks.

All facilities required for materials storage (e.g. oils, chemicals and / or liquids) will be sited on impervious bases and surrounded by impervious bund walls. The size of the bunded area will be at least equivalent to the capacity of the largest tank plus 10 per cent. All filling points, vents and

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sight glasses will be located within the bund and there will be no drain through the bund floor of walls.

In addition to being contained in suitable facilities, all bunded areas containing acids, alkalis or sulphides shall have appropriate protective lining applied to the inner walls of the bunds.

The size and layout of each bunded area shall be determined following the recommendations and risk-based assessment approach in 'Containment Systems for the Prevention of Pollution' (C736) (CIRIA, 2014). All bunded areas will drain to blind sumps with accumulated rainwater periodically removed via an appropriate Registered Waste Carrier.

Drip trays will be used underneath all static construction plant / equipment, including generators. When emptying drip trays, care will be taken and any waste oil will be returned to a designated oil recycling facility / removed via an appropriate Registered Waste Carrier.

4.5.3 Spillages / Leakages

The Operator will check the emergency spill kits weekly and rectify any issues identified.

The Operator will ensure that all construction personnel are trained in the use of the emergency spill kits. At all times, *The Operator* will ensure that a trained person is present.

In the event of a spill / leak, the person who discovers it will take immediate action.

Spills / leaks will not be washed down with a hose or by any detergents.

4.5.4 Materials Removal / Disposal

The Operator will ensure that an appropriate Registered Waste Carrier is employed to remove all waste materials, spillage and used spill kit materials and accumulated surface water collected from the secondary containment system(s) / interceptor(s).

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SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES / SURFACE WATER DRAINAGE SCHEME
Details Pursuant to Condition 27 and Condition 45 of the 2015 Deemed Planning Permission

5. ENVIRONMENTAL MONITORING AND AUDITING / REVIEW AND CHANGE CONTROL

Environmental monitoring and auditing is an essential tool to ensure all environmental requirements are achieved and environmental performance is continually improved. An environmental monitoring and auditing programme will be implemented during construction and operation of the first phase of development.

Construction and operation of the first phase of the development shall be carried out in accordance with this Document unless otherwise agreed in writing with South Holland District Council (or its successors).

SPALDING ENERGY EXPANSION

SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES / SURFACE WATER DRAINAGE SCHEME
Details Pursuant to Condition 27 and Condition 45 of the 2015 Deemed Planning Permission

FIGURES



ID	FACILITY
1	COMBUSTION TURBINE GENERATOR
2	EXHAUST GAS DIFFUSER
3	EXHAUST STACK
4	CEMS
5	WATER WASH DRAINS TANK (BELOW GRADE)
6	CCCW PUMPS
7	CCCW EXPANSION TANK
8	CCCW AIR COOLED HEAT EXCHANGER
9	WASTEWATER SUMP/PUMPS
10	INLET FILTER DROP AREA
11	FIRE WATER PUMPS ENCLOSURE
12	RAW/FIRE WATER STORAGE TANK
13	OIL WATER SEPARATOR (BELOW GRADE)
14	AIR INLET FILTER (ABOVE)
15	NET COMPRESSION SKID
16	DEMIN WATER TANK
17	COMPRESSED AIR EQUIPMENT
18	GT AIR DRYER PACKAGE
19	WATER WASH SKID
20	GT BASE MODULE
21	COMBUSTION TURBINE POWER CONTROL CENTER
22	SEE TRANSFORMER
23	SFC TRANSFORMER
24	GENERATOR STEP-UP TRANSFORMER
25	UNIT AUXILIARY TRANSFORMER
26	GENERATOR CIRCUIT BREAKER
27	MAINTENANCE CRANE PAD
28	MV/LV ELECTRICAL ENCLOSURE
29	COMBUSTION TURBINE ROTOR REMOVAL SPACE
30	SECURITY FENCE
31	ISOPHASE
32	COMBUSTION TURBINE
33	FUEL GAS FILTER
34	GAS RECEIVING FACILITY (70M x 30M)
35	SUDS POND (25M x 30M)
36	GENERATOR SET
37	CO2 CYLINDERS (FIRE FIGHTING SYSTEM)
38	VENTILATION SYSTEM OF GT ENCLOSURE
39	TEMPORARY FENCE
40	DCGT SWITCHYARD
41	400V EMERGENCY DIESEL
42	CAR PARK (60 SPACES + 10 VISITOR SPACES)
43	SITE OFFICE, APC CLIENT, B&V CIVIL SUBBIE, SIEMENS
44	SITE MANPOWER ACCESS & EGRESS - CARD ACCESS CONTROL
45	ELECTRICAL MANHOLE
46	ELECTRICAL DUCTBANK
47	GAS PIPE LINE
48	WHEEL WASHING FACILITY
49	SITE VEHICULAR ACCESS CONTROL
50	5.6KV TO 480V BFT TRANSFORMER
51	EXISTING SUB-STN TRANSFORMER

ID	TERMINAL POINTS
T1	ACCESS ROAD
T2	FUEL GAS
T3	TOWNSWATER
T4	DILY WATER
T5	STORMWATER
T6	ELECTRICAL INTERCONNECTION
T7	DCS/COMMUNICATION (AT EXISTING CONTROL BLDG)
T8	TELECOMS

Notes

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AREA ALLOCATED TO FUTURE GENERATING STATION WORKS

AREA FOR INTERFACING (NOT SHOWN)

AREA ALLOCATED TO CCS (NOT SHOWN)

REDLINE BOUNDARY

EXISTING ROAD

CONSTRUCTION

AREA TEMPORARILY USED DURING CONSTRUCTION

OPERATION

AREAS DRAINED VIA FILTER DRAINS TO THE ATTENUATION POND

AREAS AT ELEVATED RISK OF OIL CONTAMINATION DRAINED VIA AN OIL INTERCEPTOR TO THE ATTENUATION POND

POTENTIAL SOURCES OF PROCESS WATER DRAINED TO BLIND SUMPS

AREAS FOR OIL / CHEMICAL STORAGE

ATTENUATION POND

P03	ROAD LAYOUT REVISED	08/06/17	RWS	EA
P02	RED LINE BOUNDARY CORRECTED	12/05/17	RWS	EA
P01	FOR INFORMATION	10/05/17	RWS	EA
Rev	Description	Date	By	App
			Chk	

INTERGEN/SPALDING ENERGY EXPANSION LIMITED

SPALDING ENERGY EXPANSION

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FIGURE 1: INDICATIVE DRAINAGE LAYOUT

Scale:	1:500 / A1	Date:	10/05/2017	Drawn:	RWS	Checked:	EA
Drawing No:	1620002349-009-04	Rev:	P03				

SPALDING ENERGY EXPANSION

SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES / SURFACE WATER DRAINAGE SCHEME
Details Pursuant to Condition 27 and Condition 45 of the 2015 Deemed Planning Permission

APPENDIX A

SPALDING ENERGY EXPANSION

SCHEME SHOWING THE METHOD AND WORKING OF DRAINAGE FACILITIES / SURFACE WATER DRAINAGE SCHEME Details Pursuant to Condition 27 and Condition 45 of the 2015 Deemed Planning Permission

APPENDIX A: EXAMPLE CALCULATION OF THE ATTENUATION REQUIREMENTS



Surface water storage requirements for sites

www.uksuds.com | Storage estimation tool

Calculated by:	Richard Smith
Site name:	Spalding Energy OCGT
Site location:	Spalding

Site coordinates	
Latitude:	52.80467° N
Longitude:	0.13297° W

This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance "Preliminary rainfall runoff management for developments", W5-074/A/TR1/1 rev. E (2012) and the SuDS Manual, C753 (Ciria, 2015). It is not to be used for detailed design of drainage systems. It is recommended that hydraulic modelling software is used to calculate volume requirements and design details before finalising the drainage scheme.

Reference:	5971953
Date:	2017-06-08T16:20:45

Methodology	IH124
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Site characteristics

Total site area (ha)	1.24
Significant public open space (ha)	0.75
Area positively drained (ha)	0.49
Pervious area contribution (%)	30
Impermeable area (ha)	0.25
Percentage of drained area that is impermeable (%)	51
Impervious area drained via infiltration (ha)	0
Return period for infiltration system design (year)	10
Impervious area drained to rainwater harvesting systems (ha)	0
Return period for rainwater harvesting system design (year)	10
Compliance factor for rainwater harvesting system design (%)	66
Net site area for storage volume design (ha)	0.49
Net impermeable area for storage volume design (ha)	0.27

* Where rainwater harvesting or infiltration has been used for managing surface water runoff such that the effective impermeable area is less than 50 % of the 'area positively drained', the 'net site area' and the estimates of Qbar and other flow rates will have been reduced accordingly.

Design criteria

Volume control approach	Use long term storage	
	Default	Edited
Climate change allowance factor	1.4	1.4
Urban creep allowance factor	1.1	1.1
Interception rainfall depth (mm)	5	5
Minimum flow rate (l/s)	5	5
Qbar estimation method	Calculate from SPR and SAAR	
SPR estimation method	Calculate from SOIL type	
	Default	Edited
Qbar total site area (l/s)	1.74	--
SOIL type	2	2
HOST class	N/A	N/A
SPR	0.3	0.3

Hydrology

	Default	Edited
SAAR (mm)	560	560
M5-60 Rainfall Depth (mm)	20	20
'r' Ratio M5-60/M5-2 day	0.4	0.4
Rainfall 100 yrs 6 hrs	63	
Rainfall 100 yrs 12 hrs	97.79	
FEH/FSR conversion factor	1.27	1.27
Hydrological region	5	
Growth curve factor: 1 year	0.87	0.87
Growth curve factor: 10 year	1.65	1.65
Growth curve factor: 30 year	2.45	2.45
Growth curve factor: 100 year	3.56	3.56

Site discharge rates	Default	Edited
Qbar total site area (l/s)	1.74	1.74
Qbar net site area (l/s)	0.69	0.69
1 in 1 year (l/s)	5	5
1 in 30 years (l/s)	5	5
1 in 100 years (l/s)	5	5

Estimated storage volumes	Default	Edited
Interception storage (m³)	10	10
Attenuation storage (m³)	176	176
Long term storage (m³)	0	0
Treatment storage (m³)	30	30
Total storage (excluding treatment) (m³)	186	186

This report was produced using the Storage estimation tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at <http://uksuds.com/terms-and-conditions.htm>. The outputs from this tool have been used to estimate storage volume requirements. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for use of this data in the design or operational characteristics of any drainage scheme.