

USKMOUTH – FIRE PREVENTION AND MITIGATION PLAN

Simec Uskmouth Power Ltd – EPR/LP3131SW

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1 INTRODUCTION

- 1.1.1 Simec Uskmouth Power Ltd (SUP) is applying to vary its existing Environment Permit (EPR/LP3131SW) to facilitate the proposed conversion from coal and biomass to fuel pellet and biomass. A full technical description of the plant and the proposed conversion can be found in of the Permit Variation Supporting Information Document and is not reproduced in supporting studies or appendices this Fire Prevention and Mitigation Plan (FPMP) is Appendix J to the Permit Variation Supporting Information Document.
- 1.1.2 The FPMP sets out the fire prevention measures and procedures for Simec Uskmouth Power Station to meet the requirements and comply with Natural Resources Wales (NRW) FPMP Guidance¹. NRW require a FPMP for all facilities storing combustible waste and will be required to be in place under the site's environmental permit. FPMP will form part of the overall SUP management system
- 1.1.3 Fuel pellets are derived from non-recyclable, non-hazardous waste, the pellets will be transported to SUP from off site production facilities via rail. Un-pelletised, raw combustible waste will not be stored on site,
- 1.1.4 It should be noted that this FPMP has been drafted in advance of the site management system procedures being finalised. There is an overlap between the FPMP and other procedures such as fuel pellet management and acceptance procedures, and site maintenance procedures. To avoid duplication of information reference to the appropriate procedures is given at this time.
- 1.1.5 In this document the term “fuel” refers to fuel pellets and biomass unless otherwise stated.

1.2 Scope

- 1.2.1 SUP has produced this FPMP to ensure that fire prevention measures that are commensurate with the activities taking place are implemented on the site.

1.3 Processes and Activities

- 1.3.1 SUP is applying to vary its existing Environment Permit (EPR/LP3131SW) to facilitate the proposed conversion from coal and biomass to fuel pellet and biomass.
- 1.3.2 The nominal throughput of fuel pellets in the converted SUP facility totals 875,000 tonnes per annum, with a maximum throughput of 1,156,000 tonnes per annum.
- 1.3.3 SUP proposes to convert two of the three existing combustion units, unit 13 (110MW) and unit 14 (110MW), for 220 MW conversion. The third combustion unit (Unit 15) will not operate as part of the converted facility (albeit will physically remain in situ) and is not considered in this permit variation.
- 1.3.4 The SUP conversion will replicate transport patterns from previous SUP operational activity, the fuel pellets will be delivered by rail; operational consumable for abatement delivered by road; biomass delivered by road and ash transported off site by road.
- 1.3.5 Fuel acceptance procedures will be in place to ensure compliance with the stringent fuel specification. Fuel pellets will be weighed upon delivery to the site and transferred to the primary storage silos via the conveyors from the rail unloading facilities.

¹ <https://naturalresources.wales/media/682159/eng-guidance-note-16-fire-prevention-mitigation-plan.pdf> (Review Date Aug 2019)

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- 1.3.6 Fuel pellets are transferred from the primary storage silos to the day silos (where it is anticipated fuel pellets will be stored for up to 24 hours) and then on to the mills where biomass is added prior to combustion of fuel mix in the converted units.
- 1.3.7 The combustion stage will be automatically controlled to ensure optimum combustion in line with BAT conclusions.
- 1.3.8 The residues from the bag filter are collected and directed to a residue silo. The residue silo is designed to discharge product via an enclosed loading chute directly into sealed tankers and transported off site by road.
- 1.3.9 Flue gases exiting the abatement system will be discharged through the 122 m stack. The abatement plant cannot be bypassed and will be in operation at all times, including start-up and shutdown.
- 1.3.10 Back up burners fuelled by gas oil are employed.
- 1.3.11 The burners will be automatically triggered to ensure that the minimum temperature of 850°C is maintained. The burners will be used during start up.
- 1.3.12 Bottom ash and air pollution control (APC) residues will be collected and disposed of at an appropriate reprocessing facility or authorised landfill.
- 1.3.13 The option to construct an onsite ash re-purposing facility to avoid landfill is being investigated.

1.4 Site Description

Site Location

- 1.4.1 The SUP facility is located at Uskmouth Power Plant, West Nash Road, Newport, NP18 2BZ approximately 4.2 km south east of Newport city centre. The site is centred at national grid reference ST 32736 83748.
- 1.4.2 The permit boundary will not change as a result of the proposed permit variation.

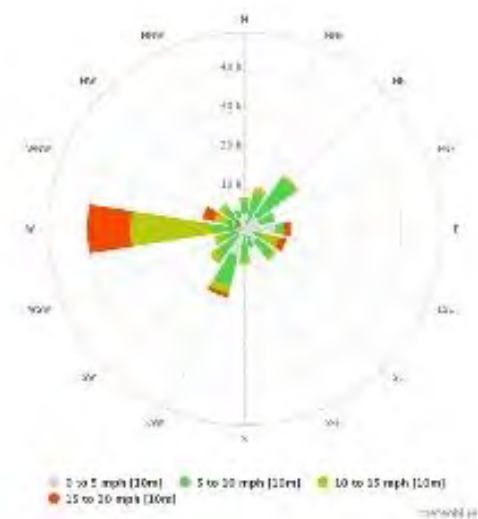
Sensitive Receptors

- 1.4.3 The following sensitive ecological receptors are located close to the site:
- River Usk SAC and SSSI
 - Severn Estuary SAC, SPA, Ramsar and SSSI
 - Newport Wetlands SSSI and National Nature Reserve (NNR)
 - Julian's Gout Land Site of Importance for Nature Conservation (SINC)
 - Alpha Steel Site SINC
 - Solutia Site SINC
 - Marshall's SINC
 - Afon Ebbw River SINC
 - Monkey Island SINC
 - Former Steel Works Site of Queensway Meadow SINC
- 1.4.4 The nearest residential properties lie approximately 1.5 km to the east of the site in the village of Nash. The Nash Sewerage Treatment Works (STW) are adjacent to the east of the site and Liberty Steel is to the north east. There are no sensitive human receptors within 1 km of the site. The nearest school is approximately 2.75 km to the north west and the nearest hospital is approximately 4 km north west of the site.

Prevailing Wind Direction

1.4.5 Prevailing wind direction for Newport is presented below:

Figure 1-1: Wind Rose for Newport



Site Layout

1.4.6 All areas of the site within the scope of the FPMP are shown on drawing 1. This plan includes the following features:

- areas where hazardous materials are stored;
- areas where biomass is stored;
- available water sources (no fire hydrants are located at or near to the site);
- location of plant, protective clothing and pollution control equipment and materials;
- location of drain covers, and any pollution control features such as drain closure valves and firewater containment systems;
- quarantine area; and
- assembly point.

1.4.7 The following drawings are also provided:

- access routes for emergency vehicles;
- building layouts;
- drainage;
- sensitive ecological receptors sensitive human receptors (which will include the location of “off-site” emergency information pack with site plan).

1.4.8 A copy of the SUP Emergency Information Pack will be physically stored off - site at 3 locations: SUP gate, Simec Atlantis Energy Bristol office and online Fire Department database used to store emergency information packs from other facilities. This online database repository is available to all Fire stations.

1.4.9 The entirety of the site is made ground and no natural unmade ground is present. However, there are areas of vegetated permeable ground. A plan showing the site surfacing is therefore provided.

2 COMBUSTIBLE, FLAMMABLE AND HAZARDOUS MATERIALS

- 2.1.1 The most significant combustible materials stored on site will be the fuel pellets and gas oil. As detailed in the NRW guidance the storage of materials that are flammable (with a flashpoint of 60°C or lower), or combustible liquids or gases are outside the scope. For this reason, the gas oil present on site has been excluded from the main focus of this FPMP, however, recognition of its potential to have an impact on fire at the SUP facility and consideration of its presence and storage has been given where relevant within this FPMP.
- 2.1.2 The main focus of this FPMP is the fuel pellets. Expected quantities and storage methods are detailed in Table 4-1. Biomass will be co-incinerated with the fuel pellets. SUP is currently permitted to combust coal and biomass, biomass will continue to be stored in the biomass storage shed. The quantities and storage arrangements for biomass are detailed in Table 2-1.
- 2.1.3 In addition to the fuel pellets other materials stored on site which present a potential risk of impact to the environment in the event of loss of containments / combustion as a result of fire are listed in Table 2-1 below.

Table 2-1: Other potentially hazardous materials on site

Hazardous Substance	Quantity Stored (max)	Where and how stored
Biomass	1,000 tonnes	Biomass storage shed
Lime	780000kg	Lime silo adjacent to stack
Activated Carbon	tbc	tbc
Diesel	32,000 litres	Fuel oil tank on coal plant north of coal stock yard
Gas oil	525,000 litres	Various locations
Transformer oils	340000litres	Transformer bays and switchrooms
Lubricating oils	10,500 litres	Main building
Turbine oils	70,000 litres	Unit header tanks
Waste oils	26,000 litres	Turbine basement
Boiler water treatment chemicals	80,000 litres	Chemical dosing room
Ammonium sulphate	tbc	tbc
Oxygen	4 W Bottles (W bottle = 85kg)	Main workshop bottle compound
Propane	1 B Bottle (B bottle = 11kg) 3 E Bottles (E bottle = 46.5kg) 2 F Bottles (F bottle = 15kg) 3 x 11kg Felt Torch Bottles	Main workshop bottle compound

- 2.1.4 Gas oil, although classified as flammable, is unlikely to self-combust under ambient storage conditions.
- 2.1.5 The facility generates bottom ash and APC residues which will be directly loaded into sealed tankers and removed off-site. Further details on the residues relevant to this FPMP are provided on section 4.1.5.

3 POTENTIAL IGNITION SOURCES

3.1.1 Potential ignition sources and management controls to prevent or minimise the likelihood of ignition sources them coming into contact with a combustible or flammable material are identified in Table 3-1 below.

Table 3-1: Summary of potential ignition sources

Ignition source	Fire management
Arson or vandalism	<p>Site security measures seek to minimise the likelihood of unauthorised access to the site.</p> <p>The site is fenced, and an electronic security gate is closed between 10 pm and 5 am. This gate is controlled from the security office which is manned 24/7. This gate can only be opened manually if the safety mechanism is disengaged.</p> <p>A second gate provides access to the Liberty Steel site. This gate remains locked unless required for access. This gate is unmanned. The rail gates are controlled from the security office. CCTV camera cover both Rail gate and LSN access gate</p> <p>CCTV cameras are in operation. Security personnel carry out a perimeter check every few hours.</p> <p>The fuel silos are located on the coal stock yard with restricted access; similarly, reagent storage is within buildings.</p>
Plant or equipment failure	<p>Failure of plant and equipment in proximity to combustible materials may have potential to cause a fire. The static plant and equipment used on the site are regularly maintained and inspected to ensure that they are functioning correctly and their potential for fire initiation is minimised. The facility undergoes routine maintenance and inspection, which is non-intrusive and involves operators completing regular checks on the plant they are operating. Preventative maintenance and intrusive inspections are conducted by fully trained maintenance personnel. The frequency of the maintenance and inspection is identified in site maintenance schedules.</p> <p>Vehicles will be fitted with fire extinguishers and mobile plant (including vehicles) will be parked away from fuel storage and processing areas. The majority of mobile plant will be external contractors' delivery vehicles. All vehicles delivering consumable or recovering ash from the site must be kept in good working order.</p>
Electrical faults	<p>The electrical distribution system undergoes certification and regular maintenance by qualified electricians. Inspections will be carried out in accordance with the inspection frequency assigned within the maintenance schedules and will be recorded. The maintenance schedule considers fire prevention.</p>
Discarded smoking materials	<p>Smoking is not permitted on site other than in designated smoking shelters which are provided for this purpose. Designated smoking areas will be located a considerable distance (> 6 m) from the fuel pellets storage and processing areas.</p>
Hot works (e.g. welding or cutting)	<p>Hot works are not generally carried out in proximity to fuel pellet storage and processing areas. If hot works are required, these are completed in the Workshops located away from fuel pellet storage and processing areas (where possible). If hot works are required in proximity to fuel pellet storage and processing areas, these works would be subject to a Hot Works Permit which will consider appropriate preventative measures to minimise the risk of initiating a fire. The Hot Works Permit will detail the provision of a fire watch after completion of hot works, appropriate measures will be recorded and those undertaking the hot works must comply with recommendations.</p>
Hot exhausts	<p>Mobile plant undergo maintenance inspection (as stated above) which includes a checking for dust in plant exhausts. If any dust is found, the plant will be cleaned following a safe system of work.</p> <p>The stack exhaust (122 m) is located at height and therefore poses minimal fire risk to the site.</p> <p>There are 5 diesel generators on site not located in proximity fuel pellet storage and processing areas</p>
Damaged or exposed electrical cables	<p>The facility design will include measures to minimise the likelihood of damaged/ exposed cables. Electrical cable runs will as far as practicable be protected in cable trays or similar. During equipment maintenance, plant and cables will be inspected for signs of damage.</p>
Neighbouring site activities	<p>The facility is located within proximity to a number of industrial operations including:</p> <p>Liberty Steel Newport:</p> <p>Liberty Steel Newport manufactures Hot Rolled Coil which involves heating steel to extremely high temperatures.</p>

Ignition source	Fire management
	<p>The fuel pellet storage and processing areas are located away from boundaries of the site and approximately 850 m from the Liberty Steel site.</p> <p>Severn Power Station:</p> <p>Severn Power Station is a gas powered combined cycle gas turbine (CCGT) with a maximum capacity of 850 MW.</p> <p>The primary fuel pellet storage silos will be located approximately 400 m from the CCGT.</p> <p>Emergency response and evacuation procedures for Uskmouth Power Station consider the risks from neighbouring site activities and vice versa. Procedures are reviewed regularly with neighbours to ensure changes in operational risks are up to date and fully considered in emergency response arrangements.</p>
Contractors and visitors unfamiliar with site	<p>Procedures will be in place to ensure all visitors and contractors follow the correct safety and fire prevention procedures. All staff and contractors will be made aware of the fire prevention strategy as part of the induction training and a copy will be made available on site. Fire prevention messages will be reinforced around the site with suitable signs.</p> <p>Procedures will also be in place to ensure that contractors undertaking work on site are qualified for the task they are undertaking in order to prevent avoidable incidents.</p>
Self-combustion (e.g. due to chemical oxidation)	<p>Fuel pellets are considered to present a low risk of self-combustion. The chemical oxidation risk increases with moisture content. The moisture content of the fuel pellets delivered will be controlled through the Fuel Supply Agreement fuel specification. The fuel pellets will be kept in waterproof systems to prevent ingress of rain water during storage or movement between plant systems.</p> <p>NRW guidance suggests that as the fuel pellets are derived from waste there may be a risk of self combustion if they are stored for more than 3 months.</p> <p>Silo management procedures will be in place to ensure that, where practicable, materials will be used on a "first in first out" basis. During normal operations it is anticipated fuel pellets will not be stored for more than 15 days on site in primary storage silos.</p> <p>Real time temperature and CO monitoring linked to control room operator audible and visual alarms will be the normal method of risk monitoring to detect self heating within the primary storage and day silos. All alarms will have an operational instructions setting out clearly the action operators should take on receipt of an alarm.</p> <p>Fuel pellet management and acceptance procedures will be established to ensure that, where possible, maximum operational storage times are complied with.</p> <p>Should the need arise to exceed the 15 day operational norm due to planned outages or unplanned forced outages all fuel risks will be assessed and additional monitoring procedures established where necessary.</p> <p>Temperature will be monitored within the primary storage and day silos to detect self-heating.</p>
Industrial heaters	N/A - not included on site
Ignition sources (naked flames, furnaces, space heaters)	The fuel pellet storage and processing areas are remote from the combustion units. There will be no space heating or naked flames in the proximity of the primary storage silos, day silos or fuel processing areas.
Open combusting (on site or adjacent sites)	N/A - not included on site. Fuel pellet combustion will only take place within the engineered furnaces.
Reactions between incompatible materials	Fuel pellet acceptance and inspection procedures are set out in the operator's management system procedures and will ensure that unacceptable fuel pellets are not stored on site. SUP will only accept fuel pellet that comply with stringent fuel specification, thereby reducing the potential for reactions between incompatible materials.
Hot loads deposited at the site	<p>Fuel pellet acceptance procedures include procedures for checking for and management of hot loads. These procedures will seek to avoid hot loads being deposited in the storage silos.</p> <p>The facility has a dedicated quarantine area located as shown in drawing 1, a hot load arriving by train will be directed to the coal stock yard by conveyors and then mobile plant will be used to move it to the quarantine area.</p>
Tramp metal	The upstream, off-site, fuel pellet manufacturing process includes "tramp" metal removal equipment before the final pelletising process.

Ignition source	Fire management
	<p>The SUP fuel pellet specification includes a target of "zero" for tramp metal.</p> <p>The SUP plant fuel reception materials handling systems will include a magnetic separation process to remove "tramp" metal that may have been inadvertently added to the delivery.</p> <p>Fire risk from tramp metal is a very low risk at this site.</p>
Batteries within fuel pellet deliveries	<p>No unprocessed waste will be delivered to the site. Fuel pellets have been subject to upstream waste management processes to comply with the stringent fuel specification. Batteries are screened out of the pellet production process by utilising magnets and eddy current separators. Fire risk from batteries in is considered to be very low at this site.</p>
Batteries in End of Life Vehicles (ELVs)	<p>N/A – The facility does not accept ELVs. The fire risks associated with batteries in ELVs are not a risk to this site.</p>
Cylinders stored at the site	<p>Oxygen and propane cylinders are stored at the site within the main workshop bottle compound, a secure location not in proximity to fuel pellet storage area. Hydrogen cylinders are stored within the secure compound well away from the fuel pellet storage and processing areas. Carbon dioxide cylinders are stored in a number of locations as fire extinguishers and spare cylinders. Carbon dioxide cylinders are not considered to be a fire risk.</p>
Leaks and spillages of oils and fuels	<p>General housekeeping procedures as outlined in the management system procedures will ensure leaks and spills are dealt with swiftly and efficiently.</p> <p>Oil tanks and locations are provided in Table 2-1. All tanks are bunded to 110% capacity of the tank. All tanks are more than 6 m from the fuel silos.</p> <p>Spill procedures will be in place to enable immediate response using spill kits and clean-up as soon as practicable. Details of the spill will be recorded, including time and date, estimated volume of liquid, chemical spilled (if known, including a description) and any further information relating to the source of the spill and any perceived effects it is having on the surrounding area. This information will be provided to the site manager. If further investigation or remedial work is deemed necessary, appropriate action will be allocated to an appropriate person in accordance with the spillage procedure.</p> <p>Spill kits will be located at various locations around the site, including an oil spill kit adjacent to oil storage tanks. All liquid fuel and reagent tanks will be appropriately bunded.</p> <p>The majority of vehicles on site deliver non fuel consumables and remove ash from site. Delivery vehicle preventative maintenance will be the responsibility of the haulage contractors. Vehicles owned by the operator will be subject to routine maintenance.</p>
Build-up of loose combustible fuel pellet, dust and fluff	<p>Dust control during fuel deliveries and movement of fuel to and from storage silos via materials handling systems needs to be controlled to prevent dangerous build up of dust outside of the enclosed systems that could be ignited resulting in a fire or an explosion.</p> <p>The plant will be designed to enclose fuel during its movement to prevent dust release to the fullest practical extent. Where this is not possible Local Exhaust Ventilation (LEV) systems will be established to collect dust which will be stored and returned to the enclosed materials handling systems.</p> <p>Where necessary normal operations will include regular and routine plant cleaning activity to control this risk.</p> <p>SUP plant design will be in full compliance with the Dangerous Substances and Explosive Atmospheres Regulations 2002.</p>

4 FIRE PREVENTION METHODS

4.1 Prevent self-combustion

Manage Storage Time

- 4.1.1 Table 4-1 provides details of the fuel pellets storage on site and provides an indication of the total amount of fuel pellets stored, as well as the expected maximum storage time and the method of management. No raw waste materials for fuel will be stored on site. The design and layout of the primary storage silos is shown on drawing 7.

Table 4-1: Main combustible and / or flammable waste

Combustible material	Form	Quantity stored (tonnes)	Expected maximum storage time under normal operation	How the material is stored
Incoming fuel - pellets	Fuel pellets produced from non-hazardous waste	Max: 40,000	15 days	4 x primary storage silos, each silo is approximately 18,000 m ³ and hold approximately 10,000 tonnes of fuel pellets (based on a density of 550 kg/m ³). 2 x day storage silos, each approximately 2,300 m ³ and hold approximately 1,300 tonnes

- 4.1.2 It is anticipated that fuel pellets will be delivered by rail over 24/7, 7 day cycle and stored for up to 15 days before combustion during normal operations. As far as practicable fuel pellets will be processed on a "first in first out" basis, the silos are loaded from the top and are designed with a vibrating floor which will feed the conveyors beneath. Prior to a planned shutdown, fuel levels would be run down to a minimal level by advising the fuel supplier well in advance. During an unplanned shutdown, the fuel supplier will be notified immediately to halt fuel deliveries. The fuel already stored on site will remain in the storage silos for the duration of the unplanned shutdown.
- 4.1.3 In these circumstances all fuel risks will be assessed and additional monitoring procedures established where necessary.
- 4.1.4 In the event that non-conforming fuel pellets are delivered to site, they could be extracted from storage silos using conveyors and deposited in the quarantine area with mobile plant, ahead of transportation off site.
- 4.1.5 Fuel pellets generates ash residues from combustion at high temperature, ash is not considered to be a highly combustible waste and therefore is not considered within this FPMP. Bottom ash discharged from the grate is collected in one of the ash hoppers where it is forced into the ash crusher by high pressure water jets. It is subsequently discharged to the settlement pits. Bottom ash is saturated at the point it discharges to settlement pits and is relatively moist when it is removed to the storage area. The combustion process is designed to maximise fuel combustion, if non-combustible fuel is present in the bottom ash it would represent a low proportion of the water saturated ash residue and pose a negligible fire risk.
- 4.1.6 Flue gas APC residue will be removed using the existing abatement system. APC residues are collected in a hopper and then pneumatically conveyed into a bulk silo. In normal operating conditions these residues contain fly ash from the combustion phase therefore are unlikely to pose a combustion risk.

Record Storage Duration

- 4.1.7 Quantities of incoming fuel pellets will be recorded in metric tonnes utilising the site rail weighbridge. This information will be recorded and stored electronically.

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- 4.1.8 The primary storage silos will be filled from the top and in rotation, the fuel pellets are supplied to the combustion units through a vibrating floor to ensure fuel pellets are supplied on a “first in first out” basis. Procedures will be in place to record the date and volume of fuel pellets stored in each silo.

Monitor and Control Temperature

- 4.1.9 The off site fuel pellet production process will entail the removal of metals from the non hazardous waste stock ahead of pellet production. There is no evidence to suggest that fuel pellets are at risk of temperature increase or self combustion when stored for extended periods. Fuel pellets will normally not be stored for longer than 15 days, thereby further reducing the likelihood of significant temperature increases. There will be no onsite shredding, chipping or similar processes conducted at SUP which give rise to heat generation. Fuel pellets and biomass will be milled together to produce a fuel mix, this process may create fines, however the product of the milling process is fed directly into the combustion units. Temperature is monitored at the mill inlets and outlets to detect any rise in temperature due to self heating during the milling process.
- 4.1.10 The amount of fines will be controlled primarily through the stringent fuel specification required by SUP. The agreed fuel specification will include a minimum particle size and the quality of fuel will be monitored via a sampling regime both by the fuel supplier and SUP.
- 4.1.11 A thermal detection system will form part of the automatic fire detection system within the silos. In the event pre-set temperature parameters in the silos are exceeded an alarm indication at the main fire alarm control panel in the control room will be triggered. When a further pre-set time has elapsed, or further pre-set temperature parameters are exceeded, or the secondary automatic detection is activated.
- 4.1.12 CCTV monitoring is provided across the site with feedback to the control room. In addition, during the working day as a matter of course site operatives who, as part of their working routine, are required to immediately report any general observations of signs of material heating.

Waste Storage

- 4.1.13 No combustible waste bales will be stored on site.
- 4.1.14 No combustible waste will be stored inside a building.
- 4.1.15 No combustible waste will be stored within containers such as skips or shipping containers.

Seasonality and Waste Stack Management

- 4.1.16 Fuel pellets will not be subject to seasonal variation that would affect the fire risk, the fuel pellets will conform to a stringent fuel specification.
- 4.1.17 No end user outlets are required as all fuel pellets delivered to site will be fed into the combustion units. Resilience of the fuel pellet supply chain is not considered relevant to this site.

Manage Waste Piles

- 4.1.18 Fuel pellets are stored in storage silos with built in fire detection and fire suppression systems. Fuel pellets are not stored in piles and consequently the FPMP guidance relating to pile management (maximum volume etc) is not considered directly applicable.
- 4.1.19 Temperature will be monitored within the primary storage silos, however monitoring of moisture content is not considered necessary as the fuel pellets will conform to a stringent fuel specification including moisture content. The storage silos are designed to prevent rainwater ingress (see drawing 7).

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- 4.1.20 There will be no turning of waste piles as waste will be stored in storage silos and utilised on a first in first out basis.

Additional Measures

- 4.1.21 Additional measures will be implemented to prevent fuel pellets falling from conveyors or silos during transfer and storage in order to minimise dust formation.
- 4.1.22 Dehumidification of air in the storage silo headspace will be implemented to reduce the risk of dust self heating.

4.2 Prevent fire spreading

Separation Distances

- 4.2.1 The fuel pellets will be stored in silos rather than piles and so the separation distance of 6 m does not directly apply. The four primary storage silos are arranged in a linear configuration, with a 5 m separation distance between each silo. The silos are constructed of concrete with steel roofs, with built in fire detection and fire suppression systems (see 6.2.7 below) designed to promptly extinguish potential fire event, thereby minimising the risk that a fire event would affect the structural integrity of the silo. The 5 m separation distance is therefore considered adequate to ensure that a fire in one silo would not spread to adjacent silos.

Fire Walls and Bays

- 4.2.2 Given the method of storage of fuel pellets in silos with built in fire detection and fire suppression systems the use of fire walls or bays is not considered appropriate or necessary.

Quarantine Area

- 4.2.3 In the event fuel pellets self heat or ignite they can be deposited and extinguished in the quarantine area. The quarantine area will be a designated area of hardstanding to the west of the primary storage silos are shown on the site layout plan at Appendix 1. It is anticipated that the quarantine area would be used only for the segregation of incoming hot loads. When a hot load is identified, it will be transported as quickly as possible and isolated in the quarantine area.
- 4.2.4 In the event that fuel pellets self heat or ignite within the storage silos this would be dealt with via the in built silo fire detection and fire suppression management system detailed in section 6.2.

5 TRAINING

- 5.1.1 Operator training will be provided to ensure that the facility will be operated by a competent workforce. Operator training will be undertaken prior to commissioning of the facility. Operational procedures will be developed against which all staff will be trained and are included in the site Environmental Management System (EMS). The SUP operating procedures will ensure the plant is operated safely and in a manner which reduces the potential for a fire event.
- 5.1.2 Training will not only address normal operations but will also include those actions required in the event of abnormal operations and emergencies. Training will include the familiarisation with this FPMP and procedures to follow in the event of a fire.
- 5.1.3 Staff with nominated fire responsibilities will receive an appropriate level of additional training to undertake these specific duties. Persons will be assigned to ensure the following duties are covered:
- safe evacuation of buildings to muster points in the event of a fire alarm;
 - a final check of building areas to ensure no one remains inside;
 - to ensure all site persons are accounted for, e.g. by taking a register of persons on site;
 - collating and recording information on the incident,
 - liaison with external firefighting teams;
 - communicating with Senior Management, external communications, other Regulators,
 - neighbours and media, as required.
- 5.1.4 A sufficient number of personnel will be trained in these roles to ensure appropriate staffing levels to carry out assigned fire duties 24 hours a day, 7 days per week.
- 5.1.5 Key operational staff will be trained in the appropriate use of firefighting systems including; when and how these firefighting systems should be used, and equally importantly when they need to put their own safety ahead of fighting a fire (i.e. when the operator should not use the firefighting systems). Note that this applies particularly to the use of manual firefighting systems. Specific training of staff tasked to assist with fire evacuations is also required to ensure that correct actions are taken in an emergency situation and that efficient evacuation, shutting down of equipment and first aid firefighting can be carried out.
- 5.1.6 Training will be carried out upon staff induction with refresher training given to key staff on a 12 monthly basis. To ensure that a structured approach can be applied across the wide spectrum of requirements for compliance with the Regulations a Fire Safety Management Plan will be developed for the facility.
- 5.1.7 Role specifications will be defined to include details on relevant qualifications and training, including where relevant, on the job training, required for that role. Records of training will be stored and maintained. As a minimum, records will include; date, type of training and training provider.
- 5.1.8 Procedures will also be in place to ensure that contractors undertaking work at SUP are qualified for the task they are undertaking and that they are aware of relevant requirements of the FPMP, EMS and environmental permit relevant to their work. Any contractor or visitor on site will receive a fire safety briefing confirming the actions to take in the event that they identify a fire as well as the actions to follow should a fire alarm sound.
- 5.1.9 All staff, contractors and visitors will be encouraged to report any potential safety risks, including an incident that had the potential to cause a fire. Any such report will be recorded, and appropriate follow-up action carried out.
- 5.1.10 The Fire Warden's responsibilities will be defined in accordance with industry good practice.

6 MITIGATION OF FIRE IMPACT

- 6.1.1 Suitable steps will be taken to prevent fire initiation and to prevent fire spread. In the event of a fire the following fire detection and firefighting systems will be in place. These aim to achieve early detection and rapid response to extinguish the fire as soon as possible.
- 6.1.2 All fires, without exception, will be reported to the Emergency Services with a request for immediate assistance.

6.2 Fuel Storage Silos

Fire Detection

- 6.2.1 The storage silos will have built in fire detection and fire suppression systems which will be installed and maintained in accordance with industry good practice and regulatory requirements.
- 6.2.2 There are two types of silo fire detection system under consideration:
- 6.2.3 Multi-gas detector mounted in the silo roof detect the products of combustion and differentiate between off-gassing and self heating (a precursor to self combustion)
- 6.2.4 Thermocouples suspended from chains within the body of silo identify the location of potential fire event.
- 6.2.5 The final design of the SUP fire system will be confirmed during the EPC design, this final design will be shared with NRW when it is available. The FPMP will be amended to include the final EPC fire design.

Fire Suppression

- 6.2.6 The fire detection system in conjunction with the suppression system will aim to promptly extinguish a fire, where possible, within 4 hours. Fire suppression systems may not always extinguish a fire, but crucially prevent a fire spreading, allowing the fire and rescue service time to respond and extinguish the fire. The design, installation and maintenance of the SUP fire suppression system will be installed and maintained in accordance with industry good practice, regulatory requirements and appropriate fire safety standards. The final design of the SUP fire system will be confirmed during the EPC design, this final design will be shared with NRW when it is available. The FPMP will be amended to include the final EPC fire design.
- 6.2.7 SUP will incorporate an automatic fire suppression system:
- automatically acts to suppress a fire as soon as it is detected; and
 - designed for compliance with the appropriate fire standards.

Fire Fighting Techniques

- 6.2.8 The SUP conversion will utilise existing site infrastructure, there are no plans to modify the existing layout, except in the addition of the primary and day storage silos, associated conveyors and upgrades to the rail way offloading. Accessibility has been considered in the placement of the fuel pellet storage silos.
- 6.2.9 The silos will incorporate a steel roof with an aperture for fuel pellet delivery from the overhead conveyor system. The silos will have built in carbon dioxide (CO₂) fire suppression system. Water will not be used to for fire suppression within the storage silos, therefore the requirement that waste is stored at least 3 m below any water spray or sprinkler fire suppression system is not relevant. The carbon dioxide fire suppression system will be based on good practice fire suppression systems used in biomass storage silos.

-
- 6.2.10 Appropriate mobile plant will be permanently available on site in order to move potential fuel pellets hot loads or non conforming fuel pellets to the quarantine area. In the event of a suspected fire within a storage silo this would be detected by silo temperature and CO monitoring at an early stage and dealt with by removing the fuel to the quarantine area or by the in built silo fire suppression and extinguishing systems.
- 6.2.11 Mobile water carriers (bowzers) are located on the site. In an emergency these could be used to tackle small fires. Water is deemed unsuitable for suppressing storage silo fires. The addition of water into the silos would add additional weight and cause the pellets to swell, thereby exerting an excessive hydraulic pressure and compromising the structural integrity of the silo, creating additional dangers.
- 6.2.12 The following mobile water carriers are on site:
- 1 x 9,000 litres bowser
 - 1 x 2,000 litres bowser
 - 1 x 800 litres trailer
- 6.2.13 Adequately trained staff will be present on site at all times. See section 5 above.
- 6.2.14 Water is available on site as described in section 6.6 below for fire fighting in the existing SUP operational areas. Water fire suppression systems are not considered for the fuel pellet storage silos, therefore additional fire water provision is not required above the existing SUP fire water provision.

6.3 SUP Fuel Conveying Systems

Fire Detection, Suppression and Extinguishing

- 6.3.1 Fuel conveyors will be equipped with infra red "spark" detection and suppression systems at all conveyor transfer and silo discharge points.
- 6.3.2 High risk fuel conveyors will be equipped with infra red camera systems designed to identify hot product on a conveyor and immediately trip or stop the conveyor to enable removal of the hot product by Plant Operators in accordance with a safe system of work.
- 6.3.3 All conveyors will be equipped with a water deluge system that can be manually initiated by Plant Operators.
- 6.3.4 The final design of the SUP fire system will be confirmed during the EPC design, this final design will be shared with NRW when it is available. The FPMP will be amended to include the final EPC fire design.

6.4 Fuel Mills

- 6.4.1 Fuel mills will be equipped with fire detection and suppression systems.
- 6.4.2 The final design of the SUP fire system will be confirmed during the EPC design, this final design will be shared with NRW when available. This FPMP will be amended to include the final EPC fire design.

6.5 Main Building

- 6.5.1 No combustible waste is stored inside any building.
- 6.5.2 The Control Room within the SUP main building is located adjacent to Unit 14. The existing plant fire suppression system comprises an automatic water spraying system, designed to spray over potential fire events to deprive the fire of oxygen.

-
- 6.5.3 This automatic water spraying system is triggered through detectors within the Main SUP Building. The automatic water spraying system is not appropriate for main plant areas containing hot steam pipes and steam turbine cylinders, here an audible and visual alarm is triggered in the control room allowing the trained engineer to decide whether it is appropriate to discharge the water spraying system or use the powder or foam fire extinguishers.

Fire Fighting Techniques

- 6.5.4 Upon activation of any type of fire detector or manual call point an initial first stage alarm will be automatically initiated. Visual and audible indication will be provided at the fire alarm panel indicating the zone in which the fire has been detected.
- 6.5.5 The fire alarm sounders will activate with a distinctive first-stage intermittent warning sound, administration staff and staff with no fire-fighting training will then evacuate the building. Staff manning the Control Room will remain during the first-stage intermittent warning sound.
- 6.5.6 During the early investigation period, trained personnel will investigate and determine which of the following options apply:
- If it is determined that it is a false alarm activation, notify the Control Room (adjacent to Unit 14) staff to cancel the first-stage alarm; or
 - Deal with the fire in its incipient stages and within their fire fighting capabilities, then notify the Control Room staff to cancel the first-stage alarm if they have successfully extinguished the fire; or
 - if it is determined that the fire is outside their fire-fighting capabilities, manually activate the second-stage evacuation alarm by pushing a call point within that fire zone and exit the building. A manually activated push-button on the fire alarm control panel in the Control Room triggers the second-stage evacuation alarm.
- 6.5.7 If, during the early investigation period; the first-stage alarm timer expires; or if a second detector in the same zone is activated; or a manual call point is activated, the second-stage evacuation alarm will be automatically initiated characterised by a distinctive continuous warning sound.
- 6.5.8 The main fire alarm panel is located in the Control Room of Main SUP building with a repeater panel located in the reception lobby of the SUP Admin Building.
- 6.5.9 If trained personnel are unable to immediately extinguish the fire, the second-stage alarm is activated, and an appropriate person contacts the Fire and Rescue Service (FRS) to attend to the fire. Access routes for vehicles and the FRS are shown on Drawing 6.
- 6.5.10 Emergency contact procedures are in place with the night security personnel.
- 6.5.11 In the event FRS attend a fire at SUP, fire water is available from the water sources identified in the section below.
- 6.5.12 Given the available firefighting techniques and means of detecting a potential fire, it is expected that a fire would be extinguished within four hours.

6.6 Fire Water Supplies

- 6.6.1 As described above, the storage silos will have built in carbon dioxide fire suppression system. Water will not be used for fire suppression within the storage silos. No additional water will be required for fire fighting within fuel pellet storage silos.
- 6.6.2 The immediate supply of water for fire fighting is located in the pressure tank; this is a storage vessel of approximately 45,000 litres, capacity and operating at a pressure of 827 kPa. Under normal operating conditions pressure tank will contain 2/3 air 1/3 water, providing 15,000 litres of

water immediately available for fire fighting. This volume of water is considered adequate for fighting small fires and to suppress larger fires.

- 6.6.3 In the event of fire, fire water is diverted from the pressure tank, this triggers a diesel starter motor that pumps water into the pressure tank.
- 6.6.4 SUP has three diesel driven pumps alongside the main boiler house each with a 5,000 litres per minute capacity.

Replenishing Water Tank

- 6.6.5 In the event of fire or after accidental discharge the pressure tank is replenished with a topping up pump with a capacity of 150 litres per minute.
- 6.6.6 This water pump is used in conjunction with the air compressor to replenish the pressure tank back to its working level and pressure.

6.7 Management of Fire Water

- 6.7.1 Water fire suppression systems are not considered for use within the fuel pellet storage silos, therefore additional fire water provision is not required above the existing SUP fire water provision.
- 6.7.2 The existing SUP site has been assessed by the Fire and Rescue Service and the capacity for storage of fire water has been deemed adequate. A spreadsheet indicating potential volumes of fire water and storage areas is at appendix B.

6.8 During and After a Fire

- 6.8.1 Contingency measures must be in place for dealing with issues during and after a fire.
- 6.8.2 In the event of a fire an initial fire assessment would be conducted by trained personnel, who would decide upon the appropriate firefighting strategy to be implemented; and the risk posed to SUP operations to decide if SUP operations should continue or be shut down.
- 6.8.3 If it was judged that it was not safe to continue SUP operations, the plant would be shut down. No deliveries of fuel pellets would be permitted to the site until the “all clear” was given.
- 6.8.4 In the event of a fire, arrangements in place to inform nearby receptors (adjacent sites and residents) of the status of the fire event and potential impact upon adjacent industrial facilities, residential properties.
- 6.8.5 In the case of such an emergency, notification of persons and organisations will be carried out in the following order:

Table 6-1: Emergency Communication Actions

Action order	Communications action
1	Contact the emergency services FIRST
2	Contact all relevant personnel using the internal contacts list in Appendix A . This will be a time consuming process so allocate this task to another employee (or more than one). If a person on the list does not reply you MUST leave a message NOTE – for major incidents, such as major fires, very serious or fatal injuries and similar you MUST ensure that Management are also informed
3	Contact relevant external persons / organisations as relevant (see external contacts list below). Note – the site permit may require specified types of emergency to be reported to EA, HSE or similar. Make sure you know any of this type of requirement and ensure contact is made

Action order	Communications action
4	Repeat contacting internal persons if there is a significant change or development in the emergency, such as fire starting to run out of control, the spread of a fire, or a change in the condition of an injured person. Such updates may be by telephone or e-mail to a set list
5	Repeat contacting internal persons when the emergency is over. Such updates may be by telephone or e-mail to a set list
6	If an emergency means that the site is closed, allocate a person to communicate with all employees to ensure they do not attend site. And, inform them once the site is open again so that they can return to work

Table 6-2: Emergency Contact Order

External contacts		
Designation	Function	Contact details
Fire	Emergency number	999 'FIRE'
	Non-emergency number	01443 232 000 (South Wales FRS HQ)
Police (if necessary)	Emergency number	999 'POLICE'
	Non-emergency number	101
Ambulance	Emergency Number	999 'AMBULANCE'
Nearest hospitals	Royal Gwent Hospital	01633 234 234
HSE	Opening hours	0345 300 9923
	Out of hours	01519 229235
UK Power Networks	24 hour number	0800 31 63 105
Local Authority:	Newport City Council (General)	01633 656 656
	General	0300 065 3000
Natural Resources Wales	24 hr incident line	0300 065 3000
	Site Inspector	Gareth Richards
Neighbouring Sites	Liberty Steel	01633 290 288
	Severn Power	01633 530 130

- 6.8.6 Once the fire has been extinguished, the site is to be made suitable for future operations. The amount of work required to complete this requirement is dependent upon the scale of the fire; however, the following tasks would be required to be carried out before the site can become operational again:
- Disposal of all combusted materials, transported off-site to landfill.
 - Clean the Quarantine Area (if used) and ensure all materials are removed.
 - Investigate the cause of the fire.
 - Once the cause of the fire is discovered, disseminate this information to all staff members to minimise the fire risk reoccurring.
 - Check all plant and equipment to ensure it is undamaged and is working appropriately.
 - Dispose of the fire water (see also section 6.7).

7 REVIEW AND MONITORING OF FPMP

7.1.1 This FPMP will be an integral part of the SUP Environmental Management System and will be treated as a live document and will be reviewed regularly to account for any changes to the business or site.

7.1.2 In addition to regular planned reviews a review of the FPMP will be conducted in the following circumstances:

- a fire is experienced at the site;
- additional combustible materials are accepted and stored on site;
- increased fuel pellet volumes are to be accepted and stored;
- any development or changes to site infrastructure; and/or
- installation of new plant or equipment.

8 CONCLUSIONS

- 8.1.1 The FPMP considers the NRW FPMP guidance in relation to the existing and proposed fire prevention and mitigation plan for SUP.
- 8.1.2 The fuel pellets will be stored within silos with built in fire detection and fire suppression systems which will be installed and maintained in accordance with industry good practice and regulatory requirements and appropriate fire safety standards. These industry good practice systems aim to detect and suppress a potential fire event.
- 8.1.3 Fire water management systems are in place to prevent the uncontrolled discharge of fire water.

The FPMP shows that the SUP site meets the requirements of the NRW FPMP guidance and all applicable and relevant industry guidance in the development of Fire Safety Systems Design has been applied.



DRAWINGS

Drawing 1 Site Layout Plan

Drawing 2 Site Drainage Plan

Drawing 3 Surface Infrastructure

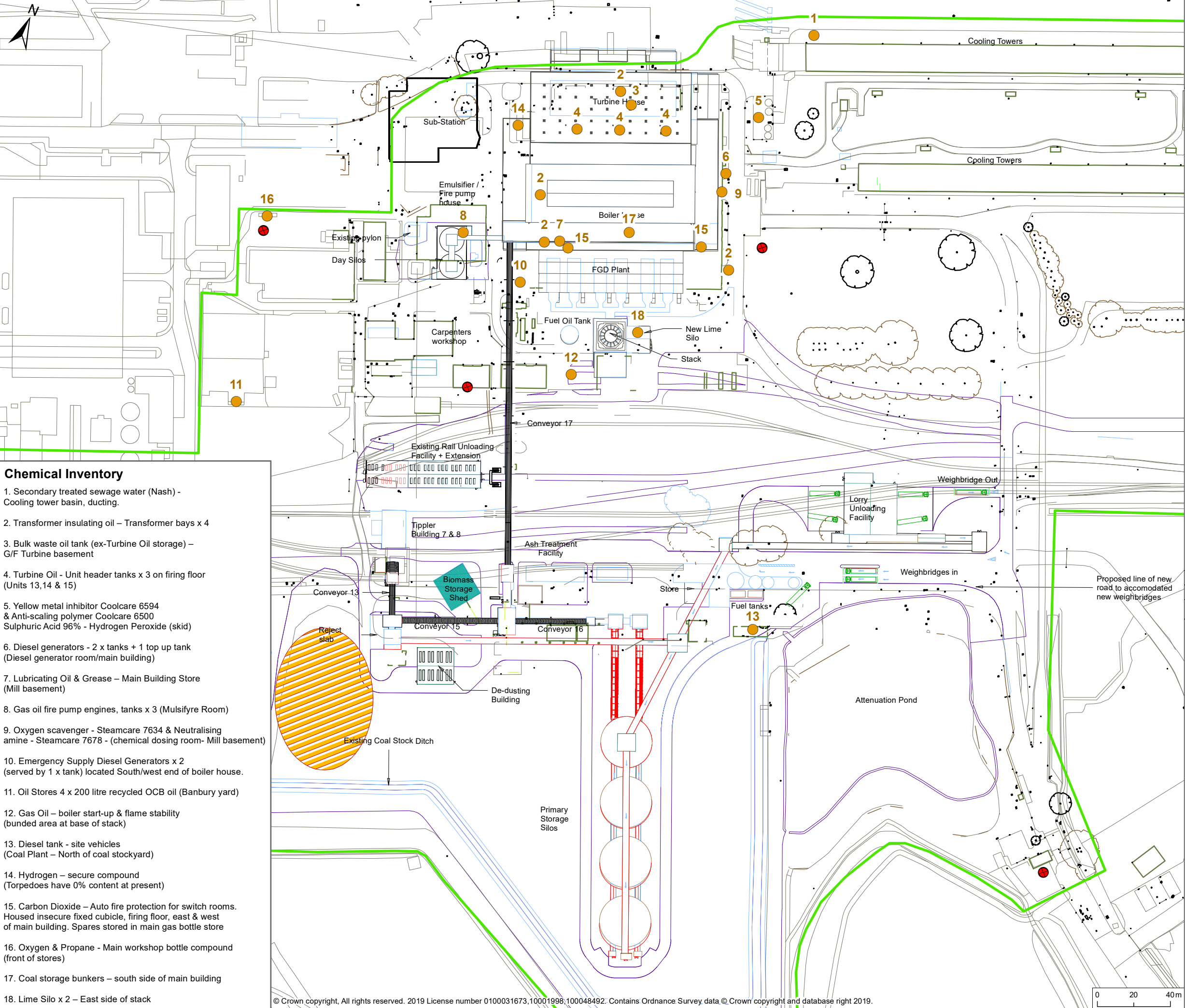
Drawing 4 Sensitive Ecological
Receptors

Drawing 5 Sensitive Human Receptors

Drawing 6 Emergency Access Routes

Drawing 7 Primary Storage Silo
Design

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Chemical Inventory

- 1. Secondary treated sewage water (Nash) - Cooling tower basin, ducting.
- 2. Transformer insulating oil – Transformer bays x 4
- 3. Bulk waste oil tank (ex-Turbine Oil storage) – G/F Turbine basement
- 4. Turbine Oil - Unit header tanks x 3 on firing floor (Units 13,14 & 15)
- 5. Yellow metal inhibitor Coolcare 6594 & Anti-scaling polymer Coolcare 6500 Sulphuric Acid 96% - Hydrogen Peroxide (skid)
- 6. Diesel generators - 2 x tanks + 1 top up tank (Diesel generator room/main building)
- 7. Lubricating Oil & Grease – Main Building Store (Mill basement)
- 8. Gas oil fire pump engines, tanks x 3 (Mulsifyre Room)
- 9. Oxygen scavenger - Steamcare 7634 & Neutralising amine - Steamcare 7678 - (chemical dosing room- Mill basement)
- 10. Emergency Supply Diesel Generators x 2 (served by 1 x tank) located South/west end of boiler house.
- 11. Oil Stores 4 x 200 litre recycled OCB oil (Banbury yard)
- 12. Gas Oil – boiler start-up & flame stability (bunded area at base of stack)
- 13. Diesel tank - site vehicles (Coal Plant – North of coal stockyard)
- 14. Hydrogen – secure compound (Torpedoes have 0% content at present)
- 15. Carbon Dioxide – Auto fire protection for switch rooms. Housed insecure fixed cubicle, firing floor, east & west of main building. Spares stored in main gas bottle store
- 16. Oxygen & Propane - Main workshop bottle compound (front of stores)
- 17. Coal storage bunkers – south side of main building
- 18. Lime Silo x 2 – East side of stack

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Legend

- Permit Boundary
- Chemical Inventory
- Muster Points
- Fuel Quarantine Area

Rev	Description	By	CB	Date

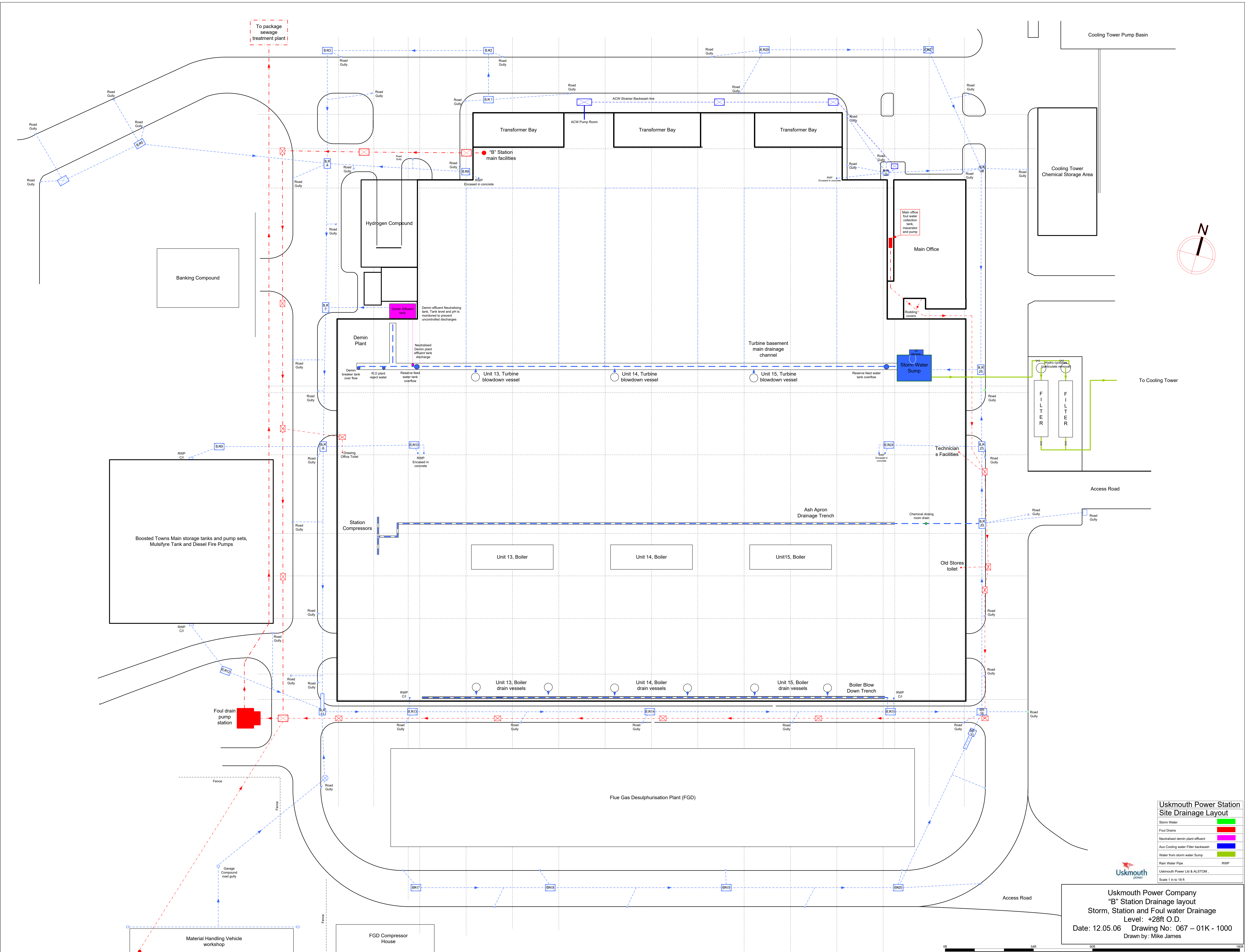


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Client Simec Uskmouth Power Ltd
Project Uskmouth Power Station
Title Fire Prevention and Mitigation Plan

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Project Number JER1649 Scale @ A3 1:2,000 Date Created NOV 2019
Drawing Number JER1649-SI-003 Rev -

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Uskmouth Power Station Site Drainage Layout	
Storm Water	Green
Foul Drains	Red
Neutralised demin plant effluent	Magenta
Aux Cooling water Filter backwash	Blue
Water from storm water Sump	Yellow
Rain Water Pipe	RWP
Uskmouth Power Ltd & ALSTOM	
Scale 1 in to 18 ft	

Uskmouth Power Company
"B" Station Drainage layout
Storm, Station and Foul water Drainage
Level: +28ft O.D.
Date: 12.05.06 Drawing No: 067 – 01K - 1000
Drawn by: Mike James



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Legend

- Permit Boundary
- Vegetated Area
- Concrete Area

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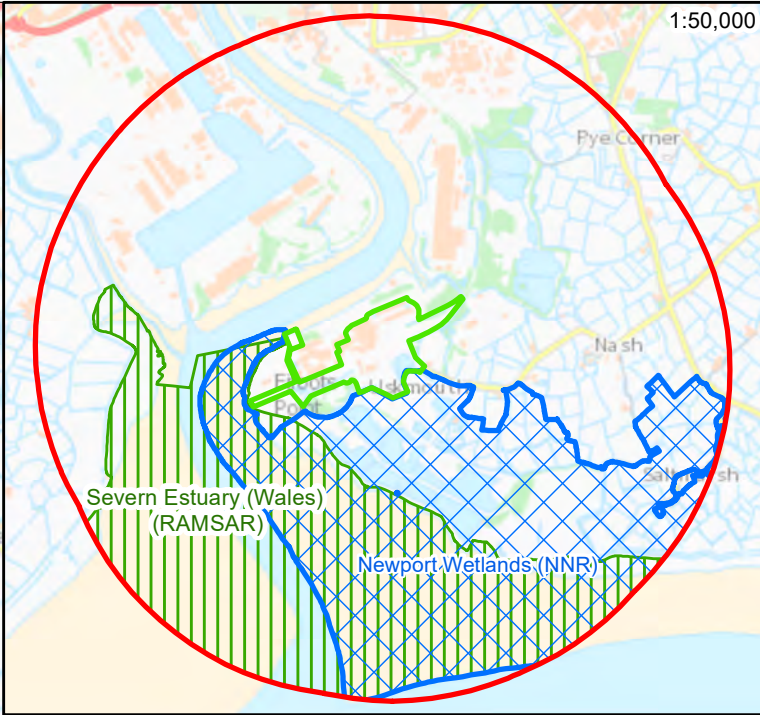
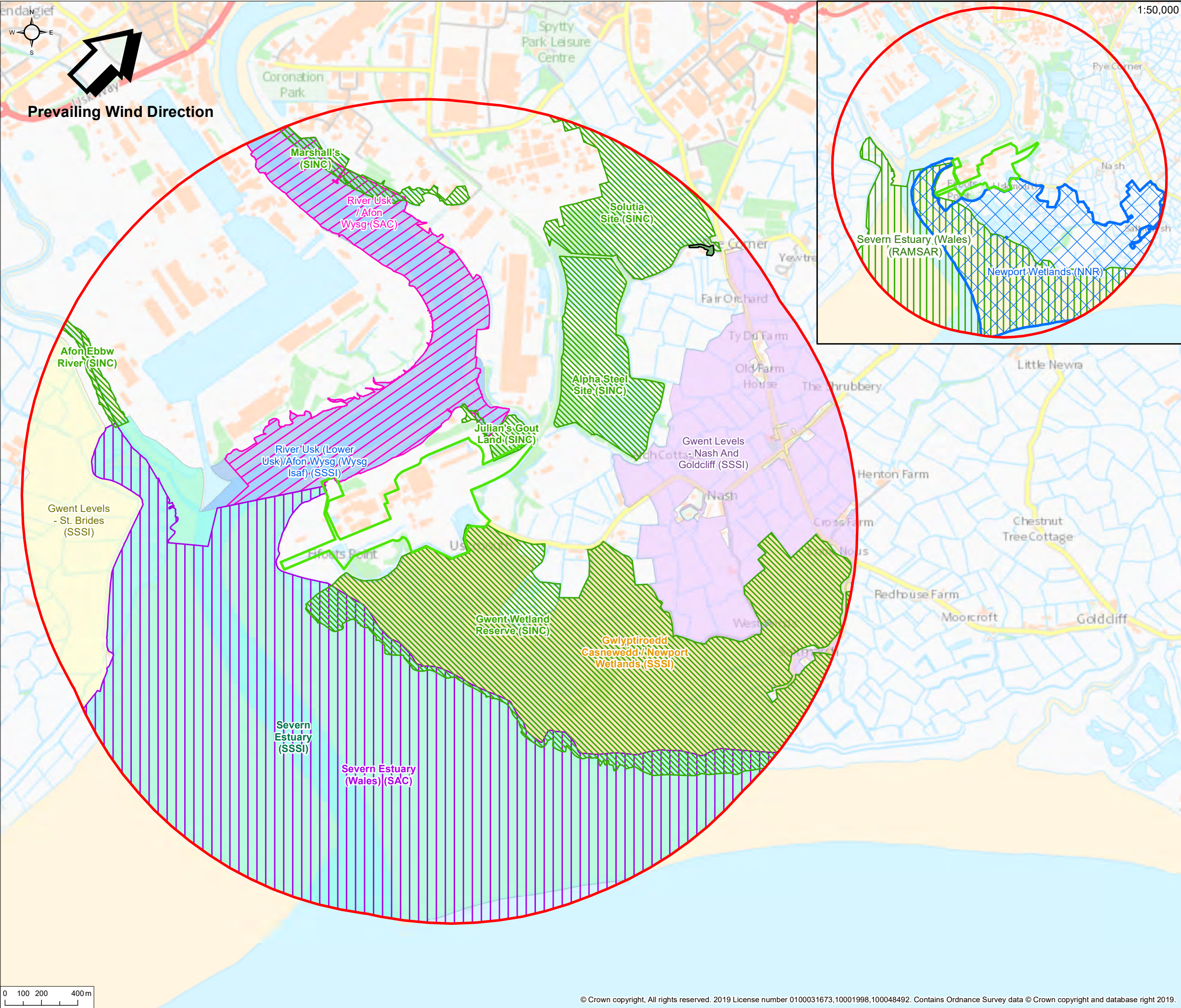
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Status	Drawn By	PM/Checked By
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Project Number	Scale @ A3	Date Created
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Legend

- Permit Boundary
- 2km Boundary from Centre of Site

Ecological Receptors

- Sites of Importance for Nature Conservation (SINC)
- Ancient Woodland
- National Nature Reserve (NNR)
- RAMSAR Sites

Site of Special Scientific Interest (SSSI)

- Gwent Levels - Nash And Goldcliff
- Gwent Levels - St. Brides
- Gwlyptiroedd Casnewedd / Newport Wetlands
- River Usk (Lower Usk)/Afon Wysg (Wysg Isaf)
- Severn Estuary

Special Area of Conservation (SAC)

- River Usk / Afon Wysg
- Severn Estuary (Wales)

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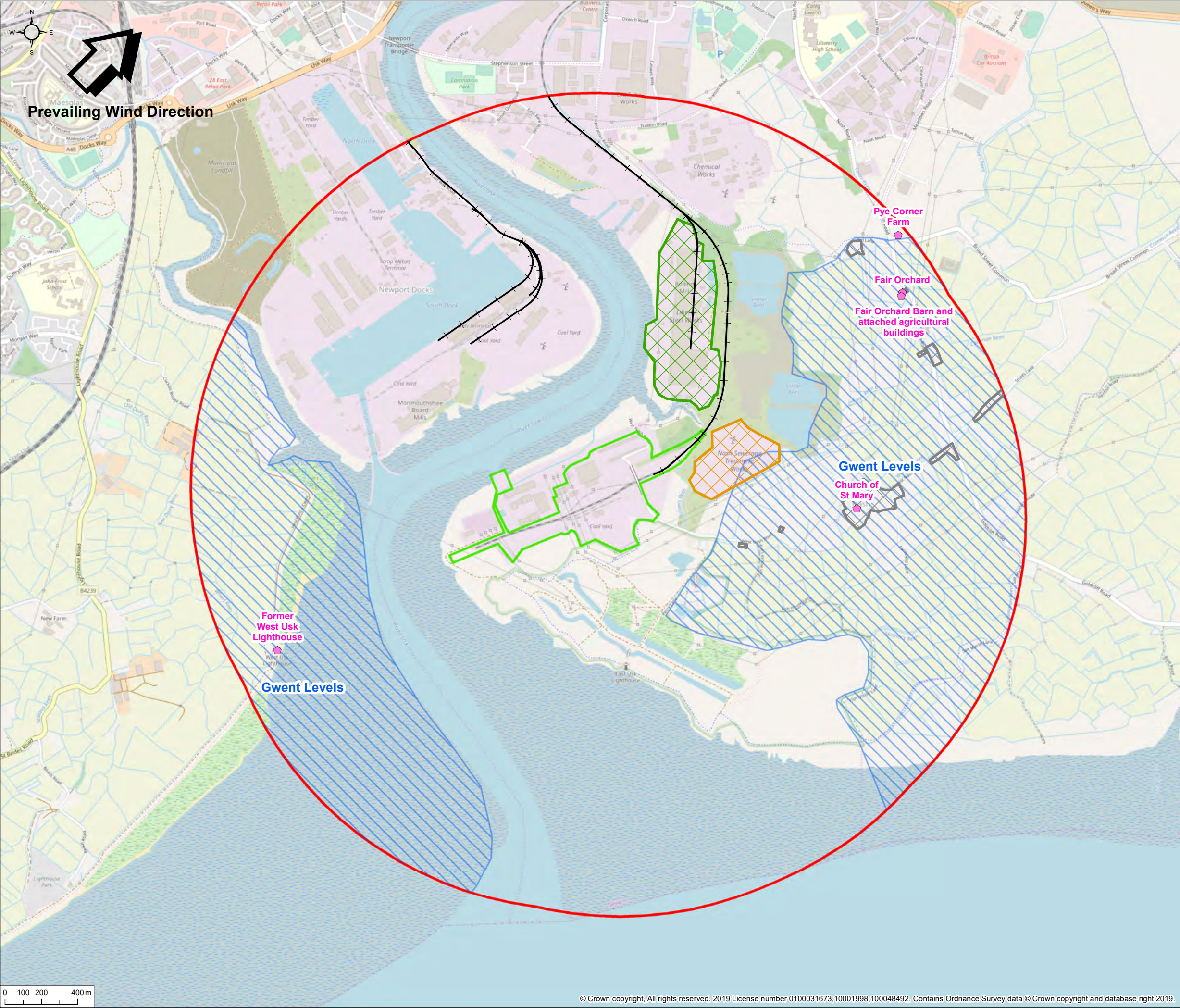
Client Tom Dearing

Project Uskmouth Power Station

Title Ecological Receptors Plan

Status	Drawn By	PM/Checked By
DRAFT	RW	FB
Project Number	Scale @ A3	Date Created
JER1649	1:20,000	OCT 2019
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- Legend**
- Permit Boundary
 - 2km Boundary from Centre of Site
 - Human Receptors**
 - Residential Area
 - Liberty Steel Works
 - Nash Sewage Treatment Works
 - Historic Landscapes Areas
 - Railway Track
 - Listed Buildings

Rev	Description	By	CB	Date



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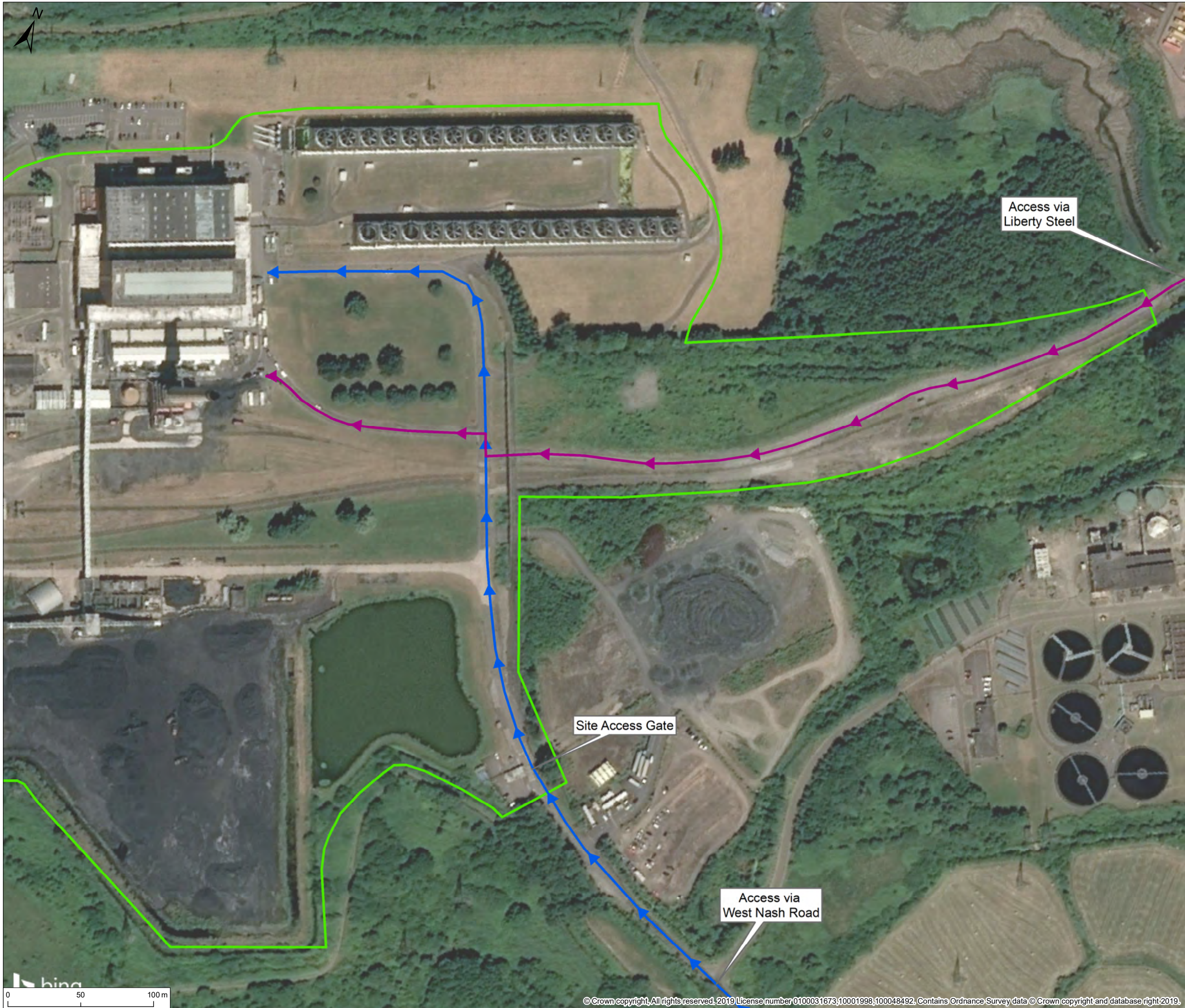
Project Uskmouth Power Station

Title Human Receptors Plan

Status DRAFT	Drawn By RW	PM/Checked By FB
Project Number JER1649	Scale @ A3 1:20,000	Date Created OCT 2019
Drawing Number JER1649-SI-002	Rev -	

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- Legend**
- Permit Boundary
 - Access via West Nash Road
 - Access via Liberty Steel

Rev	Description	By	CB	Date



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Project **Uskmouth Power Station**

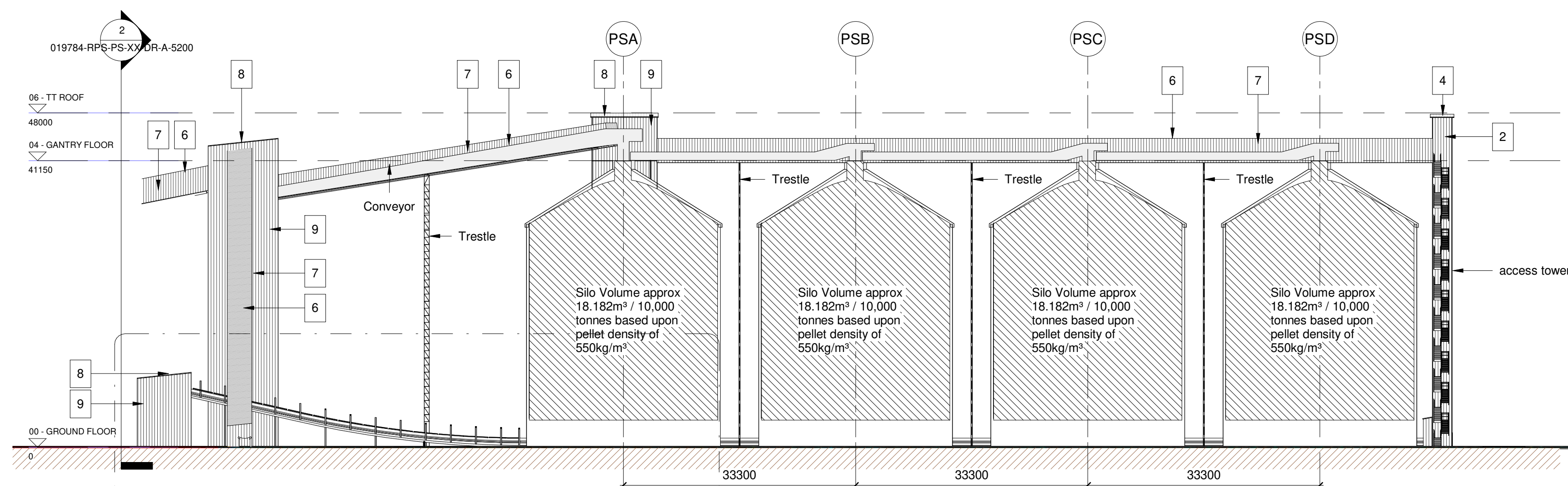
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Project Number	Scale @ A3	Date Created
JER1649	1:2,500	DEC 2019
Drawing Number		Rev
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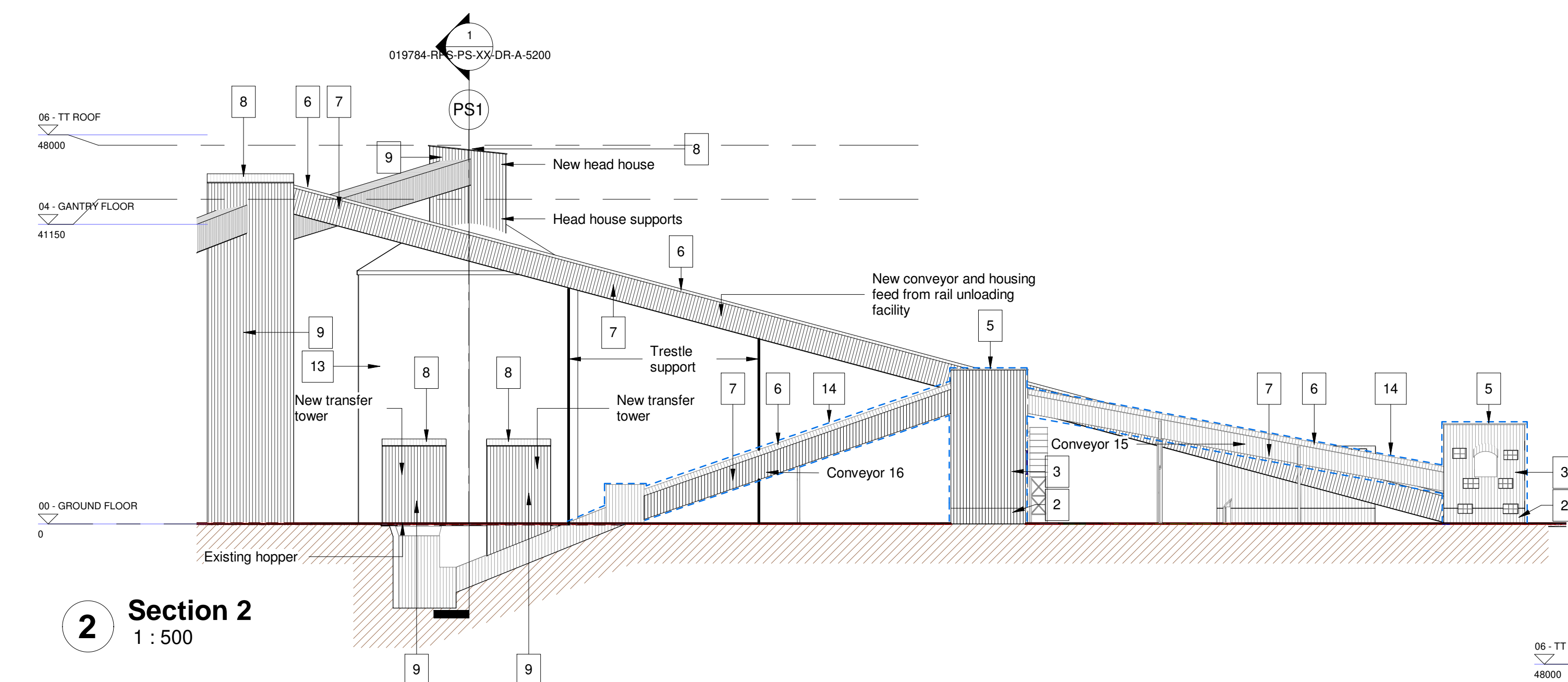
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1 Section 1
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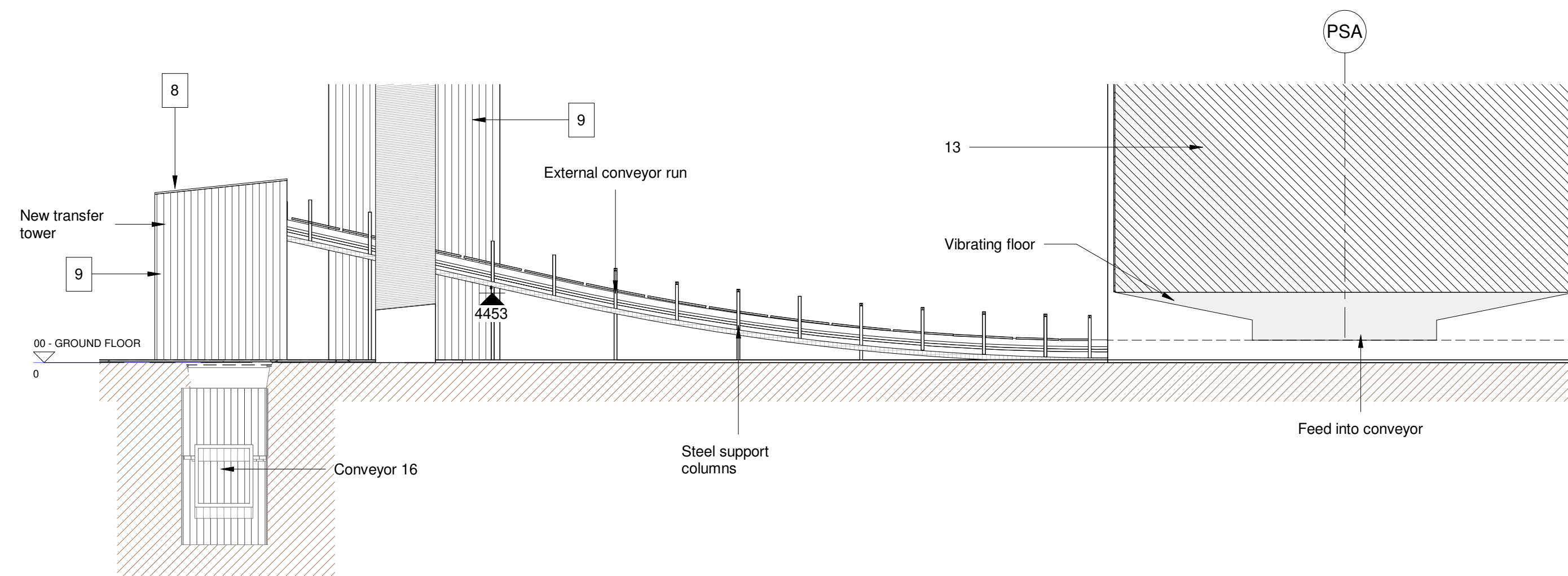
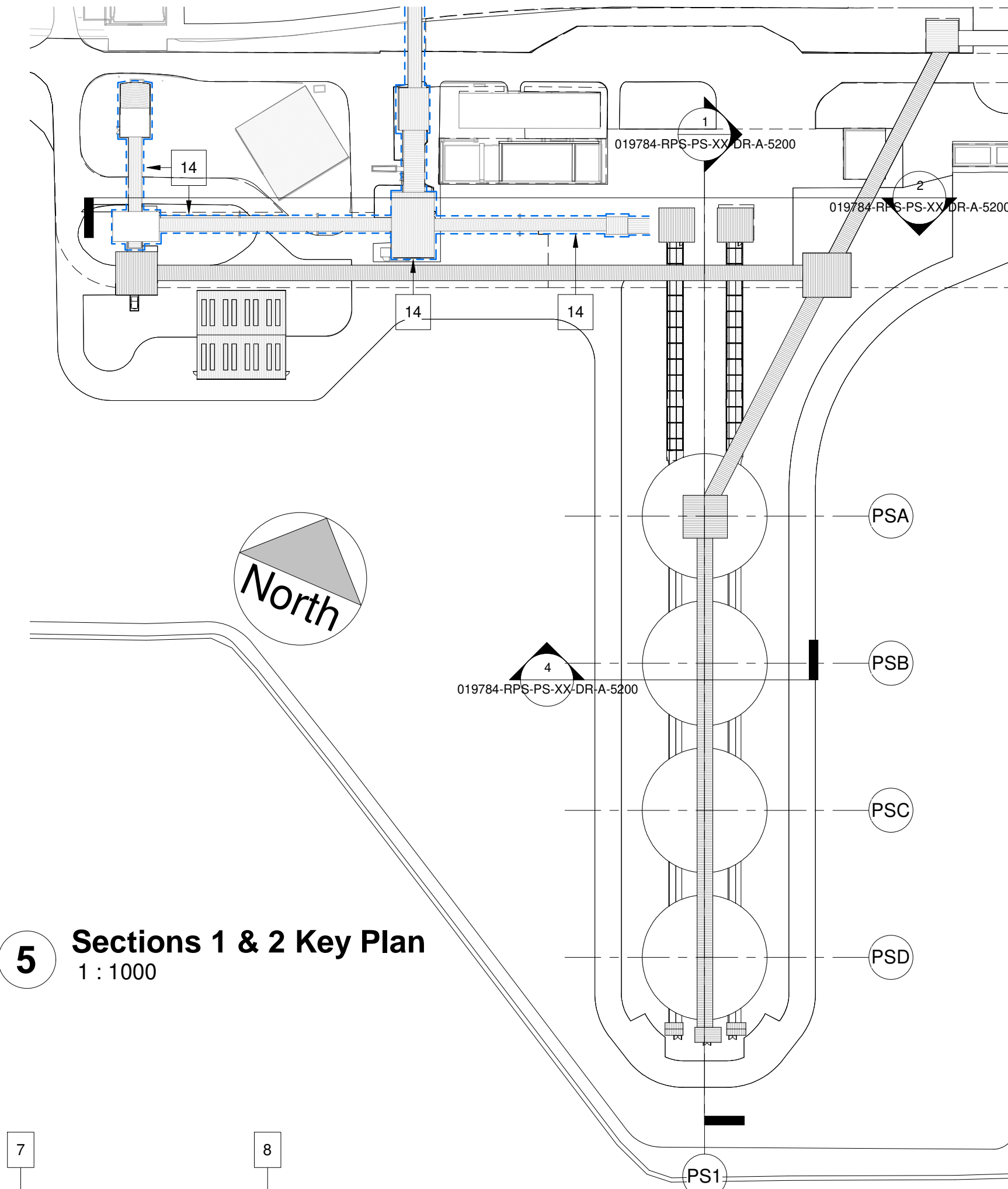


2 Section 2
1 : 500

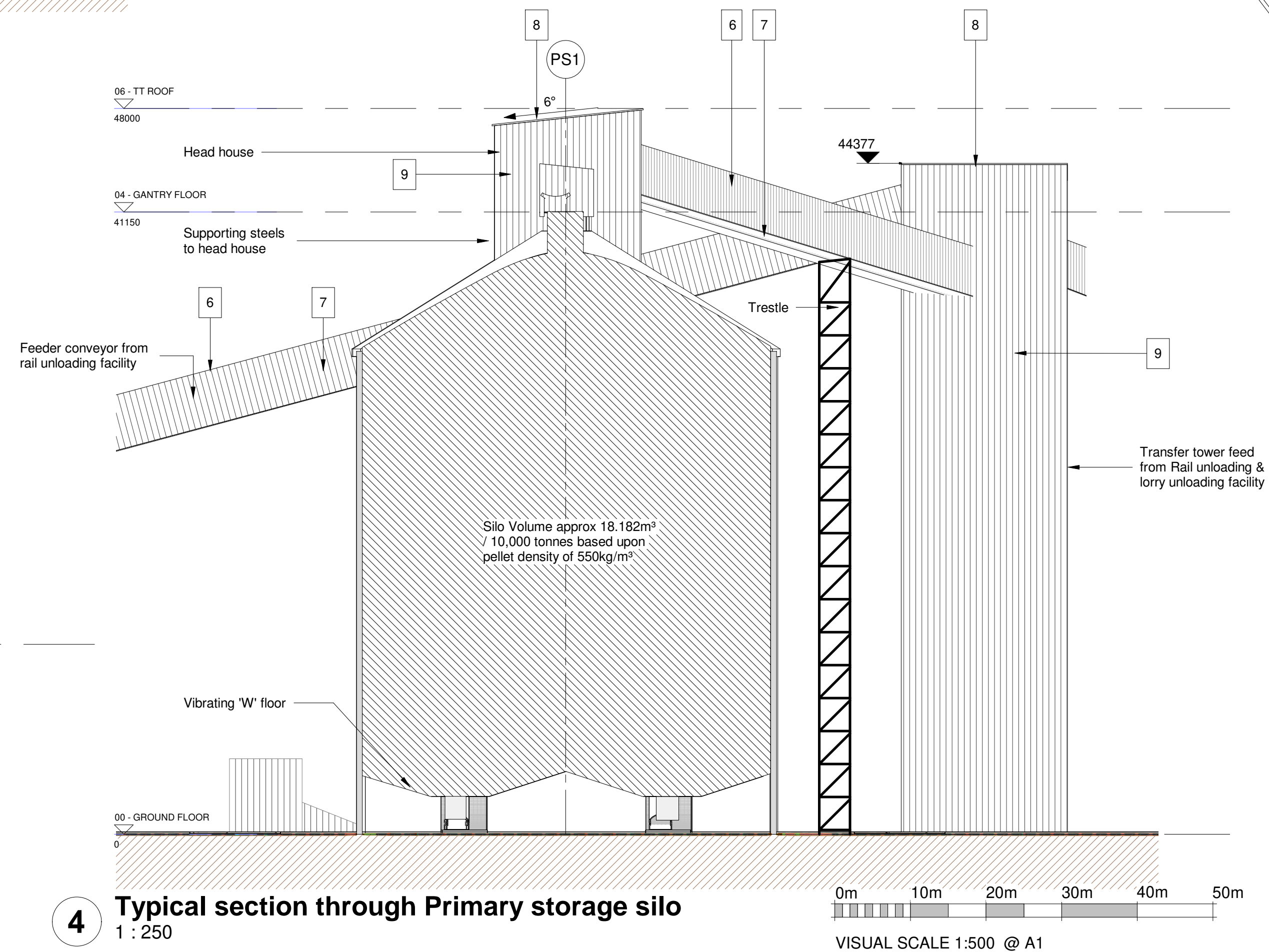
KEY:

1. Built up cladding system. Vertically laid Trapezoidal wall profile. Colour: Dark Grey.
2. Built up cladding system. Vertically laid Trapezoidal wall profile. Colour: Medium Grey.
3. Built up cladding system. Vertically laid Trapezoidal wall profile. Colour: Light Grey.
4. Built up cladding system to buildings. Vertically laid Trapezoidal wall profile. Colour: Medium Grey.
5. Built up roof system to buildings. Trapezoidal profile. Colour: Light Grey.
6. Single sheet roof system to conveyors. Trapezoidal profile. Colour: Light Grey.
7. Single sheet cladding system to conveyors. Vertically laid Trapezoidal profile. Colour: Light Grey.
8. Single sheet roof system to conveyor towers. Trapezoidal profile Colour: Medium Grey.
9. Single sheet cladding system to conveyor towers. Vertically laid Trapezoidal profile Colour: Medium Grey.
10. Integrated GRP Rooflights, profile to match roof finish
11. Steel PPC Roller Shutter Door. Colour: Dark Grey
12. Steel PPC Personnel Door. Colour: Dark Grey
13. Silo
14. Blue dashed line indicates existing building / conveyor to be reclad

5 Sections 1 & 2 Key Plan
1 : 1000



3 Section 1 - Callout 1
1 : 250



4 Typical section through Primary storage silo
1 : 250

P03	Drawing revised and updated to show silos relocated to 5m distance between units as clients request, site models revised to reflect new topographical survey	PBR	TFH	12/09/19
P02	Drawing revised and updated to show material finishes	PBR	TFH	01/08/19
P01	Initial Issue	PBR	TFH	28/06/19
Rev	Description	By	Ckd	Date

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Client
SIMEC ATLANTIS ENERGY

Project
Simec Uskmouth Power Station Conversion SUP

Title
Proposed Primary Storage Sections

Status
Preliminary

Scale @ A1
As indicated

Date Created
06/10/19

Task Team Manager
TFH

Information Author
BC

Task Information Manager
PBR

Document Number
019784-RPS-PS-XX-DR-A-5200

RPS Project Number
NK019784

Suitability
S0

Revision
P03

rpsgroup.com



APPENDICES

Appendix A

Internal Contact List

SUP Senior Managers contact list.

Ernie Rowe Station & Conversation Manager. Tel 07940785689

Paul Hebbard. SUPL Commercial Director. Tel 07790842660

Bill White. SUPL Operations Manager. Tel 07790842548

Neal Darbyshire. SUPL Engineering Manager Tel 07572456395

Ann Meredith. SUPL HR Manager Tel 07790842530

Cara Donovan. Environmental and consents Manager Tel 07469854528

David Taaffe. Director of project delivery. Tel 07716363717

Eddie Scott. Group Head of H&S. Tel 07584282286

Tim Cornelius. (CEO)

Andrew Bagley. (CFO)

Eve Watts (HR) Tel 07824568065

Appendix B

Water Storage Volumes and Locations

DRAINAGE	Criteria 1										Criteria 2										Criteria 3										Criteria 4										Criteria 5										INPUTS										Criteria 1										ASSESSMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
	Integral Bund	Hard-standing	Sump/Interceptor	Watercourse	Gravel	None (overflow)	Grav. Drain	Grav. Drain	Grav. Drain	Grav. Drain	None	Pumped Transfer	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage Tank	Reservoir/Lagoon	Storage 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