Repository Development Programme (RDP)
RDP Tranche 1 Project

Minor Civils Scope

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Document Control

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Minor Civils - Scope

Revision History				
Issue	Issued For	Date	Prepared By	Description of Changes
A	First Issue for tender	03/09/2019	M. Anderson	
B	2nd Issue for tender	25/09/2019	M. Anderson	Minor amendments following tender query. Changes in yellow highlight.
C	3rd Issue for Contract Award	12/12/2019	M. Anderson	Updated Appendix D Tender Index Spreadsheet. Changes in green fill.

CONTENTS:

LIST OF FIGURES:

LIST OF TABLES:

1. Background and Overview

1.1. Introduction

The purpose of this document is to define the scope of work for the "Minor Civils Contract", which forms part of the Repository Development Programme (RDP) Tranche 1 Project. The work consists of Civil Engineering enabling works in preparation for the main civil engineering works associated with installing the final cap over Vault 8 and the existing trench cap. In summary, the scope is to provide labour, plant, materials, project management and supervision to complete the work described Section 2 below. Work also includes establishment and maintenance of site offices, welfare and all associated temporary Works.

The site is located in West Cumbria.

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The LLWR is the UK's national low level radioactive waste disposal facility. It is one of 19 sites owned by the Nuclear Decommissioning Authority (NDA). The site is operated, under licence, by LLW Repository Ltd. on behalf of the NDA.

The site is subject to extensive licensing conditions and regulatory approvals, which are over and above common practice. This document details these general requirements and provides comprehensive information to the Tenderers to provide a tender return as detailed in the ITT.

The *Client's* objectives are:

- Collaborative engagement with the *Contractor* to deliver a safe, quality assured, cost-effective and environmentally responsible first-class programme of Works, with due regard to the socio-economic impacts on our communities;
- To use the *Contractors* expertise and knowledge to deliver the Works to the specified requirements;
- Instilling a 'right first time' attitude on all the project team, to deliver consistent high performance and certainty on delivery, benefiting from learning from experience;
- Obtain flexibility in support capability.

1.2. Repository Development Programme Background / History

As part of its role as the Nuclear Decommissioning Authority's (NDA's) Low Level Waste (LLW) Repository Site Licence Company, LLWR is responsible for ensuring the long-term availability of safe and reliable disposal / storage facilities for the nation's LLW. Legacy disposals include the historical disposal of LLW within the trenches, located in the north-east sector of the LLW Repository site. This area lies within the Reference Disposal Area (RDA), see above Figure 1 for aerial view of the site.

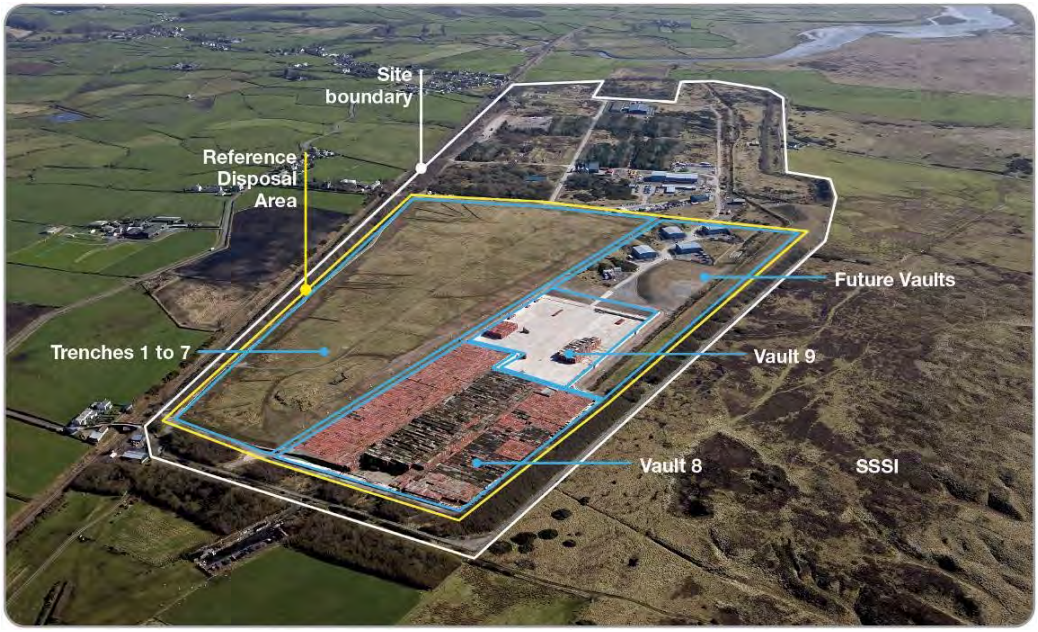


Figure 1: Arial View of The Site (2015)

In 2004 LLWR commenced detailed design work for operational disposal facilities resulting in a conceptual Modular Vaults design. This resulted in the design and construction of Vault 9, commissioned in 2010, intended for the storage and later disposal of LLW. During this period, LLWR reviewed the earlier 2002 Post Closure Safety Case (PCSC) in respect of continued site operations, resulting in the preparation of the 2011 Environmental Safety Case (ESC).

LLW Repository Ltd submitted an ESC to the Environment Agency in 2011 to demonstrate safe performance of the disposal facilities through operations, institutional control and post closure. Based on this ESC, the Environment Agency granted a revised Environmental Permit for disposal in 2015.

In 2011 LLW Repository Ltd submitted a planning application for the construction of Vaults 9A to 14 and closure of all vaults and trenches; however, after extensive discussion with Cumbria County Council (CCC), this was withdrawn, and a more modest planning application prepared. This was submitted in October 2015 based upon the construction of Vaults 9A to 11 (up to Tranche 8) and closure of all the vaults and trenches. The application was approved on 15 July 2016, subject to a series of conditions (refer to Section 1.4 for further details on Planning Application Conditions applicable to this package of Works).

NDA granted Programme Approval for the RDP on 3rd August 2016. Further work was carried out during 2016 to prepare the RDP Tranche 1 Project Detailed Volume (DV) pack, which went through LLWR's mandatory Subject Matter Expert (SME) review process and a separate Independent Review. The DV pack was submitted in November 2016, the NDA Board approved the RDP Tranche 1 Project in February 2017.

1.3. Repository Development Programme Overview

There is a requirement for a thorough planned and phased approach to the development and eventual closure of the low level waste disposal facilities within the Reference Disposal Area (RDA) at the LLWR site, with the overall "vision" that:

"At the end of this programme we will have provided sufficient safe and secure disposal capacity at the Repository for all suitable radioactive waste and closed the site such that the environment and local population are protected now and in the future."

Minor Civils - Scope

The RDP will deliver this scope of Works as outlined below.

The RDP comprises 12 tranches of work spanning a timeframe of 114 years; this includes the construction of Vaults 9A, 10, 11, 12, 13 and 14 and the closure engineering Works required for all Vaults and adjacent trenches. The RDP Tranche 1 Project will deliver this first closure engineering scope within the programme and will span over an approximate 10-year timeframe, as described below.

The RDP Tranche 1 Project will install the necessary closure engineering Works required to provide both short-term and long-term environmental protection for the wastes currently disposed in Vault 8 and the adjacent trenches.

The current "Preliminary Design" utilises a single dome for the shape of the engineered final cap covering the entire Reference Disposal Area, as shown in the below figure.

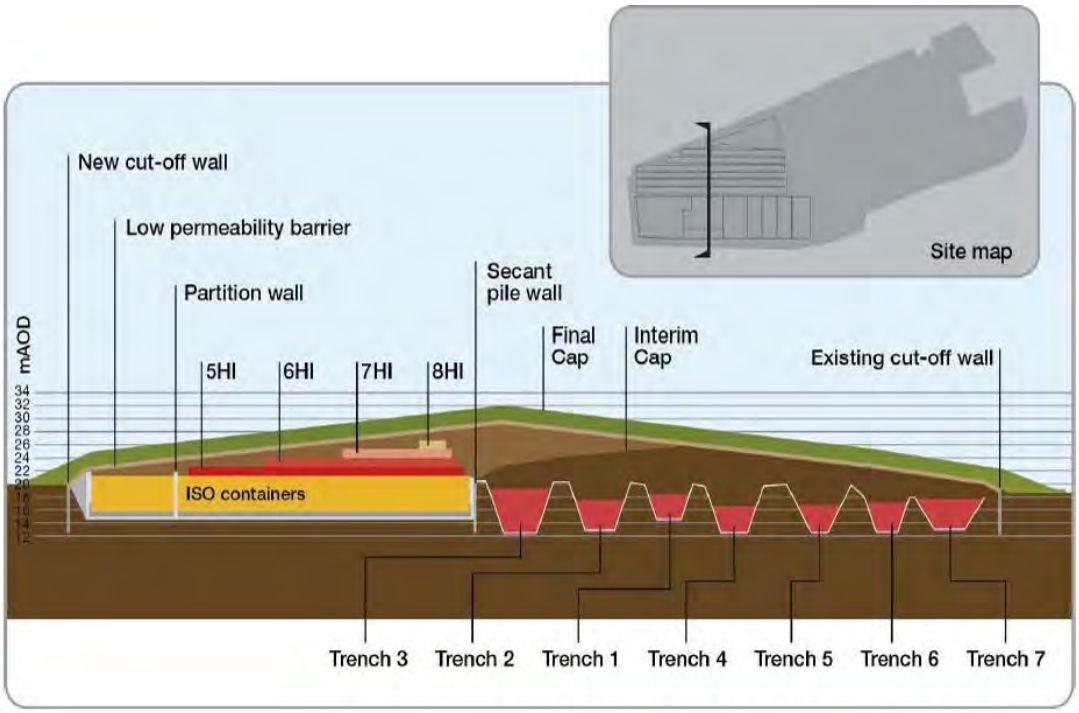


Figure 2 : Section Through Proposed Final Cap

The first tranche of work (RDP Tranche 1 Project) will implement the short-term environmental protection measures needed to comply with LLWR's revised Environmental Permit, which came into effect on 1 November 2015.

The RDP Tranche 1 Project consists of the following 3 inter-related work packages:

1. Repository Development Enabling Works;
2. Vault 8 Closure;
3. Final Cap and Trench Cap Repairs.

Repository Development Enabling Works (This work is included in the Minor Civils Scope):
This Works Package includes early construction activities such as;

- Construction of haul road network to manage all construction activities / deliveries;
- Installation of temporary accommodation facilities;

- Installation of a surface water management, including temporary drainage to manage construction activities and the eventual Final Engineered Cap drainage system;
- The preparation of material stockpile areas.

Vault 8 Closure (This work is not included in the Minor Civils Scope):
This work package will prepare the Vault 8 area ready for the placement of Final Engineered Cap. The work package includes the following activities:

- Container ullage fill methodology and implementation of the Works;
- Import and stockpile of void filling material;
- Void fill methodology (between containers) and implementation of void filling up to level 4;
- Design and installation of a running surface to enable higher stacking (up to 8 high);
- Transfer of containers from Vault 9 to Vault 8 to create stacks up to 8 high;
- Design and construction of a cut-off wall to the north and west of Vault 8.

Final Cap and Trench Cap Repairs (This work is not included in the Minor Civils Scope):
This work package will prepare and construct the engineered Final Cap over Vault 8 and the Trench Cap (north). This involves profile fill, existing trench cap membrane repairs and the placement of individual engineered layers to ensure the long-term protection of the waste contained within Vault 8 and the northern end of the trenches. In addition, the work package will implement repairs to the existing interim Trench Cap. The package comprises the following activities:

- Replace the existing trench cap membrane;
- Placement of profile and surcharge material to trench cap (north) to enable necessary settlement;
- Undertake observational monitoring of the trench cap settlement;
- Installation of trench cap environmental monitoring system including groundwater monitoring wells and trench cap probe holes;
- Placement of profile fill to Vault 8 utilising surcharge material;
- Importation and management of materials;
- Installation of the engineered Final Cap over Vault 8 and the north end of the trenches;
- Final landscaping.

The RDP Tranche 1 Project is currently in the in the Evaluate Phase and design maturity is predominantly at preliminary stage, with a few completed detailed designs ready for early enabling Works, such as the haul road and temporary drainage.

1.4. Planning Application Conditions

Planning consent was granted subject to due compliance with a series of conditions. Some of the conditions require a formal discharge approval by CCC prior to the commencement of any permanent development. Planning responses are the responsibility of the *Client* and any conditions relevant to this Contract will be formally discharged in advance of the works.
Pertinent information and constraints from the conditions relevant to this Contract are included within this Scope Document and design documentation. This includes matters such as approved hours of operation, deliveries, permitted noise levels, environmental, ecological, stockpile areas and maximum heights.

Please refer to the following planning condition responses, which are applicable to the Minor Civils Works:

- No.14 – LLWR-RDP-T1.00-RP-116: Construction Environmental Management Plan (CEMP);
- No.16 – LLWR-RDP-T1.00-RP-095: Phase Specific Ecological Mitigation and Enhancement Plan.

The *Client* has recently submitted a separate Planning Application for construction of the haul road from Street 4 to Street 6 (Ch 180 to 450), as this route was not included in the original application. There are no further constraints envisaged for this separate consent and any relevant information is included within the Scope.

2. Existing Site Information

Please refer to LLWR-RDP-T1.00-GEN-034 – Site Information document for details on existing site information.

3. Description of the Works / Scope

The Minor Civils Contract includes the following scope:

- 3.1 Monitoring Infrastructure;
- 3.1 Temporary Drainage;
- 3.2 Haul Road;
- 3.3 Stockpile Management;
- 3.4 Contractor's Office – Adjacent to Stockpile C;
- 3.6 Landscaping Requirements;
- 3.7 Environmental Monitoring Scope (Dust, Water, and Noise);
- 3.8 Miscellaneous Works and Requirements;
- 3.9 Earthworks General Requirements.

General scope applicable to all of the above areas:

- Any surplus spoil above the cut / fill balance that cannot be used within the Works can be taken to Mound 2 stockpile area and segregated, stored and maintained, as per the design specifications. Refer to Appendix I for aerial plan showing position of existing Mounds 1 and 2;
- Mound 2 can be used for temporary storage if *Contractor's* earthworks strategy requires, but rates are to be included for double handling of material;
- Final landscaping, topsoil and grass seeding. Refer to Table 1 in the document for landscaping requirements on soil depth and seed mix;
- Installation of control measures (i.e. silt fencing / temporary bunds) to prevent silty construction water run-off from entering existing watercourses and newly excavated drainage;
- Construction temporary traffic management signage, including any necessary temporary works design. Contractor to determine exact type and number of signs to satisfy their Traffic Management Plan. Signs to be surface mounted / movable. Note: this is separate to any permanent signage, refer to Section 3.2.9 for haul road permanent traffic signage proposals;
- Temporary fencing and demarcation to segregate construction areas;
- Approximately 15,000 tonnes of imported class 6F5 capping is available as free issue to the Contractor for use in the permanent works located in the Contractor's compound;
- Approximately 4,000 tonnes of crushed concrete 6F2 is also available as free issue to the Contractor for use in the permanent works, located in two stockpiles on either side of street 6 adjacent to the proposed haul road crossing;
- Stockpiles of free issue materials are to be jointly surveyed by the Contractor and the Client and the quantity agreed prior to use. Thereafter, the contractor is to manage and reconcile the quantities of materials to and from the stockpiles.

The following sections detail the main activities in each area but is not exhaustive. Tenderers are to price the items in the BoQ:

Minor Civils - Scope

3.1. Monitoring Infrastructure:

LLW Repository Ltd conducts an Environmental Monitoring Programme at the LLWR site for operational purposes and to fulfil a number of regulatory requirements specified within the Environmental Permit. There is existing environmental monitoring infrastructure across the site consisting of:

- Leachate Monitoring Infrastructure;
- Groundwater monitoring wells;
- Surface water monitoring infrastructure;
- The current trench cap weather station. The old trench cap weather station and compound;
- Historical experiments on the trench cap (i.e. cut-off wall test cells, corrosion experiments).

Some of the existing environmental monitoring infrastructure interfaces with the proposed haul road, stockpiles and drainage. Therefore, the Minor Civils scope is to deal with any affected monitoring infrastructure, from doing either of the following:

- **Protect** - if there is a risk of damaging monitoring infrastructure adjacent to the construction Works. Contractor to propose suitable protection solution that also maintains access to the monitoring infrastructure;
- **Decommission** – if existing monitoring infrastructure is redundant and clashes with proposed construction. Existing borehole standpipes to be backfilled with bentonite pellets and standpipes to be cut off at least 1.2m below existing ground level, refer to drawing RD 313 and the Monitoring Infrastructure Impact Assessment Schedule;
- **Cover (Install Piezometer)** – if existing, currently used monitoring infrastructure clashes with proposed construction (i.e. haul road earthworks fill over monitoring infrastructure). An automatic absolute water level logger which records water level (Solinst Levelogger Edge, or similar) to be installed down the existing borehole. Detail consists of:
    - Existing standpipe to be cut off at least 1.2m below existing ground level;
    - Approx. 20Lm of 40mm diameter black plastic twinwall ducting to be installed from the borehole to a ducting access chamber outside the haul road footprint (ducting to house logger cabling). Ducting to be install to SHW HCD drawing number I2, Type B detail for a deep ducting (1200mm cover);
    - Install a min 300mm x 300mm ducting access chamber outside of the haul road footprint to allow access to the logger USB cabling. Access chamber to constructed as per manufactures guidance and not allow any ground or surface water ingress into ducting. Composite Cover to be B125 rated;
    - Install automatic absolute water level logger and cabling;
    - Install an in-situ concrete plug to seal off the top of borehole. Purpose of cap is to seal and prevent any water and material fines from entering top of the standpipe. Concrete to be ST2 and slab size to be 500mm x 500mm square by 100mm deep.

The exact locations of affected monitoring infrastructure and proposed actions can be found in the following documents:

- RD 317, RD 318 and 319 marked up General Arrangement Drawings;
- Monitoring Infrastructure Impact Schedule LLWR-RDP-T1.00-SC-018, filtered to list Minor Civils scope.

3.1. Temporary Drainage:

Scope includes installation of necessary temporary drainage to enable the timely commencement of Tranche 1 activities including haul roads, the excavation of spoil from existing site mounds 1 and 2, and the emplacement of surcharge and profile fill to the northern trench cap, using existing site won material. Temporary drainage is required to ensure surface water does not have a detrimental impact on local

environment and ecology during the construction Works or compromise the final capping. Please refer to the tender index spreadsheet Appendix D for the full list of relevant design drawings, reports and specifications.

Surface water run-off is delivered to the settlement lagoons by a system of swales to piped headwalls. Each settlement lagoon contains a sediment forebay inlet and a forebay bund constructed with arrangements of rock rolls. Precast headwalls are required at inlets/outlets. Flow control measures including flow control chambers, penstocks, hydro brakes and flow monitoring devices are required in various configurations.

There are a number of discharge consents required as part of the Minor Civils Works, which will be obtained by LLWR. These will include permanent and temporary surface water discharges (i.e. discharges during construction) from the lagoons and haul road drainage. Surface water must be monitored by the *Contractor* for flow velocity, pH and turbidity at each discharge location to ensure compliance. During construction stages (i.e. before final establishment of lagoons / swales) the *Contractor* must use settlement tanks to control temporary discharges until lagoons and swales have been commissioned, please refer to CEMP ref. LLWR-RDP-T1.00-RP-116 for further details. Further details of the scope and Contractor's responsibilities for environmental monitoring are included in Section 3.7.

Please note: The drainage for the haul road and stockpiles are separate to DP2, therefore detailed separately in designs; DP5 Haul Roads and DP6 Stockpile Management respectively.

Temporary drainage scope to be installed prior to starting earthworks includes the following:

3.1.1. Settlement Lagoon B (refer to drawing RD 364 for General Arrangement):

Lagoon B is located adjacent to Lagoon F, south of the final proposed cap. This component acts as a secondary treatment device for the western catchment of the final cap and controls flow into existing Drigg Stream to a specified discharge rate. The temporary channel connection is protected with erosion control rock rolls. A sediment forebay area has been positioned at the top of the channel and will have a concrete invert to allow for mechanical de-silting methods. A 3.5 m wide access track extends around the southern bank from the inlet to the outlet. The access track continues past the outlet and will also provide access to Lagoon F. Flow discharges from the lagoon via a 300 mm dia pipeline which connects into a flow control chamber with an orifice control mounted on a central wall. Flow ultimately discharges from the flow control chamber into existing Drigg Stream through a pre-cast concrete headwall.

Settlement Lagoon B scope detailed below:

- Vegetation clearance, consisting of scrubland;
- Topsoil strip;
- Installation of Lagoon B, as per design, including connection to existing Drigg Stream and in flow measurement devices;
- Penstock to be installed on the Lagoon outlet headwall;
- Installation of a lagoon maintenance track, as per design, up to the Aspinwall drain, refer to GA 364 for delineation. The maintenance access is min 3.5m wide and shall be constructed of a 300mm min layer of Type 1 (granular sub-base) material. The bottom and sides of the fill material shall be wrapped in geotextile, refer to specification for details;
- Installation of amphibian fencing around the lagoon perimeter and an access gate, refer to RD 652 for details.

3.1.2. Section of Temporary Channel Swale (Ch 0 to 55) (connection to Lagoon B):

Refer to drawing RD 354 for General Arrangement.

A temporary channel is required on the west side of LLWR site running in parallel with the existing Drigg Stream Channel. The temporary channel will manage construction run-off from earthworks activities, such as

removal of the onsite Mound 1 and final capping Works. The scope for this package is to install the first section of the channel from Ch 0 (Lagoon B inlet) to approximately Ch 55 (backdrop chamber). This allows for the Mound 1 temporary drainage (not part of Minor Civils Scope) to be connected into the backdrop chamber at Ch 55, therefore enabling early commencement of critical major earthworks activities. The section from Ch 0 to 55 consists of a swale channel, 600mm diameter culvert pipe beneath the existing Aspinwall drain, pre-cast headwall at the culvert outlet and a backdrop chamber at the upstream end of the culvert.

Temporary Channel scope detailed below:

- Vegetation clearance, consisting of scrubland;
- Topsoil strip;
- Installation of section Ch 0 to 55 as per the design, consisting of:
  - Approx. 35m of swale, to be constructed as per design and finished in accordance with typical swale detail Type B drawing RD 389. Refer to Table 1 in the document for landscaping requirements on soil depth and seed mix;
  - Approx. 20m of 600mm diameter culvert, refer to drawing RD 378 for cross section detail.
  - 1No. pre-cast concrete headwall at the culvert outlet, refer to drawing RD 378 for cross section detail;
  - 1 No. backdrop chamber at the upstream end of the culvert, refer to drawing RD 378 for cross section detail.

3.1.3. Settlement Lagoon D (refer to drawing RD 367 for General Arrangement):

Lagoon D is located south of the proposed final cap adjacent to the Street 7 and Street 4 junction. It is an open pre-cast attenuation tank 10m x 20m x 1.2m, with a min volume of 205m3. The open pre-cast attenuation tank is to allow for settlement of suspended solids and allow for mechanical de-silting methods. This component acts as a secondary level of sedimentation treatment for the eastern catchment. To ensure flow discharges into the pond by gravity, a higher outlet from existing manholes controlling flow from the cap is required. Flow is diverted from MH7218 into a new pipe system running parallel with Street 7. The pipeline is culverted beneath Street 7, with a 1.2 m cover, before discharging into the Lagoon. The pond outlet connects to the existing surface water pipe system adjacent to Street 7.

Lagoon D is located near a Great Crested Newt breading pond (Pond 3), therefore a licence is required for construction Works in this area, which has already applied for by LLWR. Installation of an amphibian fence and management of the required trapping period will be completed in advance of the Minor Civils Works.

Settlement Lagoon D scope detailed below:

- Detailed design of pre-cast attenuation tank. The pre-cast tank is to be supplied by Fli-Carlow or a similar approved Contractor. Scope includes the end walls of the tank;
- Completion of a CCTV survey to assess the operational and structural condition of the existing downstream system (refer to sketch LLWR-RDP-T1.00-SK-058 for location). The tender is to include for two full days of surveys. Reports and CCTV footage is to be provided to the Client within 2 weeks of completion of the survey;
- Vegetation clearance, consisting of roots from scrubland (above ground cleared in advance by others);
- Topsoil strip;
- De-watering required prior to excavation / installation Works, since there is a high-water table recorded within the footprint of Lagoon D. Temporary Works design shall be submitted to LLWR for acceptance. Ground water lowering to be continuous until the lagoon is commissioned;
- Installation of Lagoon D and all associated drainage connections to the sites existing drainage;
- Penstock to be installed on the Lagoon outlet;
- Installation of a lagoon maintenance track, as per design. The maintenance access is min 3.5m wide and shall be constructed of a 300mm min layer of Type 1 (granular sub-base) material. The bottom and sides of the fill material shall be wrapped in geotextile, refer to specification for details;

- Final landscaping;
- Installation of amphibian fencing around the lagoon perimeter and an access gate, refer to RD 652 for details;
- The amphibian fence (installed by others in advance as part of the licence requirements) must be maintained by the *Contractor* for the duration of the lagoon construction. This amphibian fence is to be removed once Lagoon D is commissioned.

3.1.4. Settlement Lagoon E (refer to drawing RD 368 for General Arrangement):

Lagoon E is located south of the proposed final cap and will be used during and post construction to control the rate of flow into Drigg Stream. There is an existing building and compound (B748), plus some other features within the footprint of the proposed lagoon that will be removed (by others) in advance of lagoon construction commencement. B748 hardstanding will be left (i.e. tarmac and concrete slabs), which can be use by the *Contractor* as a temporary laydown area. Some of redundant B748 hardstanding will have to be removed to install the final lagoon.

The design details three connections, including two swale channels from Stockpile B and one precast concrete headwall outlet from the dust suppression pond dust supp. Sediment forebays, with a concrete invert has been positioned in front of the Stockpile B connection inlets. A 3.5m wide access track has been positioned to spur off Street 6 and allow access to the inlet and outlet. A ramp has also been provided for access into the main pond area for maintenance. The outlet is formed of concrete headwalls connecting to and from a flow control chamber with an orifice and flow control device mounted on a central wall.

Settlement Lagoon E scope detailed below:

- Vegetation clearance, consisting of scrubland and small trees;
- Topsoil strip;
- Removal of redundant B748 hardstanding / compound area within the footprint of the final lagoon design;
- Location and diversion of existing site services within the lagoon footprint;
- Installation of Lagoon E, including connection to existing Drigg Stream and construction of all inlets;
- Installation of 450mm diameter drainage connection from the proposed Dust Pond, including Chamber A (replacing existing chamber MH7202) and Chamber B;
  Note: Dust Pond is not required, only the 450mm diameter drain run, refer to RD 371 GA mark up;
- Installation of a lagoon maintenance track, as per design. The maintenance access is min 3.5m wide and shall be constructed of a 300mm min layer of Type 1 (granular sub-base) material. The bottom and sides of the fill material shall be wrapped in geotextile, refer to specification for details;
- Final landscaping;
- Penstock to be installed on the Lagoon outlet headwall;
- Installation of amphibian fencing around the lagoon perimeter and an access gate, refer to RD 652 for details.

3.1.5. Mound 2 Drainage and Section of Stockpile B Drainage:

Refer to drawing RD 359 for General Arrangement.

Mound 2 is located between Drigg Stream and Street 6. The onsite mounds (Mounds 1 and 2) material is designated for re-use as profile and surcharge material in the final engineered cap construction. Pre-earthworks drainage is to be installed prior to commencement of earthworks cut activities, so that construction run-off is conveyed to the settlement lagoons for treatment. The scope of this Contract includes installation of a drainage channel along the eastern and southern Mound 2 embankment toe and a section of the Stockpile B western drainage channel, connecting into Lagoon E. Approx. total length of the drainage channel is 350m. There is an existing (redundant) lagoon on the line of the proposed drain, which is to be filled in / decommissioned as part of this scope. The existing lagoon was installed during Vault 9 construction (approx. 2006) for earthworks

surface water management purposes, refer to Appendix H for locations plan. The legacy lagoon is lined with a geomembrane, has a timber boundary fence and an inlet and outlet which are blocked off / not in use. The haul road drainage is to be connected into the upstream end of Mound 2 drainage channel, please refer to DP5 design package for further details.

Mound 2 and Section of Stockpile B Drainage scope detailed below:

- Vegetation clearance, consisting of scrubland and some small trees;
- Topsoil strip;
- Existing redundant lagoon on the line of the proposed drain to be filled in / decommissioned. All redundant lagoon components (headwalls, pipes, membranes, fencing and anything part of the lagoon make up) are to be removed and disposed of through the waste management process. Refer to Stockpile B GA 331 for location of existing lagoon;
- Mound 2 drainage T1M2SOP001 to T1M2SOP007 to be constructed as per design and finished in accordance with "typical swale during construction phase detail" in drawing RD 389. Detail consists of a swale lined with geotextile (in accordance with section 514.4 of the specification for highway Works) and filled with a 100mm deep continuous layer of type b filter drain material. Please note: No straw bales to be used for additional silt capture (straw bales noted as an option on RD 389 detail), unless instructed by the Client;
- Installation of approx. 150m of silt fence along the toe of existing Mound 2 slope, in accordance with "typical swale during construction phase detail" in drawing RD 389;
- Section of Stockpile B drainage T1SBSOP002 to T1SBSOP007 to be constructed as per design and finished in accordance with typical swale detail Type B in drawing RD 389. Refer to Table 1 in the document for landscaping requirements on soil depth and seed mix.

3.2. Haul Road:

3.2.1. Design Overview:

Please refer to Section 4.47 Traffic Management for constraints on use of site roads and haul roads.

There is a requirement within the RDP Tranche 1 Project to haul imported and stockpiled material from two locations;

- Site-won existing material stockpiled south and west of Vault 9, referred to as Mounds 1 and 2;
- Imported bulk fill materials (for all RDP construction activities);

There may also be a need to transport any excess spoil arisings for re-use to mound 2 in the Minor Civils contract.

The designed haul road (DP5) satisfies this requirement, by enabling transportation of bulk earthworks materials across the LLWR site, which is segregated from normal site traffic refer to drawing RD 292 for general arrangement. The haul road design width has a 9.2m overall running width, which was derived from using best practice guidance from "CoalPro Traffic Management guidance document" for 3.5 times the maximum truck width (2.63m for a JCB 722. Note: The aforementioned haul road width factor was based on using much larger rigid mine trucks, and therefore the Contractor should not be limited to 2.63m wide trucks if they are able to demonstrate that any wider vehicle can safely operate on the designed 9.2m wide two-way haul road.

Significant components of the scheme include:

- Signalised pedestrian crossing at Street 4;
- Drop down barriers;
- Drainage culverts, headwalls manholes and hydro-brakes;
- Drainage ditches and outfalls;

- Temporary Concrete Vehicular Barriers (TCVB's).

The haul road surface water management consists of drainage swales, ditches, filter drainage, culverts, headwalls, manholes, hydro-brakes and flow monitoring devices. The Contractor to allow for access to sample water for pH and turbidity.

The haul road pavement consists of the following bound and unbound designs. Thicknesses are dependent on CBR values, but the *Contractor* is to assume 2.5% for tender purposes:

- Bound pavement designed to HD26/06 and IAN73/06R1 (2009). Consisting of the following layers:
  - Capping, nominal thickness 425mm based on 2.5% CBR;
  - Sub-base, nominal thickness 230mm based on 2.5% CBR;
  - 200mm HDM50 (DMRB HD 26/06), of nominal layer thicknesses 40mm surface course, 60mm binder course, 100mm base course.
- Unbound pavement, designed using a theoretical model, derived from first principles. Consisting of the following layers (from bottom up), based on 2.5% CBR:
  - Geogrid with combined separation layer TENSAR TX190L-G geo-composite or similar;
  - 200mm starter layer type 6C;
  - GE 2: Geo-textile separation layer as per appendix 6/5;
  - 450mm sub-base layer, with GE 1: Tensar TriAx TX 160 (or similar), refer to design specification.

Note: the unbound pavement design is based on reactive maintenance of re-profiling and compaction when surface rutting reaches 40-50mm depth. It is *Contractor's* responsibility to maintain the haul road surface during operation, for both the bound and unbound sections and prevent any degradation that results.

The sectional split between bound and unbound pavement for the Minor Civils scope of Works is detailed below and in the Bill of Quantities.

3.2.2. Haul Road Scope for the Minor Civils Package:

The RDP Project requires early haul road construction from Ch 0 to Ch 950 and Ch 1400 to 1580, as this enables timely commencement of key earthworks activities and material importation. Scope also includes design and installation of a 20m span Bridge, crossing existing Drigg Stream at approximately Ch 670.

The haul road drainage network scope to be constructed consists the following sections:

- Ch 0 to 650 - This section accommodates the Contractor's Compound and Stockpile C surface water run-off and is independent from Design Package DP2. Surface water is conveyed and treated through a series of filter drains, ditches, swales and outfalls to the East West Stream at approximately Ch 540;
- Ch 700 to 950 - Surface water is conveyed and treated through a series of ditches and swales and outfalls to Drigg Stream at approximately Ch 700;
- Ch 1400 to 1580 – is conveyed and treated through a series of ditches and piped connections, tying into DP2 drainage that eventually outfalls to the existing Drigg Stream through settlement Lagoon E.

Haul road sequencing requirements:

- The *Contractor* must include the provision for surface water run-off and discharge before starting earthworks, including the use of temporary settlement tanks;
- In cut areas, the swales are to be installed first;
- Earthworks for haul roads and forming swales in fill areas can be done concurrently;
- Include for any double handling of spoil as required.

Minor Civils - Scope

Haul road general principles:

- The haul road is designed generally for two-way traffic with the exception of the bridge crossing over Drigg Stream, and the Bridge 109 section where the haul road is single lane; The *Contractor* is to ensure that traffic is managed at these pinch points to enable earthmoving vehicles to pass safely;
- The haul route is designed to segregate earthworks haulage vehicles from site traffic. This is described further in sections 4.47 Traffic Management and 4.46 Cleanliness of the Roads.

Haul road scope applicable to all areas of the Minor Civils package is listed below:

- Trial holes / hand excavation to locate existing services within the working area;
- Vegetation clearance, consisting of scrubland and small trees;
- Topsoil strip, material to be re-used for final dressing of verges, batter and drainage channels. Any surplus topsoil to be permanently stored at Mound 2;
- Installation of the haul road drainage, refer to drainage GA RD 342, including:
  - Haul road ditches (including embankment / cutting ditches);
  - Drainage swales;
  - Filter drainage and piped culvert connections;
  - Associated chambers and headwalls.
- Existing tarmac areas to be removed to be Polycyclic Aromatic Hydrocarbon Detection (PAK) tested;
- Earthworks cut and fill to achieve design line and level;
- Soft spots to be excavated and replaced with acceptable fill, as per design specification. Refer to BoQ's for assumed quantity;
- Installation of haul road to type P1 bound pavement design (2.5% CBR assumption), including capping, sub-base and 200mm thick HDM50. Refer to below sections for confirmation of where type P1 bound pavement is application;
- Installation of haul road to Type P2 unbound pavement design (2.5% CBR assumption), including, starter layer, geotextile / geogrid and sub-base. Refer to below sections for application lengths. Refer to below sections for confirmation of where type P2 unbound pavement is application;
- Accesses into Stockpile C and Contractor's Compound area;
- Final landscaping, Refer to Table 2 in this document for landscaping requirements on soil depth and seed mix;
- Installation of Temporary Concrete Vehicle Barriers to BS EN 1317 (TVCB's) on a 50mm thick ST4 blinding foundation, refer to RD 307. TVCB's to be spaced no greater than max vehicle width. Locations and lengths defined in the below sections;
- Installation of a total of 7No. manual traffic gates, refer to RD 292 for locations and RD 307 for standard details. Specific requirements for each manual traffic gate detailed the specific area sections below section;
- On site earthworks materials sampling and testing to meet design specification requirements. Testing will include in-situ CBRs to confirm pavement design thicknesses;
- Road markings at key locations, including stop / give way markings at Street 3, Street 4 and Street 6 interfaces and edge line markings where it narrows down to a single lane and at over Bridge 109;
- Temporary fencing to segregate haul road construction areas from pedestrians to be provided by the *Contractor*.
  Note: temporary fencing locations / lengths shown on GA RD 292 are not required and omitted from this scope. *Contractor* to make an allowance for any required segregation fencing within their temporary works;
- Maintain the haul road surface during operation, for both the bound and unbound sections.

Haul road scope specific to certain sections are detailed in the below sections.

3.2.3. Section Ch 0 to 180 (Adjacent to Contractor's Compound):

This section of haul road is adjacent to the Contractor's Compound. The proposed route is partially offline (within the Contractor's compound Planning Application footprint) and eventually ties into existing Street 3, which runs into the LLWR existing rails sidings area.

Specific scope relevant to this section is detailed below:

- Existing trees and stumps will be removed in advance of the Minor Civils Contract;
- Haul road over this section to be Type P1 bound pavement design (2.5% CBR assumption), including the bell mouth accesses into Stockpile C and Contractor's Compound area;
- Installation of 1No. manual traffic gate, refer to RD 292 for location and RD 307 for standard details. Gate to span a road width of approx. 6m and include a tip support post, stop sign and a lockable tip support;
- This section of haul road drainage will be constructed in advance of the main outfall (Ch 540) being established down chainage. Therefore, the Contractor must include temporary provision for treating and temporary discharging surfacing water into the East West Stream (adjacent to the Contractor's Compound). This should include pumping water collected in a downstream Catch Pit, or sump into a temporary settlement tank, before discharged into the East West Stream (adjacent to the Contractor's Compound). Water quality must be monitored and confirmed acceptable before discharged into the East West Stream. LLWR will apply for a temporary discharge permit for this activity;
- Existing Street 3 to be widened approximately from Ch 0 to Ch 50 and reprofiled to tie in with proposed haul road, as per the design;
  Note: There is a known existing ROF surface water drain in Street 3 southern verge. The existing Chamber, Street 3 gullies (2no. of) and drain to be removed, within the footprint of the haul road footprint. Provision allowance is included in the BoQ's for dealing with this activity;
- This is the only section of haul road with a filter drain acting as the main surface water drainage. The reason this is used instead of a swale, is to save valuable space within the compound area for stockpiling of material;
- Installation of Temporary Concrete Vehicle Barriers at the following locations:
  - Approach to Street 4 crossing - 2No. 20m length sections on both the north and south verges.

3.2.4. Section Ch 180 to Ch 200 (Street 4 Crossing):

This section of haul road crosses Street 4, which is the main road through site for all, therefore access must be maintained. There is also a paved footpath in Street 4 western verge, which is the main walkway used on site. The design is a signalised junction to manage haul road and on-site traffic flows. The design also includes a pedestrian crossing. There are existing above ground services in a cable tray that require diverting below ground (further detail below). There is also below ground services in the area which are to be protected.

Specific scope relevant to this section is detailed below:

- Trial holes to locate existing services in Street 4 verges;
- Traffic and pedestrian management required to manage interface with site traffic and pedestrians;
- Removal of existing safety barrier along Street 4 eastern verge (from Street 4 haul road crossing to the proposed Street 4 access to the Contractor's Compound). Safety barrier to be set aside for reuse;
- Remove existing services from existing cable tray and provide temporary protection (until permanent protection slab and cable troughs are in place), refer to RD 845 for location;
- Remove existing cable tray and posts along Street 4 eastern verge, refer to RD 845 for location.
- Install approximately 120m of cable trough in Street 4 eastern verge, as per sketch RD 845;
- Install RC services protection detail (approx. length 20m) in Street 4 eastern verge, refer to RD 306;
- Transfer services from cable tray to new cable troughs and RC protection detail under proposed haul road;
- Install RC protection detail (approx. length 20m) in Street 4 western verge, refer to RD 306;

- Installation of Street 4 drainage crossing and road gullies. Refer to 342 for locations;
- Installation of signalised crossing, including ducting (in verges and Street 4 crossing), traffic signal equipment, kerbing, tactile paving, pedestrian guardrail, footpath as per design;
- Haul road crossing to be Type P1 bound pavement design and finished road levels to tie into Street 4 existing levels. The current assumption is that Street 4 existing pavement depths do not satisfy the design loadings for haul road traffic. Therefore, Street 4 pavement over the width (approx. 12m) of the haul road (including the ducting crossings) is to be removed and constructed to full P1 bound design at 2.5%CBR depth. The existing Street 4 surface course to be planed off and replaced from the drainage crossing to the proposed haul road crossing;
- Any Works that require full closure of Street 4 (i.e. crossings and surfacing) will need to take place over a weekend, since the site cannot close Street 4 during the week;
- Install traffic signalling cabling and commission the lights. The current assumption is that the main power feed for the traffic signalling (to be provided by LLWR, see below point) will not be in place prior to completion of the crossing. Therefore, the minor civils Contractor is to provide temporary power by means of a mobile generator for 6 months;
- LLWR will provide the design of the power supply to the lights to the *Contractor*. It is likely that this will involve a connection to the nearby street lighting cable. The *Contractor* is to allow for tee connection to the lighting cable under a cable outage, lay 10m of cable in a 150mm diameter cable duct to the traffic light control unit and connect. A provisional sum is included in the BoQ's for this activity;
- Install road markings for Street 4 traffic crossing, including stop line, give way markings, approach centre lines and pedestrian crossing markings, refer to RD 312. Road markings for Street 3 also required, including stop line and a give way marking at the proposed manual traffic gate;
- Installation of Temporary Concrete Vehicle Barriers at the following locations:
  - Approach to Street 4 crossing - 2No. 20m length sections on both the north and south verges.

3.2.5. Section Ch 200 to Ch 660 (Link to Stockpile C):

This section of haul road links up to Stockpile C and the proposed Drigg Stream Bridge crossing at approx. Ch 660. The route links up to existing Street 6 at approximately Ch 450. Street 6 is an existing site road that was originally used as a haul route for Vault 9 construction and requires widening in sections to achieve the required road width for RDP Tranche 1. The haul route crosses existing Bridge 109 (part of Street 6) where it narrows down to a single lane. The haul road drainage ditches are conveyed into larger swales that discharge into the East West Stream. There is also a small section of cutting drainage that discharges into Drigg Stream. Existing trees and stumps will be removed in advance of the Minor Civils Contract.

Specific scope relevant to this section is detailed below:

- During the construction stage of the haul road, the drainage swales to be finished in accordance with "typical swale during construction phase detail" in drawing RD 389. Detail consists of a swale lined with geotextile (in accordance with Section 514.4 of the Specification for Highway Works) and filled with a 100mm deep continuous layer of type b filter drain material. Please note: No straw bales to be used for additional silt capture (straw bales noted as an option on RD 389 detail), unless instructed by the Client. Once haul road construction is complete, temporary detail to be replaced with the final landscaping detail, refer to Table 1 in this document for landscaping requirements on soil depth, planting and seed mix for the haul road swales;
- Existing Street 6 to be widened, which includes an embankment extension to achieve the required road width;
- Haul road over this section to be Type P1 bound pavement design (2.5% CBR assumption), including the bell mouth access into Stockpile C area;
- Existing Street 6 consists of both bound and unbound surfaces. The bound surface starts approximately at the southern approach to Bridge 109 (Ch 500) and continues north. From Ch 500 south the existing Street 6 surface is unbound. There is not reliable as-built information on existing Street 6 pavement depths, so it is assumed that Street 6 existing pavement depths do not satisfy the design loadings for

RDP haul road traffic. Therefore, where the haul route uses Street 6, the existing pavement is to be removed and constructed to full P1 bound design at 2.5%CBR depth, unless CBR testing and trial holes confirm otherwise;

- Existing galvanised metal field gate, located on Street 6 adjacent to Stockpile C access to be removed;
- Installation of 2No. manual traffic gates on Street 6, refer to RD 292 for location and RD 307 for standard details. Gates to span existing road width of approx. 6m and include a tip support post, stop sign and a lockable tip support;
- Installation of a lay-by at approximately Ch 570 to 580, refer to RD 292 for location. Purpose of lay-by is to provide an area for LLWR site's monitoring team to park their van whilst carrying out routine data collection around the East West Stream;
- Installation of 2no. access steps with handrails from the haul road verge down to the HB1 and HB2 Hydrobrake Chambers (north and south banks of the East West Stream). Purpose is to provide safe means of access for construction environmental monitoring of water quality at the Hydrobrake Chambers, and for LLWR site's monitoring team routine data collection. There are no access steps details included with the design drawings. Therefore, steps to be constructed in accordance with SHW series 1100, Clause 1110 and Highways Construction Detail Drawings MCX 0138. Steps to be standard brick and paving slab detail or pre-cast option and handrails to be galvanised steel tubes;
- Install road markings for on approaches to Bridge 109 and access to Marine Holdings, including stop line, give way markings, approach centre lines and channel line markings over Bridge 109 (approx. Ch 470 to 600), refer to RD 292 indicative position, layout;
- Installation of Temporary Concrete Vehicle Barriers on the approaches and over Bridge 109 on both the east and west verges (Ch 500 to 575), as per GA RD292.

3.2.6. Bridge Crossing (Drigg Stream Ch 670):

The proposed haul road crosses the existing Drigg Stream at Ch 670. The design optioneering process concluded the most appropriate option for crossing the existing stream is by means of a modular bridging solution. Historically, the authorised aqueous discharge route for leachate generated during disposal activities was via Drigg Stream. Leachate discharges are now disposed of via marine holding tanks to the Irish Sea, although the Drigg Stream route remains an authorised route during certain emergency conditions. The historical discharges into Drigg Stream have led to low level radiological contamination of the stream bed in the proposed location of the bridge crossing. Excavating the bed material would result in unfavourable schedule and commercial risks in having to deal with the contaminated material. A modular bridge option was therefore chosen as it avoids any excavation within the existing Drigg Stream bed by spanning across the watercourse.

There is still a risk of very low levels of radiological contamination in the stream banks, which will have to be considered as part of the safe system of work (i.e. health physics to be consulted and present during excavation Works) and waste management plan. The current assumption is that existing soil in the banks contain low levels of contamination and could be characterised as VLLW. Therefore, **this material is assumed VLLW until proven otherwise** and excavated material in this location will have to be dealt with by the Contractor in the following manner:

- Excavated material from the stream banks are to be placed in dumpy bags and stored in a manner to avoid any rain water ingress by the *Contractor* (i.e. by temporary wrapping the bag in visqueen), until the material is ready to be removed from site.

The *Client* will organise and pay for any necessary characterisation testing to confirm if the material is VLLW but **require the *Contractor* to provide any necessary plant and labour** as part of the sampling activities.

The *Client* has waste routes in place for VLLW removal from site, therefore any material characterised as VLLW in the Minor Civils Contract can be removed from Site using these approved routes. The *Client* will organise and pay for any VLLW removal from site, **but require the *Contractor* is to assist by proving any necessary plant and labour** as part of the removal activities.

Bridge crossing scope is for the design and build of a modular bridging solution, including the following:

- Ground investigation in advance of construction Works to:
  - Characterisation of the soil to confirm levels contamination in the areas of proposed excavation and measure actual ground bearing pressure for design of the bridge foundations. Contractor to provide labour and plant for trial holes, samples to be taken by LLWR Environmental Monitoring Team;
  - Confirm ground conditions for abutment bridge design.
- Design, purchase and installation of Modular bridge from Mabey Bridge or a similar Contractor, including the following:
  - Bridge must span a minimum length of 20m;
  - Bridge to accommodate a maximum fully laden articulated dump truck loading up to 50 tonnes. Bridge design to allow the future earthworks Contractor flexibility in articulated dump truck selection. An example of expected upper bound dump truck models that could be used during Project are the following:
    - JCB 722;
    - Volvo A25G;
    - Caterpillar 725C2;
    - Hydrema 922-F series.
  - Bridge crossing to be single carriageway (i.e. 4.6m wide) and able to accommodate one fully laden articulated dump truck;
  - Bridge crossing does not require any pedestrian crossing;
  - Bridge to include N1 containment parapets;
  - Bridge decking to be anti-skid surfacing;
  - Design and installation of bridge abutments foundations, including a suitable transition (i.e. bridge rolling block) detail from the bridge surface to the P1 bound pavement.
- Any required temporary Works designs to accommodate installation of the bridge crossing;
- Bridge inspections by a competent person during operation, as per manufacture's recommended inspection and maintenance schedule. Inspections to be recorded and records submitted to LLWR;
- Removal of excavated VLLW material from site through approved waste streams, as noted above;
- Installation of Temporary Concrete Vehicle Barriers on the approaches to the bridge on both north and south verges. Assume 10m length TCVB sections at each verge approach. TVCB's to be interlocked at this location (i.e. not spaced so the barrier is a continuous section);
- Signing and control measures to ensure that only one vehicle at a time is on the bridge.

3.2.7. Section from Drigg Stream Bridge Crossing to Ch 950:

This section of haul road runs up to southern end of Mound 1 up to approximately Ch 950. There is an existing drainage ditch, called the Aspinwall drain, which crosses the haul road at approximately Ch 950. This section of haul road is fully offline from existing site roads and the existing ground is predominately grassland. The proposed route runs adjacent to the site security patrol track that run adjacent to site's perimeter fence.

There is a risk of very low levels of rad contamination in the stream banks for installation of the drainage headwall outfalls into existing Drigg Stream, as noted in Section "*Bridge Crossing (Drigg Stream Ch 670)"* above. Therefore, the same waste management assumptions apply.

Specific scope relevant to this section is detailed below:

- During the construction stage of the haul road, the drainage swale to be finished in accordance with "typical swale during construction phase detail" in drawing RD 389. Detail consists of a swale lined with geotextile (in accordance with Section 514.4 of the specification for highway Works) and filled with a 100mm deep continuous layer of type b filter drain material. Please note: No straw bales to be used for additional silt capture (straw bales noted as an option on RD 389 detail), unless instructed by

the Client. Once haul road construction is complete, temporary detail to be replaced with the final landscaping detail, refer to Table 1 in this document for landscaping requirements on soil depth, planting and seed mix for the haul road swales;
- Installation of haul road to type P1 bound pavement design (2.5% CBR assumption), up to Ch 750;
- Installation of haul road to Type P2 unbound pavement design (2.5% CBR assumption), from ch 750 to 950;
- Installation of P1 to P2 pavement transition detail, refer to RD 306;
- Installation of drainage culvert crossing (Aspinwall drain) at approximate Ch 950. Culvert to be constructed in accordance with DP2 design drawings RD 392 & 393, consisting of:
  - 600mm diameter pipe (concrete or plastic) in MCHW HCD F1 Class N bedding;
  - Concrete bagwork headwalls on the upstream and downstream ends of the culvert;
  - 1.1m high timber post and rail fence to demarcate culvert ends, refer to RD 392;
  - Note: service corridor shown on RD 392 not required. Dimensions to be as per the standard haul road corridor widths.
- Note: no Temporary Concrete Vehicle Barriers required in this section.

3.2.8. Section Ch 1400 to Ch 1580 (Mound 2 to Trenches Ramp):

This section of haul road links the northern section of Mound 1 to the existing Trench Cap and is located adjacent to Vault 9. The route crosses existing Drigg Stream, cuts through part of existing on-site Mound 2 before crosses existing Street 6. The proposed end of this section (Ch1580), is before the existing trench cap drain. LLWR Site Operations and Security Teams regularly use Street 6 as access, therefore traffic is to be managed by means of manual traffic gates, which are to be installed on Street 6. The haul road drainage network in this section all falls to the natural low point of Street 6, then ties into DP2 Mound 2 drainage channel (headwall HW28).

Specific scope relevant to this section is detailed below:
- Install RC services protection detail (approx. length 20m) in Street 6 eastern verge to protect existing Leachate pipeline and existing surface water drainage, refer to RD 306;
- Install RC services protection detail (approx. length 20m) to protect existing fire main pipeline at approximately Ch 1580, refer to RD 306 and RD 296;
- Installation of Street 6 drainage crossings, refer to 342 for locations;
- Installation of haul road to Type P2 unbound pavement design (2.5% CBR assumption), from ch 1400 to 1580 (excluding Street 6 crossing);
- Street 6 crossing to be type P1 bound pavement design (2.5% CBR assumption), including 10m length approaches on both eastern and western sides of Street 6. This is to accommodate stop / give way road markings on the haul road. There is not reliable as-built information on existing Street 6 pavement depths, so it is assumed that Street 6 existing pavement depths do not satisfy the design loadings for RDP haul road traffic. Therefore, the existing pavement is to be removed and constructed to full P1 bound design at 2.5%CBR depth, unless CBR testing and trial holes confirm otherwise;
- Installation of P1 to P2 pavement transition detail at required locations, refer to RD 306;
- Installation of drainage culvert crossing (Existing Drigg Stream) at approximate Ch 1410. Culvert to be constructed in accordance with DP2 design drawings RD 392 & 393, consisting of:
  - 600mm diameter pipe (concrete or plastic) in MCHW HCD F1 Class N bedding;
  - Concrete bagwork headwalls on the upstream and downstream ends of the culvert;
  - 1.1m high timber post and rail fence to demarcate culvert ends, refer to RD 392;
  - Note: service corridor shown on RD 392 not required. Dimensions to be as per the standard haul road corridor widths.
- Install road markings for Street 6 traffic crossing, including stop line, give way markings, approach centre lines, for both the haul road and existing Street 6;
- Installation of Temporary Concrete Vehicle Barriers on the approaches to Street 6 crossing. 4No. 20m length sections on both the north and south verges;

- Installation of 4No. manual traffic gates at Street 6 crossing, including the following requirements:
  - 2 No. Street 6 manual traffic gates to span existing road width of approx. 6m and include a tip support post, stop sign and a lockable tip support;
  - 2 No. haul road manual traffic gates to span one lane (i.e. running lane about to cross Street 6). Gate to include a stop sign. No tip support post and a lockable tip support required, since this would have to be within the centre of the haul road.

3.2.9. Haul Road Permanent Traffic Signage:

Permanent haul road traffic signs are to be installed as part of this Contract. There is currently no traffic signage detailed design in place, only a *Client* proposal layout which is to be finalised by the *Contractor*. Refer to Appendix K and Table 1: Proposed Haul Road Permanent Traffic Signage for details.

Note: this scope is separate from any temporary traffic management and compound signage and an allowance has been made within the BoQ's.

Haul road permanent traffic signage scope includes the following:

- Design and install haul road permanent traffic signs to the following requirements:
  - Signs to be designed and installed in accordance with the latest *Traffic Signs Manual*;
  - Signs to be mounted at min 1200 mm, unless above a footway where they are to be mounted at a min 2100 mm from ground level;
  - Sizes of sign faces to be in accordance with the recommended traffic signs manual guidance sizes for a 20mph road;
  - Sign face to be Class RA1;
  - All posts to be 76mm diameter galvanised steel with a plastic cover cap;
  - Sign foundation sizes to be confirmed by the contractor. Concrete to be ST4;
  - Final position of signs to be proposed by the *Contractor* and agreed on site with the *Client* prior to final installation.

Ref:	Description	No of sign faces per post
SGN 01	Warning Street 6 Crossing.	2
SGN 02	Ahead Only, no right or left turn.	3
SGN 03	Warning Street 6 Crossing.	1
SGN 04	Ahead Only, no right or left turn.	3
SGN 05	15 MPH (double sided / 2 sign faces)	2
SGN 06	15 MPH (double sided / 2 sign faces)	2
SGN 07	New road layout	1
SGN 08	15 MPH (double sided / 2 sign faces)	2
SGN 09	Single file traffic	1
SGN 10	Priority over oncoming traffic & 10 MPH (speed limit face double sided / 2 sign faces)	3
SGN 11	Single file traffic	1
SGN 12	Priority over oncoming traffic	1
SGN 13	Single file traffic	1
SGN 14	No pedestrian access	1
SGN 15	15 MPH (double sided / 2 sign faces)	1
SGN 16	Caution pedestrian crossing	1
SGN 17	New road layout	1

Ref:	Description	No of sign faces per post
SGN 18	Ahead Only, no right or left turn.	3
SGN 19	Caution pedestrian crossing and 15 MPH speed limit (speed limit sign double sided / 2 sign faces)	3
SGN 20	15 MPH (double sided / 2 sign faces)	1
SGN 21	New road layout	1
SGN 22	Ahead Only, no right or left turn.	3
SGN 23	No pedestrian access	1
SGN 24	Give way to oncoming vehicles and 10 MPH speed limit (speed limit sign double sided / 2 sign faces)	3
SGN 25	15 MPH (double sided / 2 sign faces)	2
SGN 26	Give way to oncoming vehicles	1
SGN 27	15 MPH (double sided / 2 sign faces)	2

Table 1: Proposed Haul Road Permanent Traffic Signage

3.3. Stockpile Management:

There are four stockpile areas; A, B, C and the Contractors Compound, refer to RD 327 for locations. Stockpiles A and B establishment are not included in the Minor Civils package.

The scope is to carry out all Works associated with stockpile management during the period of the minor civils Works Contract, including:

- Procurement, coordination and management of all required imported materials (i.e. earthworks fill, drainage materials, geotextiles etc) required as part of the Minor Civils Works Scope;
- Establishing the stockpile running surfaces and installing surface water management (drainage swales);
- Manage the transportation and distribution of materials from stockpiles to the site work areas.

3.3.1. Stockpile C:

Located adjacent to the existing Contractors Site Offices and immediately north of the East-West Stream. It is estimated that Stockpile C will hold a capacity of approximately up to 65,000m^3. Its footprint is approximately 2.1ha and stockpiles cannot exceed a height of 4m AOD (i.e. planning condition constraint). The southern boundary is constrained by the East-West Stream and will need to be managed by a 10m buffer from the bank of the stream and the stockpile site. All stockpiled materials must be segregated to prevent cross contamination. Surface water must be managed with pollution measures to prevent contaminated water from entering watercourses.

There is a risk of contaminated soils (i.e. heavy metals, TNT and other chemicals) and redundant structures (old road and rail lines) from legacy Royal Ordinance Factory Works, refer to Hazard Maps in Maps Appendix G for further details.

Stockpile C specific scope includes the following:

- Trial holes / hand excavation to locate existing services within the working area;
- Vegetation clearance, root removal and disposal. Note: Trees will be felled in advance of the Minor Civil Works;
- Topsoil strip; the earthworks strategy is to avoid generating potentially contaminated material by reducing the excavation depths and building up from existing ground where possible. Only the top 300mm depth of existing topsoil / sub-soils are to be stripped and used as part re-grading the area prior

to installing the granular running surface. Note: all stripped soils, and excavated material from stockpile perimeter drainage swale must stay within the stockpile footprint (i.e. under the proposed running surface);
- Soft spots to be excavated and replaced with acceptable fill, as per design specification;
- Potential existing watercourses within stockpile area to be treated with SED 9 detail from drawing RD 336;
- Installation of the stockpile perimeter drainage, as per design;
- Geotextile separator (Terram 1000 or similar) to be placed over the re-graded soils, before the granular running surface is constructed. Note: this is not detailed on the specific design drawings. Its purpose is to mark the interface between any potentially contaminated soils and imported materials placed above for future reference;
- Installation of running surface unbound pavement design (2.5% CBR assumption), including, 1 layer of geogrid, 375mm capping layer and surface dressed with stone dust;
- Installation of running surface unbound pavement design (2.5% CBR assumption), including, 1 layer of geogrid, 375mm capping layer and surface dressed with stone dust;
- Final landscaping, topsoil and grass seeding of verges and swales. Refer to Table 1 in this document for landscaping requirements on soil depth and seed mix;
- On site earthworks materials sampling and testing to meet design specification requirements. Testing will include in-situ CBRs to confirm pavement design thicknesses;
- Temporary fencing to segregate construction areas;
- Maintain the stockpile running surface during operation.

3.3.2. Contractor's Compound - Running Surface Establishment

Located adjacent and to the west of the rail sidings, refer to RD 337 for General Arrangement. The Contractor's Compound footprint is divided into two principle areas:

1. Imported aggregate storage area: that links up with the proposed haul road. The facility provides temporary storage for rapid offloading of aggregates, imported soils and other materials, before being moved to other internal storage areas;
2. Site Compound: a demarcated area within the overall footprint, refer to Section 12.4 for full details site compound establishment scope.

Work includes vegetation clearance and root removal (not trees), soil stripping and stockpiling, drainage and surface water management, protection of Drigg Stream and installing a suitable hardstanding surface for both principle areas. It is estimated the available aggregate storage area will hold a capacity of approx. 20,000m3. The footprint of the storage area is approx. 7ha and the stockpile cannot exceed a height of 4m AOD. The south and western boundary is constrained by existing site roads. The northern boundary is constrained by the East-West Stream and will need to be managed by a 10m buffer and bund from the bank of the stream and the site. Segregation of the different types of material in storage will be required. Drainage consists of swales and piped sections.

Like Stockpile C, there is a risk of contaminated soils (i.e. heavy metals, TNT and other chemicals) and redundant structures (old road and rail lines) from legacy Royal Ordinance Factory Works, refer to Hazard Maps in Appendix G for further details.

Contractors Compound running surface establishment scope includes the following:
- Trial holes / hand excavation to locate existing services within the working area;
- Vegetation clearance, root removal and disposal. Note: Trees will be felled in advance of the Minor Civils;
- Topsoil strip; the earthworks strategy is to avoid generating potentially contaminated material by reducing the excavation depths and building up from existing ground where possible. Only the top 300mm depth of existing topsoil / sub-soils are to be stripped and used as part re-grading the area prior

to installing the granular running surface. Note: all stripped soils, and excavated material from stockpile perimeter drainage swale must stay within the stockpile footprint (i.e. under the proposed running surface);
- Soft spots to be excavated and replaced with acceptable fill, as per design specification;
- Potential existing watercourses within stockpile area to be treated with SED 9 detail from drawing RD 336;
- Installation of the stockpile perimeter drainage, as per design;
- Geotextile separator (Terram 1000 or similar) to be placed over the re-graded soils, before the granular running surface is constructed. Note: this is not detailed on the specific design drawings. Its purpose is to mark the interface between any potentially contaminated soils and imported materials placed above for future reference;
- Installation of running surface unbound pavement design (2.5% CBR assumption), including, 1 layer of geogrid, 375mm capping layer and surface dressed with stone dust;
- Final landscaping, topsoil and grass seeding of verges and swales. Refer to Table 2 in this document for landscaping requirements on soil depth and seed mix;
- On site earthworks materials sampling and testing to meet design specification requirements; Testing will include in-situ CBRs to confirm pavement design thicknesses;
- Temporary fencing to segregate construction areas;
- Maintain the stockpile running surface during operation.

3.4. Contractor's Compound - Site Compound Establishment:

Refer to Section 12.4 and Minor Civils Compound Facilities drawing RD 845.

3.5. Contractor's Office Establishment – Adjacent to Stockpile C:

Refer to Section 12.4.

3.6. Landscaping Requirements:

The following tables details the required landscaping requirements:

Package	Area / Location	Seed type	Planting	Topsoil depth
Drainage	Swales - side slopes	Emorsgate EG8 - Meadow grass mixture for wet soils	Not required	150mm
	Swales - bed	Emorsgate EP1F - Wild flowers for pond edges	Not required	150mm
	Swales - top of bank	Germinal A4 low maintenance grass seed mix	Not required	150mm
	Lagoons - side slopes	Emorsgate EG8 - Meadow grass mixture for wet soils	Not required	150mm
	Lagoons -bed	Emorsgate EP1F - Wild flowers for pond edges	Not required	150mm
	Lagoons - top of bank	Germinal A4 low maintenance grass seed mix	Not required	150mm
	Verges	Germinal A4 low maintenance grass seed mix	Not required	150mm

Minor Civils - Scope

Package	Area / Location	Seed type	Planting	Topsoil depth
Haul Roads	Swales - side slopes	Emorsgate EG8 - Meadow grass mixture for wet soils	Not required	150mm
	Swales - bed	Emorsgate EP1F - Wild flowers for pond edges	Reed bed planting as per drawing RD 305	150mm
	Swales - top of bank	Germinal A4 low maintenance grass seed mix	Not required	150mm
	Haul Road V-ditches	Hydroseeded with Emorsgate EG8 Grass seed	Not required	150mm
	Embankment V-ditches	Hydroseeded with Emorsgate EG8 Grass seed	Not required	150mm
	Cutting V-ditches	Hydroseeded with Emorsgate EG8 Grass seed	Not required	150mm
	Verges	Germinal A4 low maintenance grass seed mix	Not required	150mm
	Embankment Slopes	Germinal A3 embankment low maintenance grass seed mix	Not required	150mm
Stockpile B, C and Contractor's Compound	Swales - side slopes	Emorsgate EG8 - Meadow grass mixture for wet soils	Not required	150mm
	Swales - bed	Emorsgate EP1F - Wild flowers for pond edges	Not required	150mm
	Swales - top of bank	Germinal A4 low maintenance grass seed mix	Not required	150mm
	Verges	Germinal A4 low maintenance grass seed mix	Not required	150mm

Table 2: Minor Civils Landscaping Requirements

3.7. Environmental Monitoring Scope:

3.7.1. Introduction:

The scope for environmental monitoring is to be read in conjunction with Sections 4.31, 4.32, 4.33, 4.34, 4.35, 4.36, and the CEMP RP/3409320.00/PROJ/00023 A. The RDP is required to comply with several planning conditions including condition 14 – Construction and Environmental Management Plan (CEMP), and condition 17 – Groundwater and Surface Monitoring. Condition 14 includes the following requirements:

Condition reference i): The monitoring of Drigg Stream flows and water quality downstream of the attenuation lagoon;

Condition reference j): The monitoring of surface water quality in any attenuation lagoon prior to discharge to Drigg Stream;

Condition reference k): A dust management plan. The plan shall be concurrent with the monitoring scheme specified within the application and detail measures by which dust will be further mitigated;

Condition reference l): A noise management plan. The noise management plan shall:

i. Provide for the monitoring of background noise levels;
ii. Identify noise monitoring locations;
iii. Set out the monitoring and reporting frequency and programme for submission of reports to the Waste Planning Authority.

The contractor's scope to support the Client in compliance with these conditions is described below.

The contractor is responsible for maintenance of all monitoring equipment in full working order for the duration of the contract. Batteries are to be protected from the effects of the weather and are expected to have a life of 15 months.

On completion of the Contract, the contractor shall hand over the monitoring equipment to the Client in full working order.

3.7.2. Water Quality and Flow Monitoring:

The general requirements for flow monitoring are included within Section 9 of the Surface Water Management Plan Ref. AEC-RDP-T1.00-RP-091. The Contractor is to provide the Contractor's Surface Water Management Plan (CSWMP) by 10 weeks after the Contract Date for acceptance by the Client. The CSWMP is to detail the Contractor's proposals for managing and controlling surface water run off to prevent pollution of the site water courses. The Plan is to include organisation, responsibilities, plans for preparation for high rainfall events and arrangements for mitigatory measures. The proposals shall also detail the arrangements for flow monitoring and sampling and testing for Turbidity and PH in compliance with the Scope.

Flow monitoring is required on the outfalls to Lagoons B, F, D and E. Flow monitoring is also required on the four haul road discharges into Drigg Stream. Flow monitors consist of a doppler unit positioned in the channel of the chamber or outfall pipe, connected to a data logger mounted on the nearby lagoon fence or fence post on the haul road outfalls.

The contractor is to supply and install, manage, maintain, control, monitor and report on surface water discharge as described in the Performance Specification below. One flow monitor is required on each discharge identified above. A spare Doppler and logger are to be provided in the event of malfunction and are to be used to replace defective units within 3 days of breakdown. Safe Systems of work are to be produced, agreed and in place to enable replacement action to be taken quickly.

3.7.3. Performance specification for flow monitoring:

Flow monitoring is required to monitor discharge flows at key points within the surface water drainage network. Flow measuring points shall be located as a minimum downstream of the temporary and permanent lagoons. Further monitoring is required on haul road drainage discharge points.
Flow monitoring setup shall consist of:

- Pipe internal mounted doppler unit;
- Cabinet or Post mounted data logger;
- Equipment shall be MCERT Accredited and certificates are to be submitted to the Client.

Typical equipment would be the ISCO 2150 Flow Module, Area Velocity Sensor and 2191 battery module or similar approved. The battery shall be the Alkaline type and have a life of 15 months. Refer to Appendix C for data sheet and list of equipment required.

One flow monitor shall be included at each outlet to the lagoons and haul road / stockpile drainage discharge points to the East West stream and Drigg stream.

The equipment shall be capable of measuring both depth and average flow velocity in both clean and heavily polluted media. The minimum accuracy of flow monitoring shall be as summarised in the table below:

Table 3: Minimum flow monitoring accuracy requirements

Measurement range -flow velocity	0 to 3 m/s
Accuracy	+/- 1.0% of flow velocity
Measurement range - depth	0 to 4m
Accuracy	+/- 0.5% of final value

The data logger shall be mounted on a post or in a secure lockable housing adjacent to the to the lagoons. It shall include internal conversion of the depth and velocity to provide direct readings of flow in either l/s or m3/s. Connection between the doppler and the data logger shall be hard wired, unless otherwise agreed. The data logger shall include measures to manually download the data. There is no requirement for remote reading of the data.

The device shall be powered by battery with a battery life of up to 15 months which is to be recharged and/or replaced for the duration of the contract.

3.7.4. Monitoring Equipment for Turbidity and PH:

Turbidity monitoring is to be carried out by sampling the water and testing with a turbidity meter. The contractor is to procure two mobile units by 12 weeks after the Contract Date, with one being kept as a spare in the event of breakage. A Thermo Scientific™ Orion™ AQ4500 Turbidity Meter or similar approved is considered acceptable, refer to Appendix C for details.

PH is to be measured with a pH pen probe which will be supplied by the Client. Any units damaged during use are to be replaced at the contractor's cost.

All monitoring equipment is to be proposed by the contractor and accepted by the Client prior to procurement.

Penstocks are required on the outlets to isolate the system and are shown on drawing RD400.

The contractor will monitor and record flow rates daily. The contractor will install flocculant dosing points using IBU containers in an agreed position upstream of each lagoon or outfall. This is to promote settlement and will be contractor will be responsible for ensuring the flocculant supply is maintained and dosage rates are appropriate. The type and make of flocculant is to be agreed with the Client. A daily visual inspection of discharges from the attenuation ponds will be carried out by the contractor. In addition, the discharges from each attenuation pond shall be monitored weekly by the contractor for turbidity and pH to ensure compliance with planning and permit constraints.

During high rainfall events or when visual inspections suggest that discharges are at risk of being non-compliant with the permit, additional sampling and testing for turbidity and pH will be carried out by the Contractor. All sample results will be assessed against compliance trigger levels set by LLWR with flocculant dosing levels altered to ensure permit compliance. All test results must be reported to the Client's Environmental Monitoring Manager. Samples will be taken at the flow control chamber at the downstream end of the lagoons, tested and recorded. Non-compliances will be reported immediately.

The contractor's Environmental Supervisor will be responsible for checking weather forecasts to predict and make provision for high rainfall events, arrange additional testing/monitoring and prepare response measures such as flocculant dose increases and penstock adjustment if required. The contractor will monitor sediment levels in the attenuation ponds and arrange sediment removal as required to ensure that sufficient capacity is maintained.

The Client's Environmental Monitoring Manager will advise the contractor of the pH and Turbidity trigger levels and produce calibration curves for the turbidity monitor using the unit supplied. Turbidity readings relating to suspended solids will then be provided to the Contractor.

3.7.5. Discharge Monitoring Prior to Commissioning of Outfalls:

During the period of construction of the lagoons and drainage, surface and ground water will need to be discharged to Drigg stream at the same permanent outfalls identified above. During this period, the contractor shall provide and use temporary measures to ensure that water is discharged within the prescribed limits using for example, Silt busters or similar, Settlement tanks, V notch weirs and conventional pumping. The *Contractor* is to submit proposals to the Client for agreement of the method to be used 6 weeks prior to implementation.

3.7.6. Dust Monitoring:

The Contractor is to submit a Dust Management Plan in compliance with the CEMP for acceptance by the Client by the end of 10 weeks after the Contract Date. Mitigation measures are to be in place when the works start on site.

The Contractor is to install and maintain 2No DustScan DS100 units or similar on the west side of vault 8 and 9. Typically, the DustScan DS100 is installed on site boundaries to assess the amount of dust travelling offsite or towards a receptor. These dust monitors will provide baseline and ongoing measurement of natural dust blown off the sand dunes from a seaward direction. If complaints about dust are received, this will provide evidence of whether the dust is natural or caused by LLWR site operations.

DS100 directional dust sampling cylinders are to be typically changed on a weekly depending on reporting and site operations. Each DS100 is supplied with 2 sampling cylinders, pre-fitted with dust collection slides (sticky pads), this allows for continuous directional dust sampling.

Equipment will be procured and permanently installed, i.e. not hired' or used intermittently.

Note that this type of monitor produces results with a lag time of about 1 week so, is unable to provide readings to aid rapid response to complaints. To overcome this, a single mobile unit such as DustMate by Turnkey Instruments Ltd or similar approved, is to be provided by the Contractor. The contractor's environmental supervisor is to accompany the LLWR environmental supervisor to measure and agree readings if trigger levels are breached.

Baseline readings will be taken over a period before construction works commence on the vault/cap. Limits will be agreed and set with the Environmental Monitoring team.

The Contractor is to install 2No Osiris dust monitors (Turnkey Instruments) or similar approved, on the east boundary. This type of monitoring equipment measures environmental dust and other airborne contaminants in real time. The units would be equipped with solar panels and batteries as there is no power supply nearby and must fulfil the project needs the flexibility to move the instruments quickly and easily as the works develop. The units are to be equipped with a router and data sim card. The unit will monitor continuously which can be read and downloaded remotely. A trigger limit can be set, and the unit is to send an alert, enabling rapid response to an event before a complaint can be raised. The mobile Dust Mate unit shall be deployed in the event of a complaint being received to the relevant property. This avoids the need to install a static monitoring unit on any of the neighbouring properties.

The data sim must not be prone to dead signal areas.

3.7.7. Noise Monitoring:

LLWR's Environmental Supervisor will take noise monitoring readings using equipment already on site. No equipment is required from the contractor.

3.8. Miscellaneous Works and Requirements:

This section details the remaining various types of Minor Civils scope required.

3.8.1. Drainage Operation and Maintenance:

Contractor to maintain the drainage swales, drainage ditches, settlement lagoons and flow control chambers and headwalls as per the recommended maintenance instructions (refer to Aecom document AEC-RDP-T1.00-RP-091), for the duration of the Contract.

3.8.2. Compound / Stockpile Operation and Maintenance:

Contractor to maintain running surfaces for the duration of the Contract.

3.8.3. Temporary Fencing:

Temporary fencing and demarcation necessary to safely segregate and control construction work areas.

3.8.4. Temporary Traffic Management:

Refer to Sections 4.47 and 4.46 for general requirements and the principles and constraints on use of site roads and haul roads. The contractor is responsible for providing temporary signage for temporary traffic management during construction.

3.8.5. Contractor's Compound & B791.2 Office Signage:

The *Contractor* is responsible for providing any necessary signage in the Contractor's Compound and B791.2 Office Compound to satisfy their Traffic Management Plan.

3.8.6. Surveying Control Establishment:

The contractor shall survey and review the existing site survey stations and is responsible for the establishment, protection, ongoing monitoring and control of any further primary survey stations and secondary setting out, necessary to set out the works.

3.8.7. Trial holes:

To confirm existing site services and other features.

3.8.8. Alterations to Existing Utilities:

The contractor is responsible for arranging any diversions and disconnections of redundant services whether known or unknown. Additional works will be instructed in accordance with the contract for dealing any unknown services or those not included in the Bill of Quantities.

3.8.9. Installation of New Utilities:

The Contractor is responsible for installing permanent connections for water and power into the contractor's compound from nearby supplies.

3.8.10. Site Clearance:

The contractor is responsible for removal and setting aside or disposal of existing signs, fences, vegetation and other objects necessary to complete the works.

3.8.11. Earthworks Materials Sampling And Testing:

Contractor to perform on site earthworks materials sampling and testing with a UKAS accredited laboratory. Testing will include in situ CBRs.

3.8.12. Redundant Services:

Contractor to remove of any redundant services (known and unknown) and dispose as waste.

3.8.13. Mound 1 amphibian fence:

Mound 1 fence (installed by others in advance of the Minor Civils Works) to be maintained by the *Contractor* for the duration of the Contract.

3.8.14. Installation of time lapse cameras:

Instruction to be issued post Contract award. Provisional sum is included in the BoQ's, details to be agreed with the Client.

3.8.15. Dust suppression:

Contractor is responsible for ensuring work areas do not generate wind-blown dust, refer to CEMP LLWR-RDP-T1.00-RP-116. This requirement includes all work areas, haul routes, site roads used by the contractor, and aggregate stockpiles. The contractor is responsible for procuring, supplying and maintaining dust monitoring equipment as described in Environmental Monitoring Scope Section 3.7.
Note: There is an existing lagoon located to the south of on-site Mound 1 installed during Vault 9 construction, refer to Appendix H for location plan. This lagoon is available for the *Contractor* to use as a source of water for dust suppression. The existing lagoon will require cleaning out and the timber boundary fencing replaced if the *Contractor* chooses to use this as an option. The *Contractor* can also create a water source from by filling up lagoons B and D once commissioned.

3.8.16. Demolition of existing monitoring hut:

Background:

B743.1 Under Vault Monitoring Hut was commissioned alongside and to the west of Vault 8 to investigate the effects of cement-modified waters on natural and engineered clay upon
which vault 8 was constructed. The hut was used for sampling from July 1988 to
March 1999. The hut sampling station is made up of 3 "windows" or groups which include 6
ducts each running into the vault floor containing hydraulic tubing. Since March 1999 the hut has been out of service however has not been decommissioned, the hut still contains sampling equipment, general waste, lab equipment etc. which will be removed by others prior to demolition and removal.

Description:

The building is a prefabricated aluminium framed timber unit. The plan dimensions are 5m x 2.55m which sits on top of a concrete slab 3.6m x 7m by 0.3m deep. It is expected that the slab is lightly reinforced with mesh.

Figure 3: B743.1 Under Vault Monitoring Hut

Power to the hut was supplied from B704.11 which was decommissioned in 2008 as part of Vault 9 construction. The cable has been disconnected at the B717 switch room and the cable was spiked in 2016. The cable is still to be disconnected at B743.1, expected to be buried 600mm below existing ground level and is to be removed over a length of 50m and disposed of by formal waste routes.

An asbestos survey has been completed and the report has confirmed that none is present. A copy of the survey will be available to the contractor on request.

Summary of B743.1 Demolition Scope:

- Disconnection of the cable on the side of the building;
- Demolition of the hut and waste disposal in accordance with LLWR waste procedures;
- Break up the slab, transport and stockpile on mound 2 for processing by others;
- Expose and Cut back the hydraulic hoses and ducts to up to 10m from the slab;
- Duct ends are to be sealed to prevent future water ingress;
- Expose and remove the power supply cable and dispose by waste routes;
- Restore the ground under the slab and the cable trench to ground level.

3.9. Earthworks General Requirements:

Please refer to Appendix E for Minor Civils Works cut and fill diagram.

The Contractor shall apply good working practices to execute the delivery of earthworks and meet the requirements of the specification. The Client considers this to be of high importance to ensure that the works are carried out efficiently, avoiding environmental issues with surface water runoff, turbidity and dust for example, completing the earthworks in manner that assures the integrity of the finished works. It is the

Contractor's responsibility to deliver the work to the specified requirements, the consequences of working inefficiently and poor quality due to poor working practices are the Contractor's risk.

Good practice to avoid poor quality – this list is not exhaustive:

- Full compliance with working methods in the Specification for Highway Works (SHW)
- Segregation of spoil of different classification and properties at the point of excavation and deposition;
- Keeping earthworks free of water;
- Protecting surfaces from the effects of weather;
- Protect formation from trafficking plant.

Good Practice efficiency measures – this list is not exhaustive:

- Control surface water, shape earthworks to falls;
- Shape spoil heaps to shed water and mechanically seal surfaces to prevent water ingress;
- Avoid unnecessary working during inclement weather;
- Work to seasonal calendars;
- Good selection of plant – type/balance/number;
- Prevent waste generated by causing acceptable spoil to be unacceptable due to working methods such as the foregoing;
- Good stockpile control of bulk drystone aggregates to minimise wastage;
- Correct use of materials – e.g. not using subbase or capping for general fill.

Imported Materials:

The works specifications are identified in the design information and in the SHW 600 series.

In addition to the material classifications in SHW 600 series, the LLWR has chemical limits for imported materials as shown in S4ULs Table, below.

The Contractor shall provide the source and provenance of their proposed supply with a statement that it does not exceed the limits of the S4ALs. If the Contractor wants to propose material that exceeds the limits in the S4ALs, they will be required to submit details for the Client to consider for acceptance. The Client may require random testing of imported materials to confirm compliance.

Limestone bulk aggregates are not allowed on the site.

LLWR Soils Suitable for Use Levels (S4ULs):

The site end-state following delicensing at the LLWR is expected to be public open space and therefore imported soils must be suitable for this land use. Furthermore, the current land use is commercial/industrial and therefore soils must also be suitable for this land use. The LLWR S4UL has therefore been set at the most stringent limit for these land use scenarios. The LLWR S4ULs are shown in the Table 4 below. S4ULs are generic screening criteria which are suitable for all uses. Soils with chemical concentrations above the shown criteria may still be suitable for use but would require further specific risk assessment by LLWR prior to authorisation.

Minor Civils - Scope

Determined	Commercial (mg/kg)	POS_{park} (mg/kg)	LLWR S4UL (mg/kg)
Metals			
Inorganic arsenic	640	170	170
Beryllium	12	63	12
Boron	240000	46000	46000
Cadmium	190	532	190
Chromium (III)	8600	33000	8600
Chromium (VI)	33	220	33
Copper	68000	44000	44000
Elemental mercury	58	30	30
Inorganic mercury	1100	240	240
Lead	1100	580	580
Methylmercury	320	68	68
Nickel	980	3400	980
Selenium	12000	1800	1800
Vanadium	9000	5000	5000
Zinc	730000	170000	170000
Petroleum Hydrocarbons			
Benzene	27	90	27
Toluene	56000	87000	56000
Ethylbenzene	5700	17000	5700
o-xylene	6600	17000	6600
m-xylene	6200	17000	6200
p-xylene	5900	17000	5900
Aliphatic EC 5-6	3200	95000	3200
Aliphatic EC >6-8	7800	150000	7800
Aliphatic EC >8-10	2000	14000	2000
Aliphatic EC >10-12	9700	21000	9700
Aliphatic EC >12-16	59000	25000	25000
Aliphatic EC >16-35	1600000	450000	450000
Aliphatic EC >35-44	1600000	450000	450000
Aromatic EC 5-7 (benzene)	26000	76000	26000
Aromatic EC >6-8 (toluene)	56000	87000	56000
Aromatic EC >8-10	3500	7200	3500
Aromatic EC >10-12	16000	9200	9200
Aromatic EC >12-16	36000	10000	10000
Aromatic EC >16-21	28000	7600	7600
Aromatic EC >21-35	28000	7800	7800

Determined	Commercial (mg/kg)	POS_{park} (mg/kg)	LLWR S4UL (mg/kg)
Aromatic EC >35-44	28000	7800	7800
Aliphatic + aromatic EC >44-70	28000	7800	7800
Polyaromatic Hydrocarbons			
Acenaphthene	84000	29000	29000
Acenaphthylene	83000	29000	29000
Anthracene	520000	150000	150000
Benz(a)anthracene	170	49	49
Benz(a)pyrene (only)	35	11	11
Benzo(b)fluoranthene	44	13	13
Benzo(ghi)perylene	3900	1400	1400
Benzo(k)fluoranthene	1200	370	370
Chrysene	350	93	93
Dibenz(ah)anthracene	3.5	1.1	1.1
Fluoranthene	23000	6300	6300
Fluorene	63000	20000	20000
Indeno(1,2,3-cd)pyrene	500	150	150
Naphthalene	190	1200	190
Phenanthrene	22000	6200	6200
Pyrene	54000	15000	15000
Coal tar (BaP as surrogate marker)	15	4.4	4.4
Chloroalkanes and alkenes			
1,2-dichloroethane	0.67	21	0.67
1,1,1-trichloroethane	660	57000	660
1,1,1,2-tetrachloroethanes	110	1500	110
1,1,2,2-tetrachloroethanes	270	1800	270
Tetrachloroethene	19	810	19
Tetrachloromethane (carbon tetrachloride)	2.9	190	2.9
Trichloroethene	1.2	70	1.2
Trichloromethane (chloroform)	99	2600	99
Chloroethene (Vinyl chloride)	0.059	4.8	0.059
Explosives			0
2,4,6-trinitrotoluene (TNT)	1000	260	260
RDX and HMX	210000	49000	49000
Pesticides			

Determined	Commercial (mg/kg)	POS_{park} (mg/kg)	LLWR S4UL (mg/kg)
Aldrin	170	30	30
Dieldrin	170	30	30
Atrazine	9300	2300	2300
Dichlorvos	140	26	26
Alpha-endosulfan	5600	2400	2400
Beta-endosulfan	6300	2400	2400
Alpha-hexachlorocyclohexane	170	47	47
Beta-hexachlorocyclohexane	65	15	15
Gamma-hexachlorocyclohexane	67	14	14
Chlorobenzenes			
Chlorobenzene	56	1300	56
1,2-Dichlorobenzene	2000	24000	2000
1,3-Dichlorobenzene	30	390	30
1,4-Dichlorobenzene	4400	36000	4400
1,2,3-trichlorobenzene	102	770	102
1,2,4-trichlorobenzene	220	1700	220
1,3,5-trichlorobenzene	23	380	23
1,2,3,4-tetrachlorobenzene	1700	1500	1500
1,2,3,5-tetrachlorobenzene	49	110	49
1,2,4,5-tetrachlorobenzene	42	25	25
Pentachlorobenzene	640	190	190
Hexachlorobenzene	110	30	30
Phenol and Chlorophenols			
Phenol	760	760	760
2-chlorophenol	3500	1100	1100
2,4-dichlorophenol	3500	1100	1100
2,4,6-trichlorophenol	3500	1100	1100
2,3,4,6-tetrachlorophenol	3500	1100	1100
Pentachlorophenol	400	110	110
Other			
Carbon disulphide	11	1300	11
Hexachlorobutadiene	31	48	31

Table 4: LLWR S4ULs

Supervision:
A key component of achievement of the 'right first time' principle is suitability and experience of the supervisors and operatives. The Contractor shall ensure:

- Managers/Supervisors have the right skills, knowledge, training and experience;

- Allocation of an adequate number of supervisors;
- Supervisors who are familiar with the type of work;
- Plant operatives and workers who have the skills, knowledge, training, experience to deliver the work safely and effectively.

Excess Spoil:

Any surplus acceptable excavated spoil that cannot be used in the works in the Enabling works phase is to be classified, transported and deposited at mound 2. Materials with different classifications are to be segregated and sealed mechanically to minimise the ingress of rain water. Class 1 and 2 material that fails testing on grading and moisture shall be dealt with similarly if it is suitable be processed in the future to make it acceptable (for example by spreading and drying to reduce moisture content to acceptable levels). Alternatively, excavated spoil may be processed to create acceptable fill at the point of deposition as itemised in the Bill of Quantities.

Class U1 and U2 shall not be stored on site for re-use, with the exception of the potentially contaminated soils in stockpile C and Contractor's compound areas which are to be retained in the area from where they are excavated with a separating geotextile above (refer to Earthworks General Requirements in Section 3.9).

4. General Constraints On How the Contractor Provides the Work Scope

The *Contractors* attention is drawn to *Repository Site Manual 08 – Contractor Information Manual for working on LLWR Nuclear Licenced Site*. The documents provide an overview of the requirements for *Contractors* undertaking any work on the LLWR Site and any off-site assets that are associated with LLWR's Nuclear Safety Case, Environmental Permit or Site Security. One of the key purposes of the document to highlight "what is different at LLWR", compared to construction projects not operating within a Nuclear Licenced Site.

It also gives brief details on what is needed to set up the Safe Systems of Work (SSOW) Process in a plant/area for control of activities which are authorised through the Safe Systems of Work Control Office.

4.1. General Constraints

The Services provided by the *Contractor* will not be exclusive; there will be other projects and operational Works ongoing during the duration of this Contract. Site clearance of trees on the haul route, Contractors Compound and Stockpile C will be carried out between September 2019 and April 2020. Also, the noise fence will commence in October 2019 for completion in May 2020.

The Licensing of Nuclear Sites is a requirement of the Nuclear Installations Act 1965.
The site is a nuclear licensed site, with several environmental permits and consents which allows the *Client* to make any necessary discharges. As such there are the associated limitations, restrictions and regulations to be complied with by all parties. To this end the *Client* has various procedures, guides, and Instructions. Key documents are referenced in this Scope Document, all of which should also be taken into consideration.

The *Contractor* must ensure they are familiar with and comply with the latest editions of these documents.

The Nuclear Site Licence for LLWR, Site Licence 82, places conditions on the Licensee which are legal requirements and require arrangements to be put in place for compliance. As such, the Site Licence forms the highest tier of the *Client's* Management System.

Although the Site Licence only applies directly to the Licensee, the application of its requirements will have an indirect effect on other companies working within the boundaries of the site. A good example of this is Control and Supervision of Operations (Licence Condition 26). The Licensee must appoint suitable persons to Command, Control and supervise any work on Site that may affect safety. For the purposes of this Clause:

- 'Command' is defined as the ability to start or stop the Work Package;
- 'Control' is defined as the assurance of the environment in which the Work Package is to be carried out;
- 'Supervision' is defined as the management of the arrangements at the work site.

Unless agreed otherwise, generally for work undertaken by the *Contractor,* the *Client* will be appointed to the roles covering the Command and Control aspects whilst the *Contractor* shall supply the Supervisory personnel. Also, due to the interaction between these Site Licence issues and the CDM Regulations, the *Client's* personnel will be appointed to the roles of Principal Design and Principal Contractor, unless otherwise agreed.

The *Client* and *Contractor* will produce a joint 'Command and Control' document explaining the joint arrangements for supervision of the Works. This is in order to preclude any duplication of roles as the CDM appointments are to ensure co-ordination between tasks on the project whilst the Site Licence condition requires appointees to be in command and control of the tasks on the Site. Due to the difficulties encountered

in attempting to define the distinction between these areas, it has been decided the pragmatic solution is to combine the roles.

However, it is also recognised that the *Contractor* will have a lot of expertise to be drawn on, and in order to perform the CDM roles to their optimum, the Client, Principle Designer and Principal Contractor need to be teamed events with the *Client's* person in the named role but utilising an appropriate mix of personnel from any of the *Contractors* involved in the project. Therefore, the *Client's* personnel will be very active in the planning, co-ordination and agreement of work.

LLWR Authorisation (full version) Radioactive Substances Act 1993 and Site Licence No.82
The *Contractors* attention is drawn to the provisions of the documents Radioactive Authorisation (full version) Radioactive Substances Act 1993 and Site Licence No. 82.

To ensure an understanding of the rules and deliver the product to the required standard, the *Contractor* is expected to employ 'Suitably Qualified and Experienced Persons' (SQEP) only, and formally appoint a number of Competent Persons, as detailed in this document. The *Contractor* will be required to demonstrate the suitability of proposed individuals prior to Works commencing and keep records of their training and experience for acceptance by the *Client.*

In addition, certain areas/buildings are classed as 'Controlled areas' due to the presence of contamination/radiation. No work is required in these areas for the Minor Civils Contract, however, access and working in such areas is strictly controlled by the *Client*.

The site is also ecologically sensitive with numerous protected species on site, such as great crested newts, adders, bats, with flora and fauna items to be protected. There is also a nearby site of Special Scientific Interest (SSSI).

4.2. Use of the Site

The *Contractor* complies with the following:

- Does not use the site for any purpose other than carrying out the Contracted Works;
- LLWR 'Standards and Expectations' policy booklet;
- *Clients* Policies, Instructions, Site Rules and Protocols, Repository Site Procedures (RSP's), Repository Site Manual (RSM's), Emergency Instructions (EI's), Operating Instructions (OI's), Departmental Instructions and the like as detailed here and in supplementary information;
- Any specified Civil and Civil Nuclear Constabulary (CNC) police regulations and requirements.

The *Contractor's* attention is drawn to the *Repository Site Manual (RSM) – 08 - 2.1 Standards and Expectations*, which provides general instructions on:

- Entry, Exit and Access to Specific Areas;
- Personal Protective Equipment;
- Vehicle and Pedestrian Management;
- Environmental Controls and Specific Hazards;
- Accident/Illness Procedure;
- Event Reporting Procedure;
- Smoking;
- Security.

Other Site Rules, Protocols, Instructions etc also cover requirements in more detail, in particular the Repository Site Procedures (RSP). The *Contractor* is required to comply with all RSP's and be aware of and take account of the Clients other procedures, rules and instructions.

4.3. Access to Site

The *Contractor's* attention is drawn to the restricted access to the Site. The *Contractor* is deemed to have visited the Site and acquainted himself with the restrictions and other matters regarding access to the Site which may affect the Works.

Entry to site is made via the Main Gate. Entry to site may also be made via the Council Gate with authorisation from the *Client [via the* 'Superintending Officer' (SO) or 'Nominated Representative' (NR)]. Access through the Council Gate will require notice of at least 2 weeks to allow LLWR to arrange security personnel to man the gate.

For details of restrictions on deliveries, including travelling through the local villages of Drigg and Holmrook, refer to Section 4.4 Deliveries.

For details of Security and access Site Pass requirements refer to Section 4.42.

Arrangements for emergency vehicle access must be maintained at all times.

Building Number B791.2 is a stoned-up compound allocated as the *Contractor's* area for office and welfare facilities (shown on Figure 6). This area contains space for approximately 14 Vehicle parking spaces. Due to the limited capacity on site and to minimise vehicular traffic through the local villages, it is a requirement that the majority of the *Contractor's* workforce will be 'bussed in' to the LLWR site.

4.4. Deliveries

Repository Site Manual (RSM - 08) Section 4.6 – Safe Use of Vehicles, Roads and Car Parks covers vehicle movements and parking. Contractor to comply with the *Client's* Traffic Management Plan ref: SR_P 002, Control of Large Goods Vehicles ref: SR_P 003 and Control of Abnormal Load Deliveries SR_P 006.

LGV's are not to arrive and leave the LLWR Site and travel through the Drigg village during the restricted travel time of 07:30 to 09:00 and 15:00 to 16:30, refer to Figure 4: Delivery Curfew Periods.

These restrictions are in place to reduce the risk to pedestrians within the village during busy periods. The periods are aligned with school collection and pick times when there is an increased safety risk to pedestrians. The times have been agreed with the local community through the Drigg and Carleton Parish Council and with the Nuclear Decommissioning Authority (NDA).

Minor Civils - Scope

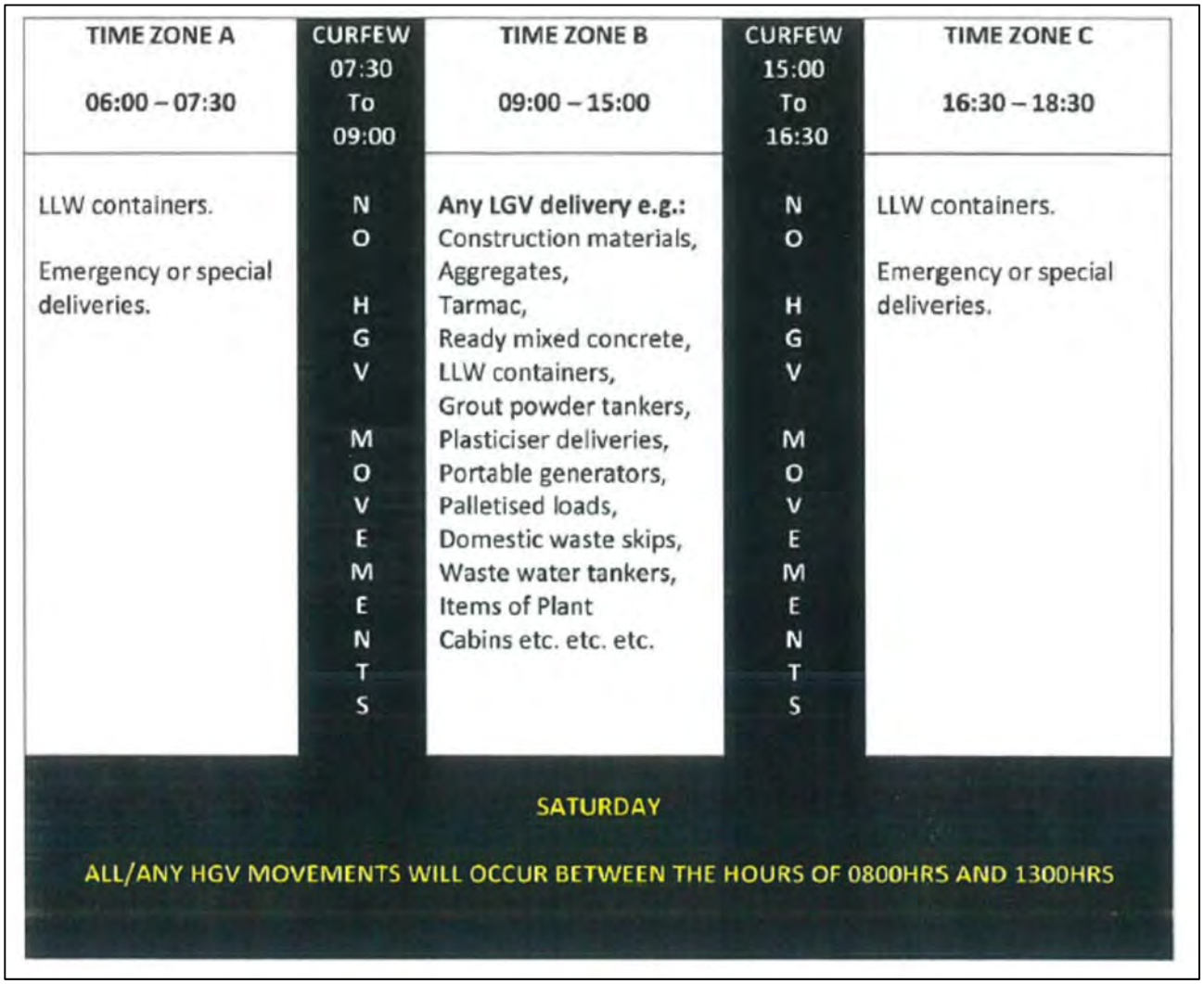


Figure 4: Delivery Curfew Periods

There is a planning requirement on the project to maximise the use of rail deliveries to reduce the amount of site traffic through Drigg Village. **Therefore, the *Contractor* shall deliver <u>all</u> aggregates and fills to site via rail.** Any deviations from this principle i.e. aggregate and fill deliveries via road, will require justification and approval by the *Client* in advance of delivery.

To clarify, the *Contractor* <u>is only restricted in delivering aggregates and bulk fills via rail</u>, all other materials can be delivered via road, such as:

- Drainage materials;
- Geotextiles and geogrids;
- Plant and equipment;
- Concrete.

The *Contractors* vehicles must carry a vehicle pass, issued at the main gate by the guard force, before they are allowed on Site. All commercial vehicle drivers will be issued with a vehicle pass on arrival at Site and they shall either be fully cleared P20 pass holders or be escorted at all times by a fully cleared P20 pass holder provided by the *Contractor*.

Notwithstanding the requirement to deliver bulk fill materials by rail, the Contractor's attention is drawing to the extract from Planning Condition No. 23 requirement below:

No more than 37 (74 movements) Heavy Goods Vehicles shall enter or leave the site in any one day (Mondays to Friday) and no more than 127 (254 movements) Heavy Goods Vehicles shall enter or leave the site in any single week. No more than 19 (38 movements) Heavy Goods Vehicles shall enter or leave on Saturday. No Heavy Goods Vehicles shall enter or leave on Sundays or Public Holidays.

Routing of vehicles on site must comply with the *RSM 08 – 9.1 "Housekeeping, Maintenance and Traffic Management"* - unless agreed otherwise by the *Client*.

RSM 08 – 4.6 "Safe use of Vehicles, Roads and Car Parks" is in place to control abnormal load deliveries. An abnormal load is defined as a vehicle that exceeds 3m wide, 18.75m length and >=40te in weight.

All LGV movements that take place during school holidays will be escorted through the village by the main *Contractor* – inclusive of February Half term, Easter break, Wit Week, Summer Holidays, October Half term & Christmas Break.

4.5. Working Hours

The *Contractors* attention is drawn to the Site Codes of Practice and the European Working Time Directive, where the normal working week shall, in essence, not exceed 48 hours (preferably worked over 5 days). In all instances the current directives shall apply and furthermore all *Contractors* shall be required to work without availing themselves of "Opt Out" arrangements in respect of the 48-hour average working week and rest days. The *Contractor* will be deemed to have included for this for this restriction in his Prices.

The *Contractor* observes and conforms to working hours of the Licensed Site. No work takes place during non-working hours or non-working days, except with the prior written consent of the *Client*.
There is a Planning Condition that stipulates the following working times for this Project:

- 07:30 - 18:00 Monday to Friday;
- 08:00 – 13:00 Saturdays **(only by exception and advanced approval by the Client)**;
- No construction works on Sunday;
- No work to take place over any Bank Holiday – this includes all days over the bank holiday weekend (Sat, Sun, Mon and Friday in Easter).

The Licensed Site is open from 06:00 and closes at 18:00. Therefore, the *Contractor*:

- Can enter the Licensed Site from 06:00, but not start construction works until 07:30;
- Must leave the Licensed Site before 18:00.

Note: *Contractor* to allow for non-productive working time of 1 (one) hour per day for attendance to daily work pre and post job briefs.

4.6. Parking

In addition to the *Clients* Site Traffic Management Plan (ref: SR_P 002), *RSM 08 – 4.6 – Safe Use of Vehicles, Roads and Car* Parks exists, to define local rules and instructions on the topic. It covers the following:

- LLWR's vehicles and roads;
- Vehicles and roads on construction projects;
- The expectations and responsibilities of vehicle users on LLWR site.

All roads, car parks etc on LLWR Site must be regarded as public highways, thoroughfares etc. *Contractors* must not only comply with LLWR's standard's, but must also ensure as required, that all vehicles are licensed, insured, MOT'd, inspected and maintained to the same standard as required on the public highway.

Due to the limited capacity on site, most of the *Contractors* workforce will be required to be parked off site, at a location to be consulted with the *Client*. There will be some parking facilities (up to 14 spaces) provided to the *Contractor* at the B791.2 compound (Contractor's Site Office adjacent to Stockpile C) for *Contractor* personnel. There will also be parking spaces available for the Contractor's plant within the Contractor's Compound adjacent to the rail sidings, please refer to Section 12.4 for further details.

Parking of cars and commercial vehicles is not permitted on roads within the Site. Parking shall be confined to those areas allocated for that purpose. Vehicles parked in any unauthorised area may be removed by the *Client's* guard force. Unauthorised parking, particularly in areas designated for emergency access, may lead to disciplinary action which may include permanent withdrawal of the persons Site Pass.

Vehicles will only be allowed onto the Licensed Site for the purpose of unloading/loading of materials, plant and equipment and is limited to set times during the day. At all other times vehicles must be parked in the accepted locations. Only *Contractor's* equipment, plant and materials, which are continuously in use to complete the Works may be retained within the Works area.

The site is limited regarding space available for the siting of lay-down areas. The *Contractor* should take note of this restriction when programming the Works and selecting his methods of working.

4.7. Temporary Fencing

The Clients *RSM 08 – 3.7 - Safe Management of Work in or on LLWR Plant and Buildings* supports this document and provides guidance on access and controls in or around LLWR plant.

Prior to the commencement of any work, the *Contractor* provides temporary fencing and information signs as agreed with the *Client*, to delineate the construction area.

The *Contractor* to provide suitable physical barriers, such as 2m high Heras type fencing, and clear safety signage to prevent unauthorised access into the work area. Hazard warning tape will not be accepted as a physical barrier.

Where temporary fencing, hoardings etc. constitute 'temporary works', the *Contractor* will be responsible for design and certification.

The *Contractor* maintains the barriers, fencing and hoardings throughout the duration of the Works. Separate vehicle and pedestrian access to the Works area shall be via locked gates/doors which shall be secured at all times and secured at the completion of each day's work.

During non-working hours, a key to each lock and out-of-hours numbers must be left with the Security Office in the event that access is required for emergency purposes.

All barriers erected by the *Client* shall only be removed with the agreement of the *Client*. Where required all such barriers are replaced and adequately secured before the work is considered to be complete.

Screens shall be erected to prevent accidental exposure and injury of personnel from bombardment by intense light, chemicals, sprays, sparks, 'flying' or falling objects and the like.

4.8. Temporary Works

The *Contractor* must manage their temporary Works in accordance with the latest British Standards, Approved Codes of Practice, Guidance and Best Practice. The *Contractor* will need an appointed temporary Works co-ordinator and temporary work supervisor.

The *Clients RSM 08 – 4.1 – Support of Structures /Temporary Works,* procedure describes the temporary Works requirements for working within LLWR site (i.e. what is different at LLWR).

Some of the *Contractor's* temporary Works designs will require formal review and acceptance by the *Client* before construction Works can commence. Such reviews will depend on the temporary Works design categorisation (i.e. complexity of design and level of risk). The *Contractor* shall submit a temporary Works register, with the expected temporary Works design check categorisations to the *Client* as early as possible in advance of construction Works. This is so the *Client* can review the temporary Works register in advance of construction and confirm what temporary Works designs require formal review and acceptance by the *Client.*

Although not an exhaustive list, below are some examples of the expected temporary Works designs:

- Modular Bridge Crossing for Haul Road Ch 660;
- De-watering at Lagoon D;
- Excavation support;
- Temporary slopes and stockpiles;
- Crane platforms;
- Access scaffolds and edge protection;
- Formwork and falsework;
- Signage;
- Site fencing.

Although not a complete list, below is a list of the temporary Works designs that will require formal review and acceptance by the *Client:*

- Modular Bridge Crossing for Haul Road Ch 660;
- De-watering at Lagoon D;
- Crane platforms.

4.9. Signage and Notice Boards

Each of the work areas will have notices e.g. "No unauthorised persons" posted at each access point and any other relevant signage advising of the hazards and rules on site. Contact names and numbers for access requirements are also to be displayed.

The *Contractor* erects suitable signage warning personnel of potentially hazardous situations or conditions. All signs shall meet regulatory requirements and be maintained throughout the work. The siting of small directional signs to facilitate deliveries and identify the *Site* location will be permitted but must be agreed with the *Client* before erection.

Name boards are permitted in work areas subject to the *Clients* consent.

4.10. Noise and Vibration

The *Contractor* shall comply with the Noise at Work Regulations 2005 and with BS 5228: 2014 (Noise and Vibration Control on Construction and Open Sites) and the Client's *RSM 08 – 4.7 Safe Management of Vibrating Equipment, 4.8 - Safe Management of Noise and RSP – 01.48 Management and Control of Exposure to Noise.*

Planning Condition 28 states that noise levels attributable to on-site construction and operational activities shall not exceed 55 dB(A) Leq (1hour) and 70 dB(A) Leq (1hour) for Works of short duration. A written record of noise monitoring shall be maintained at the site office and made available for inspection by the Waste Planning Authority or their representative at all reasonable times.

The *Contractor* fits all compressors, percussion tools, mobile plant and vehicles with effective silencers, acoustic hoods, doors and sleeves of a type recommended by manufacturers of the compressors, tools or vehicles. The Contractors will use electrically-powered portable equipment in preference to diesel where possible and will use acoustic screening for noisy activities near sensitive receptors. Audible reversing signals

on vehicles will be of the white noise type rather than beeps and the work organized such that reversing is kept to a minimum. Standard best practice methods such as not leaving engines running and appropriate maintenance of plant will be expected.

The *Contractor* does not use pneumatic drills and other noisy appliances outside *permitted working hours* without acceptance of the *Client. The Client's RSM 08 4.7 – Safe Management of Vibrating Equipment*, defines the *Clients* rules and expectations for *Contractors* when considering and using vibrating equipment. It covers both Hand Arm Vibration Syndrome (HAVS) and Whole Body Vibration issues.

The *Contractor* must be aware of each equipment's Exposure Action Value (EAV) and Exposure Limit Value (ELV) and introduce managerial controls to remove, reduce and control the risks.

4.11. Electrical Safety

The *Clients RSM 08 - 4.11 Electrical Safety*, applies and details site specific requirements for the safe management of electricity and electrical equipment. Irrespective of the requirements of this RSM the *Contractor* must comply with the requirements of:

- The Electricity at Work Regulations.
- BS7671:2018 Requirements of the IEE Regulations and Guidance.
- Any other relevant legislation, HSE Approved Codes of Practice and Guidance Notes.

All *Contractors* who use electrical supplies or electrical equipment must appoint a sufficient number of Managers/Supervisors to ensure that the requirements are complied with. These Managers/Supervisors will be referred to as Electrical Equipment Supervisors (EES's).

Where a *Contractor* is required to carry out work on LLWR electrical services/equipment the *Client* Superintending Officer is responsible to ensure that an adequate number of competent personnel are assigned to the work. The *Client's* authorised person (electrical) AP(e) will assess where required, the need for nominations for energisations, live testing etc. Please refer to the following RSM's for further details with regards to electrical safety on LLWR site:

- RSM 08 5.5 – Excavations;
- RSM 08 9.1 – Allocation of Managerial Responsibility for safe access and Housekeeping of Specific Areas of Plants under Construction;
- RSM 08 9.2 – Construction Design Management;
- RSM 01.15 – Electrical Safety.

4.12. Work at Height

The *Clients RSM 08 - 5.4 - Work at Height*, procedure describes the arrangements for compliance with the Work at Height Regulations 2005 (The Regulations) on the Site.

Where it is reasonably practicable, work at height must be avoided by planning out the task. This also includes exclusion of personnel from an area by means of devices and signs.

The order of preference for control measures to be employed (the hierarchy of control measures) is:

- Avoid work at height if it is reasonably practicable to do so;
- Use of permanent collective protection measures;
- Use of temporary collective protection measures;
- Use of Personal Protective Equipment (PPE).

A risk assessment must be undertaken before any work at height commences and where work at height is identified. So far as is reasonably practicable, the risk must be reduced to the lowest possible level in accordance with the hierarchy of control measures and where the risk is significant, this must be recorded.

Where significant risk due to work at height is identified when preparing for, or undertaking a task, the *Client* must be consulted and included in the review process for the Safe System of Work.

4.13. Safe Management of Excavation Work

RSM 08 – 5.5 - Excavation Work deals with:

- The dangers associated with, and the Safe Systems of Work which must be followed during excavation work and work in excavations;
- The requirement for on-site sampling and disposal of all excavated materials in accordance with RSM 08 – 5.5 Excavations;
- The requirement for a radiological Risk Assessment, sampling, surveys and reassurance monitoring (and consideration of the need for a Plant Modification Proposal) in accordance with RSP 2.08 and RSM.08 – section 8 - Engineering Design.

For the purposes of this RSM , “Excavation” has a wide definition and includes work such as:

- Installation of fence posts;
- Use of spikes to secure outriggers on scaffolding;
- Planting trees etc;
- Trenches;
- Single-sided excavations.

The term “excavation” excludes the majority of gardening/horticultural work such as re-turfing, edging, digging flower beds, weeding, aerating, replacing paving and kerb slabs and patching of tarmac etc. provided that:

- The *Client’s* Superintending Officer confirms that there are no known services which could be damaged by the work;
- The *Contractor* surveys the area and confirms that no services are detectable.

The *Contractor* is responsible for ensuring that all aspects of the work under his control are managed safely. He must appoint in writing a sufficient number of Competent Persons to ensure compliance with the requirements of this RSM Known as Excavation Supervisors (ES’s).

The *Contractor’s* managers, supervisors and ES’s who oversee excavation work or work in excavations must be suitably qualified and competent. For all excavation work and for all work in excavations, the *Contractor* must conduct an effective Risk Assessment; this includes radiological and non-radiological contamination. If significant risks are identified, then it must be recorded on a Risk Assessment.

The ES is responsible for completing and updating the Excavation Tag.

4.14. Use of Cranes

In addition to the *Contractor’s* own procedures and legislation, the *Client* has the following Instruction in place RSM 08 – 5.1 Safe Management of Cranes, which amongst other things covers the following:

- Risk Associated with the Use of Cranes;
- Management and Supervision;

- Rated Capacity Indicators (RCI's) and Rated Capacity Limiters (RCL's);
- Maintenance, Thorough Examination etc;
- Operation of and Immobilisation of Cranes During Bad Weather.
- Mobile & Tower Cranes: special requirements.
- Telescopic Handlers.
- Projects Where the Construction (Design & Management) Regulations Apply.

Other Instructions and rules exist, such as *RSM 08 – 5.2 – Safe Management of Lifting Operations, RSM 08 – 4.5 – Safe Management of Plant and Equipment*, all of which must be complied with.

4.15. Use of Explosives

Not permitted.
The Site Information provides information on historic land use, including unexploded ordnance (UXO) finds.

4.16. Hazardous Materials

RSM 08 – 4.15 Control of Substances Hazardous to Health covers the *Clients* rules and expectations to ensure that all hazardous substances used, produced or encountered by the *Contractor* or his *Subcontractors* are controlled, stored, used and disposed of in a safe manner.

The *Contractor* must ensure that comprehensive Risk Assessments are carried out and where significant risks are identified.

For the purpose of this RSM "Hazardous Substance" includes:

- Any substance which is a hazardous substance within the meaning of the Control of Substances Hazardous to Health Regulations (COSHH Regulations);
- Lead and lead compounds;
- Any other substance and which may be hazardous to health.

The *Contractor* must appoint a sufficient number of Competent Persons to ensure that this RSM is complied with. For the purposes of this RSM these Competent Persons will be known as Environmental Supervisors (ES's).

All ES's and all other managers and supervisors who are to any extent responsible for housekeeping, pollution prevention etc must be fully trained and be aware of the relevant legislation and guidance notes.

As part of the *Contractors* own Safety Induction Course, all employees, Subcontractors' employees and any other persons brought onto site must have the relevant details of this RSM explained to them.

Irrespective of the requirements of this RSM, the *Contractor* must ensure they are fully familiar with changes to and always comply with the Control of Substances Hazardous to Health Regulations (COSHH Regulations).

RSM 08 – 4.13 Asbestos. Covers information about the legacy of the LLWR site and the expectation of uncovering asbestos.

All excavations within the LLWR site should be planned with a consideration for unearthing asbestos. The LLWR hazard map makes reference to ROF operational areas and structures. RSP 01.41 provides further guidance on the unearthing of asbestos. Learning From Experience (LFE) from previous and ongoing Projects on LLWR site have concluded that the exposure to asbestos of the workforce is sporadic and of low intensity from excavation works around Site. **Therefore, a Licenced Asbestos Contractor is not deemed required for this Contract.**

The *Contractor* is to allow for a suitably trained and competent operative, with the ability to safely bag, tag and transfer any potential unearthed asbestos to a designated skip for the duration of the Works.
Note: The Client already has a waste route in place for the removal of asbestos from site, including a designated asbestos skip on site that the *Contractor* can use during the Minor Civils Contract for removal of an unearthed legacy asbestos.

RSM 08 informs the *Contractor* of training requirements for working with asbestos.

All excavation operations should be planned with the LLWR asbestos co-ordinator's input for safe management and disposal.

4.17. Storage of Fuel and Chemicals

Refer to *RSM 08 – 2.6 Environment and 7.1 – Safe Management of the Environment.*
This Instruction covers many topics including storage and disposal of fuel and chemicals.
Any diesel, oil, chemicals etc. which are not intended for use on site, must not be brought on to site.

All such substances which are brought onto site must be properly stored, used and disposed of, in particular:

- All static tanks, all bowsers and all drums must comply with the relevant EA PPG guidance;
- All waste/used oils must be disposed of in line with EA guidance in PPG 8;
- The entire area where fuels (including oils) are delivered, stored and dispensed must be isolated from the surface water drainage system, open ground or other porous surfaces (e.g. by use of drainage grids, gullies or kerbs in conjunction with impermeable surfaces).

The appendices of the RSM 08 instruction provide further specific requirements for tanks, hoses, drums and bowsers.

4.18. Archaeological Requirements

There are no known locations of archaeological importance, however, should the *Contractor* uncover items which may appear to have any significance, they are to refer the matter to the *Client* who will instruct what action is to be taken.

4.19. Interfaces between the Minor Civils Works and existing Works and operations

The site is operational which includes the receipt, processing, transporting and depositing 'half height ISO containers' into the Repository. Therefore, to some degree or other, much of the proposed works will interface with these operations.

Typically, the following are the *Clients* prime operations on site:

- LLW Operations:
  - At the rail sidings, grout plant, Vault 8 and 9, site roads, and services (In particular the leachate system);
- PCM Operations:
  - Decommissioning and demolition of magazines, and drum process along Street 6 between B748 and Vault 9;
- Use of Rail Network:

  - LLW package (container) deliveries, export of PCM to Sellafield, and import of materials for other projects;
- Itinerant Monitoring Workers:
  - Shared access, adjacent land use and occupation site wide.

Drawing ref Plan **RD 195** gives an indication of key areas for these operations, site offices, accommodation, welfare, workshops etc.

Refer to the Site Information / Pre-construction Information for further details, including site Hazard Maps.

The *Contractor's* operations will largely be limited to the areas of development detailed in the scope, and to the contractor's compound areas detailed in Section 12.4. There is an additional laydown area available to the Contractor at the north and west of Vault 8, suitable for the laydown of materials (details shown on sketch LLWR-RDP-T1.00-SK-062). Drawing RD344 read in conjunction with the scope above gives a good overview of the areas to be developed. During the implementation of the Minor Civils Scope, access is to be maintained to all existing buildings and along all site roads. Traffic Management Plans are to be produced by the *Contractor* and agreed with the *Client* for any closure or diversion to roads and/or footpaths required to implement the works.

The *Contractor's* operations will interface with LLW Operations, since they import / export using existing Street 4 and the site rail sidings. The *Contractor* will be completely excluded from the rail siding area and the northern end of Street 3 during LLW Operations rail import / export periods (see barrier detailed on haul road drawing RD292), as the siding becomes a controlled area with local rules applicable. The *Contractor* is to assume they will be able to deliver an average of 3 trains a week. This will allow LLWR operations to continue unaffected. To avoid clashes, all *Contractor* deliveries must be arranged collaboratively with the Client and updated on the LLWR logistics calendar.

Minor Civils works main traffic interface with existing site roads will be the haul road Street 4 crossing. Street 4 is the main access/egress to the LLWR site. Therefore, due to a larger volume of traffic and an interface between works traffic and workforce commuting to and from site offices, this crossing has been designed as a traffic signal-controlled crossing. There is a second crossing point at the haul road/Street 6 interface (adjacent to the entrance of Vault 9). This section of Street 6 is used by LLWR operational traffic only and subject to infrequent traffic moves, hence this crossing is designed with a change of priority using barriers or gates (see haul road drawing RD292).

The haul road design develops an existing section of Street 6 to the south of Stockpile C. Protocols will need to be put in place for this section of haul road; during construction and when the haul road is operational, to allow the Client and their supply chain safe access along the Street 6 haul road to the Marine Holding Tanks B1412. Access/egress to the marine holding tanks is likely to be required daily for inspection, and during repair and maintenance operations. The haul road design incorporates gated access either side of the haul road Ch425-650 to allow the *Contractor* to control traffic along the section and manage the interface.

4.20. Limitations of use of site due to Interfaces

There is very limited space available, which will limit such things as:

- Stockpiles;
- Office, welfare, parking – Need to limit on site use to essential users;
- Rail sidings – *Contractor* deliveries to be co-ordinated with *Clients* deliveries and exports.

4.21. Occupied Premises and Users

The *Contractor* shall carry out the Works with the minimum of inconvenience and nuisance to the occupants and users of adjacent and other buildings, including any which are put into use progressively as construction is completed.

4.22. Client Specific Policies and Procedures

As noted throughout this document the *Client* has various policies, rules, instructions and documents in place to ensure compliance with regulators for working on a Nuclear Licenced Site. For the benefit of the contractor, the information relevant to the contractor has been collated within RSM 08 which includes reference to the most relevant policies and procedures. These documents are also referred to throughout this document.

4.23. Plant Modification Proposals (PMP)

Much of the works will require a Plant Modification Proposals (PMP's) prepared in accordance with *RSP 1.27- Modification to or experiment on existing plant*. Proposals are drafted and approved by committee, both before works can commence, during (for changes etc), and to close off the works/project. The *Contractor* will be required to support the *Client* in the production, review, approval and updating of such documentation. The *Contractor* may also be required to attend committee meetings with the *Clients* staff to aid approval.

The current proposed PMP's for this scope are currently:

- Contractor accommodation;
- Haul Road & Stockpile Management;
- Drainage.

These control documents are an essential element of site requirements to effectively control changes on site. It is essential that proposals are produced in sufficient time to meet the *Clients* review and approvals process, via the approval committee, which meets on a fortnightly basis.

4.24. Work Planning

Work Management is used to maximise the availability of plant, equipment and systems. It also aids in the delivery of the lifetime plan, project work, milestones and targets. It manages the risks associated with conducting work, identifies the impact of work to the plant and work groups and protects the plant from unanticipated events due to the conduct of work. It ensures that the plant remains in a safe condition and maximises the efficiency and effectiveness of plant, staff and material resources. There are Repository Site Procedures (RSPs) which define the work management arrangements to be adopted, of which RSP 6.01 documents and lists the requirements.

The *Contractor* will be expected to work as an integrated whole with the *Client*. This will include interface with other projects, routine maintenance and operations, and site infrastructure management.

RSP 6.01 – Work management. Sets out the standard for safe working and work planning. It provides guidance on stakeholder engagement, timescales and committee approvals that will be required prior to starting physical works onsite.

RSP 01.24G - Terms of Reference for LLWR Document Review Committees (DRC). Provides guidance on the DRC process, which is a peer review for the methodology and risk controls associated with all operations that are controlled via an Instruction or Risk Assessment.

DRC Timeline gives a brief over view of the DRC process and the Work Planning Process along with the timescales that need to be considered when planning work.

4.25. Risk Assessments

As per RSM 08:

In line with legislation LLWR expects that all work with the potential for significant risk is assessed and the significant hazards and control measures are documented. LLWR expects a systematic process to be followed to identify all hazards associated with a task, this process involves:

- Stakeholder meeting(s) with all relevant Subject Matter Experts to ensure correct identification of hazards and controls;
- Production of task-specific risk assessments that are suitable and sufficient to reduce the risks to as low as is reasonably practicable;
- Work pack approval through the LLWR Document Review Committee (if required);
- A strict red-pen process for updating of any 'in flight' risk assessments to ensure relevant stakeholder engagement in any updates.

It is also worth noting that the LLWR work Planner will facilitate Stakeholder meetings in line with RSP 6.01-Work Management.

4.26. Work Permits

All works on site require work control authorisation. This will be performed by the *Client.*

The Clients RSM 08 13 – "Roles and responsibilities are Repository Site Procedures (RSP's)", defines all LLWR roles and responsibilities and how that role will support the *Contractor* in the Safe System of Work (SSOW) to be adopted, of which RSP 1.12 list the requirements.

The Clients RSM 08 14 – "Models", stipulate the Command and Control expectations at LLWR site as a requirement of Site Licence Condition 26.

4.27. Working in Controlled Areas

This is not envisaged in this Minor Civils Scope. Therefore, the following is provided for information.

The *Clients* RSM 08 identifies requirements associated with working in controlled areas:

- RSM 08 – 6.4 Radiological Safety advises the Contractor of the requirements;
- RSP 1.04 Radiological Control of Areas;
- RSP 1.05 Arrangements for Persons Entering a Controlled Area.

Generally, the *Client* will also provide such services as Radiological Protection Advisor (RPA), Health Physics Monitors and Supervisors, specialist clothing and equipment for controlled areas, unless specified otherwise in Work Package enquires.

The *Contractor* must be able to provide the capability to provide the RPA, health physics supervisors and monitor services described above, when requested in the Work Package enquiry.

4.28. Client Specific Policies and Procedures Audits

To ensure *Contractor* compliance with the *Clients* Site Management requirements:

- Regular audits, reporting and follow-up actions are carried out on all Contractors;
- Management investigations are carried out and conclusions are published to ensure corrective action is taken following all breaches or potential breaches of the above requirements.

4.29. Temporary Suspension of Services

Regulations governing certain areas within the *boundaries of the site* require from time to time the suspension of the Works or services in the area. When notice is given, all operatives will be required to report to a place nominated by the *Client* and to remain there until ordered to resume. Time necessarily lost thereby shall be reimbursed in accordance with the terms of the Contract.

4.30. Fire Safety Management

RSM 08 4.12 Fire Safety and RSP 1.33 – Fire Safety Management.

RSP 1.33 defines:

- The establishment of a Responsible Person (RP) and Competent Persons for the management of the risk of fire within a building;
- Arrangements for the management of the risk of fire throughout the following stages of a building's life cycle:
  - New buildings;
  - Existing buildings;
  - Construction work in or on existing buildings.

Under the terms of the Regulatory Reform (Fire Safety) Order (RRO) the RP shall ensure one or more competent persons are appointed to assist him in undertaking the preventive and protective measures identified in the Fire Risk Assessment (FRA) and any other general fire precautions. In particular, for LLWR, competent support must be engaged to oversee the initial preparation and ongoing management of FRAs. This resource shall be referred to as Fire Safety Advisors (FSA).

To ensure that other Clients and their employees (including Subcontractors etc) can assist in managing and supervising preventive and protective precautions which affect them, each other Client shall appoint in writing a sufficient number of competent persons to implement the general fire precautions and any specific requirements identified by the RP via relevant FRAs and Fire Safety Plans for the area(s) in which they are working. For other Clients these Competent Persons shall be referred to as Fire Supervisors (FS).

4.31. Ecological, Pollution, Environmental Matters

The *Client* operates to ISO 14001 Environmental Management Standard and continually strives to minimise impact on the environment through the Environmental Management System (EMS) including:

- Improving energy efficiency;
- Reduction in greenhouse gas emissions;
- Minimising the use of resources;
- Re use of materials where possible;
- Reducing the potential to cause pollution;
- Using the waste hierarchy to help minimise waste;
- Demonstrating environmental performance by best practicable means, ensuring our activities, products and services meet statutory requirements.

The Contractor is required to support the Client with these objectives during the execution and in the performance of the contract.

Safe management of the environment on the Site is of equal importance to the management of safety. *RSM 08 – 2.6 Environment and 7.1 – Safe Management of the Environment* provides Client requirement instructions.

The Client will coordinate and act as the principal point of contact with the Regulator, County Council and Local Authorities. The Client will also apply and obtain approval of discharge consents with the Environment Agency and Copeland Borough Council.

Environmental monitoring reports are to be submitted to LLWR who will include the data in the LLWR reports to Cumbria County Council.

Note: The *Client* has a full time Ecologist on site and will be available to assist and work with the *Contractor* throughout the Works.

4.32. The *Contractor*'s Environmental and Ecological Responsibilities

In addition to their own Environmental policy, the *Contractor* is required to comply with the CEMP, *Clients* objectives, and in particular the *Clients RSM 08 2.6 and 7.1 Environment.*

The RSM 08 2.6 and 7.1 – Environment explains the requirements on housekeeping, prevention of pollution, minimisation of waste etc. Irrespective of the requirements of the RSM 08, the *Contractor* must always comply with any relevant legislation e.g. the Water Resources Act, the Control of Pollution (Oil Storage) Regulations, etc.

Polluting Material:	Includes silt, cement, concrete, diesel, oil, petroleum, sewage, litter and other debris.
Controlled Waters:	Include all streams, watercourses, ponds, coastal waters and water contained in underground strata.
Controlled Waste:	Is general and hazardous waste.

The *Contractor* must appoint a sufficient number of Competent Persons to ensure that the RSM 08 2.6 and 7.1 are complied with. For the purposes of the RSM 08 these Competent Persons will be known as Environmental Supervisors (ES's).

All ES's and all other managers and supervisors who are to any extent responsible for housekeeping, pollution prevention etc must be fully trained and be aware of the relevant legislation and guidance notes specified in paragraph 2 above.

As part of the *Contractors* own safety induction course, all employees, Subcontractors' employees and any other persons brought onto site must have the relevant details of this RSM explained to them.

Responsibilities for *Contractors* generating waste include ensuring they produce and maintain a Waste Management Plan for all work, complete an "Application of Waste Hierarchy" form and comply with the hierarchy and waste disposal process, which are explained in RSP 2.13.

The *Contractor* is also required to protect both the wildlife and flora on the site.

There is a possibility of encountering a diverse selection of flora and fauna, including protected species, such as:

- Great crested newts, adders, common lizards and slow worms;
- Natterjack toads, common frogs, toads and newts;
- Badgers, bats, roe deer;
- Barn owls, ground nesting birds;
- Otters, feral cats;
- Pennyroyal, pillwort, wildflowers.

To aid control, the site is divided into Environmental Zones, with Guidance advice, Information on each area, Task sheets and Species Information sheets. The *Clients Operator* Instruction *RSG 2.01 – Protection of Wildlife During Routine Activities,* provides guidance on use of the LLWR wildlife worksheets, which are intended to ensure that routine activities do not inadvertently harm wildlife.

The worksheets are intended to apply to routine site activities and preparation works only. They are not directly applicable to non-routine projects (e.g. construction of new buildings or removal of soil bunds) which will require project specific assessments. However, they may contain useful background information for project scoping and planning and do contain instructions on actions to be taken in the event of finding species or potential evidence of their existence. The *Contractor* shall comply with all such instructions.

The *Client's Site Ecologist* will be responsible for providing expert advice on the management and physical requirements to deal with the various sensitive ecological issues on site.

The LLWR wildlife worksheets cover the whole site and are to be used in conjunction with appropriate SSOW. The worksheet task sheets also cover topics ranging from:

- The use of pesticides and herbicides;
- Digging and turf removal;
- Erection and maintenance of fencing;
- Derelict land, rubble and soil clearance;
- Working with containers;
- Excavation works on site.

The Contractor's attention is drawn to the following ecological matters:

Stockpile C:
This area is a migration route for Great Crested Newts. Prior to the start of this contract, the *Client* will install newt fence around the north and east sides of the area to prevent migration, trap and translocate any animals in the stockpile C footprint. Trees will subsequently be felled by others, leaving the area clear to carry out the installation of the stockpile works. The Contractor is required to maintain the newt fencing in serviceable condition until the end of May 2020.

Pond D:
Also inhabited by Great Crested Newts. The *Client* will install newt fence around the entire perimeter of the area to prevent future migration, trap and translocate any animals in the Pond D footprint and adjacent working area. Scrubland will subsequently be cleared by others, leaving the area clear to carry out the installation of the lagoon. The *Contractor* must maintain the newt fence throughout including access in and out of the area, and after completion of lagoon D until the end of the contract.

Mound 1:
This area is inhabited by reptiles and potentially Natterjack toads. The *Contractor* is to install ring/exclusion amphibian fencing around the mound to enable trapping to commence in April 2020. Trapping will be carried out by the LLWR site ecologist who will transfer animals to refuge areas. The *Contractor* is to maintain the amphibian fence in good order for the duration of the contract.

Natterjack toads are a protected species present in the SSSI area to the northwest area of the site. An exclusion fence has been installed around the north and west sides of vault 8 adjacent to the security track. Animals have been known to get into the site and it cannot be guaranteed that none will be present. Natterjack toads spawn in shallow water including rain puddles. Once there, they cannot be disturbed. The *Contractor* is responsible for ensuring that no areas are created or left where water can accumulate even in small quantities, especially before overnight or non-working periods. The consequences are that significant delay may occur until nature has taken its course.

Proposed Lagoons:
Amphibian fence is to be installed and maintained around all the lagoons for the duration of the works as shown on the construction drawings.

4.33. Disposal of Surface Water and Effluents

The *Contractor* shall at all times keep the work areas free from surface water and effluents, from whatever cause arising, and shall provide such temporary channels, soakaways and/or connections to drainage as are required, including silt traps, oil traps and all other measures necessary to prevent pollution of existing drains, ponds, rivers or other water courses.

The *Client* maintains compliance with legislation with respect to discharge to controlled water (streams, groundwater, sea). If the *Contractor* requires to discharge water to a surface water course they shall seek the *Client's* approval sufficiently in advance to enable the *Client* to ascertain whether a permit is required and take the appropriate action.

LLWR has three permits to cover the disposal of aqueous waste issued and regulated by the Environmental Agency. If the *Contractor* wishes to dispose of aqueous waste they shall seek the *Clients* approval sufficiently in advance to enable the *Client* (via the Discharge Coordinator) to specify any sampling, evidence of provenance etc prior to potential disposal via the site effluent system.

The *Contractor* should refer to the "Pollution Prevention for Business" issued by the www.Gov.uk, which are relevant to site contracts of all disciplines. The *Contractor* shall allow for any necessary liaison with the *Client* to gain approval from the Environment Agency for all permits and consents.

The *Contractor* will be responsible for installing water monitoring and testing equipment and monitoring their discharges to ensure the discharge is within the site limits. This includes the construction period prior to the lagoons being commissioned. The *Contractor* is to submit proposals for control of surface water run-off and discharge to LLWR for acceptance prior to commencement of excavation. Such measures may include:
Use and deployment of Silt Busters, silt fences, use of flocculant and temporary settlement tanks.

The Contractor is to provide resources to manage surface water discharge on an ongoing basis as follows:

- Continuously monitor weather forecasts and site activities to predict high run-off events that may affect water quality;
- Provide a response unit that will install and maintain silt fences; control penstocks, install, maintain and replace flocculation dosing points upstream of each lagoon; react to high turbidity readings by adjusting flocculant dosing rates; any other physical measures to control turbidity within site permitted levels;
- Retain a stock of equipment and materials to enable rapid response to high turbidity events.
- Provide for rapid deployment (less than 24 hours) for equipment such as dust busters, water pumps, settlement tanks etc.

The *Contractor* is to provide water monitoring reports on a monthly basis under normal conditions and additionally for any non-compliance event.

4.34. Refuelling of Plant:

Refer to the guidance in *RSM 08 2.6 Environment and 7.1 Safe Management of the Environment* and the CEMP RP/3409320.00/PROJ/00023 A.
The *Contractor* must ensure that all his work is planned and managed in such a way that no polluting material is discharged into any Controlled Waters either deliberately or accidentally, nor directly or indirectly via the site drainage system.

When working in or near streams, rivers and ponds, biodegradable lubricants and biodegradable hydraulic oils must be used in all plant and equipment. The contractor's attention is drawn to Drigg Stream, the East West stream and Aspinall Drain water courses on the site.

Plant may be refuelled on site using a bunded tow fuel bowser but must take place at least 10m from a water course. Refuelling of dump trucks must take place in an agreed designated area such as the Contractor's Compound.

Storage containers with a capacity of 200 litres or more must be stored in a bunded tank, bowser or other container, such as a drum or Intermediate Bulk Container (IBC), with a secondary containment of no less than 110% of the maximum contents.

A risk assessment must be completed by the *Contractor* and accepted by the *Client* before fuel storage and refuelling is carried out on site.

All static diesel or petrol fuelled plant must be sited over a drip tray which is to be emptied and maintained to prevent spillage.

Spill kits are to be provided and maintained at agreed designated positions around the site.

4.35. Control of Airborne Dust

The *Contractor* shall take such preventative measures as may be necessary to ensure that the spread of dust during the Works is kept to an absolute minimum, as described in the CEMP RP/3409320.00/PROJ/00023 A. The *Client* will install dust monitoring equipment prior to commencement of work to establish baseline and continuous measurement throughout the contract.

The *Contractor* shall support and provide information for the LLWR dust management plan within 10 weeks after the Contract Date including details of the measures that will be taken to control dust as identified in the CEMP.

4.36. The *Client*'s Environmental Responsibilities

The *Client* is responsible for ensuring that all *Contractors* working on site meet statutory requirements for environmental protection, this is achieved by:

- Ensuring that *Contractors* are made aware of the EHS&Q Policy and of any environmental improvement programmes operated by the *Client;*
- Ensuring that *Contractors* comply with relevant Rules and Instructions;
- Informing *Contractors* of site discharge limitations;
- Ensuring that *Contractors* follow the waste hierarchy and comply with ultimate safe and compliant disposal of all waste arising from their activities;

The *Clients* Environmental representative will be responsible for ensuring *Contractors* comply with site rules and procedures, including *RSM 08 -2.6 Environment and 7.1 – Safe Management of the Environment.*

4.37. Confidentiality

Contractor must comply with all regulations and seek approval from the *Client* before issuing any information relevant to the Works to any third party not identified within the Contract. This includes, but is not limited to, any publicity.

4.38. Information Classification, Handling and Disposal

There is not any Sensitive Nuclear Information (SNI) in relation to the Minor Civils Scope, and no SNI is to be produced by the *Contractor* as part of the Contract. Therefore, all information produced as part of the Minor Civils Contract is to be classified and marked OFFICIAL as a minimum. RSG 18.03_01 provides guidance on how information is to be appropriately classified, marked, shared, handled, transferred and appropriately disposed of.

4.39. Audits and Inspections of Arrangements for Handling Information

The *Client* is required to undertake reviews and inspections of *Contractor* arrangements for handling OFFICIAL documentation on this Contract. The nature and frequency of proposed inspections will be at the discretion of the *Client*.

4.40. Nuclear Industries Security Regulations 2003 (NISR)

Regulation 22 of NISR 2003 requires maintenance of such security standards, procedures and arrangements as are necessary for the purpose of minimising the risk of loss, theft or unauthorised disclosure of, or unauthorised access to, sensitive nuclear information. The principal person in any body holding sensitive nuclear information is further required to ensure that all his officers, staff, Contractors and consultants are familiar with the required security standards, procedures and arrangements for the protection of sensitive nuclear information.

4.41. Security and Protection of Site

The *Contractors* attention is drawn to the fact that the Works are to be executed on a licensed nuclear site subject to, inter alia, the *Client's* Site Licence and the provisions of the Official Secrets Acts 1911 to 1989 and the Nuclear Installations Acts 1965 and 1969 ("the Acts" for the purposes of this Clause). The requirements of the Site Licence and the Acts require that access to the *Client's* site will only be granted to those issued with an appropriate Site pass ("the Site pass") and only for the purposes of the services for which that person is engaged.

The *Contractor* will comply with the RSM 08 – 2.11 Security and *Clients* Site Rules, including *SR&P 001 Site Rules* and *SR&P 004 – Security Procedure.* These documents detail the security measures to be followed by all persons, the security control of those entering the site and the control of sensitive documents and *Clients* property.

Associated documents are:

- RSP 18.01 Security Management Framework;
- RSP 01.09 Awareness of the Hazards and Risks for Authorising Individuals Entering Low Level Waste Repository Site;
- Policies:
  - 025 Security Policy;
  - 001 Cyber Security & Information Assurance.

4.42. Security and Identification of People

The *Clients RSM 08 – 2.11 Security in conjunction with RSP – 18.02 MANDATORY SECURITY REQUIREMENTS FOR PERSONS MAKING ENTRY TO LOW LEVER WASTE REPOSITORY SITE and associated outstations,* refers. This procedure describes how to gain authorised access to Low Level Waste Repository Nuclear Licensed Site. It sets out the arrangements for security clearances and the training and documentation required for issue of site passes. Also described are the arrangements for entry of visitors to the site and the use of visitor escorts.

It is a criminal offence under the Acts to gain or attempt to gain unauthorised access to the Site and any unauthorised retention of Site passes will be reported to the Police for them to action as appropriate.

Site passes are issued to *Contractor* employees on an individual basis and the employee is personally responsible for the safe custody of the pass. Retention of the pass beyond the legitimate reason for holding it is regarded as a serious non-compliance and will affect an employee's future application for access to the site.

There is a standing requirement to wear and display site passes at all times within the licensed site.

All pass holders must be instructed that site passes must not to be displayed outside the *Clients* premises. Passes should be removed when leaving the site and must not be in public view when visiting local shops, garages etc. Failure to comply with this instruction may lead to disciplinary action being taken against the individual concerned.

It is a serious non-compliance to misuse a Site Pass. Tampering with a pass or allowing another person to utilise your pass will result in the Contractor's employee's pass being withdrawn and possible future access to the site denied.

Furthermore, a failure to clearly display a pass when required to do so may also lead to disciplinary action. On the last day of employment on the *Client's* site by an employee, the *Contractor* shall return the Site pass to the *Client's* Site Pass Office.

Temporary replacements for lost or forgotten passes, as well as the issuing of Visitor passes, can all be obtained at the site gatehouse reception.

Contractor employees who transfer from one *Contractor* to another must return their existing pass, to the LLWR Security Team. The relevant pass sponsor must then complete another application for site access. This will not be subject to further security clearance if the change occurs within the period of validity of the original site pass.

A *Contractors* pass is subject to annual renewal. Sponsors must indicate the requirement to extend the duration of validity during the normal pass renewal process.

Non-working visitors to site must be booked in at Site reception a minimum of 2 working days in advance, by a Superintending Officer or Pass Sponsor (LLWR Security Manager) or deputy. . On arrival, they will be issued with a visitor pass and arrangements made with their escort or host to collect them from the reception area and escort them whilst on site.

Lost passes must be reported in the first instance to the LLWR Security Team, Superintending Officer. A temporary pass will be issued at Site reception only when verified to do so, the temporary pass will be valid for 10 working days. If after 10 days the pass has not been found, a new permanent pass will be issued. If the pass is found, the individual must report to LLWR Security Team with both passes in order to revalidate the original pass. If an individual forgets their pass, a temporary pass can be obtained by visiting Site reception.

To obtain passes, a baseline security clearance must be obtained, via the *Client.* It should be noted that clearance for the issue of passes can take several weeks, typically 6 – 8 weeks, with SC (higher security clearance) taking considerably longer.

The *Contractor* shall comply with and implement all security procedures required and meet all costs of complying therewith, including loss of time by staff, workmen and vehicles, due to screening, the issue and examination of passes, and routine searching.

Security clearance will also need to be renewed on a periodic basis to meet the regulations.

Any known or suspected security breach must be reported immediately to the *Client*.

4.43. Protection of Existing Structures and Services

The *Contractor* must prevent damage to any existing services, structures, features, buildings, plant and equipment, which are to remain fully functional and in position during the execution of the Works.

Refer to Section 4.8 for Temporary Works process.

With regards to existing services, the *Contractor*:

- Before starting Works, must confirm and mark positions of existing mains/services;
- Shall adequately protect and prevent damage to all services, and not interfere with their operation without consent of the *Client*;
- If any damage to services results from the execution of the Works, *Contractor* to immediately notify the *Client*. The *Contractor* shall make arrangements for the work to be made good without delay to the satisfaction of the Client / Service authority or other owner as appropriate. Any measures taken by the *Client* to deal with an emergency shall not affect the extent of the *Contractor's* liability.

With regards to existing structures the *Contractor*:

- Shall provide and maintain any temporary Works necessary to preserve the stability of existing structures on the Site or adjoining that may be endangered or affected by the Works;
- Shall monitor adjacent structures and immediately report excessive movement to the *Client*.

4.44. Protection of the Works

The *Contractor* is responsible for protecting the Works until hand-over to the end user is complete. Wherever work is of an especially vulnerable nature or is exposed to abnormal risks the *Contractor is to* provide necessary protection to ensure that damage does not occur.

The construction methods and sequence selected, shall not induce undue stress or strain or cause degradation of the Works during construction, such that the scope is not delivered in accordance with the Contract documents.

4.45. Drying Out the Works

The *Contractor* shall dry out the Works and services as necessary to facilitate the progress and satisfactory completion of the Works and services.

4.46. Cleanliness of the Roads

The *Contractor* is responsible for keeping all their work areas in a clean and tidy condition which is commensurate with the expectations of a licensed site. LLWR are also obliged to respond to certain planning conditions. Condition 9 concerns wheel cleaning. LLWR's approach is to segregate earthworks haulage vehicles from site traffic to reduce the health and safety risk. This also has the benefit of minimising dirt and debris on the site roads and minimises the risk of transfer onto the public roads. However, the haul road will not be complete during the Minor Civils contract and the site roads will be used to transport plant, materials and equipment through the site, increasing the likelihood of build-up of dirt.

The LLWR requirements for cleanliness of the roads are set out below.

1. Only vehicles licenced to travel on the public highway will be allowed on the site roads. The use of dump trucks and or other large earthmoving vehicles above 6t weight limit, must be restricted to the new haul route, contractor's compound and stockpile areas;

2. The phasing of the Minor Civils work as outlined above means that the wheel wash must be installed and functioning early in the contract due to the increased risk of debris and dirt from use of haulage on the site roads. Drawing RD 845 shows the location and arrangements of the Wheel Wash facility including approach roads, which must be completed 30 weeks after the Contract Date;
3. The *Contractor* is responsible for taking measures necessary for keeping the site roads clean and preventing any dirt or debris from being carried out onto the public roads before and after the wheel wash is installed. The installation and operation of the wheel wash does not relieve the *Contractor* of this obligation;
4. LLWR will instruct the *Contractor* to suspend the use of the site roads for construction traffic if road cleanliness is not maintained. The *Contractor* will be liable for any resultant delays or additional cost resulting from such. It is essential to prevent dirt arising from the *Contractor's* operations being carried out onto the public roads. This will be considered a breach of planning condition 9. If such an event occurs, the *Contractor* is responsible for cleaning the roads and will bear the cost.

The *Contractor* is responsible for procurement, installation, maintenance, operation and repairs to the wheel wash for the duration of the contract. Until a piped water supply is available, the *Contractor* is to arrange for water supply and top up. The *Contractor* is also to provide and maintain a generator to power the wheel wash.

The wheel wash may be used by any HGV, including those not associated with the Minor Civils Contract, if it is necessary to prevent dirt being transferred onto the public roads.

The layout of the compound and position of the wheel wash during the Minor Civils phase is shown on drawing RD 845. The wheel wash is to be procured new and supplied to the specification below:

4.46.1. Wheel Wash Design and Specification

The *Contractor* will procure, install operate and maintain the wheel wash. The *Contractor* will determine the make and model of the wheel cleaning facility in accordance with the specification requirements which are set out below. The standard required will be similar to Wickham Gensol's '4mtr Tornado Wash'. Refer to Appendix F for wheel wash manufacturer's specification.

The wheel cleaning facility will be in the *Contractor's* Compound as shown in Sketch RD 845 and shall be a self-contained, surface mounted unit which will incorporate rumble access grids. The vehicle wheels will be cleaned automatically by water jets directed at the wheel treads, side walls and undercarriage. Side screens will contain the spray. The facility will be equipped with a settlement tank to separate and collect the silts, solids and any hydrocarbons washed from a vehicle. The unit will be suitable for vehicles up to 44 tonnes in weight and can clean both articulated, or rigid bodied vehicles up to a maximum width of 3.3m. A wider bespoke unit to incorporate a hand lance and the space to use it, to enable cleaning of dump trucks is required. This is for the sole purpose of the occasional cleaning the chassis of dump trucks prior to vehicle servicing or prior to leaving site on a low loader.

Requirements:

1. Proprietary wheel cleaning system;
2. Rumble Road design on ramps and over the wash platform;
3. Automatically activated;
4. High volume, solid stream nozzle jets focused on wheel treads, side walls and undercarriage;
5. Side spray high volume fan nozzles to clean the outer tyre wall and skirt;
6. Entry and exit spray to clean front and rear bumper and final wheel rinse;
7. Side screens to confine spray and debris;
8. Water to be collected and recycled for continuous re-use.
9. Waste directed and collected in a settlement tank with stages for recycling the water, collect large solids, silts and surface oils;

10. Removable internal grids on the wash platform to enable cleaning;
11. Settlement tank arrangement to facilitate emptying for silt and water removal;
12. A top up water supply will be provided;
13. Bespoke widened unit to enable safe hand lancing for chassis cleaning of dump trucks;
14. Proposed unit to be submitted to LLWR for acceptance prior to procurement.

Maintenance:

The wheel washing facility is expected to require low maintenance because it will recycle the water used for washing.
Periodic emptying of the wash platform shall be carried out facilitated by the removal of the rumble grids.
Periodic emptying of the settlement tank will depend on the rate of accumulation of silt and debris. Maintenance shall be timed outside normal delivery periods, so the system can be taken out of use to ensure continuous compliance with Planning Condition 9. Nozzles and hoses will be checked regularly for blockages, wear and damage and if necessary repaired or replaced.
Any hydrocarbons collecting between the baffle plates will be soaked up using oil booms / blankets before disposal via the site approved waste route.
Non-hazardous silt shall be removed and may be retained on site for spreading, drying and recycling back to acceptable fill, by blending with other spoil. If the silt is found to contain hazardous material, it is to be disposed of in accordance with site procedures.

A regular maintenance regime shall be established to ensure that the wheel cleaning facility continues to operate efficiently. In the event of a breakdown, deliveries by heavy goods vehicles to Site will be suspended if necessary until the facility is operational again. For short break down periods of say 1 to 2 days, the hand lance pressure wash facility referred to in **Requirements**, item 13 above, may be used but only if it is effective.

The access to and from the wheel wash will be a paved surface which will be kept clear of debris. Surface water will drain to an oil interceptor.

4.47. Traffic Management

This section is to be read in conjunction with 4.46.

The *Contractor* shall comply with the *RSM 08 Sections 3.6 - Safe Management of Contractors' Temporary Buildings and Assets in Compounds and Other Allocated Areas, 4.5 - Safe Management of Plant and Equipment (including PUWER) and 4.6 - Safe Use of Vehicles, Roads and Car Parks* and the *Client's* Traffic Management Plan (ref: SR_P 002).

The *Contractor* will be permitted to use roads and paved areas within the Site as authorised by the Client and described below. The *Contractor* shall keep roads and pavements thoroughly clean and limit the weight, speed and class of vehicles as directed.

Segregation is a key principle in the site strategy, however this cannot be fully implemented until the haul road is completed. Consequently, during the Minor Civils Contract period, the use of the site roads is necessary. It is expected however that the *Contractor* will apply the principle of segregation whenever possible.

The Minor Civils Work will be in two general areas: -

- North of Street 7 – Works include the drainage lagoons, temporary drainage and haul road from chainage 1400 to 1580. Dump trucks will not be allowed on the site roads to deliver materials due to the likely degradation on the site road and the increased health and safety risk. Road licenced

delivery vehicles e.g. tipper lorries, are therefore to be used on the site roads. Unladen dump trucks may be escorted on the site roads to the work area by arrangement;

- South of Street 7 – Main works include development of the Contractors Compound and the storage area adjacent to the sidings, haul roads between chainage 000 and 650, the Drigg stream bridge crossing at Ch. 665 and Stockpile C. Delivery of earthworks materials to the haul road Ch.180 to 650 is via the street 4 plant crossing, therefore the only interface with site traffic is the Street 4 crossing and occasional interfaces on Street 6. Dump trucks may be used in this area if they stay on the haul road footprint. Protocols and controls are to be agreed with the *Client* to prevent normal site traffic from using Street 6 at the same time as haulage vehicles. Protocols are also to be agreed to enable dump truck movement to be stopped briefly in the event of a security incident or occasional access to the Marine Holding tanks. If it is necessary to haul aggregates from Contractors Compound via the site roads, prior agreement is to be made with the *Client* but only road licenced tipper lorries will be allowed.

Tracked vehicles shall be transported on low loaders.

The service ducts and chambers within the Site carry essential services. The duct covers are designed to carry normal foot traffic and on no account shall vehicles be driven over them.

Obstruction of roads, paved areas and accesses to Works buildings within the Site will not be permitted unless notice has been given in writing and approval obtained.

The *Contractor* shall note the speed limits applicable within the Site, contravention of which may lead to disciplinary action and permanent withdrawal of the Site Pass. Speed limits on the proposed haul roads will be as follows: -

- 15mph except on the approach and crossing of the Drigg stream bridge where it shall be 10mph;
- 10mph through other work areas.

The *Contractor* shall produce an effective project Traffic Management Plan in accordance with the *Client's* Management Systems to supplement the *Client's* Traffic Management Plan.

Any additional traffic management measures required to execute the Works, shall be proposed by the *Contractor* and agreed by the *Client*.

4.48. Condition Survey

There are limited 'as built', or existing conditions drawings and information available. The accuracy of any information issued cannot be guaranteed, therefore the *Contractor* is to carry out existing condition surveys of the site roads jointly with the Client, prior to use and the provisions of 4.47 above.

As the use of the site roads is unavoidable, and dump trucks will not be used to haul acceptable fill from the sidings compound to the area north of Street 7, there will be no liability on the *Contractor* for repairs to site roads due to fair wear and tear. The *Contractor's* liability for repairs will be limited to mechanical impact damage, or fuel / oil spills for example, caused by the contractor or their Contractors.

The site road drainage on all routes used by the *Contractor* for hauling earthworks and aggregates are to be kept clear of accumulated dirt arisings by regular cleaning and maintenance of the road gullies.

Dirt arisings, collected in sweeper brushes shall be disposed of as follows: -

- Non-hazardous sweeper brush arisings may be retained on site for spreading, drying and recycling back to acceptable fill, by blending with other spoil;

- If the silt is suspected to contain hazardous material, it is to be tested and disposed of off-site in accordance with site procedures.

Drainage Surveys
The *Contractor* is to allow in the prices for c.c.t.v. camera surveys for 2 full days on existing drain runs to be advised by LLWR. A video recording and report are to be issued to LLWR by 16 weeks after the Contract Date.

4.49. Construction Setting out and Land Surveying

Control Stations:
There are a various control points located around the site. The *Contractor* will be provided with an up to date station control list upon contract award. It is the *Contractor's* responsibility to establish their own construction station control and validate its accuracy.

Design Setting Out Information:
The design setting out information is supplied either as Setting Out Points (SOP's) within the detailed design documents, or within the 3D design AutoCAD models, which is summarised below:

- **Monitoring Infrastructure:** SOP's supplied within design documents;
- **Temporary Drainage:** SOP's supplied within design documents and 3D design AutoCAD models;
- **Haul Road:** Supplied within 3D design AutoCAD models;
- **Stockpile Management:** SOP's supplied within design documents.

The *Contractor* is responsible for extracting relevant SOP information from the 3D design AutoCAD models and ensuring that that the works are installed as per the design.

The 3D design AutoCAD models will be supplied on contract award.

The *Contractor* is required to perform an Original Ground Level (OGL) survey, witnessed by the *Client,* to verify the accuracy of the Topographical data used to produce the design. The survey is to be completed following the tree clearance in each area as work proceeds. The last trees will be cleared before the end of March 2020. The *Contractor* to raise any errors or discrepancies in the data with the *Client* 2 weeks after the completion of the survey, to allow the *Client* time to address any issues.

4.50. Consideration of Others

The Works are to be undertaken adjacent to facilities that will remain operational. No disruption shall be caused to these activities unless agreed in advance by the *Client.*

The *Contractor's* attention is drawn to the following activities which are ongoing:

- LLW Container deliveries;
- On site grouting facility and operations;
- Movement of LLW /PCM drums/containers;
- General site deliveries, such as cement etc for container grouting, spares etc;
- PCM decommissioning and demolition operations.

Priority must always be given to the *Clients* site operations and administrative duties, unless agreed otherwise with the *Client.*

In addition, other Works and service will be undertaken during the Framework duration. Each Package Order enquiry will need to consider the needs of such projects. Where there is a need to determine respective priority or sequence of Works and Services, the *Client* will advise in Package Order enquiries.

4.51. Arrangements for liaison between parties

The *Clients* Project Manager (PM) will be the *Contractors* main point of contact for liaison between parties. The PM will be supported by the *Clients* Superintending Officer / Nominated Representative (SO/NR) and the Construction Manager / Principal Contractor. The PM will regularly consult with the *Contractor* about the progress of the Works and the interface with the *Clients* undertakings.

The *Client* shall identify all projects where access arrangements overlap, and all work shall be co-ordinated at such meetings as:

- Plan of the Day Meeting;
- Daily Focus Meetings;
- Weekly Site Integration Meeting.

The Contractor will be required to attend such meetings unless advised otherwise by the *Client.*

As per RSP 6.01 the Work Planner will also support the Project Team during the risk assessment stages and will ensure that key stakeholders are invited to the 'Stakeholder Meetings'.

4.52. Industrial Relations

It is the *Clients* policy to maintain a settled industrial relations climate onsite; this policy is achieved by:

- Harmonising the general terms and conditions of employment amongst a large mobile workforce comprising various disciplines and individual skills, employed by a number of different Contractors;
- Ensuring conformity to schemes of work patterns or procedures most likely to encourage good industrial relations;
- Ensuring that Contractors use the relevant labour agreements negotiated between the relevant trade unions and Clients' associations.

4.53. Employment of Local Labour

Where skills are comparable, it is Site preference that consideration is given to the use of local labour. This policy is achieved by:

- Having Contractual documents which encourage *Contractors*, when recruiting, to first prefer local labour;
- Monitoring, auditing recruitment practices by independent auditors.

4.54. Control of Site Personnel

As the Site is a Licensed Site, the *Client* has to meet certain conditions, one of which is retaining 'Command and Control' of operations on site. The Contractor will be responsible for the daily activities of his workforce, including putting them to work, but the *Client* must remain in charge of overall Command and Control, as detailed further in Section 10 and throughout this document. *RSM 08 – 3.6 Safe Management of Contractors "Temporary Buildings and assets in compounds and Allocated areas", 3.7 – Safe Management of Work in or on LLWR Plant and Buildings*

4.55. Compliance with the Client's Company and Business Unit Procedures

*R*SM 08 -3.7 Safe Management of Work in or on LLWR Plant and Buildings, provides a single source of information regarding compliance with LLWR's site standards and expectations as well as other items specific to working at the repository. The *Contractor* must ensure that all their employees and Subcontractors are aware of the LLWR requirements. Failure to comply with any of these requirements may lead to individual employees

being subjected to disciplinary procedures, instigated by the *Clients* Superintending Officer, in conjunction with the *Contractor*.

Non-compliance will not be tolerated from *Contractors*, agency supplied workers or Subcontractor personnel who visit or work within the *boundaries of the site*. The purpose of this note is to highlight to the *Contractor* some of the areas where compliance is essential, and non-compliance is likely to lead to some form of managerial action. In certain cases, non-compliance WILL result in exclusion from all of the *Client's* site. Those issues identified as resulting in exclusion have been selected on the basis that they are clear, visible and applicable to large numbers of people on the site, rather than, necessarily, their seriousness.

It should also be noted that the following list is not exhaustive, it only gives examples.

(i) Non-compliance's which will result in exclusion:
- Misuse of a Site security pass, including
  - tampering with a pass;
  - allowing another person to utilise your pass to gain entry to an area;
  - abuse of a security access control system e.g. Borer;
- any instance of eating, smoking or drinking or carrying the relevant materials in an Active Area;
- deliberate failure to adhere to barrier procedures in change rooms (entry and exit);
- driving above double the speed limit.

(ii) Non-compliance's which will lead to managerial action that may or may not include exclusion:
- Exceeding the Site speed limits;
- Unauthorised parking particularly in areas designated for emergency access;
- Failure to adhere to Operating Rules;
- Failure to work in accordance with the conditions designated on a Permit to Work or Approved Scheme of Work;
- Failure to wear designated PPE (including hard hats, earmuffs, protective clothing, safety harnesses);
- Failure to work in accordance with Site Licence Regulations e.g. sealed source procedures, film badge procedures.

(iii) Non-compliance's which may lead to managerial action:
- Wearing factory clothing outside the *boundaries of the site* in the general community (unless authorised formally to do so);
- Failure to display clearly a Site security pass;
- Failure to wear seat belts whilst driving within the *boundaries of the site* in Company or private vehicles;
- Failure of Drug and Alcohol testing.

The *Client* has adopted a zero-tolerance approach in respect of non-compliance with these standards and expectations.

It is very important for the *Contractor* to communicate this message to all employees about the standards and expectations we must work to in our changing environment.

4.56. Site Cleanliness

The existing standard of site cleanliness is to be maintained at all times.

The *Contractor* takes all necessary precautions to prevent nuisance from smoke, fumes, dust, rubbish vermin and other causes.

All work areas, parking and storage are to be kept in a clean and orderly manner, as befits a nuclear licensed establishment. The *Contractor* shall prevent paper and light material from blowing about and shall quickly recover any which might accidentally do so.

4.57. Waste Materials & Management

RSM 08 – 2.6 Environment and 7.1 Safe Management of the Environment are the *Clients* Site Instructions for managing environmental matters, including waste management, to be read in conjunction with RSM 08 – 6.5 Clearance and Exemption and RSP 2.13 – Disposal of Controlled Waste.

Contractors must ensure that they carry out their work on the basis of the following hierarchy for waste generation: Avoid, Reduce, Re-use, Recycle, Recover energy, Size reduce, Disposal.

Any *Contractors* generating waste must ensure they comply with the hierarchy and waste disposal process explained in RSP 2.13. The *Contractors* must:

- Make effective arrangements for the collection and disposal of waste from mess cabins, offices etc; any such waste awaiting collection must be kept in suitable containers such as waste bins with lids;
- Ensure that employees do not feed wildlife with food, food scraps etc;
- Make effective arrangements for cleaning of work areas, compounds etc and for the collection and disposal of rubbish, debris, off-cuts, unwanted material etc;
- The Contractors must ensure that all his work is planned and managed in such a way that no polluting material is discharged into any Controlled Waters either deliberately or accidentally;
- Comply with waste management plans prepared and approved for a task.

The *Contractor* shall provide suitable receptacles (e.g. skips) at convenient points for use by all the Subcontractors employed on the Site and shall empty them or replace them regularly. *Contractor* to appoint an individual as the "Skip Controller", who will be responsible to managing the Contractor's skips. All waste produced by *Contractors* on site must be securely stored in appropriate locations which have been agreed with the *Client* (represented by the Superintending Officer). It is the *Contractors* responsibility to ensure that the waste *Contractors* who removes any waste is registered with the EA. and the material must be disposed of at a suitably licensed Waste Management Facility. Details are given in RSP 2.13.

All skips and containers must be:

- Locked when not in use;
- Suitably covered to prevent waste being blown out;
- Clearly marked to indicate what materials they may be used for;
- Checked to be clear from contaminants prior to being brought onto site (e.g. written confirmation from Contractor that the skip has been cleaned);
- Located in positions agreed by the *Client.*

Contractors must not dispose of any low level waste. *RSM 08 – 6.5 - Clearance and Exemption of items, materials and wastes,* refers. Disposal will be by the *Client*.

Contractors will be advised by the *Client's* Low Level Waste Co-ordinator of the container/packaging/despatch arrangements/minimisation techniques to be used for the disposal of low level waste.

The *Client* will also specify the declaration forms that need to be completed by the *Contractors* and/or the low level waste skip controller for the particular area.

The *Contractors* shall not start any fire within the *boundaries of the site* without permission from the *Client's* SO who, for the purpose of this sub-clause only, will act for the *Client* and shall comply with all his instructions regarding siting, control and other safeguards. The *Contractors* shall inform the *Client's* SO immediately of any fire accidentally started whether or not the services of the fire brigade are required.

4.58. Deleterious and Hazardous Materials

RSM 08 – 4.15 COSHH covers the *Clients* rules and expectations to ensure that all hazardous substances used, produced or encountered by the *Contractors* or his Subcontractors are controlled, stored, used and disposed of in a safe manner. Please refer to Section 4.16 Hazardous Materials

For the safe management of Contaminated Land please refer to Section 4.13 Safe Management of Excavation Work

5. Contractor's Design

The following details the *Contractors* design responsibilities and requirements.

5.1. Contractors Design Responsibility

The *Contractor* is responsible for completing the following designs, refer to Section 2 for details:

- Drainage Settlement Lagoon D;
- Haul Road Modular Bridge Crossing;
- Haul Road Permanent Traffic Signage.

The design produced shall be to the standard sufficient to meet the procedures in use by the *Client.* Due to the highly regulated industry, these standards and level of design substantiation are more onerous than normal custom and practice.

Prior to engagement on a design, the *Client* will, where necessary, provide training on the procedure to be followed and expectations regarding the level of detail and standard of design documents to be provided by the *Contractor*.

The *Contractor* is responsible for ensuring that any functional specification is still valid, and formally accepted by the *Client* prior to the commencement of design development.

The following paragraphs detail the Client's engineering arrangements that the *Contractor* shall comply with.

5.2. Clients Engineering Arrangements

RSM 08 (Issue 4, April 2019, Section 8.0, pg. 61 Engineering and Design) provides details of the Engineering Capability organisation including key capabilities and roles and responsibilities. The emphasis in this Manual is the articulation of Design Authority (DA) and Design Intelligent Customer (IC) accountabilities, roles and responsibilities, which are held by the *Client*.

The *Client* will retain key CDM roles, as listed below:

- Client;
- Principal Designer.

5.3. Clients Design Engineering Procedures

The *Client* maintains a suite of procedures that guide the performance of engineering work performed. Some of the key procedures applicable to design engineering are described below. Not all of these procedures will be applicable to the Minor Civils Contract.

Additionally, with the approval of the *Client,* the *Contractor* may be allowed to use their own internal procedure if it can be shown to be equivalent and meets the *Clients* requirements.

5.4. Engineering Calculations

RSM 08 -8.0 Engineering and Design in conjunction with RSP 14.05 Engineering Calculations refers.

This section of the RSM 08 defines the requirements for the preparation and control of calculations. The procedure applies to both manual and computer-generated calculations for nuclear safety-related and non-safety related structures, systems and components.

With the approval of the *Client* the *Contractor* may use their own internal procedure if it can be shown to be equivalent to the RSM 08 and otherwise meets *Client* requirements.

For these works, it is envisaged that calculations will be produced and available for all structural elements of the following designs:

- Drainage Settlement Lagoon D;
- Haul Road Modular Bridge Crossing;
- Haul Road Permanent Traffic Signage.

5.5. Engineering Specifications

RSM 08 – 8.0 Engineering and Design in conjunction with RSP 14.06 Engineering Specifications.

This section of the RSM defines requirements and provides guidance for the development and control of specifications for the purchase of material, equipment, systems and professional services as well as specifications utilized for the installation of equipment and the erection/placement of materials. The procedure applies to nuclear safety related, important to safety and non-safety related applications.

The *Client* will typically use this procedure to specify material, equipment, systems and professional services required of the *Contractor*.

With the approval of the *Client,* the *Contractor* may use their own internal procedure for the specification of material, equipment, systems and professional services required of sub-tier Contractors if it can be shown to be equivalent to this RSM 08 and otherwise meets the *Clients* requirements.

5.6. Engineering Drawings

RSM 08 – 8.0 Engineering and Design in conjunction with RSP 14.07 Engineering Drawings (and supporting documents) refers.

This section of the RSM 08 defines the requirements for the preparation, checking and registration of engineering drawings. The procedure applies to both manual and computer generated (CAD) drawings.

While the process flow of this procedure is not mandatory, the procedure does contain mandatory requirements for the development of new or the modification of existing engineering drawings, including but not limited to: title blocks, drawing frames, symbology, layering, line weights, drawing registry, etc.

5.7. Engineering Reviews

RSM 08 – 8.0 Engineering and Design in conjunction with RSP 14.09 Engineering Reviews refers.

This section of the RSM 08 describes the requirements and key responsibilities for typical engineering design and life-cycle reviews. Design Reviews are an important activity in assisting projects to develop design engineering quality and in assuring that design engineering maturity is sufficient to progress through the various stages.

Engineering reviews will be required for the following designs:

- Drainage Settlement Lagoon D;
- Haul Road Modular Bridge Crossing;
- Haul Road Permanent Traffic Signage.

5.8. Technical Queries

RSM 08 8.0 *Engineering and Design* in conjunction with RSP 14.11 Technical Queries refer.

This section of the RSM 08 describes the procedure for review and disposition of Technical Queries (TQ) raised to request additional information or clarification of questionable items on projects for which LLWR has design responsibility.

Using the TQ system provides a uniform method of raising and resolving questions and provides an audit trail to ensure appropriate communication and accountability.

Use of this procedure is mandatory where Technical Queries are raised in connection with the Work Package.

Note: TQ's are to be managed using the document management system 4 Projects (4P), that will track from issue to close out through a workflow process.

5.9. Engineering Substantiation

RSM 08 – 8.0 Engineering and Design in conjunction with RSP 14.18 Design Justification Reports.

The *Contractor* shall produce DJR's for the below designs, to confirm the design intent and requirements are met in the design of:

- Drainage Settlement Lagoon D;
- Haul Road Modular Bridge Crossing;
- Haul Road Permanent Traffic Signage.

5.10. Design Co-ordination Responsibility

The *Contractor* is responsible for design co-ordination for all Works included in their scope. For co-ordination with other designs/projects/regulatory bodies etc. not included in their scope, liaison shall be via the *Client*, unless agreed otherwise.

5.11. Design Control

The *Contractor* is responsible for establishing the design processes and procedures to be used by the *Contractor's* design team and securing the approval of the *Client* where the *Contractor* wishes to use their own internal procedures where use of the *Client's* procedures in not mandatory. These processes must include the *Contractor's* internal checking, review and approval process as well as the external review and acceptance process where not specified by the *Client*.

Design documents required by the *Client* shall be submitted by the *Contractor* in accordance with the agreed programme early enough to allow considered examination thereof, re-submission if necessary, and to permit confirmation of acceptance before the relevant Works are carried out.

5.12. Suitably Qualified and Experienced Persons (SQEP)

The *Contractor* is responsible for ensuring that all design work is performed by SQEP personnel. This responsibility includes ensuring that all personnel assigned to the project are trained to the specific procedures to be followed in connection with the Works and the clear communications of expectations regarding compliance and the standard of design documents to be produced.

5.13. Design of Temporary Works

Where there is an impact / interface with existing site buildings, plant, equipment and facilities, the *Contractor* shall submit all temporary Works designs, to the *Client* for review /acceptance, prior to proceeding with the Works.

The Contractor shall ensure that all temporary works are approved by a suitably experience and qualified person, following the principles set out in BS5975:2008+A1:2011.

5.14. Contractor Designs Transmittal

The *Contractor* shall transmit design documents with a transmittal form containing as a minimum Contract Title and Number, Package Order Number and Specification Section reference (if applicable), Date of the submittal, Revision Number, and Responsible Designer if different from *Contractor*.

5.15. Vendor Drawings and Data

The *Contractor* is required to submit Vendor information in connection with third party designs and plant and equipment procured by the *Contractor* on behalf of the *Client*. This information may include (but is not necessarily limited to) Catalogue Cut Sheets, Vendor Design Drawings, Equipment Details, Shop Drawings, Product Data, Data Sheets, Manufacturer's Manuals and Instructions, Samples and Mock-Ups. The *Contractor* shall assume that the *Client* will require approval of Vendor information for all plant and equipment furnished by the *Contractor* for temporary and permanent installation on the LLWR site.

The *Contractor* shall carefully check all Vendor Drawings and Data prior to submission to the *Client* to ensure the accuracy and completeness of the information and compliance with the Works.

The *Contractor* shall transmit Vendor documents with a transmittal form containing as a minimum: Contract Title and Number; Package Order Number; Date of the submittal and Revision Dates; name of Manufacturer, Fabricator, or Contractor as applicable; identification of Product by description, Equipment Number, Model Number, Style Number.

5.16. Record Drawings and Data

5.16.1. Record Drawings

Current Drawings, reflecting actual field installation details, shall be maintained by the *Contractor* at all times. Drawings shall be red-penned / updated as the *work* progresses and shall be detailed to at least the same extent as the original design. These drawings shall be available for inspection at any time by the *Client*.

At completion of the works or handover, whichever is soonest, the contractor shall provide final marked up construction drawings marked with red – pen to show any as-built variation to the design. These drawings shall be stamped "As Built". All changes must be authorised and with a reference to the relevant document such as a Request for Information or Technical Query.

The *Contractor* shall submit one (1) paper copy and one (1) electronic copy (Adobe PDF on a CD) of each drawing.

5.16.2. Other Record Documents

Upon completion of manufacturing and supply of major equipment, the applicable shop drawings, diagrams, installation details, manuals and other vendor information shall be issued as Record Drawings.

The *Contractor* shall submit two (2) paper copies and one (1) electronic copy (Adobe PDF on a CD) of each document.

5.17. Design Approvals from Others

All liaison with regulatory bodies and authorities will be undertaken by the *Client*, supported by the *Contractor* where requested.

5.19. Commissioning

RSM 08 8.1Safe Management of Commissioning, read in conjunction with RSP 15.01 Commissioning & Pre-Operations refers.

The purpose of the RSM 08. (Repository Site Manual) is to define the Clients arrangements for delivery of Commissioning on the Repository Site and is the primary implementing procedure for compliance with Nuclear Site Licence Condition (SLC) 21 – Commissioning.

As the Site Licence Company, LLWR Ltd, is responsible for day to day control (management and operation) of the site and is directly accountable to the regulator for compliance with the conditions of the site licence. Site Licence Condition (SLC) 21 *Commissioning,* obligations are detailed in the RSM 08, with references indicating how each obligation is satisfied. It focuses on the delivery of Commissioning and, to a lesser extent, Pre-Operations activities in the context of project delivery.

The approach to Commissioning must be tailored for the specific task or project taking into consideration the size, complexity and risk to health and safety and to plant and equipment.

Typically, not all process steps in RSP 15.01 will be required and the associated documentation can and should be simplified where possible and if appropriate.

The following scope areas will have a commissioning interface:

1. Haul Road Street 4 Signalised Junction:
    a. The *Client* will supply and commission the power supply to the proposed traffic lights;
    b. LLWR commissioning team to witness the *Contractor's* testing and commissioning of the traffic lights. The *Contractor* to not give less than 14 days' notice to the *Client* of his intention to carry out such tests.
2. Environmental Monitoring Equipment (dust and water), refer to Section 3.7 for scope and manufacture recommendations:
    a. LLWR commissioning team to witness the *Contractor's* testing and commissioning of the of the equipment.
3. Contractor's Compound and Contractor's Office:
    a. LLWR commissioning team to witness the *Contractor's* testing and commissioning of any welfare and office accommodation. The *Contractor* to not give less than 14 days' notice to the *Client* of his intention to carry out such tests.

6. Completion

6.1. Completion Definition

In addition to the Contract requirements, the following are prerequisites for the Completion of the whole of the Works:

- Completion of all Works outlined in this Scope Document;
- Successful completion of testing and commissioning with appropriate certification;
- Removal from the site of all temporary Works, equipment, surplus materials, etc. and making good of any disturbance or damage including damage to the ground or structures;
- Works left secure with all accesses locked where required;
- All keys accounted for and adequately labelled and handed over to *Client* with itemised schedule, retaining a duplicate schedule signed by *the Client* as a receipt;
- All damage consequent upon the work made good;
- Works thoroughly cleaned;
- Moving parts of new work adjusted, eased and lubricated as necessary to ensure easy and efficient operation, including doors, windows, drawers, ironmongery, appliances, instruments, systems, valves and controls;
- Asset register of all plant or equipment procured, but to be left on Site, accepted by the *Client;*
- Handover and acceptance by the *Client*, of the final Lifetime Quality Records including information for the Health and Safety File.

6.2. Training

The *Contractor* shall provide any necessary training to the *Client* for any specialist equipment to be handed over to the *Client,* such as:

- Environmental monitoring equipment (dust, noise, water etc);
- Haul road signalised crossing.

6.3. Final Clean

The *Contactor* shall remove rubbish and debris as it arises, also surplus materials, temporary Services and plant, area by area as each is taken over by the *Client* and leave the Works perfectly clean internally and externally.

Cleaning materials and methods shall be as recommended by manufacturers of products being cleaned, and to be such that there is no damage or disfigurement to the Works or adjoining construction.

6.4. Correcting Defects

Notwithstanding the *Contractor's* obligations under the Contract, where restrictions are imposed by the *Client* due to site operations, the *Client* in advance of the *Contractor* correcting the defect(s) will give notice on; when, how, and any other constraints affecting correction.

6.5. Pre-Completion Arrangements

Any pre-completion arrangements will be detailed in the Contract or will be instructed by the *Client.*

6.6. Take Over

Notwithstanding the *Contractor*'s obligations under the Contract, RSP 08.02 Management of Contractors on the LLW Repository Site, details additional requirements relating to Contract Closure and Contract Performance.

The *Client* may take over part of the Works before Completion for the following typical reasons:

- To carry out commissioning and testing;
- To suit the *Contractor*'s method of working;
- To correct a Defect; or
- To undertake work in association with a nuclear incident, miscellaneous decommissioning Works and/or general operational activities.

Final take over the whole of the Works will occur on completion and in accordance with the Contract, unless instructed otherwise.

6.7. Hand Over Records

Hand over records are to be submitted and accepted by the *Client* to obtain Completion.

The *Contractor* will be responsible for production of all hand over records for matters such as:

- Lifetime Quality Records (LQR);
  - As built information;
  - Quality control/assurance;
  - Testing/Commissioning records etc.
- Operation and Maintenance Manuals;
- Information for the Health and Safety File.

6.8. Close Out

The *Contractor* shall assist the *Client* in establishing data on lessons learnt during the execution of the Works. There is a requirement to maintain and update, on a quarterly basis, rolling close out reports which captures data as it becomes available for re use elsewhere by the *Client*.

6.9. Document Control

4 Projects (4P) is the chosen Primary Document Management System to be used for the Minor Civils Contract. It is a collaborative web-based system that manages the revisions of documents and drawings which are controlled through built in workflows that show the progress from Author all the way through to Acceptance stage.

4P is managed by assigned administrators within LLWR's Document Control Team who have had extensive training on the system. The *Contractor* will be given access to relevant areas within 4P and LLWR Document Control will provide necessary training to the *Contractor*.

The *Contractor* must ensure that they have an appointment Document Controller.

7. Programme (Schedule)

7.1. Programme Key Dates:

In addition to the Contract terms requirements the *Contractor* shall comply with the following programme requirements and key dates.
All week references are number of weeks after Contract Date:

- Contract start date 2nd December 2019;
- Surface Water Management Plan to be submitted by end of week 10;
- Dust Management Plan to be submitted by end of week 10;
- Mobilisation complete by end of week 12;
- Quality Plan to be submitted for approval by end of week 12;
- Procure 2No Turbidity measuring units by end of week 12;
- CCTV survey and report to be completed by end of week 16;
- Complete trial holes for lagoons, compound D and Haul road crossing by end of week 18;
- Wheel wash and associated road to be complete by end of week 30;
- Complete Drainage lagoons and associated drainage by end of week 49;
- Complete haul road from ch.000 to Stockpile C by end of week 49;
- Contract Complete by end of week 88.

7.2. Programme constraints

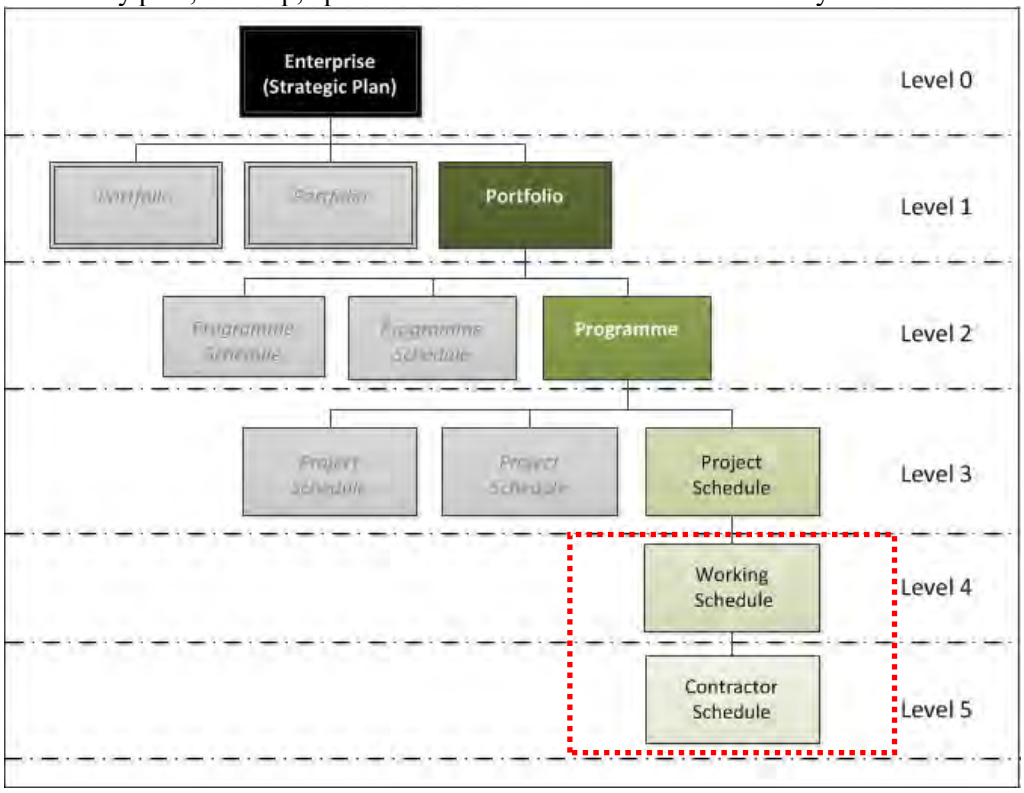
- The haul road is to be complete from ch.000 to Stockpile C before carrying out haulage of earthworks materials to and from Stockpile C;
- The Stockpile C area will not be available to commence works until 01 October 2020 due to ecological constraints with great crested newts and potentially nesting birds;
- Lagoons E and associated mound 2 and stockpile B temporary drainage, to be completed and commissioned before haul road ch.1400 to 1580 starts. This is to enable control of surface water and minimise the discharge of suspended solids to Drigg Stream before disturbing mound 2;
- Haul road outfalls, drainage swales to be completed before haul road earthworks commence;
- The haul road from Ch. 000 to 650 is to be complete before the bridge crossing is commenced;
- The haul road bridge crossing (ch.650-680 approx.) is to be completed before the section of haul road from ch.680 to 950 commences.

7.3. Clause 31 Programme

The clause 31 programme is to be submitted as described in Sections 7.4 and 7.5 below. The contractor is also to provide a mass haul diagram showing cut to fill location, destination and timing including plant resources for earthworks including capping and subbase.

7.4. Programme Requirements

The *Client's* schedules are structured in a six-level hierarchical structure, with levels 3 to 5 being the levels at which they plan, develop, update and maintain. The schedule hierarchy levels are shown in the diagram below:



The *Contractor* shall provide schedules at Level 5, that consist of a Clause 31 schedule for acceptance at Contract award, compatible with the *Clients* programming requirements, and relevant Clause 32 schedules as per the Contract requirements.

The *Contractor's* schedules are to be structured in a manner that enables the *Client* to efficiently update the level 4 working schedule. Therefore, to support the integration of level 4 and 5 schedules, the *Contractor* shall include the following Works Breakdown Structure, as a minimum in their Clause 31 and 32 schedules.

Minor Civils - Scope

No.	Task Description
1.0	**Monitoring Infrastructure**
	Required activities to complete scope detailed in Section 3.1.
2.0	**Temporary Drainage**
2.1	**Temporary Settlement Lagoon B (inc. Temp Drain Ch 0 to Ch 55 (up to Mound 1)**
	Required activities to complete scope detailed in Section 3.1.1.
2.2	**Temporary Settlement Lagoon D**
	Required activities to complete scope detailed in Section 3.1.3.
2.3	**Temporary Settlement Lagoon E**
	Required activities to complete scope detailed in Section 3.1.4.
2.4	**Mound 2 Temp Drain (inc. stockpile B eastern section) connect to Lagoon E**
	Required activities to complete scope detailed in Section 3.1.5.
3.0	**DP5 - Haul Road**
3.1	**Section Ch 0 to 180 (Adjacent to Contractor's Compound)**
	Required activities to complete scope detailed in Section 3.2.
3.2	**Section Ch 180 to Ch 200 (Street 4 Crossing)**
	Required activities to complete scope detailed in Section 3.2.
3.3	**Section Ch 200 to Ch 660 (Link to Stockpile C)**
	Required activities to complete scope detailed in Section 3.2.
3.4	**Bridge Crossing (Drigg Stream Ch 670)**
	Required activities to complete scope detailed in Section 3.2.
3.5	**Section from Drigg Stream Bridge Crossing to Ch 950**
	Required activities to complete scope detailed in Section 3.2.
3.6	**Section Ch 1400 to Ch 1580 (Mound 2 to Trenches Ramp)**
	Required activities to complete scope detailed in Section 3.2.
4.0	**Stockpile Management**
4.1	**Contractors Compound - Running Surface Establishment**
	Required activities to complete scope detailed in Section 3.3.2.
4.2	**Stockpile C**
	Required activities to complete scope detailed in Section 3.3.1.
5.0	**Contractor's Compound - Site Compound Establishment**
	Required activities to complete scope detailed in Section 12.4.
6.0	**Contractor's Office Establishment – Adjacent to Stockpile C**
	Required activities to complete scope detailed in Section 12.4..
7.0	**Miscellaneous Works**
	Required activities to complete scope detailed in Section 12.4.

Table 5: Work Breakdown Structure Requirement

7.5. Programme Arrangement

The *Contractor* shall use planning systems and computer software which is Primavera P6 (version 17) compatible.

Minor Civils - Scope

The schedules/programmes provided are expected to be a cost and resource loaded Gantt chart identifying discrete activities; dependencies, activity start and finish dates, activity durations and critical path which are demonstrably achievable.
As a minimum, the programme should include the following headings:

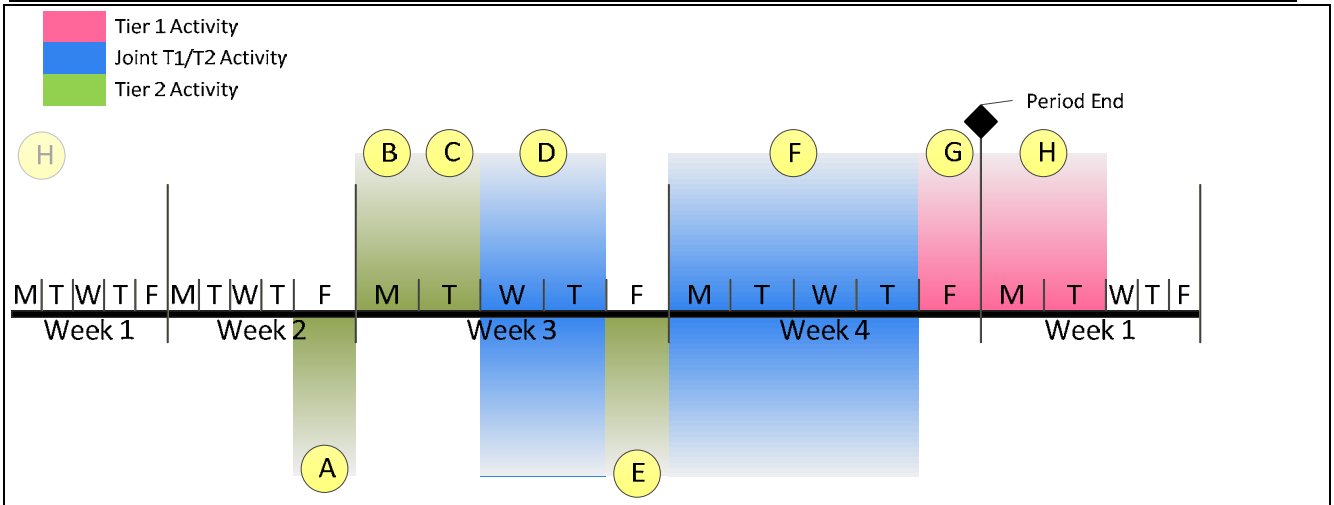
- Activity ID;
- Activity Name;
- Baseline Start;
- Baseline Finish;
- Actual Start and finish;
- Forecast Finish;
- Planned Value;
- Earned Value;
- Remaining Value;
- Schedule Variance (SV) both cost and duration;
- Total Float;
- % Complete.

For each reporting period, a submission is required for each package which provides the following information (Refer to Appendix A for latest LLWR reporting calendar):

- Forecast of the total Time Charge and expenses for the whole of the package (EAC) split per period (as per LLWR period ends);
- Explanation of the changes made since the previous forecast;
- Earned Value based on Works completed aligned to the current programme including a monthly forecast of earned value.

Please see the following timeline of the Clients reporting requirements:

Minor Civils - Scope



A	Tier 3 schedules (Level 5) submitted to Tier 2 Contractor, 2 weeks prior to period end. Update to include actual work complete to that point and two weeks forecast to period end.
B	Progress reviewed and updated in Level 4 schedules.
C	Forecast BCWP profiles issued to Tier 1 & 2 Cost Engineers/QS.
D	Joint progress and EAC assurance reviews with PM, Planner(s), Cost Engineer/QS(s).
E	Cost Report and application for payment issued to LLWR.
F	Joint cost assurance reviews and revisions.
G	Progress update of Level 3 schedules, 12.00 noon deadline and upload of BCWP and forecast to G2.
H	Actual cost and EAC upload to G2 and final reporting.

Figure 5: Client's Reporting Requirements Timeline

The *Contractor* shall forward the electronic copies (xer files and pdf) of all programmes to the *Client* for comment and, following accommodation of the necessary requirements, the *Contractor* shall forward further copies to the *Client* for distribution and retain one copy on Site.

7.6. Work of the Client and Others

The site is operational, as such the *Clients* daily operations are effectively continuous.

The LLWR site operates as a Nuclear Licence Site with daily operations including activities such as receiving LLW HHISO by rail and road, grouting and storing containers, routine and facilities maintenance various programmes and projects including PCM decommissioning, Security Enhancements and Asset Refurbishment.

All interfaces between Client and Contractors is managed through the Weekly Site Integrated Plan. Please refer to RSP 6.01 and RSG 6.01 for all scheduled meetings that require interface.

7.7. Document Submission and Approval Timescales by the Client

In addition to the standard periods for reply of the contract, the following typical response/period for reply times are required for the *Client* to review and accept key documentation.

	Document Type	Client response time	Need for DRC *
General			
Design			
	Design Basis Documentation	2 weeks	
	Calculations	3 weeks	
	Configuration Baselines	3 weeks	
	Design Drawing	3 weeks	
	Design Specifications	3 weeks	
	Technical Reports	3 weeks	
	Design Reviews	3 weeks	
	Design Assessment Report (DAR)	2 weeks	
	Design Justification Report (DJR)	2 weeks	
	Pre-commissioning Safety Report (PCSR)	2 weeks	
	Design Authority Technical Review (DATR)	3 weeks	
Construction			
	Method Statements & Risk Assessments	*3 - 4 weeks	Yes
	Quality Plans	2 weeks	Yes
	Inspection and Test plans	2 weeks	Yes
	Materials Proposals Acceptance	2 weeks	
	Acceptance of Contractors proposed Competent Personnel	2 weeks	
	Other submissions not listed above	2 weeks	
Commissioning			
	Commissioning arrangements / plans	6 weeks	
	Operation and Maintenance Instructions	6 weeks	Yes
	Contractor proposals for *Client* Training	6 weeks	
* Subject to Document Review Committee (DRC) review. Refer *to* DRC Timeline for details Method Statements & Risk Assessments review period.			

Table 6: Client Response Time to Documents

7.8. Information Required

Programmes for the respective work shall be submitted in accordance with the Contract and shall:

- Have an agreed baseline which is only changed through the relevant Contract terms;
- be structured to support 'earned value' monitoring to provide cost, schedule and earned performance indices and graphs; be supported by associated resource and quantities to validate the logic and duration of each discipline or Area of the Services;
- be on a Section, Phase and Area basis.

Programmes shall include the following information:

- Start dates, key dates and completion date;
- Planned Completion;
- Order and timing of the operations which the *Contractor* plans to do, which shall include:
    - Sufficient level of detail to enable *the Client* to co-ordinate the operational requirements of respective area and associated activities of all direct *Contractors* in an area, to optimise progress of the proposed Works;

- Design, procurements, fabrications, installations, sequencing, interfaces and commissioning activities.

- Total Float;
- Terminal Float;
- Provision of Time Risk Allowance;
- Any *Client* or third-party interfaces that can affect the *Contractors* Works, including issue of permits, drawings and other design information and approvals, approval of S*ubcontractors* and the like or other factors that may impact on the required accesses and overall co-ordination of the Works.

7.9. Revised Programme

The *Contractor* shall subsequently keep respective programmes up to date by recording progress monthly (in line with LLWR reporting calendar), or at shorter intervals as necessary, for adequate control of the work and in accordance with the Contract. Programmes to be supported by a narrative statement reference to any advancement / slippage.

The *Contractor* is within their right to submit a clause 32 schedule at any point, but the *Client* recommends this be done in-line with period end reporting timescales; a revised schedule should be submitted on the last day of the period, for review, acceptance and implementation by mid-period of the following reporting period. This then allows time for updates to be made, as per the reporting timeline in Section 7.5.

In addition to the Clause 32 schedule updates, the *Contractor* shall provide weekly programme updates, including the following:

- *Contractor* to provide a 3-week rolling programme on a weekly basis.
- *Contractor* to provide metrics report based on the agreed programme as per the table headings below. Activities to be agreed for reporting metrics by end of week 13.

Activity	Forecast previous week	Actual In the previous week	Cumulative actual to end of week	Forecast for next week	Comments

Minimum metrics required to be reported on:

- Earthworks cut (m3);
- Earthworks fill (m3);
- Completed swale (linear m);
- Completed chambers (no);
- SSOW packs;
- Inspection and Test Plans;
- Imported materials by rail;
- Imported materials by road;
- Life time records.

8. Quality Management

The *Client* requires the *Contractor* to be committed to meeting the appropriate quality standards specified in the Contract.

8.1. Quality Management Systems and Management

The *Contractor* shall operate a formal Quality Assurance (QA) system in accordance with International Standard BS EN ISO 9001:2015 together with any specific requirements set out in the Scope.

The *Contractor* should appoint an experienced and competent Quality Assurance management representative, supported by competent experienced personnel, to oversee all activities and tasks needed to achieve a desired level of excellence. All Quality Control personnel or Subcontractors utilised by the *Contractor* should be suitably experienced to enable them to perform this function.

Designers and operatives must be appropriately skilled and experienced for the type and quality of Works and services undertaken.

8.2. Quality Assurance Programme

The Contract Quality Assurance programme details the management structure and levels of responsibility and authority of personnel involved in the Contract and their specific responsibilities for site quality assurance activities and the interface arrangements between, the *Client*, Others, the *Contractor* and Sub-Contractors.

The *Contractor* provides a quality policy statement and quality plans to demonstrate that the work meets the required standards, to be submitted to the Project manager for acceptance within 12 weeks of the Contract Date.

8.3. Quality Plans

The *Contractor* must provide Quality Plans which identify the design, manufacturing and installation operations, the inspections and tests, the relevant drawings, specifications, procedures and/or instructions and the records specific to the items covered by those quality plans. The Quality Plans cover all items of Equipment, Plant and Materials supplied and installed and all work carried out. They identify relevant drawings, weld procedures, NDT procedures, processes and the activities requiring *Client* approval before any commencement of work. They also identify any inspections and tests required for statutory purposes and those outlined in the Scope, and the required 'Hold' Points which will stop the process until these inspections are passed or completed. Repository site guidance RSG 05.04_01 Quality Plan Guidance and Repository site procedure RSP 05.04 Quality Plans offer guidance on the production of quality plans.

The *Contractor* shall submit all Quality Plans, records and documents for acceptance by the *Client*. The records shall be compiled coincidental with their related activity and suitably indexed and uniquely identified, when related to *Contractors* activities. Where responsibility extends to Design, the review, checking and approval of design output, shall be suitably qualified and experienced personnel, independent of those having responsibility for the work performed.

Unless stated otherwise the *Contractor* submits to the *Client* for comment the first Quality Plan no later than 12weeks after the Contract Date of the Contract and prior to the Works commencing. No Works should be commenced prior to the approval of the *Client*

Once submitted, no departure is permitted from the Quality Plans without prior acceptance of the *Client*.

The *Contractor* maintains records as required by the accepted Quality Plans, Inspection and Test Plans and appropriate specifications.

The records will include as a minimum:

- Identification of the element, item batch or lot and its location in the *Contractor's* Works. This includes earthworks materials excavated from other areas of the site;
- The nature and number of inspections carried out and a reference to the location within the Works;
- The number and type of deficiencies found;
- Details of any correction actions taken;
- Documents marked up to show accurate progress of the *Contractor*;
- Responsibility and signatures of those performing the witness/inspection.

The compilation of records will be coincidental with manufacture and construction so that:

- The status of the Works can be readily certified at any point in time;
- The completed records are available at completion of the Works.

All the agreed Lifetime Records (LTR's), including those for non-site activities, shall be of a legible standard suitable for electronic scanning.

Copies of any document or record will be stamped 'True copy of Original' dated and signed.
Where the *Contractor* uses a Subcontractor, they will need to demonstrate to the satisfaction of the *Client* that they have a suitably robust management system for controlling the output from Subcontractor/Contractor and flow down of Contract requirements.

During the Contract, the *Client* monitors the implementation of the quality assurance arrangements. Monitoring shall be by means of surveillance of activities at the work locations and / or by formal audits of the adherence of the *Contractor* to the systems and procedures which constitute the quality assurance arrangements. A corrective action programme shall be agreed in respect of any deficiencies revealed by such monitoring.

The *Contractor* provides any facilities, including access, which may be required by the *Client* for monitoring/surveillance activities.

8.4. Quality Statement

The *Contractor* is to provide a Quality Policy Statement, which expresses their commitment to achieve the quality required.

Acceptance by the *Client* of the *Contractors* Quality Assurance arrangements or those of his Subcontractors will not relieve the *Contractor* of his obligations to meet the requirements of the Contract.

8.5. Procurement Quality Requirements

For purchase of goods, the *Client* operates a 'Product Master' system for goods specification approvals, at medium to high risk. Where relevant the *Contractor* will conform to this system. *RSP 5.14.03 - Quality Grade Selection Process* details requirements.

The *Contractor* will need to conform to the *Clients* quality grading system, which is ranked according to the risks involved. There are five grades as follows:

- Very high-risk Quality Grade 01;
- High risk Quality Grade 02;
- High/Medium risk Quality Grade 02P;
- Medium risk Quality Grade 03;
- Low/no risk Quality Grade 04.

The application of the Quality Grade to the scope results in an appropriate application of activity to mitigate the risks involved. This includes the level of approval of the *Contractor*, the requirement for an authorised specification, approval of Quality Plans, inspection, testing and certification. *RSP 5.14.03 - Quality Grade Selection Process* notes requirements.

All the Minor Civils scope is ranked at a Quality Grade 03, apart from the following exceptions, which fall into Quality Grade 2:

- Haul road bridge crossing (Drigg Stream Ch 670), due to conventional safety risks;
- Haul road signalised crossing, due to conventional safety risks;
- Drainage and monitoring elements that are imperative in ensuring the compliance with discharge consents and planning conditions, such as:
    - Settlement lagoons;
    - Hydrobrake and flow control chambers;
    - Environmental monitoring equipment (i.e. dust, noise, surface water);
    - Wheel wash;
    - Dust monitoring equipment.

8.6. Counterfeit, Fraudulent and Suspect Items (CFSI)

The *Client* is increasingly aware of the potential threat of Counterfeit, Fraudulent and Suspect Items (CFSI) with an obligation on to effectively control such risks and to prevent the use of Counterfeit, Fraudulent or Suspect items. The *Contractor* must be fully compliant with Contract requirements to prevent the use of Counterfeit, Fraudulent or Suspect items and ensure appropriate controls are managed within their supply chain.

8.7. Proprietary Products

Where relevant, products should be CE marked and the *Contractor* obtains Declaration of Conformance, for inclusion in LTR packs.

Where British Board of Agreement certified products are used, the *Contractor* complies with the limitations, recommendations and requirements of the relevant valid certificates,

8.8. Goods, Materials, Sampling and Testing Goods Requirements

The *Contractor* shall submit Material Approval Requests at least 7 working days prior to ordering of the applicable material, supplying any supporting product certification and test results. 4 Projects will be used as the Primary Document Management System, and the intention is to use a built-in workflow to manage the Material Approval Requests, showing the progress from Author all the way through to Acceptance stage. LLWR Document Control will provide necessary 4 Projects training to the *Contractor*.

The *Contractor* shall undertake compliance testing and sampling as per the design specifications.

8.9. Tolerance

Unless specified otherwise, tolerances will in accordance with the design specifications, relevant BS EN standards and the MCHW Specification for Highway Works.

9. Tests and Inspection

The *Contractor* shall undertake all necessary tests and inspections to confirm compliance with the Contract design / specifications and any specified Standard. The *Client* shall, witness tests and inspections. Such tests shall be within or outside the Working Areas.

Neither the acceptance of the *Client* or issue of a Safety Document relieves the *Contractor* of responsibility for ensuring that the *Works* and services conform to the Contract design / specifications and that all connections or adjustments are correctly made.

Construction activities carried out by *Contractor* should be performed on the basis of Inspection & Test Plans, (ITP's) and Inspection Check Lists (ICL's) or equivalent controlling documents, which should be submitted to the *Client* for acceptance as appropriate, depending on the complexity of the work and the importance for the safety of the system. Hold points and witness points should be established in the ITP's and ICL's by the *Contractor* to assess the activities concerned and verify their acceptability. A plan should be prepared by the *Contractor* to ensure that all design requirements and regulatory requirements are met during construction activities.

9.1. General Tests and Inspection

The Contractor:

- Develops the inspections and tests identified in his Quality Plan into a written inspection and test plan for acceptance by the Client. The Inspection and Test Plan will itemise in tabular form all key activities, controlling procedures, inspection requirements, related documentation and the records to be collated associated with that particular item of work;
- Gives the Client a minimum of 24 hours' notice of the conduct of inspections and tests for the purpose of witnessing them. Gives the Client for inspection for manufacturing off Site, but within the UK, 14 calendar days' notice and a minimum of 28 calendar days' notice for manufacturing taking place elsewhere;
- Allows free access to the Client to carry out the necessary audits, surveillance, inspections and tests and to prepare records;
- Records the results of all tests and inspections as per the approved ITP's and ICL's;
- Notifies the Client, in writing, if he becomes aware of any circumstances which are likely to result in any non-conformance or potential non-conformance to the Contract requirements;
- Provides all calibrated measuring and test equipment necessary to commission and test the Works and maintains current test certificates traceable to appropriate national standards. All test certificates to be made available before the commencement of the testing and commissioning and recorded as per the approved ITP's and ICL's.

The *Contractor* makes no connections or adjustments on Plant already in use or commissioned unless a safety document has already been previously issued by the *Client*. Moreover, none of the Works may be charged, energised or operated without the prior acceptance of the *Client*.

For a particular piece of Plant, it shall be subject to the *Client's* Custody/Safety Transfer scheme.

The *Contractor* submits copies of his and his Subcontractor's testing and commissioning pro-formas for acceptance to the *Client* prior to use as part of the Inspection and Test Plan acceptance process.

The *Client* reserves the right to perform further inspections or surveillance at his discretion.

The *Contractor* submits a copy of each certificate to the *Client* as soon as practicable and keeps copies of all certificates on site.

9.2. Management of Test and Inspection

Wherever inspection or testing shows that the work, goods or materials are not in accordance with the Contract:

- Will be at the expense of the *Contractor*;
- Will not be considered as grounds for a compensation event, unless the Defect is accepted.

The *Contractor* makes due allowance for the time required for final acceptance in his programme and provides access to the *Works for the Client* for inspection.

9.3. Non-Conformance

The *Contractor* reports any defects in to the *Client* without delay.

A non-conformance report will be raised by the *Contractor* proposing either suitable corrective action or a concession, for the Client to review and accept before remediation is carried out.

Details of defective work and deviations from the Contract will be included in the records to be supplied by the *Contractor*.

9.4. Clients Procedures for Inspection and Watching Tests

The Clients *RSM 08 - 3.1 Management and Supervision and RSP 8.03.03 - Verification of Construction Work* details the level of verification to be applied to a particular project and the method for carrying out that verification.

This practice is to ensure that *Contractors* are complying with the Contract Scope. The *Clients* Construction Management authorised staff verify by inspection and/or witness the *Contractors* activities.

The *Contractor* is to use the Default Verification Levels noted in RSF 08.03_01, to aid in the preparation of ITP's, which consist of the following:

- **A1** - 100% Inspection carried out by the *Client* when notified that the *Contractor* has completed his inspection activities;
- **A2** - A minimum of 10% of the *Contractor's* work is subject to inspection by the *Client*. The remaining 90% of work is subject to surveillance;
- **W1** - 100% witnesses carried out by *Client* of *Contractor* carrying out his Contractual inspection requirements;
- **W2** - A minimum of 10% of the *Contractor's* inspection activities is subject to 100% witness by the *Client*. The remaining 90% of inspection activities is subject to surveillance;
- **H** - Identifies a hold point which is applied as a control to further work. *Contractor* may not proceed to the next stage without *Client* authorisation;
- **S** - The surveillance activity is the on-going/daily monitoring of the *Contractor's* activity in accordance with the *Contractor's* controlling documents by *Client.*

10. Management of the Works and Services

The *Client's* Quality Management System (QMS) contains all policies, procedures, manuals, standard forms and guidance notes for the Repository Site and is available on the internal LLWR intranet system. Not all the QMS is relevant to the Minor Civils scope, therefore only applicable sections have been referenced within the tender documentation. If required by the *Contractor* any additional QMS documentation referenced in the tender documentation, but not issued as part of this tender, can be made available to the *Contractor* upon request during the tendering period.

Please refer to LLWR-RDP-T1.00-SC-017 - Tender Index Spreadsheet for the full list of LLWR QMS documents issued as part of this tender.

10.1. Supervision and Site Administration

The *Client* attaches the highest importance to the provision and maintenance of a consistent, efficient, effective, site-wide *Contractor* Management System.

Site management is defined as persons of the site licence company who are in command, control and supervision of operations and represent the company with whom the main *Contractor* has a contract.

- "Command" is defined as the authority over the *Contractor* or licensee to require that arrangements are put in place to ensure compliance with the nuclear site licence, discharge authorisations and other safety legislation and has the authority to stop or specify an operation;
- "Control" is defined as assuring appropriate arrangements are specified and implemented to permit work to proceed safely (at the work site). This responsibility lies with the Person Organising Work (POW) for LLWR employees and for Contractors it is the *Clients* Superintending Officer (SO).

The *Contractor* shall use Suitably Qualified and Experienced Personnel (SQEP) to administer the contract and deliver the Work Packages.

The *Contractor* shall ensure that adequate numbers of supervisors are deployed at the work front to ensure effective implementation of management measures whilst maintaining the highest housekeeping standards. The *Contractor* ensures that his supervisors are aware of their responsibility to supervise both the *Contractor's* own employees and all Subcontractors on the site.

The *Contractor* includes for within his management team the role of nominated manager for site liaison. Whilst the nominated manager may perform other roles within the management of the works, the *Contractor* ensures that this liaison duty is given a high priority throughout the contract.

The *Contractor* makes provision for a competent deputy manager to be available in the event of sickness or leave.

The nominated manager or deputy is available to attend, as required, any meetings with the *Client*, and Others. The *Contractor* makes due allowance for any exceptional meetings being outside normal working hours. The *Contractors* representative is prepared to discuss project progress and 'look ahead' activities or interdependencies, in particular those that may affect other work groups outside the Site.

10.2. Appointment of Competent Persons

The *Contractor* must appoint Competent Persons as follows before intervention work commences on site.

Contractors must propose their nominees for any of these competent person appointments by competing Form 0040 "authority to deploy". The form must be supported by a CV, training needs, qualifications, certificates, training certificates, role description and SQEP profile. When the *Client* [SO] has accepted the "authority to

deploy" in writing, the *Contractor* shall make the appointment on Form 0264 "Appointment of Managers and Supervisors with Safety Responsibilities". The *Contractor* will be expected to summarise this information in a Managerial/Supervising appointment matrix.

The *Contractor* must provide suitable evidence that operators are qualified and experienced (competent) to perform the tasks within their scope of work. This is particularly of importance when *Contractors* are likely to work in operational buildings and/or work will equipment that is designated as Safety Mechanism (SM), Safety Related Equipment (SRE) and/or Environmental Equipment (EE).

The Contractors Appointments, Training and Procedures (CATaP) ref: CATaP/JH/RDP/19/07 Section C lists the various Competent Person Appointments required.

10.3. Project Team – Others

The key contract management roles will be performed in accordance with the contract. The *Client* will be supported by the following, unless the roles are formally delegated to the *Contractor*:

- Superintending Officer (SO) – Undertakes 'Command' duties;
- Nominated Representative (NR) – Undertakes 'control' duties;
- Work Planner – Responsible for planning & Implementing work;
- Design Authority (DA) – Responsible for Design Acceptance;
- Intelligent Customer – Subject matter expert, understand and approve any bought in services that could impact on safety;
- CDM roles;
- Permit Office – Work control authorisations;
- Duty Manager;
- Building Manager;
- Duly Authorised Person (DAP) – Ensuring safety case compliance for particular locations;
- Senior Authorised Person (SAP) – Nominated 'ultimate' authority for approvals /advice on specialist disciplines.

10.4. CDM Roles

The *Client* will retain the roles of Principal Contractor and Principal Designer.

10.5. Communications

The *Client* is responsible for all external publicity and liaison with third parties, unless agreed otherwise.

10.6. Meetings

The *Client* holds meetings to review progress and other matters arising from the administration of the contract.

Every month to accord with the relevant period end in the reporting calendar, the *Client* holds a Monthly Contract Review of the *Contractor's* Progress Report.

The *Client* ensures the availability of office accommodation at the time of such meetings and attends all meetings and informs Subcontractors when their presence is required. The *Client* chairs the meetings and takes and distributes minutes. The *Contractor* ensures his attendance at all such meetings.

The following table outlines the required Meetings and Frequency:

Meeting	Purpose	Frequency	Contractor Input
Monthly Contract Review Meeting	Review of Contractor's Monthly performance	Monthly	Refer to 10.7.
Weekly Progress Meeting	Review of Weekly Performance, Safety, Quality, progress, programme, technical issues	Weekly	Project Manager and relevant Contractor personnel to attend and present including: - 3 Week Rolling programme. - Agreed Metrics - Weekly and Cumulative: Previous week Target Achieved Forecast for following week.
Construction Meeting	12 weeks look ahead and coordination of work organisation and planning across LLWR programmes and projects	Weekly (Friday)	General Forman/Works Manager, Agent or Senior Engineer. Includes pre-meeting mark-up of forward plan in the ward room.
Quality Management	Review of Status of Quality Management	Monthly	Quality Manager and Agent or Senior Engineer attends and provides Metrics for ICLs/ITP/Quality Plan/NCRs etc.
Risk and opportunities	Review of Risks and opportunities register	Bi-Monthly	Contractor Representation appropriate to the task to review and contribute to the Project Risk and Opportunities Register
Commercial	Risk Reduction Meeting - Compensation Events, Early Warnings.	Weekly	Contractor's QS to review change management

Table 7: Schedule of Meetings

10.7. Contractor's Progress Report

The *Contractor* submits a monthly progress report to the *Client* 3 days prior to each *Client*s site meeting. Notwithstanding the *Contractor's* obligations under the contract the report must include:

- Schedule, Cost Performance, Performance Measurement (Earned Value) and Estimate at Completion (EAC);
- Quality of Deliverables;
- Quality Management metrics:
- Safety and Environmental;
- Risks and Opportunities;
- Technical Performance;
- Commercial Matters;
- Early Warnings / Compensation Events / Projects Management Instructions / Risk Registers;
- Performance on agreed Key Performance Indicators (KPI).

10.8. Earned Value Report

The *Contractor* carries out detailed performance measurement using Earned Value (EV) analysis techniques and produces a monthly Project Performance Dashboard which is submitted as part of the monthly *Contractor's* Progress Report. An advance copy of this progress dashboard shall be passed to the *Client* a minimum of 3 days prior to period end. It shall indicate actual progress plus and estimate to period end.

Following acceptance by the *Client* of the first, and each subsequent revision of the programme, the *Contractor* ensures that the accepted programme is resourced loaded with cost and key resources/quantities for performance measurement purposes using suitable resource curves which reflect the work undertaken under

each activity. The resultant programme is used as the primary performance measurement tool for driving the EV reporting system.

The resource loaded programme requires the costs/prices to be accurately broken down into an appropriate level of activities. Sufficient resource loading is allocated to tail end and finishing activities including snagging and completion package preparation, in order to avoid overvaluing work in the earlier stages.

The earned value shall be calculated by the *Contractor* at monthly intervals following a quantitative analysis of physical work completed to date.

Performance Indicators are generated from the relationships of the following:

- BCWS (early) Budgeted cost of work scheduled (planned – early start dates);
- BCWS (late) Budgeted cost of work scheduled (planned – late start dates);
- BCWP Budgeted cost of work performed (earned value);
- ACWP Actual cost of work performed (actual);
- BAC Budget at Completion (current total of Prices);
- EAC Estimate at Completion (cost forecast).

The proposed performance indicators are:

- Cost variance = BCWP – ACWP;
- Schedule variance (Cost) = BCWP – BCWS;
- Schedule variance (Schedule) = Data Date - Earned Date;
- Cost Performance Index (CPI) = BCWP/ACWP;
- Schedule Performance Index (SPI) = BCWP/BCWS.

NB: CPI or SPI greater than 1 is favourable, whereas less than 1 is unfavourable.

10.9. Contract Management and Communications

All correspondence is to be in accordance with the contract.

10.10. Communications Devices (Mobile Phones, Radios etc.)

RSM08 3.4 *On Site Use of Radio Communications and Photographic Equipment provides details of LLWR employees and departments that will assist and authorise in following procedures in relation to mobile phones and radios.*

Mobile phones are permitted on site, but not the use of cameras, without the written permission of the *Client.*

Radio communications systems are permitted, subject to the user obtaining any necessary licence and *Clients* permission. All plant and machinery should carry a radio for communications with other plant users, supervisors or use in emergency situations.

10.11. Devices Capable of Taking Photographs

Contractors must apply for a Camera Permit, through the *Client's* Security Department, for any device they want to use for taking photographs on site.

Image capture on the LLWR site must be conducted in accordance with the *Client's* Policy and Guidelines, ref: *DI/GEN/015 Use of Cameras and Photographic Equipment on the Low Level Waste Repository Site*. Photographs taken on the LLWR site must be cleared through the *Client's* Security Department for removal, issue or publication.

Electronic devices containing image capture equipment fitted as an additional function, such as laptop computers, palmtop computers and mobile phones will be permitted onto the site without a camera permit provided they are used only for their primary function.

10.12. Internal and External Telephones

The *Client* provides no internal telephones.

10.13. Restrictions on *Contractor's* Right to Advertise

The *Contractor* and Subcontractors do not advertise, make any press release or statement, publish or supply for publication any information, drawing or visual recording concerning the Works and does not use the Site for the purpose of advertisement without the written consent of the *Client*.

10.14. Postage and Mailing Services

The postal address for deliveries is as noted in Section 1.1. The *Client* will not accept registered post on behalf of the *Contractor*.

10.15. Reporting and Investigation of Accidents

All *Contractors* must comply with their legal obligations under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR).

The *Contractor* must first contact the *Client* in the event of an incident which is reportable under RIDDOR occurring at the site in order to determine the responsibility for notifying the Health & Safety Executive (HSE).

RSM 08 3.8 Requirements for Reporting of Injuries and Incidents, refers.

10.16. Information and Document Software

The *Client* is currently running Microsoft Office Suite 365. The information and documentation supplied by the Contractor shall be the equivalent or compatible with such.

The *Contractor* will need to set up and provide their own remote wireless internet connection to their site offices, since there is no available wired connection that can be provided by the *Client*.

10.17. Equipment, Plant and Materials

The *Contractor* shall provide Equipment, Plant and Materials and everything necessary for the proper execution of the Work. He shall move his Equipment, Plant and Materials to give freedom of movement to other Contractors, other Site operations, or for other reasons, whenever directed.

In addition to complying with his own procedures, the *Contractor* shall comply with the *Clients* Instructions, such as:

- RSM08 Section 4.6 – Safe Use of Roads, Vehicles and Car Parks;
- RSM08 Section 4.5 – Safe Management of Plant and Equipment;
- RSM08 Section 4.11 - Electrical Safety;
- RSM08 Section 5.1 – Safe Management of Cranes;
- RSM08 Section 4.7 - Safe Use of Vibrating Equipment;
- RSM08 Section 4.3 – Safe Management of Pressure Systems;
- RSM08 Section 3.4 –Use of Radio Communications and Photographic Equipment.

Any vehicles of the *Contractor* used within the boundaries of the site shall be insured and maintained as though they were on the Public Highway and subject to the Road Traffic Acts and associated Acts. This is additional to any other insurance which the *Contractor* deems necessary to cover his liabilities and responsibilities under the Contract. Current test certificates, in accordance with the above Acts, shall be produced on demand. Drivers of such vehicles shall hold appropriate current driving licences.

The *Contractor* should note that no materials shall be stacked, or plant parked within 5 (five) metres of the *Client's* security fences.

Removal of all materials and personal property from within the *boundaries of the site* security fence must be authorised by a Property Pass issued by the *Client*.

10.18. Change Management - Project Controls

The *Client* has a requirement to exercise detailed monitoring of the whole of the Project Services, which, in general, will require the *Contractor* to provide and comply with varying levels of additional detail to supplement the primary requirements of the contract.

In summary, this is captured under the head of 'Project Controls' and will comprise:

- Management of Risk and Opportunities;
- Reporting;
- Cost and Expenditure Forecasting;
- Earned Value Analysis;
- Quantity Tracking;
- Change Control;
- Cost Control.

The *Contractor* shall provide the Project Controls requirements as identified and shall align the required planning and reporting tools with those of the *Client* for the planning and execution of the Works. The *Contractor* shall also submit and maintain details of his Estimating, Cost Control and Risk Management systems and the location(s) of his Project Control Team to be deployed during the course of the services.

With the aim of minimising duplicated effort, the *Contractor* shall afford facility to electronically interface with the *Client's* systems and shall ensure direct and comprehensive compatibility as appropriate. The *Contractor* shall also recognise that there will be a potential requirement to operate his programmes on the *Client's* system, the logistical arrangements for which will be arranged by the *Client* [Project Controls Manager] as required.

As part of the PXP, the *Contractor* shall provide a Project Control System Description for acceptance by the *Client* and shall have supporting definitions and procedures in place and accepted by the *Client* [Project Controls Manager] representative, before use.

The *Contractors* Project Control System shall support successful execution of the *Services* and shall produce accurate planning, budgeting, reporting and change control data. The information provided by the *Contractor* shall be in a form that can be directly accessed by the *Client's* Primavera planning system.

The Project Control System Description shall, as a minimum, include:

(i) a WBS, including 'dictionary' descriptions of elements of the *Services*;

(ii) the organisational breakdown structure including roles and responsibilities of each major organisation and identification of key management personnel;

(iii) the approach the *Contractor* will use to implement the project control processes, including:

- Baseline Change Control;

- Contract Management;
- Performance Measurement;
- Risk Management.

11. Working with the Client and Others

The *Contractor* is required to co-operate with the *Client* and Others in obtaining and providing information which they need in connection with the Minor Civils scope.

11.1. Sharing the Working Areas with Clients and Others

The Works are to be undertaken adjacent to offices and facilities that will remain operational. Disruption to these activities shall be kept to a minimum. The *Contractor* shall give priority to the *Clients* operations to shared areas such as access roads, car parking storage areas and the like.

11.2. Co-operation and Co-ordination

The *Contractor* to provide the Works in co-operation with the *Client* and Others.
Interfaces between Others and the *Contractor* shall be Co-ordinated through the *Client* (who will be supported by the Superintending Officer / Principal Contractor). The *Contractor* provides the following co-ordination, and attendance items:

- Synchronising the programme with the *Client* and Others for the Contract Works;
- Integration meetings with others to cross reference the sequence of the work;
- Integration and co-ordination of *Contractor's* Design with those of the *Client* and Others as necessary;
- Health Safety and Environmental briefings with Others;
- Sharing access to the Site and Working Areas;
- Co-ordination of deliveries;
- Provides information with regard to Works and programme sequence to the *Client* for the sites overarching programme;
- Provides any other information as requested by the *Client* for the purpose of co-ordinating Works, services and interfaces across the site.

11.3. Authorities and Utilities Providers

The *Client* is responsible for all liaison with authorities, regulators and utility providers and the payment of any costs or fees due.

12. Services and Other Things to Be Provided

RSM 08 – 3.6 Safe Management of *Contractors* Temporary Buildings and Assets in Compounds and other Allocated Areas, refers.

The Contractor shall provide temporary site accommodation of good repair on arrival and less than 2 years old including all necessary services and security for his offices, mess-rooms, sanitary arrangements, workshops and stores, etc.

The *Contractor* should note that no temporary structures shall be built within 5 (five) metres of the Client's security fences. The Client must be consulted if any temporary structure is to be positioned within 10 metres of the site security fences.

The *Contractor* is to provide a park and ride facility from an off-site location. A limited number of parking spaces are available on site, Section 12.4 refers.

12.1. Contractor's Equipment

The *Contractor* agrees with the *Client* the type, size and number of any plant or equipment they intend to bring on the Licensed Site 14 working days before arrival.

The *Contractor* provides the *Client* with 14 working days' notice before any large equipment or temporary accommodation units are removed from the Site.

The *Contractor* maintains an up to date equipment register of all equipment brought to Site. All equipment provided and used by the *Contractor*, shall be fit for its intended purpose. It shall be kept, used, and maintained in accordance with the relevant Regulations and Codes of Practice. Where applicable, Portable Appliance Test (PAT) and other test certificates must be available for inspection by the *Contractor*. All equipment shall be clearly identified with the *Contractor's* name and the item's identification number. The list of equipment will include air/electrically powered hand tools, gas/electric welding gear, scaffolding, mobile plant, special tools and lifting equipment, etc. *RSM 08 Section 4.5 Safe Management of Plant & Equipment*, refers.

Any equipment remaining on Site beyond 7 days after the completion date may be subject to storage charges.

The *Contractor* encloses the void below any accommodation to prevent the collection of flammable rubbish. This shall be done before the accommodation is occupied.

For reasons of site security and safety the *Contractor* shall leave a spare set of keys for all accommodation and storage facilities brought onto site at the Security Office. All keys shall be clearly identified stating what they are for and where they are located, including the name of the *Contractor*. The *Contractor* shall provide an accepted notice for display on his accommodation carrying the following information:

- Company Name;
- Postal address of the Main Office;
- Telephone number of *Contractors* Representative at Main Office;
- Name of the *Project Manager* and the *Contractor* with their respective telephone numbers.

For reasons of security, all plant must be immobilised at the end of each shift. Mobile Plant is to be secured in a fenced off area.
Earthworks Plant must be modern and well maintained to ensure compliance with the noise limits in the planning conditions, Section 4.10 refers. Additional measures must be taken where necessary, such as screening bunds to ensure compliance with the Planning Conditions.

12.2. Services and Other Things for the use of the *Client,* or Others to be provided by the *Contractor*

None required.

12.3. Services and other things to be provided by the Client

The *Contractors* main area for offices and welfare facilities will be in a designated 'Contractors' compound on site, exact location as advised In Package Order.

The *Client* provides to the *Contractor* typically the following Services and other things free of charge:

- Existing Access/Security arrangements;
- Space for accommodation, welfare & parking (refer to Section 12.4);
- Space for storage and compounds;
- Power supply for offices, messing etc. in B791.2- (Subject to available capacity of site system);
- Water (potable) - (Subject to available capacity of site system);
- Site wide tannoy and alarm systems (not for *Contractors* offices);
- Drainage outlet (surface and foul), subject to capacity of the *Clients* existing system and *Contractors r*equirements;
- Disposal of Low Level Waste;
- Routine maintenance of site roads (current road system);
- Existing rail sidings.

12.4. Contractor Facilities

The *Client* will provide two areas for *Contractor's* facilities:

1. The Contractors Facilities in area B791.2 (see Figure 6: B791.2 Existing Compound below);
2. The section of the Contractor's Compound shown on sketch RD 845 in Appendix J .

Figure 6: B791.2 Existing Compound

12.4.1. B791.2:

The B791.2 area is partially occupied by another LLWR Contractor as shown in figure 1 above but will be fully available to the Minor Civils Contractor from April 2020. This compound is intended for use as *Contractor* Offices and welfare facilities for the workforce. Mains electricity, water and foul drainage connections are available to the *Contractor*. There are car parking spaces for up to 14 vehicles. No other parking spaces will be provided, and the *Contractor* must arrange to have park and ride arrangement to transport personnel to site.

12.4.2. Contractors Compound and Stockpile D

Refer to Drawing RD 337 and Sketch ref RD 845 for general arrangement details.

The Minor Civils scope requires development of the Contractors Compound adjacent to the existing site rail sidings.

This compound has the following functions:

1. Storage area for rail deliveries;
2. Haul Road from the stockpile area and sidings to the street 4 plant crossing;
3. *Contractors* Facilities.

The compound is to be developed in the following stages:

- Start of Contract;
- Stage 1 Compound.

Start of Contract:
The existing compound is available to the Minor Civils Contractor in the south east corner shown in Figure 7 during the initial stages of the contract. This may be used for storing materials and self-serviced welfare facilities and plant until the *Contractors* facilities area in sketch ref RD 845 Appendix J has been developed. The compound already contains approximately 15000 tonnes *(check BoQ quantity for consistency)* of imported class 6F5 which is available to the contractor for installation in the permanent works.
Note that there are no currently no utilities, so the *Contractor* must provide self-servicing welfare facilities, i.e. generator, water & sewage.

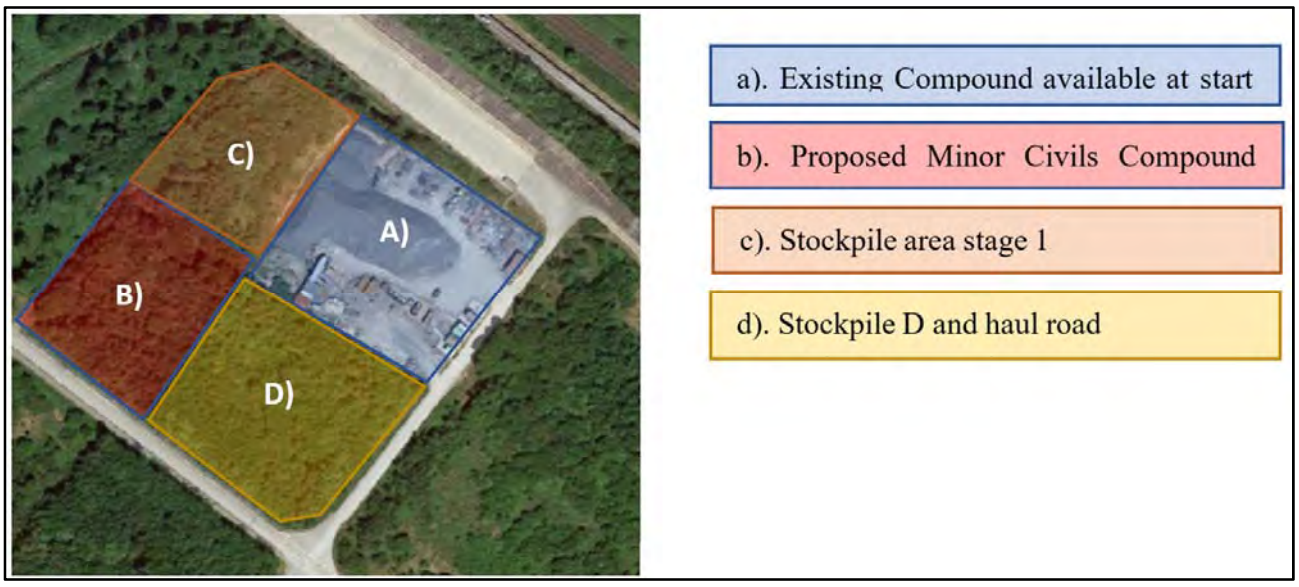


Figure 7: Contractors Compound and Stockpile D

Minor Civils - Scope

Stage 1 Compound:
The *Contractor* is to develop the compound and facilities shown on sketch RD 845. Mandated works are listed below in items 1 to 11. Optional works i.e. *Contractor's* facilities are listed in items a) to d).
Note that there are cable diversion works required as outlined below which are also associated with the Street 4 crossing works, i.e. items 1 to 4. The scope includes the following:

1. Install cable trough along street 4;
2. Divert existing electric and communication cables from the cable tray along street 4 into the cable trough;
3. Install cable protection slabs;
4. Take down existing safety fence and cable management tray;
5. Install drainage swale and pipe under proposed road;
6. Regrade and lay 375mm thick capping on terram 2000 with 1 layer of tensar (as per drawing RD 338);
7. Construct min. 5m wide access road in and out of compound including wheel wash approach;
8. Install (by week 30 after the Contract Date) and maintain Tornado recycling wheel wash or similar approved. The specification for the wheel wash is provided in Response to Planning Condition 9 – Wheel Cleaning Facilities LLWR-RDP-T1.00-RP-087-A. See below for detailed scope;
9. Signage;
10. Install safety fence to protect water monitoring boreholes (re-use from item 4 above);
11. Install fence and gates;
12. Install 32mm water supply from mains on the west side of Street 4 including road crossing. Contractor is to assume the street 4 water mains supply is available from week 46 after the Contract Date;
13. Construct mobile plant parking area with metalled surface and drainage to oil interceptor;
14. Install oil interceptor and 100mm outfall to swale in 5 above. Note: Oil interceptor provisional sum included in the BoQ's, final details to agreed post Contract award;
15. The contractor is at liberty to install and use any other establishment and facilities required within the fenced area shown on Sketch RD 845.

Contractor's Facilities:
The intended use of the Stage 1 compound is for:

a) Secure parking for mobile plant, particularly dump trucks;
b) Storage for materials (not bulk fills or aggregates);
c) Storage for red diesel if required (must be bunded, handled and stored in accordance with regulations);
d) Welfare facilities for mobile plant operatives;
e) Drop off area for operatives from the park and ride. No private cars are to be parked in this area.

The Compound is phased to suit the strategy below.

The RDP Tranche 1 project requires circa 500,000m3 of imported fill. LLWR has committed to delivering 97% of this by rail. The rate of delivery of 3 trains per week means that significant storage areas are required, i.e. storage areas A, B, C and D/Contractor's Compound. A and B will not be available until later in the project due to preceding activities. Areas C and D are included in the Minor Civils scope and provide valuable early stockpile storage. Planning conditions allow the use of Stockpile D to be used for a compound. This restricts the volume of imported material that can be stored, but the primary purpose of the sidings is to provide space to enable the train deliveries to be off-loaded quickly before being transferred to the workface or another stockpile.

During the Stage 1, i.e. the Minor Civils Works Contract, only Stockpile D will be available. Therefore, the storage area has been extended to the north as shown sketch RD 845 and area c) in Figure 7 above. The *Contractor* is at liberty to manage the use of area b) and c) in figure 2 to balance their compound needs and the need to deliver imported materials at a rate that meets the *Contractor's* programme.

In summary the *Contractor's* Compound will be phased as follows:

Minor Civils - Scope

a) Tree and root clearance completed by others by December 2018;
b) Contractor uses area a) in figure 2 at the contract start up and develops area c);
c) Contractor moves facilities into area b);
d) Stockpile D including the haul road, completed in area a) & d).

13. Health and Safety

The *Client* (LLW Repository Ltd) as the licensee is the corporate body who is in day to day control of processes and activities on the site.

In order to discharge these legal duties, the *Client* must display attributes that support its role as an 'Intelligent Customer'. Please refer to RSM 08 – 2.3 – Intelligent Customer for the definition of intelligent Customers (IC). The IC posts are filled by LLW Repository Ltd staff only and these role holders will monitor *Contractors* activities on the site to ensure that they are working to the agreed arrangements.

In association with safety, the expectation is for the Contractors to follow the requirements contained in the following sections.

RSM 08 – 2.4 Safety (details LLWR's expectations for managing safety).

RSM 08- 3.8 Reporting and Investigation of all 'Off Normal' Conditions including Injuries and Incidents

In addition to the above LLWR expect the *Contractor* to work within the Health and Safety at Work Act and the relevant regulations, along with their own agreed arrangements.

LLWR wish for the *Contractor* to work in line with any best practice and utilise best Practice techniques where practicable.

13.1. Health and Safety Requirements

The *Contractor* must comply with UK legislation, the *Contractor's* own procedures and those stipulated by the *Client*.

13.2. Clients Safety Requirements

The *Client* must have the capability of utilising *Contractors* intelligently so that their work is under their control. This means that there must be sufficient suitably qualified and experienced staff with the appropriate time and support to, amongst other things:

- Define all work specifications including design and safety aspects;
- Choose an appropriate *Contractor* after assessing its arrangements, capabilities and safety record;
- Manage and control the work;
- Ensure *Contractors* staff are competent, suitably qualified, experienced and trained;
- Ensure the *Contractor* is delivering the required product or work to the appropriate standard;
- Review and accept the work back into its organisation when complete;
- Monitor (regular audit's and evaluation) the performance of the *Contractor* and take appropriate action if it is inadequate.

13.3. Reporting Requirements

The *Contractor* will be required to comply RSM 08- 3.8 Reporting and Investigation of all 'Off Normal' Conditions, including Injuries and Incidents. However, irrespective of the requirements of the RSM 08 the *Contractor* must comply with their legal obligations under the 'Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013' (RIDDOR).

The *Contractor* must inform the *Client's* Superintending Officer / Nominated Representative as soon as possible if an incident or accident has occurred.

Refer to RSM 08 section 4.2- 'Management of First Aid', for how the Contractor will manage the First Aid on LLWR site.

13.4. Safety Management, Supervision and Qualifications

RSM 08 3.1 Managerial Responsibilities refers.

Any *Contractors* Manager/Supervisor who is responsible for the safety management of personnel or plant must have their responsibilities clearly outlined. This will ensure that there is a clear understanding and record of the responsibilities of individuals.

It is essential that each *Contractor* has available a sufficient number of Competent Persons who are capable of giving Environmental, Health & Safety advice; these persons will be known as 'Contractors Safety Managers'. The number of competent persons must be agreed by the *Client* [Superintending Officer].

Any Safety Manager who is appointed to provide any service at site must provide an efficient and effective safety service to his Client and must:

- Have a thorough working knowledge of all relevant legislation, Codes of Practice, etc;
- Unless otherwise agreed with the *Client*, attend all 12 modules of the IOSH "Managing Safely" Scheme or equivalent agreed with the Client within 12 months of appointment;
- Have a thorough working knowledge of (and access to) RSP's, RSM's, Safety Bulletins, etc;
- Ensure that all employees (including Site Managers, Supervisors and operatives/personnel are fully and effectively informed about all changes in relevant legislation, RSP's, RSM's, HSE Codes of Practice, etc;
- Where based full-time on site, not undertake duties other than EH&S safety management and EH&S advice;
- Ensure that all injuries and incidents are reported and investigated in accordance with RSM 08 3.8 - Reporting and Investigations of Injuries and Incidents.

The *Client Project Manager* may require the *Contractor* to cease to employ in connection with the Contract any person associated with the *services* whose continued employment thereon is considered undesirable. This applies in cases of breach of safety and welfare requirements as in other matters.

13.5. Safety Inductions

RSM 08 – 3.1 – Managerial Responsibilities refer to requirements.
The *Contractor* must ensure that all his personnel and Subcontractors attend the *Contractors* own safety induction course, which as a minimum must cover the following points:

- The *Contractors* own applicable rules;
- Relevant parts of the *Clients* site rules and traffic management plan;
- Expected behaviours on site;
- Arrangements for car parking;
- Welfare arrangements;
- Site emergency arrangements which must be followed;
- Fire precautions;
- Use of Fire & rescue service;
- Housekeeping and environmental management;
- Security arrangements;
- Reporting and investigating injuries, incidents, illness etc.

13.6. Safety Training

All those employed on site shall have a minimum level of training, in accordance with CATaP/JH/RDP/19/07. The *Contractor* will be required to ensure, that their resources have undertaken and passed relevant training.

Where the *Contractor* considers that they have an alternative course which they believe meets the standard requirement they must submit the proposal (with all necessary course documentation, accreditations etc) to the *Client* [SO]. Where the *Client* considers that the proposal may be a suitable alternative they will consult with the relevant subject matter experts for acceptance/rejection of the proposal.

13.7. Management of Subcontractors

RSM 3.2 – Approval and Management of Subcontractors refer.

There is a requirement on the *Client* not to grant any approval without first deciding;

- How third parties are to be controlled safely;
- How the third party is to comply with the site safety management system.

Where a *Contractor* is required to comply with a requirement, the *Contractor* is responsible for ensuring that his *Subcontractors* also comply.

RSM08 was produced in order to establish a consistent set of common standards to be met by all *Contractors* whilst working on site. It is the responsibility of each *Contractor* to ensure that copies of relevant RSM's, RSP's, etc are issued and explained to their on-site Subcontractors; the *Contractor* must keep a written record to show that this has been done.

The *Clients RSM 08 3.2 – Approval and Management of Subcontractors*, procedure deals with the appointment by the *Contractor* of a competent person to manage Subcontractors on site. The *Contractor* must ensure that a competent person from within the *Contractors* organisation is made responsible for the safety management of each Subcontractor carrying out work on the site. The competent person must be of management/supervisory status and must be appointed in writing.

13.8. Drug and Alcohol Policy

RSM 08 3.3 – Compliance requirements for working on LLWR, confirms the *Clients* policy.

The substance drugs and alcohol policy applies to the LLWR workforce including hired staff, *Contractors*, Subcontractors and visitors on the *Client* premises.

*Contractor*s must ensure that no person is allowed on site whilst under the influence of drugs and alcohol. *Contractor*s must ensure that anybody on site found to be under the influence of drugs or alcohol has their Contract terminated.

Contractors personnel on the *Clients* premises may be subject to for cause testing:

- If there is reasonable suspicion that the individual is under the influence of drugs or alcohol;
- After an incident, accident etc.

The test may take up to 2 hours from notification that a test is required to actually undertaking the test. If the person therefore wishes to use the toilet then they should be allowed to do so, however this should be under the supervision of the supervisor:

- Any individual asked to provide a urine sample may also be accompanied by his union representative or colleague of his choice;
- Subsequent action by the *Client* will then be judged on the basis of the returned

sample result using the current national drink driving limit as a guide;
- Failure to provide a sample without reasonable grounds will lead to disciplinary action.

13.9. Site Induction Procedures

RSM 08 3.3 – Compliance requirements for working on LLWR, confirms the *Clients* policy regarding Site Inductions.

"Short-Term Escorted Worker" is defined as any *Contractor* whose personnel are escorted *at all times* by the SO or some trained and competent person acting on the *Clients* [SO's] behalf. Unless the Contractor is a "Short-Term Escorted Worker", all *Contractor*s personnel (including managers, supervisors and Subcontractors) must attend the *Clients* site induction course before starting work on site and before they can be issued with an appropriate site pass.

The induction course lasts approximately 1 hour and deals with:
- Site emergency procedures;
- Basic health, safety and environmental rules;
- Security and conduct;
- Each person must fill in the attendance register and must satisfactorily complete the short written assessment before he is issued with a site pass.

Everyone employed within the boundaries of the site shall attend the *Client's* organised Induction Course (approximately 1 (one) hour). Anyone who will be employed within the boundaries of the site for more than 1 (one) month, or those visiting on a regular basis, shall also attend the IOSH Working Safely course (2 (two) working days). Those employed within the boundaries of the site for less than 1 (one) month will be required to attend training in those modules of the IOSH Working Safely course that are germane to their employment. All *Contractor* personnel accessing the Site area will be required to attend a project specific induction (approximately 1 (one) hour).

13.10. Refresher courses

All personnel must re-attend the *Client's* organised Induction Course at least once in every five-year period. Where any person has not worked on site for one year or more he must re-attend the course.

13.11. Site Emergency Exercises

A number of Emergency Exercises are arranged throughout the year by the *Client*. Each exercise will require participation by all personnel on site at the time, including the *Client's* own staff, *Contractors*, *Subcontractors* and delivery personnel. Typically, production will cease for a period of 3 hours during each exercise. Tenderer's are to allow in the prices and Clause 31 Programme for 9no. emergency exercises per year. One of these will be specifically for the purposes of integrating the Contractor into the LLWR emergency procedures.

<u>The total proposed exercises for 2020 are listed below:</u>

Proposed dates for site level exercises with Cumbria Fire & Rescue Service:
- Thursday 5th March;
- Thursday 30th April;
- Thursday 18th June;
- Thursday 10th September (site demonstration exercise);
- Thursday 5th November.

Proposed dates for site level exercises with Cumbria Police:
- Thursday 21st May;

- Thursday 10th September (site demonstration exercise);
- Thursday 8th October.

Dates have not yet been set for 2021 but the contractor is to assume a similar schedule to the one above based on the nearest Thursday.

13.12. Behavioural Standards Policy

The *Client's* Standard & Expectations booklet confirms expected behaviours by all employed on the site. It covers topics such as:

- Individual Behaviours;
- Leadership;
- Commitment to Safety;
- Environmental Responsibility;
- Quality and Delivery;
- Learning and Continuous Improvement.

13.13. Harassment

LLWR operate a policy for dealing with harassment at work and this policy is applicable to all people employed within LLWR including contract and Hired staff. LLWR regards all forms of offensive behaviour towards another person as a serious issue.

It is recognised that harassment is a personal and sensitive issue and any problems may be resolved through informal means. Anyone who is subjected to harassment of any kind should in the first instance speak to his or her supervisor. Further assistance can be obtained from the *Client* [Superintending Officer] or Safe Call.

Anyone who is found to be the instigator of harassment will be the subject of an investigation which may also involve the police depending on the severity of the case and the withdrawal of access to the site.

13.14. Method Statements

The *Contractor* and their Subcontractors develops safe, quality methods of work and communicates these to the *Contractor's* employees, Subcontractors and others. Where there are risks to quality standards, injury to personnel or risk of damage to Plant and Materials or the environment, in addition to risk assessments the working methods and sequence of work must be documented in the form of method statements. These must address all risks, including those that are identified during design and any emergent risks that arise during the course of the works or are caused by the work itself.

The level of detail required in the method statements shall depend on the size and complexity of the task and the nature and significance of the potential risks. The format and level of detail required in Method Statements is to be agreed with the *Client*, and this will be covered during the stakeholder engagement meeting, and will need to cover such things as:

- Functional requirements;
- Design/Construction sequence assumptions;
- Quality Assurance hold points
- Constraints considered;
- Interface management;
- Impact on other Works;
- General logic and sequencing;
- Labour and equipment necessary;
- Key milestone dates or hold points.

Method Statements that support Risk Assessments and form part of a work pack are subject to the DRC approval timescales detailed in Section 4.24 Work Planning of this document.

13.15. Legal Requirements

As per *RSM 08 - 10.2 – Construction Design and Management'*, LLWR will retain certain key roles which are identified in CDM. This is the Principal Designer, Principal Contractor and Client.

All duty Holders, including the contractor will abide by CDM2015 and the guidance which is contained in L153.

This RSM 08 also confirms the close correlation between the requirements of the CDM regulations and the requirements of site licence conditions such as:

SLC 9 – Instructions to persons on the site;
SLC 10 – Training;
SLC 12 – Duly authorised and other suitably qualified and experienced persons;
SLC 14 – Safety documentation;
SLC 19 – Construction or installation of new plant;
SLC 20 – Modification to design of plant under construction;
SLC 21 – Commissioning;
SLC 22 – Modification or experiment on existing plant;
SLC 26 – Control and supervision of operations;
SLC 35 – Decommissioning.

The management arrangements and policies in place at the Site ensure compliance with the site licence conditions (described in the RSM 08 Appendix 2).

The *Contractor* shall comply with all enactments, regulations and working rules relating to safety, health and welfare. Particular attention is drawn to the Construction (Design and Management) Regulations 20015 (CDM) and all amendments and regulations made there under.

The *Contractor* shall, throughout the course of the Contract, assure and demonstrate to the LLWR that:

(i) They have adequate safety procedures to carry out the work, particularly with reference to the requirements of legislation and *Client's* and Site Regulations;
(ii) The employees possess the Skills, Knowledge and Experience and have had all adequate training;
(iii) The Contractor must be aware of all the potential hazards associated with their activities and realise the residual hazards of the LLWR site.

The *Contractor* must arrange for suitable Personal Protective Equipment to be provided for use by all their employee's and Subcontractors, personnel who visit or work within the boundaries of the site, and the *Contractor* shall ensure that all his employees, including those of his Subcontractors, wear the appropriate equipment and are trained in the use thereof.

13.16. CDM – Pre-Construction Information

RSF 01.70.23 Pre-Construction Information Register, confirms the contents required in the Pre-Construction Information (PCI) document to be issued.

Where the *Contractor* is responsible for design, they shall also be responsible for provision of all necessary PCI documentation, at least to the standard and level of detail noted in the above document, codes of practice and HSE guidance.

Please refer to RSP 01.70 for further information on pre-construction information, also extract from RSP 01.70 below;

> *"Information shall be provided in a form which ensures that hazards, and any details about how they should be addressed, are clear to the reader. With the exception of simple projects with few hazards, information should be presented using form RSF 01.70_23 Pre-Construction Information (or equivalent).*"

And

> "*Information about the Project and the planning and management of the Project may be held within the Client Brief and need not be duplicated if it is in a suitable form."*

13.17. CDM – Construction Phase Plan

The *Contractor* shall produce the Construction Phase Plan in line with the requirements of CDM Regulations 2015. The Construction Phase Plan shall be produced following discussion with the Principal Contractor on the required format and content; the format and content shall take account of the works to be completed, LLWR construction and safety management processes which need to be followed and HSE/CITB guidance on Construction Phase Plans. The Construction Phase Plan may be used once it has been accepted by the Principal Contractor.

The Construction Phase Plan is reviewed by the *Client* and progressed until satisfactory. The *Contractor* is responsible for maintaining the status of the Construction Phase Plan in order to ensure it reflects *Clients* and the *Contractors* own safety policies and regulatory requirements accurately.

Significant amendments to the *Contractor's* Construction Phase Plan require endorsement by the *Client* prior to implementation.

13.18. CDM – Health and Safety File

The *Contractor* will be responsible for providing the relevant information to the *Client,* so the Principle Designer can compile and maintain the Health and Safety File.

Relevant information may include (but not limited to) the following:

- Brief description of the work carried out;
- Any hazards that have not been eliminated through the design and construction processes, and how they have been addressed (e.g. surveys or other information concerning asbestos or contaminated land);
- Key structural principles (e.g. bracing, sources of substantial stored energy – including pre- or post-tensioned members) and safe working loads of structures;
- Hazardous materials used (e.g. lead paints and special coatings);
- Information regarding the removal or dismantling of installed plant and equipment (e.g. any special arrangements for lifting such equipment); e.g. placement and removal of the bridge and foundations, ditto precast;
- Health and safety information about equipment provided for cleaning or maintaining the structure;
- The nature, location and markings of significant services, including underground cables (gas supply equipment etc);
- Information and as-built drawings and any plant and equipment (e.g. the means of safe access to and from service voids and fire doors).

The *Contractor* is informed that the Health and Safety File will take the form of an index to key documentation required to allow future management of foreseeable risks; the level of detail referenced shall be proportionate to the foreseeable risks involved in any future construction work and must not constitute a schedule of all project documentation or a generic handover listing. Referenced documentation need not be attached to the

Health and Safety File but must be issued to (or otherwise available to) the Client. Where referenced documents are not stored within LLWR Document or Drawing Registry systems, this document should clearly state the exact filing location. All refenced documents will be supplied to the client on completion.

13.19. Inspections

The *Clients* staff have the right to inspect any element of the *Contractor's* procedures, personnel competency records, risk assessments, method statements and the like, to ensure compliance and adherence to the *Clients* policies.

13.20. Design Hazards

Please refer to the Designer's Risks Assessments:

- AEC-RDP-T1.00-RA-017_DP5 Designers Risk Assessment;
- AEC-RDP-T1.00-RA-020-A DP3 Designers Risk Assessment;
- AEC-RDP-T1.00-RA-021-A DP3 Designers Register of Residual Risk;
- AEC-RDP-T1.00-RA-022 - DP6_Designer's Risk Assessment;
- AEC-RDP-T1.00-RA-027 A DP2 Designers Risk Assessment.

For temporary Works designs, the *Contractor* must ensure that the design process addresses the need to eliminate and control hazards and risks associated with designs. The same principles apply to any permanent designs to be completed by the *Contractor*.

Hazard in Construction Studies (HAZCON's) were completed as part of the design review process for each of the design packages. Please refer the following HACON's for relevant information for the *Contractor*, such as possible conventional safety issues, environmental hazards, operability issues, actions following the study and outstanding issues:

- SCD712 - Haul Roads (DP5) HAZCON;
- SCD739 - Cap Perimeter Drainage (DP2) HAZCON;
- SCD746 - RDP Stockpile Management (DP6) HAZCON - Issue 1.

Note: Please refer to the *"Findings and Conclusions"* sections with each HAZCON report (located towards the front end of each document), for a summary of the key health and safety issues for the *Contractor* to consider / address during construction.

13.21. Subcontracting

13.22. Restrictions or requirements for Subcontracting

The *Contractor* must have an established process for Subcontractor selection based on competencies, facilities, equipment, financial good standing, safety and appropriate quality standards, management systems, and resources to ensure they have the capability to conform to the Contract requirements.

Applications for approval to place any sub-Contract must be made as follows:

- If a Subcontractor has not been approved by LLWR during the Contract tender stage, then the *Contractor* must complete Sections 1 and 2 of RSF 08.02_015 Main Contractors proposed sub-Contractors' and submit to LLWR for approval;
- Confirmation of approval for a specific project or part of will be given in writing by the SO and the commercial representative and work must not commence on site until such approval has been given.

13.23. Acceptance Procedures

In addition to the *Contractor's* Contractual obligations, the *Contractor* shall submit a commercial approval form to the *Client* for each Subcontractor prior to commencement of the Works. All necessary proforma's will be issued to the successful *Contractor* for acceptance.

The commercial approval for Subcontractor proforma includes the name of *Subcontractor* whom the *Contractor* intends to use to provide the *Works* and *Services*. The business address, a statement of the content of the proposed Subcontract package, the basis of the remuneration and confirmation of inclusion of the applicable NDA 'flow down' Contractual terms as required by the Contract.

14. Accounts and Records

Notwithstanding the *Contractor's* obligations, the *Contractor* is to provide a cost report at each assessment date, which forecasts the total final Cost for the whole of the Works and an explanation of the changes since the previous forecast.

The report will include as a minimum a detailed breakdown of Price for Works Done to Date, agreed Compensation Events, a forecast of the remaining Works to be completed and any costs indicated in the project Risk Register i.e. Early Warnings.

14.1. Payment and Invoicing

The payment process is summarised as follows:

The *Contractor* applies for payment, and the *Client* certifies payment following each assessment date as required by the Contract.

After receiving the payment certificate which will include Goods Receipt Numbers (GRN), the *Contractor* provides a tax invoice.

The *Contractor* sends the invoice to:

Accounts Payable
LLW Repository Ltd
Pelham House,
Pelham Drive
Calderbridge
Cumbria
CA201DB
Tel: 01946770328
Email: llwraccountspayable@llwrsite.com

The *Contractor* ensures that all invoices submitted shall quote the relevant:

- Purchase order number, amount and applicable GRN(s)

14.2. Construction Industry Scheme (Where Applicable)

Where the Works fall within the scope of the Construction Industry Scheme, the *Contractor* complies with his obligations under the Scheme and itemises his invoice to distinguish between taxable and non-taxable Works.

14.3. Additional Records

The *Contractor* will maintain a record of the what proportion of the Contract spend has been Subcontracted and what value of those Subcontracts have been spent with Small to Medium Enterprises (SME's).

The *Client* is mandated to provide the Authority (NDA) financial reporting data which includes but is not limited to:

- Value of Subcontract spend;
- Percentage of Subcontract spend against Contract value;
- Value of Subcontract spend attributed to SME's;
- Percentage of Subcontract spend attributed to SME's.

The *Contractor* will maintain financial records of the requirement above and report to the *Client* each month.

Additional records required:

- Daily allocations sheets which as a minimum should detail all operations undertaken. For each operation carried out the minimum detail that should be recorded is:
    - Duration;
    - Number or operatives;
    - Plant and equipment used;
    - Each daily allocation sheet should also record any delays encountered including the duration, number or operatives, plant and equipment relating to the delay;
    - Additionally, each daily allocation sheet should also record any additional scope which is carried out (including provisional sums). This should be record to the same level of information as for the delays;
    - The daily allocation sheets should be submitted to LLWR by 08:00 the morning after for countersignature.
- Type and quantity of all materials delivered to site by rail and road. Please refer to Deliveries Section 4.4 for details on material delivery constraints to the site.

15. Clients Work Specifications and Drawings

Refer to Appendix D - LLWR-RDP-T1.00-SC-017 - Tender Index Spreadsheet for the full list of work specifications, drawings and supporting documents.

16. Socio-Economic Plan (Social Impact)

The *Contractor* prepares a Socio-Economic Plan and submits that plan to the *Project Manager* within 12 weeks after the Contract Date.

The Socio-Economic Plan may consider, but is not limited to the following factors:

- Social Impact;
- Social Benefits;
- Sustainability - positive outcomes for sustainability and local employment;
- Number of Apprentices employed for this contract;
- Return of long time unemployed back to work;
- Charitable Contributions.

The *Project Manager* may reject the Socio-Economic Plan for the following reasons:

- the *Contractor*'s plans which it shows are not practicable;
- It does not represent the Contractors plans realistically; or
- It does not comply with the Scope.

17. Reference Documents

1. LLWR-RDP-T1.00-SC-017 - Tender Index Spreadsheet (full list of documents and drawings);
2. LLWR-RDP-T1.00-RP-116: Planning Condition 14 - RDP Construction Environmental Management Plan (CEMP);
3. LLWR-RDP-T1.00-SK-060: Contractors Facilities in area B791.2;
4. LLWR 'Standards and Expectations' policy booklet;
5. LLWR-RDP-T1.00-SK-062 - Additional Laydown Area;
6. LLWR-RDP-T1.00-RP-095: Planning Condition 16 Response - RDP Ecological Mitigation Plan;
7. SCD712 - Haul Roads (DP5) HAZCON;
8. SCD739 - Cap Perimeter Drainage (DP2) HAZCON;
9. SCD746 - RDP Stockpile Management (DP6) HAZCON - Issue 1;
10. CATaP/JH/RDP/19/07: Contractors Appointments, Training and Procedures;
11. LLWR-RDP-T1.00-SK-058: Existing Drainage Requiring c.c.t.v;
12. RD 845 - Minor Civils Compound Facilities;
13. Wickham Gensol Wheel Wash Specification Appendix F ;
14. LLWR-RDP-T1.00-SK-063 - Borehole Log Location plan;
15. LLWR-RDP-T1.00-GEN-032 - Borehole Log Location plan supporting spreadsheet;
16. SCD712 - Haul Roads (DP5) HAZCON;
17. SCD739 - Cap Perimeter Drainage (DP2) HAZCON;
18. SCD746 - RDP Stockpile Management (DP6) HAZCON;
19. LLWR-RDP-T1.00-SK-064 - Mound 1 and 2 Locations;
20. DRC Schedule Appendix B ;
21. LLWR-RDP-T1.00-SK-065 - Existing Lagoon Location Adjacent to Stockpile B;
22. LLWR-RDP-T1.00-SK-066 - Existing Lagoon Location South of Mound 1;
23. RSM 1.15 - Electrical Safety;
24. RSP 1.11 - Management and Control of Risk Assessments;
25. RSP 1.11.06 – Excavations;
26. RSP 1.12 - Work Release;
27. RSG 1.15.02 - Safe Use of Portable Generators on the LLWR Site;
28. RSP 2.02 - Radiological Sentencing of Items, Materials and Waste leaving the LLW Repository Site;
29. RSP 2.13 - Disposal of Non-Radiological (Controlled Waste);
30. RSP 6.01 - Work Management;
31. RSP 14.07 - Engineering Drawings;
32. RSP 14.09 - Engineering Reviews;
33. RSP 14.10 - Design Change Control;
34. RSP 14.11 - Technical Queries;
35. RSG 1.15_01 - Electrical Safety rules;
36. RR0202 - LLWR Non-Radiological Waste Skip/Container Owner;
37. RSM 08 - Contractor Information Manual for working on LLWR Nuclear Licenced Site;
38. RSP 01.09 - Awareness of the Hazards and Risks for Authorised Individuals Entering Low Level Waste Repository Site;
39. RSP 02.08 - SAFE MANAGEMENT OF CONTAMINATED LAND;
40. RSP 08.03.03 - Verification of Construction Work;
41. RSP 14.05 - Engineering Calculations;
42. RSP 14.06 - Engineering Specifications;
43. RSP 14.18 - Design Justification Reports (DJRs);
44. RSP 18.02 - MANDATORY SECURITY REQUIREMENTS FOR PERSONS MAKING ENTRY TO LOW LEVER WASTE REPOSITORY SITE;
45. RSP 5.14.01 - Quality Inspections;
46. RSG 05.04_01 - Quality Plan Guidance;
47. RSP 05.04 - Quality Plans;

48. RSG 2_01 - Protection of Wildlife During Routine Activities;
49. SR_P 001 - Site Rules;
50. SR_P 002 - Traffic Management Plan;
51. SR_P 003 - Control of LGV Arrival and Exit from LLWR Site;
52. SR_P 004 - Security Protocol;
53. SR_P 006 - Control of Abnormal Load Deliveries;
54. SR_P 010 - Radio Communication Protocol;
55. DI/GEN/015 - Use of Cameras and Photographic Equipment on the Low Level Waste Repository Site;
56. 1 B 93228 - Cable Routing Drawing External to Substations;
57. LLWR-RDP-T1.00-GEN-034 - Site Information RDP Tranche 1 Project - Minor Civils Construction (Enabling Works);
58. LLWR-RDP-T1.00-SK-067 - Redacted Live Services Drawing (as of 21/08/2019) CAD file;
59. RD195 - Low Level Waste Repository Building Schedule General Arrangement Site Plan Showing Existing Facilities;
60. LLWR-RDP-T1.00-SK-068: Haul Road Permanent Signage Proposal;
61. Accounting and Business Calendar 19-20.

18. Glossary of Abbreviations

Glossary of abbreviations included in the document:

Abbreviation	Definition
ACWP	Actual Cost of Work Performed
AFC	Anticipated Final Cost
ALARP	As Low As Reasonably Practicable
Approval	(and words derived therefrom) means the Acceptance in writing of the *Client* unless specified otherwise
BS	British Standard
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BAT	Best Available Technique
BPEO	Best Preferred Environmental Option
CATaP	Contractors Appointments, Training and Procedures
CCC	Cumbria County Council
CDM	The Construction (Design & Management) Regulations 2015.
Ch	Chainage
Competent Person	A named person nominated by the *Contractor* and approved by the *Client*
CPI	Cost Performance Indicator
DA	Design Authority (Client role)
ESC	Environmental Safety Case
DRC	Document Review Committees
LFE	Learning From Experience
EVA	Earned Value Analysis
FLT	Fork Lift Truck
IC	Intelligent Customer (Client Role)
HAZCON	Hazard in Construction Study
KPI's	Key Performance Indicators
The Licensed Site	The LLWR licensed nuclear site where the Contract Works and services are to be carried out
LTP	Life Time Plan
LLW	Low Level Nuclear Waste
LLWR	LLW Repository Ltd. (The Client)

Abbreviation	Definition
MCHW	Manual of Contract Documents for Highway Works
NDA	Nuclear Decommissioning Authority
ONR	Office for Nuclear Regulation
PCSC	Post Closure Safety Case
PM	Project Manager
PXP	Project Execution Plan
QMS	Quality Management System
RCA	Radiological Controlled Area
RDA	Reference Deposal Area
RDP	Repository Development Programme
RSP	Repository Site Procedure
SLC	Site Licence Company to whom the Health and Safety Executive has granted a Nuclear Site Licence pursuant to section l of the Nuclear Installations Act 1965 (as amended)
SLP	Sellafield Ltd Procedure
SLSP	Sellafield Ltd Supporting Procedure
SM	Safety Manager
SOP's	Setting Out Points
SSOW	Safe System of Work
SQEP	Suitably Qualified and Experienced Person
TVCB's	Temporary Concrete Vehicular Barriers
The Site (or the site)	The *Clients* site from which or at which the Works are to be carried out/performed.
SPI	Schedule (programme) Performance Indicator
WBS	Work Breakdown Structure

Table 8: Glossary of Abbreviations

19. APENDICES

The following appendices are included in this document:

- Appendix A Appendix A Accounting and Business Calendar 19-20;
- Appendix B DRC Timeline;
- Appendix C Flow & Turbidity Performance Requirements;
- Appendix D Tender Index Spreadsheet (Full List of Tender Documents);
- Appendix E Earthworks Cut and Fill Diagram;
- Appendix F Wheel Wash Specification;
- Appendix G Hazard Maps;
- Appendix H Existing Lagoons Locations from Vault 9 Construction;
- Appendix I Aerial Plan of Mounds 1 and 2;
- Appendix J RD 845 Minor Civils Compound Facilities Sketch.
- Appendix K Proposed Haul Road Permanent Signage Layout.

Appendix A Accounting and Business Calendar 19-20

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2019/20 CALENDAR

Period End | Bank Holidays | Xmas Close Down

Contractor to Issue Monthly Report | Monthly Progress Meeting

PERIOD 1 (13) Apr-19					
WEEK	14	15	16	17	18
Sun		7	14	21	28
Mon	1	8	15	22	29
Tues	2	9	16	23	30
Wed	3	10	17	24	
Thurs	4	11	18	25	
Fri	5	12	19	26	
Sat	6	13	20	27	

PERIOD 2 (14) May-19					
WEEK	19	20	21	22	
Sun		5	12	19	26
Mon		6	13	20	27
Tues		7	14	21	28
Wed	1	8	15	22	29
Thurs	2	9	16	23	30
Fri	3	10	17	24	31
Sat	4	11	18	25	

PERIOD 3 (15) Jun-19					
WEEK	23	24	25	26	27
Sun		2	9	16	23	30
Mon		3	10	17	24	
Tues		4	11	18	25	
Wed		5	12	19	26	
Thurs		6	13	20	27	
Fri		7	14	21	28	
Sat	1	8	15	22	29	

PERIOD 4 (16) Jul-19					
WEEK	28	29	30	31	
Sun		7	14	21	28
Mon	1	8	15	22	29
Tues	2	9	16	23	30
Wed	3	10	17	24	31
Thurs	4	11	18	25	
Fri	5	12	19	26	
Sat	6	13	20	27	

PERIOD 5 (17) Aug-19					
WEEK	32	33	34	35	
Sun		4	11	18	25
Mon		5	12	19	26
Tues		6	13	20	27
Wed		7	14	21	28
Thurs	1	8	15	22	29
Fri	2	9	16	23	30
Sat	3	10	17	24	31

PERIOD 6 (18) Sep-19					
WEEK	36	37	38	39	40
Sun		1	8	15	22	29
Mon		2	9	16	23	30
Tues		3	10	17	24	
Wed		4	11	18	25	
Thurs		5	12	19	26	
Fri		6	13	20	27	
Sat		7	14	21	28	

PERIOD 7 (19) Oct-19					
WEEK	41	42	43	44	
Sun		6	13	20	27
Mon		7	14	21	28
Tues	1	8	15	22	29
Wed	2	9	16	23	30
Thurs	3	10	17	24	31
Fri	4	11	18	25	
Sat	5	12	19	26	

PERIOD 8 (20) Nov-19					
WEEK	45	46	47	48	
Sun		3	10	17	24
Mon		4	11	18	25
Tues		5	12	19	26
Wed		6	13	20	27
Thurs		7	14	21	28
Fri	1	8	15	22	29
Sat	2	9	16	23	30

PERIOD 9 (21) Dec-19					
WEEK	49	50	51	52	1
Sun		1	8	15	22	29
Mon		2	9	16	23	30
Tues		3	10	17	24	31
Wed		4	11	18	25	
Thurs		5	12	19	26	
Fri		6	13	20	27	
Sat		7	14	21	28	

PERIOD 10 (22) Jan-20					
WEEK	2	3	4	5	
Sun		5	12	19	26
Mon		6	13	20	27
Tues		7	14	21	28
Wed	1	8	15	22	29
Thurs	2	9	16	23	30
Fri	3	10	17	24	31
Sat	4	11	18	25	

PERIOD 11 (23) Feb-20					
WEEK	6	7	8	9	
Sun		2	9	16	23
Mon		3	10	17	24
Tues		4	11	18	25
Wed		5	12	19	26
Thurs		6	13	20	27
Fri		7	14	21	28
Sat	1	8	15	22	29

PERIOD 12 (24) Mar-20					
WEEK	10	11	12	13	14
Sun		1	8	15	22	29
Mon		2	9	16	23	30
Tues		3	10	17	24	31
Wed		4	11	18	25	
Thurs		5	12	19	26	
Fri		6	13	20	27	
Sat		7	14	21	28	

Appendix B DRC Timeline

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Weekly Programme		Week 1							Week 2							Week 3							Week 4							Week 5							Week 6							
Task Description	Dur	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M
Work Planning Schedule (RSP6.01)																																												
Integration meeting - each Wednesday	1																																										
Scope identified/Work Request raised/Work Planner identified	1																																										
Work Planner to arrange stakeholder meeting (duration dependent on stakeholder availability 1 week indicative timescale)																																											
Work Planner issues Work Planning Checklist (WPC) & actions																																											
Production of Risk Assessment and Method Statement (RAMS) (duration determined by Contractor)																																											
Highlight scope to business within integration meeting T-4	1																																										
Internal review of RAMS before submission to DRC (duration dependent on complexity of task)																																											
Submit as per DRC schedule (see fragnet below)	1																																										
Completion of WPC actions (could include production of Waste Management Plan, Traffic Management Plan, PMP, PTE, ordering materials, logistics co-ordination)																																											
Work Planning readiness review if required																																											
T-1 work scope frozen for T0, work pack ready (cut-of Wednesday for following week)																																											
Work Commence																																											
Document Review Committee (DRC) schedule (RSP01.24G)																																												
Submit to DRC 3 working days before meeting	0																																										
DRC review period	3																																										
DRC (Weekly meeting)	1																																										
DRC draft minutes production time	2																																										
Complete actions/amendments to documents for sign of by DRC Chair	3																																										
DRC documents uploaded to document control system for SSOW production	2																																										
SSC comments lead time	3																																										
Work Planner compile work pack	3																																										
SSOW in to document control	3																																										
Approved SSOW released to start works	0																																										

Appendix C Flow & Turbidity Performance Requirements

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Isco Product Data

Isco 2150 Area Velocity Flow Module

The 2150 Flow Module uses continuous wave Doppler technology to measure mean velocity. The sensor transmits a continuous ultrasonic wave, then measures the frequency shift of returned echoes reflected by air bubbles or particles in the flow.

The 2150's "smart" area velocity probe is built on digital electronics, so the analog level is digitized in the sensor itself to overcome electromagnetic interference. The probe is also factory-calibrated for 10-foot (3 meter) span at different temperatures. This built-in calibration eliminates drift in the level signal, providing long-term level stability that reduces recalibration frequency and completely eliminates span recalibration.

In field use, the 2150 is typically powered either by two alkaline, or Isco Rechargeable Lead-acid batteries, within a 2191 Battery Module. Highly efficient power management extends battery life up to 15 months at 15-minute data storage intervals. Other power options (including solar) are available.

Applications

- Portable and permanent-site AV flow monitoring for inflow and infiltration, capacity assessment, sewer overflow, and other sewer studies.
- Measuring shallow flows in small pipes. Our low-profile area velocity sensor minimizes flow stream obstruction and senses velocity in flows down to 1 inch (25 mm) in depth.

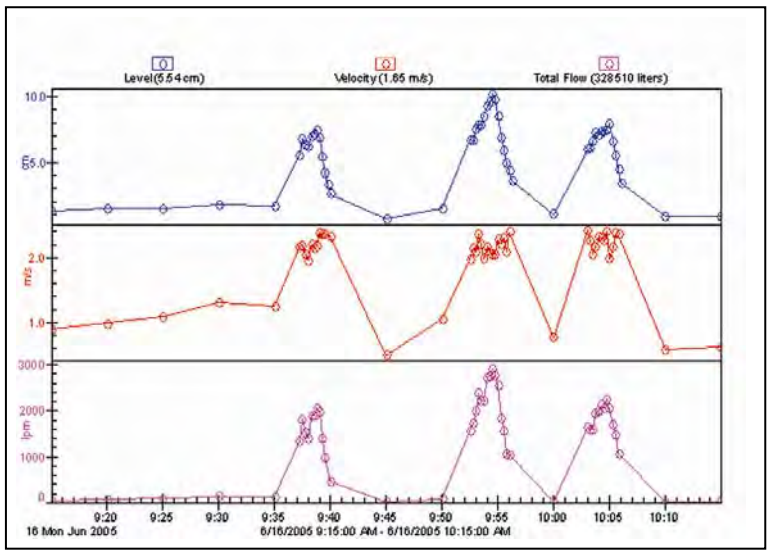
Standard Features

- Rugged, submersible enclosure meets NEMA 4X, 6P (IP68) environmental specs.
- Chemically resistant epoxy-encapsulated sensor withstands abuse, resists oil and grease fouling, and eliminates the need for frequent cleaning.
- Replaceable high-capacity internal desiccant cartridge and hydrophobic filter protect sensor reference from water entry and internal moisture.
- Pressure transducer vent system automatically compensates for atmospheric pressure changes to maintain accuracy.
- The quick-connect sensor can be easily removed and interchanged in the field without requiring recalibration.
- Up to four 2100 Series flow modules can be networked by stacking and/or extension cables.

Above left: Additional modules can be added for redundant or multi-stream measuring (Isco 2110 Ultrasonic Module shown). Right: Optional mounting rings provide quick, secure sensor installation in round pipes from 6 to 80 inches (150 to 2000 mm).

Software Features

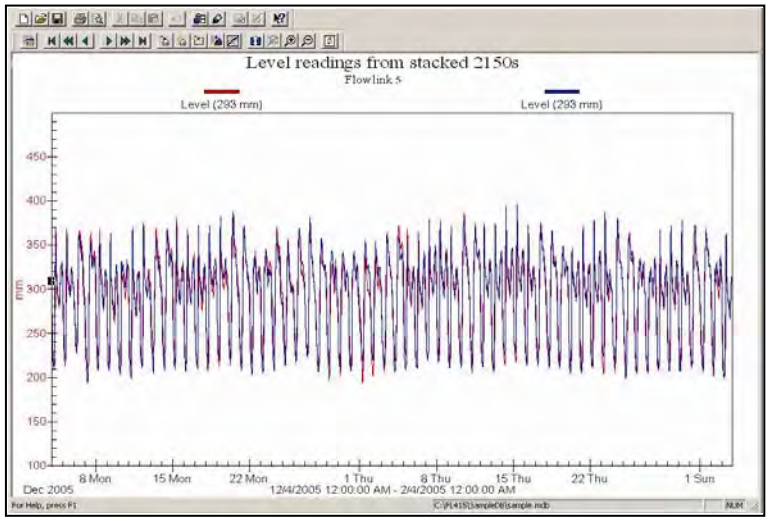
- Secure data storage. All data are continuously stored in flash memory to protect against loss in case of power failure
- Easy to upgrade. New operating software can be downloaded into non-volatile flash memory, without affecting stored program and data.
- Records and stores input voltage and temperature data.
- Variable rate data storage lets you change the data storage interval when programmed conditions occur. This feature assures maximum information about an exceptional event – such as an overflow – while conserving power and data capacity during normal conditions.
- 38,400 bps communication provides speedy setup and data retrieval.



Variable rate data storage

The 2150 flow module has the ability to automatically switch data storage rates based on varying conditions.

In the example at left, the 5-minute data storage rate automatically changed to 30 seconds when the flow rose above a programmed level.



Level stability

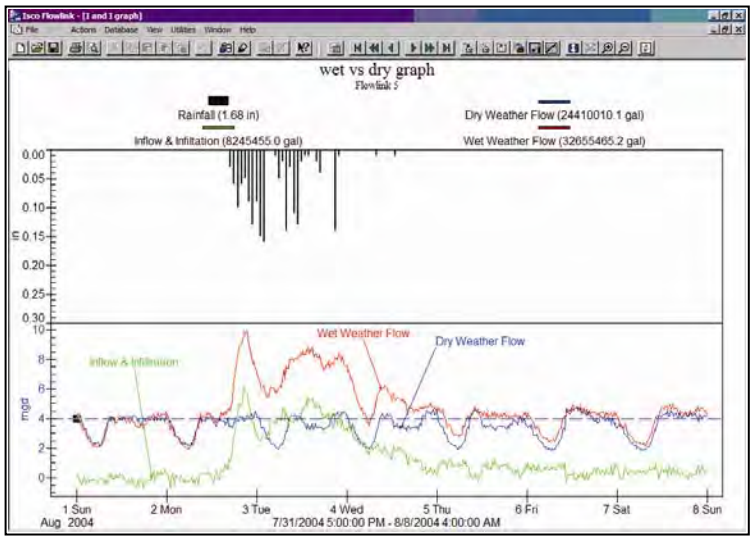
Frequent multipoint level recalibration is a requirement with other area velocity flow meters. Isco's exclusive "smart" sensor design in the area velocity probe yields exceptionally low drift in the level signal.

The 2150's factory-calibrated 3-meter span totally eliminates the need for cumbersome span recalibration in the field.

In the example at left, two area velocity probes were installed at the same site. The level readings from both sensors track closely without any drift, over an 8-week period.

Flowlink® Data Analysis

Isco Flowlink® Software is a powerful tool for analyzing flow and water quality data. It provides site setup, data retrieval, and comprehensive data analysis, as well as advanced reporting and graphing. See separate datasheets for details on Flowlink and Flowlink Pro software.



The Flowlink screen shown above gives a comparison of dry and wet weather flows, plus rainfall typical of an inflow & infiltration study

Information Delivery

Isco 2100 Series Flow Modules offer a wide variety of communication and retrieval options, to minimize the need for expensive on-site visits and confined space entry. These include:

Isco 2103 Land-line Modem Module
Reliable two-way dial-up communication between down-hole 2100 Flow Modules and your desktop computer, equipped with Isco Flowlink Software. A dial-out feature enables the system to transmit a text message alarm to your digital cell phone or pager.

Isco 2103c Cellular Modem Module
All the features of the 2103 Modem with the convenience of cell phone access. And the 2103c can automatically send data via the Internet to a designated server running Flowlink Pro software, using economical 1xRTT packet-switched data transmission.

Isco 2108 Analog Output Module
Provides current outputs for use with Isco 2100 Series Area Velocity and Ultrasonic Flow Modules. It allows easy interface with SCADA/DCS or other secondary instrument systems.

Modbus
2100 Series Flow Modules provide digital RS 232 Modbus output that can be used to interface with external communication modules, SCADA systems, or other devices.

On-site Data Retrieval

Isco Flowlink Software
Download and process data on-site. Enjoy unmatched data management capability, advanced data editing and analysis, powerful reporting and presentation choices, and a variety of downloading and data handling options.

Isco 2101 Field Wizard
A durable, weatherproof module for on-site data retrieval. Don't risk damage to your fragile notebook PC. The 2101 Field Wizard provides on-site display of current readings, information about stored data, diagnostics, and more.

Interrogate all 2100 Series Flow Modules in the stack at one time, and store more than 14 days' data from up to 20 modules!

Isco 2102 Communication Module
Connect with your Isco 2100 Series Flow Modules from the safety and convenience of your vehicle.

Digital spread-spectrum radio signals enable "drive-up" data retrieval, system configuration, and level calibration, with minimum power consumption. "Plug and Play" setup – no interfacing needed.

Specifications

2150 Flow Module	
Size (HxWxD):	2.9 x 11.3 x 7.5 in (74 x 287 x 191 mm)
Weight:	2.0 lb (0.9 kg)
Materials of construction:	High-impact polystyrene, stainless steel
Enclosure (self-certified):	NEMA 4X, 6P (IP68)
Temperature Range:	-40° to 140° F (-40° to 60° C) operating and storage
Power Required:	12 VDC nominal (7.0 to 16.6 VDC), 100 mA typical, 1 mA standby
Power Source:	Typically, an Isco 2191 Battery Module, containing 2 alkaline or 2 rechargeable lead-acid batteries. (Other power options are available; ask for details.)
Typical Battery Life:	Using 15-minute data storage interval Energizer® Model 529 alkaline - 15 months Isco rechargeable lead-acid - 2.5 months
Program Memory:	Non-volatile programmable flash; can be updated using PC without opening enclosure; retains user program after updating.
Built-in Conversions	
Flow Rate Conversions:	Up to 2 independent level-to-area conversions and/or level-to-flow rate conversions.
Level-to-Area Conversions:	Channel Shapes - round, U-shaped, rectangular, trapezoidal, elliptical, with silt correction; Data Points - Up to 50 level-area points.
Level-to-Flow Conversions:	Most common weirs and flumes; Manning Formula; Data Points (up to 50 level-flow points); 2-term polynomial equation
Total Flow Calculations:	Up to 2 independent, net, positive or negative, based on either flow rate conversion
Data Handling and Communications	
Data Storage:	Non-volatile flash; retains stored data during program updates. Capacity 395,000 bytes (up to 79,000 readings, equal to over 270 days of level and velocity readings at 15-minute intervals, plus total flow and input voltage readings at 24-hour intervals)
Data Types:	Level, velocity, flow rate 1, flow rate 2, total flow 1, total flow 2, input voltage, temperature
Storage Mode:	Rollover; 5 bytes per reading.
Storage Interval:	15 or 30 seconds; 1, 2, 5, 15, or 30 minutes; or 1, 2, 4, 12, or 24 hours Storage rate variable based on level, velocity, flow rate, total flow, or input voltage
Data Retrieval:	Serial connection to PC or optional 2101 Field Wizard module; optional modules for spread spectrum radio; land-line or cellular modem; 1xRTT. Modbus and 4-20 mA analog available.
Software:	Isco Flowlink for setup, data retrieval, editing, analysis, and reporting
Multi-module networking:	Up to four 2100 Series Flow Modules, stacked and/or remotely connected. Max distance between modules 3300 ft (1000 m).
Serial Communication Speed:	38,400 bps

2150 Area Velocity Sensor	
Size (HxWxD):	0.75 x 1.3 x 6.0 in (19 x 33 x 152 mm)
Cable (Length x Diameter):	25 ft x 0.37 in (7.6 m x 9 mm) standard. Custom lengths available on request.
Weight (including cable):	2.2 lbs (1 kg)
Materials of construction:	Sensor - Epoxy, chlorinated polyvinyl chloride (CPVC), stainless steel Cable - Polyvinyl chloride (PVC), chlorinated polyvinyl chloride (CPVC)
Operating Temperature:	32° to 140° F (0° to 60° C)
Level Measurement:	Method - Submerged pressure transducer mounted in the flow stream Transducer Type - Differential linear integrated circuit pressure transducer Range (standard) 0.033 to 10 ft (0.010 to 3.05 m); (optional) up to 30 ft (9.15 m). Maximum Allowable Level 34 ft (10.5 m) Accuracy ±0.01 ft from 0.033 to 10 ft, (±0.003 m from 0.01 to 3.05 m,) Long-Term Stability ±0.023 ft/yr (±0.007 m/yr) Compensated Range 32° to 122°F (0° to 50°C)
Velocity Measurement:	Method - Doppler ultrasonic, frequency 500 kHz Typical Minimum Depth 0.08 ft (25 mm) Range -5 to +20 ft/s (-1.5 to +6.1 m/s) Accuracy (in water with uniform velocity profile, speed of sound = 4850 ft/s, for indicated velocity range) ±0.1 ft/s from -5 to 5 ft/s (±0.03 m/s from -1.5 to +1.5 m/s) ±2% of reading from 5 to 20 ft/s (1.5 to 6.1 m/s)
Temperature Measurement:	Accuracy ±3.6° F (±2° C)

2191 Battery Module	
Size (HxWxD):	6.0 x 9.6 x 7.6 in (152 x 244 x 193 mm)
Weight (without batteries):	3.2 lb (1.4 kg)
Materials of construction:	High-impact polystyrene, stainless steel
Enclosure (self certified):	NEMA 4X, 6P, (IP68)
Batteries:	Two 6-volt Energizer Model 529* alkaline (25 Ahrs capacity) or Isco Rechargeable Lead-acid (5 Ahrs capacity) recommended. *Note – Energizer 529 ER does not give specified life.

2150 Ordering Information

Contact your Teledyne Isco representative for complete ordering details and information on other 2100 Series Modules.

Description	Part No.
2150 with AV sensor, 2191 Battery Module, and Handle	68-2050-002
2150 Module with AV sensor (only)	68-2050-001
Isco Flowlink® 5 Software	68-2540-200
Energizer® Model 529 Alkaline Lantern Battery (2 required)	340-2006-02
Isco Rechargeable Lead-acid Battery (2 required)	60-2004-041
Charger for Lead-acid Batteries (holds 2 batteries)	60-2004-040

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Internet: www.isco.com

Water is life. Protect it.

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Water Analysis Instruments
Thermo Scientific Orion AquaMate
and AQUAfast Product Brochure

Reliable water analysis

Precise & Affordable

A complete line of Spectrophotometers, Colorimeters and Turbidity Meters for water and wastewater analysis.

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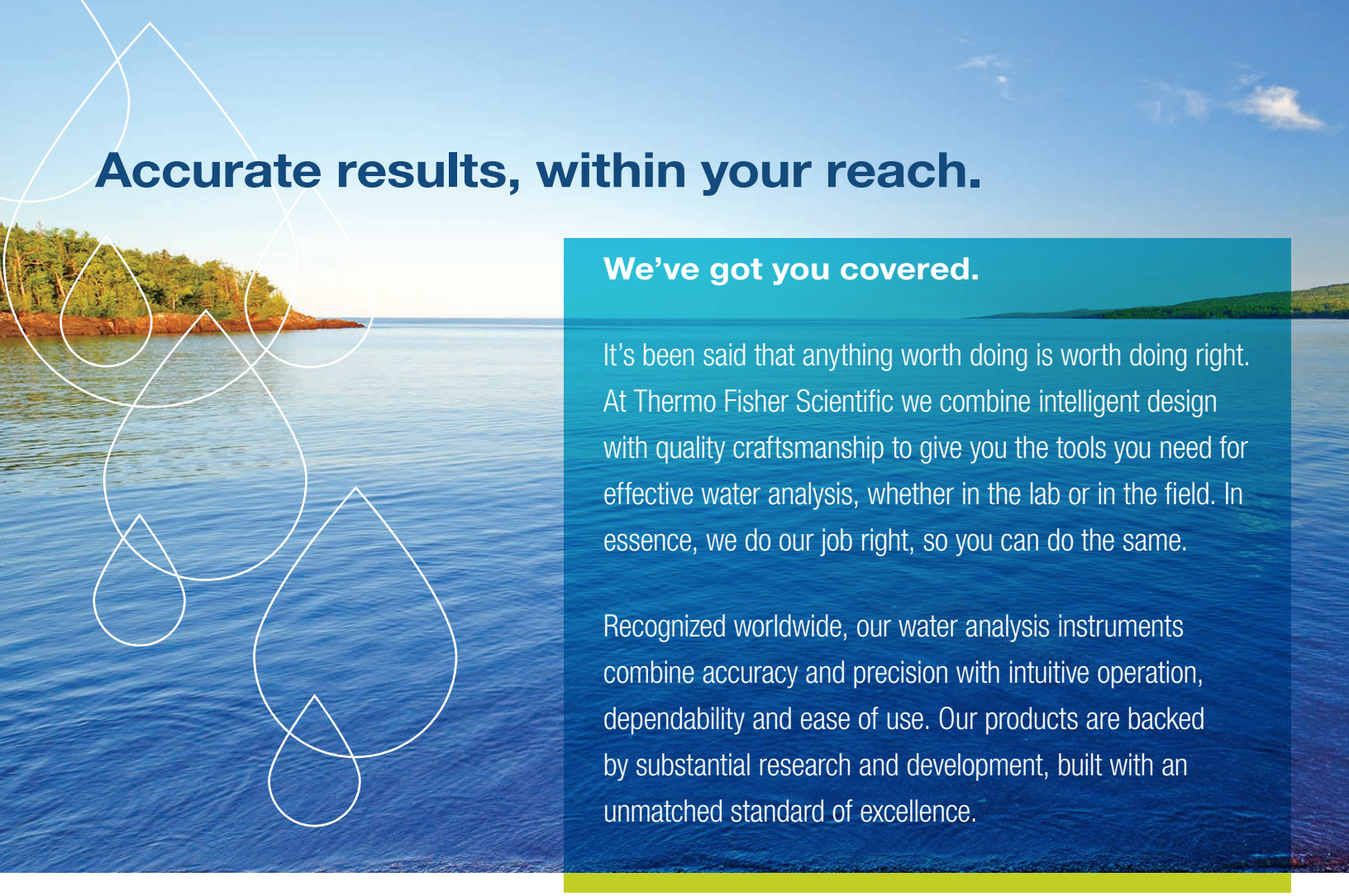


Accurate results, within your reach.

We've got you covered.

It's been said that anything worth doing is worth doing right. At Thermo Fisher Scientific we combine intelligent design with quality craftsmanship to give you the tools you need for effective water analysis, whether in the lab or in the field. In essence, we do our job right, so you can do the same.

Recognized worldwide, our water analysis instruments combine accuracy and precision with intuitive operation, dependability and ease of use. Our products are backed by substantial research and development, built with an unmatched standard of excellence.

Spectrophotometers

Lab Intelligence

A good lab depends on expert equipment.
Thermo Scientific™ Orion™ AquaMate™ Spectrophotometers are the ideal instrument for water and wastewater analysis laboratories, combining innovative technology, compact design and accurate results.

- Spectrophotometers that meet your requirements–choose the AquaMate 8000 UV-Vis or AquaMate 7000 Vis instrument
- Simple and efficient sample analysis using over 260 preprogrammed methods for common reagent chemistries
- One-point calibration adjustment feature ensures the highest accuracy from preprogrammed methods
- User customizable methods for absorbance, % transmittance and concentration testing
- Performance verification tests ensure wavelength accuracy and instrument functionality

Colorimeters/Turbidity Meters

Fieldwork Essentials

Portable design with uncompromised performances.
Thermo Scientific™ Orion™ AQUAfast™ Colorimeters and Turbidity Meters are accurate, dependable and easy to use, with handheld portability, a wide range of methods, optimum wavelengths, user-friendly displays, and easy calibration.

- Rugged, handheld portability and waterproof instruments for fieldwork convenience
- User-friendly interface for quick and easy results processing
- Compatibility with several test parameters and reagent types
- Methods comply with numerous regulatory requirements for drinking water and wastewater analysis

Orion AquaMate 7000 Vis Spectrophotometer

The cost-effective solution for accurate, visible-only measurements

The AquaMate 7000 Vis Spectrophotometer offers 325 to 1100 nm selectable wavelengths and 5 nm spectral bandwidth and is ideal for most routine concentration measurements. For its relatively small footprint and lightweight design, it boasts numerous features at a competitive price. The intuitive user interface and simple, single-beam optical geometry generate accurate results.

Orion AquaMate 8000 UV-Vis Spectrophotometer

The ideal instrument for extensive, full wavelength measurement options

The AquaMate 8000 UV-Vis Spectrophotometer offers 190 to 1100 nm selectable wavelengths and 1.8 nm spectral bandwidth and delivers unsurpassed data quality throughout the entire UV to near-IR region of the spectrum. A dual-beam optical geometry and high-intensity, instant-on xenon lamp are utilized for accurate measurements and five year average lamp lifespan. Superior signal-to-noise performance and fast wavelength scanning technology allow high-quality spectral data to be acquired quickly and reliably.

We offer a full line of Thermo Scientific Orion Colorimetery and Turbidity Meters

Using optical measurement, colorimeters measure the concentration of ions in water and turbidity meters determine the clarity of water due to particulate content.

Regulations ensure our drinking water is safe and our wastewater will not alter or destroy local ecosystems and oceans. Disinfectants, used to purify water, are commonly tested by colorimetry. Groundwater that is the source of a drinking water supply may be checked for iron level and the chemical form of that iron. Water components that increase maintenance frequency may be tested regularly to monitor and maximize time online. Many test reagents are available for measuring parameters that are reported as required on regulatory compliance permits.

Orion AquaMate Spectrophotometers include over 260 preprogrammed methods for easy and convenient measurements using Orion AQUAfast reagent chemistries and chemistries from additional leading reagent manufacturers. Methods are stored on the USB memory stick, so they can be added or removed from the instrument as needed. The included 3-position turret allows a variety of vial sizes to be used with adjustable 13-25mm round vial holder, 20-50mm rectangular vial holder and 10 mm square vial holder. AquaMate Spectrophotometers also utilize performance verification tests to ensure wavelength accuracy and instrument functionality.

AquaMate 7000 Vis Spectrophotometer

- Selectable wavelengths in the visible range of 325 to 1100 nm
- Single-beam optics and Tungsten-halogen lamp
- 5.0 nm spectral bandwidth, ideal for most routine concentration measurements
- Simple operation, expanded functionality and great value
- 1 year warranty

AquaMate 8000 UV-Vis Spectrophotometer

- Selectable wavelengths in the UV and visible range of 190 to 1100 nm
- Dual-beam optics utilizing a Xenon Flash lamp that is always ready with no required warm up and average five year lifespan to reduce maintenance costs
- 1.8 nm spectral bandwidth for optimal resolution
- Enhanced wavelength scanning technology that acquires high-quality spectral data at speeds up to 4,200 nm per minute
- 1 year warranty

Depending on the needs of your lab, choose the **AquaMate 7000 Vis Spectrophotometer** for 325 to 1100 nm wavelengths or choose the **AquaMate 8000 UV-Vis Spectrophotometer** with full 190 to 1100 nm wavelengths for a greater range of measurement options.

Use your current chemistry reagents–no need to change. The AquaMate preprogrammed methods are compatible with many leading reagent manufacturers or create your own methods, so virtually any brand of reagent can be used.

Specifications	AquaMate 8000 UV-Vis Spectrophotometer	AquaMate 7000 Vis Spectrophotometer
Optical Design	Dual beam – internal reference detector	Single beam
Spectral Bandwidth	1.8 nm	5.0 nm
Light Source (Typical Lifetime)	Xenon flash lamp (5 years)	Tungsten-halogen lamp (1000 hours)
Detector	Dual silicon photodiodes	Silicon photodiode
Wavelength		
Range	190 to 1100 nm	325 to 1100 nm
Accuracy	±1.0 nm	±1.0 nm
Repeatability	±0.5 nm	±0.5 nm
Slew Speed	11,000 nm/min	11,000 nm/min
Scanning Speed	10 to 4,200 nm/min	10 to 4,200 nm/min
Data Interval	0.2, 0.5, 1.0, 2.0, 3.0, 5.0 nm	1.0, 2.0, 3.0, 5.0 nm
Photometric		
Measurement Modes	Absorbance, % transmittance, concentration	Absorbance, % transmittance, concentration
Range	-0.5 to 5.0 A ; -1.5 to 125 %T ; ±9999 C	-0.1 to 3.0 A ; -0.3 to 125 %T ; ±9999 C
Linearity	Up to 3.5 A at 260 nm	Up to 3.0 A at 340 nm
Accuracy	±0.005 A at 1.0 A, <0.00025 at 0.0 A	0.5 % or ±0.005 A, whichever is greater up to 2 A
Noise	<0.00050 at 1.0 A, <0.00080 at 2.0 A RMS at 260 nm	<0.001 A at 0.0 A, <0.002 A at 2.0 A Peak-to peak at 340 nm
Drift	<0.0005 A/hr	0.002 A/hr after warm-up
Stray Light	<0.08 %T at 220 nm and 340 nm, <0.1 %T at 340 nm and 400 nm, <1.0 %T at 198 nm	<0.08 %T at 220 nm and 340 nm, <0.1 %T at 340 nm and 400 nm, <1.0 %T at 198 nm
Display	Graphical with LCD backlight– 9.7 x 7.1 cm (3.8 x 2.8 in)	Graphical with LCD backlight– 9.7 x 7.1 cm (3.8 x 2.8 in)
Keypad	Sealed membrane with tactile response keys	Sealed membrane with tactile response keys
Connectivity	USB type A port for USB stick (front panel), USB type B port for computer (rear panel), USB type A port for printer (rear panel)	USB type A port for USB stick (front panel), USB type B port for computer (rear panel), USB type A port for printer (rear panel)
Dimensions	30 W x 40 D x 25 H cm (11.8 x 15.7 x 9.8 in)	30 W x 40 D x 25 H cm (11.8 x 15.7 x 9.8 in)
Weight	8.6 kg (19 lb.)	8.6 kg (19 lb.)
Power Requirements	100 to 240 V ; 50 to 60 Hz	100 to 240 V ; 50 to 60 Hz

Cat. No.	Description
AQ8000	AquaMate 8000 UV-Vis Spectrophotometer, includes methods on USB memory stick, 6-position turret, 3-position turret, 1-position turret, user documentation, dust cover, USB cable, and 110 V, 220 V, 240 V power cords
AQ7000	AquaMate 7000 Vis Spectrophotometer, includes methods on USB memory stick, 3-position turret, user documentation, dust cover, USB cable, and 110 V, 220 V, 240 V power cords
AQ006C	AquaMate 6-position vial holder turret for six 10 mm square vials
AQ003C	AquaMate 3-position vial holder turret for one adjustable 13-25 mm round vial, one adjustable 20-50 mm rectangular vial and one 10 mm square vial
AQ001C	AquaMate 1-position vial holder turret for one 10 mm square vial
AQ100C	AquaMate 1-position vial holder turret for one 100mm rectangular vial
AQ7LMP	AquaMate 7000 replacement Tungsten lamp in pre-aligned fixture
AQ0USB	AquaMate methods, USB memory stick
AQCHNV	AquaMate power cord, China, Australia, New Zealand plug
AQ240V	AquaMate power cord, 240 V UK, Singapore plug
AQ220V	AquaMate power cord, 220 V Euro plug
AQ110V	AquaMate power cord, 110 V US, Japan plug
AC2V24	24 mm round vials, 12 pack

Note: When ordering the AQ8000 or AQ7000 instruments, the AQCHNV power cord must be ordered separately.

Colorimeters

Thermo Scientific™ Orion™ AQ3700 Colorimeter

Featuring tests for nitrogen, phosphate and COD

Preprogrammed with many colorimetry reagents and digestion tests.

This portable meter is the newest addition to the colorimetry line offering over 90 preprogrammed method options.

- Multi-parameter colorimeter with six wavelength options and wavelength auto-selection by preprogrammed method
- IP67 waterproof with 1000 data-point memory and long battery life
- Numerous preprogrammed tests for powder, tablet and liquid reagent chemistries, reaction tubes, COD digestion tubes and acid digestion tubes, including nitrogen and phosphate nutrient testing
- User interface available in selectable languages of English, French, German, Indonesian, Italian, Polish, Portuguese and Spanish

Thermo Scientific™ Orion™ AQ4000 Colorimeter

Offers numerous preprogrammed tests for reagent chemistries

Easily create and store your own calibration curve for up to 10 new tests.

Take the guesswork out of sample preparation and measurement with the Auto-Test ampoules and the exclusive Auto-ID feature.

- Multi-parameter colorimeter with four wavelength options and wavelength auto-selection by preprogrammed method
- Portable and IP67 waterproof with 100 data-point memory and 2,500 hour average battery life
- Compatible with powder, tablet and liquid reagent chemistries, Auto-Test ampoules and COD digestion tubes
- Auto-Test ampoules contain pre-measured liquid reagents and automatically identify the species to be measured, select the wavelength and initiate the method on the meter
- Computer interface for data transfer using RS232 port

AQ3700 Colorimeter	Specifications
Incident Light Source	6 light emitting diodes (LED)
Wavelengths	430, 530, 560, 580, 610, 660 nm
Wavelength Accuracy	±1nm
Photometric Accuracy	±0.005 Abs
Sample Cell Compatibility	13 mm, 16mm and 24 mm round
Power	4 AA batteries
Warranty	2 years

Cat. No.	Description
AQ3700	AQ3700 meter with 4 AA batteries, 24 mm vials, 16 mm vials, 16 mm vial adapter, 13 mm vial adapter, field case, user guide with test methods, tablet tampering stir rod and vial cleaning brush
AC2V16	Replacement 16 mm vials, 10 pack
AC2V24	Replacement 24 mm vials, 12 pack
AC3SR24	Sealing rings for 24 mm vials, 12 pack
AC3VSK	Verification standard kit for AQ3700 colorimeter, set of 6
AQ37IRIM	IRIM data transfer device for AQ3700 colorimeter
AC3CBR	Vial cleaning brush, 5 pack
COD165	Thermoreactor for digestion methods, 100°C, 120°C, 150°C, 160°C and 165°C temperature control
CODS01	1000 ppm COD standard, 475 mL
CODS10	10000 ppm COD standard, 475 mL

AQ4000 Colorimeter	Specifications
Incident Light Source	4 light emitting diodes (LED)
Wavelengths	420, 520, 580, 610 nm
Wavelength Accuracy	±2nm
Photometric Accuracy	±0.005 A
Sample Cell Compatibility	13 mm, 16mm and 24 mm round
Power	4 AA batteries
Warranty	2 years

Cat. No.	Description
AQ4000	AQ4000 meter with 4 AA batteries, 16 mm vial, zero vial kit, 16 mm vial adapter, 13 mm vial adapter, field case, user guide, tablet tampering stir rod and vial cleaning brush
AC2V16	Replacement 16 mm vials, 10 pack
AC2V24	Replacement 24 mm vials, 12 pack
AC3CBR	Vial cleaning brush, 5 pack
AQ4CBL	RS232 cable for data download and software update
AQ4ZER	AQUAfast zero kit
COD165	Thermoreactor for digestion methods, 100°C, 120°C, 150°C, 160°C and 165°C temperature control
CODS01	1000 ppm COD standard, 475 mL
CODS10	10000 ppm COD standard, 475 mL

Turbidity Meters

Thermo Scientific™ Orion™ AQ4500 Turbidity Meter

All-in one capability, featuring both White and Infrared light sources

The only meter you need for all your turbidity testing.

Includes a dual source LED to allow readings that comply with reporting requirements for both EPA 180.1 and ISO 7027 methods.

- U.S. EPA approved white light LED 180.1 method for reporting turbidity
- ISO 7027 IR LED method for reporting turbidity
- Portable and IP67 waterproof with 100 data-point memory and 2,500 hour average battery life
- Orion AQ4500 Drinking Water and Wastewater Methods approved for U.S. EPA regulatory reporting
- Computer interface for data transfer using RS232 port

Thermo Scientific™ Orion™ AQ3010 Turbidity Meter

Faster calibration with step-by-step prompts

Includes a field case for easy storage and transport.

Easily determine the clarity of your sample with a user-friendly interface, large display and 0 to 1000 NTU auto-ranging.

- ISO 7027 IR LED method for reporting
- Employs Nephelometric principle of turbidity measurement
- Meets criteria specified in ISO 7027 and DIN 27027 standards
- Portable and IP67 waterproof with long battery life
- Easy vial indexing with continuous measurement mode
- Simple interface and low cost of ownership

AQ4500 Turbidity Meter	Specifications
Incident Light Source	Dual Source - White Light LED and IR LED
Measurement Modes	EPA 180.1, ISO nephelometric, ISO absorbance, IR ratiometric, % transmittance, EPA GLI method 2, EBC (European Brewing Chemists), ASBC (American Society of Brewing Chemists)
Measurement Ranges	0 to 4000 NTU EPA 0 to 2000 NTU GLI range 0 to 40 NTU ISO-7027 0 to 150 FAU IR Ratio 0 to 4000 NTU EBC 0 to 24.5 ASBC 0 to 236
Resolution	0.01 (0 to 9.99 NTU), 0.1 (10 to 99.9), 1 (100 to 4000)
Sample Cell Compatibility	24 mm round
Power	4 AA batteries
Warranty	2 years

Cat. No.	Description
AQ4500	AQ4500 meter with 4 AA batteries, primary standard calibration kit, 24 mm turbidity vials, field case, user guide, silicone oil and cloth
AC2T24	Replacement 24 mm turbidity vials, 12 pack
AC45ST	Primary turbidity standard calibration, set of 5
AC45FZ	4000 NTU Formazin turbidity standard, 475 mL
AC45S1	Silicon oil and cloth
AC3CBR	Vial cleaning brush, 5 pack
AQ4CBL	RS232 cable for data download and software update

AQ3010 Turbidity Meter	Specifications
Incident Light Source	IR LED
Measurement Modes	ISO nephelometric
Measurement Ranges	0.01 to 1000 NTU
Resolution	0.01 (0.01 to 19.99 NTU), 0.1 (20 to 99.9), 1 (100 to 1000)
Sample Cell Compatibility	25 mm round
Power	4 AAA batteries
Warranty	3 years

Cat. No.	Description
AQ3010	AQ3010 meter with 4 AAA batteries, EPA approved primary standard kit, 25 mm turbidity vials, field case, user guide, silicone oil and cloth
AC3V25	Replacement 25 mm vials, 3 pack
AC301S	EPA approved and ISO accepted polymer-based primary turbidity standard kit, set of 4
AC3SIL	Silicon oil and cloth
AC3CBR	Vial cleaning brush, 5 pack

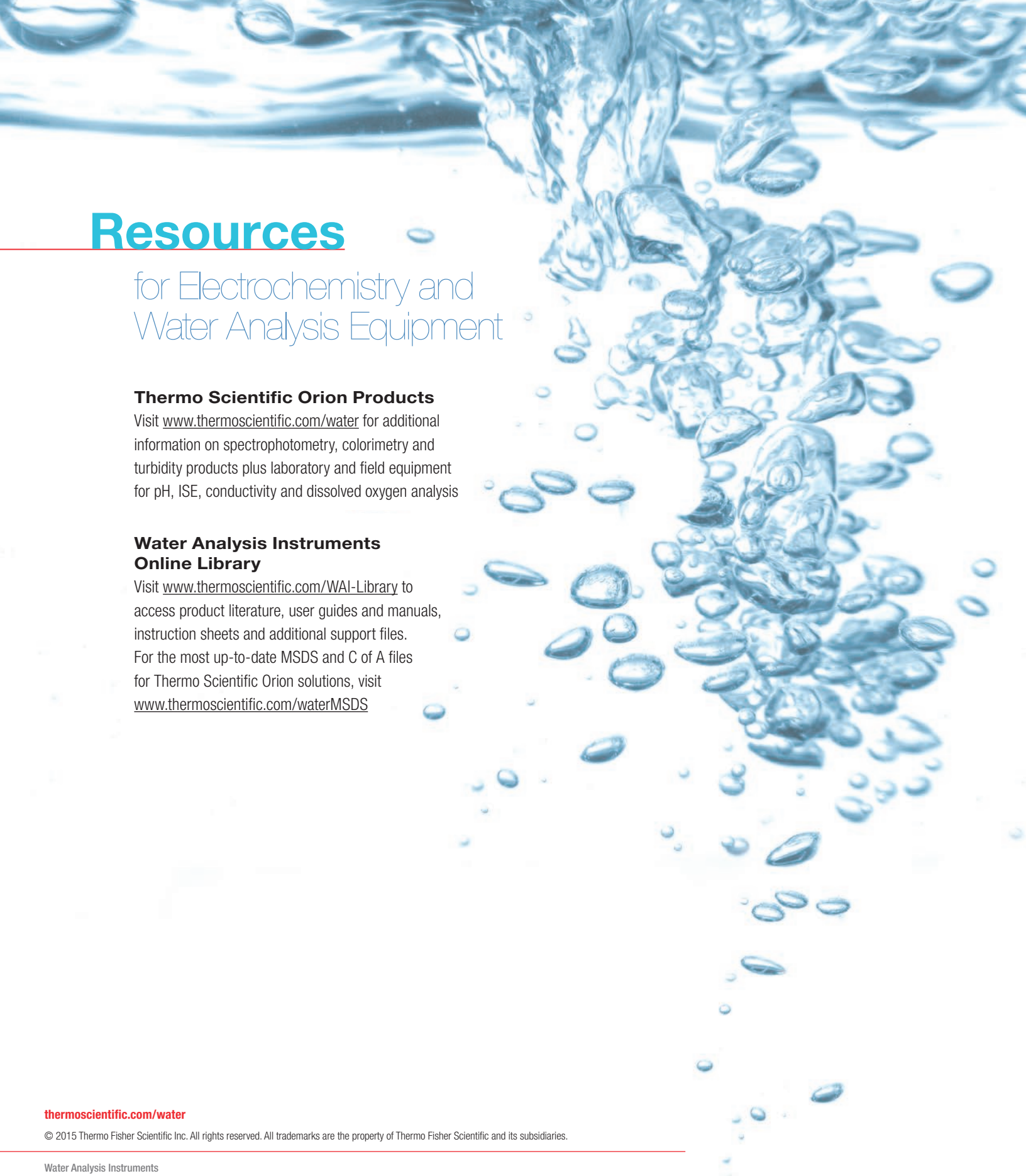
Visit our online library at www.thermoscientific.com/WAI-Library to review colorimetry and turbidity approvals and our approved Orion AQ4500 Drinking Water and Wastewater turbidity methods that are approved for EPA compliant reporting. We have posted application notes and briefs to assist you with testing.

Thermo Scientific Orion AQUAfast Reagent Chemistries

Parameter	Cat. Number	Description	Reagent Type	Range	No. of Tests	AQ8000	AQ7000	AQ4000	AQ3700
Alkalinity	AC2002	Alkalinity-M, Acid/Indicator Method	Tablet	5 - 200 mg/L	100	•	•	•	•
	AC3002P	Alkalinity-P, Acid/Indicator Method	Tablet	5 - 300 mg/L	100	•	•		•
Aluminum	AC2027	Aluminum, Eriochrome Cyanine R Method	Tablet	0.01 - 0.3 mg/L	50	•	•	•	•
	AC4027	Aluminum, Eriochrome Cyanine R Method	Ampoule	0.04 - 0.25 mg/L	30			•	
	AC4P27	Aluminum, Eriochrome Cyanine R Method	Powder & Liquid	0.01 - 0.25 mg/L	100	•	•		•
Ammonia	AC2012	Ammonia as Nitrogen (N), Indophenol Blue Method	Tablet	0.02 - 1 mg/L	50	•	•	•	•
	AC4010	Ammonia as Nitrogen (N), Ultra Low Range, Salicylate Method	Ampoule	0.2 - 30 mg/L	30			•	
	AC4011	Ammonia as Nitrogen (N), High Range, Nesslerization Method	Ampoule	1 - 14 mg/L	30			•	
	AC4012	Ammonia as Nitrogen (N), Low Range, Nesslerization Method	Ampoule	0.5 - 7 mg/L	30			•	
	AC4P12	Ammonia as Nitrogen (N), Salicylate Method	Powder	0.01 - 0.8 mg/L	100	•	•	•	•
	ACR011	Ammonia as Nitrogen (N), High Range, Salicylate Method	Reaction Tube	1 - 50 mg/L	50	•	•		•
	ACR012	Ammonia as Nitrogen (N), Low Range, Salicylate Method	Reaction Tube	0.02 - 2.5 mg/L	50	•	•		•
Boron	AC3089	Boron, Azomethine Method	Tablet	0.1 - 2 mg/L	100				•
Bromine	AC2035	Bromine, DPD Method	Tablet	0.05 - 13 mg/L	100	•	•		•
Chloride	AC2017	Chloride, Silver Nitrate/Turbidity Method	Tablet	0.5 - 25 mg/L	50	•	•	•	•
	AC4017	Chloride, Ferric Thiocyanate Method	Ampoule	2.5 - 40 mg/L	30			•	
Chlorine	AC2070	Chlorine, Free & Total, DPD Method	Tablet	0.01 - 6 mg/L	100	•	•	•	•
	AC2071	Chlorine, Free, DPD Method	Tablet	0.01 - 6 mg/L	100	•	•	•	•
	AC2072	Chlorine, Total, DPD Method	Tablet	0.01 - 6 mg/L	100	•	•	•	•
	AC3072	Chlorine, Total, High Range, KI / Acid Method	Tablet	5 - 200 mg/L	100	•	•		•
	AC4070	Chlorine, Free & Total, DPD Method	Ampoule	0.4 - 5 mg/L	30			•	
	AC4P71	Chlorine, Free, DPD Method	Powder	0.02 - 2 mg/L	100	•	•	•	•
	AC4P72	Chlorine, Total, DPD Method	Powder	0.02 - 2 mg/L	100	•	•	•	•
Chlorine Dioxide	AC2099	Chlorine Dioxide, DPD Method	Tablet	0.02 - 11 mg/L	100	•	•		•
	AC4099	Chlorine Dioxide, DPD Method	Ampoule	0.8 - 11 mg/L	30			•	
COD	CODL00	COD, Low Range, Dichromate Digestion Method	Digestion Tube	0 - 150 mg/L	25	•	•	•	•
	CODH00	COD, Mid Range, Dichromate Digestion Method	Digestion Tube	0 - 1500 mg/L	25	•	•	•	•
	CODHP0	COD, High Range, Dichromate Digestion Method	Digestion Tube	0 - 15000 mg/L	25	•	•	•	•
Color	-----	Color, Pt-Co Scale, Direct Reading	-----	0 - 500 Pt-Co units	-----	•	•		•
Copper	AC2029	Copper, Free & Total, Biquinoline Method	Tablet	0.05 - 5 mg/L	50	•	•	•	•
	AC4029	Copper, Soluble, Bathocuproine Method	Ampoule	0.5 - 12 mg/L	30			•	
	AC4P29	Copper, Free, Bicinchoninate Method	Powder	0.05 - 5 mg/L	100	•	•	•	•
Cyanide	AC4P06	Cyanide, Pyridinebarbituric Acid Method	Powder & Liquid	0.01 - 0.5 mg/L	100				•
	AC4006	Cyanide, Isonicotinic-Barbituric Acid Method	Ampoule	0.04 - 0.4 mg/L	30			•	
Cyanuric Acid	AC2098	Cyanuric Acid, Melamine Method	Tablet	0 - 160 mg/L	100	•	•		•
DEHA	AC3088	DEHA, PPST Method	Tablet & Liquid	0.02 - 0.5 mg/L	100				•
	AC4P88	DEHA, PPST Method	Powder & Liquid	0.02 - 0.5 mg/L	100				•
Fluoride	AC2009	Fluoride, SPADNS Kit Method	Liquid	0.05 - 2 mg/L	50	•	•	•	•
Hardness	AC3032C	Hardness, Calcium, High Range, Murexide Method	Tablet	50 - 900 mg/L	100				•
	AC3032C2	Hardness, Calcium, Low Range, Murexide Method	Tablet	0 - 500 mg/L	100				•
	AC3032T	Hardness, Total, Metallphthalein Method	Tablet	2 - 50 mg/L	100	•	•		•
Hydrazine	AC3030LQ	Hydrazine, 4-(Dimethyl-amino)-Benzaldehyde Method	Liquid	0.005 - 0.6 mg/L	50				•
	AC2030	Hydrazine, 4-(Dimethyl-amino)-Benzaldehyde Method	Powder	0.05 - 0.5 mg/L	30	•	•	•	•
Hydrogen Peroxide	AC3069	Hydrogen Peroxide, DPD/Catalyst Method	Tablet	0.03 - 3 mg/L	100				•
Iron	AC2078	Iron (II & III), PPST Method	Tablet	0.02 - 1 mg/L	100	•	•	•	•
	AC4078	Iron, Total & Soluble, Phenanthroline Method	Ampoule	0.2 - 6 mg/L	30			•	
	AC4P78	Iron, Ferro, 1,10-Phenanthroline Method	Powder	0.02 - 3 mg/L	100	•	•	•	•
	AC4P79	Iron, Total, TPTZ Method	Powder	0.02 - 1.8 mg/L	100	•	•	•	•

Parameter	Cat. Number	Description	Reagent Type	Range	No. of Tests	AQ8000	AQ7000	AQ4000	AQ3700
Manganese	AC2055	Manganese, Formaldoxime Method	Tablet	0.2 - 4 mg/L	50	•	•	•	•
	AC4055	Manganese, Periodate Method	Ampoule	2 - 30 mg/L	30			•	
	AC4P54	Manganese, Low Range, PAN Method	Powder & Liquid	0.01 - 0.7 mg/L	100	•	•		•
	AC4P55	Manganese, High Range, Periodate Oxidation Method	Powder & Liquid	0.1 - 18 mg/L	100	•	•	•	•
Molybdate	AC4P42	Molybdate / Molybdenum, Mercaptoacetic Acid Method	Powder	0.5 - 66 mg/L	100	•	•	•	•
Nitrate	AC2007	Nitrate as Nitrogen (N), Zinc Reduction Method	Tablet & Powder	0.08 - 1 mg/L	50			•	•
	ACR007	Nitrate as Nitrogen (N), Chromotropic Acid Method	Reaction Tube	1 - 30 mg/L	50	•	•		•
	AC4004	Nitrate as Nitrogen (N), Cadmium Reduction Method	Ampoule	0.2 - 1.5 mg/L	30			•	
	AC4005	Nitrate as Nitrogen (N), Cadmium Reduction Method	Ampoule	0.4 - 3 mg/L	30			•	
	AC4007	Nitrate, Cadmium Reduction Method	Ampoule	5 - 50 mg/L	30			•	
Nitrite	AC2046	Nitrite as Nitrogen (N), N-(1-Naphthyl)-Ethylenediamine Method	Tablet	0.01 - 0.5 mg/L	100	•	•	•	•
	AC4P46	Nitrite as Nitrogen (N), Diazotization (Azo) Method	Powder	0.01 - 0.3 mg/L	100	•	•	•	•
	AC4046	Nitrite as Nitrogen (N), Diazotization (Azo) Method	Ampoule	0.08 - 0.8 mg/L	30			•	
Nitrogen, Total	ACD004	Nitrogen, Total, Low Range, Persulfate Digestion Method	Digestion Tube	0.5 - 25 mg/L	50	•	•		•
	ACD007	Nitrogen, Total, High Range, Persulfate Digestion Method	Digestion Tube	5 - 150 mg/L	50	•	•		•
Oxygen	AC4008	Oxygen, Indigo Carmine Method	Ampoule	2 - 15 mg/L	30			•	
Ozone	AC3048	Ozone, DPD/Glycine Method	Tablet	0.02 - 2 mg/L	100	•	•		•
	AC4048	Ozone, DPD Method	Ampoule	0.2 - 5 mg/L	30			•	
pH	AC2001	pH, Phenol Red Method	Tablet	6.5 - 8.4	100	•	•	•	•
	AC3001	pH, Phenol Red Method	Liquid	6.5 - 8.4	30	•	•		•
	AC3001BP	pH, Bromocresol Purple Method	Tablet	5.2 - 6.8	100				•
	AC3001TB	pH, Thymol Blue Method	Tablet	8.0 - 9.6	100				•
Phosphate	AC2095-WA	Phosphate, Ortho, Phosphomolybdic Acid/Ascorbic Acid Method	Tablet	0.05 - 4 mg/L	50	•	•	•	•
	AC2096	Phosphate, Ortho, Vanadomolybdate Method	Tablet	1 - 80 mg/L	50	•	•	•	•
	AC4095	Phosphate, Ortho, Stannous Chloride Method	Ampoule	0.3 - 8 mg/L	30			•	
	AC4P95	Phosphate, Ortho, Phosphomolybdenum/Ascorbic Acid Method	Powder	0.06 - 2.5 mg/L	100	•	•	•	•
	ACD095	Phosphate as P, Total, Persulfate Digestion/Ascorbic Acid Method	Digestion Tube	0.02 - 1.1 mg/L	50	•	•		•
	ACD095AH	Phosphate as P, Acid Hydrolyzable, Acid Digestion/ Ascorbic Acid Method	Digestion Tube	0.02 - 1.6 mg/L	50	•	•		•
	ACR095	Phosphate, Ortho, Phosphomolybdenum/Ascorbic Acid Method	Reaction Tube	0.06 - 5 mg/L	50	•	•		•
Potassium	AC3019	Potassium, Tetraphenylborate-Turbidity Method	Tablet	0.7 - 12 mg/L	100				•
Silica	AC2060	Silica, Silicomolybdate, Heteropoly Blue Method	Tablet	0.05 - 4 mg/L	50	•	•	•	•
	AC2061	Phosphate Removal for AC2060 Method	Tablet	-----	100	•	•	•	•
	AC4060	Silica, Heteropoly Blue Method	Ampoule	0.5 - 10 mg/L	30			•	
	AC4P60	Silica, High Range, Silicomolybdate Method	Powder	1 - 90 mg/L	100	•	•	•	•
Sodium Hypochlorite	AC3072	Sodium Hypochlorite, Potassium Iodide Method	Tablet	0.2 - 16 %	100				•
Sulfate	AC2082	Sulfate, Barium Sulfate/Turbidity Method	Tablet	5 - 100 mg/L	100			•	•
	AC4082	Sulfate, Barium Sulfate/Turbidity Method	Ampoule	8 - 100 mg/L	30			•	
	AC4P82	Sulfate, Barium Sulfate/Turbidity Method	Powder	5 - 100 mg/L	100	•	•	•	•
Sulfide	AC2016	Sulfide, DPD/Catalyst Method	Tablet	0.04 - 0.5 mg/L	50	•	•	•	•
	AC4016	Sulfide, Acid Soluble, Methylene Blue Method	Ampoule	0.2 - 3 mg/L	30			•	
Zinc	AC2065	Zinc, Zincon Method	Tablet	0.02 - 1 mg/L	50	•	•	•	•
	AC4065	Zinc, Zincon Method	Ampoule	0.3 - 3 mg/L	30			•	

Many of the AQUAfast reagent chemistries use U.S. EPA approved methods for drinking water and/or wastewater. Visit www.thermoscientific.com/water for the most current list of U.S. EPA compliant reagent chemistry methods.



Resources

for Electrochemistry and Water Analysis Equipment

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Appendix D Tender Index Spreadsheet (Full List of Tender Documents)

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RDP Minor Civils Tender Information Document Tracker - AECOM DESIGN					Date:	12/12/2019
No.	**Title**	**Doc Reference (4 Projects)**	**Revision**	**Design Package**	**Document Type**	**Scope Comment**
1	CDM Designers Risk Register	AEC-RDP-T1.00-RA-027	A	DP2 Drainage	Designer Risk Assessment	
2	Post Residual Risks	AEC-RDP-T1.00-RR-007	A	DP2 Drainage	Designer Risk Assessment	
3	Surface Water Drainage	AEC-RDP-T1.00-SP-033	C	DP2 Drainage	Specification	
4	Water Drainage Manhole & Pipeline Schedule	AEC-RDP-T1.00-SC-014	A	DP2 Drainage	Schedule	
5	Surface Water Management Plan	AEC-RDP-T1.00-RP-091	A	DP2 Drainage	Report	
6	Surface Water Drainage T1 General Arrangement	RD 344	A	DP2 Drainage	Design Drawing	
7	Surface Water Drainage T1 Key Plan	RD 345	A	DP2 Drainage	Design Drawing	
8	Proposed Surface Water System Arrangement Construction Phasing Part A	RD 346	A	DP2 Drainage	Design Drawing	
9	Proposed Surface Water System Arrangement Construction Phasing Part B	RD 347	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
10	Proposed Surface Water System Arrangement Construction Phasing Part C	RD 348	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
11	Proposed Surface Water System Arrangement Construction Phasing Part D	RD 349	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
12	Proposed Surface Water System Arrangement Construction Phasing Part E Scheme Completion	RD 350	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
13	Tranche 1 Plan and Profile Drigg Stream Sheet 1 of 3	RD 351	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
14	Tranche 1 Plan and Profile Drigg Stream Sheet 2 of 3	RD 352	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
15	Tranche 1 Plan and Profile Drigg Stream Sheet 3 of 3	RD 353	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
16	Tranche 1 Plan and Profile Temporary Channel Sheet 1 of 2	RD 354	A	DP2 Drainage	Design Drawing	Only short section of drainage in scope, refer to Scope Doc.
17	Tranche 1 Plan and Profile Temporary Channel Sheet 2 of 2	RD 355	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
18	Tranche 1 Plan and Profile East Cap Perimeter Channel	RD 356	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
19	Surface Water Drainage Mound 1 Drainage	RD 357	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
20	Tranche 1 Setting Out Points Mound 1 Drainage	RD 358	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
21	Tranche 1 Plan and Profile Mound 2 Drainage	RD 359	A	DP2 Drainage	Design Drawing	
22	Tranche 1 Sections West Perimeter Channel Drigg Stream	RD 360	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
23	Tranche 1 Sections West Temporary Channel	RD 361	A	DP2 Drainage	Design Drawing	Only short section of drainage in scope, refer to Scope Doc.
24	Tranche 1 Sections East Perimeter Channel Drigg Stream	RD 362	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
25	Tranche 1 General Arrangement Temporary Lagoon A	RD 363	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
26	Tranche 1 General Arrangement Temporary Lagoon B	RD 364	A	DP2 Drainage	Design Drawing	
27	Tranche 1 General Arrangement Temporary Lagoon C	RD 365	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
28	Tranche 1 General Arrangement Temporary Lagoon C Profile	RD 366	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
29	Tranche 1 General Arrangement Temporary Lagoon Attenuation D	RD 367	B	DP2 Drainage	Design Drawing	
30	Tranche 1 General Arrangement Temporary Final Lagoon E	RD 368	A	DP2 Drainage	Design Drawing	
31	Tranche 1 General Arrangement Temporary Lagoon F	RD 370	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
32	Surface Water Drainage Dust Suppression Storage Pond Sheet 1 of 2	RD 371	A	DP2 Drainage	Design Drawing	Dust pond not in scope, refer to Scope Doc.
33	Surface Water Drainage Dust Suppression Storage Pond Sheet 2 of 2	RD 372	A	DP2 Drainage	Design Drawing	Dust pond not in scope, refer to Scope Doc.
34	Surface Water Drainage Temporary Pond Outlet Details	RD 373	A	DP2 Drainage	Design Drawing	
35	Surface Water Drainage Drigg Stream Haul Road Culvert	RD 377	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
36	Surface Water Drainage Temporary Channel Culverts	RD 378	A	DP2 Drainage	Design Drawing	
37	T1 Setting Out Points Channels	RD 387	A	DP2 Drainage	Design Drawing	
38	Surface Water Drainage Typical Swale Details	RD 389	A	DP2 Drainage	Design Drawing	
39	Surface Water Drainage Retaining Wall Details - Cross Section	RD 390	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
40	Surface Water Drainage NW Retaining wall Details - Long Section	RD 391	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
41	Surface Water Drainage Haul Road Crossing Details Sheet 1 of 2	RD 392	A	DP2 Drainage	Design Drawing	
42	Surface Water Drainage Haul Road Crossing Details Sheet 2 of 2	RD 393	A	DP2 Drainage	Design Drawing	
43	Surface Water Drainage Haul Road Crossing Details Existing Cap Channel	RD 394	A	DP2 Drainage	Design Drawing	Not part of Scope FI Only
44	Surface Water Drainage Backdrop Manhole Details	RD 395	A	DP2 Drainage	Design Drawing	
45	Surface Water Drainage Flow control Chamber Details	RD 396	A	DP2 Drainage	Design Drawing	
46	Surface Water Drainage Typical Lagoon Details	RD 397	B	DP2 Drainage	Design Drawing	
47	Surface Water Drainage Erosion Control Details Sheet 1 of 2	RD 398	A	DP2 Drainage	Design Drawing	

RDP Minor Civils Tender Information Document Tracker - AECOM DESIGN					Date:	12/12/2019
No.	**Title**	**Doc Reference (4 Projects)**	**Revision**	**Design Package**	**Document Type**	**Scope Comment**
48	Surface Water Drainage Erosion Control Details Sheet 2 of 2	RD 399	A	DP2 Drainage	Design Drawing	
49	Surface Water Drainage Headwall Details	RD 400	A	DP2 Drainage	Design Drawing	
50	AMPHIBIAN FENCING TYPICAL DETAILS	RD 652	A	DP2 Drainage	Design Drawing	
51	DP3 Residual Risk Register	AEC-RDP-T1.00-RA-021	A	DP3 Monitoring Infrastructure	Designer Risk Assessment	
52	DP3 Designers Risk Assessment	AEC-RDP-T1.00-RA-020	A	DP3 Monitoring Infrastructure	Designer Risk Assessment	
53	DP3 Impact Assessment Schedule	AEC-RDP-T1.00-GEN-031	A	DP3 Monitoring Infrastructure	Schedule	Not all in scope, refer to filtered schedule.
54	DP3 Impact Assessment Schedule - Filtered for Minor Civils Scope	AEC-RDP-T1.00-SC-018	A	DP3 Monitoring Infrastructure	Schedule	
55	DP3 Monitoring Infrastructure Headworks	RD 313	A	DP3 Monitoring Infrastructure	Design Drawing	Not all in scope, refer to marked up drawing.
56	DP 3 Monitoring Infrastructure GA	RD 317	A	DP3 Monitoring Infrastructure	Design Drawing	Not all in scope, refer to marked up drawing.
57	DP3 Monitoring Infrastructure GA	RD 318	A	DP3 Monitoring Infrastructure	Design Drawing	Not all in scope, refer to marked up drawing.
58	DP3 Monitoring Infrastructure GA	RD 319	A	DP3 Monitoring Infrastructure	Design Drawing	Not all in scope, refer to marked up drawing.
59	Pavement Technical Note	AEC-RDP-T1.00-RP-090	A	DP5 Haul Roads	Technical Note	
60	DP5 Designers Risk Assessment	AEC-RDP-T1.00-RA-017	A	DP5 Haul Roads	Designer Risk Assessment	
61	DP5 Traffic Signal Configuration	AEC-RDP-T1.00-SP-028	B	DP5 Haul Roads	Specification	
62	Appendix 12_5 Specification - Traffic Signal	AEC-RDP-T1.00-SP-032	B	DP5 Haul Roads	Technical Note	
63	DP5 Haul Road Specification	AEC-RDP-T1.00-SP-026	A	DP5 Haul Roads	Specification	
64	DP5 - Drainage Schedule	AEC-RDP-T1.00-SC-015	A	DP5 Haul Roads	Schedule	
65	General Arrangement	RD 292	A	DP5 Haul Roads	Design Drawing	Not all in scope, refer to Scope Doc.
66	DP5 Typical Sections	RD 293	A	DP5 Haul Roads	Design Drawing	
67	DP 5 Typical Sections	RD 294	A	DP5 Haul Roads	Design Drawing	
68	DP5 Typical Sections	RD 295	A	DP5 Haul Roads	Design Drawing	
69	DP5 Utilities General Arrangement	RD 296	A	DP5 Haul Roads	Design Drawing	
70	DP 5 Long Sections	RD 298	A	DP5 Haul Roads	Design Drawing	
71	DP5 Long Sections	RD 299	A	DP5 Haul Roads	Design Drawing	
72	DP5 Long Sections	RD 300	A	DP5 Haul Roads	Design Drawing	
73	DP5 Cross Sections	RD 302	A	DP5 Haul Roads	Design Drawing	
74	DP 5 Cross Sections	RD 303	A	DP5 Haul Roads	Design Drawing	
75	DP5 Street 4 Cross Section	RD 304	A	DP5 Haul Roads	Design Drawing	
76	DP5 Construction Details	RD 305	A	DP5 Haul Roads	Design Drawing	
77	DP5 Construction Details	RD 306	A	DP5 Haul Roads	Design Drawing	
78	DP5 Construction Details	RD 307	A	DP5 Haul Roads	Design Drawing	
79	DP5 Horizontal Tracking	RD 308	A	DP5 Haul Roads	Design Drawing	
80	DP5 - Vertical Tracking	RD 309	A	DP5 Haul Roads	Design Drawing	
81	DP5 - Environmental Risk Assessment	RD 310	A	DP5 Haul Roads	Design Drawing	
82	DP5 Traffic Management Plan	RD 311	A	DP5 Haul Roads	Design Drawing	
83	DP5 Street 4 Signalised Crossing	RD 312	A	DP5 Haul Roads	Design Drawing	
84	DP5 Drainage General Arrangement	RD 342	A	DP5 Haul Roads	Design Drawing	Not all in scope, refer to Scope Doc.
85	Haul Road Design 040419.DXF	No Ref:	Issue 04/04/2019	DP5 Haul Roads	Design Model	
86	DP6 - Outline Installation Method Statement	AEC-RDP-T1.00-MS-014	A	DP6 Stockpile Management	Method Statement	
87	DP6 - Stockpile Management - Design Calculations	AEC-RDP-T1.00-CAL-010	A	DP6 Stockpile Management	Calculation	
88	DP6 Stockpile Management RA	AEC-RDP-T1.00-RA-022	A	DP6 Stockpile Management	Designer Risk Assessment	
89	Stockpile Material Sampling Specification	AEC-RDP-T1.00-SP-003	A	DP6 Stockpile Management	Specification	
90	Earthworks Specification	AEC-RDP-T1.00-SP-027	A	DP6 Stockpile Management	Specification	
91	DP6 - Stockpile Locations	RD 327	A	DP6 Stockpile Management	Design Drawing	Not all in scope, refer to Scope Doc.
92	Stockpile A General Arrangement	RD 328	A	DP6 Stockpile Management	Design Drawing	Not part of Scope FI Only
93	Stockpile A Typical Sections	RD 329	A	DP6 Stockpile Management	Design Drawing	Not part of Scope FI Only
94	DP 6 SED Stockpile A and B Standard Details	RD 330	A	DP6 Stockpile Management	Design Drawing	
95	DP6 - Stockpile B General Arrangement	RD 331	A	DP6 Stockpile Management	Design Drawing	Only section of drainage to Lagoon E in scope
96	DP6 - Stockpile B Typical Sections	RD 332	A	DP6 Stockpile Management	Design Drawing	Only section of drainage to Lagoon E in scope
97	DP6 - Stockpile B Construction Details	RD 333	A	DP6 Stockpile Management	Design Drawing	Only section of drainage to Lagoon E in scope
98	Stockpile C General Arrangement	RD 334	A	DP6 Stockpile Management	Design Drawing	
99	DP6 - Stockpile C Typical Sections	RD 335	A	DP6 Stockpile Management	Design Drawing	
100	DP 6 SED Standard Details	RD 336	A	DP6 Stockpile Management	Design Drawing	
101	Stockpile D General Arrangement	RD 337	A	DP6 Stockpile Management	Design Drawing	

RDP Minor Civils Tender Information Document Tracker - AECOM DESIGN					Date:	12/12/2019
No.	**Title**	**Doc Reference (4 Projects)**	**Revision**	**Design Package**	**Document Type**	**Scope Comment**
102	DP6 - Stockpile D Typical Section	RD 338	A	DP6 Stockpile Management	Design Drawing	
103	DP 6 - Stockpile D Construction Details	RD 339	A	DP6 Stockpile Management	Design Drawing	
104	DP6 - Stockpile A Typical Sections	RD 640	A	DP6 Stockpile Management	Design Drawing	Not part of Scope FI Only
105	DP6 - Stockpile A Sections and SOPD	RD 718	A	DP6 Stockpile Management	Design Drawing	Not part of Scope FI Only
106	DP6 - Stockpile B Sections and SOPD	RD 719	A	DP6 Stockpile Management	Design Drawing	
107	DP6 - Stockpile C Sections and SOPD	RD 720	A	DP6 Stockpile Management	Design Drawing	
108	DP6 - Stockpile D Sections and SOPD	RD 721	A	DP6 Stockpile Management	Design Drawing	

Revisions / additions

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RDP Minor Civils Tender Information Document Tracker - ALL OTHER DOCS		Date:	12/12/2019
No.	**Title**	**Doc Reference (4 Projects)**	**Document Type**
1	Accounting and Business Calendar 19-20	No ref	Guidance
2	LLW_standards and expectations booklet	No ref	Sketch
3	WI CCTV for Drainage	LLWR-RDP-T1.00-SK-058	Sketch
4	Minor Civils Compound Facilities	RD 845	Guidance
5	Contractors Appointments, Training and Procedures	CATaP/JH/RDP/19/07	Report
6	Planning Condition 14 - RDP Construction Environmental Management Plan (CEMP)	LLWR-RDP-T1.00-RP-116	Report
7	Planning Condition 16 Response - RDP Ecological Mitigation Plan	LLWR-RDP-T1.00-RP-095	Sketch
8	Sketch for Contractors Office Adjacent to Stockpile C	LLWR-RDP-T1.00-SK-060	Specification
9	Wheel Wash details from manaufacturer	No ref	Manual
10	Contractor Information Manual for working on LLWR Site	RMS 08	Sketch
11	Additional Laydown Area.	LLWR-RDP-T1.00-SK-062 -	Sketch
12	Borehole Log Location plan	LLWR-RDP-T1.00-SK-063	Spreadsheet
13	Borehole Log Location plan supporting spreadsheet	LLWR-RDP-T1.00-GEN-032	Other
14	Site Borehole Log Information (zip files 2no.)	No ref	Hazcon
15	Haul Roads (DP5) HAZCON	SCD712	Hazcon
16	Cap Perimeter Drainage (DP2) HAZCON	SCD739	Hazcon
17	RDP Stockpile Management (DP6) HAZCON - Issue 1	SCD746	Sketch
18	Mound 1 and 2 Locations	LLWR-RDP-T1.00-SK-064	Guidance
19	Appendix B DRC Schedule	No ref	Risk Register
20	Contractors Facilities in area B791.2	LLWR-RDP-T1.00-SK-060	Sketch
21	Wheel Wash spec	No ref	LLWR QMS
22	Existing Lagoon Location South of Mound 1	LLWR-RDP-T1.00-SK-066	LLWR QMS
23	Existing Lagoon Location Adjacent to Stockpile B	LLWR-RDP-T1.00-SK-065	LLWR QMS
24	Electrical Safety	RSM 1.15	LLWR QMS
25	Management and Control of Risk Assessments	RSP 1.11	LLWR QMS
26	Excavations	RSP 1.11.06	LLWR QMS
27	Work Release	RSP 1.12	LLWR QMS
28	Safe Use of Portable Generators on the LLWR Site	RSG 1.15.02	LLWR QMS
29	Radiological Sentencing of Items, Materials and Waste leaving the LLW Repository Site	RSP 2.02	LLWR QMS
30	Disposal of Non-Radiological (Controlled Waste)	RSP 2.13	LLWR QMS
31	Work Management	RSP 6.01	LLWR QMS
32	Engineering Drawings	RSP 14.07	LLWR QMS
33	Engineering Reviews	RSP 14.09	LLWR QMS
34	Design change Control	RSP 14.10	LLWR QMS
35	Technical Queries	RSP 14.11	LLWR QMS
36	Electrical Safety rules	RSG 1.15_01	LLWR QMS
37	LLWR Non-Radiological Waste Skip/Container Owner	RR0202	LLWR QMS
38	Contractor Information Manual for working on LLWR Nuclear Licenced Site	RSM 08	LLWR QMS
39	Awareness of the Hazards and Risks for Authorised Individuals Entering Low Level Waste Repository Site	RSP 01.09	LLWR QMS
40	SAFE MANAGEMENT OF CONTAMINATED LAND	RSP 02.08	LLWR QMS
41	Verification of Construction Work	RSP 08.03.03	LLWR QMS
42	Engineering Calculations	RSP 14.05	LLWR QMS
43	Engineering Specifications	RSP 14.06	LLWR QMS
44	Design Justification Reports (DJRs)	RSP 14.18	LLWR QMS
45	MANDATORY SECURITY REQUIREMENTS FOR PERSONS MAKING ENTRY TO LOW LEVER WASTE REPOSITORY SITE - use this title	RSP 18.02	LLWR QMS
46	Quality Inspections	RSP 5.14.01	Site Rule
47	Quality Plan Guidance	RSG 05.04_01	Site Rule
48	Quality Plans	RSP 05.04	Site Rule
49	Site Rules	SR_P 001	Site Rule
50	Traffic Management Plan	SR_P 002	Site Rule
51	Control of LGV Arrival and Exit from LLWR Site	SR_P 003	Site Rule
52	Security Protocol	SR_P 004	Drawing
53	Control of Abnormal Load Deliveries	SR_P 006	Report
54	Radio Communication Protocol	SR_P 010	Drawing
55	Cable Routing Drawing External to Substations	1 B 93228	LLWR QMS
56	Site Information RDP Tranche 1 Project - Minor Civils Construction (Enabling Works)	LLWR-RDP-T1.00-GEN-034	Report
57	Redacted Live Services Drawing (as of 21/08/2019) CAD file	LLWR-RDP-T1.00-SK-067	Sketch
58	Protection of Wildlife During Routine Activities	RSG 2_01	LLWR QMS
59	GA Site Plan Showing Existing Facilities	RD195	Sketch
60	Appendix C - 2150-data-sheet.pdf	No ref	Specification
61	Appendix C - B-AQUAMATECOLOR-E_1112_RevA_WEB.pdf	No ref	Specification
62	Appendix E -Minor Civils Earthworks Cut and Fill Diagram.pdf	No ref	Other
63	Crushed concrete gradings (4000 tonnes located south of Vault 9)	No ref	Other
64	HAZARD MAP A	No ref	Drawing
65	HAZARD MAP B	No ref	Drawing
66	HAZARD MAP C	No ref	Drawing
67	HAZARD MAP D	No ref	Drawing
68	POLICY 004 - Environmental Health & Safety & Quality Policy	Issue 8	LLWR QMS

Revisions / additions

Appendix E Earthworks Cut and Fill Diagram

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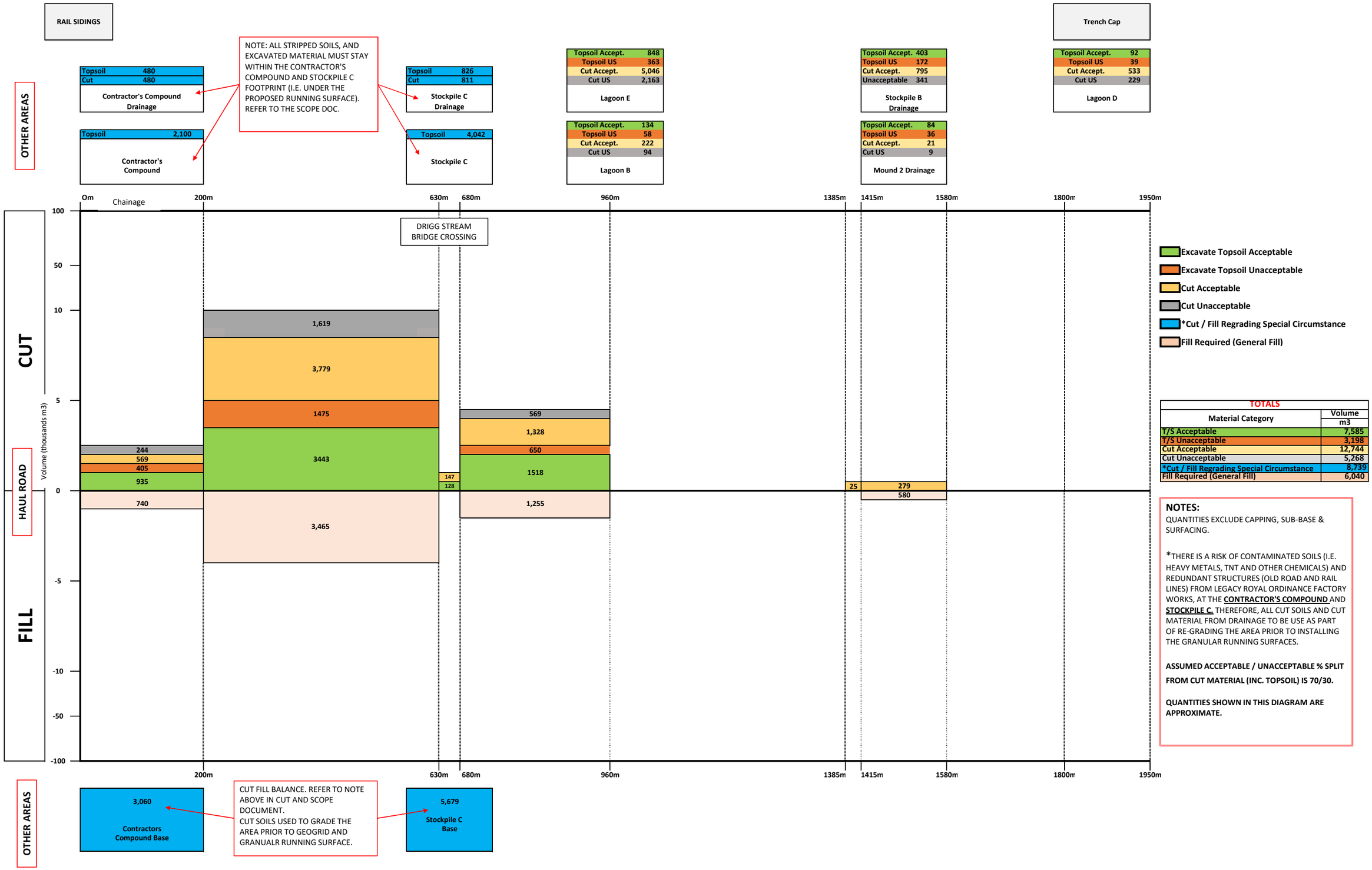
RDP TRANCHE 1 PROJECT: MINOR CIVILS SCOPE

EARTHWORKS CUT AND FILL DIAGRAM



TOTALS	
Material Category	Volume m3
T/S Acceptable	7,585
T/S Unacceptable	3,198
Cut Acceptable	12,744
Cut Unacceptable	5,268
*Cut / Fill Regrading Special Circumstance	8,739
Fill Required (General Fill)	6,040

NOTES:

QUANTITIES EXCLUDE CAPPING, SUB-BASE & SURFACING.

*THERE IS A RISK OF CONTAMINATED SOILS (I.E. HEAVY METALS, TNT AND OTHER CHEMICALS) AND REDUNDANT STRUCTURES (OLD ROAD AND RAIL LINES) FROM LEGACY ROYAL ORDINANCE FACTORY WORKS, AT THE **CONTRACTOR'S COMPOUND** AND **STOCKPILE C.** THEREFORE, ALL CUT SOILS AND CUT MATERIAL FROM DRAINAGE TO BE USE AS PART OF RE-GRADING THE AREA PRIOR TO INSTALLING THE GRANULAR RUNNING SURFACES.

ASSUMED ACCEPTABLE / UNACCEPTABLE % SPLIT FROM CUT MATERIAL (INC. TOPSOIL) IS 70/30.

QUANTITIES SHOWN IN THIS DIAGRAM ARE APPROXIMATE.

04/09/2019

Appendix F Wheel Wash Specification

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4mtr Tornado Wash

Dimensions

Ramp

Length	**3000mm**
Width	**1100mm**
Height	**400mm**

Wash Platform

Length	**4000mm**
Width	**3500mm**
Height	**380mm**

Screens

Length	**4000mm**
Height	**2000mm**

Tank

Length	**6000mm**
Width	**2000mm**
Height	**1500mm**

Surface Sump

Length	**3000mm**
Width	**800mm**
Height	**380mm**

Total Footprint

Length	**10000mm**
Width	**7300mm**

Wickham's range of surface mounted wheel washing systems is a combined result of industry knowledge built up since Wickham began in 1958.

The Tornado spray system offers any site ultimate performance, minimal maintenance and due to its complete surface mounted design, the ability to change the unit's location with very little effort as the site changes.

Using the tried and tested rumble road design, it is an essential feature throughout the Tornado system assisting in the removal or compacted dirt and debris within the wheels of the vehicle. Wickham have fully galvanised the rumble grids to ensure they are up to job of dealing with construction traffic day in day out without the unattractive flaking of paint. To make maintenance and servicing easier, the central grids can also be removed to allow easy access to the wash platform.

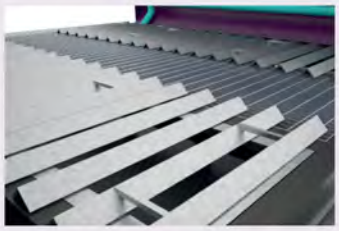
Where the Tornado packs its biggest punch is within its 74 nozzle spray configuration throughout its 4mtr wash platform. With 40 high volume, solid stream jets all focussed directly at the wheel treads and under carriage, it ensures that all the water is focused in the right place. Jets located between the galvanised treads face toward the oncoming vehicle ensuring the water is hitting the face of the tyre and inner and outer wheel with a final undercarriage blast as the vehicle leaves.

Wickham have also included a side spray set up of 18 high volume fan nozzles, designed to wash and rinse any excess mud that may have covered the outer tyre wall and skirt of the vehicle. This comes complete with an entry and exit curtain spray made up of an additional 16 high volume solid stream jets. Angled toward the centre of the wash platform, these jets are focussed at cleaning the front and rear bumper and final wheel rinse to ensure all vehicles are cleaned effectively.

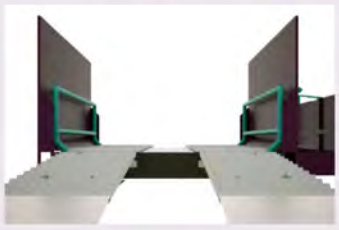
To minimise down time, the Tornado system also has a unique double wash down feature which ensures effective silt removal that has accumulated within the wash platform. This wash down directs the waste effluent down a sloping floor toward 3 outlets connecting to a surface mounted sump where the waste water is directed to the 3 stage settlement tank.

Unlike other wheel cleaning systems, large solids such as stones and rocks are removed instantly by a simple filter plate, the remaining water and silt is held within the 3 stage settlement tank for recycling. Baffle plate's aid in the settlement of the silt whilst also holding back any surface oils within the water, resulting in the final stage being available for wash water. Each section can be emptied via its own waste outlet valve or the plates can be completely removed for even easier access from above for silt removal.

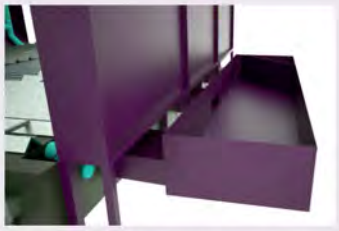




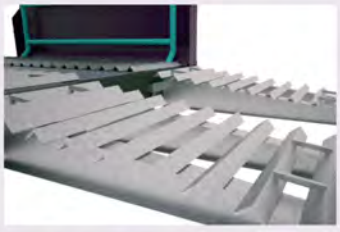
Removable Grids



Screens



Surface Sump



Galvanised Angle

System Specification

- Suitable for vehicles up to 44 tonne.
- Suitable for rigid axel and articulated vehicles.
- Maximum vehicle width 3000mm.
- 16,000ltr, 3 Stage settlement tank.
- 2,220ltr/pm High power submersible wash pump.
- 960ltr/pm Automatic waste return pump.
- High powered ultrasonic entry sensor.
- 74 High flow spray nozzles.

Key Features

- Completely surface mounted.
- Removable internal grids.
- Galvanised steel angle throughout.
- Side screens for water retention.

Wickham Gensol

Web: www.wickhamgensol.co.uk | Tel: +44 (0) 1494 771 182
Wickham Gensol Ltd | Commerce Park | Croydon | Surrey | CR0 4YL

Appendix G Hazard Maps

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Hazard Map A

Hazards from exposure to substances

FOR GUIDANCE ONLY

Map is correct at time of publication and subject to revision. All shown locations are approximate. Consult SSC/SO for latest information.

Report ALL discoveries of suspect features.

For details of potential soil contamination please contact EM&SC Team or Asbestos Co-ordinator for further information.

The LLWR Site Characterisation Report can be obtained from the LLWR Environmental Monitoring Manager if additional land quality information is required.

Legend

- Chemical Contamination
- Elevated Activity
- TNT Discoveries
- Potentially contaminated drainage
- Potential for TNT contamination
- Suspected Elevated Activity
- Potential for soil contamination (incl asbestos)
- Site boundary

Prepared By: H. Dornan
Date: 08.08.2019
Issue number: 13

N
W E
S

0 125 250 500 Meters

OFFICIAL

LLW Repository Ltd

Hazard Map B

Hazards from physical features

FOR GUIDANCE ONLY

Map is correct at time of publication and subject to revision. All shown locations are approximate. Consult SSC/SO for latest information.

Report ALL discoveries of suspect features.

The LLWR Site Characterisation Report can be obtained from the LLWR Environmental Monitoring Manager if additional land quality information is required.

Suspected UXO Discoveries

Location	LR Number	Date	Description
1	BN07070828	23/07/2007	Several yellow soap like items found with asbestos in entrance tunnel to B713.
2	0712080	18/12/2007	Approx 6 Percussion caps for grenades - no charges
3	0710034	10/03/2007	TNT found in trial pit in B741 Bund (C2 area)
4	Unknown	Unknown	2 no. 20mm rounds, 194_ - Safe.
5	Unknown	Unknown	Bullet. 9mm round. Live. Stored in Police Firing Range.
6	Unknown	Unknown	Bullet. 9mm round. Live. Stored in Police Firing Range.
7	Unknown	Unknown	Small arms shell casing (possibly non-military). Safe.
8	Unknown	Unknown	2 no. 20mm anti aircraft rounds, 1943 - shell casing only. Safe
9	Unknown	Unknown	75mm Projectile (empty). Fuse missing. WW1 - not a fully assembled shell. Safe.
10	Unknown	Unknown	Bullet. .303 round. Live. Stored in Police Firing Range
11	Unknown	Unknown	Protection cap from 60mm? shell - flattened. Safe.
12	Unknown	Unknown	75mm shell casing, 1942 - flattened. Safe.
13	Unknown	Unknown	20mm round fuse section, 194_ - Safe
14	10050190	15/05/2010	6Lb shell case. Safe.

Known Voids

Location	Description
A	ROF manhole
B	Unknown ROF infrastructure
C	Unknown ROF infrastructure
D	Tunnel ROF (entrance blocked)
E	Toluene/paraffin tank
F	Toluene/paraffin tank
G	Toluene/paraffin tank
H	Toluene/paraffin tank
H	ROF pump chamber
I	Abandoned experiment
J	ROF manhole
K	ROF manhole
L	ROF manhole
M	ROF manhole
N	ROF manhole
O	ROF drainage chamber
P	ROF drainage chamber
Q	Pipe chamber
R	ROF manhole

Legend

- Known Voids
- Suspected UXO Discoveries
- Cut Off Wall
- IGS Tracer Tests
- UXO clearance certificate areas
- UXO avoidance survey area
- UXO survey area
- Surface Water
- Leachate Lines

N W E S

Prepared By: J, Champion
Date: 27/02/2019
Issue number: 11

0 100 200 400 Meters

OFFICIAL

LLW Repository Ltd

Hazard Map C

Environmentally Sensitive Areas

FOR GUIDANCE ONLY

All locations shown are approximate.

Map is correct at time of publication and subject to revision. All shown locations are approximate. Consult SSC/SO for latest information.

Buffer zones around the GCN breeding ponds are shown. Please contact the Environmental and Technical Team prior to all works within 250m of the marked ponds.

This map supplements RSG 2_01, all work must be undertaken in accordance with RSG 2_01.

Natterjack toads in ponds off-site but close to the site boundary

Pond 3

Pond 6

Pond 26

OFFICIAL

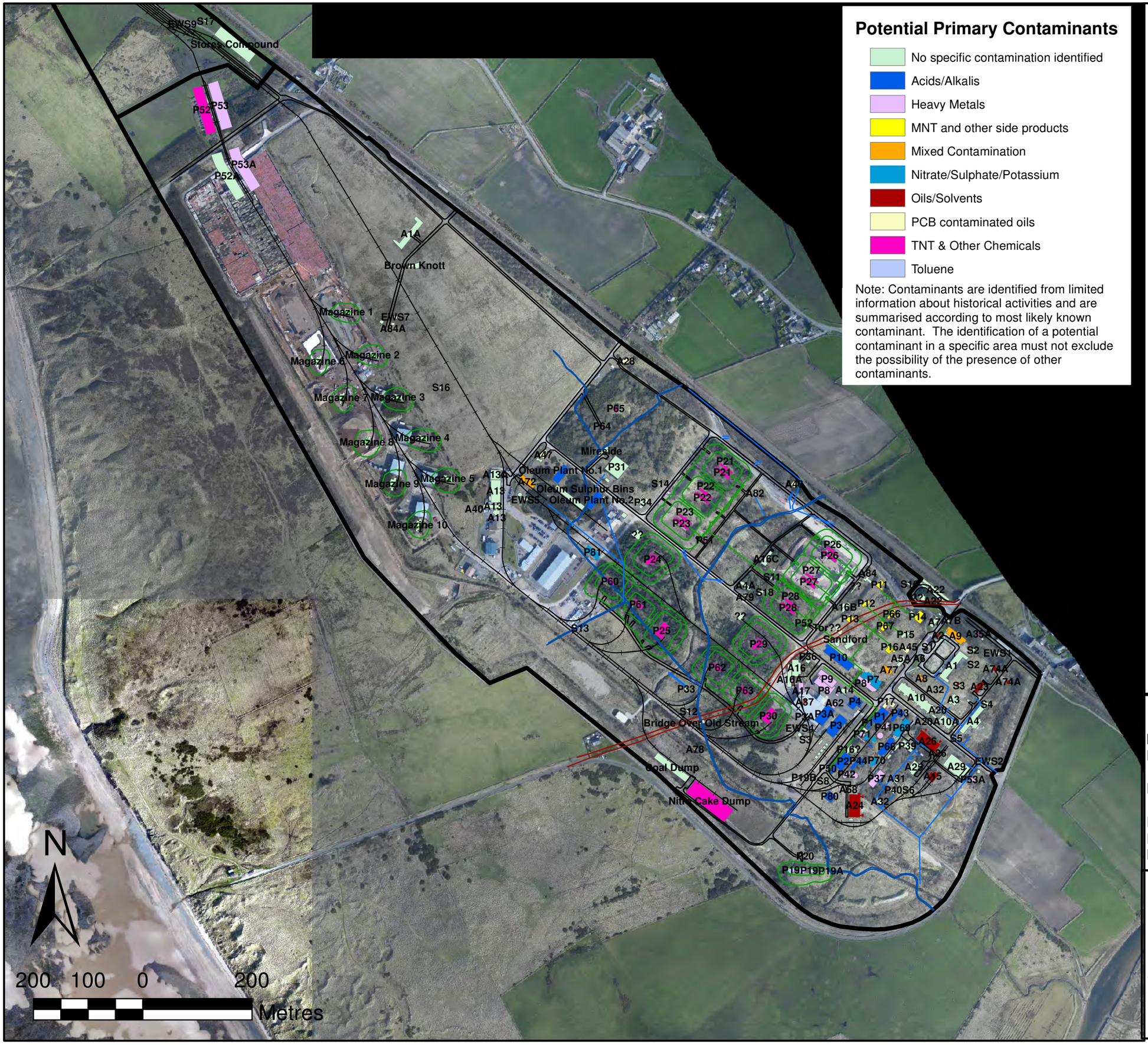
Legend

- Bat roost
- Japanese Knotweed Area
- Natterjack Toad Area
- GCN Pond
- Reptile Hibernacula
- Pennyroyal
- Environmentally sensitive area
- Pillwort
- SSSI
- GCN Pond 250m buffer zone

Issue: 7
Prepared By: C. Arthur
Date: 30.01.2019

N
W E
S

0 125 250 500 Meters



Potential Primary Contaminants

- No specific contamination identified
- Acids/Alkalis
- Heavy Metals
- MNT and other side products
- Mixed Contamination
- Nitrate/Sulphate/Potassium
- Oils/Solvents
- PCB contaminated oils
- TNT & Other Chemicals
- Toluene

Note: Contaminants are identified from limited information about historical activities and are summarised according to most likely known contaminant. The identification of a potential contaminant in a specific area must not exclude the possibility of the presence of other contaminants.

LLW Repository Ltd

LLWR Hazard Map D

Historical Locations of ROF Buildings

Legend

- ROF Surface Water Drain
- ROF Stream Diversion - Orignal Path
- ROF Railways
- ROF Gantry
- ROF Acid Lines
- ROF Old Shore Road
- ROF Landscape Features
- ROF Site Boundary
- ROF Roads

For GUIDANCE only

Map shows knowledge at time of publication.
For latest information, consult SSC / SO.

Report ALL discoveries of suspect features.

Issue: 3
Issue Date: 08/08/2019
Prepared by: J.Champion

Notes:-

This map represents the understanding at the time of issue and its interpretation is subject to amendment at any time.

Appendix H Existing Lagoons Locations from Vault 9 Construction

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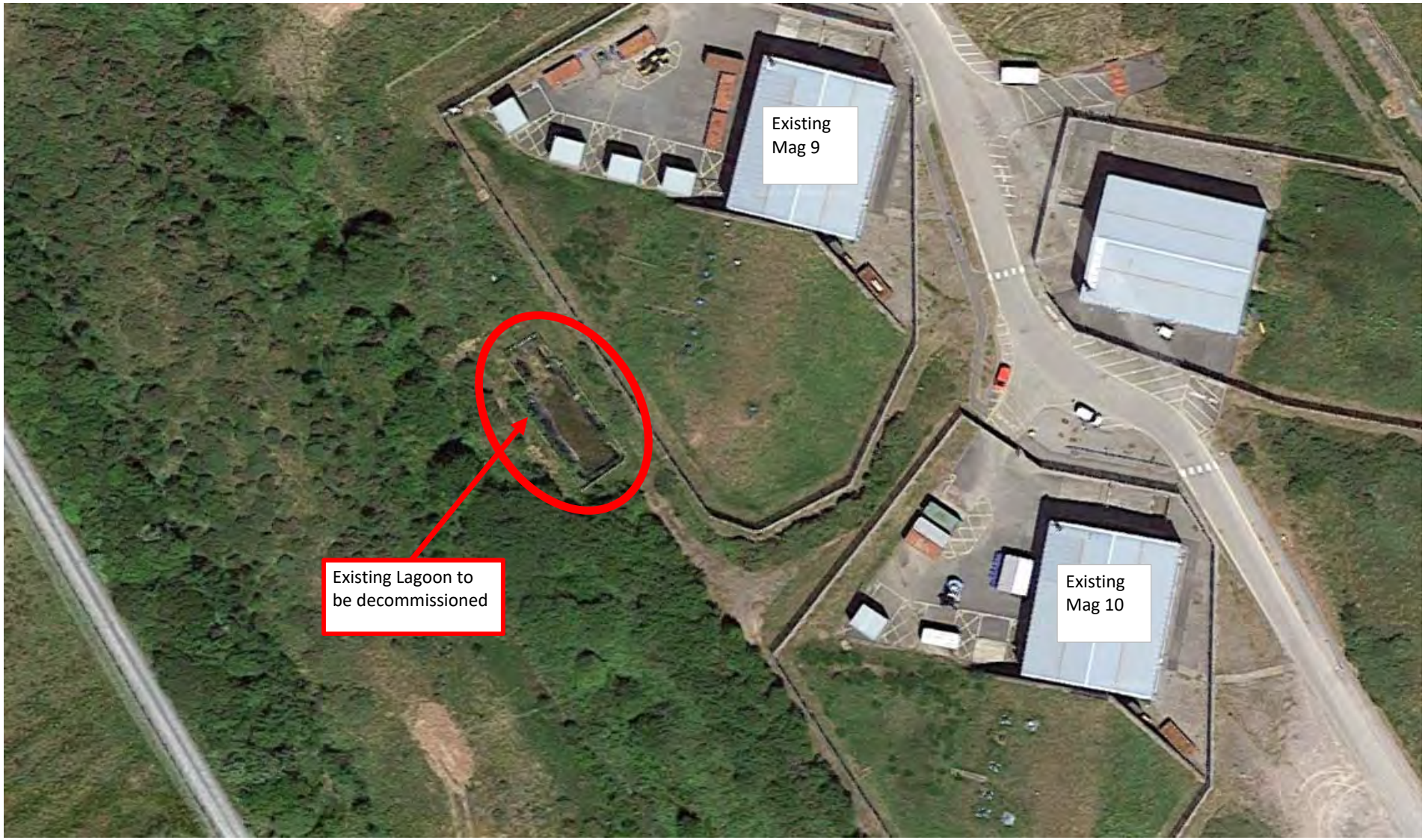
Existing Redundant Lagoon Location Adjacent to Stockile B




Existing Drigg Stream
Street 6
Mound 1
Existing Lagoon

Appendix I Aerial Plan of Mounds 1 and 2

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Mound 1 and 2 Locations

Appendix J RD 845 Minor Civils Compound Facilities Sketch

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STAGE 1 - MINOR CIVILS CONTRACT:

1. STAGE 1 CONTRACTORS COMPOUND TO BE UNBOUND PAVEMENT SED22 SHOWN ON DRAWINGS RD 330 AND RD 339. ASSUMED CBR 2.5%.
2. MOBILE PLANT PARK UP AREA 32m x 6m. DWG RD 306 TABLE 1 OPTION P1 5% CBR.
3. OIL INTERCEPTOR/OUTFALL TO FILTER DRAIN.
4. STAGE 1 STORAGE AREA - DETAIL SED22.
5. 5m WIDE ACCESS ROAD - DETAIL RD 306 TABLE 1 OPTION P1 5% CBR.
6. WATER SUPPLY - 32mm. CONNECTION ON WEST SIDE STREET 7 TO COMPOUND BOUNDARY FENCE.
7. WATER SUPPLY TO WHEEL WASH.
8. WHEEL WASH - SEE WORKS INFORMATION.
9. TEMPORARY SIGNS.
10. FENCE AND GATES. 1.8m HIGH CHAIN LINK.

CONTRACTOR FACILITIES
THE CONTRACTOR IS TO USE THE MINOR CIVILS COMPOUND FACILITY FOR WELFARE UNITS FOR MOBILE PLANT OPERATIVES AND STORAGE OF MATERIALS. INCLUDING FUEL.
THE CONTRACTOR IS AT LIBERTY TO AMEND THE LAYOUT OF THE AREA INSIDE THE COMPOUND FENCE

- PAVED SURFACES
- TEMPORARY WELFARE (SELF CONTAINED)
- CONCRETE TROUGH 2x600mmx320mm WITH D400 COVER
- 1.8m CHAIN LINK FENCE (290m)
- MOBILE PLANT/DUMP TRACKS
- ROAD LICENSED HGVs

NORTH

PERIMETER DRAINAGE SWALE A
T1SDSOP006
T1SDSOP005
FLOW
T1SDSOP004
SECTION B-B REFER TO RD338
PERIMETER DRAINAGE – FILTER DRAIN A
T1SDSOP002
T1SDSOP001
STOCKPILE D DRAINAGE TO DISCHARGE INTO PROPOSED HAUL ROAD MANHOLE
PGL = 10.80
100
SOPRS03
PGL = 11.00
PGL = 11.50
SOPRS04
APPROX. LOCATION OF EXISTING LLWR MONITORING POINT TO BE MAINTAINED
T1SDSOP007
150
T1SDSOP008
T1SDSOP003
ø1350 MANHOLE
SILT FENCING TO BE ALIGNED ADJACENT TO ALL DRAINAGE
FILTER DRAIN – REFER TO RD342 FOR DETAILS
SOPRS05
STAGE 1 STORAGE AREA
T1SDSOP009
FLOW
PGL = 11.00
PGL = 11.00
PGL = 11.00
PGL = 11.50
SOPRS06
SOPRS08
SOPRS07
50
ø1200 MANHOLE
T1SDSOP013
SHALLOW COVER OVER PROPOSED FILTER DRAIN. CONTRACTOR TO IMPLEMENT EXCLUSION ZONE TO PREVENT LOADING OF PIPELINE
HAUL ROAD, SEE DESIGN PACKAGE 5 GENERAL ARRANGEMENT DRAWING (RD 292) FOR DETAILS
SOPRS09
SOPRS10
SECTION A-A REFER TO RD338
T1SDSOP010
200
PGL = 11.35
CONCRETE SLAB CROSSING 1.5mx10mx350mm
STAGE 1 CONTRACTORS COMPOUND
AVAILABLE CONTRACTOR'S COMPOUND STORAGE AREA
PGL = 11.50
SOPRS11
FILTER DRAIN. PIPE ø375
FLOW
PGL = 11.00
FILTER DRAIN B
CONTRACTOR'S COMPOUND STORAGE AREA WILL BE PREDOMINANTLY BE USED AS A MATERIAL HANDLING AREA FOR OFFLOADING IMPORTED MATERIAL FROM TRAIN DELIVERIES. AREA WILL NOT BE USED AS A LONG TERM STOCKPILE.
SOPRS12
PERIMETER DRAINAGE SWALE A
PLANT PARKING AREA
100
T1SDSOP014
T1SDSOP011
150
SILT FENCING TO BE ALIGNED ADJACENT TO ALL DRAINAGE
FILTER DRAIN – REFER TO RD342 FOR DETAILS
SOPRS13
PGL = 11.50
FLOW
T1SDSOP015
EXIT FOR LIGHT VEHICLES
HGV EXIT
WHEEL WASH
150
152
SOPRS02
PGL = 11.90
SOPRS01
T1SDSOP012
295
RE-USE SAFETY FENCE TO PROTECT EXISTING BOREHOLE CHAMBERS
PGL = 11.85
ø1200 MANHOLE
LP
LP
LP
LP
IN
OUT
T1SCSOP031
T1SCSOP030
T1SCSOP029
SERVICES PROTECTION SLAB
3 no. EXISTING MONITORING POINT CHAMBERS TO BE RETAINED. LOCATION TO BE CONFIRMED
PGL = 12.20
SERVICES PROTECTION SLAB 10mx1.5m AS PER HAUL ROAD DRAWING

Scale
0 5 10 20 40m
Original Size (A1) 1:500 @ A1 1:1000 @ A3

JCB ADT 722 Articulated Dump Truck

Overall Length	9.199m
Overall Width	2.652m
Overall Body Height	4.730m
Min Body Ground Clearance	0.776m
Max Track Width	2.652m
Lock to lock time	5.00s
Wall to Wall Turning Radius	9.040m

NOTES:

1. FOR DETAILS OF DRAINAGE LONG SECTIONS AND SETTING OUT DETAILS REFER TO RD 721
2. FOR HAUL ROAD GENERAL ARRANGEMENT REFER TO RD 292

KEY:

EXISTING:
- WATERCOURSE

PROPOSED FOR DP6:
- PGL — PROPOSED GROUND LEVEL
- AREA TO BE CLEARED OFF ALL VEGETATION, TOPSOIL AND OTHER OBSTRUCTION, UNLESS WHERE IT FORMS THE EXISTING VERGE FOR STREETS 4 AND 5, OR AS STATED OTHERWISE IN SPECIFICATION APPENDIX 2/1. TOPSOIL TO BE STORED ON SITE.
- AREA AVAILABLE FOR STOCKPILING BULK MATERIAL, MAXIMUM 4m HIGH WITH SIDE SLOPES NOT STEEPER THAN 1 IN 3.
- SECTION LINES - REFER TO DRAWING RD338.
- PROPOSED DP6 FILTER DRAIN
- STOCKPILE FORMATION FALL DIRECTION
- POTENTIAL EXISTING WATERCOURSE, PRESENCE TO BE CONFIRMED ON SITE. TREATMENT WITH SED 9 ON DRAWING RD 336.
- PROPOSED DP7 INTERIM CAP REPAIR CONTOURS
- PROPOSED DP6 SECURITY FENCE
- PROPOSED SILT FENCE AND VEHICLE EXCLUSION ZONE

PROPOSED FOR DP2:
- PERIMETER CAP DRAIN
- DP2 DRAINAGE CHANNEL

PROPOSED FOR DP5:
- UNBOUND SURFACE (PAVEMENT TYPE 1)
- BOUND SURFACE (PAVEMENT TYPE 2)
- 1 IN 2.5 BATTER (INDICATIVE)
- HAUL ROAD FILTER DRAIN
- HAUL ROAD CARRIER DRAIN

STOCKPILE AREA D RUNNING SURFACE SETTING OUT POINTS

ID	EASTING	NORTHING	ELEVATION
SOPRS01	305863.85	498959.49	11.90
SOPRS02	305830.81	498984.50	11.85
SOPRS03	305928.09	499097.04	11.00
SOPRS04	305982.81	499054.14	11.50
SOPRS05	305970.32	499036.74	11.50
SOPRS06	305953.75	499025.08	11.50
SOPRS07	305943.18	499029.26	11.50
SOPRS08	305937.58	499039.04	11.40
SOPRS09	305919.36	499028.17	11.40
SOPRS10	305924.01	499018.44	11.50
SOPRS11	305921.68	499005.52	11.50
SOPRS12	305903.63	498997.07	11.50
SOPRS13	305878.07	498980.77	11.50

NOTES:
ALL SETTING OUT POINTS AND ELEVATIONS TO BE VERIFIED FOLLOWING SITE CLEARANCE AND UPDATED TOPOGRAPHIC SURVEY.

RUNNING SURFACE MAKE UP SUMMARY

CBR	RUNNING SURFACE THICKNESS	GEOGRID REQUIREMENTS
1.5%	450 mm	2 LAYERS REFER TO SED 20
2.5%	375 mm	1 LAYER REFER TO SED 22 ON RD 330
5%	185 mm	1 LAYER REFER TO SED 22 ON RD 330
7%	150 mm	1 LAYER REFER TO SED 22 ON RD 330

RUNNING SURFACE FORMATION LEVEL TO BE THICKNESS FROM ABOVE TABLE BASED ON FORMATION CBR BELOW THE PROPOSED LEVELS.

Rev.	Date :	Rev.	Date :	Rev. A	Date : 20.08.2019
Lifecycle Stage:		Lifecycle Stage:		Lifecycle Stage: Detailed Design	
Revision Notes:		Revision Notes:		FOR CONSTRUCTION	

	Drafter	Designer	Checked	Lvl.	Approved	Drafter	Designer	Checked	Lvl.	Approved	Drafter	Designer	Checked	Lvl.	Approved
Name											I BARTOSOVA	I BARTOSOVA	T BAGLEY		T BAGLEY
Organisation				....					....		LLWR	LLWR	LLWR	....	LLWR
Signature	.....			....		.....			....		.....			....	

Project No.	34/09320
Original Size	A1
Discipline	CS&A
Type	LAYOUT
Scale	NBS
Building No.	B704
System No.	–
System Eng. No.	6
CM Category	NCB

LLW Repository Ltd
Old Shore Road , Drigg , Holmrook , Cumbria, CA19 1XP

Plant Item No.	
Plant Title	LOW LEVEL WASTE REPOSITORY
Geographic Location	DRIGG, CUMBRIA
–	

LOW LEVEL WASTE REPOSITORY
MINOR CIVILIS COMPOUND FACILITY

Drg. No. RD 845 Rev. A

Security Class: OFFICIAL

LLWR_2019_A1_BORDER_ISS.2

Appendix K Proposed Haul Road Permanent Signage Layout

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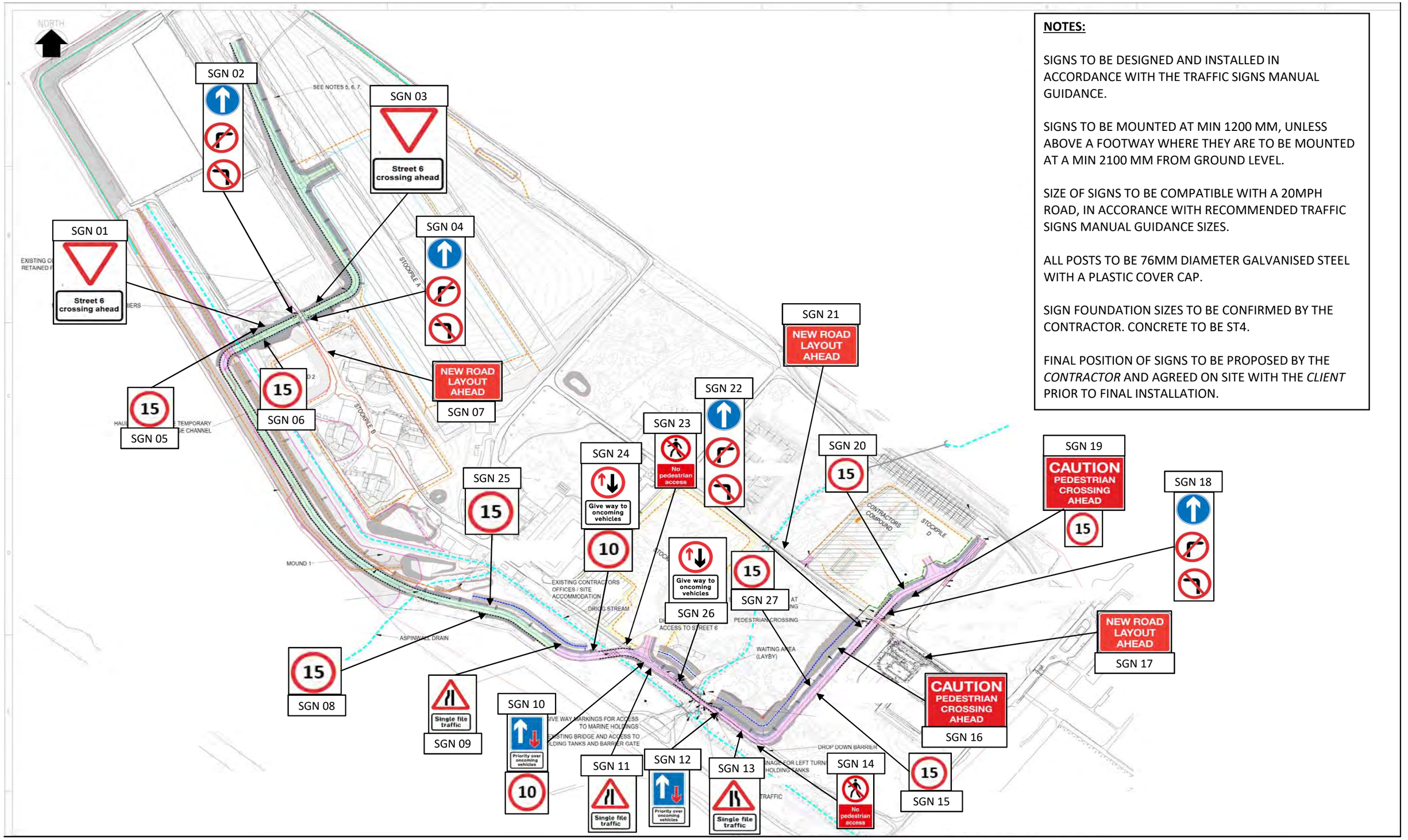

NOTES:

SIGNS TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE TRAFFIC SIGNS MANUAL GUIDANCE.

SIGNS TO BE MOUNTED AT MIN 1200 MM, UNLESS ABOVE A FOOTWAY WHERE THEY ARE TO BE MOUNTED AT A MIN 2100 MM FROM GROUND LEVEL.

SIZE OF SIGNS TO BE COMPATIBLE WITH A 20MPH ROAD, IN ACCORANCE WITH RECOMMENDED TRAFFIC SIGNS MANUAL GUIDANCE SIZES.

ALL POSTS TO BE 76MM DIAMETER GALVANISED STEEL WITH A PLASTIC COVER CAP.

SIGN FOUNDATION SIZES TO BE CONFIRMED BY THE CONTRACTOR. CONCRETE TO BE ST4.

FINAL POSITION OF SIGNS TO BE PROPOSED BY THE *CONTRACTOR* AND AGREED ON SITE WITH THE *CLIENT* PRIOR TO FINAL INSTALLATION.