Attachment C

Closure Plan & Environmental Liability Risk Assessment

JSPE

J Sheils Planning & Environmental Ltd

CLOSURE PLAN & ELRA

Clashford Recovery Facilities Ltd.

Closure Plan & Environmental Liability Risk Assessment

Clashford, Naul,

County Meath.

August 2018

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1 INTRODUCTION

Clashford Recovery Facilities Ltd., Ring Commons, Balbriggan, County Dublin currently has a waste licence application (W0265-01) under assessment by the EPA for the continued operation of its existing Waste Recovery Facility (WRF) on lands at Naul Townland, Naul, Co. Meath (National Grid Reference 285633E 253005N). The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soil and stone, and recovery of inert construction and demolition (C&D) waste. The proposed soil recovery facility including site infrastructure comprises c. 24.2 ha of the total landholding of 33.4 ha at Clashford (Refer to Figure B 2.2 Rev C). The lands have mostly been restored to beneficial after-use (agriculture and forestry) under successive waste permits. Only Phase 3 of the site remains to be backfilled using imported soil and stone whilst Phase 2 is currently undergoing final landscaping and cultivation to agricultural use.

It has been calculated that there is c. 348,000 tonnes of available void space capacity remaining. Assuming a fil rate of 80,000 to 140,000 tonnes per annum this will give a life of 3 to 5 years for the backfilling operations.

Clashford Recovery Facilities Ltd has also recently submitted a planning application for permission (P.A.Reg. Ref. AA180893) for development at this site, within part of a sand and gravel pit (P.A. Reg. Ref. QY36, QC 17.QC2085) which is currently under restoration at Clashford, Naul, Co. Meath. The development will consist of the recovery of construction and demolition waste to produce secondary aggregates. The existing site office including welfare facilities will be replaced including provision of septic tank and percolation area. The wheelwash will be upgraded and relocated towards the site entrance. The existing palisade fence at the entrance is to be replaced with a stone wall and separate entrance gate provided for access to the site office. A weighbridge, hard standing area with drainage to oil interceptor, semi-mobile crushing and screening plant and other ancillaries will be provided. The total application area including the site infrastructure covers c. 0.8 ha of lands. The development will be subject to the requirements of a waste management licence (Reg. No. W0265_01) which is currently under consideration by the Environmental Protection Agency (EPA).

It is proposed to import up to 20,000 tonnes per annum of inert construction and demolition waste for production of secondary aggregates (to be exported from the site). It is proposed that this activity will extended beyond the life of the backfill operations to meet Clashford Recovery Facilities ongoing need for a facility to recover C&D waste for the production of secondary aggregates.

The overall purpose of closure and restoration/aftercare is to ensure that the necessary measures are taken to avoid any risk of environmental pollution and, where pollution has been caused, to return the site to a satisfactory state.

The following plan has been prepared by J Sheils Planning & Environmental Ltd (JSPE) on behalf of the operators Clashford Recovery Facilities Ltd. JSPE specialises in providing independent professional planning and environmental advice to the extractive and inert waste management industries. The principal, John Sheils is a qualified mining engineer, chartered minerals surveyor, with a post graduate diploma in environmental protection and professional qualifications in quarry management. JSPE are professionally indemnified and governed by the RICS (Minerals and Waste Management Faculty) and Society of Chartered Surveyors codes of practice.

There are three steps to completing closure and restoration/aftercare plans:

- Step 1: Scoping
- Step 2: Closure
- Step 3: Restoration/aftercare

2 SCOPING

This report has been prepared in accordance with "*Guidance on assessing and costing environmental liabilities 2014*" (EPA 2014a).

Closure and **closure plan** refer to relatively short-term measures necessary to close a site satisfactorily including decommissioning and residuals management. For many sites, there will be no environmental liabilities once closure, decommissioning and residuals management are completed, and so only a closure plan is required.

Restoration/aftercare and **restoration/aftercare plan** refer to longer term measures that are necessary where environmental liabilities remain following closure, e.g. contaminated soil and groundwater, landfills, extractive waste facilities, mines, quarries and soil recovery facilities. Measures may encompass activities such as remediation, rehabilitation, reinstatement, ongoing emissions control and monitoring.

It is noted that the guidance considers that both a Closure and Restoration/After Care Management Plan (CRAMP) may be required for soil recovery facilities. However, the guidance further states that in relation to soil and groundwater contamination, where it is relatively limited and will be addressed by short-term actions such as removal for treatment off-site, this can be addressed as part of the closure plan. A restoration/aftercare plan is **required only where the measures necessary are more complex and long-term**, e.g. installation of barriers, pump and treat, monitored natural attenuation.

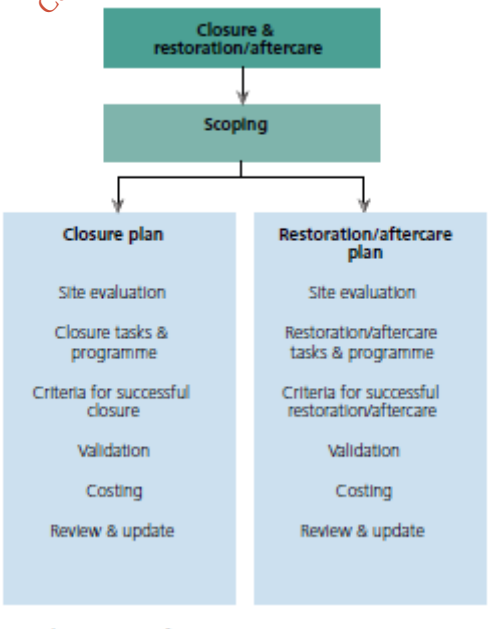


Figure 2-1 Closure and Restoration/Aftercare Process (Source EPA 2014a)

In this case only inert soil and stone and inert construction and demolition waste is to be accepted at the facility for recovery and phased restoration of a sand and gravel pit to a landform that will be in keeping with the surrounding landscape.

Clean closure is envisaged such that all plant is safely removed for reuse or recycling, and all wastes are removed off site at the time of closure for appropriate recovery or disposal. Monitoring undertaken should demonstrate that there are no outstanding environmental issues.

There will be no on-going requirement for environmental monitoring after recovery operations have ceased.

An aftercare scheme will be implemented with the aim of bringing the restored soils (and hence land) into a condition which does not need to be treated differently from undisturbed land in the same use. The final restoration of the site will facilitate an agricultural after-use similar to that which existed prior to extraction works.

A final site-inspection 6 months after site closure will be carried out to ensure that the final site restoration scheme implemented is functioning and progressing as required.

It is evident from the above description given the relatively short-term measures necessary to close the site satisfactorily, that there will be no environmental liabilities once closure, decommissioning and residuals management are completed, and so only **a closure plan** is considered necessary.

3 THE CLOSURE PLAN

3.1 CLOSURE PLAN SUMMARY

Activity name and address

Waste recovery facility on lands at Clashford C&D WRF, Naul, Co. Meath

Name of the licensee: Clashford Recovery Facilities Ltd

Licence number: W0265-01

Name and address of person/organisation who prepared the plan

J Sheils Planning & Environmental Ltd, 31 Athlumney Castle, Navan, Co Meath.

Classes of activity (to be) licensed and carried out;

The principal activity is Class R 5 (P) of the Fourth Schedule of the Waste Management Act 1996, as amended (recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials). Other activities include Class R 13 of the Fourth Schedule (Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)).

Risk category

"Low" Determined from "*Guidance on assessing and costing environmental liabilities 2014*" (EPA 2014a).

Scope

Closure Plan (incorporating aftercare requirements)

Overall closure costs

The total closure and restoration/aftercare costs have been calculated as **€75,141** (not adjusted for inflation).

Details of any previous closure plans

Not Applicable

Financial provision mechanism

To be agreed with EPA following agreement on Closure Plan Costing.

Review period for the closure and restoration/aftercare plans.

The closure and aftercare requirements will be subject to annual review.

3.2 CLOSURE PLAN INTRODUCTION

The scoping exercise carried out in preparation of this Plan has determined that given the relatively short-term measures necessary to close the site satisfactorily, that there will be no environmental liabilities once closure, decommissioning and residuals management are completed, and so only a closure plan is considered necessary.

3.2.1 GENERAL DESCRIPTION OF THE ACTIVITY AND SITE

Clashford Recovery Facilities Ltd., Ring Commons, Balbriggan, County Dublin has applied to the Environmental Protection Agency for a waste licence for the continued operation of its existing waste recovery facility on lands at Naul Townland, Clashford, Co. Meath. The lands have been progressively restored subject to successive WMP's dating back to 2001. (National Grid Reference: 313399E 261545N) (Refer to Figure A.1.0 Rev A).

The site of the quarry and WRF is on a landholding of c. 33.4 ha, owned by the applicant Clashford Recovery Facilities Ltd.

The lands have a history of sand and gravel working, which dates back to at least the early 1980's. These lands were worked under a succession of planning permissions.

The quarry and WRF operate under the terms and conditions imposed under P.A. Reg. Ref.QY36, QC 17. QC 2085 and P.A. Reg. Ref. 85/512, PL.17/5/72181.

Meath County Council confirmed in a letter dated 16/10/17 that a restoration scheme for the quarry lands as submitted has been agreed with the Planning Authority.

Since 2001, the quarry site is being progressively restored in accordance with a phased restoration scheme using imported soil and stone subject to successive Waste Management Permits granted by Meath County Council (e.g., Waste Permit Reg. No. WMP 2005/25).

The WRF at Clashford continued to operate under the conditions of the existing Waste Permit (Reg. No. WMP 2005/25), whilst the application for a Waste Management Licence remains undecided.

Phase 3 of the area relating to Waste Permit (WMP 2005/25) is the only area remaining to be restored by importation of soils and stones. This area is also within the area relating to P.A. Reg. Ref. QY36, QC 17.QC2085.

A hay, straw and farm machinery storage shed, horse stables, dungstead and soiled water tank (P.A. Ref. AA161106) are currently being constructed on part of the lands restored under Phase 2.

The facility has remained closed since August 2017 and Meath County Council have informed our client that Environmental Order No. A02789/2017 (Section 55 Notice (WMA Act, 1996, as amended) is to remain in place until such time as the EPA reach a decision with respect to Waste Licence application.

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soil and stone, and recovery of inert C&D waste.

The site is situated at approximately 60-80 m AOD in a predominantly rural area of south County Meath, across the Delvin River immediately north of the village of Naul in County Dublin. The quarry is being restored by backfilling up to 10m of inert soil and stone (average c. 5.4m). The area being restored s c. 750m long east to west and 530m wide north to south at its widest narrowing to c. 40m towards the east (Refer to Figure B.2.1 Rev C).

It is proposed that circa 40,000 to 70,000 cubic metres per annum of inert materials will be accepted to site (subject to market conditions) to complete the restoration of the lands to beneficial after use.

A total of c. 2,270,000 tonnes (1,135,000,000 m^3) has been received to data. It is estimated that 348,000 tonnes (174,000) tonnes is required to be complete the final restoration of the lands (Phase 3).

The intention is to develop the lands for beneficial use (agricultural use or forestry), and to this end, the lands previously restored including Phase 1 are now being grazed by sheep and horses. Phase 2 is currently undergoing final landscaping and cultivation to agricultural use.

Clashford Recovery Facilities Ltd has recently submitted a planning application (P.A. Ref. AA180893) for permission for development at this site, within part of a sand and gravel pit (P.A. Reg. Ref. QY36, QC 17.QC2085) which is currently under restoration at Clashford, Naul, Co. Meath. The development will consist of the recovery of construction and demolition waste to produce secondary aggregates.

The existing site office including welfare facilities will be replaced including provision of septic tank and percolation area. The wheelwash will be upgraded and relocated towards the site entrance. A weighbridge, hardstanding area with drainage to oil interceptor, semi-mobile crushing and screening plant and other ancillaries will be provided. The hardstanding area will be used for quarantine/inspection of the incoming C&D waste to be recovered. Skips will be provided for removal of deleterious material (i.e. steel, timber, plastic). A hardstanding area will be provided for stockpiling of processed secondary aggregates (Refer to Figure B.2.1 Rev C).

The site infrastructure will occupy an area of c. 0.8 ha within the waste licence application area. It is proposed to import up to 20,000 tonnes per annum of inert construction and demolition waste for production of secondary aggregates (to be exported from the site). It is proposed that this activity will extended beyond the life of the backfill operations (subject to planning) to meet Clashford Recovery Facilities ongoing need for a facility to recover C&D waste for the production of secondary aggregates. Redundant structures, plant equipment and stockpiles will be removed from site on cessation of activity.

3.2.2 COMMENCEMENT

Activities at the Clashford WRF will continue upon granting of the waste licence by the Agency.

3.2.3 AUTHORISATION AND REVISION

It should be noted that the closure and aftercare requirements will be subject to annual review and compliance with relevant conditions attached to the waste licence.

3.2.4 CLASSES OF ACTIVITIES

The principal activity is Class R 5 (P) of the Fourth Schedule of the Waste Management Act 1996, as amended (recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials). Other activities include Class R 13 of the Fourth Schedule (Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)).

3.2.5 CLOSURE REQUIREMENTS

Closure and aftercare requirements specified in the waste licence granted for the proposed development will be considered as part of the annual review.

3.3 SITE EVALUATION

3.3.1 OPERATOR PERFORMANCE

Clashford Recovery Facilities Ltd is an established small family run business based in Naul, Co Meath. Mr Larry Kiernan, Facility Manager, is responsible for the overall management of the facility. The facility manager has over 40 years' experience including 17 years in operating & Managing the existing Waste Recovery Management Facility.

Clashford Recovery Facilities Ltd will implement an EMS for the facility subject to granting of the Waste Licence.

A facility EMS will be developed and will be put in place in compliance with conditions attached to the Waste Licence. A key benefit of operating an EMS is to encourage a review of all processes on a site and their impact on the environment, and the assessment of how these impacts can be reduced. The operator will maintain a system of continuing improvement and strive to ensure it meets all environmental commitments and licence conditions.

Mr. Larry Kiernan of Clashford Recovery Facilities Ltd is also responsible for the 'Environmental Management' of the facility. In this role, he has responsibility to ensure that the proposed Environmental Management System, Environmental Objectives & Targets and the Environmental Monitoring Plan are fully implemented.

Details with respect to monitoring parameters and frequency of monitoring will be addressed within the EMS, being subject to agreement with the EPA.

The EMS will include an 'Environmental Monitoring Programme' for the monitoring of water, dust and noise, and will be subject to compliance with any conditions attached to any decision to grant a Waste Licence for the facility including prioritising and scheduling of actions to be taken.

Material acceptance procedures, emergency preparedness & response, and complaints procedures will also be addressed.

The monitoring programme results will be submitted to relevant regulatory authority on a regular basis, and therefore made available for inspection by interested parties.

3.3.1.1 SITE INVESTIGATIONS & MONITORING

Detailed geological and hydrogeological assessments were prepared as part of the Waste Licence application (Refer to Waste Licence Application Sections I.2 to I.5) and the 2018 Environmental Impact Assessment Report (EIAR) for the site.

An Environmental Assessment and Risk Assessment report (HES Report Ref. P1317-2) has also been prepared by Hydro Environmental Services (HES) in response to a notice issued by the EPA on 18th December 2017 under Article 16(1) of the Waste Management (Licencing) Regulations 2004, which required an environmental liabilities risk assessment (ELRA) to be prepared in accordance with Guidance on assessing and costing environmental liabilities (EPA 2014). This (characterisation) report identifies the environmental risks associated with the Clashford site to allow the ELRA to be undertaken. The HES report brings together historical monitoring data together with recent site investigation data completed by HES on 13th March 2018 and 23rd April through to 1st May 2018.

Site investigation work carried out on the subject site allows for a more accurate understanding of the current site subsoil. An assessment was carried out by Dr. Robert Meehan on behalf of JSPE on 6th January and 21st January 2009[1]. (Refer to Waste Licence Application Section I.5). In this investigation, the general site area included various depths of topsoil, and this was underlain by unmottled SILT/CLAY. In some poorly drained areas the subsoil material was found to be heavily consolidated, either naturally stiff or over-compacted.

Site investigations in 2018, undertaken by HES, have identified similar soils and subsoils geology. In addition, a number of the completed boreholes penetrated deep enough to encounter the underlying natural ground. This confirms that subsoils below the fill material comprises sand and gravels and some silts. The underlying natural material was generally found to be clean and dry, with no evidence of leaching or contamination.

The majority of the fill material encountered in the 2018 site investigation comprised of SILT and CLAY consistent with the glacial deposits found in Meath and North County Dublin (glacial tills and boulder clays).

Site investigation works included borehole drilling and soil sampling, trial pit excavation and soil sampling, and groundwater and surface water sampling from existing monitoring locations.

The following figure shows the location of Surface and Groundwater monitoring locations.

[1] Assessment of Filled Subsoils for Waste Licence Application at Naul, Co. Meath, Final Report, Prepared by EurGeol Dr. Robert T. Meehan P. Geo, Report Reference No. 16046, dated 10th February 2009.

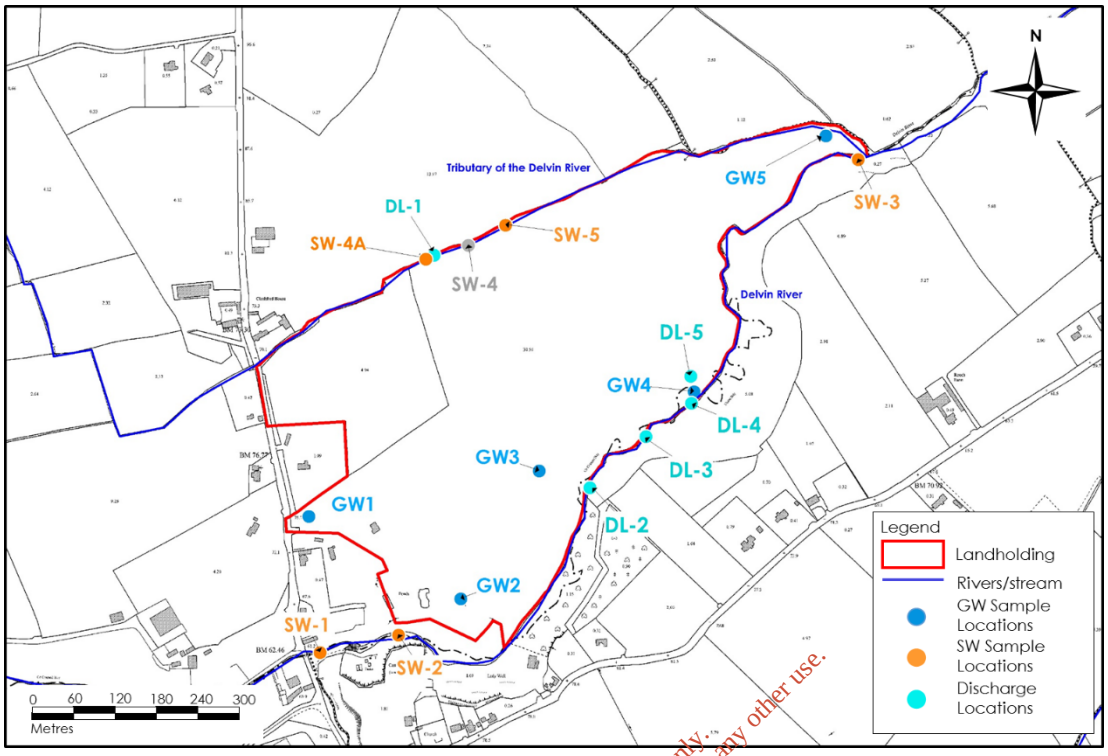


Figure 3-1 Groundwater and surface water sampling locations

The following provides a summary of site investigations.

- Various historic phases of site investigation (2009, 2014 and 2017) have been completed at the site. Previous studies related to the entire site and comprised trial pitting and drilling of groundwater monitoring wells;
- Site investigations in 2018, undertaken by HES, has identified soils and subsoils consistent with those encountered during the 2009, 2014 and 2017 investigations. Imported soils/subsoils are generally dry, grey brown, and comprise mainly stiff boulder clays and glacial tills. Natural (underlying) ground was encountered below the fill material in boreholes BH03, and BH04, and BH05. The imported fill material is similar in nature to glacial deposits found in County Meath and north County Dublin;
- There is a small percentage of C&D material in the imported fill, and this mainly comprises concrete and plastic, and some builders' materials. Broken concrete gravels and gravel fill were generally found close to on site access roads. This type of material appears to have been used to make up the site roads as fill progressed;
- Depths of imported fill varies between 4 and 8.5 mbgl in Phase 2 Restoration Area. The original ground contours in Phase 2 prior to filling were between 62 and 71 mOD.

Current ground levels are between 71 and 77 mOD. The total volume of imported fill is 452,000m^3;

- 2018 laboratory analysis of groundwater did not detect any significant levels of pollutants in the groundwater samples taken at the Clashford WRF site. However, elevated levels of iron, manganese, arsenic, barium, chloride, potassium and ammonium were recorded. The detections of iron, manganese, and ammonia are attributed to natural background conditions underlying the site. A likely source of elevated nitrogen, potassium and chloride is land spreading of organic fertilizer to aid in the revegetation process at the site. The other detections (arsenic and barium) are considered to be minor exceedances.
- 2018 laboratory analysis of surface water did not detect any significant levels of pollutants in the samples besides high coliform and orthophosphate concentrations. However, these are not unexpected in an area of agricultural land use and with the presence of the Naul WWTP in close proximity to the site;
- A CSM (conceptual site model) was developed for the site and based on historic groundwater level data, the groundwater gradient in the underlying bedrock is in east-southeast direction. Groundwater flow in the upper section of the bedrock aquifer is expected to discharge into the Delvin River locally;
- The main sources of potential contamination identified included leakage and spillage of fuels and chemicals, leaching to groundwater from the infill deposition areas and material with pollution potential on site surfaces such as loose sediment. The pathways by which the contamination could reach potential receptors include surface water runoff and on-site drainage pathways and lateral and vertical migration via groundwater flow paths. The potential receptors included local surface water courses, the underlying bedrock aquifers and the County Council/Irish Water groundwater supply wells;
- The potential on-site sources of contamination identified are not significant and the environmental risk posed to the identified receptors by these sources is considered to be low. Controls such as appropriate bunding and an effective environmental management plan, typically conditioned under a waste licence, will effectively manage the risks posed to groundwater and surface at the site;
- While there are several small water quality issues with the existing groundwater quality dataset, overall the available data (soils, leachate, groundwater and surface water

data) indicates that there is no apparent significant indictor that identifies the existing Clashford site as a major source of groundwater contamination locally;

- A Local Authority/Irish Water groundwater abstraction well is located to the east of the Clashford site, although the site is not mapped within the OPZ of the source. There is no risk posed to this OPZ from the Clashford WRF facility, as they are hydraulically disconnected on opposites side of the Delvin River;
- Based on the available environmental data, there has been no significant impact on the environment from the imported fill within Phase 2 Restoration Area or from the overall Clashford WRF site. Similarly, the expansion of the site through the importation of stone and soil-based fill material will not have a significant effect as they are composed of inert material that will not produce a contaminant leachate;
- There is a considerable distance between Phase 2 Restoration Area of the Clashford WRF site and any of the Natura 2000 sites. The same can be said for the entire Clashford WRF. For all Natura 2000 sites sediment or surface water has to travel in the river and then the sea to get to any of the Natura 2000 sites. The shortest flowpath is to the River Nanny Estuary and Shore SPA (Site Code: 004158), and this is some 10.5kms (including 1.5kms of open sea water). The distances involved and the dilution available imply that any discharges from the Clashford WRF cannot conceivably impact on these downstream designated sites; and,
- Based on all available environmental data, the overall risk to groundwater and surface water from the fill located in Phase 2 Restoration Area is low and the will not affect the status of the local surface water bodies (Delvin River and tributary) and groundwater bodies (Duleek GWB and Lusk GWB).

In order to assess ongoing water quality in this area of the site it is important to continue to monitor local groundwater and surface water quality to establish seasonal trends.

It is considered that following restoration and the mitigation measures incorporated in the design that there will be no significant effects in terms of Land, Soils and Geology. Due to the inert nature of the fill material, no significant residual impacts on the water environment are anticipated.

3.3.2 ENVIRONMENTAL PATHWAYS AND SENSITIVITY

Detailed geological and hydrogeological assessments were prepared as part of the Waste Licence application (Refer to Waste Licence Application Sections I.2 to I.5) and the 2018 Environmental Impact Assessment Report (EIAR) for the site.

With respect to closure and aftercare requirements the following provides a summary of the relevant information with respect to identifying environmental pathways and sensitivity which is addressed in more detail in the geological and hydrogeological assessment reports referred to above. .

3.3.2.1 SITE GEOLOGY AND HYDROGEOLOGY

3.3.2.1.1 Soils and Subsoils

The subject site contains a number of topsoil types (**www.gsi.ie**). The most common soil type within the site is shallow well drained mineral soils from acidic parent material, with some areas of shallow, poorly drained mineral soils. In reality, due to the use of the site as a quarry/extraction pit in the past, a large amount of the soil/overburden has been removed. Along the Delvin River the soil is mapped as mineral alluvium.

The mapped subsoil type (**www.gsi.ie**) for the subject site is almost all mapped as gravels derived from Lower Palaeozoic sandstones and shales (GLPSsS), with an area of Bedrock outcrop or subcrop (Rck) in the south of the site and mineral alluvium (A) along the Delvin River.

Site investigation work carried out on the subject site allows for a more accurate understanding of the current site subsoil. An assessment was carried out by Dr. Robert Meehan on behalf of JSPE on 6th January and 21st January 2009[2]. In this investigation, the general site area included various depths of topsoil, and this was underlain by unmottled SILT/CLAY. In some poorly drained areas the subsoil material was found to be heavily consolidated, either naturally stiff or over-compacted.

Site investigations in 2018, undertaken by HES, have identified similar soils and subsoils geology. In addition, a number of the completed boreholes penetrated deep enough to encounter the underlying natural ground. This confirms that subsoils below the fill material comprises sand and gravels and some silts. The underlying natural material was generally found to be clean and dry, with no evidence of leaching or contamination.

The majority of the fill material encountered in the 2018 site investigation comprised of SILT and CLAY consistent with the glacial deposits found in Meath and North County Dublin (glacial tills and boulder clays).

[2] *Assessment of Filled Subsoils for Waste Licence Application at Naul, Co. Meath, Final Report, Prepared by EurGeol Dr. Robert T. Meehan P. Geo, Report Reference No. 16046, dated 10th February 2009.*

3.3.2.1.2 Bedrock Geology

The bedrock underneath the proposed site area is mapped by the GSI as Ordovician Metasediments (OM) in the north and centre of the site and Dinantian Pure Unbedded Limestones (DPUL) in the south of the site.

GSI Sheet No. 13, Bedrock Geological Map of Meath, indicates that the majority of the site is underlain by brown-grey mudstone and siltstone from the Clashford House Formation with andesite sheets of the Herbertstown Formation sporadically occurring throughout. The southeastern section of the site is mapped as mudbank limestone.

Bedrock outcrops noted in the eastern end of the site are consistent with the brown-grey mudstone and siltstone from the Clashford House Formation.

3.3.2.1.3 Hydrology

In a regional context, the site is situated in the Eastern River Basin District (ERBD) within Hydrometric Area 08. The site is located in the Nanny-Delvin catchment area and in the Delvin_SC_010 sub-catchment under the Water Framework Directive (WFD).

The Delvin River, which forms the southern and south eastern boundaries of the site, flows in a north-easterly direction to its discharge point to the Irish Sea, approximately 7 km north-east of the site. In addition, a tributary of the Delvin River flows along the northern boundary of the site and joins the Delvin at the most easterly tip of the site.

Surface water drainage is generally to the north, and drains via existing settlement ponds, and then into the tributary to the Delvin River which forms the north-western boundary of the Clashford WRF site. This stream flows to the northeast and enters the Delvin River downstream of the Clashford WRF site.

The site is located between two surface waterbodies, the Delvin River and its tributary. Both of these waterbodies have been assigned an overall status designation of “Moderate” and in terms of its overall risk designation are noted as being at “At Risk”.

The tributary of the Delvin River which flows along the northern boundary of the site is at a significantly lower elevation than the quarry site. Similarly, the northern bank of the Delvin River, where the site is located, is at a higher elevation than the watercourse itself and as such the risk posed to the Clashford WRF site from fluvial flooding is low.

3.3.2.1.4 Hydrogeology

The Ordovician Metasediments which are mapped to underlie the north and centre of the site are classified by the GSI as a Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones (Pl). The Dinantian Pure Unbedded Limestones in the south of the site are classified as a Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (Ll).

These rock types represent the boundary of two groundwater bodies (GWB). The Ordovician Metasediments are part of the Duleek GWB (IE_EA_G_012) and the limestones form part of the Lusk GWB (IE_EA_G_014).

The site contains two mapped bedrock fault lines, on the north and south of the Lusk GWB. There are no local mapped karst features mapped in the area of the Clashford WRF site.

Groundwater flow is confirmed as being to the east-southeast towards the Delvin River. Groundwater elevations at the site vary between ~43.9 and ~68.45 mOD. Water levels fluctuate seasonally between 1-2m in all on site monitoring wells.

The mapped groundwater vulnerability rating for the majority of the site is classified as 'High (H)' by the GSI. An area along the southern boundary of the site is mapped as 'Extreme (E)' and 'Rock at or near surface (X)'.

There are a number of water wells located within the site boundary. Well GW1, located near the site entrance from the R108, is intended as a water supply source for the office, canteen and toilet facilities within the site. Well GW2, located in the south of the Clashford WRF site is used as a water source for the site sprinkler system and farmland area.

Please note that other wells on site (GW3, GW4, and GW5) are groundwater monitoring wells, and are not used for groundwater abstraction.

The Outer Protection Zone (OPZ) for public water supply well 2925NEW093 is within ~300m of the Clashford WRF site but is separated from the site by the Delvin River. As groundwater flows from the Clashford WRF site discharge to the Delvin River, groundwater from the site is not considered to be hydraulically connected to this OPZ.

Groundwater Body Status (GWB) status is defined based on the quantitative status and chemical status of the GWB. Both the Duleek GWB and Lusk GWB which underlie the site are assigned "Good Status".

3.3.2.2 PROXIMITY TO SENSITIVE RECEPTORS, INCLUDING HUMANS

The application area for the WRF refers an area of c. 24.2 ha located in the southwestern corner of the larger landholding of c. 33.4 ha, which is being progressively restored. The landholding is owned by the applicant Larry Kiernan of Clashford Recovery Facilities Ltd.

The site is located within the Townland of Naul, immediately north of Village of Naul, located on the Dublin-Meath border. Land use surrounding the site is generally agricultural in nature, composed of both grassland and tillage. There are a number of residential dwellings on the R108 that runs along the western boundary of the site. Adjacent to the site is a concrete plant operated by Kilsaran. The Naul wastewater treatment plant (capacity 400 PE) is located on the southern bank of the Delvin River, approximately 130 m southwest of the Clashford WRF site. The WWTP discharges into the Delvin River upstream of the Clashford WRF site.

The existing quarry development has been undergoing progressive reinstatement to agricultural/woodland using imported material for at least 17 years, under successive waste permits. A waste licence is now required to complete the final stages of the restoration programme and will also address the recovery of inert C&D waste.

The northeastern (Restored Lands) and the south-central (P1) sectors of the quarry site have been restored to agricultural use, and are currently supporting livestock, while a plantation of broadleaf forest fringes much of the eastern half of the quarry site. Only phase 3 of the site remains to be backfilled using imported soil and stone whilst Phase 2 is currently undergoing final landscaping and cultivation to agricultural use.

The impact of the restoration works to date has had a positive impact on the environment in returning these lands to beneficial use including establishing new woodland habitat along the Delvin River valley. The visual amenity of the locality has also benefited from the restoration works being undertaken.

3.3.2.3 DESIGNATED SITES

The quarry site at Clashford, which includes the application site, is not included in any area with an ecological designation (NHA, cSAC or SPA). The only Natura 2000 sites within 15km of Naul are the Laytown Dunes/Nanny Estuary cSAC (Site Code 0554), the River Nanny and Shore SPA (Site Code 4158) and the Skerries Island SPA (Site Code 4122).

Screening for Appropriate Assessment was carried out previously with respect to the EPA Waste Licence Application W0265-01. The findings of the assessment, were, in view of best scientific knowledge, it is concluded that the activity, individually or in combination with other plans or projects is not likely to have a significant effect on the Natura 2000 network, and the

conservation objectives of the sites. In accordance with Regulation 42(8)(a) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, a Stage 2 Appropriate Assessment is therefore not required.

Further information was also submitted to the EPA on 20/03/2016 in accordance with notice issued under Article 14(2)(b)(ii) of the Waste (Licensing) Regulations including the following statement by the appointed ecological consultants, Roger Goodwillie & Associates.

'The recent monitoring of the Delvin River has shown that outflows from the site have not altered the condition of the river to any significant extent. EPA Q- values show that on all sampling occasions the river below the development site is in better condition than that above it. Invertebrates (what Q-values are based on) are more sensitive to substances in the water than birds, so if they are not affected then neither will the visiting birdlife which is the basis of the SPA designation' of sites downstream. (Roger Goodwillie, Consulting Ecologist 2016, pers. comm., 22nd January 2016).

Further correspondence in the form of a letter from HES to the EPA on 18th March 2016 confirms the lack of connectivity between the Natura 2000 sites and the Clashford WRF site.

"*There is a considerable distance between the Clashford site and any of the Natura 2000 sites. For all Natura 2000 sites sediment or surface water has to travel in the river and then the sea to get to any of the Natura 2000 sites. The shortest flowpath is to the River Nanny Estuary and Shore SPA (Site Code: 004158), and this is some 10.5kms (including 1.5kms of open sea water). Assuming an average near shore sea depth of 5m, and using the near shore 500m width (as a likely flowpath from the Delvin estuary towards the SPA), the volume of this near shore body of water is some 3,750,000m^3 of sea water. The dilution available in the sea for any minor water quality issue in the Delvin River is significant and will buffer the SPA from any significant potential impact."*

As such the risk to surface water and to groundwater from the site is not significant. Given the separation distances, and the very unlikely scenario of significant pollution emerging or being discharged from the site, the risk to downstream Natura 2000 sites is not significant.

3.3.2.4 EMISSIONS

The only waste to be accepted at the facility for recovery comprises inert "soils and stone" and inert construction and demolition waste.

The main potential sources of emissions from an inert waste recovery facility would be from noise or dust associated with the movement, handling and placement of materials. Possible other emissions to the atmosphere would be from machinery exhaust fumes and also possible

emissions to groundwater and/or surface water in the event of a fuel or oil spillage. Full descriptions of possible emissions, means of abatement and treatment measures are contained in Attachments E, F and I of the Waste Licence Application and Section 4 of the EIAR which accompanied the application.

Clean closure is envisaged such that all plant is safely removed for reuse or recycling and all wastes are removed off site at the time of closure for appropriate recovery or disposal.

There will be no on-going requirement for environmental monitoring of emissions after recovery operations have ceased. It is proposed that groundwater monitoring is continued during the aftercare programme for a period up to the final site inspection.

An aftercare scheme will be implemented with the aim of bringing the restored soils (and hence the same use. The final restoration of the site will facilitate a beneficial after-use (agricultural or forestry).

Final site-inspection 6 months after site closure will be carried out to ensure that the final site restoration scheme implemented is functioning and progressing as required.

3.3.3 SITE PROCESSES AND ACTIVITIES

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soil and stone, and recovery of inert construction and demolition waste.

Phase 3 of the area relating to Waste Permit (WMP 2005/25) is the only area remaining to be restored by importation of soils and stones. Progressive restoration involving grass seeding of restored areas was carried out on a staged basis to reduce the effects of soil erosion, windblown dust, to aid ground stabilisation and as an effective means of weed control. On completion of each phase of development final restoration including grading, seeding and landscaping will be carried out.

This area also contains the necessary site infrastructure including site office, waste quarantine and inspection area, wheelwash, etc. The existing site office including welfare facilities will be replaced including provision of septic tank and percolation area. The wheelwash will be upgraded and relocated towards the site entrance. The existing palisade fence at the entrance is to be replaced with a stone wall and separate entrance gate provided for access to the site office. A weighbridge, hard standing area with drainage to oil interceptor, semi-mobile crushing and screening plant and other ancillaries will be provided. The hard standing area will be used for quarantine/inspection of the incoming C&D waste to be recovered. The proposed facility site layout is shown by Figures D.1.1 & D.1.2 – Rev C.

It is estimated that the backfilling of the quarry will require three to five years with an additional year to complete the cultivation and final restoration of the lands. It is proposed that the C&D recovery of secondary aggregates will continue beyond the life of the restoration operations (subject to planning permission).

Redundant structures, plant equipment and stockpiles will be removed from site on cessation of the Waste Recovery activity.

3.3.4 INVENTORY OF BUILDINGS, PLANT AND EQUIPMENT

Details of the site infrastructure are provided in Attachment D of the Waste Application.

Appropriately scaled drawings (≤A3) have also been provided showing the location and relevant details with respect to site infrastructure (Refer to Figures D.1.1 to D.1.2).

The necessary plant and machinery, site infrastructure is in place to facilitate the continued phased restoration of a sand and gravel pit using imported inert soil and stone, and recovery of inert C&D waste.

The existing site office including welfare facilities will be replaced including provision of septic tank and percolation area. The wheelwash will be upgraded and relocated towards the site entrance. A weighbridge, hard standing area with drainage to oil interceptor, semi-mobile crushing and screening plant and other ancillaries will be provided. The hard standing area will be used for quarantine/inspection of the incoming C&D waste to be recovered. The proposed facility site layout is shown by Figures D.1.1 & D.1.2 – Rev C.

The boundaries of the site are secure being established hedgerows and stock proof fencing.

Plant on site comprises a bulldozer, excavator, tractor, yard sweeper, quad bike. 4wd jeeps are also used intermittently on site.

A weighbridge is to be provided on site. Trucks entering the site are typically 4 axle 9 cu.m capacity rigid bodied tippers. Details with respect to truck loads and volume of inert materials received are recorded in a log book at the site inspection office.

As trucks enter the wheelwash a number or shaker bars will aid the release of mud from tyre grooves. The wheelwash will also incorporate underfloor, vertical and horizontal spray bars that will be activated by sensor. The wash water will be recycled through a system of settlement chambers with provision for discharge to the existing settlement ponds on site.

Water supply is stored in a large steel tank which is sourced from an on-site bored well. The wash-water is discharged through a system of silt lagoons with overflow to a surface water

outlet. The settlement tanks will be periodically cleaned and the silt used within the restoration of the site.

Diesel Plant on site will be refueled using a mobile fuel bowser or double skinned road tanker. This is due to the fact that the bunded fuel storage tank which has been removed was subject to burglary.

Refueling will take place on the hard standing area to be provided at the C&D Recovery area with drainage to oil interceptor.

The existing site office accommodation comprises of a large portacabin (approx. 10m x 3m). This is to be replaced by a similar structure (3.6mx 12.65m) comprising an office, toilets and canteen (sink and water heater only).

No major vehicle servicing/repairs are carried out on site. Plant and machinery used on site will be parked on the hard standing at the site entrance outside of normal operating hours.

3.3.5 INVENTORY OF RAW MATERIALS, PRODUCTS AND WASTES INCLUDING STORAGE CAPACITIES

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soil and stone, and recovery of inert C&D waste.

It is proposed that circa 40,000 to 70,000 cubic metres per annum of inert materials will be accepted to site (subject to market conditions) to complete the restoration of the lands to beneficial after use. It is estimated that c. 20,000 tonnes per annum of inert construction and demolition waste is to be recovered at the facility.

A total of c. 2,270,000 tonnes (1,135,000,000 m^3) has been received to data. It is estimated that 348,000 tonnes (174,000) tonnes is required to be complete the final restoration of the lands (Phase 3).

Any small quantities of timber, plastic, paper and steel will be separated for recovery and/or disposal offsite.

The water supply for the site office and wheelwash is met by an existing borehole on site. The potable water supply for the site office will be met by bottled water. An existing single-phase overhead electricity supply provides for lighting and heating of the office. An overhead telephone line also serves the site office.

There are two water wells at the southwestern part of the site, GW1 and GW2. Well GW1 is located near the western site boundary to the north side of the site entrance. Well GW2 is located in the southern part of the site. GW1 supplies water for the office, canteen and toilet

facilities. GW2 supplies the site sprinkler system and farmland areas and livestock. It is understood that that the average abstraction is approximately 450l/day.

The only raw materials used on site are diesel, hydraulic oil and engine oil, which are used to operate diesel powered plant on site. The overall fuel use by on-site plant will amount to about 30,000 litres/annum. All refuelling of site plant will take place on a concrete hardstanding area. Surface runoff from the hard standing will be directed to a silt trap with discharge to ground via a Class I Full retention separator. Diesel Plant on site will be refueled using a mobile fuel bowser or double skinned road tanker. As such there is no fuel storage on site.

3.4 CLOSURE TASKS AND PROGRAMMES

This section details the plant, structures, equipment and other materials which require consideration as part of the closure process.

Clean closure is envisaged such that all plant is safely removed for reuse or recycling and all wastes are removed off site at the time of closure for appropriate recovery or disposal.

Redundant structures, plant equipment and stockpiles will be removed from site on cessation of recovery activity. Machinery and buildings will either be utilised on other sites or be sold as working machinery or scrap. In the case of machinery to be scrapped all contaminants will be removed, drained or flushed from all plant, tanks and pipelines. All residues containing fuels, oils and other contaminants will be removed off site for recovery or disposal.

Diesel Plant on site will be refueled using a mobile fuel bowser or double skinned road tanker. This is due to the fact that the bunded fuel storage tank which has been removed was subject to burglary.

Refueling will take place on the hard standing area to be provided at the C&D Recovery area with drainage to oil interceptor.

Oil and Waste oil products are stored under cover. All oil barrels and lubricants are stored on spill pallets/ spill trays.

Spill kits are also maintained on site and the Company will put in place an emergency response procedure for hydrocarbon spills, and appropriate training of site staff in its implementation.

Waste oils are disposed of by a licensed waste contractor and removed off site.

As such no special measures are considered necessary with respect to closure in relation to fuel and oil products.

The hard-standing areas shall be broken up and the material recovered. The site access will be retained as agricultural access to the restored lands.

Whilst clean closure is envisaged and the site will be restored in a progressive manner consideration has been given to the need to complete the final restoration and aftercare of the area comprising the site office, weighbridge, wheelwash, and waste inspection/quarantine area. For the purposes of closure planning adequate provision has been included in the costings (Refer to Section 3.7 below).

It is expected that it will take up to six months to undertake the closure process and a further six months for Aftercare.

Table 3-1 Closure, Restoration and Aftercare Programme

Activity	Closure Period						Aftercare Period					
	1	2	3	4	5	6	1	2	3	4	5	6
Completion of Backfill	■	■	■									
Environmental Validation Audit	■											
Recovery/disposal of residual waste						■						
Removal of hard standings & site infrastructure	■	■	■	■	■	■						
Decommissioning of P&M						■						
Noise & Dust Monitoring	■					■						
Groundwater Monitoring			■			■			■			■
Trial Pitting/ EPA inspection						■						
Final contouring, grading, cultivation, grass seeding	■	■	■	■	■	■						
Inspection and enhancement of hedgerows if necessary						■	■					
Application of Fertiliser, weed control as necessary,	■	■	■	■	■	■	■	■	■	■	■	■
Remediation of any localised areas of soil compaction and ponding of surface water as, and if, required							■	■	■	■	■	■
Surrender of Licence												■

Notes: 1. Periods shown are shown in Months

3.5 CRITERIA FOR SUCCESSFUL CLOSURE

Successful clean closure will be expected to be achieved when it can be demonstrated that there are no remaining environmental liabilities at the site. In practice this will require demonstration that the following criteria have been met:

- All plant safely decontaminated using standard procedures and authorised contractors.
- All Wastes handled, temporarily stored and disposed or recovered in a manner which complies with regulatory requirements.
- All relevant records relating to waste and materials movement and transfer or disposal will be retained throughout the closure process.
- It is proposed that on completion of backfilling operations that a number of trial pits will be opened to confirm the nature of the placed materials. All soils encountered will be described in accordance with the British Standards Institution Code of Practice for Site Investigations (BS 5930:2015) which gives a geotechnical classification of the materials encountered, in particular bulk density, structure and textural characteristics. Bulk samples will be collected and retained for analysis from both topsoil and subsoil in each pit, should it be required. A log summary including photographic record of the trial pits will be kept. The results of the survey will be made available to the EPA. The EPA will also be invited to visit the site as part of the site inspection. The purpose of the inspection is to ensure that there is no soil or groundwater contamination at the site.
- The Environmental Management System shall remain in place and will continue to be actively implemented during the closure period.

3.6 CLOSURE PLAN VALIDATION

An Environmental Validation Audit of the site will be carried out following the announcement of closure and prior to actual decommissioning and closure operations taking place. The audit will devise an accurate inventory of all plant, equipment and wastes on the site. This inventory will be used as a benchmark against which successful decommissioning will be assessed.

It is proposed that the Environmental Validation Audit will be undertaken by JSPE and/or other independent Auditor to be agreed with EPA prior to the validation commencing.

The scope of the validation audit will be agreed in advance with the EPA and following approval, the chosen independent auditor will complete the validation audit. The completed validation audit report will be submitted to the EPA for approval.

The Environmental Management System including environmental monitoring (Groundwater only) shall remain in place and will continue to be actively implemented during the closure period.

The licence holder shall carry out such tests, investigation or submit certification, as requested by EPA in accordance with the waste licence to confirm that there is no risk to the environment.

As such a two-stage site inspection/investigation programme has been proposed with respect to closure (Refer to Table 3.1 above). As outlined above the results of the surveys will be made available to the EPA. The EPA will also be invited to visit the site as part of the site inspections.

3.7 CLOSURE PLAN COSTING

Whilst clean closure is envisaged and the site will be restored in a progressive manner consideration has been given to the need to complete the final restoration and aftercare of the area comprising the site office, wheelwash, weighbridge, quarantine and inspection areas (c. 0.8 ha). For the purposes of closure planning adequate provision has been included in the costings and this scenario is considered to represent a worst-case scenario in the event of cessation resulting from abandonment of the activity.

It is acknowledged that as a typical condition of any waste licence that the Agency may amend the licence at any time in certain circumstances in accordance with section 42B of the Waste Management Act 1996 as amended, to require, or not require as the case may be, the putting in place of a financial provision to incorporate costings for CRAMP and/or Environmental Liabilities Risk Assessment. This amendment may be implemented by the Agency in the event of an incident that creates a significant residual environmental liability or where the environmental risk profile changes on site.

The following Table 3-2 provides details with respect to the cost of restoration of the site.

Table 3-2 Estimate of Closure Plan Costs

Task/Description	Quantity	Unit	Rate	Cost €	Source (See Notes)
Restoration of Hard Standing Area					
Place & Grade topsoil (0.3m depth)	2,400	m^3	€1.00	2,400	JSPE
Landscaping/Seeding/Planting (Contractor)	5	days	500	2,500	EPA 2014a
Decontamination					
Not considered necessary due to inert nature of waste materials.				0	
Plant & Machinery/ Prefabricated Office					
To be sold/used on other Sites				0	
Waste Disposal/Recovery					
Hard standing areas/concrete to be recovered for use				0	
Facility Security & House keeping					
Operative to be on site one day per week during 6 month aftercare period	24	days	150	3,600	Clashford
Management & Utility Costs					
Management (Site Supervisor) – 25% time allocation	6	Months	1,000	6,000	EPA 2014a
General Administration (2 days per month)	12	days	300	3,600	EPA 2014a
1 General operative	6	Months	2,400	14,400	Clashford
Insurance	1	Unit	5,000	5,000	Clashford
Power (six months)	6250	kWh	0.16	1,000	EPA 2014a
Fuel (six months)	15000	litres	0.48	7,200	Clashford
Environmental Monitoring					
Surface & Ground water monitoring for aftercare period (2 rounds)	20	sample	150	3,000	EPA 2014a
Report Prepared by Environmental Consultant	1	day	750	750	JSPE
Environmental Validation Audit					
To be carried out following the announcement of closure and prior to actual decommissioning and closure operations taking place.	1	unit	5,000	5,000	EPA 2014b
Site Inspections					
Trial Pit programme on completion of backfilling for the remaining area (c. 0.8 ha)	4	Unit	90	360	EPA 2014a
Environmental Consultant (including Reporting)	3	day	750	2,250	JSPE
Final Inspection of site (6 months after completion of landscaping)	2	day	750	1,500	JSPE
Surrender of Licence					
Fee for Surrender of a waste licence	1	unit	6,000	6,000	WML Reg.s
Consultancy Costs	5	day	750	3,750	JSPE
Subtotal				68,310	
Contingency (10%)				6,831	
Total				**75,141,**	

3.8 CLOSURE PLAN REVIEW AND UPDATE

The Closure Plan will be reviewed and updated annually as part of the Annual Environmental Report submission to the EPA.

The updated and reviewed Closure Plan will take account of any site or process changes, technology changes and costing changes.

3.9 RESTORATION & AFTERCARE

Following on from the scoping exercise (Refer to Section 2 above) it was determined given the relatively short-term measures necessary to close the site satisfactorily, that there will be no environmental liabilities once closure, decommissioning and residuals management are completed, and so only **a closure plan** is considered necessary.

However, an aftercare scheme will be implemented with the aim of bringing the restored soils (and hence land) into a condition which does not need to be treated differently from undisturbed land in the same use. The final restoration of the site will facilitate an agricultural after-use similar to that which existed prior to extraction works.

A final site-inspection 6 months after site closure will be carried out to ensure that the final site restoration scheme implemented is functioning and progressing as required.

Details (including costings) with respect to final restoration, aftercare and site inspection have been addressed as part of the closure plan above.

3.10 FUTURE PROOFING COSTS

3.10.1 CONTINGENCY

The contingency is a specific provision for unplanned or unforeseeable items (e.g. mobilisation issues due to weather conditions, changes due to incomplete design information, changes in regulatory requirements) and provides an additional level of confidence in relation to the costing.

The closure requirements and costs for this activity are well defined, relatively straightforward and not subject to a large number of unknowns. In that context, a contingency of 10% is considered appropriate and is provided to allow for unplanned or unforeseeable items (Refer to Table 3.2 above).

As the activity moves towards closure and restoration/aftercare, the level of uncertainty should decrease, particularly as sections of the site are progressively restored. As a result, the level of contingency necessary may also decrease.

3.10.2 COST PROFILE

The lands have mostly been restored to beneficial after-use (agriculture and forestry) under successive waste permits. Only Phase 3 of the site remains to be backfilled using imported soil and stone whilst Phase 2 is currently undergoing final landscaping and cultivation to agricultural use. A copy of the final Restoration Plan (Drawing No. B.2.4, Rev C) and Cross Sections (Drawing No. B.2.5, Rev C) are attached.

Progressive restoration involving grass seeding of restored areas shall be carried out on a staged basis to reduce the effects of soil erosion, windblown dust, to aid ground stabilisation and as an effective means of weed control. On completion of each phase of development final restoration including grading, seeding and landscaping will be carried out.

Whilst clean closure is envisaged and the site will be restored in a progressive manner consideration has been given to the need to complete the final restoration and aftercare of the area comprising the site office, weighbridge, wheelwash, and waste inspection/quarantine area.

Redundant structures, plant equipment and stockpiles will be removed from site on cessation of recovery activity. Machinery and buildings will either be utilised on other sites or be sold as working machinery or scrap. In the case of machinery to be scrapped all contaminants will be removed, drained or flushed from all plant, tanks and pipelines. All residues containing fuels, oils and other contaminants will be removed off site for recovery or disposal.

Whilst it is planned to decommission and remove these facilities on completion of waste recovery activities at the site, for the purposes of closure planning adequate provision has been included in the costings and this scenario is considered to represent a worst-case scenario in the event of cessation resulting from abandonment of the activity.

On this basis it is considered that any financial provision required with respect to closure, restoration and aftercare should be based on the closure costs as detailed (Refer to Table 3.2 above).

3.10.3 INFLATION/DISCOUNTING

It is proposed to use the Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last calculation/revision.

3.10.4 REVIEWING AND UPDATING COSTS

Closure and restoration/aftercare costs will be reviewed annually and any proposed amendments thereto notified to the EPA for agreement. It is proposed to adopt the following formula when updating costings:

$$\text{Revised Cost} = (\text{Existing Cost} \times \text{WPI}) + \text{CiCC}$$

where:

WPI = Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, law, regulations, regulatory authority charges or other significant changes.

3.11 FINANCIAL PROVISION

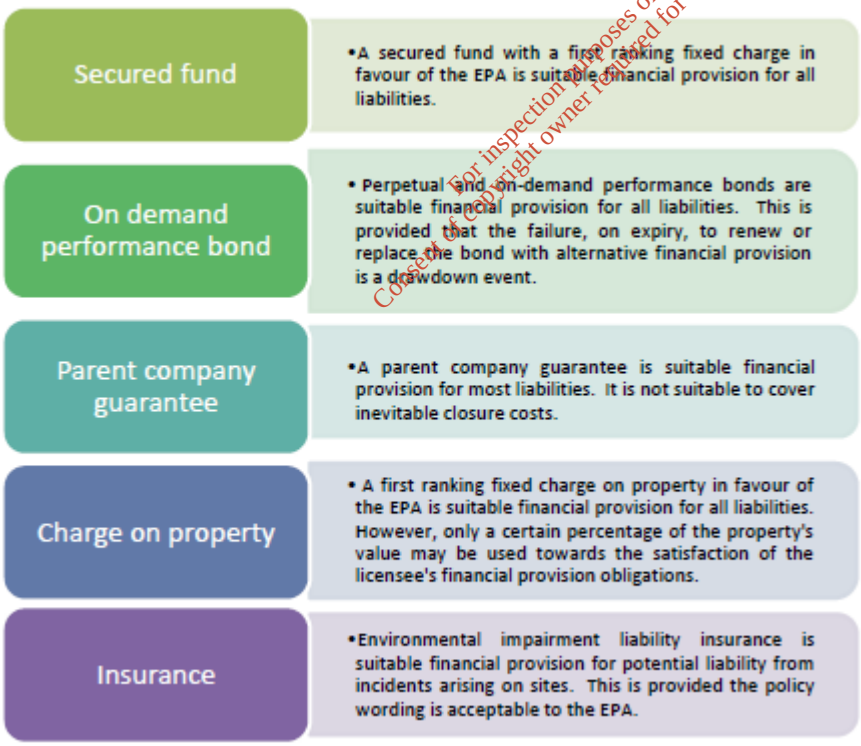
The document *Guidance on Financial Provision for Environmental Liabilities, Environmental Protection Agency (EPA) 2015* sets out broad guidance in relation to how the Environmental Protection Agency (EPA) anticipates it will approach financial provisions.

Financial provisions are, in broad terms, required to cover environmental liabilities that may occur during the operating life of a licensed facility or that may arise from or following the closure of a licensed facility.

The EPA's preference is for the use of established and low risk financial instruments, which are in line with the principles of being secure, sufficient and available when required. The type of financial instrument(s) accepted by the EPA will depend on the nature of the risk being covered.

The following forms of financial instrument are, in principle, acceptable to the EPA:

Figure 3-2 Forms of Financial Instruments acceptable to EPA



It is acknowledged that as a typical condition of any waste licence that the Agency may amend the licence at any time in certain circumstances in accordance with section 42B of the Waste Management Act 1996 as amended, to require, or not require as the case may be, the putting in place of a financial provision to incorporate costings for CRAMP and/or Environmental

Liabilities Risk Assessment. This amendment may be implemented by the Agency in the event of an incident that creates a significant residual environmental liability or where the environmental risk profile changes on site.

Clashford Recovery Facilities Ltd has estimated the closure and restoration/ aftercare requirements **(€75,141)**. Clashford Recovery Facility if deemed necessary will put in place a secure fund, and/or on demand performance bond. The form and value of the financial provision being subject to agreement with the EPA.

4 INCIDENTS

4.1 INTRODUCTION

Environmental liability risk assessment (ELRA) considers the risk of incidents occurring that could result in liabilities materialising, e.g. fire, fuel spillages. Proactive environmental risk management can both increase compliance and significantly reduce the potential for an incident. The result is a lower risk profile for an activity and a potentially lower cost in making financial provision. The two key objectives of the ELRA process are:

- to identify and quantify environmental liabilities focusing on unplanned, but possible and plausible events occurring during the operational phase; and
- to provide a mechanism to encourage continuous environmental improvement through the management of potential environmental risk.

The ELRA approach is a standard risk assessment that involves the assessment of the likelihood of occurrence of an event in combination with the consequences of that event. This is followed by the costing of the plausible worst-case scenario for the purposes of informing the level of financial provision (cover) necessary.

The ELRA procedure is illustrated by the following Figure 4.1.

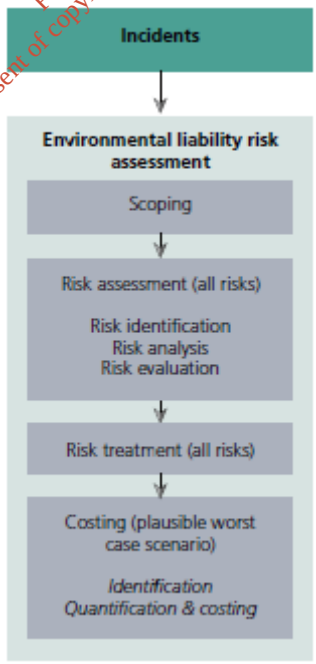


Figure 4-1 Environmental liability risk assessment process (Source EPA 2014a)

4.2 SCOPING

The purpose of ELRA is to identify and cost risks to the environment (surface water, groundwater, atmosphere, land, flora, fauna and human health).

In this case only “soils and stone” and inert C&D waste is to be accepted at the facility for recovery and phased restoration of a sand and gravel pit to a contoured landform that will be in keeping with the surrounding landscape.

The main potential sources of emissions from a soil and stone waste recovery facility would be from noise or dust associated with the movement, handling and placement of materials. Possible other emissions to the atmosphere would be from machinery exhaust fumes and also possible emissions to groundwater in the event of a fuel spillage.

Clean closure is envisaged such that all plant is safely removed for reuse or recycling and all wastes are removed off site at the time of closure for appropriate recovery or disposal. Monitoring undertaken should demonstrate that there are no outstanding environmental issues.

There will be no on-going requirement for environmental monitoring of emissions after recovery operations have ceased. It is proposed that surface and ground water monitoring is continued during the aftercare programme for a period up to the final site inspection.

An aftercare scheme will be implemented with the aim of bringing the restored soils (and hence land) into a condition which does not need to be treated differently from undisturbed land in the same use. The final restoration of the site will facilitate an agricultural after-use similar to that which existed prior to extraction works.

A final site-inspection 6 months after site closure will be carried out to ensure that the final site restoration scheme implemented is functioning and progressing as required.

It is evident from the above description given the relatively short-term measures necessary to close the site satisfactorily, that there will be no environmental liabilities once closure, decommissioning and residuals management are completed.

It is considered that the site activity will require the ELRA to address liabilities from past and present activities.

4.3 RISK ASSESSMENT

4.3.1 RISK IDENTIFICATION

Key information required for the risk identification process on the site operation, performance and sensitivity has been provided in Section 3.2 & 3.3 of this report.

During the risk identification, all the processes on site were identified and the risks associated with each process were listed. The risk identification process was carried out by an experienced environmental consultant with over 25 years' experience in the extractive and inert waste management industries, consultation with the appointed hydrogeological consultants and the proposed facility manager. All potential causes of failure of the processes and the effect/impact on the environment were identified. All plausible risks identified are listed in Table 4.1.

Table 4-1 Plausible risk identified for the activity

Risk ID	Process	Potential Risk
1	Fuel Storage	Leakage of fuel during refuelling
2		Accidental spillage of fuels and lubricants by construction plant placing the inert fill and other operational procedures
3	Suspended Solids	Material with pollution potential on site surfaces e.g. sediment, and subsequent entrainment in site runoff during rainfall events
4	Backfilling	Leaching to groundwater from the infilled deposition areas
5	Waste Water Treatment	Uncontrolled release of sewage
6	Waste Management Practices	Rogue load of contaminated material
7	Fugitive Dust Emissions	Dust generation associated with placement of materials and/or recovery operations during prolonged periods of dry weather
8	Noise Emissions	Excessive noise emissions due to poor operational practice and implementation of abatement
9	Traffic	Excessive speed can result in increases in noise, dust emissions

4.3.2 RISK ANALYSIS

The risks above were assessed against likelihood and consequence as per Tables 4.2 and 4.3; the results are presented in Table 4.4.

Table 4-2 Risk classification table - likelihood (EPA 2014a)

Rating	Likelihood	
	Category	Description
1	Very Low	Very low chance of hazard occurring
2	Low	Low chance of hazard occurring
3	Medium	Medium chance of hazard occurring
4	High	High chance of hazard occurring
5	Very High	Very high chance of hazard occurring

Table 4-3 Risk classification table - consequence (EPA 2014a)

Rating	Consequence	
	Category	Description
1	Trivial	No impact or negligible change to the environment
2	Minor	Minor impact/localised or nuisance
3	Moderate	Moderate impact to environment
4	Major	Severe impact to environment
5	Massive	Massive impact to a large area, irreversible in medium term

Table 4-4 Risk Analysis

Risk ID	Process	Potential Risk	Environmental effect	Consequence Rating	Basis of Consequence	Likelihood Rating	Basis of Likelihood	Risk Score (Consequence x Likelihood)
1	Fuel Storage	Leakage of fuel during refuelling	Contamination of soil and groundwater due to release of hydrocarbons	3	Limited storage volume. Hazardous and persistent material.	1	All refuelling of site plant will take place on a concrete hardstanding area. Surface runoff from the hard standing will be directed to a silt trap with discharge to ground via a Class I Full retention separator. Diesel Plant on site will be refueled using a mobile fuel bowser or double skinned road tanker. As such there is no fuel storage on site	3
2		Accidental spillage of fuels and lubricants by construction plant placing the inert fill and other operational procedures	Contamination of soil and groundwater due to release of hydrocarbons	3	Limited storage volume. Hazardous and persistent material.	1	All refuelling of site plant will take place on a concrete hardstanding area. Surface runoff from the hard standing will be directed to a silt trap with discharge to ground via a Class I Full retention separator. Diesel Plant on site will be refueled using a mobile fuel bowser or double skinned road tanker. As such there is no fuel storage on site. Oil and Waste oil products are stored under cover. All oil barrels and lubricants are stored on spill pallets/ spill trays. Spill kits are also maintained on site. Waste oils are disposed of by a licensed waste contractor and removed off site. ERP training will be provided.	3
3	Suspended Solids	Material with pollution potential on site surfaces e.g. sediment, and subsequent entrainment in site runoff during rainfall events	Contamination of surface water, soils and/or groundwater	2	Potential for rainfall to mobilise fines in loose backfilled materials and carry them toward the surface water features.	2	Without mitigation the probability of occurrence of an increase in suspended solids and potential for contaminated runoff entering surface water during operation of the facility is 'low' to 'medium'.	4
4	Backfilling	Leaching to groundwater from the infilled deposition areas	Contamination of groundwater and/or surface water	2	Material to be delivered in individual loads and therefore any contaminated loads would be of small quantities with minor localised impacts.	2	Based on Assessments to date of soils placed , soil testing and groundwater quality results, the risk posed to current or future site operatives at the Clashford WRF site or to the environment based on the current and proposed site use as a waste recovery facility is considered to be low.	4
5	Waste Water Treatment	Uncontrolled release of sewage.	Contamination of groundwater and/or surface water	2	Failure to empty septic tank on routine basis.	1	The installation and of the septic tank and percolation area will be in compliance with the EPA (2010), COP: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. < 10). The WWT system will be subject to a maintenance contract	2
6	Waste Management Practices	Rogue load or contaminated material.	Contamination of soil, groundwater and/or surface water.	3	Material to be delivered in individual loads and therefore any contaminated loads would be of small quantities with minor localised impacts.	3	Imported material to be inert soil and stone and C&D waste. The likelihood of occurrence is medium without adeqaute inspection, acceptance and quarantine procedures being put in place.	9
7	Fugitive Dust Emissions	Dust generation associated with internal movement, loading and unloading of vehicles; placement of materials throughout the site; activities associated with the processing area. Risk increases during prolonged periods of dry weather.	Uncontrolled dust emission to air with potential for localised nuiscance at nearest receptors.	2	Localised, intermittent nuiscance for nearby sensitive receptors.	3	Medium chance of occuring particulary in the absence of mitigation measures.	6
8	Noise Emissions	Excessive noise emissions due to poor operational practice and implementation of abatement measures.	Nuiscance at noise sensitive receptors.	2	Localised, intermittent nuiscance for nearby noise sensitive receptors.	3	Medium chance of occuring particulary during phases when restoraton works are being carried out near noise sensitive receptors. Need to ensure mitigation measures are implemented and due consideration is given to timing and duration of restoration works.	6
9	Traffic	Excessive speed can result in increases in noise and dust emissions.	Nuiscance at sensitive receptors due to noise and dust associated with traffic.	2	Localised, short duration nuisance for nearby receptors.	2	Low likelihood of occurrence due to existing traffic control measures including recessed entrance, weighbridge, surfaced access road, wheelwash, speed limit signs.	4

4.3.3 RISK EVALUATION

The purpose of risk evaluation is to assist in making decisions, using the outcomes of the risk analysis, identifying and prioritising the risks for risk treatment. Each of the risks is ranked to assist in the prioritisation of treatment (Refer to Table 4.5).

Table 4-5 Risk evaluation

Risk ID	Process	Potential Risk	Consequence Rating	Likelihood Rating	Risk Score (Consequence x Likelihood)
6	Waste Management Practices	Rogue load of contaminated material	3	3	9
7	Fugitive Dust Emissions	Dust generation associated with internal movement, loading and unloading of vehicles; placement of materials throughout the site; activities associated with the processing area. Risk increases during prolonged periods of dry weather.	2	3	6
8	Noise Emissions	Excessive noise emissions due to poor operational practice and implementation of abatement.	2	3	6
3	Suspended Solids	Material with pollution potential on site surfaces e.g. sediment, and subsequent entrainment in site runoff during rainfall events	2	2	4
4	Backfilling	Leaching to groundwater from the infilled deposition areas	2	2	4
9	Traffic	Excessive speed can result in increases in noise, dust emissions	2	2	4
1	Fuel Storage	Leakage of fuel during refuelling	3	1	3
2		Accidental spillage of fuels and lubricants by construction plant placing the inert fill and other operational procedures	3	1	3
5	Waste Water Treatment	Uncontrolled release of sewage	2	1	2

The following risk matrix has been developed to allow the risks to be easily displayed and prioritised (Refer to Table 4.6). The consequence and likelihood ratings are used in the matrix with the level of consequence forming the x-axis and the likelihood forming the y-axis. The matrix is colour coded to provide a broad indication of the critical nature of each risk. The matrix provides a visual tool for regular risk reviews since the success of mitigation can be easily identified.

The risk matrix indicates that there are no risks in the red zone requiring priority treatment. There is one risk in the amber zone requiring treatment through mitigation or management action. All other risks are located in the green zone, indicating the need for continuing awareness and monitoring on a regular basis. However, assessment of the green zone risks has indicated that a number of these risks can be reduced through the implementation of mitigation measures. These risk treatment measures will be adopted where considered cost-effective to further reduce the risks.

Table 4-6 Risk matrix

Likelihood							
	V. High	5					
	High	4					
	Medium	3		7,8	6		
	Low	2		3,4,9			
	V. Low	1		5	1,2		
			1	2	3	4	5
			Trivial	Minor	Moderate	Major	Massive

Consequence

4.4 RISK TREATMENT

The output of the risk treatment process is the development of a statement of measures to be taken to minimise the environmental risk of the activity. The statement of measures is presented in Table 4.7, where a set of appropriate and achievable mitigation measures are assigned to each risk, with a risk owner responsible for the ongoing management of the risk and a timeframe for implementation of the risk mitigation measure.

Monitoring and review of the risk assessment process will be carried out to verify continuous improvement in the risk profile of the operation. This ongoing review will also facilitate the inclusion of new risks and the updating of existing risks based on implemented risk treatment.

At a minimum the ELRA process will be conducted in line with the licence requirements, but reviews will be carried out on a more regular basis in the event of major infrastructural changes on site or in light of incident investigation. All aspects of the ELRA management process will be recorded and traceable to ensure transparency in the decision-making process. Updates to the ELRA process will be communicated to the Agency via the facility AER.

Table 4-7 Statement of Measures

Risk ID	Process	Potential Risk	Risk Score	Mitigation Measures to be taken	Outcome	Action	Date of Completion	Owner/ Contact Person
6	Waste Management Practices	Rogue load or contaminated material.	9	Put in place delivery, inspection & acceptance procedures. Designate quarantine area with drainage to Class I Full retention separator. Impliment environmental monitoring programme.	Reduced potential for importation of contaminated material; early detection on environmental pollution.	Prepare SOP and ensure staff are trained.	On Commencement	Facility Manager
7	Fugitive Dust Emissions	Dust generation associated with internal movement, loading and unloading of vehicles; placement of materials throughout the site; activities associated with the processing area. Risk increases during prolonged periods of dry weather.	6	•During dry weather the haul roads and stockpiles are sprayed with water to dampen any likely dust blows. •Static and mobile wet dust suppression systems will be located at strategic points in the process if required. •Drop heights are kept to a minimum by using short conveyors and maintaining stocks under the head drum load out points. •A wheel wash facility has been installed on site. •A sprinkler system has been installed on the site access road. •Main site haulage routes within the site shall be maintained with a good temporary surface •All internal roadways will be adequately drained, to prevent ponding. •A road sweeper is available for use on a weekly basis and/or if a spillage occurs onto the public roadway. •Suitable vegetation is to be provided on restored areas at the earliest opportunity. •Regular servicing of facility plant & machinery. •Ongoing dust monitoring to ensure threshold limits are not exceeded.	These measures are considered sufficient to ensure that dust emissions will remain below recognised thresholds for this type of development.	Periodic review of dust mitigation measures	On Commencement	Facility Manager
8	Noise Emissions	Excessive noise emissions due to poor operational practice and implementation of abatement measures.	6	•The provision of temporary peripheral screen banks. •General site activity will be within the existing pit and below the level of the nearest residences. •The use of designated haul roads to ensure that site traffic is removed from nearest noise sensitive receptors. •All machinery used will be CE certified for compliance with EU noise control limits. •Regular maintenance of all plant and machinery is an integral part of site management. •All plant and machinery is switched off when not in use. •A noise management programme will be defined as part of the EMS.	These measures are considered sufficient to ensure that noise emissions will remain below recognised thresholds for this type of development.	Periodic review of Noise mitigation measures	On Commencement	Facility Manager
3	Suspended Solids	Material with pollution potential on site surfaces e.g. sediment, and subsequent entrainment in site runoff during rainfall events	4	•Adequate drainage network for the interception and treatment of runoff prior to entry into surface water drains •Strict control measures to ensure only suitable material is allowed onto the site •It is proposed to install perimeter drains where required around the restoration area to capture and divert runoff to the current closed system for treatment. • Surface water monitoring including for Suspended Solids will continue to be undertaken on a quarterly basis.	These measures together with phased restoration are considered adequate to reduce the potential for contaminate runoff entering groundwater and/or surface water.	Facility Manager to inspect working areas weekly and prioritise progressive restoration	Ongoing	Facility Manager
4	Backfilling	Leaching to groundwater from the infilled deposition areas	4	Put in place delivery, inspection & acceptance procedures. Implement environmental monitoring programme. During backfilling of the pit, all temporary surfaces will be graded to facilitate over-ground run-off of surface water, thereby minimising the volume of rainfall percolating through the backfilled material. This will further reduce any residual risks of any potential contaminants leaching into the soil and bedrock (or groundwater). It is proposed that on-going groundwater monitoring is conducted Only suitably permeable and inert material should be used in the restoration process, thereby reducing the potential to create a low permeability zone which could hinder local/ regional groundwater recharge and/or creating an impermeable barrier to groundwater recharge. Slurry spreading and organic fertiliser spreading on-site should adhere strictly to the Good Agricultural Regulations S.I. No. 31 of 2014.	Based on Assessments to date of soils placed , soil testing and groundwater quality results, the risk posed to current or future site operatives at the Clashford WRF site or to the environment based on the current and proposed site use as a waste recovery facility is considered to be low .	Prepare SOP and ensure staff are trained.	On Commencement	Facility Manager
9	Traffic	Excessive speed can result in increases in noise and dust emissions.	4	Car parking including visitors parking will be provided at the site office. Trucks entering the site report to the site office where each load will be inspected as to its suitability to be recovered on site. The site entrance has also been designed to ensure that queuing for vehicles entering the site is accommodated within the curtilage of the site entrance. All trucks exiting the site leave through the wheelwash facility. The wheelwash will be upgraded and relocated towards the site entrance. In the unlikely event that a spillage occurs, the applicant will ensure that spilled material is removed from the road surface in a safe and timely manner, as soon as they become aware of it, or are notified that a spillage has arisen. A weighbridge will be provided. Traffic direction signs, warning signs, speed limit signs are established throughout the site.	Reduced potential for air and noise emissions.	Periodic review of traffic control measures. Complaints/ Incidents procedure.	On Commencement	Facility Manager
1	Fuel Storage	Leakage of fuel during refuelling	3	A double skinned mobile fuel bowser is used to refuel plant and machinery on site. Oil and Waste oil products are stored under cover. All oil barrels and lubricants are stored on spill pallets/ spill trays. Spill kits are also maintained on site and the Company will put in place an emergency response procedure for hydrocarbon spills, and appropriate training of site staff in its implementation. Waste oils will be disposed of by a licensed waste contractor and removed off site.	Reduced potential for spillage during refuelling operations.	Provide spill pallets/spill trays and spill kits. Train staff on emergency response procedures.	On Commencement	Facility Manager
2		Accidental spillage of fuels and lubricants by construction plant placing the inert fill and other operational procedures	3	Hard standing with drainage to Class I Full Retention Separator. All oil barrels and lubricants will be stored on spill pallets/ spill trays. Spill kits will be maintained on site and the Company will put in place an emergency response procedure for hydrocarbon spills and appropriate training of site staff in its implementation. Regular maintenance of plant and machinery.	Reduced potential for contamination of soils and groundwater	Provide Spill pallets/spill trays and spill kits. Train staff on Emergency response procedures	On Commencement	Facility Manager
5	Waste Water Treatment	Uncontrolled release of sewage.	2	The installation and of the septic tank and percolation area will be in compliance with the EPA (2010), COP: Wastewater Treatment and Disposal Systems Serving Single Houses (p.e. < 10). The WWT system will be subject to a maintenance contract	Reduce potential for contamination of groundwater	Review maintenance contract periodically	3 months	Facility Manager

4.5 COSTING

This section details the approach for calculating the level of financial provision (cover) required in relation to the risks identified by the ELRA process. The methodology for costing the level of financial provision necessary is based on costing the plausible worst-case scenario.

4.5.1 IDENTIFICATION OF THE PLAUSIBLE WORST-CASE SCENARIO

The plausible worst-case scenario refers to the plausible event that poses the maximum environmental liability, i.e. consequence, during the period to be covered by the financial provision.

The plausible worst-case scenario may be represented by the risk with the highest consequence rating. In that case, this risk should be the basis for financial provision and should be quantified and costed as detailed below.

The ELRA has not identified any risks resulting in a major consequence. The risk matrix (Refer to Table 4.6 above) indicates that there are no risks in the red zone requiring priority treatment. There is one risk (Risk ID 6) in the amber zone requiring treatment through mitigation or management action. All other risks are located in the green zone, indicating the need for continuing awareness and monitoring on a regular basis. However, assessment of the green zone risks has indicated that a number of these risks can be reduced through the implementation of mitigation measures.

As such the plausible worst-case scenario is taken to be the risk associated with the importation of a rogue load of contaminated material.

4.5.2 QUANTIFICATION AND COSTING

The plausible worst-case scenario (Risk ID 6) has been quantified and costed in Table 4.8.
The plausible worst-case scenario is predicted to involve:

- Importation of rogue loads (typically 20 tonne loads)
- For the purpose of a worst-case scenario we will assume that due to unforeseen circumstances there has been a breakdown in delivery, inspection and acceptance procedures for a working day resulting in up to 10 loads of non-hazardous material (suitable for disposal to Inert landfill) being placed in the backfill area.
- In addition to removal and/or quarantine pending removal of this material the following remedial measures have also be considered.

- Site visit/site investigation by Environmental Consultant to ensure that all contaminated materials have been removed.
- Testing of material.

Table 4-8 Quantification and costing of plausible worst-case scenario

Task	Description	Quantity (No)	Measurement Unit	Unit Rate	Cost	Source (see notes)
Response to Risk ID 6: Importation of Rogue Loads	***Site Investigation***					
	Environmental Consultant (including Reporting)	3	day	750	2250	1
	Trial Pits	4	unit	90	360	2
	Remediation					
	Excavation of Soils	100	m3	1.5	150	2
	Wast Disposal / Recovery					
	Disposal of non-hazardous soil (Gate Fee)	200	tonne	20	4000	2
	Transport of Solid non-hazardouse (20 tonne loads, tonne assuming 100 km each-way trip)	200	tonne	15	3000	2
	Waste sampling and analysis					
	Waste sampling and analysis (WAC suite as per tables 2.1.2 and 2.1.2.2 of Council Decision 2003/33/EC). Costs could be much higher if additional analysis is required.	4	sample	400	1600	2
	Subtotal				**11360**	
	Contingency (10)				1136	
	Total				**12496**	

Notes:
1. Cost provided by JSPE Ltd Planning & Environmental Consultants
2. Costs based on EPA Guidance on assessing and costing environmental liabilities - Unit cost rates for verification (EPA 2014)

Whilst due consideration has been given to the quantification and costing of the above plausible worst-case scenario; the operator proposes to put in place comprehensive delivery, inspection and acceptance procedures and management systems to ensure that such an eventuality will not arise.

4.6 OUTCOMES AND NEXT STEPS

Implementation of the results of the ELRA will be reported to the EPA annually through a statement of measures included with the facility AER. The ELRA will be reviewed as necessary to reflect any significant changes on site, and in any case every three years.

The financial provision has been based on the plausible worst-case scenario as detailed above. This is the maximum liability that may be incurred and as such, financial provision is calculated as **€12,496** based on this event.

Environmental Impairment Liability (EIL) Insurance is, in principle, an acceptable financial instrument for potential liabilities from incidents. EIL Insurance must cover "*the full costs of responding and remedial measures if an incident occurs at a licenced facility*". (EPA 2016).

Clashford Recovery Facilities Ltd has in place adequate Pollution Liability insurance with respect to the Clashford Facility.

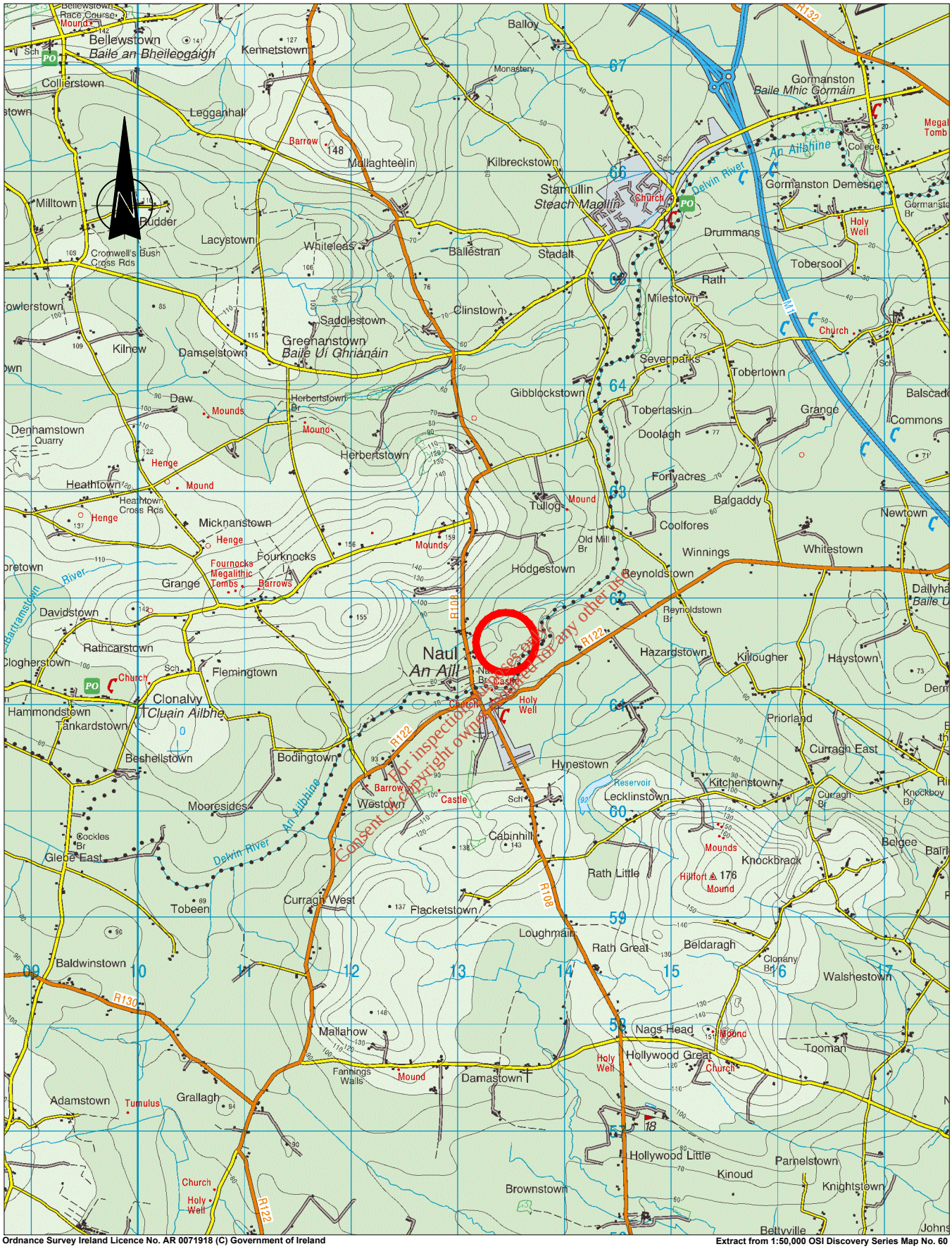
Any cover for the licenced facility/activity (to the amount determined by ELRA) will be ring-fenced from the cover for the other elements of the business (e.g. other sites or off-site transport activities). The cover for environmental response and remedial measures (to the amount determined by ELRA) will be ring-fenced from the cover for other liabilities (while still extending to clean-up of the Licensee's property and third party property).

REFERENCES

1. Guidance on assessing and costing environmental liabilities, Environmental Protection Agency (EPA) 2014a
2. Guidance on assessing and costing environmental liabilities - Unit cost rates for verification, Environmental Protection Agency (EPA) 2014b
3. Guidance on assessing and costing environmental liabilities - Frequently asked questions, Environmental Protection Agency (EPA) 2014c
4. Guidance on Financial Provision for Environmental Liabilities, Environmental Protection Agency (EPA) 2015
5. Guidance on financial provision for environmental liabilities - Additional guidance on environmental impairment liability insurance, Environmental Protection Agency (EPA) 2016

Drawings

No.	Revision	Title	Scale	Size
A 1.0	A	Site Location Map	50000	A4
B 2.1	C	Site Plan	3500	A3
B 2.2	C	Location Map (500m)	6000	A3
B 2.4	C	Site Restoration Plan	3500	A3
B 2.5	C	Site Cross Sections	3500	A3
D 1.1	C	Site infrastructure Plan	1000	A3
D 1.2	C	Surface Water Management Plan	3500	A3



Ordnance Survey Ireland Licence No. AR 0071918 (C) Government of Ireland

Extract from 1:50,000 OSI Discovery Series Map No. 60

Scale: 1:50,000

0m 500m 1km 2km

Legend

Site Location

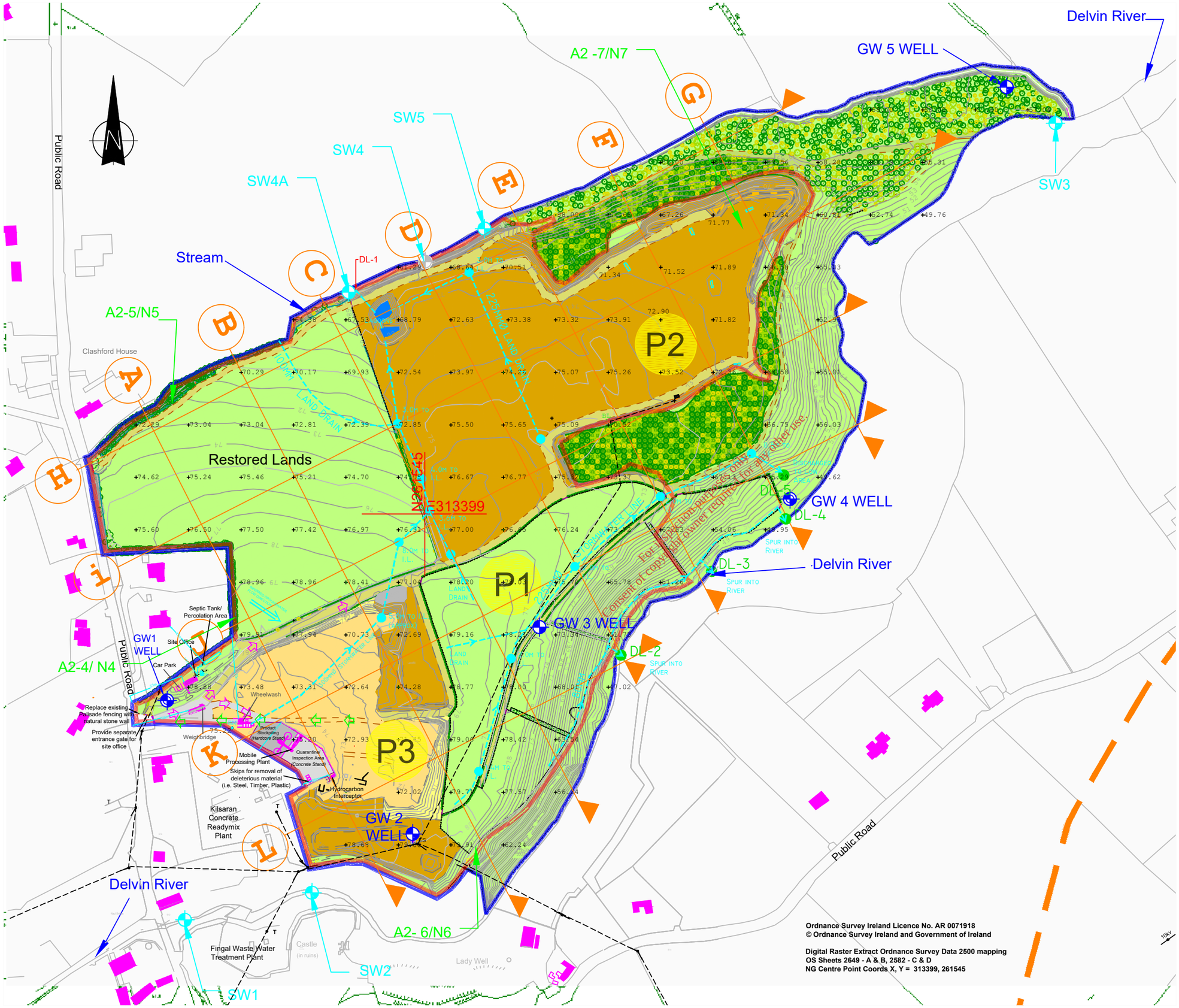
JSPE

31 Athlumney Castle,
Navan, Co Meath
Phone/Fax: 046 9073997
Mobile: John Sheils 087/ 273 0087
Email: john.sheils@jspe.ie

J SHEILS PLANNING & ENVIRONMENTAL LTD

Site Location Map
Clashford Recovery Facility
Naul
Co. Meath

Author: John Sheils	Job No. JSPE 170
Date: 22/6/2018	Ref No. A 1.0 Rev. A



Scale 1:3500

0m 40m 120m

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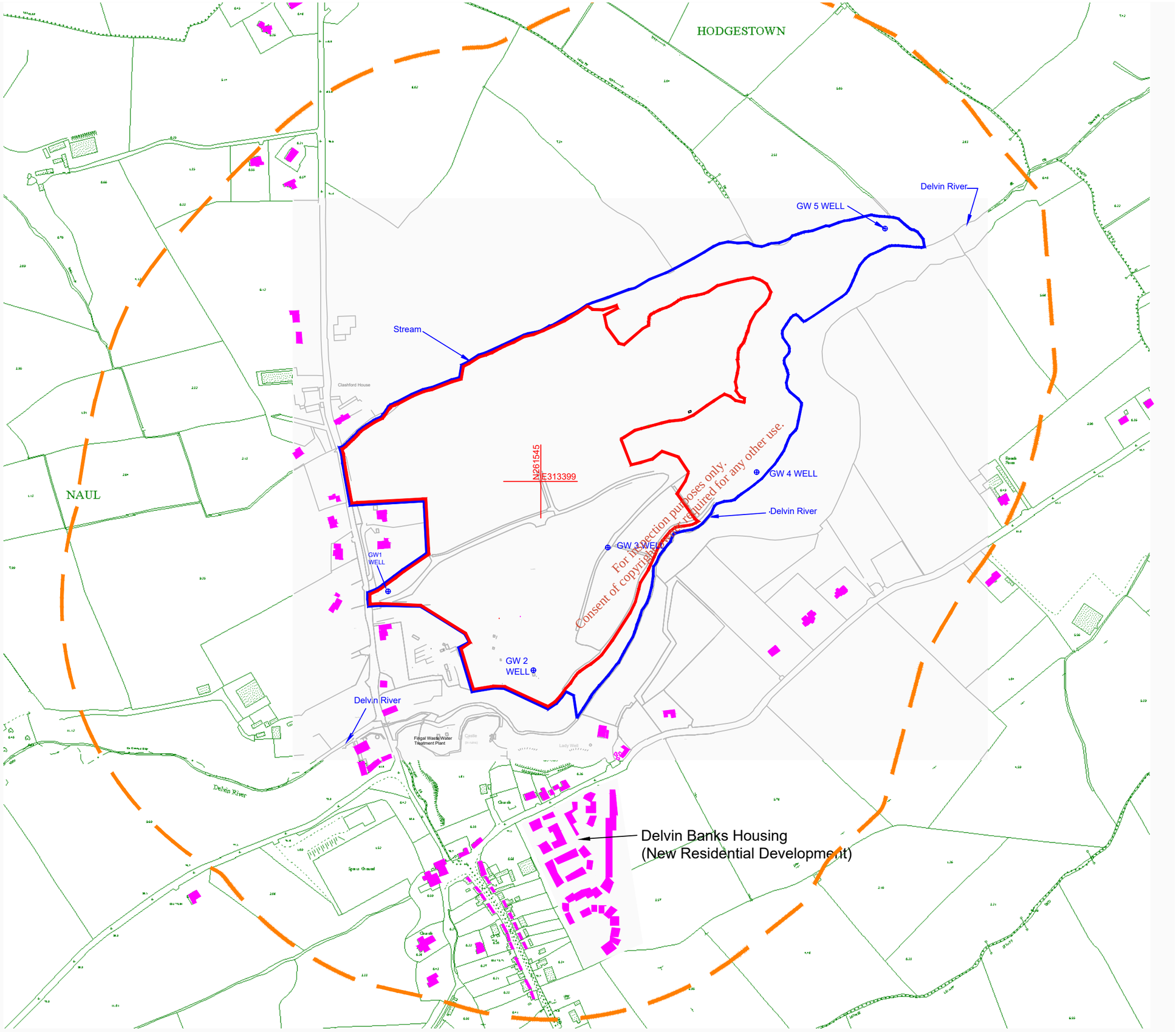
Email: john.sheils@jspe.ie
J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT: **Clashford Recovery Facilities Ltd**

DRAWING: **SITE PLAN**

LOCATION: **NAUL TOWNLAND**
Naul, Co. Meath.

Drawn by: John Sheils	Scale: 1 /3500	
Checked by: John Sheils	Job No.: JSPE 173	
Date: 8/06/18	Figure No.: B 2.1	Rev.: C



Digital Raster Extract Ordnance Survey Data 2500 mapping
OS Sheets 2649 - A & B, 2582 - C & D
NG Centre Point Coords X, Y = 313399, 261545

Scale 1:6000

0m 80m 240m

JSPE
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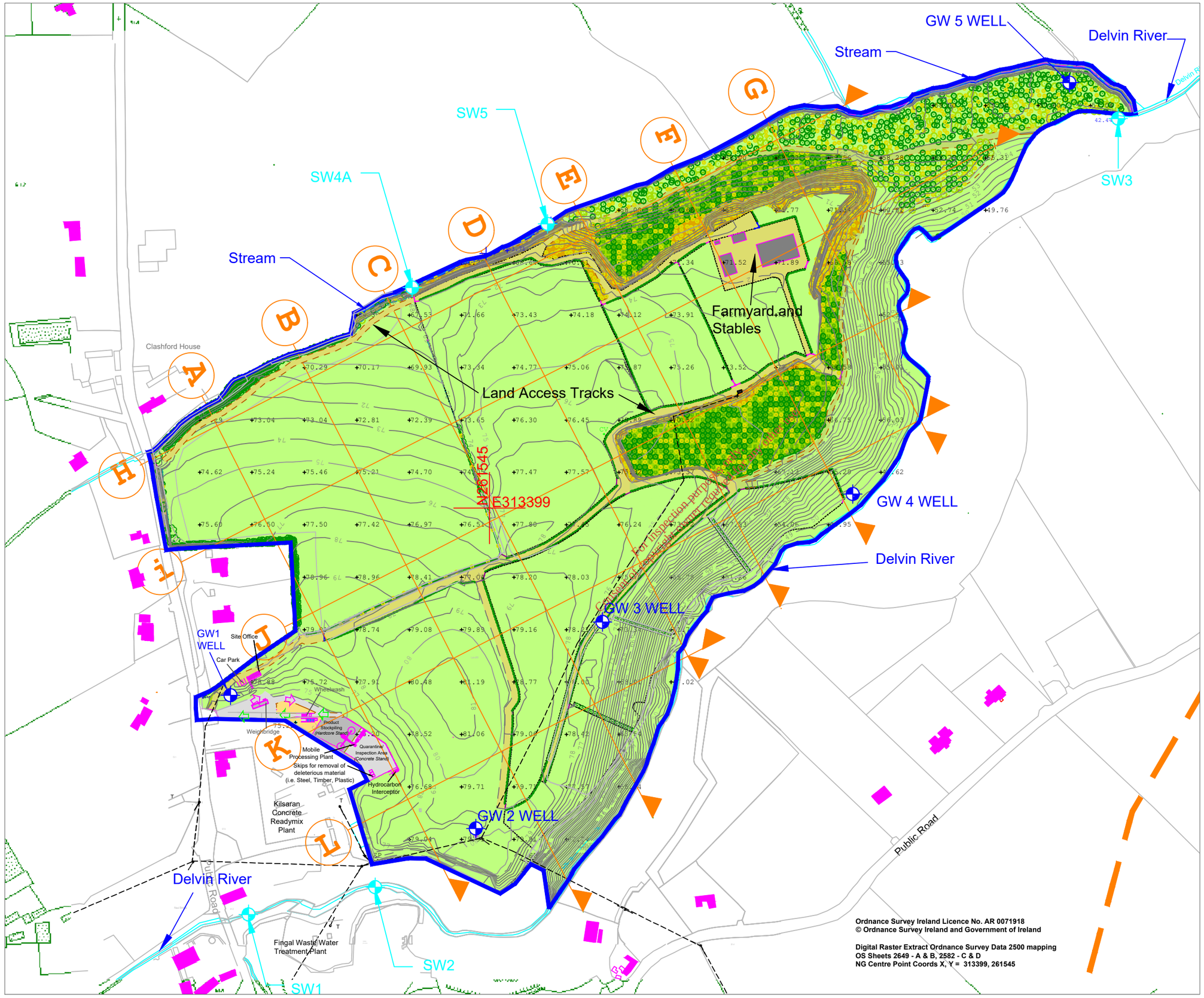
Email: john.sheils@jspe.ie
J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT: **Clashford Recovery Facilities Ltd**

DRAWING: **LOCATION MAP (500m)**

LOCATION: **NAUL TOWNLAND Naul, Co. Meath.**

Drawn by: John Sheils	Scale: 1 /6000	
Checked by: John Sheils	Job No.: JSPE 173	
Date: 8/06/18	Figure No.: B 2.2	Rev.: C



Applicants Ownership(c.33.4 ha)

Residences

500m offset from Application Boundary

Restored Area

Restored Area (Planted)

Contours

Spot Levels (mAOD)

Cross Sections

Power line

Surface Water monitoring point

Ground Water monitoring point

Monitoring Points National Grid Coordinates

GW1 = IG Coords E313153, N261367
GW2 = IG Coords E313387, N261240
GW3 = IG Coords E313508, N261437
GW4 = IG Coords E313747, N261559
GW5 = IG Coords E313954, N261951
SW1 = IG Coords E313170, N261158
SW2 = IG Coords E313291, N261184
SW3 = IG Coords E314000, N261917
SW4A = IG Coords E313326, N261756
SW5 = IG Coords E313456, N261817

Scale 1:3500

0m 40m 120m

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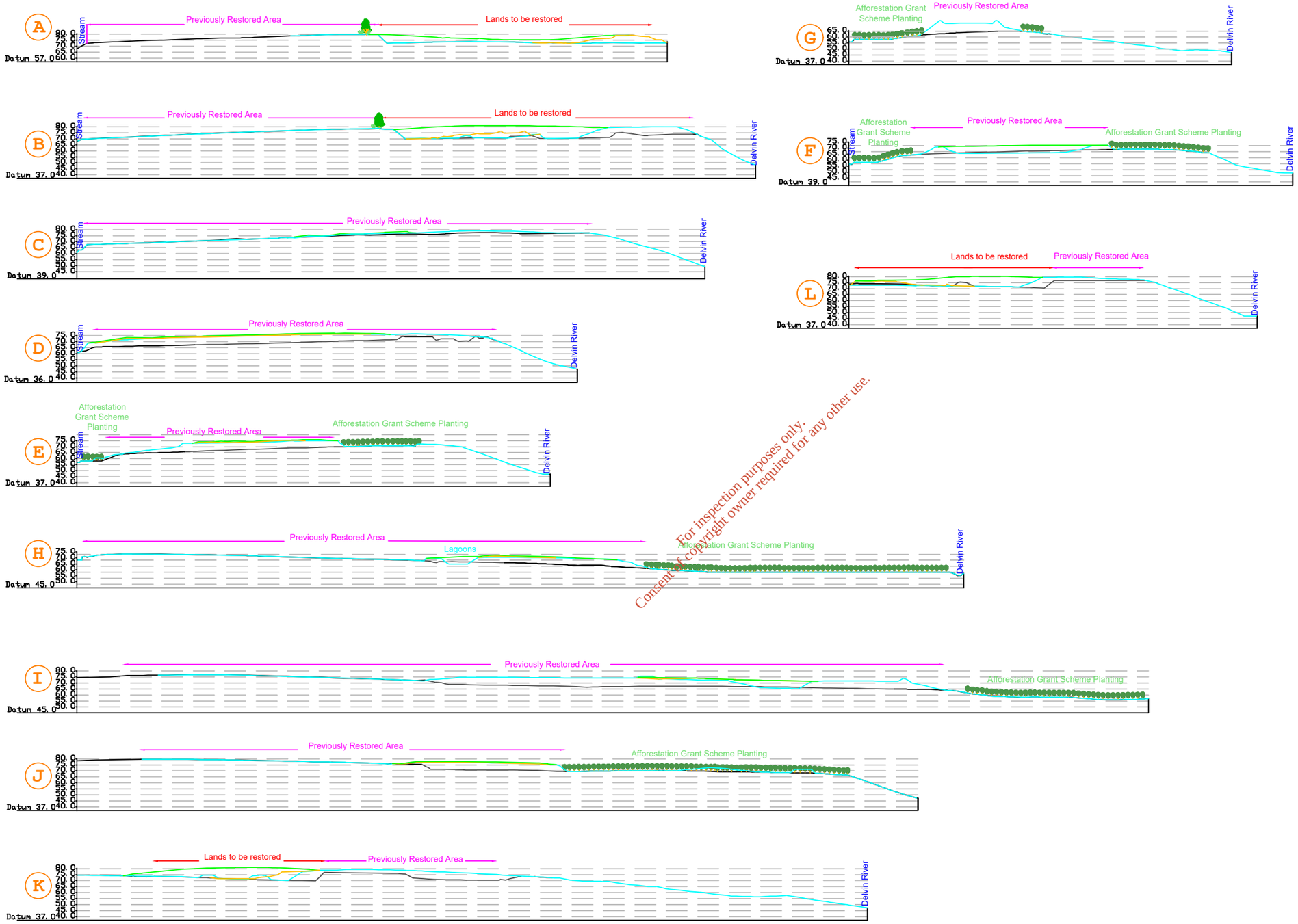
CLIENT: **Clashford Recovery Facilities Ltd**

DRAWING: **SITE RESTORATION PLAN**

LOCATION: **NAUL TOWNLAND Naul, Co. Meath.**

Drawn by: John Sheils	Scale: 1 /3500	
Checked by: John Sheils	Job No.: JSPE 173	
Date: 8/06/18	Figure No.: B 2.4	Rev.: C



Legend

- Final Landform Profile (mAOD)
- Existing Ground Profile (mAOD) - 2009
- Existing Ground Profile (mAOD) - 2016
- Existing Ground Profile (mAOD) - 2018
- Lands to be restored

Minimum Fill Depth <1m
Maximum Fill Depth 10m
Average Fill Depth 5.4m

Scale 1:3500

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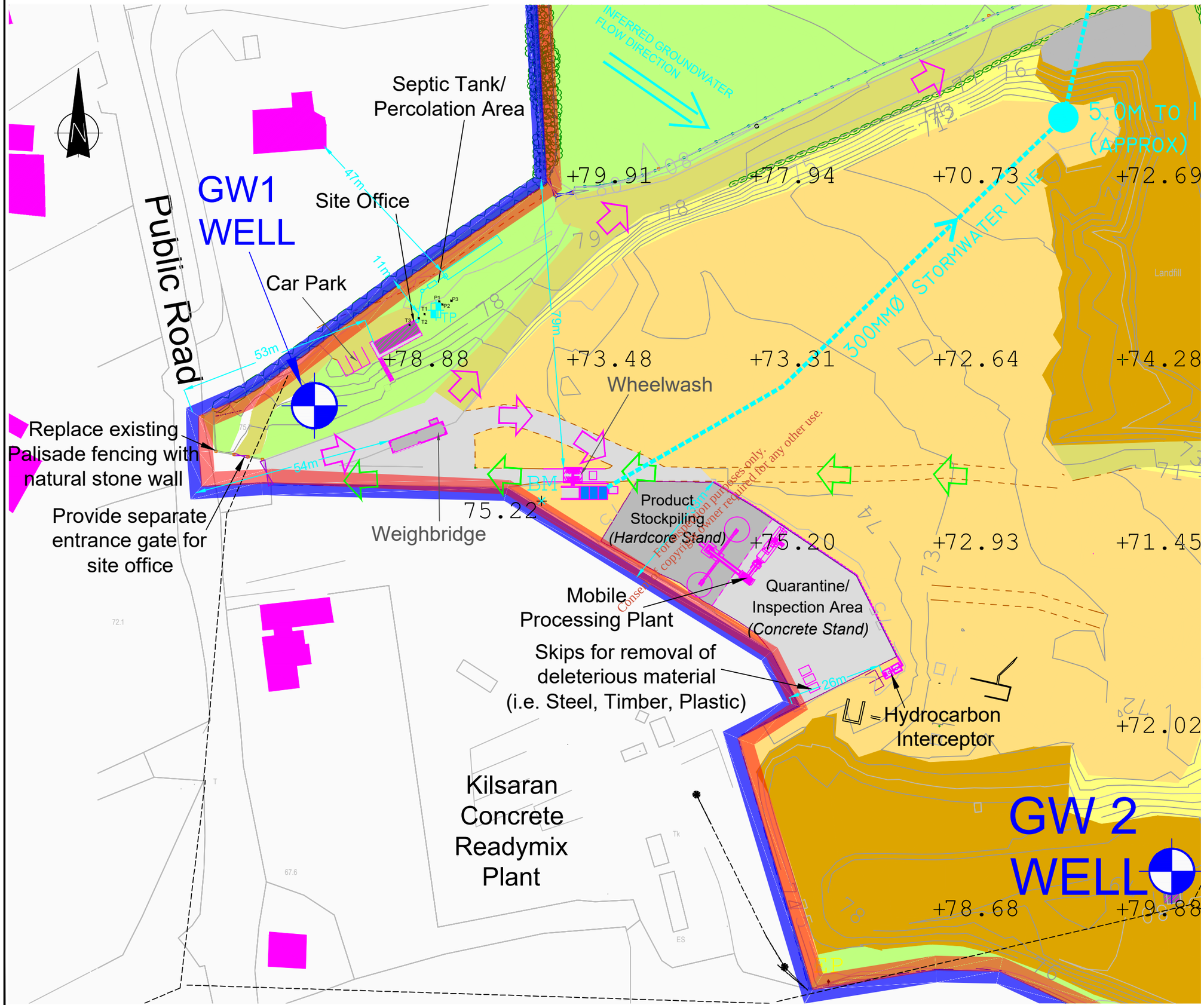
CLIENT
Clashford Recovery Facilities Ltd

DRAWING
CROSS SECTIONS

LOCATION
NAUL TOWNLAND
Naul, Co. Meath.

Drawn by: John Sheils	Scale: 1 /3500	
Checked by: John Sheils	Job No.: JSPE 173	
Date: 16/04/2018	Figure No.: B 2.5	Rev.: C



Scale 1:1000

0m 20m 60m

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CLIENT: **Clashford Recovery Facilities Ltd**

DRAWING: **SITE INFRASTRUCTURE PLAN**

LOCATION: **NAUL TOWNLAND, Naul, Co. Meath.**

Drawn by	Scale	
John Sheils	1 /1000	
Checked by	Job No.	
John Sheils	JSPE 173	
Date	Figure No.	Rev.
08/06/18	D 1.1	C

Delvin River
GW 5 WELL
A2 -7/N7
SW5
SW4
SW4A
SW3
Stream
DL-1
A2-5/N5
Clashford House
P2
Restored Lands
E 313399
N 245
P1
GW 4 WELL
DL-4
DL-5
DL-3
Delvin River
GW 3 WELL
DL-2
P3
GW 2 WELL
Public Road
Septic Tank/ Percolation Area
GW1 WELL
Site Office
Car Park
A2-4/ N4
Wheelwash
Weighbridge
Replace existing Palisade fencing with natural stone wall
Provide separate entrance gate for site office
Product Stockpiling /Hardcore Stand
Quarantine/ Inspection Area /Concrete Stand
Mobile Processing Plant
Skips for removal of deleterious material (i.e. Steel, Timber, Plastic)
Hydrocarbon Interceptor
Kilsaran Concrete Readymix Plant
Delvin River
Fingal Waste Water Treatment Plant
Castle (in ruins)
Lady Well
SW2
SW1
A2- 6/N6
Public Road
Ordnance Survey Ireland Licence No. AR 0071918
© Ordnance Survey Ireland and Government of Ireland
Digital Raster Extract Ordnance Survey Data 2500 mapping
OS Sheets 2649 - A & B, 2582 - C & D
NG Centre Point Coords X, Y = 313399, 261545

Application Area(c.24.2 ha)
Applicants Ownership(c.33.4 ha)
Residences
500m from Site Boundary
Backfilling Area
Restored Area
Restored Area (Planted)
Contours
Spot Levels (mAOD)
Cross Sections
Phasing
Groundwater Well
Surface Water Monitoring Location
Discharge from Lagoons (DL-1)
Groundwater Discharge Locations
Asphalt Surface
Power Line
Traffic Out
Traffic In
Distance of Structures from Boundaries of Site
Trial Pit (TP)
T(1-3) T-Test Percolation Holes
P(1-3) P-Test Percolation Holes

Scale 1:3500

0m 40m 120m

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CLIENT
Clashford Recovery Facilities Ltd

DRAWING
SITE INFRASTRUCTURE - SURFACE WATER MANAGEMENT PLAN

LOCATION
NAUL TOWNLAND
Naul, Co. Meath.

Drawn by: John Sheils	Scale: 1 /3500		
Checked by: John Sheils	Job No.: JSPE 173		
Date: 8/06/18	Figure No.: D 1.2	Rev.: C	