



JSPE

J Sheils Planning & Environmental Ltd

SAND & GRAVEL MERCHANTS LTD.

THORNBERRY TOWNLAND

KILL

Co. KILDARE

Waste Management Licence Application

W0264-01

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1 INTRODUCTION

1.1 GENERAL BACKGROUND

Projects likely to have significant effects on the environment *by virtue of their nature, size and location* are subject to the requirement for an Environmental Impact Assessment (EIA). The EIA is a systematic process undertaken to identify and evaluate the potential environmental impact of proposed projects. The EIA also seeks to consider alternatives and propose mitigation measures to ensure the development is carried out within recognised and accepted standards. This EIS pertains to the continued operation of a Waste Recovery Facility (WRF) located at a quarry in Thornberry Townland, Kill, Co. Kildare.

The lands have a history of sand and gravel working. Planning Permission P.A. Reg. Ref. No. 771/85, PL 9/5/70970 was granted on 05/09/1985 for development comprising the restoration of derelict land to agricultural use by managed land fill scheme using dry non-industrial toxic waste. It should be noted that the only material imported to site has comprised inert soil and stones, and recovery of construction and demolition waste (concrete, bricks, tiles and ceramics).

The lands have been progressively restored subject to successive WMP's dating back to 2001. The current waste management permit (Waste Permit Reg. No. WMP 30/2001B) was granted by Kildare County Council for a 36 month period on 16th May 2007. In consideration of this application the file including the above planning permission was referred to the Planning Section of Kildare County Council. The Planning Section stated that they had no objection to the waste permit application subject to compliance with the conditions of planning. Details with respect to planning history have been provided in Attachment B.3 of the Waste Licence application. The principal activity is recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soils, stone, and recovery of inert construction and demolition waste. Up to 70,000 cubic metres per annum is being accepted to the site and circa 25,000 cubic metres is required to complete the restoration of the site.

The original void space was estimate to be c. 180,000 cubic metres on submission of the Waste Management Licence application in 2009. It has been calculated that the void space remaining is only c. 25,000 cubic metres based on the original scheme submitted with the Waste Management Application.

Changes in Waste Management legislation which came into effect in June 2008 (S.I. No. 821 of 2007, and S.I. No. 86 of 2008), now require a Waste Management Licence issued by the Environmental Protection Agency (EPA) in order to operate a waste recovery facility with a lifetime total intake volume in excess of 100,000 tonnes. The waste licence application (W0264-01) was submitted on 13/02/2009. The Agency considers that the application must be made subject to an environmental impact assessment (EIA). As such the environmental impact statement will be submitted to the Agency with the application.

1.2 SITE LOCATION

The site is located within the Townland of Thornberry, c. 2km southeast of Kill, on the east side of local L2019 road (Refer to Figure A1.0).

The site of the quarry and WRF comprises c. 10ha of a leasehold of 11.4ha, which the applicant, Sand and Gravel Merchants Ltd., lease from Mr. Patrick Cullen, the owner.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads or at the end of lanes off the latter (Refer to Figure B 2.2, Rev. A, for locations of residences).

1.3 APPLICANT

Sand & Gravel Merchants Ltd has an established small family run business based in Thornberry, Kill, Co Kildare. The company employs up to 3 people directly on site (currently 2 due to recent economic recession).

The WRF requires one person operating a bull-dozer/back-hoe excavator, one general foreman to monitor and inspect the quality and suitability of imported materials being brought to the site for recovery/sorting/transfer, and one other general site operative.

1.4 ANY DIFFICULTIES IN COMPILING SPECIFIED INFORMATION

No major difficulties arising from either deficiencies in technology, knowledge or expertise were encountered in the preparation of the EIS. The EIS has been prepared by consultants with considerable experience in the compilation of waste licence applications and the carrying out of Environmental Impact Assessments (EIA's) for waste management developments.

2 DESCRIPTION OF THE DEVELOPMENT

2.1 ALTERNATIVES EXAMINED

It is standard practice in the preparation of an EIS to consider alternative project locations, designs and processes with regards to environmental effects.

The lands have a history of sand and gravel working. The lands have been progressively restored subject to successive WMP's dating back to 2001. The current waste management permit is Waste Permit Reg. No. WMP 30/2001B. As such it was not considered particularly relevant in this case for the applicant to identify and appraise the merits of alternative sites for the proposed material recovery activity. It is the existence of this requirement for reinstatement using inert materials, and the environmental gain derived therefrom, that constitutes the principal qualification of the application site.

The design of the facility is driven by the basic processes of recovery of C&D waste, with the recovery by backfilling of otherwise unusable materials to meet the requirement to reclaim the quarry back to the pre-extraction condition. Because the waste recovery facility will share

much of the infrastructure of the quarry, design alternatives are constrained by the design of the existing facility and the imperative of achieving maximum synergy. The design is driven by the need to maximise operational efficiencies and economic return.

Alternative processes for the recovery of C&D waste other than by simple combinations of mechanical separation, sorting, crushing, and screening are not apparent. Waste recovery lies at the second lowest tier in the European Waste Hierarchy, and as such is the process of last resort prior to disposal. Process alternatives diminish as we descend the tiers of the hierarchy from the pinnacle of prevention to reduction, reuse, recycling, recovery and ultimately to disposal/landfill at the base.

Waste recovery by simple mechanical means of usable product, and backfilling unusable waste, represents the optimum economic utilisation of inert C&D waste. Diverting waste material out of the disposal stream into reuse off-site including secondary aggregates, and the improvement of land as part of the reinstatement of a quarry, with resulting reduction in primary resource utilisation, offer significant environmental gains.

2.2 CHARACTERISTICS OF THE PROJECT

2.2.1 THE EXISTING SITE

The site is located within the Townland of Thornberry, c. 2km southeast of Kill, on the east side of local L2019 road (Refer to Figure A1.0). Access to the site is gained from the local road L2109 adjoining the western site boundary. The site lies c. 2km south of Junction 7 on the N7 dual carriageway (north of Kill), and c. 6km northwest of the N81 (north of Blessington).

The site of the quarry and WRF comprises c. 10ha of a leasehold of 11.4ha, which the applicant, Sand and Gravel Merchants Ltd., lease from Mr. Patrick Cullen, the owner. The workings are effectively screened from views on local road L2019 by intervening mature and often heavily wooded hedgerows, but are open to distant, views from elevated ground to the east.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads or at the end of lanes off the latter (Refer to Figure B 2.2, Rev. A, for locations of residences). Although there are no residences within the leasehold, there is a single farmstead within the landholding (i.e., landowners residence), whilst there are six residences within 500m of the site (i.e., one on the landholding, two adjacent to the site entrance, and three on the L2019 north of the site: Refer to Figures A1.0, B 2.2 for site location details).

Land-use in the area consists of a patchwork of agricultural fields that are classed as pasture and subordinate non-irrigated arable land, reflecting medium-high intensity agricultural. Areas of industrial and commercial use occur at Arthurstown, Thornberry, as well as nearby at Hartwell Lower and Oldmilltown, whilst areas of discontinuous urban fabric occur at Kill and Naas.

2.2.2 THE PROPOSED DEVELOPMENT

Sand and Gravel Merchants Ltd, Upper Punchestown, Rathmore, Naas, County Kildare has applied to the Environmental Protection Agency for a waste licence for the continued operation of its existing waste recovery facility on lands at Thornberry Townland, Kill, Co. Kildare.

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soils, stone, and recovery of inert construction and demolition waste. Up to 70,000 cubic metres per annum is being accepted to the site and circa 25,000 cubic metres is required to complete the restoration of the site. The original void space was estimate to be c. 180,000 cubic metres on submission of the Waste Management Licence application in 2009. It has been calculated that the void space remaining is only c. 25,000 cubic metres based on the original scheme submitted with the Waste Management Application.

It is considered that it will take approximately 4-6 months to complete the backfilling operations. An additional 6 months to a year should be allowed to complete final restoration to agricultural land. The existing site layout is shown by to Figure B.2.1 - Rev A.

The lands are to be restored to agricultural use by importation and recovery of inert materials in accordance with a phased restoration scheme. It is the intention to develop them for agricultural use. A bulldozer is used to appropriately grade and compact the material to the desired profile as shown by the detailed plans and sections (Refer to Figures B.2.4 and B.2.5).

Mitigation measures to alleviate any adverse impacts from the facility on the environment have been incorporated into the design to ensure that the facility can be operated within the accepted standards for this type of development.

2.3 DESCRIPTION OF THE PROPOSED OPERATIONS

Sand & Gravel Merchants Ltd has an established small family run business based in Thornberry, Kill, Co Kildare.

It is proposed that working hours at the application site will be that waste is accepted at the site between the hours of 08:00 hours to 18:00 hours on working days Monday to Friday inclusive and 08:00 hours to 13:00 hours on Saturday. These hours of operation are as stipulated in Waste Management Permit No. 30/2001B. No operations will be carried out on Sundays or public holidays.

The company employs up to 3 people directly on site (currently 2 due to recent economic recession).

The facility's infrastructural requirements includes internal roads and quarry/WRF related plant and machinery. All of these are already in place and represent common infrastructure shared between the quarry and WRF. Provision of hard standing areas, quarantine material and residual waste is an additional requirement of the MRTF, and will be sited to maximise operational efficiencies. The existing quarry plant including mobile crushing and screening plant will be utilised to process C&D waste to produce saleable aggregates. The proposed facility site layout is shown by Figure D.1.1 – Rev A.

Access to the site will be gained through the existing entrance onto the Kilwarden to Punchestown Local L2019 Road. All materials will be transported to and from the application site using heavy goods vehicles (HGV's). The site access road has been provided with an asphalt surface for a distance of c. 150 metres. Imported clean construction and demolition waste (concrete and brick) is used to construct internal haul roads as required on site.

Recovery and re-cycling activities at the application site involves tipping of previously stockpiled 'unprocessed' material into a mobile crushing & processing plant using a front-end loader. Material produced by the plant is then transported by front-end loader to 'processed' stockpiles. Recycled material is used for internal haul roads and/or dispatched offsite.

No sorting of materials other than separation of rebar from concrete will be undertaken on site as all material will be sorted and segregated at source before being brought to the application site. Rebar (reinforced steel) separated from concrete will be stored in the designated quarantine area awaiting removal off-site by a licensed scrap merchant.

The nature of the development is the continued phased restoration of a sand and gravel pit using imported inert soils, stone, and recovery of inert construction and demolition waste. The lands are to be restored to agricultural use by importation and recovery of inert materials in accordance with a phased restoration scheme. It is the intention to develop them for agricultural use.

On completion of each phase of development final restoration including grading, seeding and landscaping will be carried out. The final contours and topography for the site is shown by the Final Landform Plan Figure B.2.4 and Cross Sections B.2.5.

Redundant structures, plant equipment and stockpiles will be removed from site on cessation of activity. Plant and machinery will either be utilised by the operators on other sites, or be sold as working machinery or scrap. Any hard standing areas shall be broken up and the material incorporated into the final restoration scheme and or processed to produce secondary aggregates. The site access will be retained as agricultural access to the restored lands.

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 surface and/or groundwater in the event of a fuel spillage. The proposed development will also be operated within acceptable standards for this type of development.

3 ENVIRONMENTAL CONSIDERATION

3.1 HUMAN BEINGS

The impact on human's beings forms one of the most important aspects to be considered in an EIS. The principal concern in respect to this proposed development is that human beings should experience no significant unacceptable diminution in an aspect, or aspects of 'quality of life' as a consequence of the construction and operation of the proposed development.

The site of Thornberry quarry and WRF is located in a rural area in the townland of Thornberry, c. 2km southeast of Kill. The site is located on lands immediately east of, and with direct access to local road L2019. The site lies c. 2km south of Junction 7 on the N7 dual carriageway (north of Kill), and c. 6km northwest of the N81 (north of Blessington).

The western boundary of the quarry and WRF site terminates adjacent to the L2019 local road, whilst the eastern and northern boundaries abut agricultural land, and the southern boundary abuts the largely restored Arhurstown landfill.

The WRF comprises the entirety of the quarry site of c. 10.4ha, and most of the existing applicants lease holding of c. 11ha, which is shown on Figure B2.2 - Rev A. The eastern section of the quarry site (i.e., Phase 1) site has largely been completed with final grading and capping with topsoil now taking place. The western and central sections, designated as Phase 2, which houses all of the site infrastructure, constitute the current active backfilling operations, and remain in a disturbed and degraded state, typical of active quarry workings. The development will also continue to use the established quarry infrastructure including internal roads, crushing and screening plant and other ancillaries.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads or at the end of lanes off the latter (Refer to Figure B 2.2 – Rev A, for locations of residences). There is a single farmstead within the landholding (i.e., landowners residence), whilst there are six residences within 500m of the site (i.e., one on the landholding, two adjacent to the site entrance, and three on the L2019 north of the site).

Kildare's strategic advantage is its proximity to Dublin and location within the capital city region, which is the most economically dynamic and progressive area of the country. Kildare benefits from this proximity to Ireland's primary economic hub and National Gateway, and the largest market in the State.

During the recession Kildare's unemployment levels rose dramatically from the end of 2007 to 2013, and remained a factor of about 3½ times the pre-recession levels, essentially fluctuating between 17,500 and 20,000 during 2010 and 2013. The dramatic increase in unemployment has been largely associated with the collapse of the construction industry and the associated service industries. The recent improvement in unemployment figures reflects stabilisation in job losses and an improving economic outlook, combined with the historical pressure valve of emigration.

Operations within the quarry site, which includes the WRF, are carried out in accordance with all relevant legislation / regulations and with the best work practices for the industry.

Thornberry WRF

Adequate fencing, signage and other barriers have been erected around the quarry site, which will also correspond to the WRF, for the safety of the general public and to prevent livestock straying into the development. Large lockable gates are in place to guard against unauthorised and unsupervised entry to the site outside of working hours.

The proposed continued operation of the WRF at Thornberry arises from: (1) from the continued demand of human beings to have their buildings, roads and structures, modified and improved, resulting in the generation of large volumes of inert C&D waste, including soil and stone; and (2) the requirement to restore land, previously disturbed and degraded by sand and gravel extraction at the Thornberry quarry, through backfilling with recovered inert soil and stone. The recycling and recovery of C&D waste is essential to reduce resource utilisation and divert reusable inert waste from landfill.

Although Thornberry is a rural location, it is strategically located within a catchment area with numerous large settlements, such as Kill, Naas, Sallins, Blessington, Clane, Kilcullen, Newbridge and the southern sector of the Dublin Metropolitan area, rendering the WRF well positioned to recover large volumes of inert soil and stone. There is also a preference for the deposition of soil and stone to be underpinned by a beneficial use in order to be considered waste recovery. Consequently, co-location of a waste recovery facility at Thornberry quarry has significant positive impacts, and is thus environmentally preferred.

It is expected that the potential negative impacts on human beings and amenity of the area arising from the WRF, above those already arising from the quarry, relate mainly to nuisance from noise, dust and traffic.

The quarry has put in place a number of mitigation measures with respect to environmental management and monitoring to ensure that operations do not result in significant impacts on the surroundings, including the human environment.

The site will be reinstated in accordance with the phased restoration scheme for the quarry, and thus integrated back into the surrounding landscape with the attendant improvement to the visual amenity of the area.

The quarry has contributed indirectly to sustaining and developing the local and regional economy through the supply of building products, and has provided employment for local people, both directly and indirectly.

The proposed continuation of the WRF would provide a valuable and necessary resource to the county and wider region, providing a beneficial use for the recovery of inert soil and stone as an alternative to landfill. The WRF already exists and has an established record of meeting its regulatory obligations and current environmental standards.

Traffic entering and leaving the site will use the existing established quarry site access. The L2019 road servicing the site is generally in good condition, and is considered suitable for the expected volumes of HGV traffic.

Upon decommissioning, the site will be restored in accordance with the approved restoration scheme for the quarry. Therefore in the long term, the site will be assimilated back into the landscape in a planned manner.

Thornberry WRF

There are potential impacts arising from the operational phase of the WRF, and these include dust, noise and traffic. As no additional construction related to the WRF is envisaged, construction will thus have an imperceptible impact on the human environment.

There are no recorded archaeological, architectural or cultural heritage features within the area of land take, but there are 2 structures (i.e., a burial and architectural fragment) in the surrounding environment within c. 500m standoff. Despite the proximity of these protected structures and monuments, the WRF will have imperceptible impacts on recorded archaeological, architectural or cultural heritage features, such that mitigation measures are considered unnecessary.

The impact of inert waste recovery on this site will be considerable in local terms but will not result in any loss of heritage values in the locality.

If the proposed continuation of the WRF did not proceed, the recovery of inert soil and stone at the WRF would not occur, and result in the failure to divert these volumes from disposal in landfill, as required under the Waste Framework Directive 2008. Furthermore, the Thornberry site would be unable to complete the phased restoration of the quarry void and the proper reinstatement of the land.

Sand & Gravel Merchants Ltd. has established an on-going environmental monitoring programme for the Thornberry quarry and WRF site. The programme will allow on-going monitoring of environmental emissions (e.g., noise, dust, water) from the site, thereby assisting in ensuring compliance with any future requirements or regulations. The results of this monitoring will be made available to the EPA and the Local Authority on a regular basis, where members of the public may examine it. The future monitoring programme will be revised accordingly, subject to compliance with any conditions attached to a decision to grant a Waste Management License.

The development can be controlled and regularised in accordance with the scheme as outlined in this document, through continued environmental monitoring and by planning conditions imposed by the relevant regulatory authority. The proposal will have no major and/or long-term effect on the human environment.

Once the proposed continued operation of the WRF is authorised with a Waste Management License, and mitigation measures provided for, there are no significant residual impacts envisaged in terms of community and other socio-economic issues.

3.2 FLORA AND FAUNA

The site is an extensive sand and gravel quarry in glacial material south-east of Kill. It was dug at various times in the past so that there are 'sub-quarries', separate extracted sections accessed off a central roadway. The most recent (or driest) of these create a habitat of exposed sand, gravel or till whereas the areas which are now accepting inert waste are spoil & bare ground. Some little-used land is more vegetated and either recolonising bare ground or dry meadows & grassy verges. This includes a section at the NW end, previously used for the disposal of sediment from washings. A south-facing bank of scrub follows much of the southern boundary and it is crowned by an overgrown hedgerow.

Thornberry WRF

The site holds a large population of rabbits and evidence of their grazing and digging activities is ubiquitous. There were also signs of foxes but none of badgers though these could occasionally visit. Stoats would also be expected. Bats are not likely to occur (except at the western end) as there is so little tree cover.

The birds seen included both open ground species such as meadow pipit, skylark, pied wagtail, sand martin and lapwing and those of treed or bushy surroundings. The latter were woodpigeon, stock dove, magpie, rook, blackbird, song thrush, robin, wren and goldfinch. There was a tiny sand martin colony (3 nests) at the NW end just off-site while a young lapwing was seen on the equivalent area within the site.

The vegetation is diverse enough to support a good range of insects, including solitary bees. The common blue is a likely butterfly as there are records in Nash et al (2012) for adjacent 10km squares. The more frequent species such as small tortoiseshell, small white and meadow brown were seen on site.

The overall site is relatively diverse, having typical habitats of sand quarries including some damp areas. Parts of the site have been disused for many years so are developing scrub and small trees.

There are two Natura 2000 sites located within 15km of the site, Poulaphuca Reservoir SPA (Site Code 004063) and the Red Bog cSAC (Site Code 000397). Both are many metres higher in altitude and there is no pathway by which impacts from Thornberry could be felt by their habitats or species.

In addition there are four downstream sites in Dublin Bay; North Dublin Bay (0206) and South Dublin Bay (0210) are cSAC's while North Bull Island (4006) and South Dublin Bay (4024) are SPA's.

The nearest designated site to the Thornberry WRF is the pNHA (Site Code 001394) at Killeel Wood c. 2km to the east, Other pNHA's within 15km of the site are;

Ballynafagh Bog pNHA (Site Code 000391); Ballynafagh Lake pNHA (Site Code 001387); Grand Canal pNHA (Site Code 002104); Mouds Bog pNHA (Site Code 000395); Liffey Valley Meander Belt pNHA (Site Code 000393); Poulaphuca Reservoir pNHA (Site Code 000731); Red Bog pNHA (Site Code 000397).

The quarry site at Thornberry, which includes the application site, is not included in any area with an ecological designation (NHA, cSAC or SPA).

The site does not have a direct ecological connection with any of the Natura 2000 areas except for the Dublin Bay sites. Since no outflows are expected from the operation of the project and, if this was to occur, the dilution factor in river water and in Dublin Bay is so vast, no impacts on ecology or on Natura 2000 sites can be reasonably expected.

Screening for Appropriate Assessment was carried out with respect to the licence application and a copy of this report was previously submitted to the EPA. The findings of the screening for Appropriate Assessment were 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, or the conservation objectives of the sites. A Stage 2 Appropriate Assessment is therefore not required.

There will no direct or indirect impact on any pNHA as a result of the continued operation of the WRF at Thornberry.

The impact of the continued recovery of inert waste in the quarry and its restoration to farmland is considerable in local terms as it will lead to the disappearance of most of the existing flora and fauna. The plants and animals that require open soils and disturbance to grow will diminish though the lapwing may persist on nearby arable farmland given the right conditions. On the other hand the development of scrub and on the edges of the site will tend to diversify the larger fauna such as birds and mammals unless this becomes dominated by Japanese knotweed. Therefore there will be gains as well as losses.

Action will be taken to control the spread of Japanese knotweed (a statutory invasive alien). Most clumps will be left in situ and covered by fill. When this is reclaimed to grassland any persisting shoots can be mown for several years and killed in this way. More active measures of control will be pursued on marginal ground where shrubs/ trees have been planted or are developing. These will be carried out as early as possible before the clumps attain large size.

The impact of inert waste recovery on this site will be considerable in local terms but will not result in any loss of heritage values in the locality. The changes will be both negative (loss of open habitats) and positive (gain of woody species, control of Japanese knotweed).

3.3 SOIL & GEOLOGY

The Thornberry quarry was developed on a meandering, glacial ridge known as a moraine, in order to extract the constituent sand and gravel.

The quarry resource has been extensively worked and the quarry void is in the process of being backfilled with imported soil and stone, capped with topsoil, as per the phased restoration scheme. Most of the original topsoil has been stockpiled together with imported topsoil for the purpose of restoring previous sections of the site.

The sand and gravel deposit has been largely extracted, leaving a thick sequence of boulder clay up to 15m thick at the base of the quarry pit. Bedrock was not observed during the site visit, because of the complete lack of exposure on site.

The Carrighill Formation underlies the entire application site and consists of greywacke, siltstones and shales. The Carrighill Formation is identified as Poor Bedrock Aquifer (Pu), which is generally unproductive. Because the Carrighill underlies the entire site and is a poor aquifer, the sensitivity of the geological and groundwater interest of the site is determined to be very low.

A search of the GSI Geological Heritage Database indicates that there are no sites of geological heritage within or near the site of the WRF, although six such designated sites occur within c. 15km. The nearest site of geological interest is the Slate Quarries Site (i.e., Site Code KE004) near Blessington, which is c. 4km southeast of the Thornberry site. The next nearest site is the Glen Ding Dry Glacial Channel Site (i.e., Site Code KE006) c. 5.5km southeast of the site. The other four sites are in excess of 9km removed from the site.

The nature of the WRF involves the importation and placement of inert soil and stone as backfill in the quarry void. The application site for the WRF occupies the existing worked-out

quarry area, and as such will have no impact on virgin soils, sands and gravels, which have already been stripped, disturbed or extracted. As a result of backfilling using inert soils and stones, the WRF will continue to progress the reinstatement of the quarry back to land suitable for agriculture, and thus will have a positive impact.

The WRF will have no indirect impact on the local or regional geology, as placement of the inert soil and stone will not release contaminants onto the lands, whilst dust from the WRF will be tightly controlled.

The WRF recovers significant quantities of inert soil and stone through backfilling in the quarry void. Failure to recover soil and stone for the beneficial use of land improvement, specifically reinstatement of a quarry, could result in unnecessary exhaustion of landfill space. Thus, it is considered that the proposed continuation of the WRF will have a positive impact.

The interaction of the quarry and WRF is seen as 'symbiotic' and positive, with no negative cumulative impacts on the geological environment identified.

There is no bedrock exposed within the quarry or the site of the WRF, and as such no impact on bedrock geology as a result of the WRF is expected. The WRF is also not expected to have any significant negative impact on the surficial geology of the site or surrounding area, and thus no mitigation measures are proposed. Ultimately, after final land reclamation of the quarry site, with the land restored to agriculture, there will be no residual impact on the surrounding environment from the WRF.

3.4 WATER

The primary objective of the hydrological and hydrogeological risk assessment is to assess the impact posed to surface water and groundwater in the area by the proposed WRF activities. Where appropriate, mitigation measures are recommended.

The site is primarily used as a WRF for the recovery of inert C&D waste, primarily soil and stone, in the restoration of the quarry void. The land in the southern section of the site is currently being restored to agricultural use, whilst the unrestored quarry area is dominated by bare, exposed ground with hedgerows and fragments of scrub at the edges of the site.

In a regional context, the site is situated in the Kill River Sub Basin, within the catchment of the Liffey River, in the Eastern River Basin District. The Kill River rises in the Uplands east of the site near Kiltel and flows in a west northwesterly direction approximately 500m north of the site.

A surface water stream, which is essentially a wet drainage ditch, skirts around the eastern boundaries of the Arthurstown Landfill site and the application site, before turning to flow in a northwesterly direction north of the site before flowing into the Kill River. The eastern boundary of the application site is set back on the landholding to create a >30m buffer zone from the stream.

The sand and gravel deposit has been largely extracted from within the application area, leaving a thick sequence of boulder clay up to 15m thick at the base of the quarry void. Glacial tills or boulder clays do not contain water and are not productive. Thus, the black boulder clay acts an impermeable layer (i.e., aquaclude) beneath the quarry floor, and effectively isolates

the groundwater in the upper silt, sand and gravels from the groundwater in the bedrock aquifer beneath.

The landowner's property and farm is serviced by a well (PW2) which is included in the groundwater monitoring programme for the adjoining Arthurstown landfill site. There are 22 groundwater monitoring wells at the Arthurstown Landfill site adjoining the Thornberry site, seven of which are routinely sampled for chemical analysis, and therefore are of interest here. Four of the Arthurstown monitoring wells (MW1 to MW4) are actually located within the application site at Thornberry, but only MW2 and MW3 (i.e., GW2 and GW1, respectively) were capable of being monitored in 2008-2009. Furthermore, GW1 is in an area of the site currently being backfilled and restored, and thus has now been decommissioned. Finally, analysis of MW2/GW2 indicates significant contamination, which was attributed to agricultural activity on adjacent lands, and not to the Arthurstown Landfill or Thornberry WRF (South Dublin County Council 2013).

The Carrighill Formation underlying the Thornberry site are classified as a poorly productive bedrock aquifer. The Kilcullen Ground Waterbody (GWB), of which the site at Thornberry forms part, is assessed as having Good groundwater status in terms of Water Framework Directive (WFD) Status 2007-2009, but also as being 'at risk of not achieving good status' in 2015.

The quarry floor is typically maintained at a depth of 1.5 to 2m above the winter water table level, whilst the groundwater quality, as measured at monitoring wells MW2 and MW3, is significantly impacted by agricultural activities. The Thornberry landowners well (PW2) shows evidence of contamination by sewage.

There will be no requirement to discharge water from the site as it is proposed that the quarry and WRF will continue to be worked dry. There are no surface water features on the site, including settlement lagoons or ponds. The majority of surface water run-off on-site will be allowed to percolate to the underlying water table or allowed to discharge to the existing land drainage system.

In order to reduce the impact of the ongoing restoration works on groundwater and surface water receptors, the following are details of remedial measures/procedures to be implemented at the site in order to ensure that the source and/or the pathway is removed. In this way, the potential risk for groundwater/surface water contamination at site is minimised.

The most effective means by which to implement the proposed measures is to condition the mitigation measures as part of a granting of license at the site. In general, the most effective mitigations measures for the site are:

- Adequate containment of site fuels and oils, to prevent any accidental spillages which may migrate to the subsoils and underlying groundwater;
- Dedicated maintenance and refuelling locations;
- Good work practices to provide adequate control measures for accidental spillages;
- Strict control measures to ensure only suitable material is allowed onto the site, i.e. thorough inspection of waste loads entering the site to confirm inert nature prior to deposition on-site;

Thornberry WRF

- Only granular wastes should be deposited into areas immediately above the groundwater table to prevent the influx of suspended solids into groundwater;
- Ensuring that surface run-off is free from contaminating substances and suspended solids;
- Maintain existing buffer zone between restoration areas and surface drainage to east of site;
- The specific mitigation measures could be included in an Environmental Management Plan as part of the conditions for the site waste licence.

Groundwater monitoring on-site is reduced to a single well that is contaminated by nearby agricultural activities. It is proposed that groundwater monitoring be carried out during the operation of the WRF and quarry restoration.

As the Facility Management at Arthurstown are relocating a number of the ground water boreholes, and as results will soon be made available to the EPA as part of the 2014 Annual Environmental Report (AER), it is proposed that an assessment of the results of relevant wells is incorporated with respect to any future monitoring regime for the WRF at Thornberry. This is recommended to ensure that the proposed continuation of the WRF and the restoration of the site is not impacting on the groundwater beneath the site.

The evidence to date indicates that the existing excavation and restoration area has not impacted significantly on surface water quality downstream of the site.

Any potential risks to groundwater and surface water from operating the WRF will be minimised/prevented through the adherence to the proposed mitigation measures.

3.5 CLIMATE

The quarry development, including a co-located WRF handling inert soil and stone, is not of sufficient scale to have any direct or indirect impacts on the regional or local climatic conditions.

If the WRF is not licensed to continue operations, then inert soils and stone waste materials may have to be transported further afield with a consequential impact in terms of increased exhaust emissions for transport of materials to more removed WRF facilities and/or landfill sites. It is considered that the proposed continued operation of the WRF will have a slight to imperceptible positive impact with respect to climate due to restoration to agriculture.

3.6 AIR QUALITY

The principle concern in respect of potential airborne dust emissions from the proposed development is the effect on residential amenity.

The materials to be recovered are principally "soils and stone" and inert construction and demolition waste. Any dust generated by the operation will comprise inert particulate matter.

Experience of reclamation workings indicates that mechanical activity is the most significant factor in material erosion and dust generation. Dust emanates from the placement of

Thornberry WRF

materials, the movement of vehicles on internal roads, loading and processing operations. However the effect of wind is also an important factor in dust generation and problems may arise at reclamation workings when both factors arise simultaneously.

The current air quality in the region is known to be “good” and thus the impact on air quality with respect to the existing quarry/WRF is considered to be negligible.

The quarry at Thornberry lies directly to the north of the Arthurstown Landfill site. The Arthurstown landfill recently ceased operation (August 2014). The dust monitoring results shows that there has been no significant cumulative impact with respect to the operation of both developments. The restoration works using imported “soil and stone” are no different from normal quarry restoration operations. As such there is no cumulative impact with respect to the movement and placement of materials during the progressive restoration of the quarry development.

The proposed development will also be operated within acceptable standards for this type of development.

A number of measures have been adopted to minimise dust emissions to the atmosphere from general site activity, internal haulage, processing and tipping operations as follows:

- During dry weather the haul roads are sprayed with water to dampen any likely dust blows. A water bowser will be available on site as required for this purpose.
- Consideration will be given to location of mobile plant so as to ensure that any principle dust sources cannot adversely affect sensitive off-site locations.
- 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.
- Main site haulage routes within the site shall be maintained with a good temporary surface, as is the case at present.
- All internal roadways will be adequately drained, to prevent ponding.
- Suitable vegetation is to be provided on restored areas at the earliest opportunity.
- Ongoing dust monitoring to ensure threshold limits are not exceeded.

Dust emissions from the facility will be controlled and monitored. Dust emissions and their management will be addressed in the 'Environmental Management System' (EMS) for the Thornberry site.

It is considered given the nature of the activity, control and abatement measures and management of the existing quarry that emissions of pollutants to the atmosphere are not likely to degrade the environment (i.e., be injurious to public health, or have a deleterious effect on flora or fauna or damage property, or impair or interfere with amenities or with the environment).

3.7 NOISE

The principle concern in respect of potential noise emissions from the development is the effect on residential amenity. Noise monitoring to date has shown that site activity at the existing facility are within accepted thresholds for this type of development. Noise monitoring is carried out at nearby residences and site boundaries adjoining same (Refer to Figure F.1.0 – Rev A).

The restoration works using imported “soil and stone” are no different from normal quarry restoration operations. As such there is no cumulative impact with respect to the movement and placement of materials during the progressive restoration of the quarry development.

Noise resulting from the operations can be kept to acceptable levels by the implementation of good design, effective operation and management and by the adoption of ‘best practices’. Reducing noise at source wherever possible is the most effective way of minimising the impact but barriers and screens between noise source and receptor can also be used to very good effect.

The type of mitigation techniques implemented to reduce noise are detailed below:

- The provision of temporary peripheral screen banks to screen site activities from outside views as necessary.
- 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.
- Regular maintenance of all plant and machinery is an integral part of site management and is important in helping to minimise noise impact.
- All plant and equipment will conform to noise emission limits set out in Statutory Instrument No. 320 of 1998 European Communities Construction Plant and Equipment-Permissible Noise Levels (Regulations, 1998) and amendment set out in Statutory Instrument No. 359 of 1996.

The operator has established an environmental monitoring programme to include noise monitoring. It is proposed to continue to carryout noise monitoring at the three locations (N4 to N6) which includes the nearest noise sensitive locations (Refer to Figure F.10 – Rev A). It is proposed to carryout noise monitoring on a bi-annual basis.

The results of monitoring to date shows that the development can comply with the noise level threshold as specified and as a consequence the development will have no significant effects regards noise levels in the area. Noise emissions and their management will be addressed in the 'Environmental Management System' (EMS) for the Thornberry site.

This programme will allow on-going monitoring of noise emissions from the site, thereby assisting in ensuring compliance with any future requirements or regulations.

Through implementation of the proposed mitigation measures it is considered the development will continue to have no significant effects with regard to noise levels on the local residences, their property, livestock and amenity.

3.8 LANDSCAPE

Kildare possesses a diverse range of landscapes, including extensive lowlands in the north and south, uplands at the foothills of the Wicklow Mountains in the east, tracts of boglands in the northwest, the undulating central undulating lands, including the Curragh, and several important waterways, such as the Liffey and Barrow River Corridors and the Royal Canal. These landscapes intrinsically constitute an invaluable element of Kildare's natural resource base.

The Kildare Landscape Character Assessment, which constitutes part of the Kildare County Development Plan (CDP) 2011-2017, identifies and describes the landscape character of the entire county. It also evaluates the capacity of different areas to accept change, without disproportionate effects and proposes a series of policies and recommendations to guide developments in each type of landscape.

The WRF site is co-located within the Thornberry quarry site, and occupies c. 10ha within a leaseholding of c. 11.4ha. The site is situated at approximately 135-150m AOD in an area characterised as rural in nature, but which is peripheral to the urban area of Kill and Naas.

The quarry site boundaries are largely maintained with well-treed, mature hedgerows and stock fencing, and the WRF is well screened from public view along local road L2019. The potential viewshed of the WRF site is restricted to partially open views at the entrance due to existing mature hedgerow on the L2019 roadside, and to distant views from the Kiltel road to the east. The partially open views of the quarry at the site entrance on local road L2019 is largely a passing view.

The area has an established history of sand and gravel working, and these activities have co-existed with other predominantly agricultural land uses in the area, principally medium-high intensity farming. The predominant land use within the WRF site, which is to be co-located within the quarry site, is by definition that of quarrying activities related to the extraction of sand and gravel, and associated operations such as placement of soil and stone in quarry restoration.

The eastern section of the quarry site (i.e., Phase 1) site has largely been completed with final grading and capping with topsoil now taking place. The western and central sections, designated as Phase 2, which houses all of the site infrastructure, constitute the current active backfilling operations and remain in a disturbed and degraded state, typical of active quarry workings.

On completion of site activities, the site of the quarry and WRF will be decommissioned and reinstated in accordance with the approved quarry restoration scheme, and thus integrated back into the surrounding landscape. Thus, the land use will revert to agricultural use, primarily as arable and grassland.

Residential property in the area typically comprises one-off single residences and farmsteads along public roads or at the end of lanes off the latter. There is a single farmstead within the landholding (i.e., landowners residence), whilst there are six residences within 500m of the site (i.e., one on the landholding, two adjacent to the site entrance, and three on the L2019 north of the site). The road network in the area is of a local character, although the roads have surfaces, widths and alignments that are superior to that of a typical rural location.

Thornberry WRF

The site at Thornberry lies within Eastern Transition LCA and is the only Landscape Character Type (LCT) belonging to Transition Lands. The Eastern Transition LCA is located between the uplands and lowlands in the east of the County, and is characterised by undulating topography.

The area from Thornberry/Arthurstown to Hempstown Commons (north of Blessington) to Ballymore Eustace and to Punchestown shows evidence of historical and current sand and gravel extraction. Thus, the site of the quarry and WRF is surrounded by land that is principally occupied by agriculture, but with a significant footprint from mineral extraction sites in the wider area.

As the WRF is co-located within the existing quarry, it is considered that the WRF will not result in any adverse change in land cover, but rather reinstate disturbed and degraded quarry workings to agricultural land.

There are three designated Scenic Routes within the general area (i.e., <5km radius) of the Thornberry site. There are two protected views and prospects within the general area (i.e., <5km radius) of the Thornberry site.

The results of the visual field survey have shown that due to intervening topography, screening, and vegetation, views towards the WRF site are generally very limited views of the entrance from the L2019 road, and distant views from elevated ground to the east.

Although when restored the site will attain a slightly domed topographic profile, existing peripheral screening of intervening banks with tall mature hedgerows is expected to remain effective at screening views along the L2019.

The domed profile of the Arthurstown landfill screens potential views from the west and southwest, and forms a middle distance backdrop or secondary ridgeline to any potential view from the north to northeast including along the L2019.

The distant views from the road running on elevated ground between Killeel to Rathmore show the Arthurstown landfill under final restoration. The WRF facility which is on lower ground is not open to significant views and is partially screened by intervening hedgerows. Phase 1 of the restoration scheme is nearing completion and is to be graded top soiled/seeded during the next available planting season. Phase 2 will not be open to significant views being effectively screened by perimeter between site and the adjoining Arthurstown landfill.

The restoration plan involves the progressive backfilling of the quarry void on a phased basis, with natural inert soil and stone sourced externally and imported, followed by placement of the previously stripped overburden. Topsoil will be seeded and the area returned to useable improved land for agricultural grassland for livestock grazing.

3.9 CULTURAL HERITAGE

There are no Recorded Monuments, Protected Structures, Architectural Conservation Areas, proposed Architectural Conservation Areas, National Inventory of Architectural Heritage (NIAH) structures or NIAH historic gardens or designed landscapes within the proposed development area. As a result there will be no direct or indirect construction impact on the recorded or unrecorded archaeological, architectural or cultural heritage resource.

There will be no construction or operational visual or noise impact on the archaeological, architectural or cultural heritage resource. There will be no residual impacts on the archaeological, architectural or cultural heritage resource. There will be no cumulative impacts on the archaeological, architectural or cultural heritage resource.

There will be no direct or indirect construction impact on the recorded or unrecorded archaeological, architectural or cultural heritage resource. As such, no mitigation measures are required.

There will be no construction or operational visual or noise impact on the archaeological, architectural or cultural heritage resource. As such, no mitigation measures are required.

3.10 MATERIAL ASSETS

Kildare has significant resources in terms of aggregates, a resource that had come under pressure due to increased demand prior to the collapse of the construction industry in 2008. Since aggregates can only be worked where they occur, it is important to identify the location of these resources with a view to safeguarding them, coupled with the protection of amenities, prevention of pollution and the safeguarding of aquifers and ground water.

The area around Thornberry has a history of sand and gravel working, with extraction from the glacial deposits, such as moraines and other glaciofluvial outwash deposits. Furthermore, the adjoining disused sand and gravel quarry at Arthurstown has been developed as a landfill for the deposition of municipal waste. These activities, including the existing quarry have co-existed with other land uses in the area, which are mainly agricultural.

Sand & Gravel Merchants Ltd has an established small family run business based in Thornberry, Kill, Co Kildare. The company employs up to 3 people directly on site (currently 2 due to recent economic recession). The quarry has contributed indirectly to sustaining and developing the local and regional economy through the supply of building products, and has provided employment for local people, both directly and indirectly.

There are few residences in the immediate area, with only 6 within 500m. Residential development predominantly consists of isolated farm dwellings and of owner occupied bungalow/houses along public roads (Refer to Figure B 2.2 – Rev A).

With exception of the M7 and the N81, the roads in the immediate area are of a local character and typical of a rural location. The M7 motorway (at Junction 7) lies c. 2km to the north, whilst the N81 National Secondary Road is c. 6km to the southwest, just north of Blessington. The Dublin-Limerick and Cork mainline railway runs north of Kill, with the nearest station at Naas c. 6.5km to the west.

The predominant land use within the application site, which is co-located within the quarry site, is by definition that of quarrying activities related to the extraction of sand and gravel and associated operations such as placement of soil and stone in quarry restoration. Ultimately, the Thornberry site will be reclaimed in accordance with the approved quarry restoration scheme, and thus undergo a change of land use back to agricultural.

Most site traffic serving the WRF is either off the N7 at Junction 7 near Kill, or off the N81 at Blessington on the R410, or the Rathmore Road north of Blessington.

Thornberry WRF

The traffic impact of the quarry is at present considerably less than it was at full production in the period prior to 2008. During that period the traffic generated by the quarry had no adverse effect on traffic movement on the surrounding road networks. The traffic arising from the proposal to continue operating the WRF and importing soil and stone into the quarry will not increase traffic above the 2008 levels. The traffic impact of the WRF and quarry on the surrounding road network is considered minimal.

The water supply for the quarry and WRF is provided by the existing well on site, although potable water is brought on site. It is proposed that a chemical toilet (portaloo) will also be provided, and a maintenance contract will be entered into with the supplier.

Most residential properties in the area are serviced by a mains supply, which is operated by the local group water scheme. The landowner's property and farm is serviced by a well (PW2) which is included in the groundwater monitoring programme for the adjoining Arthurstown landfill site. The houses in the area are serviced by septic tank systems and proprietary effluent treatment systems.

Power to local residences is provided by overhead lines, which form part of ESB's country-wide, typically low voltage, electricity distribution network.

There are no recorded archaeological, architectural or cultural heritage features within the area of land take, but there are 2 structures (i.e., a burial and architectural fragment) in the surrounding environment within c. 500m standoff. Despite the proximity of these protected structures and monuments, the WRF will have imperceptible impacts on recorded archaeological, architectural or cultural heritage features, such that mitigation measures are considered unnecessary.

The workings are effectively screened from views on local road L2019 by intervening mature and heavily wooded hedgerows, but are open to distant, but significant views from elevated ground to the east. The distant views from the road running on elevated ground between Killeel to Rathmore show the Arthurstown landfill under final restoration. The WRF facility which is on lower ground is not open to significant views and is partially screened by intervening hedgerows. Phase 1 of the restoration scheme is nearing completion and is to be graded top soiled/seeded during the next available planting season. Phase 2 will not be open to significant views being effectively screened by perimeter between site and the adjoining Arthurstown landfill.

The nearest designated site to the Thornberry WRF is the pNHA (Site Code 001394) at Killeel Wood c. 2km to the east. There will no direct or indirect impact on it or any pNHA as a result of the continued operation of the WRF at Thornberry.

The geological feature upon which the quarry was developed, and from which sand and gravel is extracted, is not designated as a County Geological Site nor as a NHA Site.

On completion of waste recovery activities at the WRF, the entire site will be reinstated in accordance with the approved quarry restoration scheme. Therefore in the long term, the site will be assimilated back into the landscape in a planned manner, with the attendant improvement to the visual amenity of the area.

The proposed continued operation of the WRF at Thornberry arises from: (1) from the continued generation of large volumes of inert C&D waste, including soil and stone; and (2)

the requirement to restore land, previously disturbed and degraded by sand and gravel extraction at the Thornberry quarry, through backfilling with recovered inert soil and stone. The recycling and recovery of C&D waste, mainly soil and stone, is essential to reduce resource utilisation and divert reusable inert waste from disposal in landfill, as required under the Waste Framework Directive 2008 (2008/98/EC), and the European Communities (Waste Directive) Regulations, 2011 (S.I. 126 of 2011).

The Thornberry site is located on local road L2019, c. 2.5km southeast of Kill, and c. 6.5km east of Naas. Most site traffic serving the WRF is either off the N7 dual carriageway at Junction 7 (north of Kill) c. 2km north of the site, or off the N81 (north of Blessington) c. 6km southeast of the site. The location thus renders the WRF centrally positioned to deliver recovery of inert soil and stone from a catchment area within the Greater Dublin Area (GDA) with many burgeoning population centres and under strong development pressures.

There is a preference for the deposition of soil and stone to be underpinned by a beneficial use in order to be considered waste recovery. Consequently, co-location of a waste recovery facility at Thornberry quarry, has significant positive impacts, and is thus environmentally preferred.

It is expected that the potential negative impacts on material assets of the area arising from the WRF will relate primarily to nuisance from noise, dust and traffic. Indirect or cumulative impacts associated with other similar developments within the area are dealt with where necessary under the respective topic in the EIS.

Sand & Gravel Merchants Ltd. has established an on-going environmental monitoring programme on site. This programme will allow on-going monitoring of environmental emissions (noise, dust, water) from the site, thereby assisting in ensuring compliance with any future requirements or regulations. The results of this monitoring will be made available to the EPA and the Local Authority on a regular basis, where members of the public may examine it. The monitoring programme will be revised in order to ensure compliance with conditions attached to any decision to grant a Waste Management License.

The development can be controlled and regularised in accordance with the scheme as outlined in this document, through continued environmental monitoring and by planning conditions imposed by the relevant regulatory authority. The development does not have a significant impact on lands, property or amenity within the area and hence there will be no significant effect on material assets.

3.11 TRAFFIC

The access to the facility for all Heavy Goods Vehicles is from the National Primary Route N7 via Junction 6 Kilwarden and thence along the local road L2019 to the facility. The L2019 is high quality local road with a speed limit of 80 km/hr.

The existing traffic volumes on the road network in the vicinity of the facility are lower than the peak flow volumes in 2007/2008.

The volume of peak hour traffic generated by the facility is the determining factor of the impact of the facility. The projected import of recovery material into the facility is estimated to be up

to 70,000 Cubic meters per annum of inert waste. This represents an average weekly import of 1400 Cubic meters, or 2800 tonnes, or 25 inward truck movements per day. It is proposed that 100% of this material will be used as backfill within the facility.

The maximum production period for the facility was in 2007/2008. According to the facility operators the site accepted 40 laden trucks per day.

As construction activity has reduced since 2008 the present traffic generated by the facility is approximately 50% of peak.

The generated volume split of existing facility related traffic at the L2019/Facility junction was estimated as 100% HGV's eastwards to the N7 National Primary for peak facility traffic.

The Facility will not increase the traffic movements in future years on the junction as the Facility will be closed based on available void space and the current rate of filling in the near future. It is to be noted that there will also be a significant reduction of HGV movements on the completion of the Arthurstown Land Fill site.

The Quarry and Waste Recovery Facility will continue to import material for infill until the infill area is exhausted and the lands restored to beneficial after-use. On the basis of the available void space and current rate of backfill the importation of inert materials to this site will cease in the near future and the site shall be restored in accordance with the proposed final restoration scheme.

The site access road has been provided with an asphalt surface for a distance of c. 180 metres. There is ample provision within the pit area to facilitate queuing of traffic. Imported clean construction and demolition waste (concrete and brick) is used to construct internal haul roads as required on site.

In the event of material being spilled on the public road the quarry operator will ensure that spilled material is removed from the road surface in a safe and timely manner, as soon as they notice or are notified that a spillage has arisen. Regular sweeping of the access road and site entrance will also be carried out.

Traffic direction signs, warning signs, speed limit signs are established throughout the site.

It is considered that given the scale of the proposed development and the nature and condition of the road serving the site, and the proposed mitigation measures that the development will not lead to a greater risk to public safety by reason of traffic hazard.

The following are the conclusions of the analysis of the traffic impact of facility:

1. The capacity of the L2019 at the facility site is between 600 and 1035 pcu's/hr.
2. The traffic impact of the facility on the surrounding road network is considered minimal, (on average the projected facility traffic is 8.4% of the total traffic at the peak hour) given the present and medium forecasted level of activity at the facility.
3. The traffic impact of the facility is at present considerably less than it was at full production prior to 2008. During this peak period the traffic generated by facility had no adverse effect on traffic movement on the surrounding road networks.

Thornberry WRF

4. The level of turning movements at the L2019/Facility Access junction are of a low volume within the total capacity of the road network and the proposed facility traffic represents 8.4 % average of these movements.
5. The L2019 is fully realigned as a standard single carriageway road with verges stretching to the west and east of the Facility Access junction.
6. The quality of the L2019 pavement in the vicinity of the facility entrance is at present in good condition.
7. The L2019, N7 and the adjacent receiving network is of a high quality and will be able to cater for the facility generated traffic.

3.12 INTERACTION OF THE FOREGOING

The interactions of the impacts and mitigation measures between one topic and another, where applicable, are discussed under the respective sub-sections within Section 3 of the EIS.

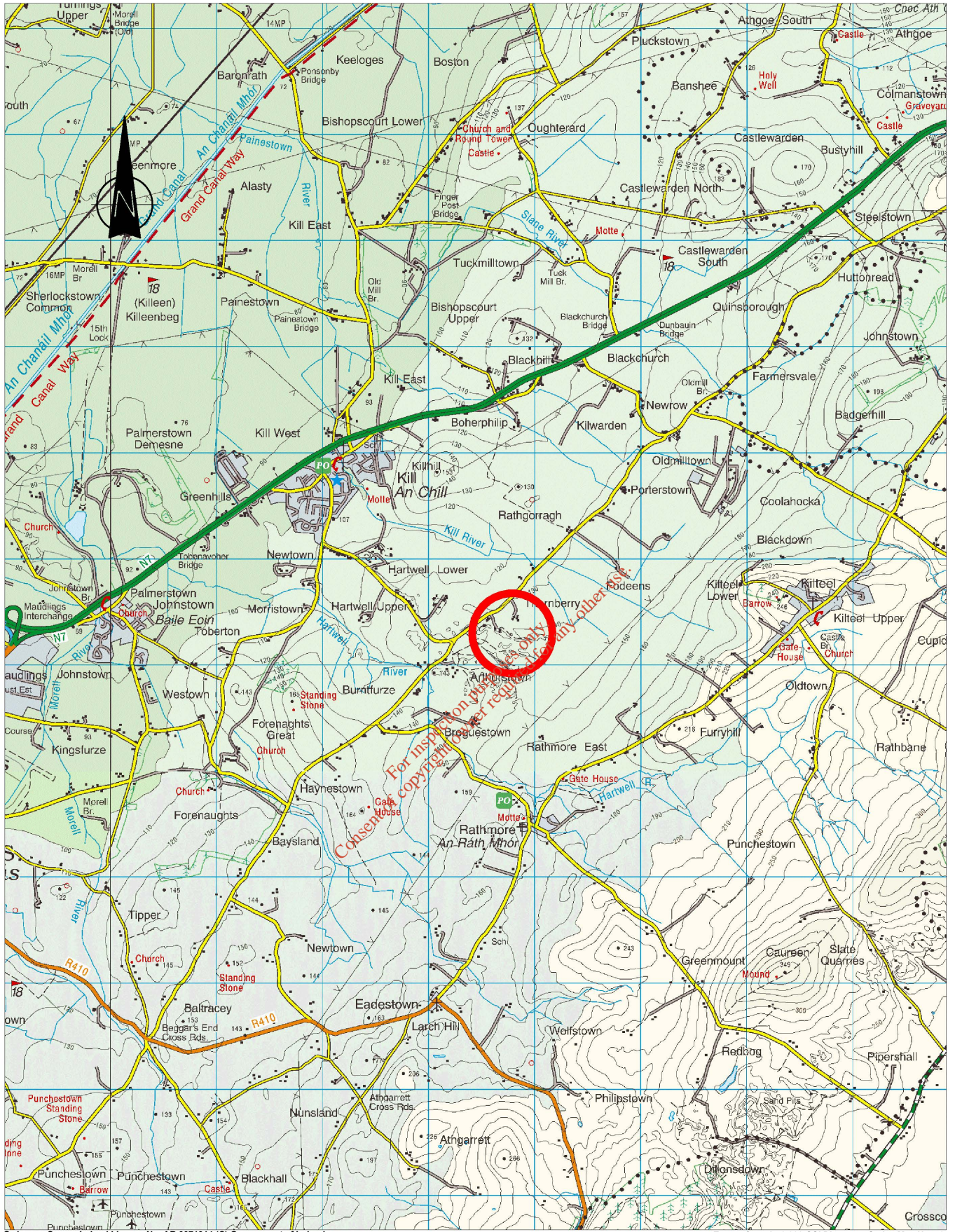
In terms of protecting the environment, the impacts of the proposed development of a Waste Recovery Facility (WRF) at Thornberry have been assessed and where required, appropriate mitigation measures provided to remedy any significant adverse effects on the environment.

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4 FIGURES

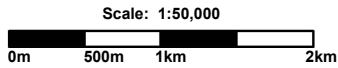
Figure No.	Revision	Title	Scale	Size
A 1.0	-	Site Location Map	50000	A4
B 2.1	A	Site Plan	3000	A3
B 2.2	A	Location Map (500m)	5000	A3
B 2.4	-	Site Restoration Plan	3000	A3
B 2.5	-	Site Cross Sections	2000	A3
D 1.1	A	Site infrastructure	3000	A3
F 1.0	A	Environmental Monitoring Plan	3000	A3

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Extract from 1:50,000 OSI Discovery Series Map No. 56



Legend
Site Location

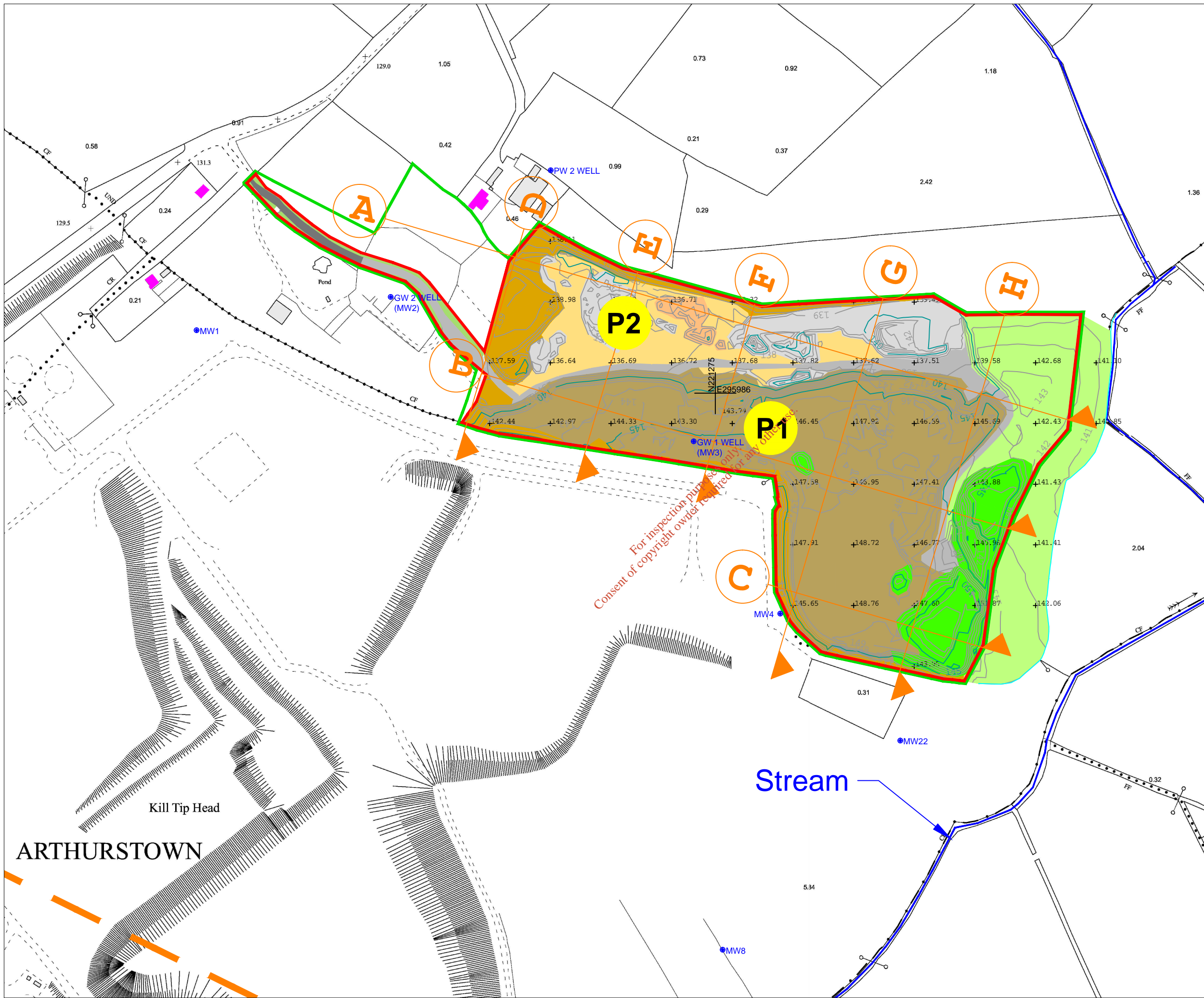


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Site Location Map
Sand & Gravel Merchants Ltd
Thornberry Townland
Kill
Co. Kildare

Author: John Sheils	Job No. JSPE 175
Date: 21/09/14	Ref No. A 1.0



- Application Area (c.10.0ha)
- Applicants Leasehold (c.11.4ha)
- Residences
- 500m from Site Boundary
- C & D Materials
- Active Pit Area
- Backfilling Area
- Restored Area
- Contours
- Spot Levels (mAOD)
- Sections
- P2 Phasing
- Tarmacadam Surface

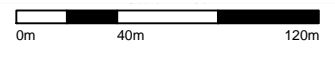
● GW 1 WELL Wells

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Digital Raster Extract Ordnance Survey Data 2500 mapping
OS Sheets 3511 - A B C D 3510 - D

NG Centre Point Coords X, Y = 295986 221275

Scale 1:3000



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J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT
SAND & GRAVEL MERCHANTS LTD

DRAWING
SITE PLAN

LOCATION
**THORNBERRY TOWNLAND
Kill, Co. Kildare.**

Drawn by	John Sheils	Scale	1 / 3000
Checked by	John Sheils	Job No.	JSPE 175
Date	19/09/14	Figure No.	B 2.1
		Rev.	A

ARTHURSTOWN

Stream

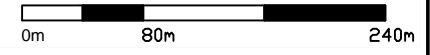
Kill Tip Head



- Application Area (c.10.0ha)
- Leasehold Area (c.11.4ha)
- Residences
- GW 1 WELL Well
- 500m from Site Boundary
- Power Lines
- Surface Water

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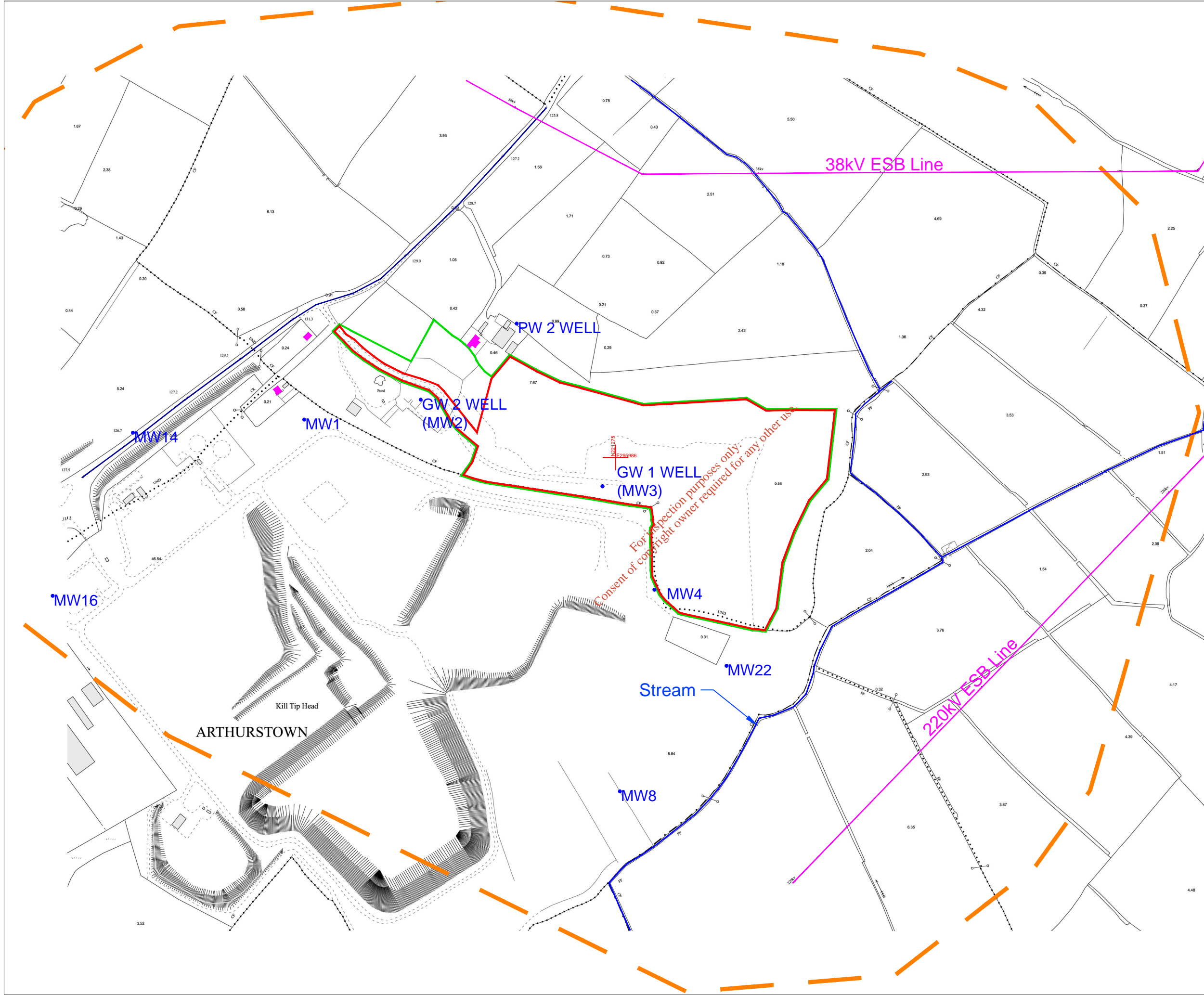


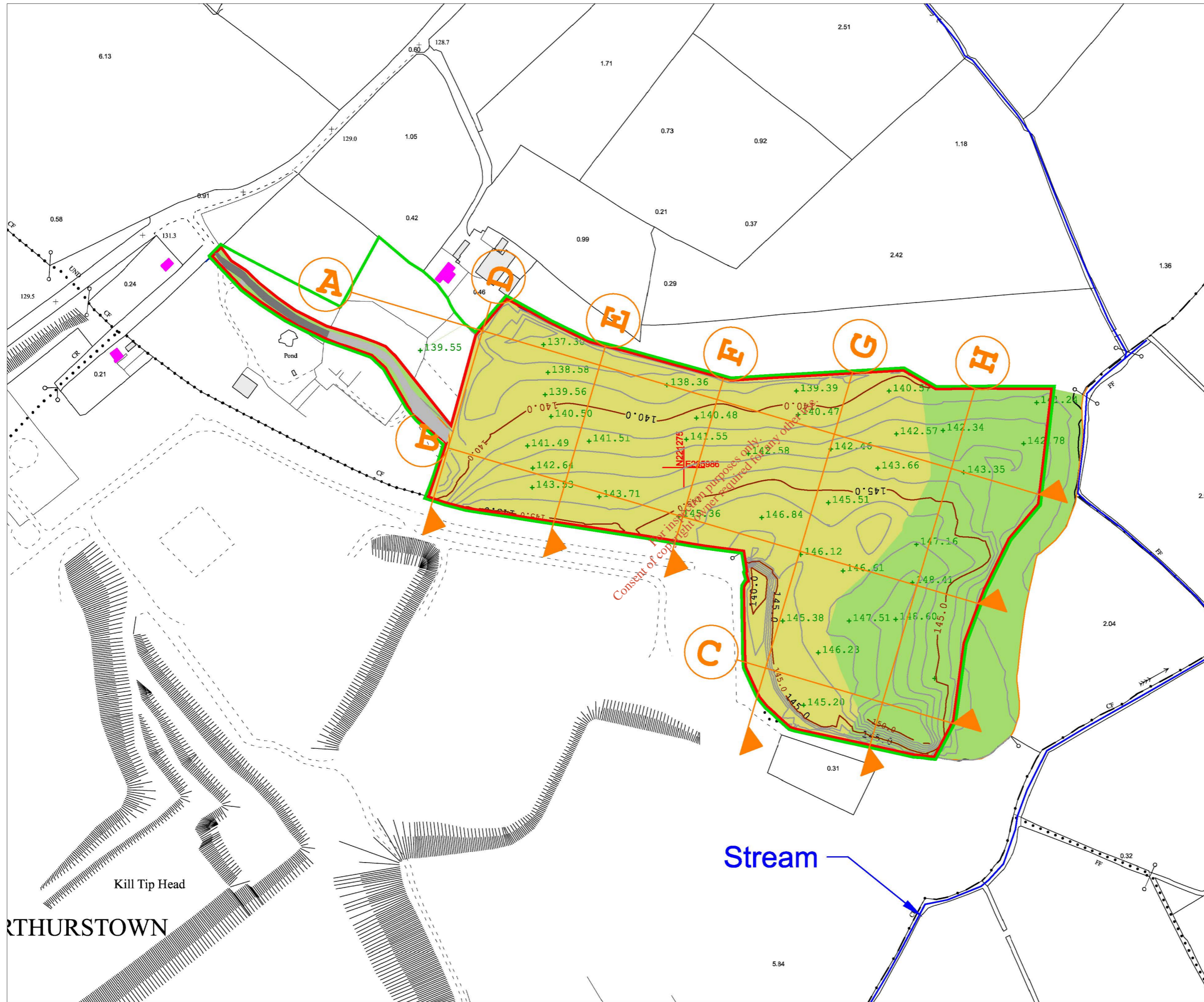
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J SHEILS PLANNING & ENVIRONMENTAL LTD

CLIENT	SAND & GRAVEL MERCHANTS LTD		
DRAWING	LOCATION MAP (500m)		
LOCATION	THORNBERRY TOWNLAND Kill, Co. Kildare.		

Drawn by	John Sheils	Scale	1 /5000
Checked by	John Sheils	Job No.	JSPE 175
Date	21/09/14	Figure No.	B 2.2
		Rev	A

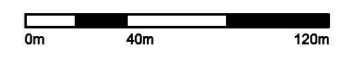




- Application Area (c.10.0ha)
- Leasehold Area (c.11.4ha)
- Residences
- Grassland
- Restored Area
- Contours
- Spot Level (mAOD)
- Sections
- Tarmacadam Surface (Retained for Agriculture Access)

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 OS Sheets 3511 - A B C D 3510 - D
 NG Centre Point Coords X, Y = 295986 221275

Scale 1:3000



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 Email: john.shells@jspe.ie

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DRAWING
RESTORATION PLAN

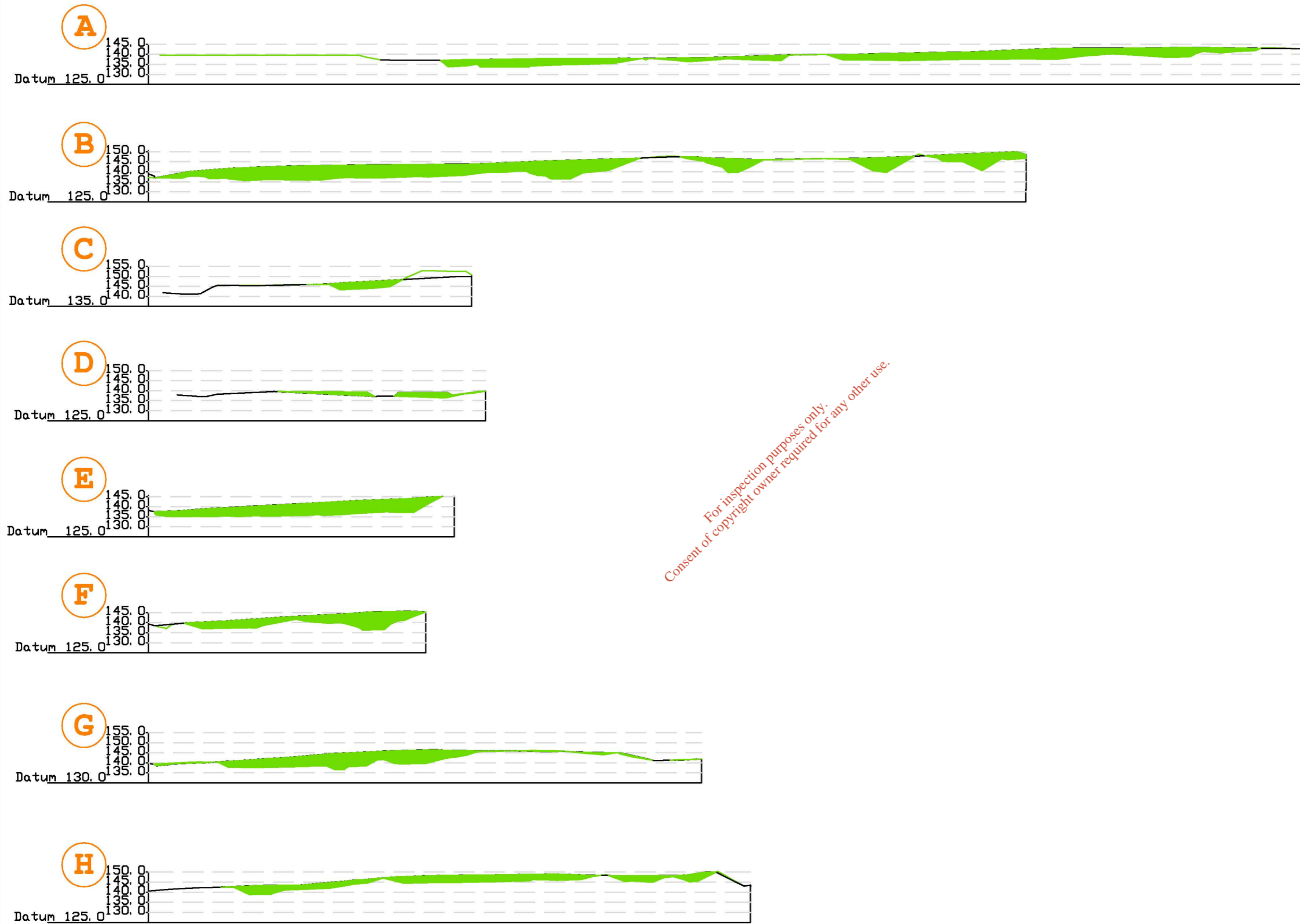
LOCATION
**THORNBERRY TOWNLAND
 Kill, Co. Kildare.**

Drawn by Diarmuid O'Sullivan	Scale 1 / 3000
Checked by John Shells	Job No. JSPE 175
Date 20/01/09	Figure No. B 2.4

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THURSTOWN

Stream



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Legend

-  Final Landform Profile (mAOD)
-  Restoration Profile
-  Existing Ground Profile (mAOD)

Minimum Fill Depth <1m
 Maximum Fill Depth 9m
 Average Fill Depth 4 to 5m

Scale 1:2000



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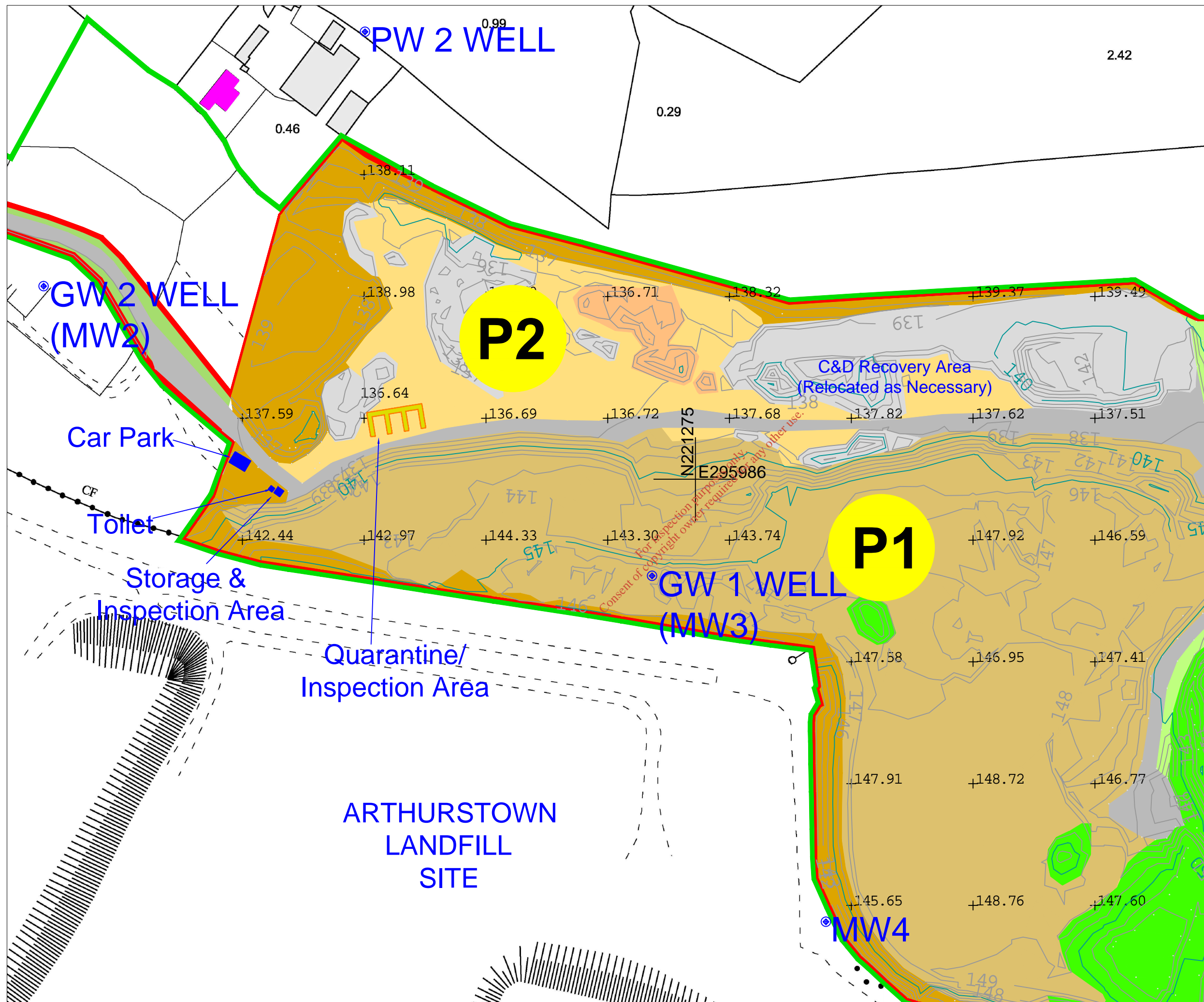
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DRAWING
SITE CROSS SECTIONS

LOCATION
**THORBERRY TOWNLAND
 Kill, Co. Kildare.**

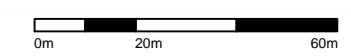
Drawn by Diarmuid O'Sullivan	Scale 1 /2000
Checked by John Shells	Job No. JSPE 170
Date 18/01/09	Figure No. B 2.5



- Application Area (c.10.0ha)
- Leasehold Area (c.11.4ha)
- Residences
- C & D Materials
- Active Pit Area
- Backfilling Area
- Restored Area
- Contours
- Spot Levels (mAOD)
- Phasing
- ↶ Traffic Out
- ↷ Traffic In
- Tarmacadam Surface
- ⊙ Well

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Scale 1:1500

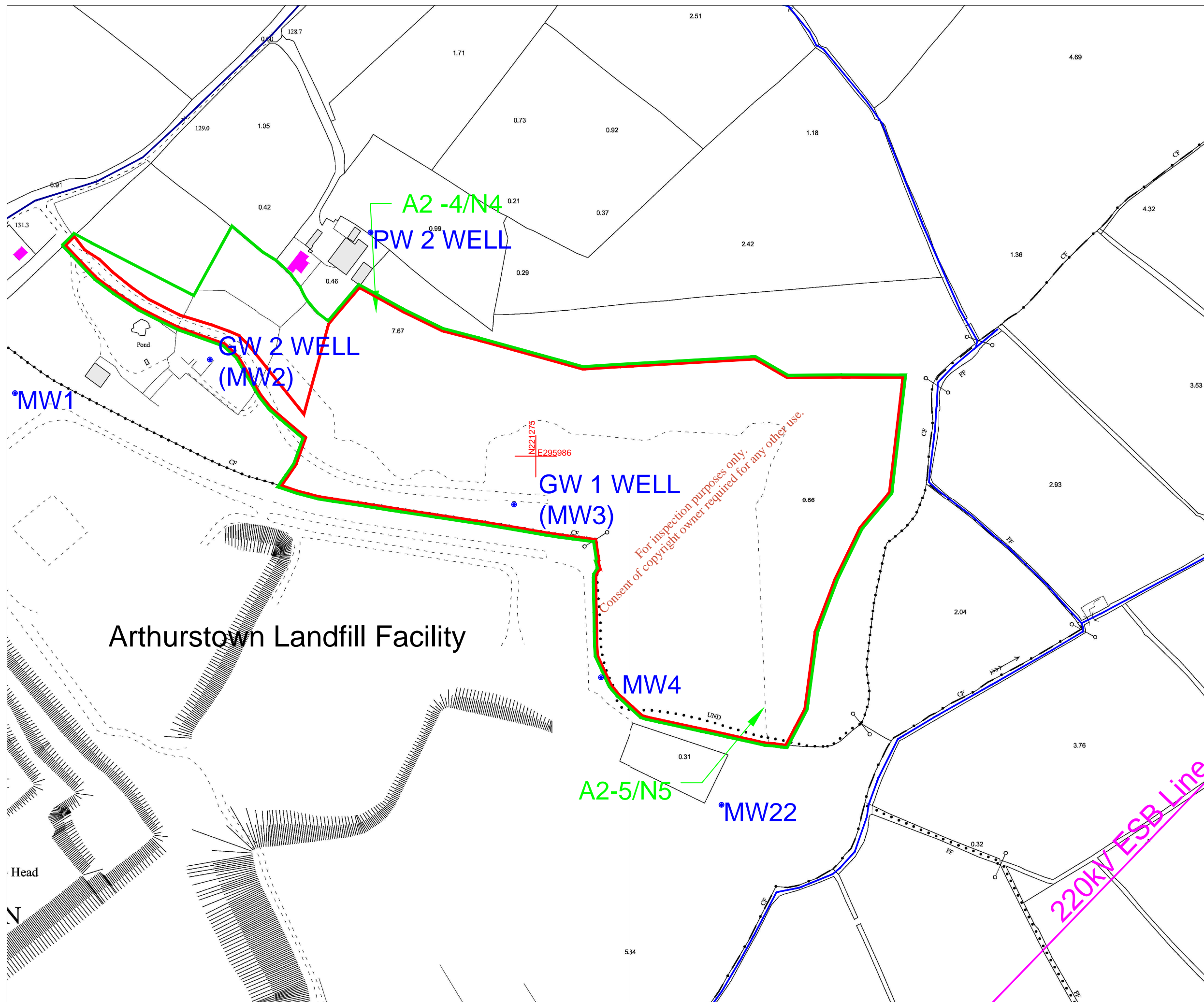


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DRAWING	SITE INFRASTRUCTURE		
LOCATION	THORBERRY TOWNLAND Kill, Co. Kildare.		

Drawn by	John Sheils	Scale	1 / 1500
Checked by	John Sheils	Job No.	JSPE 175
Date	21/09/14	Figure No.	D 1.1
		Rev	A



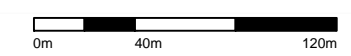
- Application Area (c.10.0ha)
- Leasehold Area (c.11.4ha)
- Residences

- GW1 Ground Water monitoring point
- A2 -4 Dust monitoring point
- N1 Noise monitoring point

Monitoring Points National Grid Coordinates
 A2-4/ N3 = IG Coords E295854, N221394
 A2-5/N4 = IG Coords E296170, N221067
 GW1 = IG Coords E295968, N221235
 GW2 = IG Coords E295718, N221354
 PW2 = IG Coords E295850, N221459
 MW1 = IG Coords E295558, N221327
 MW4 = IG Coords E296040, N221093
 MW22 = IG Coords E296139, N220989

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DRAWING
ENVIRONMENTAL MONITORING PLAN

LOCATION
**THORNBERRY TOWNLAND
 Kill, Co. Kildare.**

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Checked by John Sheils	Job No. JSPE 175	
Date 21/09/14	Figure No. F 1.0	Rev A