



Irish Water

VARTRY WATER SUPPLY PROJECT

**VARTRY WATER TREATMENT PLANT
AND RESERVOIR IMPROVEMENTS
AA SCREENING REPORT**



October 2016



NICHOLAS O'DWYER LTD.**VARTRY WATER SUPPLY PROJECT****VARTRY WATER TREATMENT PLANT AND RESERVOIR
IMPROVEMENTS****AA SCREENING REPORT**

**Nicholas O'Dwyer Ltd
Consulting Engineers
Nutgrove Office Park
Nutgrove Avenue
Dublin 14**

October 2016

PROJECT NO. 20586					
Revision	Reason for Revision	Prepared by	Reviewed by	Approved by	Issue Date
-	First Issue for Internal Review	JW	RC/CAS	JO	01/10/2015
A	Second Issue following Client Review	JW	RC	JO	29/11/2015
B	Third Issue following Updated WAC	JW	RC	JO	19/08/2016
C	Fourth issue following IW Review	JW	RC	JO	20/09/2016
D	Fifth Issue following Revised Proposals	JW/RC	PM	JO	28/10/2016

CONTENTS

1	INTRODUCTION	4
1.1	Background	4
1.2	Legislative Context	4
1.3	The Aim of this Report	5
1.4	Appropriate Assessment Process	6
2	DESCRIPTION OF THE PROPOSED WORKS	8
2.1	Outline	8
2.2	New Water Treatment Plant	8
2.2.1	Treatment Process and Reservoir Abstraction	8
2.2.2	Management of Process Water and Sludge	8
2.2.3	Discharges	9
2.3	Spillway Channel	9
2.4	Draw-off tower and Dam Tunnel	11
2.5	Siphon Pipes	12
2.6	Best Practice Construction and Biosecurity Measures	13
3	DESCRIPTION OF THE RECEIVING ENVIRONMENT	21
3.1	Overview	21
3.2	Existing WTP	21
3.3	Proposed WTP Site	21
3.4	River Vartry	22
4	NATURA 2000 SITES	25
4.1	Identification of Relevant Natura 2000 Sites	25
4.2	Designated Sites of Relevance	29
4.3	Characteristics of the Designated Sites	29
4.3.1	Ecological Network Supporting Natura 2000 Sites	31
4.3.2	Annex II Species	31
5	POTENTIAL IMPACTS OF THE PROPOSED WORKS	32
5.1	Overview	32
5.2	Construction Effects	32
5.2.1	Potential Pollution-Related Adverse Effects	32
5.2.2	Potential Disturbance from Noise and Vibration	33
5.3	Operational Effects	33
5.4	Cumulative and in Combination Impacts	34
5.4.1	Cronroe Abstraction (Annagolan)	34
5.4.2	Other RBMP Pressures/Threats	35

6	SCREENING ASSESSMENT	36
6.1	Impacts on Habitats	36
6.1.1	Atlantic salt meadows <i>Glauco-Puccinellietalia maritima</i>	36
6.1.2	Mediterranean salt meadows <i>Juncetalia maritima</i>	36
6.1.3	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davalliana</i>	37
6.1.4	Alkaline fens	38
6.2	Impacts on Species	39
6.2.1	Otter <i>Lutra lutra</i>	39
7	SCREENING CONCLUSIONS	41
8	REFERENCES	43

TABLES

Table 3-1	Background Water Quality Monitoring Stations and EQS	24
Table 4-1	Natura Sites located within the zone of Impact from the proposed works (*=priority habitat)	27

FIGURES

Figure 2-1	Map Showing Location of Vartry WTP	16
Figure 2-2	Aerial Photograph Showing Location of the Proposed WTP	17
Figure 2-3	Aerial Photograph of the Proposed Reservoir and Spillway Works	17
Figure 2-4	Layout of the Proposed WTP	18
Figure 2-5	Drawing of the Proposed Works to the Spillway	19
Figure 2-6	Drawing of the Proposed Siphon Pipes	20
Figure 4-1	Natura 2000 Sites within 15 km of the Proposed Works	26

APPENDIX 1 - Finding of No Significant Effects Report

1 INTRODUCTION

1.1 Background

The Vartry Water Supply Scheme currently provides treated drinking water to around 220,000 customers in north Wicklow and south Dublin (approximately 15% of average daily demand in the Greater Dublin Water Supply Area). Due to its age, condition and strategic importance, the Vartry Water Supply Scheme is in urgent need of improvement and has been listed on the EPA Drinking Water Remedial Action List.

This project will address the water quality concerns raised by the EPA and provide security of a quality supply for the existing supply area. The programme of works proposed can be summarised as follows:

1. New Water Treatment Plant. This is required to address water quality concerns and reduce output during Algal Blooms (April—May) and comply with EPA drinking water requirements.
2. Improvement works of the Overflow Spillway. This is required to increase the hydraulic capacity of the spillway channel in the vicinity of the existing road bridge to allow for the safe passage of flows during future extreme rainfall events.
3. Improvement works to the existing Draw-off Tower within the reservoir and works to replace or refurbish valves and pipes in poor condition within the existing dam to provide security of supply.

This report provides an Appropriate Assessment Screening (AA) for the above proposals at the existing Vartry Reservoir site in County Wicklow.

This report assesses whether the construction and operation of the works, alone or in combination with other plans and projects, are likely to have significant effects on a Natura 2000 Site(s) in view of best scientific knowledge and the conservation objectives of the site(s). Natura 2000 Sites are those identified as sites of European Community importance designated as Special Areas of Conservation under the Habitats Directive or as Special Protection Areas under the Birds Directive.

1.2 Legislative Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as "*The Habitats Directive*", provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and

Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4), of the Habitats Directive, set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment (AA):

Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, will be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities will agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Article 6(4) states:

If, in spite of a negative assessment of the implications for the [Natura 2000] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States will take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It will inform the Commission of the compensatory measures adopted.

1.3 The Aim of this Report

This screening document provides an assessment of the ecological impacts of the construction and operation of the new Vartry Water Treatment Plant. The report has been prepared in accordance with the following current guidance:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities [DEHLG, 2009, Revised February 2010];
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC [EC, 2007];
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC [EC, 2002]; and
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC [EC, 2000])

A baseline ecological survey was carried out at the site on 7th August 2015 by an experienced ecologist. The ecological survey assessed the habitats present within the site in accordance with the methodology set out in the "A Guide to Habitats in Ireland" (Fossitt, 2000).

By taking the ecological impact assessment in a step by step manner in relation to the habitats and species of the Natura 2000 sites, together with their conservation objectives, this report seeks to inform the screening process required as the first stage of the process pursuant to Article 6.3 of the EU Habitats Directive.

The report is laid out as follows:

Section 1 provides an introduction, Section 2 provides a description of the proposed works and Section 3 provides a description of the receiving environment. Section 4 details the Natura 2000 sites of relevance, their ecological characteristics and Conservation Objectives, Section 5 details potential impacts and Section 6 provides the Screening Assessment followed by the Screening Conclusion in Section 7.

1.4 Appropriate Assessment Process

Stage 1: Screening / Test of Significance

This process identifies whether the proposed works are directly connected to or necessary for the management of a Natura 2000 Site(s); and identifies whether the proposed works are likely to have significant impacts upon a Natura 2000 Site(s) either alone or in combination with other projects or plans.

The output from this stage is a determination for each Natura 2000 Site(s) of not significant, significant, potentially significant, or uncertain effects. The latter three determinations will cause that site to be brought forward to Stage 2.

Stage 2: Appropriate Assessment

This stage considers the impact of the proposed works on the integrity of a Natura 2000 Site(s), either alone or in combination with other projects or plans, with respect to (1) the site's conservation objectives; and (2) the site's structure and function and its overall integrity. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts is required.

The output from this stage is a Natura Impact Statement (NIS). This document must include sufficient information for the Competent Authority to carry out the appropriate assessment. If the assessment is negative, *i.e.* adverse effects on the integrity of a site cannot be excluded, then the process must consider alternatives (Stage 3) or proceed to Stage 4.

Stage 3: Assessment of Alternatives

This process examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 Site. This assessment may be carried out concurrently with Stage 2 in order to find the most appropriate solution. If no alternatives exist or all alternatives would result in negative impacts to the integrity of the Natura 2000 Sites then the process either moves to Stage 4 or the project is abandoned.

Stage 4: Assessment Where Adverse Impacts Remain

This process is an assessment of compensatory measures where, in the light of an assessment of Imperative Reasons of Overriding Public Interest (IROPI), it is deemed that the project or plan should proceed.

2 DESCRIPTION OF THE PROPOSED WORKS

2.1 Outline

As part of the Vartry Water Supply Scheme, a new water treatment plant (WTP) and other necessary reservoir improvements are to be constructed at the existing Vartry WTP site in the townland of Roundwood, c. 2.8km south-west of Roundwood village (see Figure 2.1 for the site location, Figure 2.2 for an aerial photograph and Figure 2.3 for the proposed plant layout). The proposed site for the new WTP covers an area of c. 1.4ha within the Vartry WTP site boundary which covers c. 22ha.

The existing dam, spillway and WTP at Vartry was constructed in the 1860's and a number of extensions and upgrading projects have been undertaken in the interim. It utilises a Slow Sand Filtration Process subsequent to which lime, chlorine and fluorine are added to the filtered water prior to flowing into a Covered Reservoir. The Vartry Water Supply Scheme is included in the current EPA's Remedial Action List (RAL) under the heading "*EPA Audit Observation – Treatment and Management Issues*".

2.2 New Water Treatment Plant

The new Vartry WTP will replace the existing Slow Sand Filtration WTP and provide full water treatment facilities including processes that provide an effective barrier to diatomic algae that has caused seasonal reductions in production capacity in recent years. It will also address drinking water quality regulations limits for trihalomethane and microbiological concentrations (notably cryptosporidium oocysts).

2.2.1 Treatment Process and Reservoir Abstraction

The treatment process will provide a Coagulation, Flocculation, Clarification and Rapid Gravity Filtration (FCF + RGF) with enhanced individual filtration control and monitoring. The treatment plant will be capable of reliably producing 80 MI/day of treated drinking water, in compliance with the Drinking Water Regulations. The proposed Vartry WTP will be served by the existing Vartry Reservoir raw water source. There is no proposed change to the existing abstraction regime.

2.2.2 Management of Process Water and Sludge

It is proposed that all process water generated by the new water treatment plant will be treated and pumped back to the WTP and blended with the inflow water. This will result in no discharge of treated process water from the new water treatment plant to the environment.

During the treatment process some residual water and sludge is generated. Any sludge generated will be thickened, dewatered and removed off-site for disposal to a licenced facility.

Scouring or dewatering of any pipes, tanks or other plant within the site that contains chlorinated water, such as drinking water in pipes or storage will be fully dechlorinated in accordance with the Irish Water Standard Operating Procedure prior to discharge to surface waters.

2.2.3 Discharges

The existing plant discharges water from the slow sand filters to the downstream river. There is also a periodic discharge of washings from the existing slow sand filters to a local tributary that flows into the River Vartry. The established practice, prior to 2008, was to discharge on average 4.6MI/d to the river from the Water Treatment Plant except in extreme drought conditions when the discharge was pumped back to the existing filters. Since 2008, and due to the ongoing deterioration of the existing asset, the average discharge has increased to 10.5MI/d. The existing discharge from the settled filter sand washings averages 0.1MI/d and once the new works are complete this discharge will no longer be required. The current practice for the water treatment plant is to back-pump discharges from the filter beds to the head of the works during low flow periods. This has resulted in extended periods of zero discharge from the works and low flow in the River Vartry. Once the new works are complete it is proposed to discharge a minimum of 5,000 m³ per day of reservoir (natural) water downstream of the plant and to cease the practice of back pumping. This approximates the established practice at the site with the exception of:

1. No more back pumping during drought conditions; and
2. No more discharge of settled sand wash water.

A management regime of freshet releases and increased discharges when possible is also proposed.

2.3 Spillway Channel

The spillway channel runs from the dam weir at the south-eastern end of the Lower Vartry Reservoir at National Grid Reference (NRG) 321621E 201807N. The regrading works are proposed immediately south of the R764 road bridge at NGR 321635E 201789N to the area where there is a change in slope of the channel, a distance of about 170m, at NGR 321629E 201615N as shown in **Figures 2.2 and 2.3**. The channel slope will be 1 in 55 which maintains supercritical flow in the channel. It is estimated that works to the spillway would take 3 months to complete.

The base width of the channel will be maintained but not widened, however, some excavation of the sides of the channel will be needed for access and vegetation clearance. It is proposed that an access path be maintained on the west bank of the

spillway to allow for visual inspection. Slope trimming, where required, is likely to be preferred on the east bank.

The works will consist of tree felling, ground clearance and rock excavation to achieve the new spillway profile. The spillway will have a minimum discharge capacity of 160 m³/s.

It is proposed that the Contractor's compound be located in the field to the east of the spillway, downstream of the road, with access established through where the existing toilet block is located which is to be demolished. A ramp will be constructed down the spillway east bank to facilitate plant access to the spillway channel. This will be retained for future maintenance access.

Preliminary works will be required to clear trees and ground vegetation on access routes and along the spillway channel. This will be carried out outside of the bird nesting season.

A number of measures will be used to ensure that the working excavation zone is dry and that no sediment laden run-off enters the River Vartry. These are that:

- The reservoir water level will be controlled at a level below top water level during the spillway works. This will typically be set at least 0.5m drawdown. This will prevent waves overtopping the weir and minimise leakage through the weir.
- A bund will be formed upstream of the working area in order to maintain a dry working area. Any water draining to this bund will be pumped through a settlement tank to discharge back into the reservoir.
- Site clearance on the spillway channel banks will not to be undertaken during wet conditions, i.e. when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours.
- No works on the riverbank will be carried out when rainfall of more than 3 mm/hour is forecast within the next five days in the River Vartry catchment.
- Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment.

Fuelling and lubrication of equipment will only be carried out in designated areas which will not to be close to any watercourse. Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of by a licenced waste contractor. Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling.

Felled trees and excavated rock will be stockpiled outside of the channel and high risk flood zones. Plant will not be stored within the spillway outside of working hours.

The spillway banks are to be reinstated in a manner so as to minimise the potential for erosion, and to return the bank to as close to its original condition as possible.

To avoid the introduction of invasive non-native species and fish pathogens, all plant and machinery utilised on site will be thoroughly cleaned and washed using high pressured steam cleaning before delivery to the site. A visual inspection for evidence of attached plant or animal material, or adherent mud or debris will be completed on all equipment that has come into contact with the water before leaving the site.

To avoid impacts on suitable salmonid spawning areas downstream of the works, excavation will take place outside the period October to May, inclusive. Agreement with IFI and NPWS must be obtained as to the dates when the work can be allowed.

2.4 Draw-off tower and Dam Tunnel

The draw off tower and dam tunnel connecting to the water treatment plant is located at the south-eastern end of the Lower Vartry Reservoir at NGR 321421E 201708N as shown in **Figure 2.2**. It is estimated that the intake upgrade will take 9 months to complete.

The methodology for valves and fittings replacement will be similar to Dublin City Council's "*Outline Scope of Works - Proposed Methodology & Sequencing. Revision E – Updated 04.02.2005*" and will include the following:

- Isolate pipeline in draw-off tower. (Provide double isolation).
- Completely drain 33" & 48" pipes.
- Remove valve house main window and provide temporary support.
- Remove floor in valve chamber and supporting wall. Install supporting framework to replace horizontal support provided by ground floor arch.
- Remove valves and fittings and install temporary blank flanges on downstream end of 24", 33" & 48" pipes.
- Install temporary support structure and flooring.
- Construct gantry.
- Excavate down to crown of pipe 48" pipe and remove side fill material.
- Drill hole in spring line if required to enable attachment for pulling pipes apart. Remove pipe. Assuming existing CI pipes are spigot and socket, it may be

possible to pull the pipes apart. The method will form part of the contractor's detailed method statement.

- Undertake metallurgical examination of pipe (specialist).
- Excavate down to crown of 33" pipe and remove side fill material.
- Drill hole in spring line to enable attachment for pulling pipes apart. Remove pipe.
- Excavate down to bedrock and remove all existing pipe supports *etc.*
- Carefully excavate around 33" and 48" pipe immediately downstream of stop wall. If spigot end exposed measure distance from spigot to stop wall.
- Measure pipes outside and inside diameters at a number of points to confirm out of roundness, pipes circumference and thickness.
- Cut pipes. (300mm to 400mm from face of stop wall will be required for connecting coupling).
- Geotechnical and structural assessment of wall, tunnel and bedrock.
- Install and grout anchors into central stop-wall and bedrock for new flange plate
- Install thrust flange plate, guard valves *etc.*
- Construct new invert to tunnel (TBC), construct pipe support plinths for 800mm dia and 1200mm dia pipes.
- Install 800mm dia and 1200mm dia pipes.
- Install high level walkway above 800mm dia pipe.
- Remove temporary flooring and supports in valve chamber.
- Install pipework, valves, flow meters, and telemetry lines to/from existing chemical/office building.
- Commission valves in valve chamber.
- Reinstate flooring and supports in valve chamber.

2.5 Siphon Pipes

The current proposal is to install siphon pipes (see Figure 2.4) to meet the following requirements:

- Maintain supplies to the water treatment works in the event of sudden failure of existing pipes and fittings;
- Maintain supplies whilst the existing intake pipes to be taken out of service for the upgrading works;

- Control the reservoir water level at a maximum nominal specified level below top water level whilst the spillway works are being carried out.

The minimum capacity of the siphon system will be 90 MI over 20 hours. (1.25 m³/s).

The siphon pipe installation would consist of:

- Three HDPE siphon pipes buried in the downstream face of the dam.
- Priming valves to be located at the highest point (in chamber within the crest road).

It is estimated that the siphon pipes would take 6 weeks to install.

2.6 Best Practice Construction and Biosecurity Measures

Throughout the Design – Build works, the Contractor will take account of relevant legislation, Inland Fisheries Ireland Guidelines for work near rivers and best practice UK CIRIA guidance including but not limited to the following:

- C532 Control of water pollution from construction sites: guidance for consultants and contractors;
- C648 Control of water pollution from linear construction projects;
- SP156 Control of water pollution from construction sites – guide to good practice.

During construction of the new WTP best practice environmental control measures will form part of the construction methodology for the site. These will be included in a Construction Management Plan (CEMP) for the site which will be agreed in advance with the statutory authorities. It will be a contractual obligation that the Contractor implements Best Practice Construction and Biosecurity Methods when undertaking works on behalf of Irish Water.

In addition to the general best-practice measures detailed below, the contractor will be required to incorporate any additional/specific measures and consider seasonal constraints detailed in environmental reports pertaining to the project, if any (e.g. appropriate assessment reports, ecological reports or invasive species management plans). These reports may also detail requirements for pre-construction surveys (e.g. badger, bats), treatment of invasive species, or ecological monitoring, which also need to be undertaken.

General Pollution Control:

- The works area, will be kept to the minimum area required to carry out the proposed works and will be clearly marked out in advance of the proposed works. Vegetation will be retained where possible. In particular, a buffer strip of natural

vegetation of at least 10m will be retained adjacent to waterbodies, or otherwise as agreed with IFI.

- No in-stream works will be carried out without prior approval from Inland Fisheries Ireland (IFI). IFI guidelines for the protection of watercourses (IFI, 2016^a) will be adhered to in full. Any specific recommendations provided by IFI will be fully implemented.
- No machinery will enter or cross the sites drainage channels, and any temporary crossings will be approved by IFI prior to use.
- Any waste arising from construction works will be disposed of to a licensed waste facility by a licensed waste handler.

Control of Sediments:

- In order to avoid indirect sedimentation impacts on nearby surface waters, run-off from construction areas (either surface water or ground water generated during dewatering of excavations) will be intercepted and managed through a series of treatment stages that will include suitably designed settlement pond/filter channels along with other pollution control measures such as silt fences and silt mats. Pumping and transport of water off-site in tankers will be required if volumes prevent effective control by other means. The contractor will be obliged to maintain any water management system in satisfactory working order throughout the period of construction activities. This will ensure that there will be no direct or indirect discharge of surface or ground water generated during construction activities to any surface water feature (drain, stream, river).
- Stockpiles will be sited over 50m from any surface water feature or drainage channel. Stockpiles or areas of bare soil will be covered (or seeded if not required in the short-term).
- Groundworks adjacent to waterbodies will not take place during periods of heavy precipitation.

Control of other pollutants:

- Wet concrete is corrosive and can cause serious pollution to watercourses. A number of measures are proposed below to ensure concrete does not enter a watercourse:
 - Concrete pours will be closely managed by a dedicated team and directed by a site foreman.
 - Where shuttering is used, measures will be put in place to prevent against shutter failure and control storage, handling and disposal of shutter oils.

^a IFI (2016) Guidelines for the Protection of Fisheries During Construction Works in and Adjacent to Waters. <http://www.fisheriesireland.ie>

- Wash water from cleaning ready mix concrete wagons and mixers may be contaminated. Concrete wagons and mixers will be washed off site.
- Activities which result in the creation of cement dust will be controlled by dampening down areas.
- Raw or uncured waste concrete will be removed from the site by a licenced waste contractor and disposed of at a facility licenced to accept the material.
- All fuels, lubricants and hydraulic fluids will be kept in secure bunded areas remote from the watercourse. The bunded area will accommodate 110% of the total capacity of the containers within it. Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place with all staff properly briefed. Any waste oils or hydraulic fluids will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner.
- Storage areas, machinery depots and site offices will be located remotely from the watercourse.
- All refuelling and lubrication of equipment will take place on sealed and bunded surfaces in order to avoid the potential for accidental spillage of hydrocarbons.
- All plant and machinery will be regularly maintained and serviced to minimise release of hydrocarbons.
- Spill kits will be present in all plant machinery.
- Oil booms and oil soakage pads will be kept on site to deal with any accidental spillage.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.

Ecological measures:

- Any clearance of trees or vegetation required will be undertaken outside of the period March 1st to August 31st in order to avoid impacts to breeding birds.
- Felled trees will be left in-situ for at least 24hrs to allow bats, if present, to escape prior to sawing/mulching.
- An invasive species survey of the site has been completed and Invasive Species were not identified. During the proposed works the Contractor will be required to adhere to the following in order to avoid the spread and introduction of non-native invasive species and noxious weeds:
 1. Providers of any soil, gravel or stone brought on to the site will be required to ensure that it is free of any non-native invasive species.
 2. Tyres and tracks of plant machinery and construction related vehicles will be power washed and checked for the presence of plant material e.g. leaves, roots

and rhizomes from non-native invasive species prior to arrival on-site, and after works are completed.

3. If future site surveys reveal the presence of non-native invasive species, an Invasive Species Management Plan will be prepared in accordance with the Irish Water Invasive Species Management protocol and implemented. This will be overseen by an ecologist trained in Invasive Species Management.

 - Day to day monitoring of water quality, effectiveness of silt and pollution control measures and general compliance with prescribed best practice control measures will be carried out by the Resident Engineer. An Ecological Clerk of Works (ECow) will be appointed to oversee monitoring on a weekly basis and during critical periods of construction to ensure control measures are effective in protecting the surrounding environment.



Figure 2-1 Map Showing Location of Vartry WTP



Figure 2-2 Aerial Photograph Showing Location of the Proposed WTP

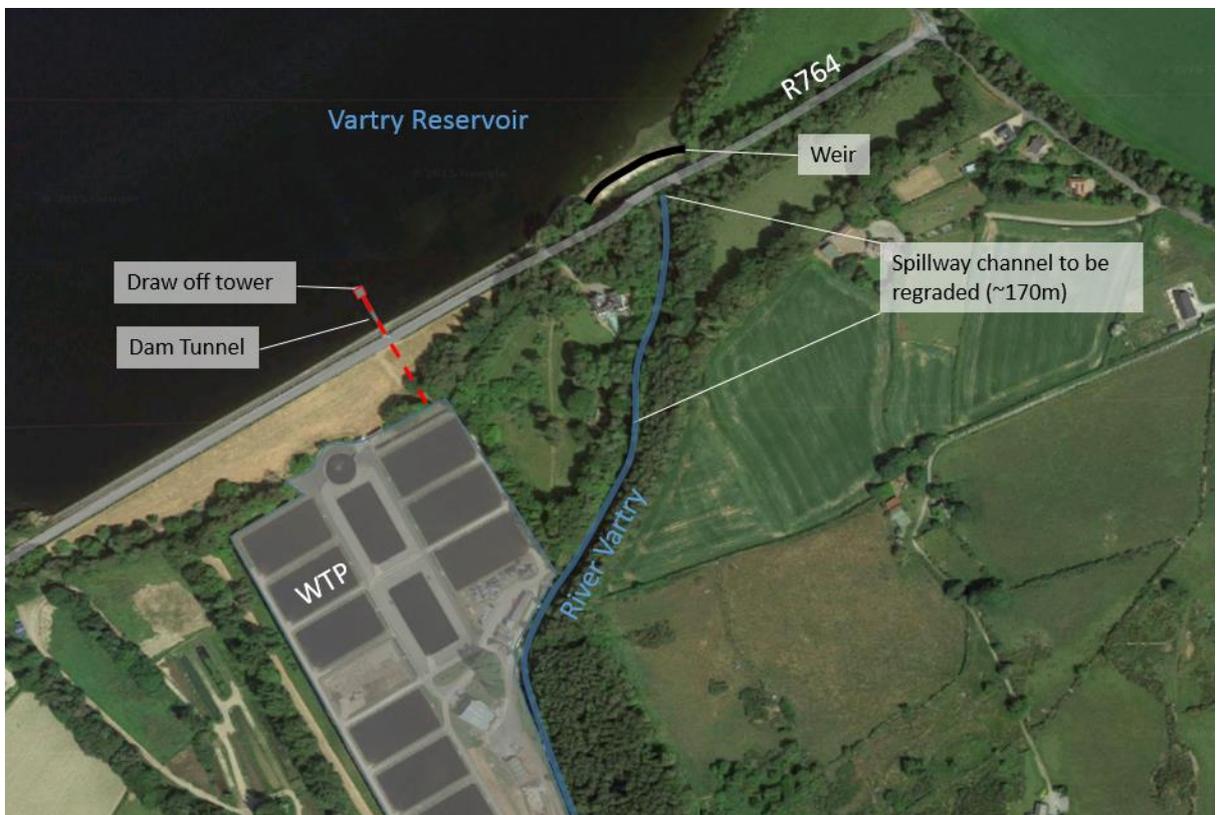


Figure 2-3 Aerial Photograph of the Proposed Reservoir and Spillway Works

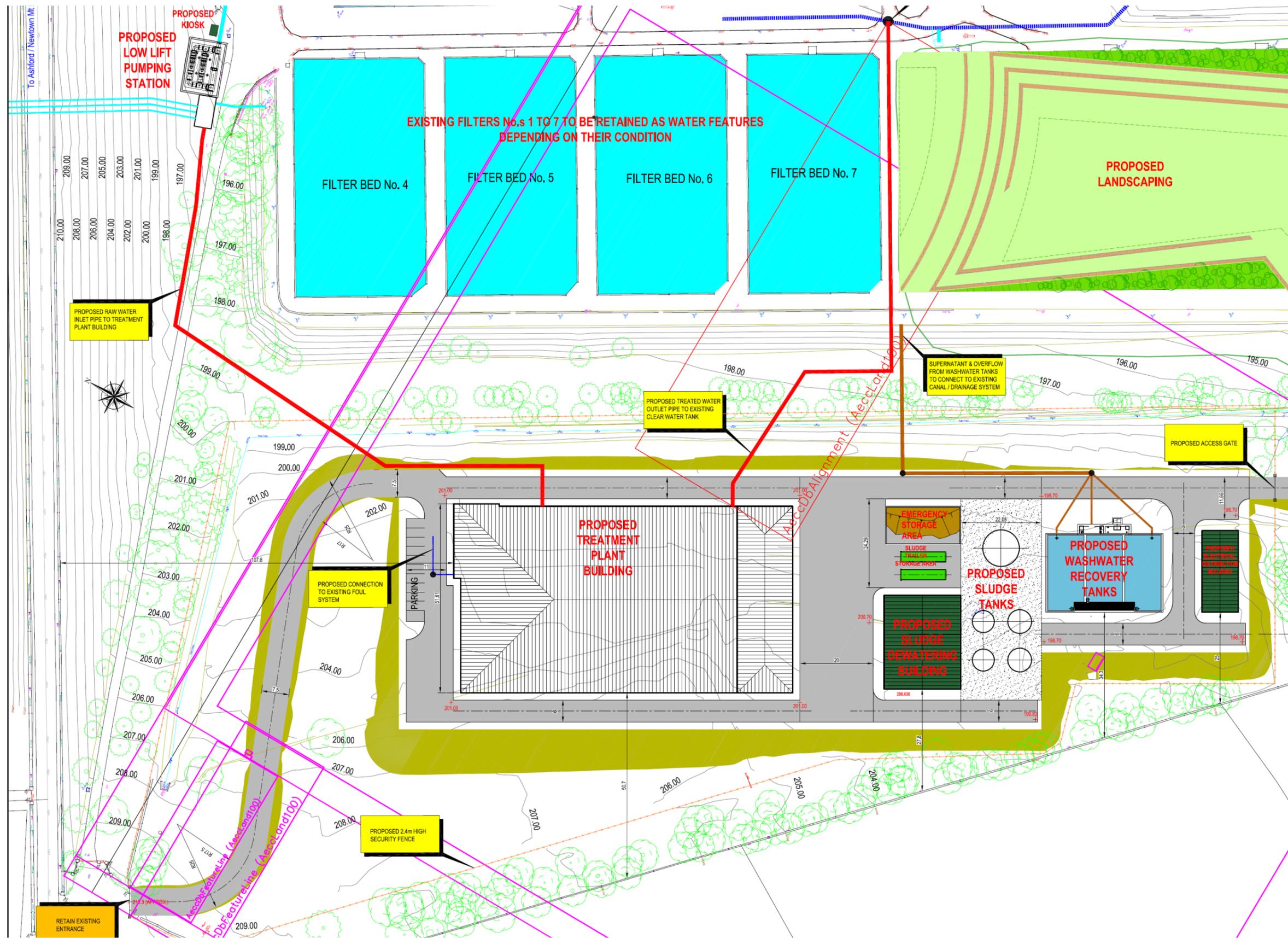


Figure 2-4 Layout of the Proposed WTP

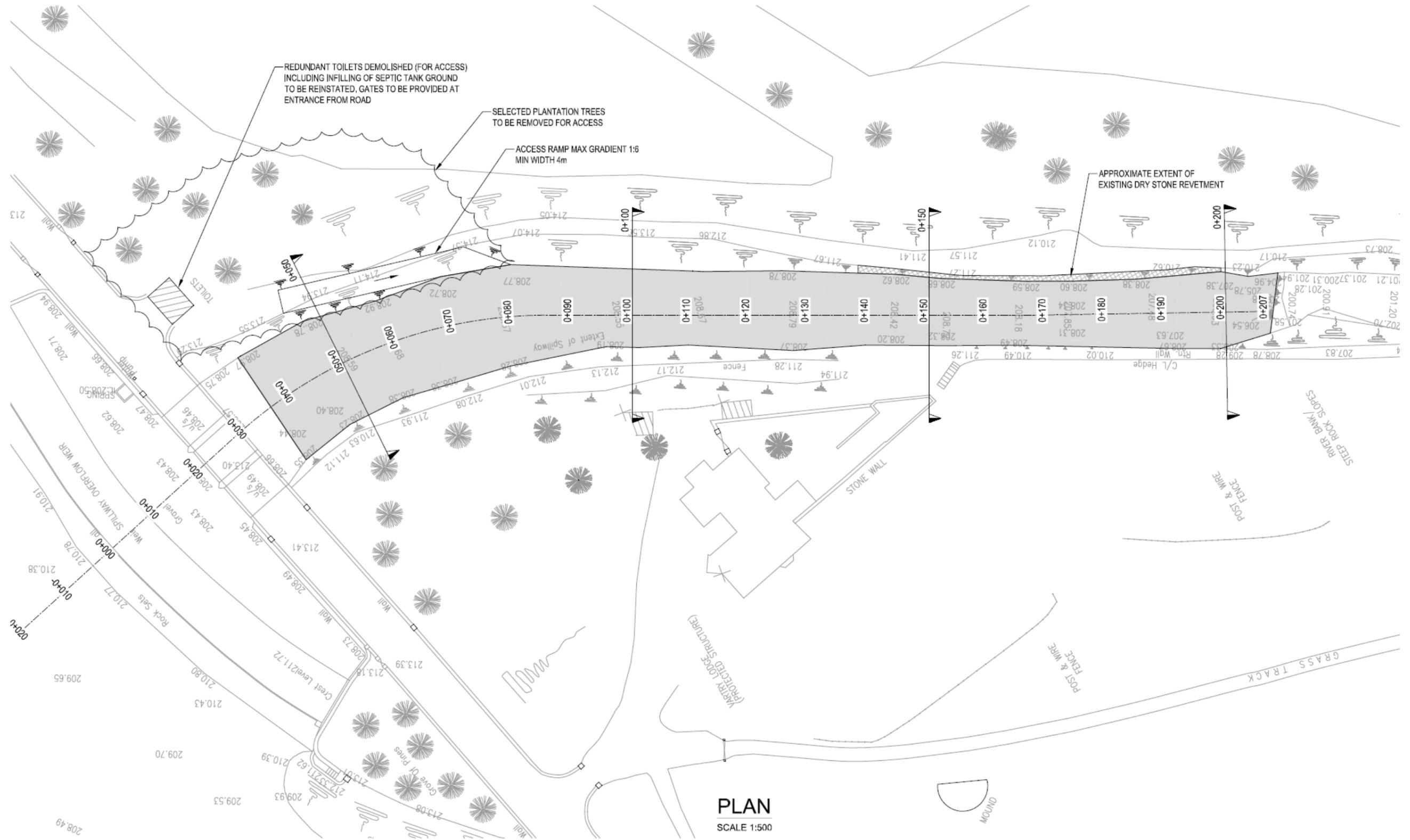


Figure 2-5 Drawing of the Proposed Works to the Spillway

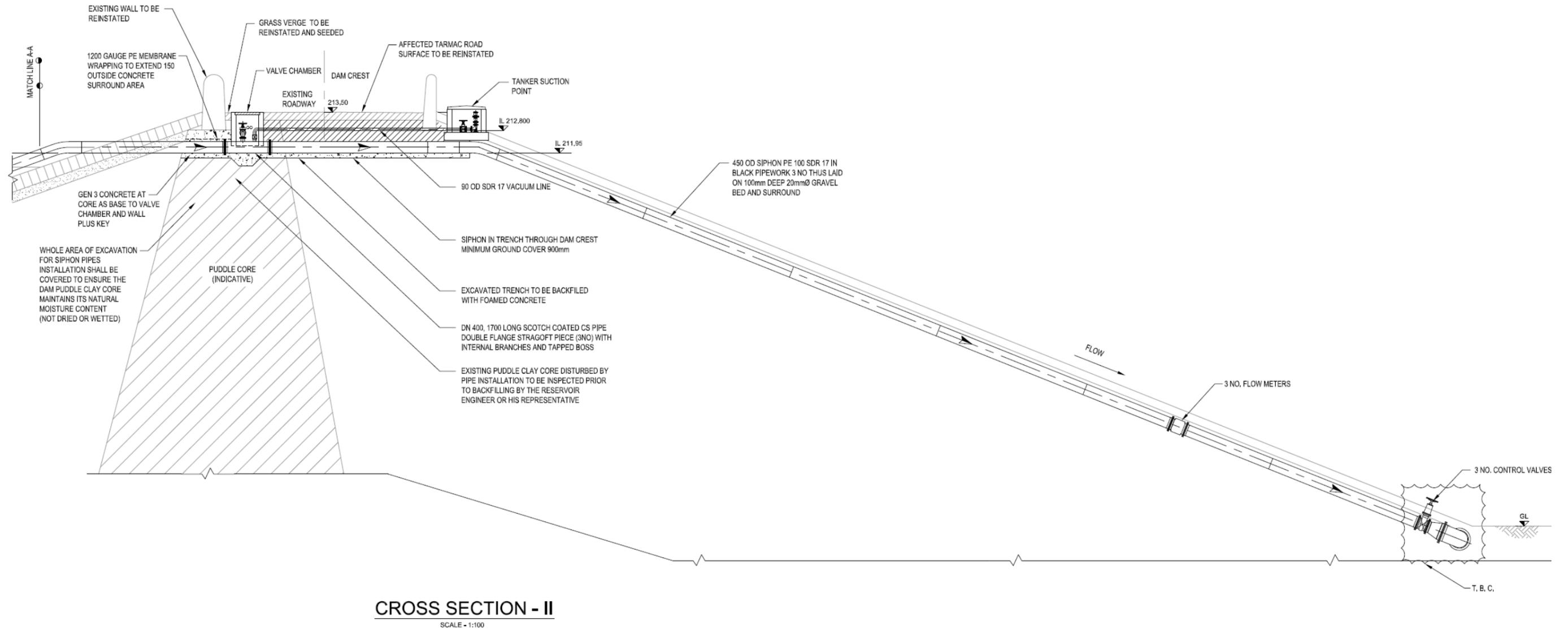


Figure 2-6 Drawing of the Proposed Siphon Pipes

3 DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1 Overview

The Vartry WTP is situated within the Vartry River Catchment and the soil type consists of a loamy drift with igneous and metamorphic stones. The WTP is located immediately south of the Vartry Reservoir (Lower) and the River Vartry flows along the eastern and southern boundary of the site. The immediate surroundings are characterised by agricultural farmland and patches of semi-natural woodland to the east, south and west and Vartry Reservoir (Lower) to the north.

3.2 Existing WTP

The existing WTP is located in the center of the site boundary and comprises a series of Slow Sand Filter ponds **FL8** with associated feeder channels **FW4**, Water Treatment Facility buildings and an access road **BL3**. The ponds are frequently bordered by species-rich grassy verges **GS2** and occasionally ornamental shrubs **WS3**. Vartry Lodge **BL3**, a residential house associated with the WTP is located within the north-east section of the site and is surrounded by mixed broadleaved/conifer woodland **WD2** and dry meadows **GS2** with scattered trees **WD5**. The southern bank of the reservoir dam supports species-rich neutral grassland **GS2** with some scattered trees **WD5** and ornamental shrubs **WS3** at the southern edge.

3.3 Proposed WTP Site

The proposed new WTP is situated within land at the western section of the site. This area is bordered by mixed broadleaf/conifer woodland **WD2** with a mature mixed treeline **WL2** bisecting the area north to south. The north-western area of the site is dominated by semi-improved neutral grassland **GS1** with patches of scrub vegetation **WS1** at the field margins. The eastern section of the proposed WTP area contains seven settling ponds **FL8** that are a series of connected waterbodies used for sediment settlement in order to reduce suspended solids within the effluent discharge. The ponds are situated perpendicular to the slope and in two rows with percolation occurring between the ponds in each row. The ponds vary in size but all are rectangular shallow structures approximately 8 m in width and 25 to 30 m in length. They have shallow grassed banks which are mown and the ponds are subject to periodic maintenance by cleaning out accumulated sediments. The ponds varied in water quality, turbidity and abundance of associated aquatic vegetation.

Ponds 1 and 2 are the smallest with the remainder being fairly uniform in size. Pond 1 occurs in the southwest of the group and is the first in the sequence of through-flow. This pond has a thick accumulation of silt and no aquatic vegetation present.

Pond 2 located immediately downslope, is a similar sized to pond 1 but has very little standing water. It has a luxuriant grass sward indicating considerable nutrient enrichment. Pond 3 is entirely open water which supports a small amount of broad-leaved pondweed *Potamogeton natans*.

Pond 4 which is the lowest in this row consists of open water in its southern third while the northern part is a dense growth of sedge *Carex* sp. with a small amount of rush *Juncus* sp.. There are no macrophytes in the open water. Ponds 5 to 7 form a chain to the north of the ponds 1-4. Pond 5 consists of open water which is very turbid and has no aquatic macrophytes present. Pond 6 is primarily open water though at its northern end there is a dense raft of creeping bent grass *Agrostis stolonifera*. Broad-leaved pondweed *Potamogeton natans* is abundant in the open water along with small amounts of flote grass *Glyceria fluitans*. Pond 7 supports a dense sward of hard rush *Juncus inflexus* and creeping bent *Agrostis stolonifera*, with virtually no open water.

North of the ponds was an area of recolonizing bare ground **ED3** and patches of scrub **WS1**. A drainage ditch **FW4** borders the proposed WTP site to the east and north that contained moderately flowing water with a depth of <15cm. A drainage ditch **FW4** borders the proposed WTP site to the east and north which discharges directly into the River Vartry ca. 200 m south-east of the proposed works.

3.4 River Vartry

The River Vartry runs along the eastern boundary of the site and the existing WTP discharges into the river at two locations.

The spillway channel south of the reservoir weir and north of the supernatant discharge locations is predominantly dry at most times of the year with minimal water flow from seepage and groundwater sources. The channel bed supports reed and large sedge swamp **FS1** in places with areas of exposed siliceous rock **ER1** also present. The spillway seasonally floods when the reservoir exceeds top water level during periods of sustained high precipitation. At the time of the ecological survey, the spillway channel was largely dry and supported abundant riparian vegetation within the section immediately south of the road bridge where sediment had been deposited during flood episodes. This area was categorised as reed and large sedge swamp FS1 as it was dominated by common reed *Phragmites australis* but also contained herbaceous plants such as watermint *Mentha aquatica*, water forget-me-not *Myosotis scorpioides*, marsh pennywort *Hydrocotyle vulgaris*, foals watercress *Apium nodiflorum*, hard rush *Juncus inflexus*, jointed rush *Juncus articulatus*, bur-reed *Sparganium* sp., marsh ragwort *Senecio aquaticus*, marsh woundwort *Stachys palustris* and lesser spearwort *Ranunculus flammula*.

Further south along the spillway the channel bed comprised exposed siliceous rock ER1 that was dominated by mosses but also contained pockets of grasses, ferns and sapling trees.

The spillway contains steep/vertical earth and stone banks on the east and west side. The banks of the spillway support highly modified mixed woodland WD2 that includes beech *Fagus sylvatica*, ash *Fraxinus excelsior*, larch *Larix* sp., pine *Pinus* sp., oak *Quercus robur*, cherry laurel *Prunus laurocerasus*, holly *Ilex aquifolium*.

South of the present supernatant discharge locations the river supports a moderate flow with a rocky substrate and is categorized as eroding river **FW1**. The river is bordered by mixed broadleaved/conifer woodland **WD2**.

Otter spraints were recorded on the bank of the Vartry Reservoir north of the site and immediately south of the R764 Road bridge within the spillway channel which confirm the presence of otters along the River Vartry.

The River Vartry downstream of the WTP is contains populations of fish species at Moderate Status (IFI, 2014) and provides foraging resources for otter. Otter habitat preferences are not confined to waterways and this species is likely to travel through other habitats within the site boundary such as woodland and grassland on occasion.

No otter holts were recorded along the River Vartry within the vicinity of the WTP.

The River Vartry is designated a Salmonid Water under the European Communities (Quality of Salmonid Waters) Regulations, 1988. Salmon *Salmo salar*, brown trout *Salmo trutta* and sea trout *Salmo trutta* were recorded within the river during surveys in 2008 (Central and Regional Fisheries Board, 2008).

The most recent EPA biological monitoring assessment (2010) identified the River Vartry to have an overall 'Good' water quality status with a 'Good' ecological status, 'Good' fish status, 'Good' hydromorphology status, 'Good' general physio-chemical status and 'High' macroinvertebrate status. The EPA Biological Water Quality monitoring data upstream of the discharge at Ballinastoe Bridge was Q4 – Q5 (High Status) and the nearest monitoring point downstream at Annagolan Bridge was Q4 (Good status).

The River Vartry has been listed as being at risk of not achieving Good status based on water abstraction and impoundments (1a).

Monitoring data of the River Vartry both upstream (Vartry Reservoir, weekly and monthly samples since Jan 2016) and downstream (Annagolan Bridge, monthly samples since 2013) demonstrate that the water quality within the River Vartry is in compliance with Schedule 5 of the European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009) as shown in Table 3.1 below. In terms of the

European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 293/1988), the upstream and downstream monitoring data is also in compliance with this standard and in particular the EQS for Suspended Solids which is not a parameter in the European Communities Objective (Surface Water) Regulations.

Table 3-1 Background Water Quality Monitoring Stations and EQS

P'meter	Background Concentration								Salmon- id Reg	EQS Rivers Good Status (SI 272 of 2009)	EQS Rivers High Status (SI 272 of 2009)
	Vartry Reservoir (DCC/NOD Samples)				Annagolan Bridge (EPA Values)						
	Min	Max	Avg	95%	Min	Max	Avg	95%			
DO	%Saturation								50%>9 mg/l or ~82%	120%>95%ile >80%	120%>95%ile >80%
	80	109	95	99	81	108	100	106			
pH	6.7	7.9	7.2	7.6	6.1	7.4	6.8	7.2	6.0-9.0	06-Sep	06-Sep
Suspended Solids, mg/l	<5	9	<5	<5	1	30	3.74	8.3	<=25	Not Set	Not Set
BOD₅, mg/l	<1				0.3	2.2	0.9	1.4	<=5	<1.5 mean or	<1.2 (mean) or <2.2 (95%ile)
Fluoride, µg/l	<0.05	0.11	0.07	0.10	-	-	-	-	-	500	500
Nitrites as NO₂, mg/l	<0.05				0.001	0.012	0.004	0.009	0.5	-	-
Total Ammonia as N, mg/l	<0.01	0.04	0.02	0.04	0.00	0.06	0.02	0.031	-	<0.065 mean or <0.14 (95%)	<=0.040 (mean) or <=0.090 (95%ile)
Non Ionised Ammonia (NH₃)	-				-				<=0.02	-	-
MRP mg/l	<0.01				0	0.04	0.01	0.011		<0.035 mean or <0.075 (95%)	<=0.025 mean or <=0.045 (95%ile)
Total Residual Chlorine, mg/l	-				-				<=0.005	-	-
Total Zinc, µg/l	1	7	5	7	ND	44	8	31	200	50	50
Dissolved Copper, µg/l	1	3	<3	2.85	ND	6.5	1	4.7	22	5	5

4 NATURA 2000 SITES

4.1 Identification of Relevant Natura 2000 Sites

This section of the screening process describes the Natura 2000 sites within the potential impact zone of the proposed works. As recommended in “*Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities produced by the Department of the Environment, Heritage and Local Government*” a 15 km buffer zone from the centre of the proposed works has been chosen, along with identifying any other receptor pathways (*i.e.* rivers, streams or ecological corridors) as a precautionary measure, to ensure that all potentially affected Natura 2000 sites are included in the screening process.

Figure 4.1 shows the location of all Natura 2000 sites within the 15 km zone of impact and those connected to the proposed works *via* receptor pathways. **Table 4.1** lists the Natura 2000 sites within this zone of impact, the qualifying interests of each of the identified Natura 2000 Sites, the potential impact and the initial screening determination. Those sites or individual qualifying interests that are screened out at this stage (primarily as a result of being too great a distance away and having different habitat requirements) are not assessed any further. Natura 2000 sites or qualifying interests that are brought forward for further assessment are highlighted in **Table 4.1**.

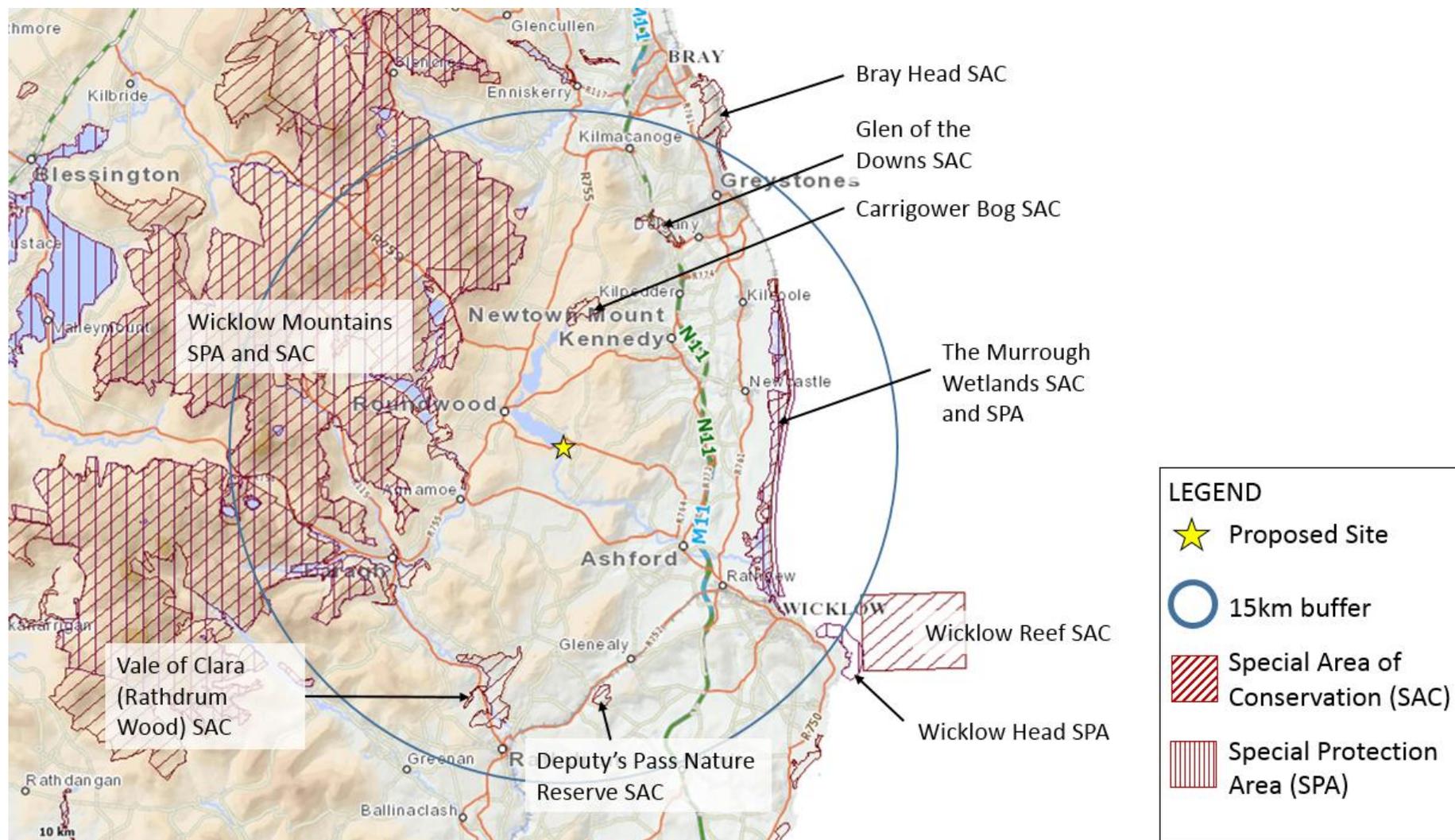


Figure 4-1 Natura 2000 Sites within 15 km of the Proposed Works

Table 4-1 Natura Sites located within the zone of Impact from the proposed works (*=priority habitat)

Site Code	Site Name (approx. distance from the proposed works)	Qualifying Interest	Potential Impact	Screened In/Out
002122	Wicklow Mountains SAC (4km)	[3130] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i>	None- due to distance and lack of potential impact pathway	Screened Out
		[3160] Natural dystrophic lakes and ponds		
		[4010] Northern Atlantic wet heaths with <i>Erica tetralix</i>		
		[4030] European dry heaths		
		[4060] Alpine and Boreal heaths		
		[6230] Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*		
		[7130] Blanket bogs (* if active bog)		
		[8110] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)		
		[1355] Otter <i>Lutra lutra</i>	Potential for ex-situ disturbance	Further Assessment Required
000716	Carriggower Bog SAC (5km)	[7140] Transition mires and quaking bogs	None- due to distance and lack of potential impact pathway	Screened Out
000733	Vale of Clara (Rathdrum Woods) SAC (9km)	[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	None- due to distance and lack of potential impact pathway	Screened Out
002249	The Murrough Wetlands SAC (9km)	[1210] Annual vegetation of drift lines	None – due to distance and lack of potential impact pathway	Screened Out
		[1220] Perennial vegetation of stony banks	None – due to distance and lack of potential impact pathway	
		[1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	Potential impact from pollution and sedimentation as River Vartry flows into the SAC	Further Assessment Required
		[1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>)	Potential impact from pollution and sedimentation as River Vartry	

Site Code	Site Name (approx. distance from the proposed works)	Qualifying Interest	Potential Impact	Screened In/Out
			flows into the SAC	
		[7210] Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> *	Potential impact from pollution and sedimentation as River Vartry flows into the SAC	
		[7230] Alkaline fens	Potential impact from pollution and sedimentation as River Vartry flows into the SAC	
000719	Glen of the Downs SAC (10km)	[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	None- due to distance and lack of potential impact pathway	Screened Out
000717	Deputy's Pass Nature Reserve SAC (11km)	[91A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles	None- due to distance and lack of potential impact pathway	Screened Out
000714	Bray Head SAC (14km)	[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts	None- due to distance and lack of potential impact pathway	Screened Out
		[4030] European dry heaths		
002274	Wicklow Reef SAC (15km)	[1170] Reefs	None- due to distance and lack of potential impact pathway	Screened Out
004040	Wicklow Mountains SPA (6km)	[A098] Merlin <i>Falco columbarius</i>	None- due to distance and lack of suitable habitat at site	Screened Out
		[A103] Peregrine <i>Falco peregrinus</i>		
004186	The Murrough SPA (10km)	[A001] Red-throated Diver <i>Gavia stellata</i>	None – no interaction due to distance	Screened Out
		[A043] Greylag Goose <i>Anser anser</i>		
		[A046] Light-bellied Brent Goose <i>Branta bernicla hrota</i>		
		[A050] Wigeon <i>Anas penelope</i>		
		[A052] Teal <i>Anas crecca</i>		
		[A179] Black-headed Gull <i>Chroicocephalus ridibundus</i>		
		[A184] Herring Gull <i>Larus argentatus</i>		
[A195] Little Tern <i>Sterna albifrons</i>				
004127	Wicklow Head SPA (14km)	[A188] Kittiwake <i>Rissa tridactyla</i>	None – no interaction due to distance	Screened Out

4.2 Designated Sites of Relevance

Table 4.1 above lists the Natura 2000 sites within the zone of possible potential impact of the proposed works area. There are eight SACs and three SPAs within this zone.

One feature of Qualifying Interest (QI) for the Wicklow Mountains SAC and four features of QI for The Murrough Wetlands SAC were considered to have some potential for impact resulting from the proposed development:

Wicklow Mountains SAC [002122]

- [1355] Otter *Lutra lutra*

The Murrough Wetlands SAC [00249]

- [1330] Atlantic salt meadows *Glauco-Puccinellietalia maritimae*
- [1410] Mediterranean salt meadows *Juncetalia maritima*
- [7210] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**
- [7230] Alkaline fens

After an initial review of Natura 2000 sites, it was considered that “no pathway” exists by which the proposed works could impact upon any other designated site and therefore only the Wicklow Mountains SAC and The Murrough Wetlands SAC and the five QIs listed above were brought forward for further assessment.

4.3 Characteristics of the Designated Sites

The characteristics of the Wicklow Mountains SAC and The Murrough Wetlands SAC are described below. The Conservation Objectives of the features of qualifying interest are discussed in Section 6 - Screening Assessment in the context of the potential impacts on them.

Wicklow Mountains SAC [002122]

Wicklow Mountains SAC is a complex of upland areas in Counties Wicklow and Dublin, flanked by the Blessington reservoir to the west and Vartry reservoir in the east, Cruagh Mountain in the north and Lybagh Mountain in the south. Most of the site is over 300 m, with much ground over 600 m. The site has been designated due to the presence of Annex I habitats: oligotrophic to mesotrophic standing waters, dystrophic lakes, wet heath, dry heath, alpine and subalpine heaths, species-rich nardus grassland, active blanket bogs, siliceous scree, calcareous rocky slopes, siliceous rocky slopes, old oak woodlands. It is also designated due to the presence of otter *Lutra lutra*.

Otters predominantly live alongside rivers, lakes and other water bodies and use the water systems to hunt their preferred food; salmon, trout, perch and pike. They will also

hunt species such as frogs, small mammals and waterfowl. Otters can hold territories of varying size depending on the availability of food, coastal territories can be as small as 2 km and upland territories as large as 20 km. They can have multiple holts throughout their territory, the holts are located on the bank-side of rivers and lakes where suitable vegetation exists to cover the burrows entrances.

The vegetation over most of Wicklow Mountains SAC is a mosaic of heath, blanket bog and upland grassland (mostly on peaty soil, though some on mineral soil), stands of dense Bracken *Pteridium aquilinum*, and small woodlands mainly along the rivers. Mountain loughs and corrie lakes are scattered throughout the site.

Conservation Objective: To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The Murrough Wetlands SAC [002249]

The Murrough is a coastal wetland complex which stretches for 15 km from Ballygannon to north of Wicklow town, and in parts, extends inland for up to 1 km. A shingle ridge stretches the length of the site and carries the mainline Dublin-Wexford railway. The site comprises a series of coastal habitats and brackish to freshwater marshes. Drainage directly to the sea is impeded along most of the site by a shingle ridge. There are two main outlets to the sea and there is seepage into the marshes under the shingle ridge and where breaches occur. Freshwater drains into the site via the Vartry River and many drains. Freshwater springs provide a permanent source of water for a complex fen system. Other habitats present on the site include salt marsh, tidal reed bed, freshwater reedswamp, wet grassland, wet woodland, mudflat, dry heath and dry grassland.

The site has been designated due to the presence of the following Annex I habitats: Annual vegetation of drift lines, Perennial vegetation of stony banks, Atlantic salt meadows *Glauco-Puccinellietalia maritimae*, Mediterranean salt meadows *Juncetalia maritima*, Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*, Alkaline fens.

This site is of importance as it is the largest coastal wetland complex on the east coast of Ireland. Although much affected by drainage, it still contains a wide range of coastal and freshwater habitats, some of which contain threatened plants. Areas on the site contain a rich invertebrate fauna, including several rarities. It is an important site for both wintering and breeding birds and supports a variety of species listed on Annex I of the E.U. Birds Directive.

Conservation Objectives:

1. To maintain the Annex I habitats for which the cSAC has been selected at favourable conservation status: Annual vegetation of drift lines; Perennial vegetation of stony banks; Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*); Mediterranean salt meadows (*Juncetalia maritimi*); Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; Alkaline fens.
2. To maintain the extent, species richness and biodiversity of the entire site
3. To establish effective liaison and co-operation with landowners, legal users and relevant authorities.

4.3.1 Ecological Network Supporting Natura 2000 Sites

An analysis of the proposed Natural Heritage Areas and designated Natural Heritage Areas in terms of their role in supporting the species using Natura 2000 sites was undertaken. It was assumed that these supporting roles mainly related to mobile fauna such as mammals and birds which may use pNHAs and NHAs as "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account during the rest of the AA process.

Vartry Reservoir has been proposed as a Natural Heritage Area (Site Code: 001771). The existing WTP is located adjacent to the southern boundary of the pNHA.

Devil's Glen pNHA (Site Code: 000718) is located 2.4 km south of the proposed works and comprises a section of the River Vartry downstream of the proposed spillway works. The pNHA encompasses an area of mixed woodland within the river valley.

4.3.2 Annex II Species

Annex II species, including Atlantic Salmon *Salmo salar* and River Lamprey *Lampetra fluviatilis*, have been recorded within the River Vartry downstream of the proposed development. These are not listed as features of Qualifying Interest for the Murrough Wetlands SAC or Wicklow Mountains SAC and have therefore not been considered further in this Appropriate Assessment Screening Report. The Ecological Impact Assessment prepared for the development considers these species.

5 POTENTIAL IMPACTS OF THE PROPOSED WORKS

5.1 Overview

The purpose of this section of the screening assessment is to examine the possibility that the proposed works, either individually or in combination with other plans and projects, may result in significant negative effects on the Conservation Objectives of any Natura 2000 site and its qualifying interest (QI).

The potential impacts on Natura 2000 sites or their QIs resulting from the proposed works to the WTP include:

- Impacts on water quality due to accidental spillages/pollution events during the construction phase.
- Impacts from noise and vibration during the construction phase.
- Impacts on flow and water level during the operational phase.

None of the Natura 2000 sites lie within the boundaries of the proposed works area; therefore, no direct impacts will occur through land take or fragmentation of habitats.

5.2 Construction Effects

5.2.1 Potential Pollution-Related Adverse Effects

Mobilisation of silt and sediment is one of the most likely potential pollutant pathways during construction works. The construction of the new Vartry WTP will involve movement of plant and materials within the development footprint. Although this is over 150m west of the River Vartry, there is a feeder channel which runs along the eastern boundary of the proposed WTP to the Vartry which provides ecological continuity with the river.

The regrading works to the spillway have the potential to have an indirect impact on the aquatic environment within the River Vartry due to the potential for accidental releases of fuels/oils/chemicals from construction plants and increased levels of sediment within the stream flow as a result of the excavation works. The liberation of sediment can also occur during the earthworks phase of construction due to the excavation of the channel bed. Excessive discharges of highly turbid water can cause water pollution and the settling out of large quantities of sediment can smother benthic organisms. Siltation can be particularly injurious to aquatic species such as juvenile Atlantic salmon. Releases of pollution and sediment would then enter the River Vartry and subsequent effects on water quality and associated local aquatic ecology could result.

There is one Natura 2000 site, the Murrough Wetlands SAC, with a potential impact pathway from the proposed construction activities on the site via the River Vartry c. 13.5 km along the potential receptor pathway south-east of the works.

These above risks relate to the construction phase of the project only and are therefore temporary in nature. Appropriate pollution control measures will be employed in accordance with current IFI guidance (IFI, 2016^b) for all works within close proximity to any watercourse and best practice environmental control measures detailed in **Section 2** will be employed to ensure that detrimental impacts through pollution or permanent physical damage to the watercourses are avoided during construction.

In addition, due to the large distance between the proposed works and the Natura 2000 site (13.5 km) and the significant dilution factors involved, it can be concluded on the basis of scientific information that the construction related impacts, alone, or in combination within other plans and projects will not have a significant effect on the Murrough Wetlands SAC.

5.2.2 Potential Disturbance from Noise and Vibration

Increased levels of noise and vibration will occur during the construction phase of the proposed WTP (approximately 24 months). There will be no increase in noise and vibration from present baseline levels during the operational phase. Construction noise and vibration has the potential to disturb species within adjacent habitats such as otter, which is a QI of the Wicklow Mountains SAC. Otters can hold large territory ranges that will occasionally span river catchments. Due to their high mobility, otters associated with the Wicklow Mountains SAC could hold a territory that includes Vartry Reservoir and its surroundings. Due to the mobility of the Otter and availability of other suitable territory within the area it can be concluded on the basis of scientific information that the construction related impacts, alone, or in combination within other plans and projects will not have a significant effect on any ex-situ otters associated with the Wicklow Mountains SAC.

5.3 Operational Effects

The existing plant discharges water from the slow sand filters to the downstream river. There is also a periodic discharge of washings from the existing slow sand filters to a local tributary that flows into the River Vartry. The established practice, prior to 2008, was to discharge on average 4.6MI/d to the river from the Water Treatment Plant except in extreme drought conditions when the discharge was pumped back to the existing filters. Since 2008, and due to the ongoing deterioration of the existing asset the

^b IFI (2016) Guidelines for the Protection of Fisheries During Construction Works in and Adjacent to Waters. <http://www.fisheriesireland.ie/>

average discharge has increased to 10.5MI/d. The existing discharge from the settled filter sand washings averages 0.1MI/d and once the new works are complete this discharge will no longer be required. The current practice for the water treatment plant is to back-pump discharges from the filter beds to the head of the works during low flow periods. This has resulted in extended periods of zero discharge from the works and low flow in the River Vartry. Extended periods of zero discharge from the works and subsequent low flow in the river are detrimental to water quality (decreasing oxygen levels) and aquatic flora and fauna.

Once the new works are complete it is proposed to discharge a minimum of 5,000 m³ per day of reservoir (natural) water downstream of the plant and to cease the practice of back pumping. This will lead to a higher baseline flow of the river at such times. The avoidance of extreme low flows by ensuring a minimum discharge of 5,000 m³ per day is likely to have a positive impact on water quality and aquatic flora and fauna within the river.

It can be concluded, on the basis of scientific information, that this flow will not have a significant impact on the Qualifying Interests of the Murrough Wetland SAC.

5.4 Cumulative and in Combination Impacts

Cumulative impacts or effects are changes in the environment that result from numerous human-induced alterations. Cumulative impacts can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

As part of the Screening for an Appropriate Assessment, in addition to the proposed works, other relevant projects and plans in the region must also be considered at this stage. This step aims to identify at this early stage any possible significant in-combination or cumulative effects/impacts of the proposed development with other such plans and projects on the Natura 2000 sites.

5.4.1 Cronroe Abstraction (Annagolan)

Drinking water supply to the Cronroe Reservoir is presently abstracted from the River Vartry close to Annagolan Bridge. The abstraction is approximately 50 m³/hr (1.2 MI/d) and serves the village of Ashford and surrounding area from the Cronroe Reservoir. If the Vartry WTP project proceeds then it is intended that the Cronroe Reservoir would be supplied from the new Vartry WTP and the abstraction at Annagolan Bridge would cease. This would result in a benefit to the Lower Vartry and the Murrough Wetlands SAC from additional water. No significant effect is expected.

5.4.2 Other RBMP Pressures/Threats

The current River Basin Management Plan mapping indicates that the Vartry is 'not at risk' of achieving Good status. The only identified pressure is the current Vartry WTP discharge and for this the EPA has specified a 'Review' risk classification.

6 SCREENING ASSESSMENT

6.1 Impacts on Habitats

6.1.1 Atlantic salt meadows *Glauco-Puccinellietalia maritima*

Atlantic salt meadows are a QI of the Murrough Wetlands SAC and the River Vartry flows into the wetlands 9 km south-east of the proposed WTP.

If any sediment run-off generated during the construction phase of the proposed development was allowed to enter the River Vartry via the drainage ditch adjacent to the site it could ultimately end up in the Murrough Wetlands. This run-off, along with any pollution or oil spill from construction machinery may affect suspended solid levels and water quality in the wetland habitats. Sediment controls, which form part of the construction methodology (see **Section 2**) will be implemented and will ensure that sediment run-off does not occur. Additionally, due to the distance from the proposed works along the potential impact pathway (13.5 km) to the designated site it can be concluded that the Atlantic salt meadows associated with the Murrough Wetlands could not be significantly affected by run-off from the WTP site.

The Conservation Objectives for the Murrough Wetland SAC with regards to Atlantic salt meadows is to maintain or restore the favourable conservation condition of the habitat (NPWS, 2015). Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

For the reasons outlined above, the conservation objectives for the Murrough Wetlands SAC to maintain the favourable conservation condition of the Atlantic salt meadow habitat (NPWS, 2015) will not be compromised as there will be no reduction in the habitat area and the community types will be conserved. Therefore, impacts on this qualifying interest can be screened out.

6.1.2 Mediterranean salt meadows *Juncetalia maritima*

Mediterranean salt meadows are a QI of the Murrough Wetlands SAC and the River Vartry flows into the wetlands 9 km south-east of the proposed WTP.

If any sediment run-off generated during the construction or maintenance phases of the proposed development was allowed to enter the River Vartry via the drainage ditch adjacent to the site it could ultimately end up in the Murrough Wetlands. This run-off,

along with any pollution or oil spill from construction machinery may affect suspended solid levels and water quality in the wetland habitats. Sediment controls, which form part of the construction methodology (see **Section 2**) will be implemented and will ensure that sediment run-off does not occur. Additionally, due to the distance from the proposed works along the potential impact pathway (13.5 km) to the designated site it can be concluded that the Mediterranean salt meadows associated with the Murrough Wetlands could not be significantly affected by controlled run-off from the WTP site.

The Conservation Objectives for the Murrough Wetland SAC with regards to Mediterranean salt meadows is to maintain or restore the favourable conservation condition of the habitat (NPWS, 2015). Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

For the reasons outlined above, the conservation objectives for the Murrough Wetlands SAC to maintain the favourable conservation condition of the Mediterranean salt meadow habitat (NPWS, 2015) will not be compromised as there will be no reduction in the habitat area and the community types will be conserved. Therefore, impacts on this qualifying interest can be screened out.

6.1.3 Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

Calcareous fens are a QI of the Murrough Wetlands SAC and the River Vartry flows into the wetlands.

If any sediment run-off generated during the construction phase of the proposed development was allowed to enter the River Vartry via the drainage ditch adjacent to the site it could ultimately end up in the Murrough Wetlands. This run-off, along with any pollution or oil spill from construction machinery may affect suspended solid levels and water quality in the wetland habitats. Sediment controls, which form part of the construction methodology (see **Section 2**) will be implemented and will ensure that sediment run-off does not occur. Additionally, due to the distance from the proposed works along the potential impact pathway (13.5 km) to the designated site it can be concluded that the calcareous fen associated with the Murrough Wetlands could not be significantly affected by controlled run-off from the WTP site.

Calcareous fen habitats could potentially be impacted by a reduction in flow or water level in the River Vartry. However, the proposed compensation flow from the Vartry reservoir for low flow periods (5 MI/d during periods when the reservoir is not spilling) is the discharge flow that was in place when the Murrough Wetland SAC was identified as a Site of Community Interest (the precursor to a cSAC) in 1998. Therefore, there will be no impact to the conservation objectives of the QI by the proposed works.

The Conservation Objectives for the Murrough Wetland SAC with regards to calcareous fens is to maintain or restore the favourable conservation condition of the habitat (NPWS, 2015). Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

For the reasons outlined above, the conservation objectives for the Murrough Wetlands SAC to maintain the favourable conservation condition of the Calcareous fen habitat (NPWS, 2015) will not be compromised as there will be no reduction in the habitat area and the community types will be conserved. Therefore, impacts on this qualifying interest can be screened out.

6.1.4 Alkaline fens

Alkaline fens are a QI of the Murrough Wetlands SAC and the River Vartry flows into the wetlands 9 km south-east of the proposed WTP.

If any sediment run-off generated during the construction phase of the proposed development was allowed to enter the River Vartry via the drainage ditch adjacent to the site it could ultimately end up in the Murrough Wetlands. This run-off, along with any pollution or oil spill from construction machinery may affect suspended solid levels and water quality in the wetland habitats. Sediment controls, which form part of the construction methodology (see **Section 2**) will be implemented and will ensure that sediment run-off does not occur. Additionally, due to the distance from the proposed works along the potential impact pathway (13.5 km) to the designated site it can be concluded that the Alkaline fen habitats associated with the Murrough Wetlands could not be significantly affected by controlled run-off from the WTP site.

Alkaline fen habitats could potentially be impacted by any reduction in flow or water level in the River Vartry. However, the proposed compensation flow from the Vartry reservoir for low flow periods (5 MI/d during periods when the reservoir is not spilling) is the discharge flow that was in place when the Murrough Wetland SAC was identified as a

Site of Community Interest (the precursor to a cSAC) in 1998. Therefore, there will be no impact to the conservation objectives of the QI by the proposed works.

The Conservation Objectives for the Murrough Wetland SAC with regards to alkaline fens is to maintain or restore the favourable conservation condition of the habitat (NPWS, 2015). Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable.

For the reasons outlined above, the conservation objectives for the Murrough Wetlands SAC to maintain the favourable conservation condition of the alkaline fen habitat (NPWS, 2015) will not be compromised as there will be no reduction in the habitat area and the community types will be conserved. Therefore, impacts on this qualifying interest can be screened out.

6.2 Impacts on Species

6.2.1 Otter *Lutra lutra*

No evidence of or suitable locations for an otter holt were identified along the banks of the River Vartry within the vicinity of the proposed works during the ecological survey.

Otter are a QI of the Wicklow Mountains SAC and, due to their large home ranges, individuals associated with the SAC could hold territories that also encompass the proposed works area (*i.e. ex situ* species, Annex IV species).

Water pollution represents one of the principal threats to otter populations in Ireland (Reid *et al.*, 2013). Otters can tolerate significant levels of pollution (Chanin, 2003; Bailey & Rochford, 2005; Romanowski *et al.*, 2012) but poor water quality tends to result in reduced numbers and variety of fish species which in turn will have a negative impact on otter presence in polluted waterways. Any change in water quality as a result of pollution or increased sedimentation during construction could potentially have indirect negative effects on otters, as a result of reduced food supply. However, based on the works proposed no negative water quality impacts on the receiving waterbody from the construction of the works. Therefore, the foraging resources for otters within the River Vartry will not be reduced.

Elevated noise and vibration levels during the construction phase of the project will occur. There is potential for otters adjacent to the proposed works to be subject to certain levels of disturbance. The main disturbance will be as a result of the increase in

noise and vibration during construction of the WTP. Otters are considered to be mainly nocturnal, particularly within freshwater territories, and are mainly active after dusk and before dawn (Hayden & Harington, 2000). Therefore, the noise and vibration disturbance associated with the construction works which will occur during daylight hours, will not have a significant impact on otter populations because the otter will not be passing through the site during working hours. The absence of an otter holt within the vicinity of the works indicates that no breeding otters would be disturbed by the proposed works.

The Conservation Objectives for the Wicklow Mountains SAC with regards to otter is to maintain or restore the favourable conservation condition of the species (NPWS, 2015). Favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Impacts on this qualifying interest from the proposed works are not considered to be significant and therefore can be screened out at this stage.

7 SCREENING CONCLUSIONS

The proposed works will provide a new water treatment process on the existing site and ensure that the water supply is safeguarded and that the reservoir continues to operate safely.

One feature of Qualifying Interest (QI) for the Wicklow Mountains SAC and four features of QI for The Murrough Wetlands SAC were considered to have some potential for impact resulting from the proposed development. There is hydrological connectivity between the proposed development and the Murrough Wetlands via the River Vartry (13.5 km downstream).

During the construction phase, best practice construction and biosecurity measures, which form part of the construction methodology (see **Section 2**) will be implemented and will ensure that significant impacts do not occur. In addition, construction activities relating to the proposed works will take place over 4 km from the nearest Natura 2000 site (Wicklow Mountains SAC) and there will therefore be no direct impacts on this or any other Natura 2000 sites.

During the operational phase there will be no discharge of wastewater or supernatant to the River Vartry. The operational phase will ensure a minimum compensation flow from the reservoir of 5,000 m³ per day at all times. When compared to previous practice, where the flow downstream of the plant during drought conditions was zero this will lead to a significant improvement in the baseline flow of the river during drought periods. This additional water will not have a significant impact on any Qualifying Interests.

As such, it can be concluded on the basis of scientific evidence, that impacts on the Murrough Wetlands SAC and the Wicklow Mountains SAC and their features of qualifying interests will not be significant.

Elevated noise and vibration has the potential to have a disturbance effect on ex-situ otter populations associated within the Wicklow Mountains SAC during construction. Due to the small-scale nature of the disturbance and the timing of works during daylight periods only, the disturbance associated with the construction phase of the development is not significant. Impacts on the Conservation Objectives of Wicklow Mountains SAC and their features of Qualifying Interest relating to disturbance will not be significant.

On the basis of the findings of this Screening for Appropriate Assessment, it is concluded that the construction and operation of the new Vartry WTP and improvements to the operation of the reservoir, on their own or in combination with other plans or projects will not have a significant effect on the Natura 2000 network and a Stage 2 Appropriate Assessment is not required. This Report concludes the Appropriate Assessment process.

A Finding of No Significant Effects Report has been completed and is presented in Appendix 1 of this report.

8 REFERENCES

- Bailey, M. & J. Rochford. 2005. Otter survey of Ireland 2004 / 2005. Irish Wildlife Manuals No. 23. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.
- Chanin, P. 2003. Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough
- CRFB. 2008 Sampling Fish for the Water Framework Directive – ERFB Rivers 2008 The Central and Regional Fisheries Boards.
- DEHLG. 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Revised February 2010). Department of the Environment, Heritage and Local Government.
- DoEHLG. 2008. Circular L8/08 Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Department of the Environment, Heritage and Local Government.
- European Commission. 2000. Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.
- European Commission. 2002. Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.
- European Commission. 2007. EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission.
- European Commission. 2000b. Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg.
- European Commission. 2001. Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels.
- European Commission. 2007a. Interpretation Manual of European Union Habitats [Online] Available at: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/docs/2007_07_im.pdf
- EPA, Envision Map Viewer. Available at: <http://gis.epa.ie/Envision>. Last accessed on 21st August 2015.
- Fossitt. 2000. A Guide to Habitats in Ireland.

- Hayden, T. & R. Harrington. 2000. Exploring Irish Mammals. Duchas, Dublin
- NWPS databases and Map. Available at: <http://webgis.npws.ie/npwsviewer/>. Last accessed 21st August 2015.
- NPWS. 2007. The Status of EU Protected Habitats and Species in Ireland Vol. 1. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.
- NPWS. 2013. The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS. 2015. Conservation objectives for The Murrough Wetlands SAC [002249]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.
- NPWS. 2015. Conservation objectives for Wicklow Mountains SAC [002122]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.
- Ordnance Survey Ireland (2015). Mapviewer. Available at: <http://maps.osi.ie/publicviewer/#V1,588882,739883,0,10>
- Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & W.I. Montgomery. 2013. National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- Romanowski, J., Brezinski, M. & M. Zmihorski. 2012. Habitat correlates of the Eurasian Otter *Lutra lutra* recolonizing Central Poland. Acta Theriol, 58: 149-155.
- Water Framework Directive databases and Map. Available at: http://watermaps.wfdireland.ie/NsShare_Web/. Last accessed 21st August 2015.

APPENDIX 1

Finding of No Significant Effects Report

Name of project or plan	Vartry WTP and Reservoir Improvements
Name and location of Natura 2000 site	Wicklow Mountains SAC (4km) The Murrough Wetlands SAC (9km)
Description of the project	A new Water Treatment Plant (WTP) will replace the existing WTP and provide full water treatment facilities including processes that provide an effective barrier against cryptosporidium, effective removal of colour & TOC that give rise to the generation of THM and the effective treatment for diatomic algae that has caused seasonal reductions in production capacity in recent years. It will provide a Coagulation, Flocculation, Clarification and Rapid Gravity Filtration Process (FCF + RGF) with enhanced individual filtration control and monitoring. Upgrade works to the reservoir spillway, draw-off tower and installation of a siphon will ensure that the reservoir can continue to operate safely.
Is the project or plan directly connected with or necessary to the management of the site?	No.
Are there other projects or plans that together with the project or plan being assessed could affect the site?	No.
The Assessment of Significance of Effects	
Describe how the project or plan (alone or in combination) is likely to affect the European Site(s).	<p>The purpose of this section of the screening is to examine the possibility that the proposed site works, either individually or in combination with other plans and projects, may result in significant effects on the Conservation Objectives and the integrity of the Natura 2000 Sites identified.</p> <p>There are no Natura 2000 sites that lie within the boundary of the proposed development area and, as such, there will be no direct impacts on any designated areas. Having established no direct impacts or habitat fragmentation, the assessment concentrates on potential indirect impacts.</p> <p>A worst case scenario would occur whereby the project would result in a significant detrimental change in water quality as a result of discharges to the River Vartry which flows into The Murrough Wetlands SAC 9km south-east. The effect would have to be considered significant in terms of changes in water quality which would affect the habitats for which the SAC are designated.</p> <p>The proposed construction works the distance of over 13.5 km along the potential receptor pathway from the site to the SAC it is concluded that there are no</p>

	<p>significant impacts on its Conservation Objectives. Increased levels of noise and vibration will occur during the construction phase of the WTP upgrade. This has the potential to disturb species within adjacent habitats such as otter, which is a QI of the Wicklow Mountains SAC. Otters can hold large territory ranges that will occasionally span river catchments. Due to their high mobility, otters associated with the Wicklow Mountains SAC could hold a territory that includes Vartry Reservoir and its surroundings.</p>
<p>Explain why these effects are not considered significant.</p>	<p>The site is connected to the Murrough Wetlands SAC via the River Vartry.</p> <p>The proposed construction techniques and the distance of 13.5km between the site and the SAC it concluded that there are no significant impacts on its Conservation Objectives.</p> <p>Elevated noise and vibration has the potential to have a disturbance effect on local otter populations during construction. Due to the small-scale nature of the disturbance and the timing of works during daylight periods only, the disturbance associated with the construction phase of the development is not considered to be significant.</p>
<p>List of agencies consulted: provide contact name and telephone or e-mail address.</p>	<p>Consultation is not required with the NPWS when a proposed project has been screened out.</p>
<p>Response to consultation.</p>	<p>N/A</p>
<p>Data Collected to Carry Out the Assessment</p>	
<p>Who carried out the assessment?</p>	<p>Paul Murphy and Nicholas O'Dwyer on behalf of IW</p>
<p>Sources of data</p>	<p>NPWS database; EPA database; WFD Ireland database; and Information from Irish Water.</p>
<p>Level of assessment completed</p>	<p>Desktop and Field walkover survey</p>
<p>Where can the full results of the assessment be accessed and viewed?</p>	<p>Wicklow County Council Planning Department</p>
<p>Overall Conclusion</p>	<p>Stage 1 Screening indicates that the upgrade of Vartry WTP and associated reservoir improvements will not have a significant impact on the Natura 2000 network and it can be excluded on the basis of scientific information. Therefore, a Stage 2 'Appropriate Assessment' under Article 6(3) of the Habitats Directive 92/43/EEC is not required.</p>