



Irish Water

VARTRY WATER SUPPLY UPGRADE PROJECT

VARTRY RESERVOIR AND WATER
TREATMENT PLANT UPGRADE
Additional Information Response



September 2016



IRISH WATER

VARTRY WATER SUPPLY PROJECT

VARTRY RESERVOIR AND WATER TREATMENT PLANT UPGRADE ADDITIONAL INFORMATION RESPONSE

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EXECUTIVE SUMMARY

The Vartry Water Supply Scheme was established in the 1860's and comprises the following elements:

- Vartry Impounding Reservoir
- Vartry Water Treatment Plant
- Vartry to Callowhill Tunnel
- Trunk Mains from Callowhill to Stillorgan
- Open drinking water reservoirs at Stillorgan

The scheme has operated successfully over the last 150 years serving large areas of Wicklow and south Dublin with potable drinking water and currently supplies an estimated 220,000 people.

In recent years some elements of the scheme have started to fail most notably the existing intake pipes from the dam, the existing slow sand filters at the treatment plant and the existing tunnel.

This planning application relates to the improvements needed to the existing intake and water treatment plant which will address:

1. Supply failure risk from the existing intake
2. Water quality concerns and supply failure risks at the water treatment plant

The upgrade works are essential if water supply is to be maintained within the region and this view is fully supported by both the Environmental Protection Agency (EPA) and the Health Services Executive (HSE) (see correspondence in Appendix 1).

The scheme works by capturing flows in the upper catchment of the River Vartry and storing them in the existing impounding reservoirs. When the reservoirs are full (about **40% of the time**) water 'spills' over a weir into the downstream channel. This generally occurs between November and April. For the remainder of the time the downstream flow comprises mainly of water released through the water treatment plant^a. This includes water used to drain down and start up filters, leakage and any overflows from the filters. The volume of discharge has historically ranged from zero flow during drought conditions, when water has been pumped back to the filters, to approximately 5MLD^b when back pumping has not been required.

The impounding reservoirs have had a controlling influence on the downstream reaches of the River Vartry since their construction over 150 years ago. The river currently enjoys 'Good'^c overall water quality status and the stretch of river immediately downstream of the plant has maintained a 'good/high' status since the EPA commenced water quality monitoring in 1978. The long established practice of releasing 0-5MLD immediately downstream of the plant has occurred during this timeframe (i.e. when a 'good/high' status has been maintained).

The existing filters are an aging asset with poor structural integrity and have been in decline for some time. The amount of water currently recorded in the discharge channel has increased significantly to between 10 to 15MLD of which approximately 10-13MLD is attributed to leakage. If left unaddressed leakage will continue to increase as the filters deteriorate further and clearly this is unsustainable, hence the need for the new plant.

^a Some local springs also contribute to the downstream flows but these reduce to zero or close to zero during extreme drought conditions

^b MLD – Megalitres per day

^c 'Good' Ecological Status, 'Good' physio-chemical status, 'good' nutrient enrichment status, 'High' chlorophyll status and 'High' macrophyte status resulting in an overall 'Good' water quality status as assessed by the EPA

Notwithstanding **Irish Water's** existing water abstraction rights, which do not require any compensation flow, Irish Water clarify that they will discharge a minimum flow of 5,000 m³/day downstream of the works when the new water treatment plant is constructed i.e. Irish Water will cease the practice of returning water to the filters by back pumping during drought conditions. This will lead to a significant improvement in the 95%ile and DWF estimate of zero when the lower reaches of the river need it the most.

Irish Water will also continue to engage with stakeholders along the river such as the IFI, EPA, Riparian Landowners and fishery interests to explore how other measures, such as the regular release of freshet flows and increased downstream flows when available, could be accommodated, while balancing the primary needs of water supply to over 220,000 customers.

Any water used as part of the treatment process will be appropriately treated prior to its release into the River Vartry. Strict discharge standards and corresponding treatment technology will be employed by Irish Water to ensure the quality of water released to the river meets the required Environmental Quality Standards (EQS). Monitoring equipment connected to alarms and automatic valves will ensure this water is monitored at all times and only water meeting the specified standards will be released to the river. In the unlikely event that the standard is not reached an automatic valve will shut off the discharge and downstream flows will be maintained by discharging water from the reservoir.

Irish Water is committed to ensuring the proposed improvement works will not have a negative impact on the environment and in particular the downstream reaches of the River Vartry. Irish Water are supportive of the re-establishment of a monitoring station at an appropriate location on the river and will continue to support the river basin management plan in partnership with other stakeholders along the river.

This report contains detailed responses to the Additional Information Request from the planning authority Wicklow County Council in relation to the proposed development at Vartry Water Treatment Site, Vartry, Roundwood, Co. Wicklow (refer Planning Register Reference 16/363). The responses are summarised below:

1. Appropriate Assessment

The existing dry weather flow at the water treatment plant is estimated at or close to zero. This is because water used in the plant has been pumped back to the filters during drought conditions. Irish Water clarify that they will discharge a minimum flow of 5,000 m³/day downstream of the works when the new water treatment plant is constructed i.e. Irish Water will cease the practice of returning water to the filters by back pumping during drought conditions.

It is proposed to provide additional treatment for the process water from the new plant, through the existing slow sand filters (or other appropriate treatment processes), such that any discharge water entering the river will in itself comply with the EQS.

The above measures will ensure there are no significant adverse impacts on the River Vartry. The Appropriate Assessment Screening Report has been updated and is attached to this response and concludes **"A Finding of No Significant Effects"**.

2. Additional Bat Surveys

Additional bat surveys have been completed as requested. The surveys did not find any bat roosts within the stone structures at Vartry Reservoir and Water Treatment Plant. Precautionary mitigation measures have been recommended to avoid potential disturbance to individual or small numbers of bats that may opportunistically roost in the structures on occasion.

3. Future Use of Existing Filter Beds 1 - 7

Irish Water clarify that the existing filter beds 1 to 7 will be retained as water features.

1 ADDITIONAL INFORMATION REQUEST

By way of letter dated 1st June 2016, Wicklow County Council requested the following information in order to fully assess the proposed development at Vartry Water Treatment Site, Vartry, Roundwood, Co. Wicklow (refer Planning Register Reference 16/363). A copy of the additional information request is included in Appendix 2.

1. *Having regard to the increase in the supernatant discharge to the Vartry River, the Planning Authority considers that further information is required with respect to the assimilative capacity of the Vartry to fully assess the impact of this discharge, and to allow the Planning Authority to screen the development for Appropriate Assessment. Accordingly you should submit the following information*

i. Submit flow readings/estimates for dry weather flow at the discharge location when maximum daily abstractions are occurring at the proposed water treatment plant. This flow figure should take account of any water leaking from old filters, sluices or weirs to the river, after the proposed upgrade. It should also take account of any minimum compensatory flows proposed to ensure that adequate assimilative capacity exists in the Vartry River.

ii. Clarify what the maximum Total Chlorine concentration of the treated wastewater will be during normal operation and after maintenance and any scouring.

iii. Clarify the concentration of Aluminium in the receiving water downstream of the proposed at the proposed concentration of 2mg/l at 4000m³/day, and compare to any available Environmental Quality Standards or guide values for surface waters and salmonid fish.

iv. Clarify what tributary, referred to in the application, joins the Vartry River 300m downstream of the proposed discharge location and clarify what extra assimilation this will give to the proposed discharge. Please note that the nearest mapped tributary downstream of the proposed discharge appears to be the Tomdaragh tributary, (1.2 km downstream).

v. The applicant should clarify what the impact would be on the abstraction and quality of raw water for the Wicklow Regional Public Water Supply downstream of Annagolan Bridge.

vi. The applicant should submit a revised waste assimilative capacity assessment to include any pertinent parameters taking account any discharges in the river flow at the points of discharge.

Note where the information shows that significant impacts cannot be screened out a Natura Impact Statement may be required.

2. *The bat survey submitted indicate no records for Daubentons bats, it is unclear if stone structures were surveyed for Daubenton roost which are*

present in high numbers on the Vartry system. Further bat surveys must be undertaken of these structures to ascertain whether they contain roosts, and appropriate measures to deal with any such findings.

3. *It is noted that the reports submitted indicate that whilst filter beds 1-7 will be retained their longterm retention may not be feasible from an operations point of view. This matter should be clarified, and the Landscape and Visual Affects report should be amended to have full regard to the filling in of these elements if this is to be carried out. Please note the Planning Authority consider that the retention of the filter beds should be pursued as they are important in reflecting the history of the lands, and the public's understanding of the site.*

Furthermore your response to this item may be relevant to your response to Item 1 given the existing leakage from filter beds 1-7.

A detailed response to the above is contained in the following sections.

SECTION 3 RESPONSE ON ASSIMILATIVE CAPACITY

SECTION 4 RESPONSE ON ADDITIONAL BAT SURVEY

SECTION 5 RESPONSE ON FUTURE USE OF EXISTING FILTER BEDS 1 - 7

2 RESPONSE ON ASSIMILATIVE CAPACITY

2.1 Additional Information Request

1. *Having regard to the increase in the supernatant discharge to the Vartry River, the Planning Authority considers that further information is required with respect to the assimilative capacity of the Vartry to fully assess the impact of this discharge, and to allow the Planning Authority to screen the development for Appropriate Assessment. Accordingly you should submit the following information*

i. *Submit flow readings/estimates for dry weather flow at the discharge location when maximum daily abstractions are occurring at the proposed water treatment plant. This flow figure should take account of any water leaking from old filters, sluices or weirs to the river, after the proposed upgrade. It should also take account of any minimum compensatory flows proposed to ensure that adequate assimilative capacity exists in the Vartry River.*

ii. *Clarify what the maximum Total Chlorine concentration of the treated wastewater will be during normal operation and after maintenance and any scouring.*

iii. *Clarify the concentration of Aluminium in the receiving water downstream of the proposed at the proposed concentration of 2mg/l at 4000m³/day, and compare to any available Environmental Quality Standards or guide values for surface waters and salmonid fish.*

iv. *Clarify what tributary, referred to in the application, joins the Vartry River 300m downstream of the proposed discharge location and clarify what extra assimilation this will give to the proposed discharge. Please note that the nearest mapped tributary downstream of the proposed discharge appears to be the Tomdaragh tributary, (1.2 km downstream).*

v. *The applicant should clarify what the impact would be on the abstraction and quality of raw water for the Wicklow Regional Public Water Supply downstream of Annagolan Bridge.*

vi. *The applicant should submit a revised waste assimilative capacity assessment to include any pertinent parameters taking account any discharges in the river flow at the points of discharge.*

Note where the information shows that significant impacts cannot be screened out a Natura Impact Statement may be required.

2.2 Flow and Quality Assessment

i. *Submit flow readings/estimates for dry weather flow at the discharge location when maximum daily abstractions are occurring at the proposed water treatment plant. This flow figure should take account of any water leaking from old filters, sluices or weirs to the river, after the proposed upgrade. It should also take account*

of any minimum compensatory flows proposed to ensure that adequate assimilative capacity exists in the Vartry River.

2.2.1 Existing Dry Weather Flow estimate at the discharge location

The previous flow estimates downstream of the water treatment plant were calculated using the EPA Hydro-Tool. Given the heavily modified characteristic of the existing catchment this has proved unreliable. A detailed hydrological assessment of flows in the River Vartry has now been undertaken and is included in Appendix 3. The findings of that assessment are summarised hereunder.

A simplified schematic layout of the plant is illustrated in Figure 2-1 below.

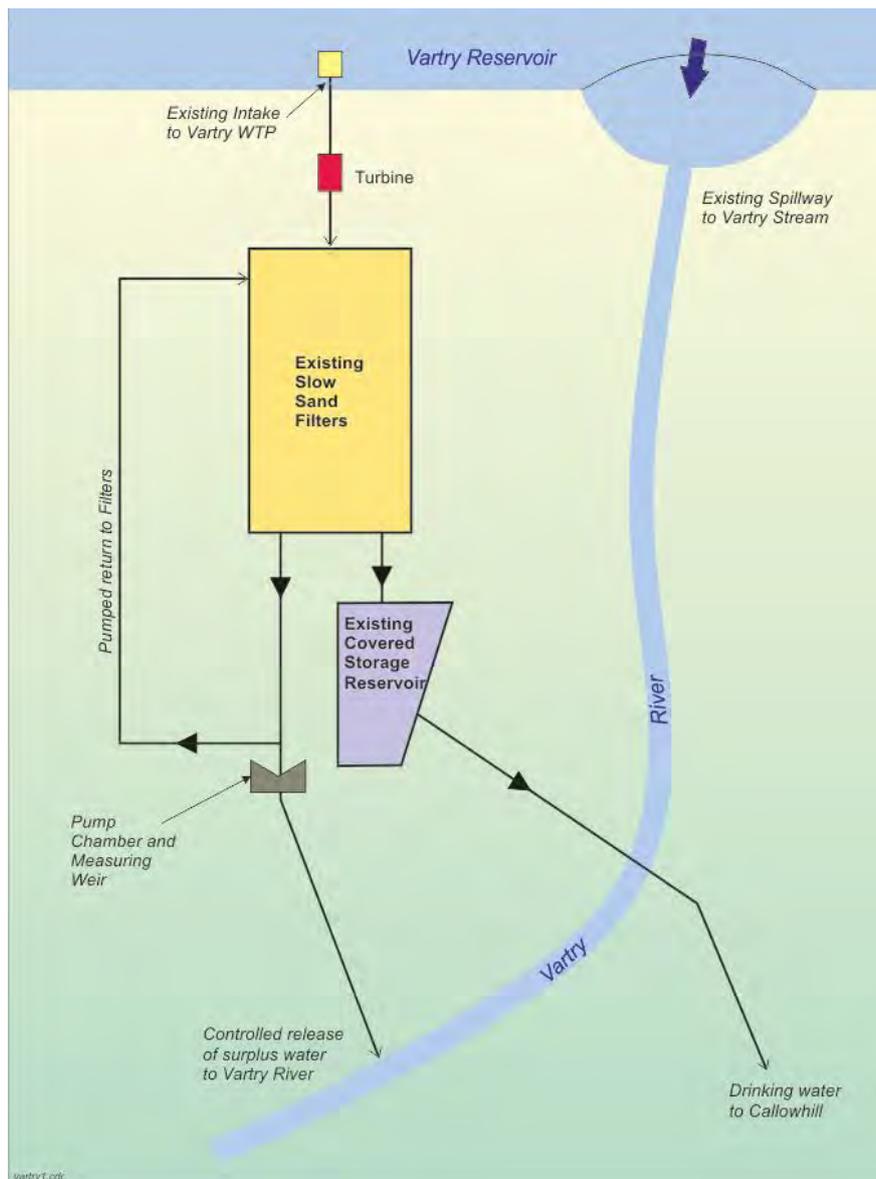


Figure 2-1 Schematic Layout of Vartry Water Treatment Plant

When the reservoir is not spilling the flow immediately downstream of the plant is predominately made up of releases from the plant. This release consists of water used to drain down and start up filters during the washing cycle and overflows and leakage through the filters. The release of water from the WTP has been recorded at a measuring weir since 1988. A graph illustrating the flow through the weir is presented in Figure 2-2 below.

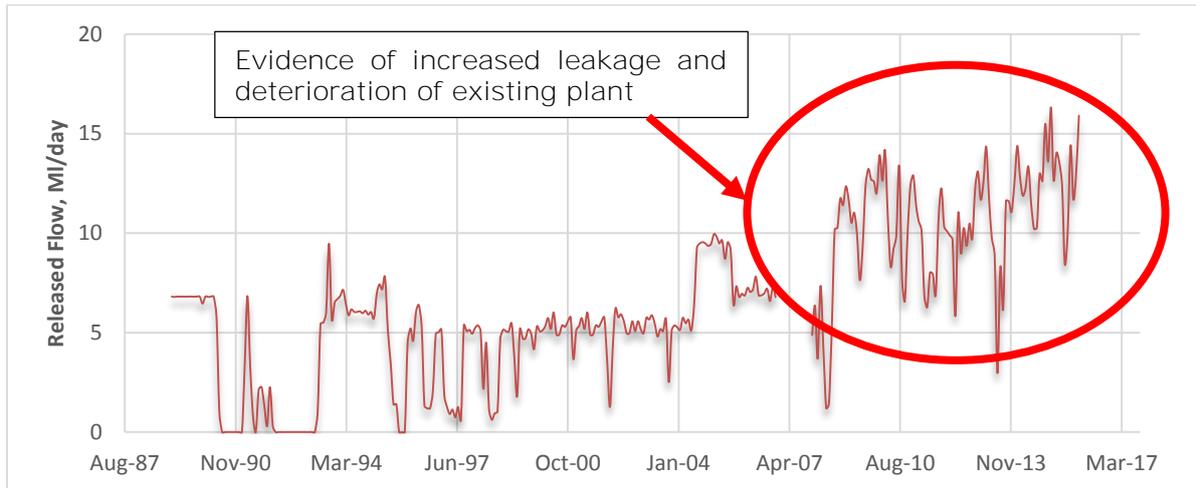


Figure 2-2 Measured Monthly Average Flows from the WTP to the Vartry River from 1988^d to 2016

There may be other losses through the plant/reservoir from seepage or leaks not recorded in the measuring weir. However, these are considered minor in nature and insignificant during drought conditions (refer to the “River Vartry Hydrological & Water Quality Report”).

Based on the records illustrated above the established normal release from the plant to the River Vartry is between zero and circa 5MLD. The average recorded between 1988 and 2007 is 4.6MLD and this is the reported normal practice extending back to the **1920’s when the second impounding reservoir** was completed. Water has been pumped back to the filters when required, such as the summers of 1990 and 1995 when all water was returned to the filters.

The existing filters are an aging asset with poor structural integrity and have been in decline for some time. The amount of water currently recorded in the leakage channel has increased significantly to between 10 to 15MLD of which approximately 10-13MLD is attributed to leakage. Clearly this is unsustainable and if left unaddressed leakage will continue to increase as the filters deteriorate further.

The water released from the plant since 2008 has increased due to a number of factors:

- Works carried out between 2006 and 2008 when new filters, pipework and a covered storage reservoir were installed resulting in increased leakage from the existing filters to the drainage collection channel;
- The continued deterioration of the structural integrity of the existing slow sand filters means that more and more water is leaking into this collection channel. This is illustrated in the upward trend of the graph in recent years and is one of the reasons why the new Treatment Plant is required.
- In recent **years’** reservoir levels have remained relatively high, as no significant drought has occurred, and returning water to the filters by back pumping has not been a major consideration.

The average release for the period 2008 to 2015 (there were no records for 2007) has increased to 10.5MLD. It is worth noting however that even with the increased leakage, considerable flows have been returned to the works, with the corresponding reduction in release water, when deemed necessary. This occurred most noticeably in 2008 and 2013 as illustrated above where reduced flows of approx. 1.2 and 3MLD respectively were released.

^d No records from 1868 to 1988

In addition to the above releases, water also flows into the River Vartry over the reservoir spillway when the reservoir is full as illustrated in Figure 2-3 below. These flows have been estimated using the change in storage volumes in Vartry Reservoir with an allowance for water used in the treatment plant.

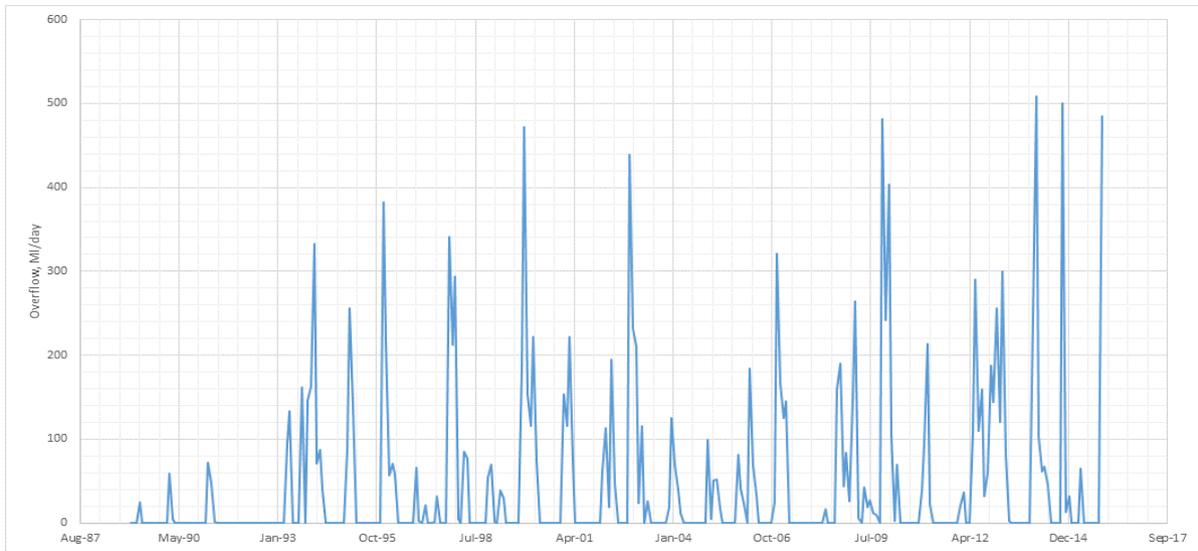


Figure 2-3 - Flows from the reservoir to the Vartry River from 1988 to 2016

A flow duration curve (FDC) for the Vartry River immediately downstream of the plant has been generated using the data contained in Figure 2-2 and Figure 2-3 as illustrated in Figure 2-4 below.

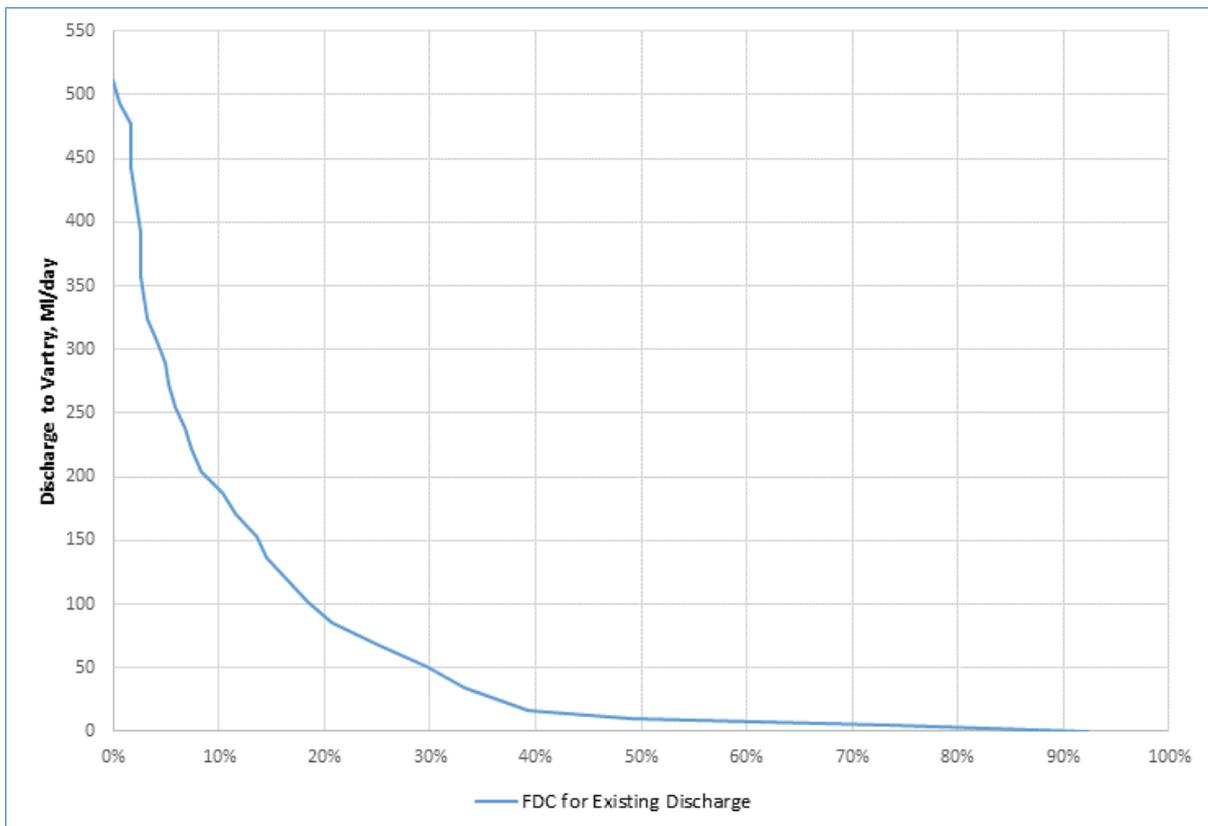


Figure 2-4 Flow Duration Curve immediately downstream of the plant

The above graph illustrates there have been times (approximately 8% of the time) when no flows were released downstream of the water treatment plant. Therefore, flows downstream only arise 92% of the time. Accordingly, the existing 95%ile and Dry Weather Flow^e is estimated as zero.

2.2.2 Predicted Dry Weather Flow estimate at the discharge location

Following completion of the new water treatment plant water will continue to spill from the reservoir when it is full and releases will continue from the plant as part of the treatment process. It is estimated that the water released from the new plant following treatment will be in the region of 5,000m³/day. It is not proposed to pump this water back to the plant during drought conditions as has happened previously.

A predictive FDC has been generated to demonstrate the projected change in the flow regime of the river following completion of the works as illustrated in Figure 2-5 below. The low flow range has been magnified to highlight the proposed change.

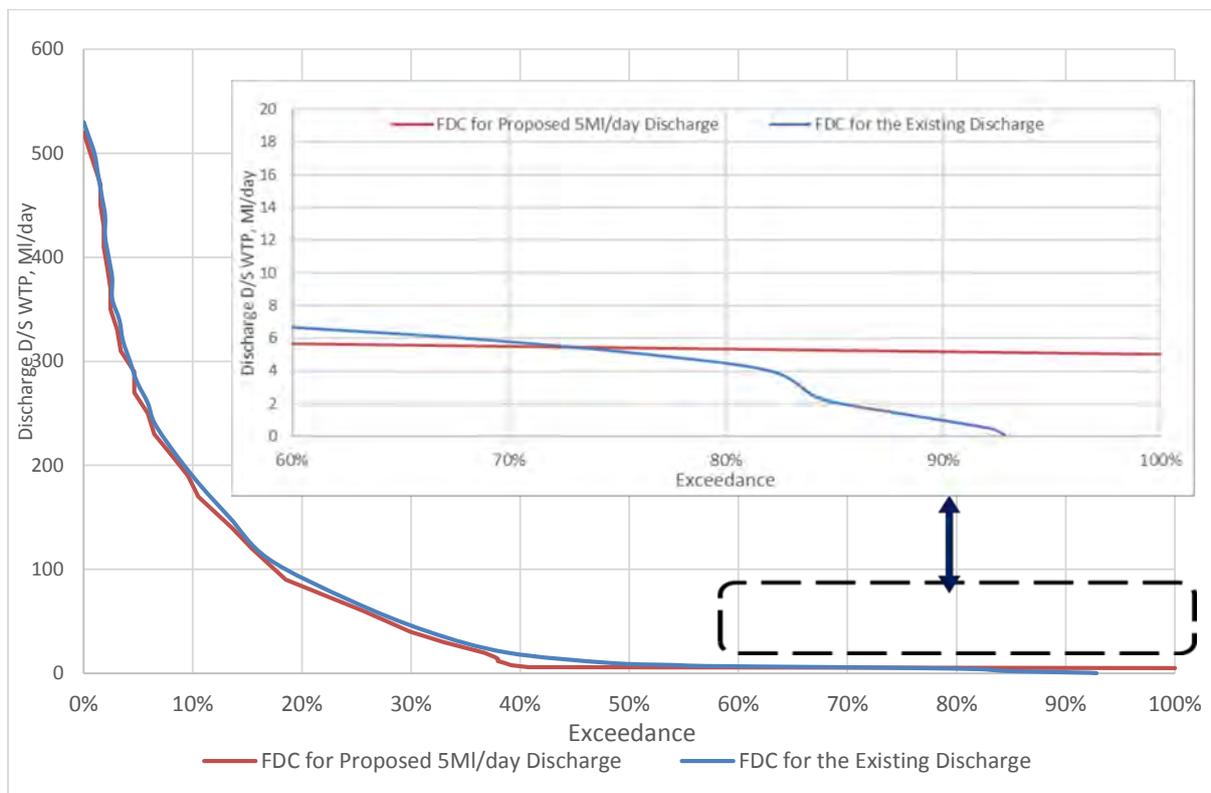


Figure 2-5 Projected Flow Duration Curve immediately downstream of the plant

As illustrated above there will be an increase in downstream flows above the 73%ile interval (i.e. statistically 27% of the time) when it is most needed in the downstream reaches and this will have a significant hydrological benefit to the river.

2.2.3 Other Flows in the River Vartry

A more detailed analysis on other flows within the Vartry Catchment is included in the hydrological report (Appendix 3), particularly at Devils Glen and Ashford Weir.

^e Dry Weather Flow is a term used to describe low flows and is defined by the EPA as the annual minimum daily mean flow rate with a return period of 50 years (i.e. statistically the flow that occurs at the 98%ile interval)

A Flow Duration Curve has been estimated at Devils Glen based on data between 1952-1979^f as illustrated in Figure 2-6 hereunder. This estimates the existing 95%ile and dry weather flow at 3,000 m³/day and 1,600 m³/day respectively.

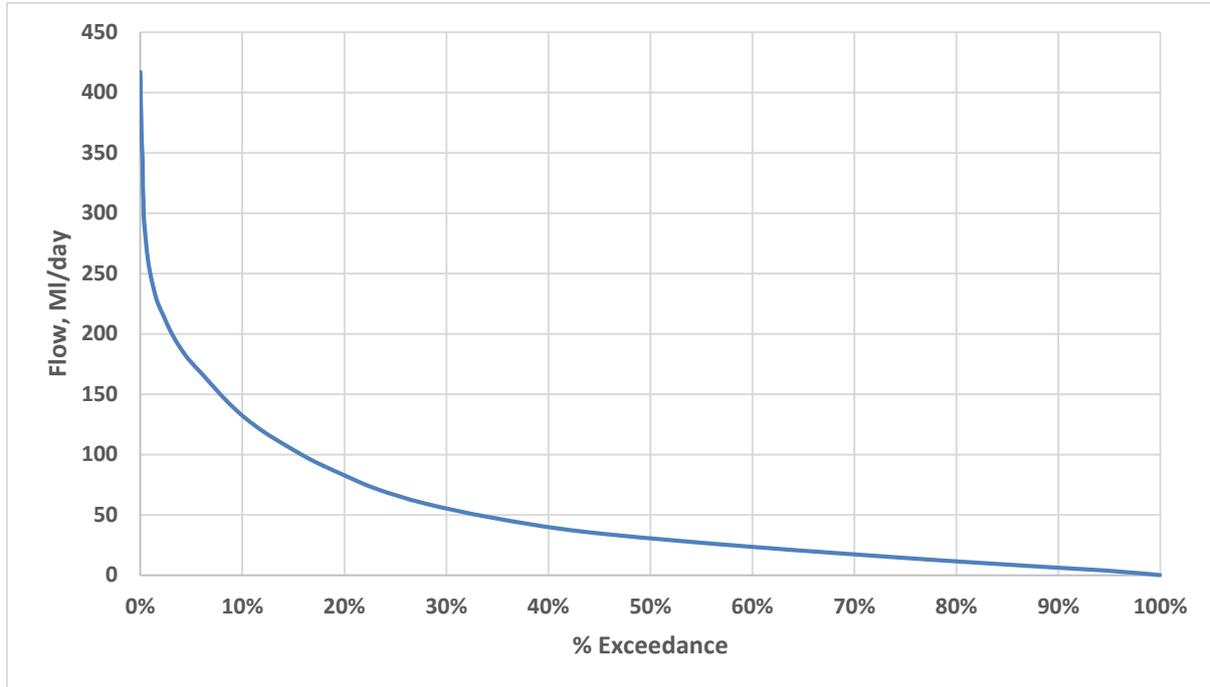


Figure 2-6 Existing Flow Duration Curve at Devils Glen

When the proposed works are completed and a minimum flow of 5,000 m³/day is released at all times downstream of the works these low flows will be expected to increase to c8,000m³/day and 6,600m³/day respectively and have a similar significant improvement to the river low flows as illustrated in Figure 2-7 below.

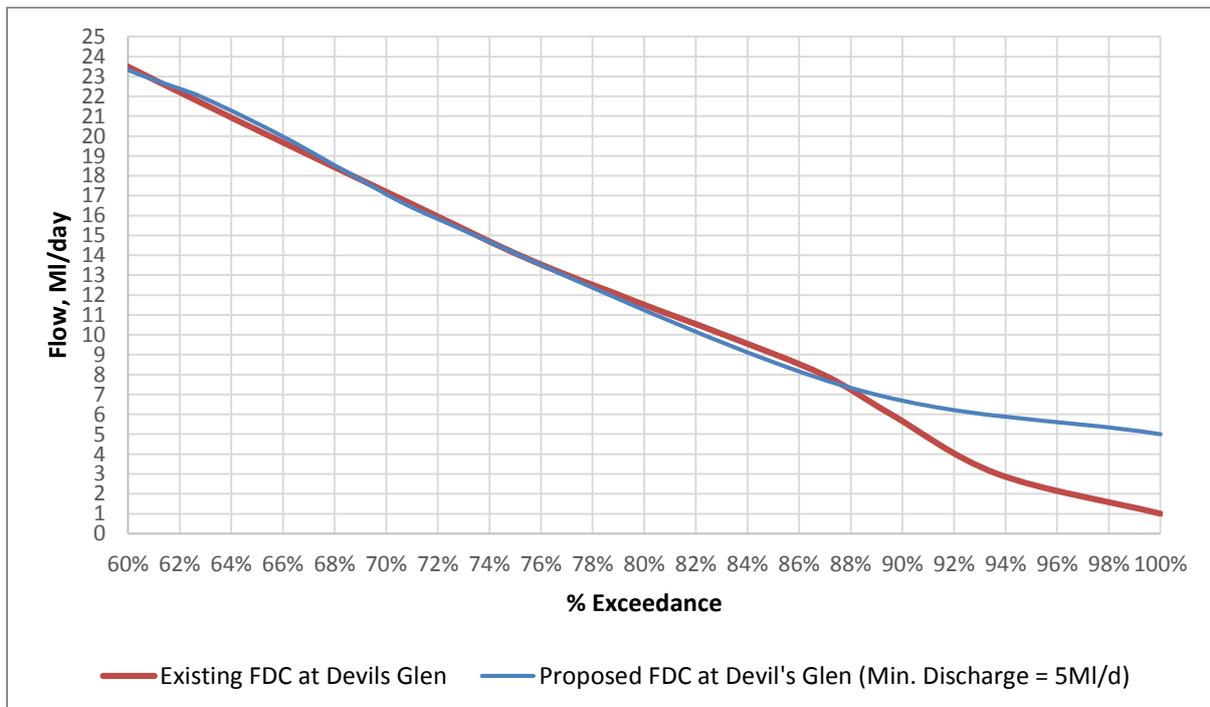


Figure 2-7 Predicted Flow Duration Curve at Devils Glen

^f The gauge was discontinued after 1979

In 1995 a low flow of 35l/s (approximately 3,000m³/day) was recorded by the EPA at Ashford Weir when it is estimated there was no flow downstream of the plant. This is regarded as an extremely dry summer flow with very low flows being recorded in rivers throughout Ireland. Under the current proposals, and in similar drought conditions, this flow would increase significantly to approximately 8,000m³/day and would be a significant benefit to the low flow conditions in the river.

2.2.4 Summary on Hydraulic Conditions in the River Vartry

Notwithstanding their existing water abstraction rights, which do not require any compensation flow, Irish Water clarify that they will discharge a minimum flow of 5,000 m³/day downstream of the works when the new water treatment plant is constructed i.e. Irish Water will cease the practice of back pumping during drought conditions. While this is less than the estimated existing leakage through the filters it represents a significant improvement in the existing 95%ile and DWF estimate of zero when the lower reaches of the river need it the most.

Irish Water will also continue to engage with stakeholders along the river such as the IFI, EPA, Riparian Landowners and fishery interests to explore how other measures, such as the regular release of freshet flows and increased downstream flows when available, could be accommodated while balancing the primary needs of water supply to over 220,000 customers.

2.2.5 Quality Assessment of Proposed Treated Process Water returns

The River Vartry downstream of the works at Annagolan Bridge has been classified as having good or good/high quality classification since the EPA records began in 1978 as summarised below.

Table 2-1 EPA Biological Monitoring Records for Annagolan Bridge, River Vartry

Site ID: 10V010100	
Year	Q Value
1978	5
1982	4-5
1986	5
1990	4-5
1994	4
1997	4
2000	4-5
2003	4
2006	4-5
2009	4
2012	4*
2015	4

Q Value Classifications: 4 – Good; 4 - Good; 4-5 – High; 5 - High*

This period includes time when the quantity of water released through the existing plant was between 0 and 5MLD as outlined previously in Section 2. On this basis, the proposed flow regime of at least 5MLD downstream of the plant will ensure the hydraulic conditions to 'Protect' this status will be maintained.

It will also be necessary however to ensure the quality of discharge is such that these standards can be maintained. There will be times when little or no dilution is available for treated process water prior to its discharge to the River Vartry. Accordingly, additional

treatment from that normally provided at water treatment plants will be required. While the provision of this treatment will from part of the Design and Build contract for the new works, an assessment of using the existing slow sand filters as an additional treatment stage has demonstrated that the necessary standards are readily achievable.

A detailed assessment of the quality of treated process water returns is contained in the "River Vartry Hydrological & Water Quality Report" (refer to Appendix 3). This includes a comparison of the treated process water with the existing water quality at Vartry Reservoir and Annagolan Bridge, Environmental Quality Standards (EQS) and Salmonid Regulations for key water quality parameters as summarised in Table 2-2 below.

Table 2-2 Background Concentration, Discharge Quality and EQS

Parameter	Discharge Conc. Post SSF (95% ile)	Background Conc. (95% ile)*	EQS (Good)	EQS (High)
Turbidity, NTU	<1.0 NTU	4.4	N/A	N/A
TSS, mg/l	1.4	<5 (8)	<=25	<=25
BOD ₅	0.75	<1, (1.4)	<1.5 (mean) or 2.6 (95%)	<1.2 (mean) or 2.2 (95%)
Total Ammonia, mg/l	0.026	0.04, (0.031)	<0.065(mean) or 0.14 (95%)	<=0.040 (mean) or <=0.090 (95%ile)
**Total Phosphorus, mg/l	0.01	N/A	N/A	N/A
MRP, mg/l	N/A	<0.01, (0.011)	0.035 mean or 0.075 (95%)	<=0.025 (mean) or <=0.045 (95%ile)
Total Aluminium	0.017	0.038	N/A but 0.2 applied	N/A but 0.2 applied

* Values in brackets are for Annagolan Bridge, other values are Vartry Reservoir

**Total Phosphorus includes dissolved and particulate forms of Phosphorus. MRP is predominately dissolved phosphorus which is bio available for plant uptake. The anticipate MRP levels in the final water will be significantly less than the total phosphorus levels and therefore there are no anticipated difficulties meeting the required standard

The results demonstrate that the treated process water will in itself comply with the EQS standards. Accordingly, there will not be a significant effect on water quality downstream of the works.

Water quality monitors fitted with appropriate alarms shall be installed on the outlet from the washwater settlement tanks and in the outlet chamber to the River Vartry. Alarm levels shall be set to alert operatives if the water quality is approaching the specified limit so appropriate pre-emptive action can occur in a timely fashion. Emergency shut off valves shall also be installed in the unlikely event of quality levels being exceeded. This will ensure that the treated process water complies with the necessary standards.

In the unlikely event that the discharge standards are not met by the treated process water it will not be discharged to the river. In such circumstances a minimum flow of 5,000 m³/day will still be discharged through the plant by diverting water from the reservoir through the reservoir pipework into the downstream river.

2.2.6 Summary

Notwithstanding Irish Water’s existing water abstraction rights, which do not require any compensation flow, Irish Water clarify that they will discharge a minimum flow of 5,000 m³/day downstream of the works when the new water treatment plant is constructed i.e. Irish Water will cease the practice of returning water back to the filters by back pumping

during drought conditions. This is a significant improvement in the 95%ile and DWF estimate of zero when the lower reaches of the river need it the most.

Irish Water will also continue to engage with stakeholders along the river such as the IFI, EPA, Riparian Landowners and fishery interests to explore how other measures, such as the regular release of freshet flows and increased downstream flows when available, could be accommodated, while balancing the primary needs of water supply to over 220,000 customers.

Any water used as part of the treatment process will be appropriately treated prior to its release into the River Vartry. Strict discharge standards and corresponding treatment technology will be employed by Irish Water to ensure the quality of water released to the river meets the required Environmental Quality Standards (EQS). Monitoring equipment connected to alarms and automatic valves will ensure this water is monitored at all times and only water meeting the specified standards will be released to the river. In the unlikely event that the standard is not reached an automatic valve will shut off the discharge and downstream flows will be maintained by discharging water from the reservoir.

Irish Water is committed to ensuring the proposed improvement works will not have a negative impact on the environment and in particular the downstream reaches of the River Vartry. Irish Water are supportive of the re-establishment of a monitoring station at an appropriate location on the river and will continue to support the river basin management plan in partnership with other stakeholders along the river.

2.3 Chlorine Concentrations

ii. Clarify what the maximum Total Chlorine concentration of the treated wastewater will be during normal operation and after maintenance and any scouring.

2.3.1 Response

It is not proposed to discharge any chlorinated water into the River Vartry. Any water used in the filter backwash operation would be taken from the treatment stream prior to chlorination. In the event that chlorine products are used as an oxidizing agent in the treatment process water would be dechlorinated prior to discharge.

Any water used in periodic cleaning or scouring of pipework or reservoirs during maintenance would be dechlorinated prior to discharge. Irish Water are aware of the risks associated with discharging chlorinated water to surface water streams and have developed Safe Operating Procedures (SoPs) for all operation activities throughout the water network to ensure these risks are mitigated. A copy of these procedures is available on request.

2.4 Aluminium Concentrations

iii. Clarify the concentration of Aluminium in the receiving water downstream of the proposed at the proposed concentration of 2mg/l at 4000m³/day, and compare to any available Environmental Quality Standards or guide values for surface waters and salmonid fish.

2.4.1 Response

Aluminium is not listed as a parameter in the Salmonid Regulations nor is it listed in the Environmental Quality Standards (EQS) for surface waters. The latest review paper for

UKTAG1 (in support of setting EQS for surface waters for the WFD) concluded that there was insufficient information to derive standards for Aluminium⁹ in surface waters.

The Parametric Value under the existing Drinking Water Regulations is 0.2 mg/l and we have examined the option of adopting a precautionary approach and applying the drinking water standard to the aluminium concentration in the treated process water returns as there will be times when no dilution will be present in the receiving water.

As outlined previously the process water used in the new plant will be treated in settlement tanks and the existing slow sand filters prior to discharge to the river. Because of the high removal efficiencies of slow sand filters (refer to the Hydrological and Water Quality Report in Appendix 3) the anticipated concentration in the treated process water returned to the river is estimated at less than the drinking water standard of 0.2mg/l.

Accordingly, it is now proposed to take a precautionary approach and adopt a limiting concentration of 0.2mg/l Aluminium in the treated process water returns.

2.5 Downstream Tributary

iv. Clarify what tributary, referred to in the application, joins the Vartry River 300m downstream of the proposed discharge location and clarify what extra assimilation this will give to the proposed discharge. Please note that the nearest mapped tributary downstream of the proposed discharge appears to be the Tomdaragh tributary, (1.2 km downstream).

2.5.1 Response

There is a small unnamed tributary immediately downstream of the plant and not 300m downstream of the proposed discharge location (this was an incorrect reference). It has been assumed that this tributary will not contribute in any meaningful way to the assimilative capacity of the river.

2.6 Wicklow Regional Public Water Supply

v. The applicant should clarify what the impact would be on the abstraction and quality of raw water for the Wicklow Regional Public Water Supply downstream of Annagolan Bridge.

2.6.1 Response

It is Irish Water's intention to rationalise the Wicklow Region WSS and supply it entirely from Vartry WTP once the upgrade works are complete. The need to maintain the Cronroe Supply at present is because of the existing security of supply difficulties from Vartry at times of algal blooms.

When the upgrade works are complete at Vartry WTP, Irish Water plan to rationalisation the Cronroe supply by maintaining the existing reservoir at Cronroe and serving it from the upgraded Vartry Water Treatment Plant. This in time will eliminate the need for the existing abstraction at Annagolan Bridge and increase low flows in the river further downstream.

⁹ <http://www.wfduk.org/sites/default/files/Media/Environmental%20standards/UKTAG%20Environmental%20Standards%20Phase%203%20Final%20Report%2004112013.pdf>

The existing abstraction at Annagolan Bridge is estimated at 50m³/hr or approximately 1,200m³/day and once this abstraction ceases it will add a further contribution to the baseflow in the river downstream of Annagolan Bridge. This beneficial impact has not been included in the hydrological estimates outlined earlier and once this abstraction ceases will increase the DWF estimates as follows:

Location	Existing DWF	Post Works DWF	DWF after Annagolan Bridge Abstraction ceases
	m ³ /day	m ³ /day	m ³ /day
Devil's Glen	1,600	6,600	7,600
Ashford Weir	3,000	8,000	9,000

However, these improvements can only be realised if the proposed upgrade proceeds.

2.7 Waste Assimilative Capacity

vi. The applicant should submit a revised waste assimilative capacity assessment to include any pertinent parameters taking account any discharges in the river flow at the points of discharge.

2.7.1 Response

The previous waste assimilative capacity (WAC) assessment was based on the EPA Hydro-Tool to estimate 95%ile flows in river catchments. However, following a detailed assessment of the particular hydrological conditions in the River Vartry this has proved unreliable.

When water is not spilling over the reservoir there are times when the flow in the river upstream of the discharge location will be at or close to zero. Additional treatment will be provided by the existing slow sand filters or other appropriate technology to ensure the treated process water meets the necessary EQS. An updated waste assimilative capacity assessment has been carried out based on the updated data as summarised in Table 2-2 and repeated below.

Table 2-3 Background Concentration, Discharge Quality and EQS

Parameter	Discharge Conc. Post SSF (95% ile)	Background Conc. (95% ile)*	EQS (Good)	EQS (High)
Turbidity, NTU	<1.0 NTU	4.4	N/A	N/A
TSS, mg/l	1.4	<5 (8)	<=25	<=25
BOD ₅	0.75	<1, (1.4)	<1.5 (mean) or 2.6 (95%)	<1.2 (mean) or 2.2 (95%)
Total Ammonia, mg/l	0.026	0.04, (0.031)	<0.065(mean) or 0.14 (95%)	<=0.040 (mean) or <=0.090 (95%ile)
**Total Phosphorus, mg/l	0.01	N/A	N/A	N/A
MRP, mg/l	N/A	<0.01, (0.011)	0.035 mean or 0.075 (95%)	<=0.025 (mean) or <=0.045 (95%ile)
Total Aluminium	0.017	0.038	N/A but 0.2 applied	N/A but 0.2 applied

* Values in brackets are for Annagolan Bridge, other values are Vartry Reservoir

**Total Phosphorus includes dissolved and particulate forms of Phosphorus. MRP is predominately dissolved phosphorus which is bio available for plant uptake. The anticipate MRP levels in the final water will be significantly less than the total phosphorus levels and therefore there are no anticipated difficulties meeting the required standard

The results anticipate that the treated process water will in itself comply with the EQS standards and it is therefore proposed to apply the EQS High Status Standard to the proposed discharge.

Water quality monitors fitted with appropriate alarms shall be installed on the outlet from the washwater settlement tanks and in the outlet chamber to the River Vartry. Alarm levels shall be set to alert operatives if the water quality is approaching the specified limit so appropriate pre-emptive action can occur in a timely fashion. Emergency shut off valves shall also be installed in the unlikely event of quality levels being exceeded. This will ensure that the treated process water complies with the necessary standards.

In the unlikely event that the discharge standards are not met by the treated process water it will not be discharged to the river. In such circumstances a minimum flow of 5,000 m³/day will still be discharged through the plant by diverting water from the reservoir through the reservoir pipework into the downstream river.

The Appropriate Assessment Screening Report has been updated and is attached to this response (refer to Appendix 4) and concludes "***A Finding of No Significant Effects***".

3 RESPONSE ON ADDITIONAL BAT SURVEY

3.1 Additional Information Request

2. *The bat survey submitted indicate no records for Daubentons bats, it is unclear if stone structures were surveyed for Daubenton roost which are present in high numbers on the Vartry system. Further bat surveys must be undertaken of these structures to ascertain whether they contain roosts, and appropriate measures to deal with any such findings.*

3.2 Additional Information Response

3.2.1 Introduction

A number of additional Bat Surveys were carried out at the subject site. The results of these surveys are included in Appendix 4 and summarized hereunder.

3.2.2 Methodology

Daytime Inspection

A daytime inspection of the was carried out on 15th June 2016 in accordance with *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). A ladder and powerful torch were used to inspect internal and external features for use by bats.

Automated Detector Survey

Anabat Express bat detectors (Titley Scientific) were placed underneath each arch of the road bridge 30/06/16 – 01/07/16 and the interior and exterior of the Intake tower 29/07/16 – 30/07/16. Survey methods were in accordance with Section 8.2 of *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Sonograms from the automated detectors were obtained in the 'zero-crossing' format and viewed using AnalookW software (Corben 2014). Species were identified with reference to *British Bat Calls: A Guide to Species Identification* (Russ 2012), based primarily on frequency and call shape, but occasionally with reference to call slope for *Myotis* spp. Social calls were classified as unidentified bats unless they closely matched the examples provided in Russ (2012).

Emergence / Re-entry Surveys

A manned evening emergence survey (29th June 2016) and dawn re-entry survey (8th July 2016) were carried out at the Road Bridge and a dawn re-entry survey was carried out at the Intake Tower (4th August 2016) by two experienced Ecologists to confirm the presence or likely absence of roosting bats. The surveyors were equipped with an ultrasonic bat detector (Batbox Duet and EM3) and a digital file recorder (Zoom H1 Recorder) for later analysis. The surveyors recorded all bat activity, but particularly focussed their attention on whether bats emerged or re-entered the structures. The surveyors documented the results by noting the time, bat species and behaviour. The surveyors had good lines of sight for bat surveying and it is highly unlikely that even quietly echolocating bats were missed. The emergence survey commenced at least 15 minutes prior to sunset and continued for at least 2 hours. Both dawn surveys commenced at least 1.75 hours before sunrise and finished at sunrise. All surveys were carried out at suitable times of year and during suitable weather to record bat activity: no rain, no strong wind and air temperatures above 8°C.

3.2.3 Results

Road Bridge

The Road Bridge was found to have high suitability as a bat roost, with a large number of deep crevices of varying sizes within the brickwork of all three arches. Some crevices appeared to be internally wet which reduced their suitability as a roost.

During the automated detector survey five bat species were recorded including soprano pipistrelle, common pipistrelle, **Leisler's bat**, brown long-eared bat and **Daubenton's bat**. **A total of 35 passes from Daubenton's bat were recorded and activity was concentrated** in the middle of the night with minimal activity at dawn, suggesting that a roost was unlikely. There was slightly higher soprano and common pipistrelle activity at dawn, although only 10-20 calls over a 30 minute period, which is likely to represent one or two bats.

During the evening emergence survey, one soprano pipistrelle was recorded soon after sunset (in full daylight) suggesting a nearby roost, but no bats were observed emerging from the structure. No bats were observed entering the bridge during the dawn re-entry survey. **A single Daubenton's bat briefly investigated a crevice but did not enter.** Based on the results of the emergence / re-entry survey, backed up by the Anabat survey, there was no evidence of a maternity roost in the bridge. There was a suggestion that **single soprano pipistrelle or Daubenton's bat could roost opportunistically in the western arch**, but there was no concrete evidence of a roost. The bridge would be suitable for hibernating bats in winter months, but this could not be confirmed at the time of survey. No impacts are predicted at this stage, but there could be impacts if bats were present at the time of works. However, impacts would probably be limited to single bats, so unlikely to be significant.

Valve House

Externally, the Valve House was in a good state of repair and the stonework did not contain any crevices that might provide opportunities for roosting bats. The interior was easily accessible for bats as the door is routinely left open. The main room is very light and did not contain any crevices or cavities that could be used by crevice dwelling bat **species such as Daubenton's bat. A tunnel extends from the main room and has low light levels but does not contain any cracks or cavities that would provide suitability as a roost.** No evidence of bats (droppings, feeding remains etc.) was recorded during the survey. The internal tunnel was considered potentially suitable for free-hanging bat species such as brown long-eared bats as a hibernation roost during winter. However, the Valve House is in constant use throughout the year which may deter bats from roosting.

Further surveys were not considered necessary as the absence of suitable roosting locations and lack of field signs indicate that the Valve House is not used as a summer roost.

Intake Tower

Internally, the Intake Tower was very light and draughty and was not considered suitable for roosting bats. The external stonework contained numerous cracks where mortar had degraded which provided potential features for individual or small numbers of crevice roosting bat species such as pipistrelle sp., or **Daubenton's bat**.

During the automated detector survey there was a relatively high level of activity with **780 bat passes recorded from five species.** The species recorded included **Leisler's bat, common pipistrelle, soprano pipistrelle, Daubenton's bat and brown long-eared bat.** The most frequently recorded species was soprano pipistrelle but common pipistrelle, **Leisler's and Daubenton's bat also showed relatively high levels of activity.** No bats were recorded in the 30 minute period after sunset or before sunrise. The last Daubenton's

bat was recorded 2 hours before sunrise suggesting that a roost within the structure is **unlikely. There was very little Leisler's activity for most of the night, but it increased to** about 55 passes in the last one hour before dawn which indicates individuals foraging above the reservoir before returning to a roost nearby.

During the dawn re-entry survey four bat species were recorded including common pipistrelle, soprano pipistrelle, Leisler's bat and Daubenton's bat. **There was a high level** of foraging activity from both common pipistrelle and soprano pipistrelle between 04:00 and 05:00, although no pipistrelle sp. were recorded after 05:00, well before sunrise. **Leisler's bat were frequently recorded foraging high above the reservoir between 04:00** and 05:00, but none were observed flying close to the Intake Tower, ruling out the **possibility of a roost for this species. Two passes for Daubenton's bat were recorded** between 04:10 and 04:20 which were observed foraging close to the reservoir surface. No bats were observed investigating or entering any of the crevices within the Intake Tower and it can be concluded that no bats were roosting within the structure at the time of the survey.

3.2.4 Mitigation

Road Bridge

No bats were observed emerging or entering the bridge structure during the surveys and, as such, the presence of a maternity roost (breeding site) can be ruled out. Male and non-breeding female bats are transient animals that can use multiple roosts through the active (summer) period. Therefore, there is potential that individuals or small numbers of bats may opportunistically use the bridge as a roost on occasion. A pre-construction survey is recommended to determine whether bats are present at the time of works. As no maternity roost was identified there is no requirement for timing restrictions of the construction works. Construction methods should avoid lighting after dusk, because the bridge and spillway was identified as comprising an important commuting route / feeding area.

Valve House

No evidence of bats or features suitable for use by crevice dwelling bat species were recorded during the inspection. As such, it was concluded that the Valve House was not used as a summer roost. However, the tunnel could provide suitable habitat for hibernation. Therefore, if works are to commence in the period from October through to March, they should be preceded by an inspection for hibernating bats.

Intake Tower

No bats were observed entering the structure during the survey and, as such, the presence of a maternity roost (breeding site) can be ruled out. A pre-construction inspection / survey is recommended to determine whether bats are present at the time of works. As no maternity roost was identified there is no requirement for timing restrictions of the construction works. Construction methods should avoid lighting after dusk, because the surrounding reservoir was identified as representing an important feeding area.

3.2.5 Summary

The surveys did not find any bat roosts within the stone structures at Vartry Reservoir and Water Treatment Plant. **Daubenton's bat were recorded** foraging within the vicinity of the Road Bridge and Intake Tower but were not observed using the structures as a roost. Precautionary mitigation measures have been recommended to avoid disturbance to individual or small numbers of bats that may opportunistically roost in the structures on occasion.

4 RESPONSE ON FUTURE USE OF EXISTING FILTER BEDS 1 - 7

4.1 Additional Information Request

3. *It is noted that the reports submitted indicate that whilst filter beds 1-7 will be retained their long term retention may not be feasible from an operations point of view. This matter should be clarified, and the Landscape and Visual Affects report should be amended to have full regard to the filling in of these elements if this is to be carried out. Please note the Planning Authority consider that the retention of the filter beds should be pursued as they are important in reflecting the history of the lands, and the public's understanding of the site. Furthermore your response to this item may be relevant to your response to Item 1 given the existing leakage from filter beds 1-7.*

4.2 Additional Information Response

Irish Water confirm that the existing filter beds 1 to 7 will be retained as water features.

APPENDIX 1 – CORESPONDENCE FROM THE EPA AND HSE



Mr Tom Cuddihy,
Irish Water,
Foley Street,
Dublin 1.

Office of Environmental Enforcement
Environmental Protection Agency
Dublin, Christchurch Road
Dublin 14, Ireland

T: +353 (0) 204 2700
F: +353 (0) 204 2700
E: info@epa.ie
W: www.epa.ie

7th June 2016

Re: Vartry and Stillorgan Water Supply

Dear Mr Cuddihy,

I refer to your recent correspondence dated 3rd June 2016 regarding the submission of planning applications in respect of the Vartry and Stillorgan Water Supplies.

The Vartry Water Supply Scheme has been identified by the Environmental Protection Agency (EPA) as being at risk of failure to meet the requirements of the national drinking water standards and was included on the original EPA Remedial Action List (RAL) in 2008. The supply was included on the RAL due to EPA concerns about the safety and security of the supply. It is the largest supply on the RAL serving approximately 220,000 persons.

The EPA has concerns about the existing Vartry tunnel as it was constructed 150 years ago and surveys carried out previously have confirmed that the unlined tunnel is at imminent risk of failure. There is no alternative water supply to large parts of North Wicklow and South Dublin in the event that this tunnel should fail and thus large numbers of consumers would be left without water should this risk be realised. The tunnel also has high levels of infiltration of untreated water which presents water quality risks as this ingress can occur quite rapidly after rainfall meaning that the overlying soil has insufficient time to remove potential microbiological contaminants. Previous EPA audits reported that an average of 2,000 m³/d water was entering the tunnel though the actual amount fluctuates and is weather dependent.

The final treated water at the Vartry Water Treatment Plant and the water post Callow Hill has had intermittent detections of low levels of *Cryptosporidium*. *Cryptosporidium* is a parasite capable of causing serious illness particularly in immunocompromised individuals and its detection in treated water is unacceptable and it should not be present in water supplied to consumers. Furthermore, some of the supply zones served by the Vartry Water Treatment Plant intermittently fail to meet the parametric value in the *European Communities (Drinking Water) Regulations, 2014* for Trihalomethanes (THMs). This is due to inadequate removal of organic material in the slow sand filters at Vartry and may be exacerbated by ingress into the tunnel.

Finally, the security of supply from the scheme is also at risk due to algal (diatom) blooms which can occur from March to May, blinding the existing slow sand filters and reducing output from the plant by over 50%. This has had a significant impact on the volume of water treated and has led to water shortages in North Wicklow in previous years.

For these reasons the EPA welcome the replacement of the Callow Hill Tunnel and the upgrade of the Varray Water Treatment Plant at the earliest opportunity.

The Stillorgan Reservoir is one of only two open treated water storage reservoirs remaining in Ireland with the other (Ballyboden) to be replaced in 2017. It is also the largest treated water reservoir in the country. The open storage of treated water places the supply at risk of direct risk of environmental (e.g. microbiological pollution from wildlife) or deliberate contamination (e.g. from unauthorised access, vandalism or terrorism). Previous EPA audits have found evidence of unauthorised access to the reservoir which puts the supply at risk. The immediate risk of microbiological contamination has been mitigated by the installation of UV treatment in outflow from the reservoir in 2015 but the risk of deliberate contamination from unauthorised access remains.

The EPA has been calling for the covering or replacement of the Stillorgan Reservoir at the earliest opportunity to address these concerns.

The EPA welcomes the implementation of solutions to these issues at the Varray and Stillorgan Water Supply at the earliest opportunity as it will address the water quality concerns raised by the EPA and provide safe and secure drinking water supply for the existing supply area.

If you have any queries or wish to discuss this matter please do not hesitate to contact me at 01 2680105.

Yours sincerely



David Flynn
Programme Manager



Department of Public Health HSE-East
Dr Steevens Hospital
Dublin 8

Tel. 01 6352145
Fax. 01 6352103

15th August 2016

Mr Tom Cuddy
Irish Water
Foley Street
Dublin 1

Re Vartry Water Treatment Plant upgrade, replacement of Callow Hill Tunnel and covering of Stillorgan Reservoir

Dear Mr Cuddy,

The Department of Public Health welcomes Irish Water's plans for upgrading the Vartry Water Treatment Plant (VWTP), replacement of Callow Hill tunnel and covering of the open reservoir at Stillorgan. The supply serves approximately 220,000 people in north Co. Wicklow, Durr Loughaire Rathdown and south east of Dublin city.

VWTP and Callow Hill

The Department of Public Health has concerns about the risks to human health from the current quality of the drinking water in the VWTP supply. There are intermittent detections of low levels of *Cryptosporidium* and *Giardia* in the treated water leaving VWTP (at Chamber 7 testing point) and also after passing through Callow Hill tunnel (high levels of untreated water infiltrates the supply passing through the tunnel).

Cryptosporidium is a protozoan parasite which usually causes acute diarrhoeal illness and can result in severe illness in immunocompromised individuals. As there is no specific treatment it is difficult to manage. There was a large outbreak of Cryptosporidiosis due to drinking water contamination in Galway some years ago and the VWTP is at risk of such an outbreak.

Giardia lamblia is also a protozoan parasite that causes acute diarrhoeal illness and in some cases may be prolonged (the duration of the illness is variable with a range of 1-90 days reported (average 2-3 weeks). There are specific treatments available for Giardiasis.

The Department of Public Health closely monitors notifications of human cases of Cryptosporidiosis and Giardiasis and while no outbreak has been detected to date this is an on-going risk.

Both *Cryptosporidium* and *Giardia* form cysts at one stage of their life cycle and these can survive in the environment for months and therefore are often in raw water. Water treatment plants should be efficient at removing or inactivating *Cryptosporidium* and *Giardia* to protect human health.

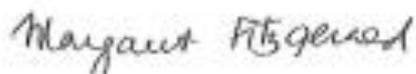
Coverage of open reservoir at Stillorgan

The reservoir at Stillorgan contains treated water from Vartry supply mixed with water from Ballymore Eustace supply and supplies people in Dun Laoghaire Rathdown and south east of Dublin city. The Department of Public Health has concerns about the risks to human health from the current security of the drinking water in the Stillorgan Reservoir. Open storage of treated water means the water is at risk of environmental contamination from microbiological pollution by wildlife, or from deliberate contamination due to vandalism or terrorism. The installation of UV treatment in 2015 has mitigated microbiological risks but the risk of deliberate contamination remains.

Conclusion

Dr John Gray, Medical Officer of Health for Dublin, had the foresight to secure drinking water for Dubliners from Vartry and this has served Dubliners well for past generations. The Department of Public Health welcomes these initiatives which will safely provide good quality drinking water to the population living on this supply area for generations to come.

Yours sincerely,



Dr Margaret Fitzgerald IMC D453
Director Public Health and Medical Officer of Health Dublin, Wicklow, Kildare

APPENDIX 2 – ADDITIONAL INFORMATION REQUEST



Comhairle Contae Chill Mhantáin

WICKLOW COUNTY COUNCIL

Forbartha agus Pleanála - Planning and Development

01/06/2016

Irish Water
c/o Nicholas O'Dwyer Ltd
Unit 4E
Nutgrove Office Park
Nutgrove Avenue
Dublin 14

Áras An Chontae / County Buildings
Cill Mhantáin / Wicklow
Guthán / Tel: (0404) 20148
Faics / Fax: (0404)69462
Rphost / Email: plandev@wicklowcoco.ie
Suíomh / Website: www.wicklow.ie

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2/6
602

RE: Planning and Development Regulations 2001-2015 – Planning Register Reference 16/363 - Irish Water - water treatment plant including a water treatment building (gross area of approx 4670 sqm) a low lift pumping station, sludge treatment facilities including a sludge dewatering building, sludge balancing tank, thickening tanks, sludge holding tank and sludge storage tank and sludge storage facility, washwater recovery and settlement tanks and an electrical distribution building to replace the existing water treatment scheme, alteration to the existing reservoir offtake tower, addition and alteration to pipework and structures within the existing reservoir dam, construction of a piped siphon over the existing reservoir dam, demolition of a disused public toilet, regrading of the existing overflow spillway and associated landscaping and site development works at Vartry Water Treatment Site Vartry Roundwood

A Chara,

With reference to the above application I am to inform you that the information submitted is not adequate to enable a decision to be made.

Accordingly, in pursuance of Article 33 of the Planning & Development Regulations, 2001-2015 notice is hereby given requiring the information requested on the following page(s)

This information is essential in order to fully assess the proposal. If it is not received within 6 months from the date of this notice the application will be automatically declared withdrawn. **Please ensure your response is clearly marked with the above planning register reference number otherwise it may not be considered as a response to this request and may be declared withdrawn as above.**

All drawings submitted in response to Article 33 must comply with the requirements of Article 23 of the Planning and Development Regulations 2001-2015.

Mise le Meas,

C. Cantelbury
ADMINISTRATIVE OFFICER
PLANNING & ECONOMIC DEVELOPMENT

*Tá an doiciméid ar fáil ar iarratas i bhformáid eile/malartach.
This document is available in alternative formats on request.*

Seoltar gach comhfreagras chuig Stiúrthóir Seirbhíisí, Forbartha agus Pleanála.
All correspondence should be addressed to the Director of Services, Planning and Development.



Planning and Development Regulations 2001-2015 – Planning Register Reference 16/363 - Irish Water - water treatment plant including a water treatment building (gross area of approx 4670 sqm) a low lift pumping station, sludge treatment facilities including a sludge dewatering building, sludge balancing tank, thickening tanks, sludge holding tank and sludge storage tank and sludge storage facility, washwater recovery and settlement tanks and an electrical distribution building to replace the existing water treatment scheme, alteration to the existing reservoir offtake tower, addition and alteration to pipework and structures within the existing reservoir dam, construction of a piped siphon over the existing reservoir dam, demolition of a disused public toilet, regrading of the existing overflow spillway and associated landscaping and site development works at Vartry Water Treatment Site Vartry Roundwood

1. Having regard to the increase in the supernatant discharge to the Vartry River, the Planning Authority considers that further information is required with respect to the assimilative capacity of the Vartry to fully assess the impact of this discharge, and to allow the Planning Authority to screen the development for Appropriate Assessment. Accordingly you should submit the following information
 - i. Submit flow readings/estimates for dry weather flow at the discharge location when maximum daily abstractions are occurring at the proposed water treatment plant. This flow figure should take account of any water leaking from old filters, sluices or weirs to the river, after the proposed upgrade. It should also take account of any minimum compensatory flows proposed to ensure that adequate assimilative capacity exists in the Vartry River.
 - ii. Clarify what the maximum Total Chlorine concentration of the treated wastewater will be during normal operation and after maintenance and any scouring.
 - iii. Clarify the concentration of Aluminium in the receiving water downstream of the proposed at the proposed concentration of 2mg/l at 4000m³/day, and compare to any available Environmental Quality Standards or guide values for surface waters and salmonid fish.
 - iv. Clarify what tributary, referred to in the application, joins the Vartry River 300m downstream of the proposed discharge location and clarify what extra assimilation this will give to the proposed discharge. Please note that the nearest mapped tributary downstream of the proposed discharge appears to be the Tomdaragh tributary, (1.2 km downstream).
 - v. The applicant should clarify what the impact would be on the abstraction and quality of raw water for the Wicklow Regional Public Water Supply downstream of Annagolan Bridge.
 - vi. The applicant should submit a revised waste assimilative capacity assessment to include any pertinent parameters taking account any discharges in the river flow at the points of discharge.

Note where the information shows that significant impacts cannot be screened out a Natura Impact Statement may be required.

2. The bat survey submitted indicate no records for Daubentons bats, it is unclear if stone structures were surveyed for Daubenton roost which are present in high numbers on the Vartry system. Further bat surveys must be undertaken of these structures to ascertain whether they contain roosts, and appropriate measures to deal with any such findings.
3. It is noted that the reports submitted indicate that whilst filter beds 1-7 will be retained their longterm retention may not be feasible from an operations point of view. This matter should be clarified, and the Landscape and Visual Affects report should be amended to have full regard to the filling in of these elements if this is to be carried out. Please note the Planning Authority consider that the retention of the filter beds should be pursued as they are important in reflecting the history of the lands, and the public's understanding of the site.
Furthermore your response to this item may be relevant to your response to Item 1 given the existing leakage from filter beds 1-7.