

Licensing Action Required - Reg 18(3)(b) Notice Sent - 4 for Churchtown and Environs

Licence (D0444-01)

Licence: Churchtown and Environs (D0444-01)

Status Reason: Closed

Issued On: 27/02/2014

Due Date: 31/01/2014

Action Type: Licensing Action Required

Status History Action: Reg 18(3)(b) Notice

Notification

Dear Applicant

Please address the Notice located below. Any response shall be in line with the timeframes specified within the body of the Notice.

Yours sincerely

Environmental Licensing Programme

Office of Climate, Licensing & Resource Use

Tel: 053-9160600

Associated Documents

- Reg 18(3)(b) Notice Sent - 4.pdf

Response Documents

- Churchtown WWDL D0444-01, EPA Licensing Action - Reg.

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Comhairle Contae Chorcaí Cork County Council

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Office of Climate, Licensing & Resource Use,
Environmental Protection Agency,
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For Attention of: Ms Loretta Joyce

31st January, 2014

Re: Licensing Action - Reg 18(3)(b) Notice Sent - 4 for Churchtown and Environs. Licence (D0444-01)

A Chara,

I refer to correspondence issued on 12/11/2013 in relation to the above. The attached report and appendices address the queries raised.

Is mise le meas,

Denis Beecher.

Executive Engineer.

Waste Water Pumping & Treatment Zone 4,
WATER SERVICES DIRECTORATE

Direct Tel: 022-21123

Email: denis.beecher@corkcoco.ie

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**Licensing Action – Reg. 18(3)(b) Notice Sent – 4 for Churchtown and Environs.
Licence (D0444-01).**

Question 1.

Provide a desktop conceptual model characterising the hydrogeology of the percolation area at Churchtown WWTP using the Source – Pathway – Receptor Model. The model can be based on existing information and / or data and should include the location of the percolation pipes in relation to rock. The potential pathways for waste water discharge to sensitive receptors such as drinking water abstractions and streams should be included in the model. Guidance on the Source – Pathway – Receptor Model is provided in the Guidance on the Authorisation of Discharges to Groundwater, published by the EPA.

Response 1.

The Source in this instance is the treated effluent from Churchtown WWTP. Analysis of the Primary Discharge (Source) has been completed by Cork County Council for Urban Wastewater Monitoring throughout 2012 and 2013. Please see attached (Appendix A) the monitoring of the Primary Discharge (Source) completed through 2012 and 2013. Monitoring results are available for the BOD, COD and Suspended Solids Parameters only as Ortho-Phosphate and Ammonia analysis was not required for Churchtown WWTP under the Urban Wastewater Regulations.

The potential receptors identified by analysis of GSI Mapping and Site Investigations previously completed on site are;

Groundwater;

- Regionally Important Karstified Diffuse Acquirer.
- Cork County Council 3 No. Public Supply Wells located some 3 Km East, North-East of the Primary Discharge.

Surface Water;

- Drain / Watercourse located immediately adjacent to the WWTP sites Eastern Boundary. This Drain / Watercourse is ultimately a tributary of the River Awbeg. The confluence of this Drain with the River Awbeg is within the area defined as a Special Area of Conservation SAC 002170.

The Primary Discharge from Churchtown WWTP is a constructed percolation area within the site of the WWTP. This Percolation Area in conjunction with the Hydro-geological properties of the immediate area form the pathway for potential pollution from Churchtown WWTP Primary Discharge to the receptors identified above.

The general area surrounding the Churchtown WWTP and Percolation Area can be summarised as having the following Hydro-geological properties;

Sub-Soil -	Till derived chiefly from Namurian Rocks.
Aquifer Category -	Rkd, Regionally Important Karstified Diffuse.
Groundwater Vulnerability -	Moderate
Bedrock Outcrops -	Closest Mapped Outcrop is some 370m due South of the Primary Discharge.

When the above information is considered in the context of EPA Guidance on the Authorisation of Discharges to Groundwater, Appendix F – Groundwater Protection

Response Matrices and Minimum Separation Distances it is noted that there is no response matrix available or published for Percolation Areas on the scale constructed at Churchtown WWTP. The response matrix for On-Site (Waste Water Treatment) Systems for Single Houses (EPA 2009) which is possibly the closest approximation to the existing percolation area pathway to the conditions at Churchtown WWTP generates a response of R1, i.e. Acceptable subject to normal good practice (i.e. system selection, construction, operation and maintenance in accordance with the Code of Practice (EPA, 2009)).

Details of the Percolation Area Construction have been submitted previously in response to Reg. 18(3)(b) Notice Sent (3).

Please see attached (Appendix B);

- Site Investigation completed on the site of the Percolation Area prior to construction.
- Churchtown WWTP Filter Bed / Percolation Area Layout.
- Churchtown WWTP Filter Bed / Percolation Area Typical Section.

The Site Investigation Trial Holes most relevant to the existing Percolation Area location are Trial Holes No. 3 and No. 4. The depth of soil prior to encountering bedrock in both Trial Hole Nos. 3 and 4 was 2.2m. The Typical Section available for the constructed Percolation Area demonstrates the Percolation Pipe-work laid in washed gravel approximately 300mm below ground level under-laid with a further 200mm of sand over a loosened area of subsoil. Excluding the depth of washed gravel and sand under the percolation pipe-work this would indicate that there is a minimum of approximately 1.6m subsoil between the base of the percolation trench and the bedrock. The actual distance between the percolation pipe-work and the bedrock is similarly estimated as 1.9m.

The Site Investigation completed indicated an average P Value of 45 mins/25mm across the site. In accordance with Table F:3 Recommended Minimum Distance between a Receptor and a Percolation Area contained within EPA Guidance on the Authorisation of Discharges to Groundwater a minimum depth of soil / subsoil of 1.2m is required for Percolation Areas where P is >30 and the existing Percolation Area is in compliance with this requirement. All the minimum separation distances between the existing Percolation Area and receptors as per Table F:3 Recommended Minimum Distance between a Receptor and a Percolation Area are exceeded. Furthermore the Primary Discharge is subjected to UV Dis-Infection at the WWTP prior to discharge to the existing percolation area.

The Primary Discharge does not discharge directly at any single point location to the Surface Water receptor identified above. The potential pathways for pollution from the Primary Discharge to the Surface Water receptor is via the Percolation Area or potentially overground in the event of failure and surface ponding as a result of hydraulic overload to the percolation area.

Question 2.

Provide Primary Discharge Monitoring Results for the last year – BOD, COD, Suspended Solids, Ortho-Phosphate and Ammonia.

Response 2.

Please see attached (Appendix A) the monitoring of the Primary Discharge (Source) completed through 2012 and 2013. Monitoring results are available for the BOS, COD and Suspended Solids Parameters only as Ortho-Phosphate and Ammonia analysis was not required for Churchtown WWTP under the Urban Wastewater Regulations.

Question 3.

The hydraulic loading of the discharge on the percolation is much more than the loading identified in the EPA's Code of Practice: Wastewater Treatment Systems for Single Houses, calculate the hydraulic loading of the discharge on the percolation area (m^3/day and $l/m^2/day$) and assess whether the percolation area has a capacity to accept the calculated hydraulic loading.

Response 3.

The Churchtown WWTP is designed to cater for a loading of 936 P.E. at a hydraulic loading rate of some 238 litres / p.e. / day which equates to a Design Dry Weather Flow of $223 m^3/day$ approx.

The Design Dry Weather Flow of $223 m^3/day$ approx. distributed over the percolation area of $1,800 m^2$ equates to a hydraulic loading to the percolation area of $123.76 l/m^2/day$.

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Appendix A – Primary Discharge Monitoring Results 2012 and 2013.


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[Index](#)

Churchtown WWTP Outlet								Mean value	UWW Reg Limits
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent		
Sample Code	GW185	GW437	GW797	GW1027	GW1196	GW1292			
Sample Date	29/03/2012	07/06/2012	29/08/2012	24/10/2012	29/11/2012	12/12/2012			
Sample Type	Composite	Composite	Composite	Composite	Composite	Composite			
Flow M ³ /Day	*	*	*	*	*	*			
BOD mg/L	5	1.5	1.2	1.5	1.6	1.6	2.1	25	
COD mg/L	42	10.5	10.5	10.5	10.5	10.5	16	125	
Suspended Solids mg/L	18	4	1.25	1.25	4	1.25	5	35	

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0 0 0 0 0 0 0 0

 exceeds Urban Wastewater Regulations Limits

 half of LOD for statistical purposes

 Unapproved Results

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Churchtown WWTP Outlet							Mean value	UWW Reg Limits
Sample	Effluent	Effluent	Effluent	Effluent	Effluent	Effluent		
Sample Code	GX029	GX267	GX444	GX651	GX1068	GX1284		
Sample Date	17/01/2013	13/03/2013	08/05/2013	02/07/2013	25/09/2013	21/11/2013		
Sample Type	Composite	Composite	Composite	Grab	Composite	Composite		
Flow M ³ /Day	*	*	*	*	*	*		
BOD mg/L	1.9	1.3	5.1	9.0	3.4	2.6	3.9	25
COD mg/L	10.5	10.5	26	72	10.5	10.5	23	125
Suspended Solids mg/L	6	6	21	60	18	4	19	35

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0 0 0 1 0 0

- exceeds Urban Wastewater Regulations Limits
- half of LOD for statistical purposes
- Unapproved Results

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Appendix B – Churchtown WWTP Site Investigation & Percolation Area Layout.

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TRIAL PIT RECORD							
Contract: CHURCHTOWN WASTEWATER TREATMENT PLANT No. Location: Treatment Plant Site Client: Date: 04/10/2005					PIT No. 1 Sheet Excavation Method: JCB Ground Level:		
Description	Rod Level	Legend	Depth (m) bgl	samples			Remarks
				Ref No	Type	Depth	
TOPSOIL							
Orange/brown clay			0.40				
Gray slaty rock			1.60				
Observations		Groundwater Conditions					
TRIAL PIT ENDED AT 2.1m DEPTH		NO WATER ENCOUNTERED					

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TRIAL PIT RECORD							
Contract: CHURCHTOWN WASTEWATER TREATMENT PLANT No. Location: Treatment Plant Site Client: Date: 04/10/2005					PIT No. 2 Sheet Excavation Method: JCB Ground Level:		
Description	Rod Level	Legend	Depth (m) bgl	samples			Remarks
				Ref No	Type	Depth	
TOPSOIL							
Orange/brown clay			0.20				
Gray slaty rock			1.00				
Observations		Groundwater Conditions					
TRIAL PIT ENDED AT 2.1m DEPTH		NO WATER ENCOUNTERED					

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TRIAL PIT RECORD							
Contract: CHURCHTOWN WASTEWATER TREATMENT PLANT No. Location: Treatment Plant Site Client: Date: 04/10/2005					PIT No. 3 Sheet Excavation Method: JCB Ground Level:		
Description	Rod Level	Legend	Depth (m) bgl	samples			Remarks
				Ref No	Type	Depth	
TOPSOIL							
Orange/brown clay			0.20				
Gray slaty rock			2.20				
Observations		Groundwater Conditions					
TRIAL PIT ENDED AT 2.3m DEPTH MADE GROUND ASSOCIATED WITH ACCESS ROAD NO LONGER IN USE.		NO WATER ENCOUNTERED					

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TRIAL PIT RECORD							
Contract: CHURCHTOWN WASTEWATER TREATMENT PLANT No. Location: Treatment Plant Site Client: Date: 04/10/2005					PIT No. 4 Sheet Excavation Method: JCB Ground Level:		
Description	Rod Level	Legend	Depth (m) bgl	samples			Remarks
				Ref No	Type	Depth	
TOPSOIL							
Gray mottled clay			0.20				
Orange/brown clay			0.20				
Gray slaty rock			2.20				
Observations		Groundwater Conditions					
TRIAL PIT ENDED AT 2.2m DEPTH		WATER TABLE AT 1.8M DEPTH bgl					

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PERCOLATION TEST

Type of Test: T-Test or P-Test

Percolation Test Hole	1	2				
Depth from ground surface to top of hole (mm) (A)	600mm	700mm				
Depth from ground surface to base of hole (mm) (B)						
Depth of hole (mm) [B-A]						
Dimensions of hole [length x breadth (mm)]						
Each hole must be pre-soaked twice before the test is carried out (from 10.00a.m. to 5.00 p.m. and from 5.00 p.m. to the next morning)						
Date of test	05/10/2005	05/10/2005				
Date pre-soaking started	04/10/2005	04/10/2005				
Time filled to 400mm						
Time water level at 300mm						
Percolation Test Hole No.	1	2				
Fill No.	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)
1			4m30s			1m46s
2			4m39s			2m01s
3			5m33s			2m09s
Average Δt			4m54s	Average Δt		1m59s
Average Δt/4 = [Hole No. 1] <u>1.2</u> (t ₁)			Average Δt/4 = [Hole No. 2] <u>0.5</u> (t ₂)			
T-Value = (t ₁ + t ₂)/2 = _____ (min/25mm)						
Result of Test: T=						
Comments:						

PERCOLATION TEST

Type of Test: T-Test or P-Test

Percolation Test Hole		3		4		
Depth from ground surface to top of hole (mm) (A)		700mm				
Depth from ground surface to base of hole (mm) (B)						
Depth of hole (mm) [B-A]						
Dimensions of hole [length x breadth (mm)]						
<p>Each hole must be pre-soaked twice before the test is carried out (from 10.00a.m. to 5.00 p.m. and from 5.00 p.m. to the next morning)</p>						
Date of test		05/10/2005				
Date pre-soaking started		04/10/2005				
Time filled to 400mm						
Time water level at 300mm						
Percolation Test Hole No.	3			4		
Fill No.	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)
1			50s			
2			58s			
3			1m10s			
	Average Δt		0.99m	Average Δt		
Average Δt/4 = [Hole No. 1] <u>0.25</u> (t ₁)				Average Δt/4 = [Hole No. 1] _____ (t ₂)		
<p>T-Value = (t₁ + t₂ + t₃)/2 = <u>0.65</u> (min/25mm)</p>						
<p>Result of Test: T= 0.65</p>						
<p>Comments: Excessive percolation</p>						

PERCOLATION TEST

Type of Test: T-Test or P-Test

Percolation Test Hole	1	2					
Depth from ground surface to top of hole (mm) (A)	400mm	400mm					
Depth from ground surface to base of hole (mm) (B)							
Depth of hole (mm) [B-A]							
Dimensions of hole [length x breadth (mm)]							
<p>Each hole must be pre-soaked twice before the test is carried out (from 10.00a.m. to 5.00 p.m. and from 5.00 p.m. to the next morning)</p>							
Date of test	05/10/2005	05/10/2005					
Date pre-soaking started	04/10/2005	04/10/2005					
Time filled to 400mm							
Time water level at 300mm							
Percolation Test Hole No.	1	2					
Fill No.	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)	
1			172			172	
2							
3							
Average Δt			172	Average Δt			172
Average Δt/4 = [Hole No. 1] <u>43</u> (t ₁)			Average Δt/4 = [Hole No. 1] <u>43</u> (t ₂)				
<p>T-Value = (t₁ + t₂)/2 = _____ (min/25mm)</p>							
<p>Result of Test: T=</p>							
<p>Comments: See last page</p>							

PERCOLATION TEST

Type of Test: T-Test or P-Test

Percolation Test Hole	3	4				
Depth from ground surface to top of hole (mm) (A)	400mm	4000mm				
Depth from ground surface to base of hole (mm) (B)						
Depth of hole (mm) [B-A]						
Dimensions of hole [length x breadth (mm)]						
<p>Each hole must be pre-soaked twice before the test is carried out (from 10.00a.m. to 5.00 p.m. and from 5.00 p.m. to the next morning)</p>						
Date of test	05/10/2005	05/10/2005				
Date pre-soaking started	04/10/2005	04/10/2005				
Time filled to 400mm						
Time water level at 300mm						
Percolation Test Hole No.	3	4				
Fill No.	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)
1			212			147
2						
3						
Average Δt			212	Average Δt		147
Average Δt/4 = [Hole No. 1] <u>53</u> (t ₁)			Average Δt/4 = [Hole No. 1] <u>37</u> (t ₂)			
<p>T-Value = (t₁ + t₂)/2 = _____ (min/25mm)</p>						
<p>Result of Test: T=</p>						
<p>Comments: See last page</p>						

PERCOLATION TEST

Type of Test: T-Test or P-Test

Percolation Test Hole		5	6
Depth from ground surface to top of hole (mm) (A)		400mm	4000mm
Depth from ground surface to base of hole (mm) (B)			
Depth of hole (mm) [B-A]			
Dimensions of hole [length x breadth (mm)]			
Each hole must be pre-soaked twice before the test is carried out (from 10.00a.m. to 5.00 p.m. and from 5.00 p.m. to the next morning)			
Date of test		05/10/2005	05/10/2005
Date pre-soaking started		04/10/2005	04/10/2005
Time filled to 400mm			
Time water level at 300mm			
Percolation Test Hole No.	5	6	
Fill No.	Start Time (at 300mm)	Finish Time (at 200mm)	Δt (min)
1			272
2			
3			
Average Δt		272	Average Δt
Average Δt/4 = [Hole No. 1] <u>68</u> (t ₁)		Average Δt/4 = [Hole No. 1] <u>25</u> (t ₂)	
T-Value = (t₁ + t₂ + t₃ + t₄ + t₅ + t₆)/6 = 45 (min/25mm)			
Result of Test: T= 45			
Comments:			

NOTES

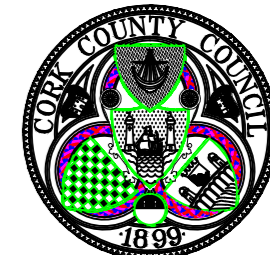
1. EXISTING TREATMENT PROCESS UNIT TO BE MADE REDUNDANT.
2. SPECIFIC SIZE AND TYPE OF NEW TREATMENT PROCESS UNITS IS DEPENDANT ON SYSTEM PROVIDERS (TO BE APPOINTED).
3. HEIGHT OF NEW PROCESS UNITS WILL NOT EXCEED 3.5M ABOVE EXISTING GROUND LEVEL.



SITE LAYOUT PLAN
SCALE : 1/500

Rev	Date	Drawn	Check	Revision Description
A	04/04/05	AF	EC	ISSUED FOR PLANT & PLANNING

Cork County Council,
Northern Division.

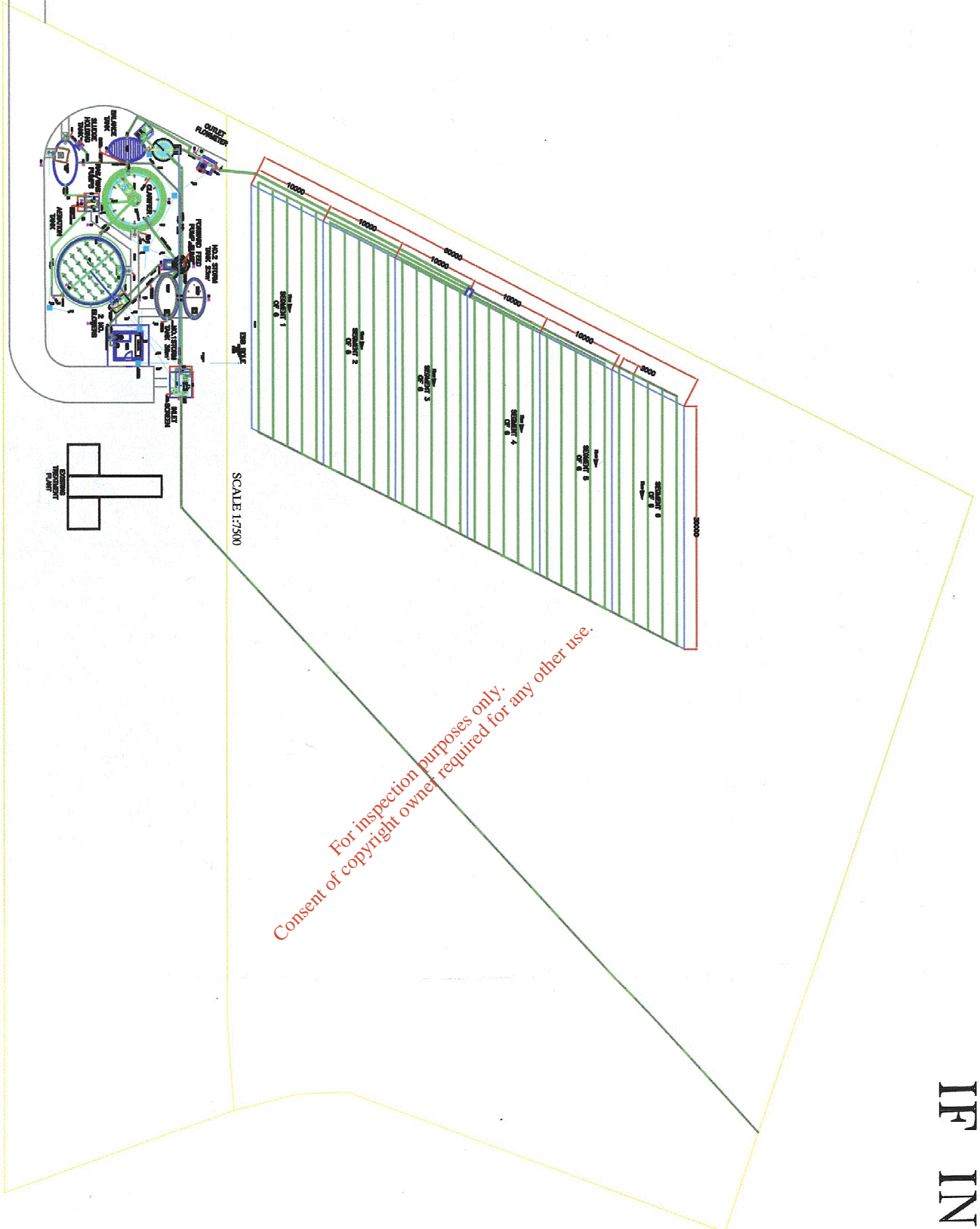


E. FLYNN, B.E.,
COUNTY ENGINEER,
COUNTY HALL,
CORK.

Job Title:
**UPGRADE OF CHURCHTOWN WASTE
WATER TREATMENT PLANT**

Drawing Title:
SITE INVESTIGATION

Scales: AS SHOWN	Surveyed by: —	Drawn by: AF
Designed by: AF	Checked by: AF	Date: 06/10/05
Drawing number: NC04-12-W-004	Rev A	



IF IN

TYPICAL SECTION

