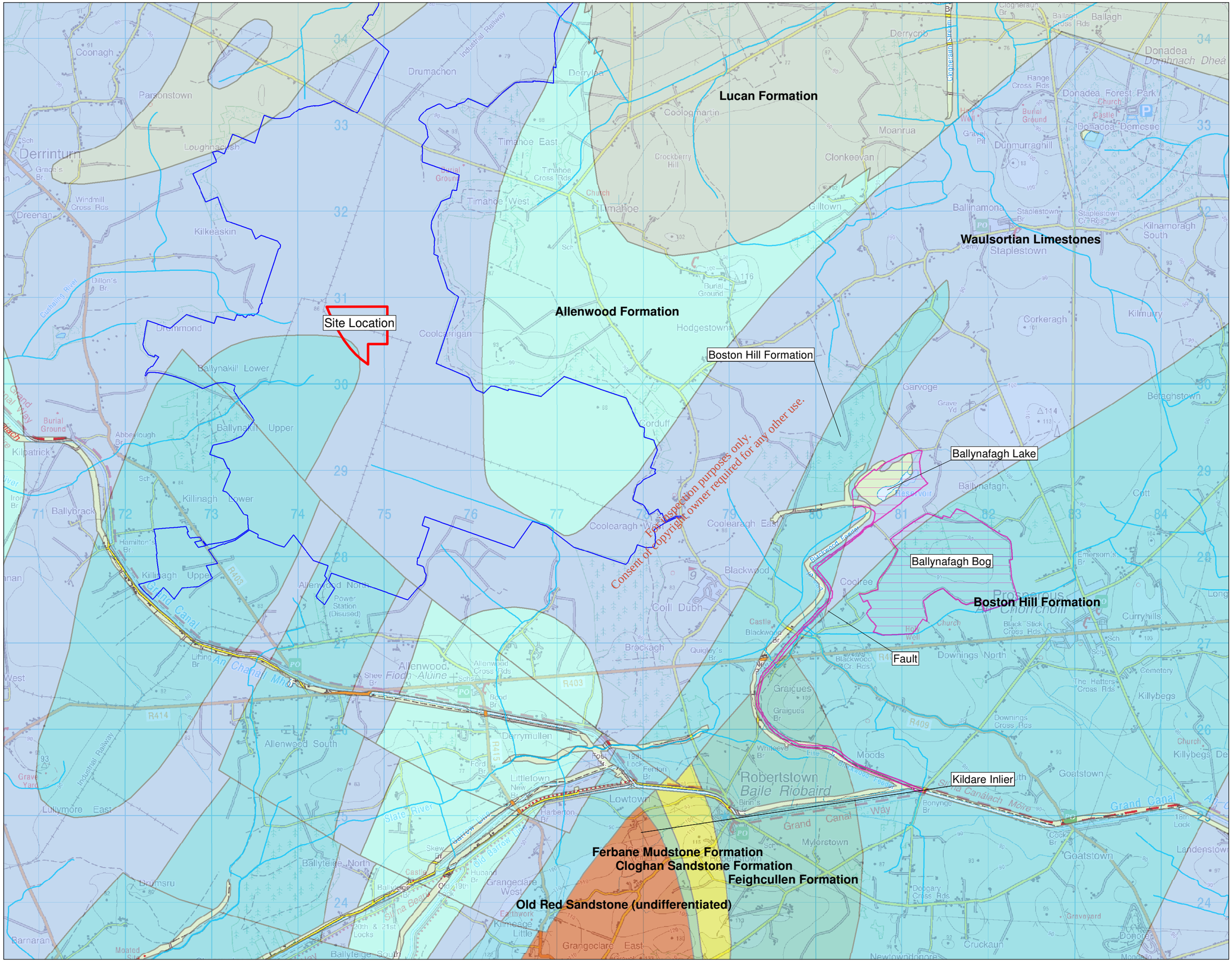

Legend

- Site Boundary
- Ownership Boundary
- Old Red Sandstone (Undifferentiated)
- Lucan Formation
- Feighcullen Formation
- Boston Hill Formation
- Allenwood Formation
- Waulsortian Limestones
- Cloghan Sandstone Formation
- Special Area of Conservation - SAC

0 145290 580 870 1,160
Metres

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
D01	03-10-12	Issued	M.N.	J.D.

Client: BORD NA MÓNA

Project: DREHID MECHANICAL BIOLOGICAL TREATMENT (MBT) FACILITY

Title: BEDROCK GEOLOGY MAP WITH DESIGNATED SPECIAL AREAS OF CONSERVATION

Scale @ A3: 1:40,000

Prepared by:	Checked:	Date:
M. Nolan	J.Dillon	October 2012

Project Director: D.Grehan

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6301

Figure 3 A

Summary of Section 2.4.5, page 84-87 of the Drehid Waste Management Facility Intensification and Extension EIS – (ABP Reference PL09.PA0004)

Aquifer Potential

The groundwater flow characteristics within the limestones underlying the site are dominated by secondary permeability, i.e. fissure flow. There is effectively no primarily permeability (inter-granular permeability) in these rocks.

As part of this hydrogeological investigation of the aquifer potential a 72 hour pump test was carried out to determine the characteristics of the aquifer. The pump test was undertaken on borehole GW6. Before the pump test began the static water level (SWL) in all monitoring boreholes was recorded to act as a datum for measurement during the test. The water levels in all boreholes were measured periodically to determine if the pumping was resulting in a radial cone of depression as a result of drawdown from the pumped borehole.

The pump test was undertaken by pumping from GW6, which was drilled to a finished 150mm diameter borehole. The other boreholes installed at the site were monitored during the course of the pump test to observe any water level fluctuations. The discharge drawdown data from the pump test are included in Appendix 2.4.7.

The only water level fluctuation in the observation wells was recorded in monitoring wells BH1D and BH1S, which are approximately 35m from the pumping well. A drawdown of 1.53 m was achieved in BH1D with a drawdown of 0.6 m being achieved in borehole BH1S indicating the pumping and drawdown only had a very localized effect.

The peak pump rate measured during the test was 56m^3/day. The pump rate of 43m^3/day was used for calculations as an average pump rate maintained during the log cycle in which the data was interpreted (i.e. 10 to 100 minutes), due to slight fluctuation in discharge during the test. These fluctuations in pumping rate are discussed below.

Due to slight variation in the pumping rates observed during the test, the pumping rate used in the Jacob Calculation was correlated with the pumping rate observed during a full log cycle. A value of 43m^3/day was used for the calculation of the aquifer transmissivity in the 10 to 100 minutes log. The drawdown per log cycle during the 10 to 100 minutes log cycle was 37.2m (with actual observed drawdown between 25 and 27 m, however as per the Jacob Method the drawdown per log cycle is used). Therefore, the figures used for calculating the Transmissivity are a drawdown per log cycle of 37.2m and the pumping rate of 43m^3/day, giving a calculated transmissivity of 0.215 m^2/day (See Calculation Appendix 2.4.8).

Following 100 minutes of pumping the drawdown in the well began to vary, making the determination

of a straight line slope for calculation difficult. A similar slope (and hence Transmissivity value) is noted from 1709 minutes to 2909 minutes. Notwithstanding the slight variation, the drawdown in the pumped well was at a relatively steady-state (though oscillating) at a level between 23m and 27m (with an approximate average value of 25m).

A Logan Approximation calculation which relates transmissivity to the pumping rate and steady-state drawdown in a well was applied to this data for pumping after 100 minutes. The Logan Approximation was deemed an appropriate method to approximate the aquifer transmissivity due to the slight variation in drawdown in the pumped well. The values used were a pumping rate 48.5 m^3/day (an average pumping rate over the 100 to 4349 minute period) and a drawdown of 25 m. This Logan calculation gave a transmissivity result of 2.37 m^2/day, presented as a rounded value of 2 m^2/day. The calculated specific capacity of the pumping well is 1.94 m^3/day/m, using the above values of the average mid to late pumping rate of 48.5 m^3/day and an average drawdown of 25 m. This means the well would be classified as Well Productivity Class V (the lowest classification), as per the Geological Survey of Ireland well classification system.

An additional analysis of the pump test data was undertaken using a simplified Thiem Equation formula. This simplified Thiem equation was derived by Aslibekian (1998) and is normally applied to steady radial flow in a confined aquifer in typical Irish Aquifers. The simplified Thiem Equation gave a transmissivity result of 2.31 m^2/day, confirming the values obtained through other methods of data interpretation. (See calculation, Appendix 2.4.8).

The values for Transmissivity calculated from drawdown data from GW6 are presented below in Table 1.

Table 1: Transmissivity Values from Drawdown Data from GW6PW

Analytical Method used	Jacob Straight Line (10 to 100 minutes)	Logan Approximation (100-4349 minutes)	Aslibekian (simplified Thiem Equation)	Arithmetic Mean
T (m^2/day)	0.215	2.37	2.31	1.7

The recovery period of the aquifer pump test was monitored and the data interpreted using the Jacob Straight Line Method using a semi-log plot of residual drawdown (s') vs. t'/t (time since cessation of pumping divided by time since commencement of pumping). The recovery period was 210 minutes long with water levels recovering from a drawdown of 25.93 m to within 1.37 m of zero drawdown (the SWL prior to the test).

Monitoring of the data ceased after continuous monitoring of the data curve showed there was sufficient data to allow an analysis to be carried out and due to the incrementally slower recovery

which always occurs in the final metre of any recovery test, but which is more due to well effects than aquifer response.

Analysis of the graphs showed three subtly different slopes for late, mid and early points in the recovery (highest values of t'/t are early time, lowest values are late time). Values of transmissivity were calculated using the highest pumping rate observed of 56m^3/day and also the average pumping rate over the 72 hours of 49m^3/day. The calculated values of transmissivity for the recovery data are presented below in Table 2. The transmissivity data from the recovery data is in agreement with the values determined from the pump test drawdown data, with transmissivity values of approximately 2m^2/day (See Graph and Calculations in Appendix 2.4.8).

Table 2: Transmissivity Values from Recovery Data from GW6PW

Pumping Rate	**Late**	**Mid**	**Early**	**Average**
m^3/day	T (m^2/day)	T (m^2/day)	T (m^2/day)	T (m^2/day)
56.68	3.84	1.7	0.72	2.09
49.14	3.3	1.47	0.62	1.81

Analysis of drawdown data from observation well GW1D gave calculated transmissivity of 16 m^2/day. Analysis of recovery data using the two pumping rates resulted in transmissivity values in general agreement with the values calculated using drawdown data, with values of 16.06 and 18.5 m^2/day being calculated, as presented in Table 3.

Table 3: Transmissivity values from recovery data at observation well GW1D

Pumping Rate	**Average**
m^3/day	T (m^2/day)
56.68	18.5
49.14	16.06

A distance drawdown analysis was carried out by plotting the two data points on a semi-log plot (using 25 m as the steady drawdown for the pumping well and 1.53m as the maximum drawdown for GW1) the straight line intercepts the zero drawdown line at 19.6 m from the pumping well. This indicates that the zone of depression induced by pumping extends approximately 20m. While this is a correctly calculated value, it is most likely not a valid number given the very low drawdowns achieved. It does however demonstrate that the cone of depression is quite restricted in area due to the low Transmissivity of the bedrock aquifer.

When a Jacob Straight Line analysis is applied, using the distance drawdown method using the maximum and averaged pumping rates over the test, the calculated transmissivity values of 0.76 and 0.88 m^2/day (as presented in Table 4) are in general agreement with values calculated with the Jacob Drawdown and Recovery and Aslibekain Calculations above.

Table 4: Transmissivity Values from Distance Drawdown Analysis

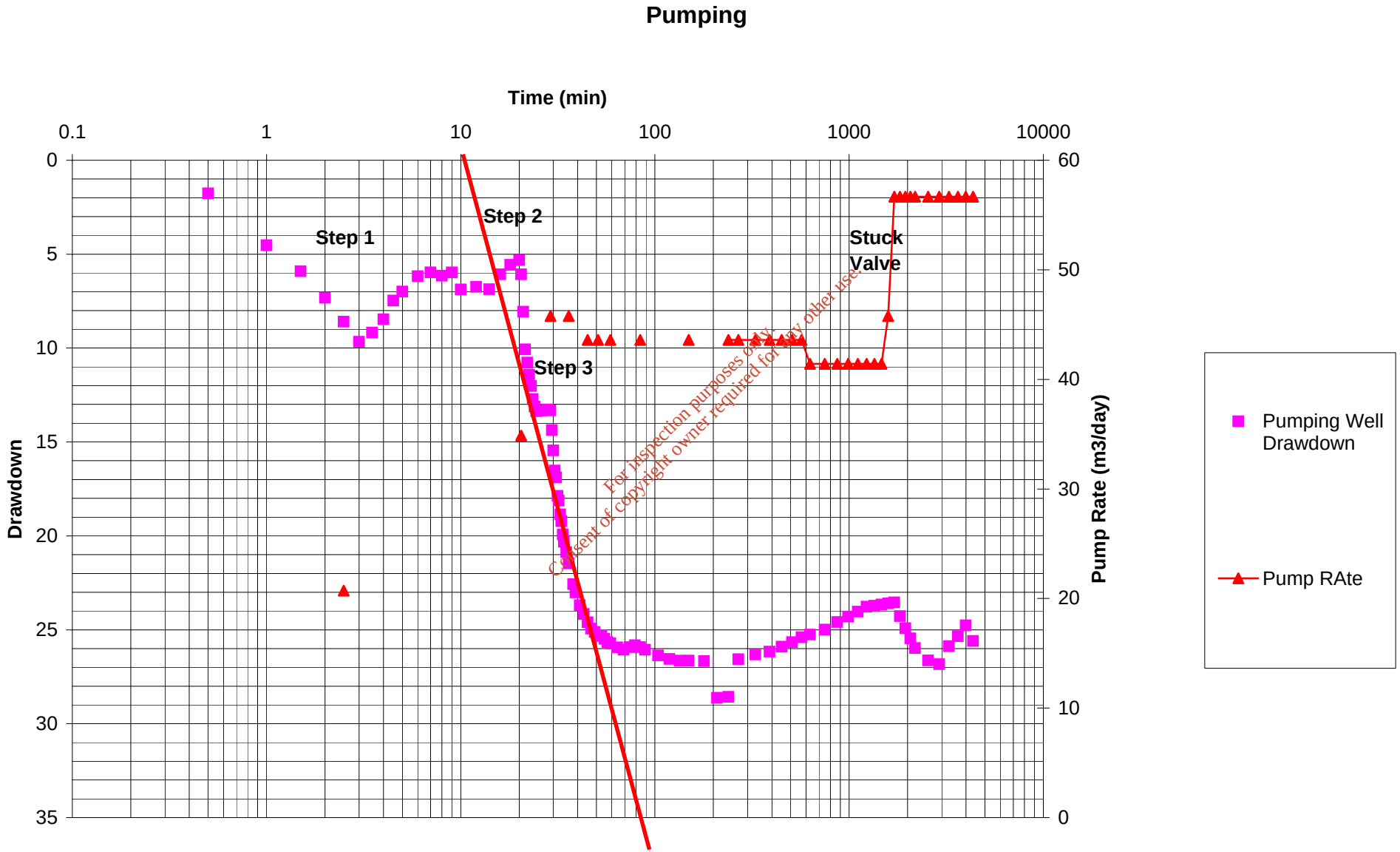
Pumping Rate	Average
m^3/day	T (m^2/day)
56.68	0.88
49.14	0.76

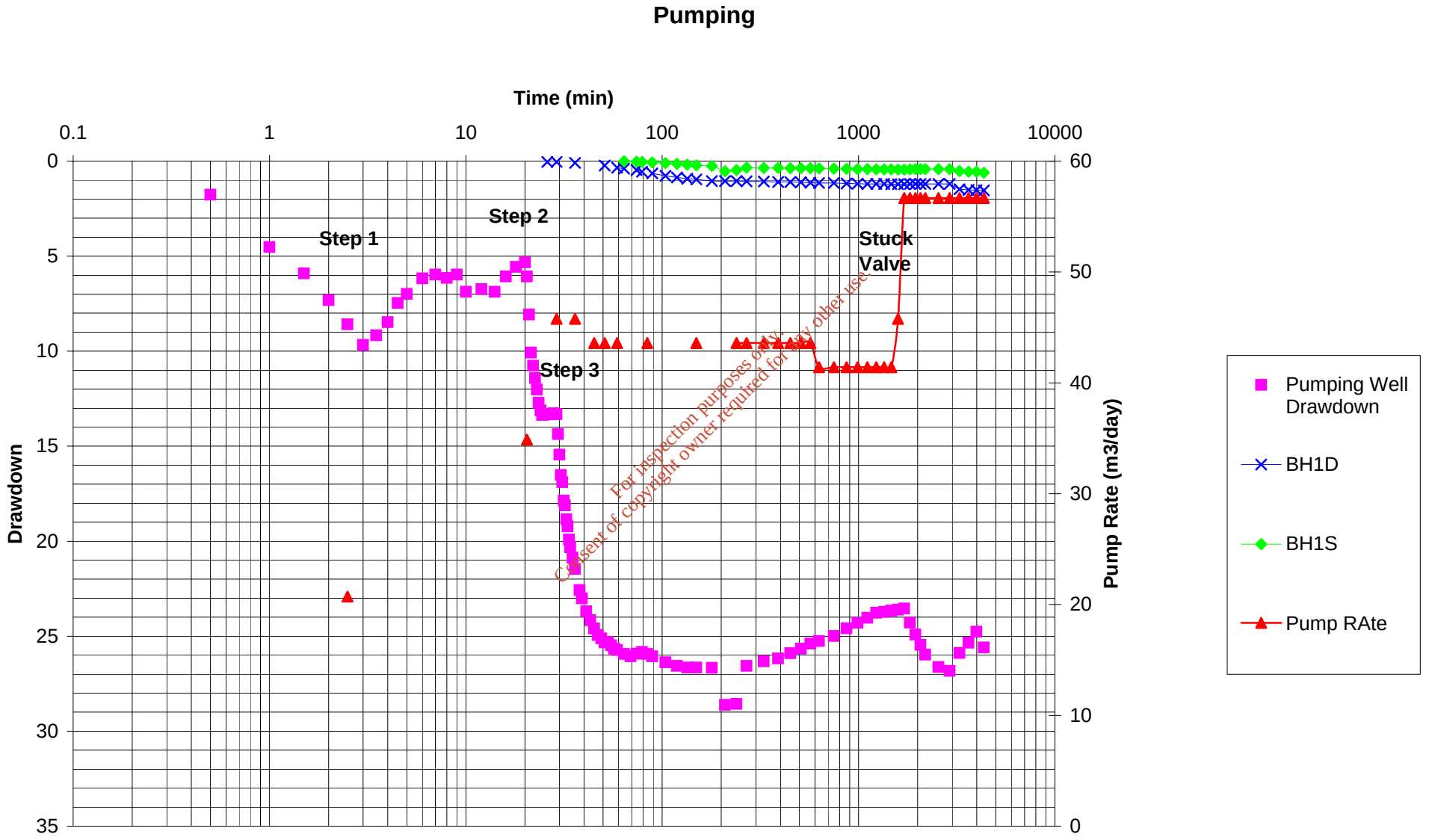
No appreciable drawdowns were detected in the other monitoring boreholes. While minor water level fluctuations occurred these cannot logically be related to the pumping well, with SWLs actually increasing (GW5D) and one well (GW4S) showing a decrease in water levels of 0.19 m and then an increase in water levels after 2000 minutes, halfway through the pumping period (see graphs in Appendix 2.4.8).

Discussion of Results

Although on-paper there is an order of magnitude difference between the calculated transmissivity values for Mid and Late pumping time values the numbers are only important in that they express that the transmissivity is low. The calculated transmissivity values for the pumping well of 0.2 m^2/day (for drawdown) to 2 m^2/day (for recovery) at GW6 and 16 m^2/day (for drawdown) and 18.5m^2/day (for recovery) at observation well GW1D are typical of the Waulsortian Limestone in the northern half of Ireland. These values concur with transmissivity values ranging from 0.3 to 115m^2/day with a 50th Percentile value of 10m^2/day (Aslibekian 1998) for the Waulsortian elsewhere in the Midlands. The consistency of the results allows for a high degree of confidence in the Transmissivity value presented as being in the region of 2 to 16 m^2/day, with the transmissivity value of 2m^2/day from the pumping well being the most representative of the aquifer.

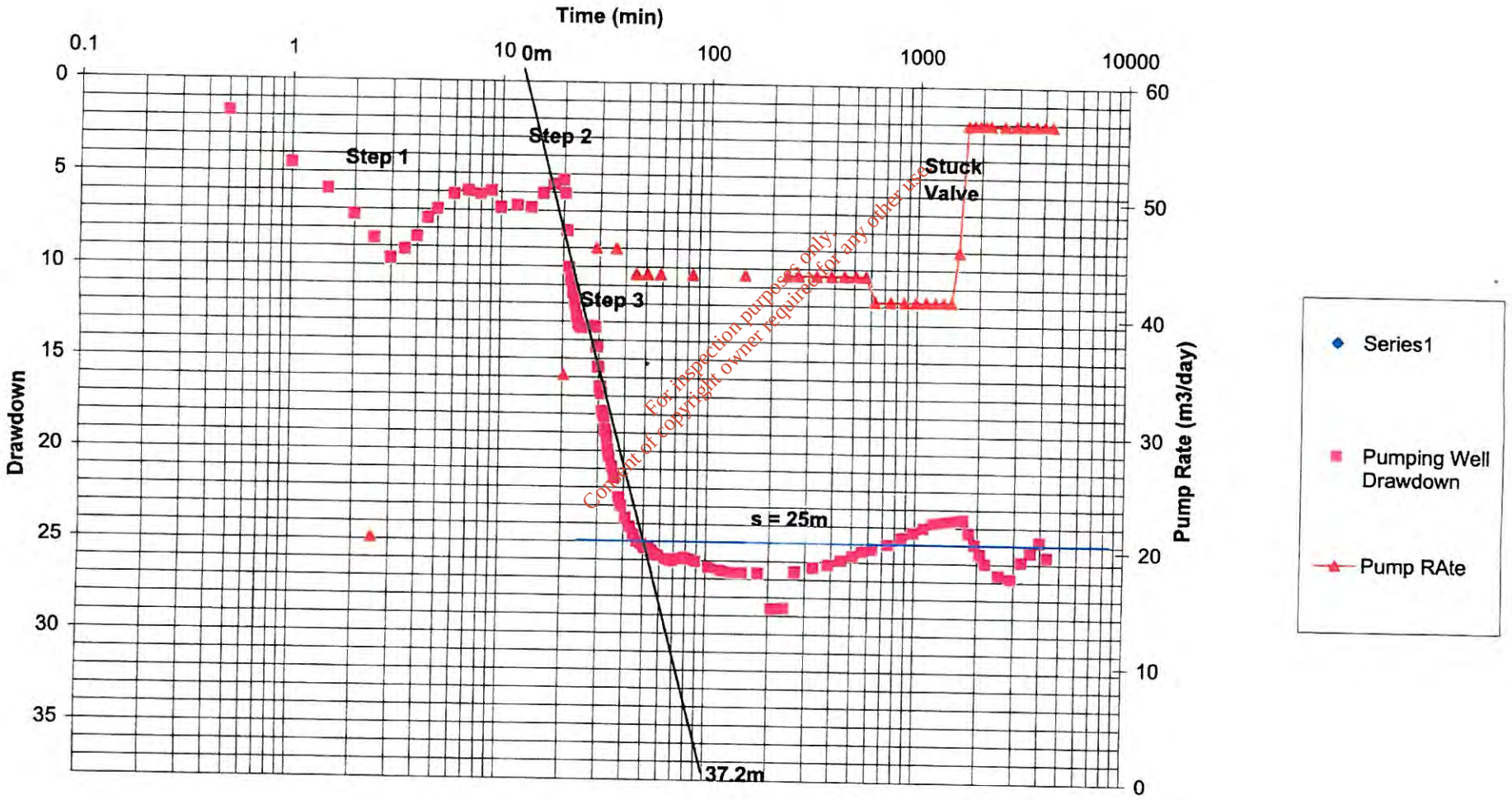
APPENDIX 2.4.7
Pump Test Data





APPENDIX 2.4.8
Pump Test Calculation Sheets and Graphs

Drawdown and Pumping Rate at Pumping Well GW6 Drehid



Jacob Straight Line Formula

$$T = \frac{2.3Q}{4\pi \Delta s}$$

Q = Pumping Rate (m^3/d)
Δs = Drawdown per Log Cycle (m)

10–100 Minutes

$Q = 43.6\ m^3/d$

$\Delta s_{10-100} = 37.2\ m$

$$T = \frac{2.3 \times 43.6\ m^3/d}{4\pi \times 37.2\ m} = 0.215\ m^2/d$$

Logan Approximation Calculation

$$T = \frac{1.22\ Q}{s}$$

Q = Pumping Rate (m^3/d)
s = Drawdown in Well (m)

s varies between 23m and 27m but averages at 25m. $\therefore s = 25m$

$Q = 48.5\ m^3/d$

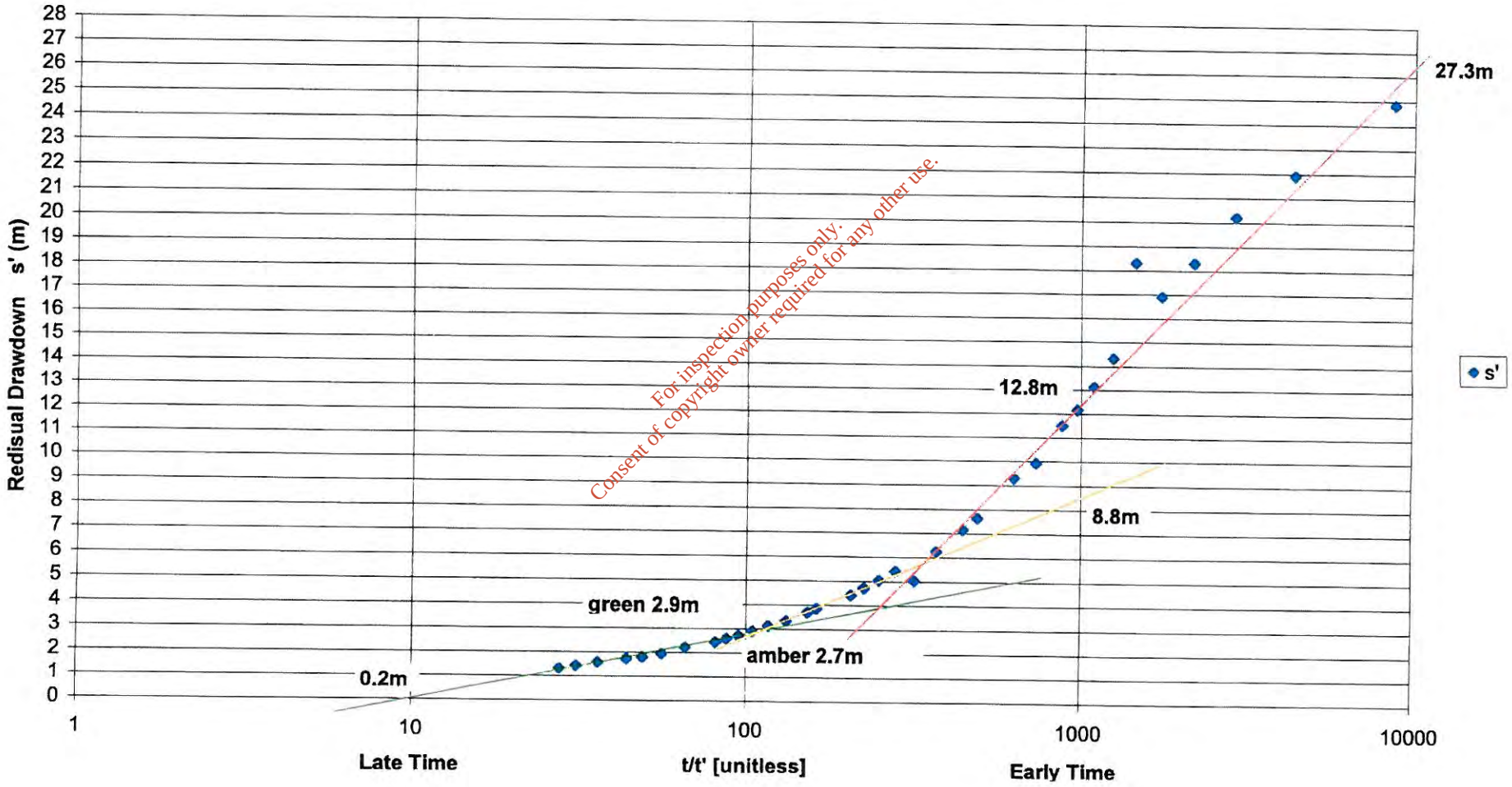
$$T = \frac{1.22 \times 48.5\ m^3/d}{25m} = 2.37\ m^2/d$$

Results:

Jacob Transmissivity 10 – 100 minutes
$T = 0.215\ m^2/d$

Logan Approximation Transmissivity 100 – 4349 minutes
$T = 2.37\ m^2/d$

Recovery Data plot for GW6PW Drehid
Showing Jacob Slopes used for Calculations



Project Sheet

TES

1131

BNM - DREHID LANDFILL

TES - GW6 PUMP TEST

RECOVERY T-CALCS

Sheet No. 1 of 2

KM

JACOB STRAIGHT LINE RECOVERY FORMULA

$$T = \frac{2.3Q}{4\pi \times \Delta s'}$$

$\Delta s'$ = CHANGE IN RESIDUAL DRAWDOWN PER LOG CYCLE (m)

$Q = \bar{Q}$, AVERAGE PUMP RATE FOR TEST (m^3/d)

$= 148.40 m^3$ PUMPED OVER 4349 MINUTES (72 hours = 4,320 minutes)

$= 49.14 m^3/d$

LATE TIME

$\Delta s' = 2.9m - 0.2m = 2.7m$

$T = \frac{2.3 \times 49.14 m^3/d}{4\pi \times 2.7m} = 3.33 m^2/d$

MID TIME

$\Delta s' = 8.8m - 2.7m = 6.1m$

$T = \frac{2.3 \times 49.14 m^3/d}{4\pi \times 6.1m} = 1.47 m^2/d$

EARLY TIME

$\Delta s' = 27.3m - 12.8m = 14.5m$

$T = \frac{2.3 \times 49.14 m^3/d}{4\pi \times 14.5m} = 0.62 m^2/d$

RESULTS USING $\bar{Q} = 49.14 m^3/d$

LATE TIME	$T =$	$3.33 m^2/d$
MID TIME	$T =$	$1.47 m^2/d$
EARLY TIME	$T =$	$0.62 m^2/d$
MEAN	$T =$	$1.81 m^2/d$

IF $Q_{max} = 56.68 m^3/d$

LATE TIME

$\Delta s' = 2.7m$

$T = \frac{2.3 \times 56.68 m^3/d}{4\pi \times 2.7m} = 3.84 m^2/d$

MID TIME

$\Delta s' = 6.1m$

$T = \frac{2.3 \times 56.68 m^3/d}{4\pi \times 6.1m} = 1.70 m^2/d$

EARLY TIME

$\Delta s' = 14.5m$

$T = \frac{2.3 \times 56.68 m^3/d}{4\pi \times 14.5m} = 0.72 m^2/d$

RESULTS USING $Q_{max} = 56.68 m^3/d$

LATE TIME $T = 3.84 m^2/d$

MID TIME $T = 1.70 m^2/d$

EARLY TIME $T = 0.72 m^2/d$

MEAN $T = 2.09 m^2/d$

Project Sheet

TES

BNM - DREHID LANDFILL

1131 ASLIBEKIAN T= CALC

KM

$$T = \frac{q \times \ln\left(\frac{1}{r} \times \sqrt{\left(\frac{Q}{\pi \varepsilon}\right)}\right)}{2\pi}$$

q = SPECIFIC CAPACITY $(m^3/d/m) = \frac{48.5 m^3/d}{25m} = 1.94 m^3/d/m$

r = radius of BOREHOLE TUBE $(m) = 0.150m$

Q = PUMPING RATE $(m^3/d) = 48.5 m^3/d$

ε = RECHARGE RATE $(m/d/m^2) = 5 \times 10^{-4} m/d/m^2$*

*stated AS ESTIMATED RECHARGE RATE FOR MIDLAND AQUIFER IN PAPER - TAKEN FROM SEVERAL STUDIES.

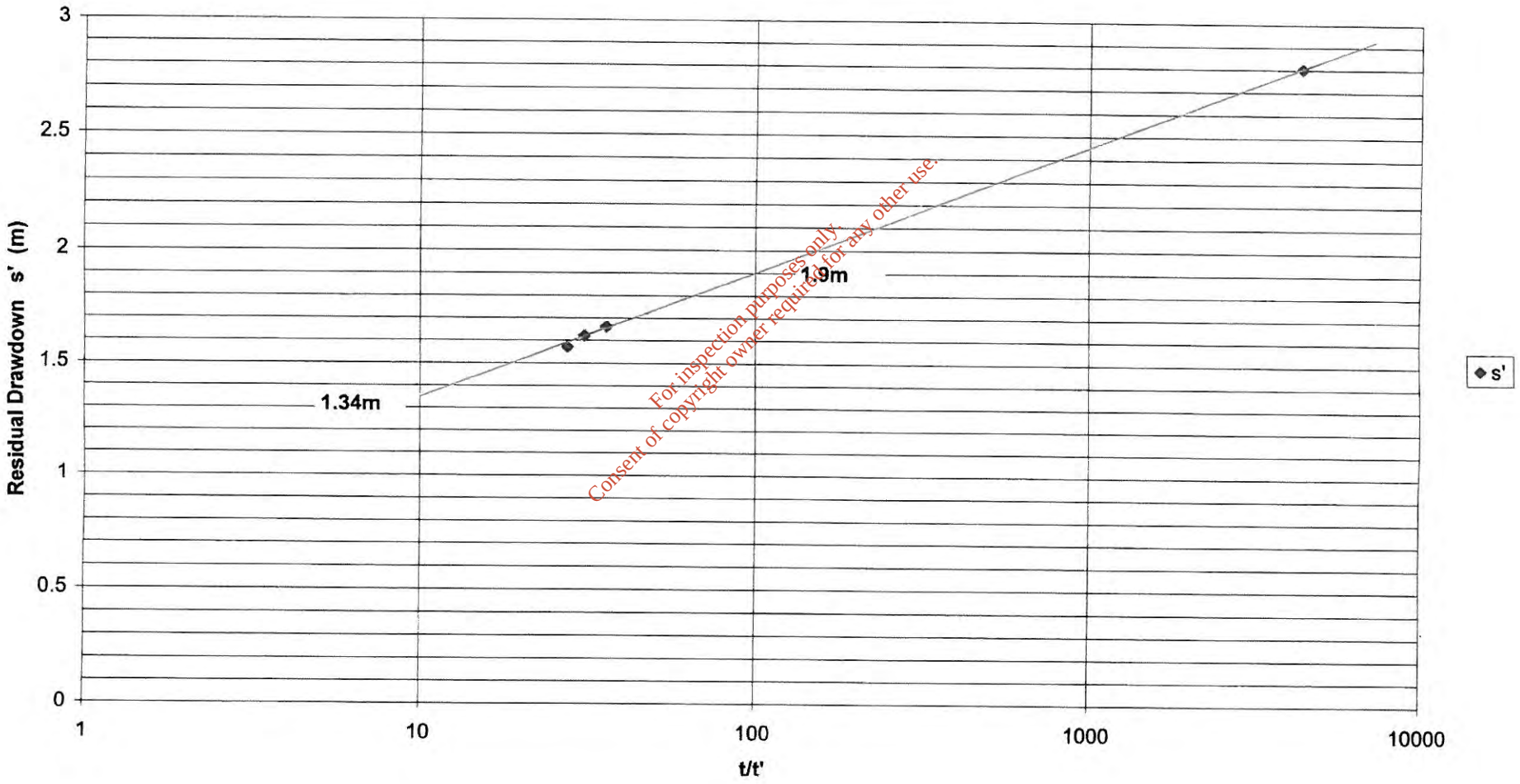
$$T = \frac{1.94 m^3/d/m \times \ln\left(\frac{1}{0.15} \times \sqrt{\frac{48.5 m^3/d}{\pi \times 5 \times 10^{-4} m/d/m^2}}\right)}{2\pi}$$

$$= \frac{1.94 m^3/d/m \times \ln\left(1.7572 \times 10^3\right)}{2\pi}$$

$$= \frac{1.94 m^3/d/m \times 7.472}{2\pi}$$

$$T = 2.31 m^2/d$$

Recovery Test data at BH1D
Showing Jacob Slope used for Calculations



Project Sheet

TES

BNM - DREHID LANDFILL
TES - GW6 PUMP TEST
GW10 RECOVERY T-CALC

1131

JACOBS STRAIGHT LINE RECOVERY FORMULA

$$T = \frac{2.3Q}{4\pi\Delta s'}$$

$\Delta s'$ = CHANGE IN RESIDUAL DRAWDOWN PER LOG-CYCLE (m)

Q = $\bar{Q}$, AVERAGE PUMPING RATE FOR TEST (m^3/d)
148.4 m3 OVER 4349 MINUTES
(72 HOURS = 4,320 minutes)
= 49.14 m^3/d

Q_{max} = MAXIMUM PUMPING RATE DURING TEST (m^3/d)

Q_{max} = 56.68 m^3/d $\quad \Delta s (1.9m - 1.34m) = 0.56m$

$\bar{Q}$ $\quad T = \frac{2.3 \times 49.14 m^3/d}{4\pi \times 0.56m} = 16.06 m^2/d$

Q_{max} $\quad T = \frac{2.3 \times 56.68 m^3/d}{4\pi \times 0.56} = 18.53 m^2/d$

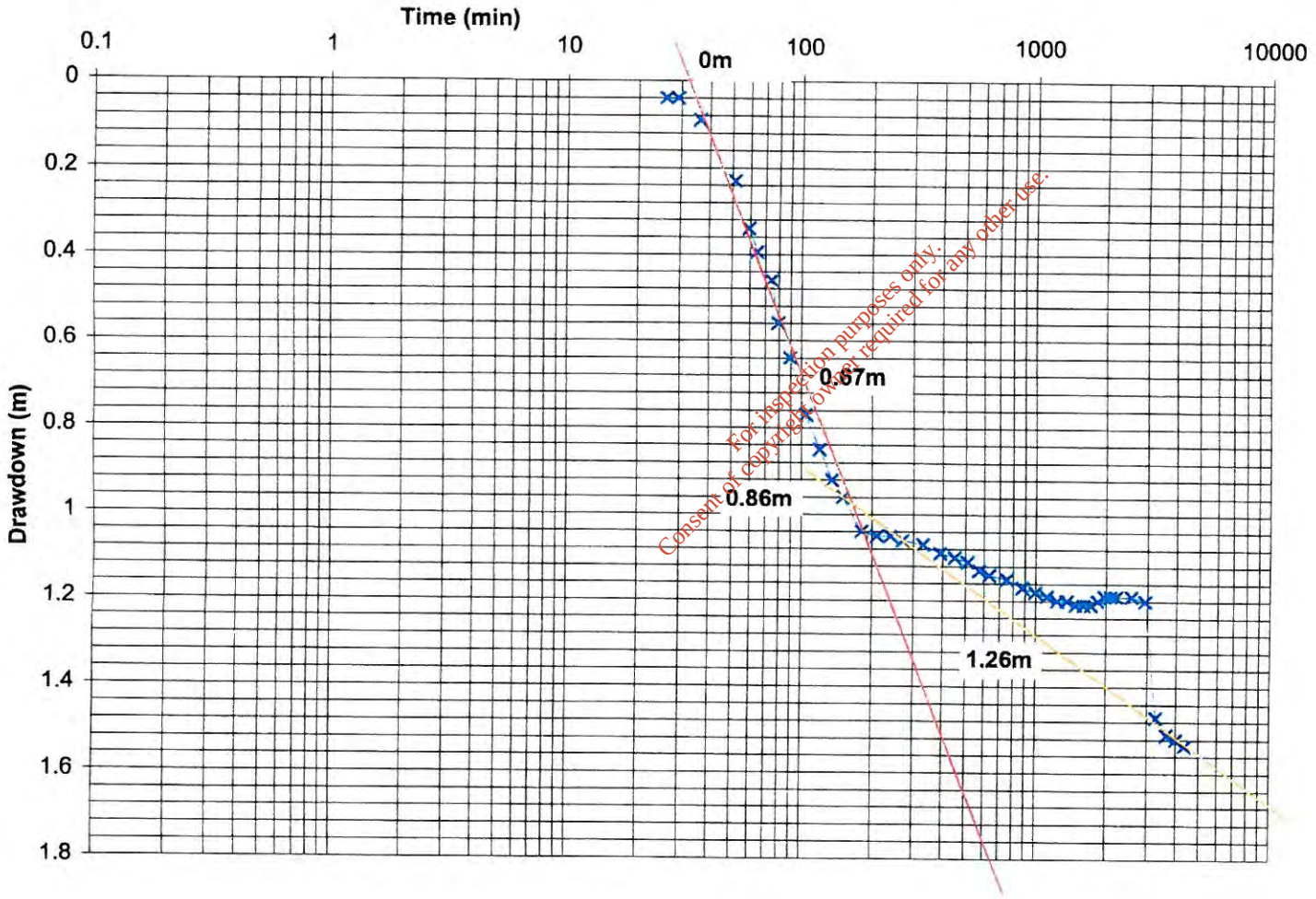
RESULTS

$\bar{Q}$ $\quad T = 16.06 m^2/d$

Q_{max} $\quad T = 18.53 m^2/d$

MEAN $T = 17.3 m^2/d$

Drawdown Data at GW1D
Showing Jacob Slopes used for Calculations



Project Sheet:

TES

Project	Design	Job	Sheet No
Format: TES - GW1 Pump Test GW1D - Drawdown T-Calc	Minutes		Revision No / Date
Project No: 1131	Telephone Log / Other Record		Prepared / Checked

Jacob Straight Line Formula

$$T = \frac{2.3Q}{4\pi \Delta s}$$

Q = Pumping Rate (m^3/d)
Δs = Drawdown per Log Cycle

Early Time 10-100 minutes

$Q = 43.6\ m^3/d$

$\Delta s = 0_m - 0.67_m = 0.67m$
(slope line intersects zero drawdown at 21 minutes, use $s=0$ as negative value would not make sense)

$$T = \frac{2.3 \times 43.6 m^3/d}{4\pi \times 0.67m} = 11.9\ m^2/d$$

Late Time

$Q = 48.5\ m^3/d$

$\Delta s = 1.26_m - 0.86_m = 0.4m$

$$T = \frac{2.3 \times 48.5 m^3/d}{4\pi \times 0.4} = 22.19\ m^2/d$$

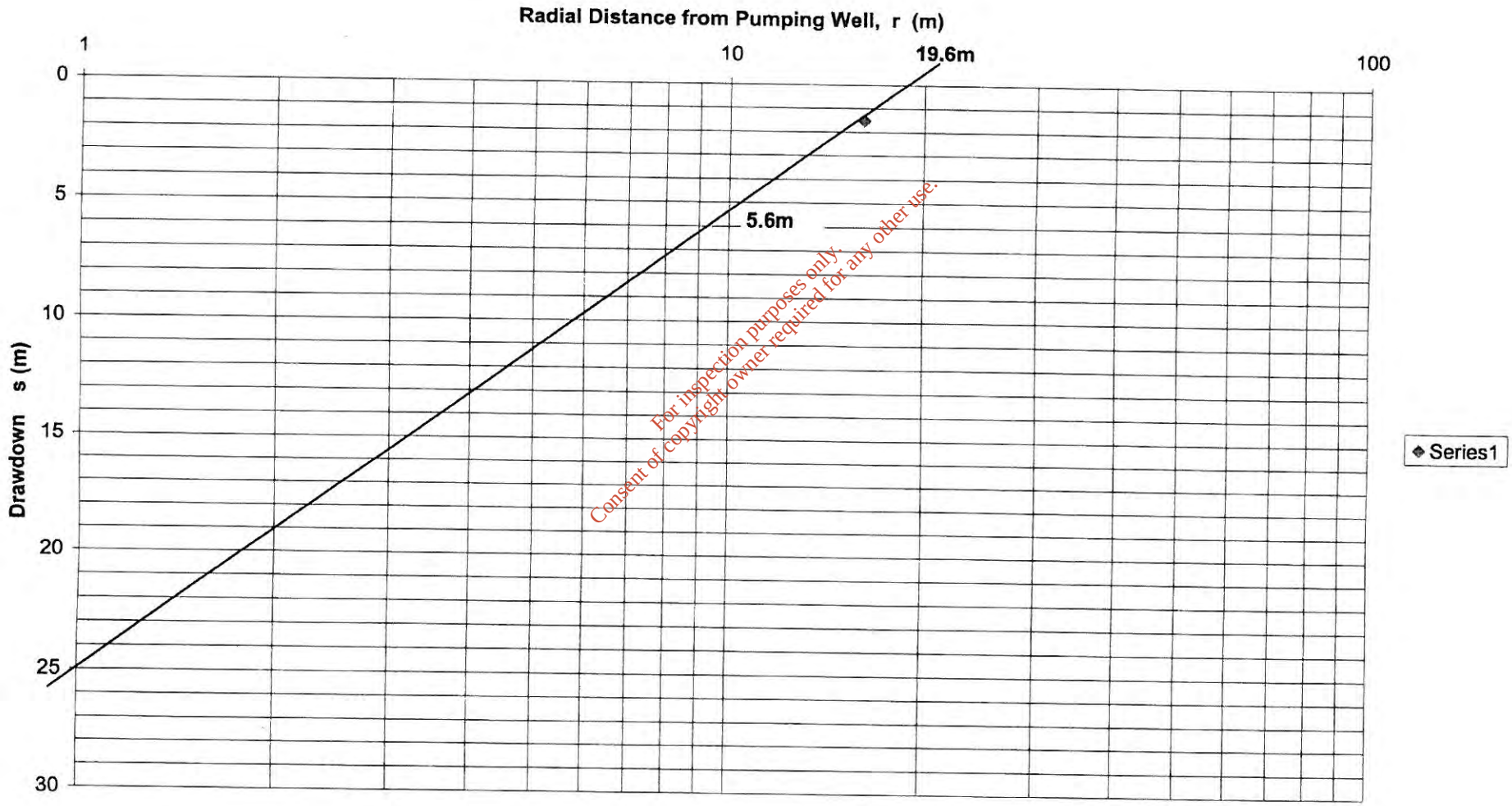
Results

Early Time $T = 11.9\ m^2/d$

Late Time $T = 22.19\ m^2/d$

Mean $T = 17.05\ m^2/d$

Zero Drawdown analysis using GW6 & GW1D



Project Sheet

TES

BNM – DREHID LANDFILL

DISTANCE DRAWDOWN ANALYSIS GW6 + GW1D

1131

JACOBS DISTANCE DRAWDOWN

STEADY s IN GW6 = 25m

$\bar{Q}$ = 49.14 m³/d

Q_{MAX} = 56.68 m³/d

$$T = \frac{2.3Q}{2\pi \Delta s}$$ DISTANCE DRAWDOWN FORMULA

Δs = DRAWDOWN PER LOG CYCLE.

Δs_{1-10} = 25.0m − 5.6m = 19.4 m

$\bar{Q}$ $T = \frac{2.3 \times 49.14 m^3/d}{2\pi \times 19.4m} = 0.927 m^2/d$

Q_{MAX} $T = \frac{2.3 \times 56.68 m^3/d}{2\pi \times 19.4} = 1.069 m^2/d$

RESULTS

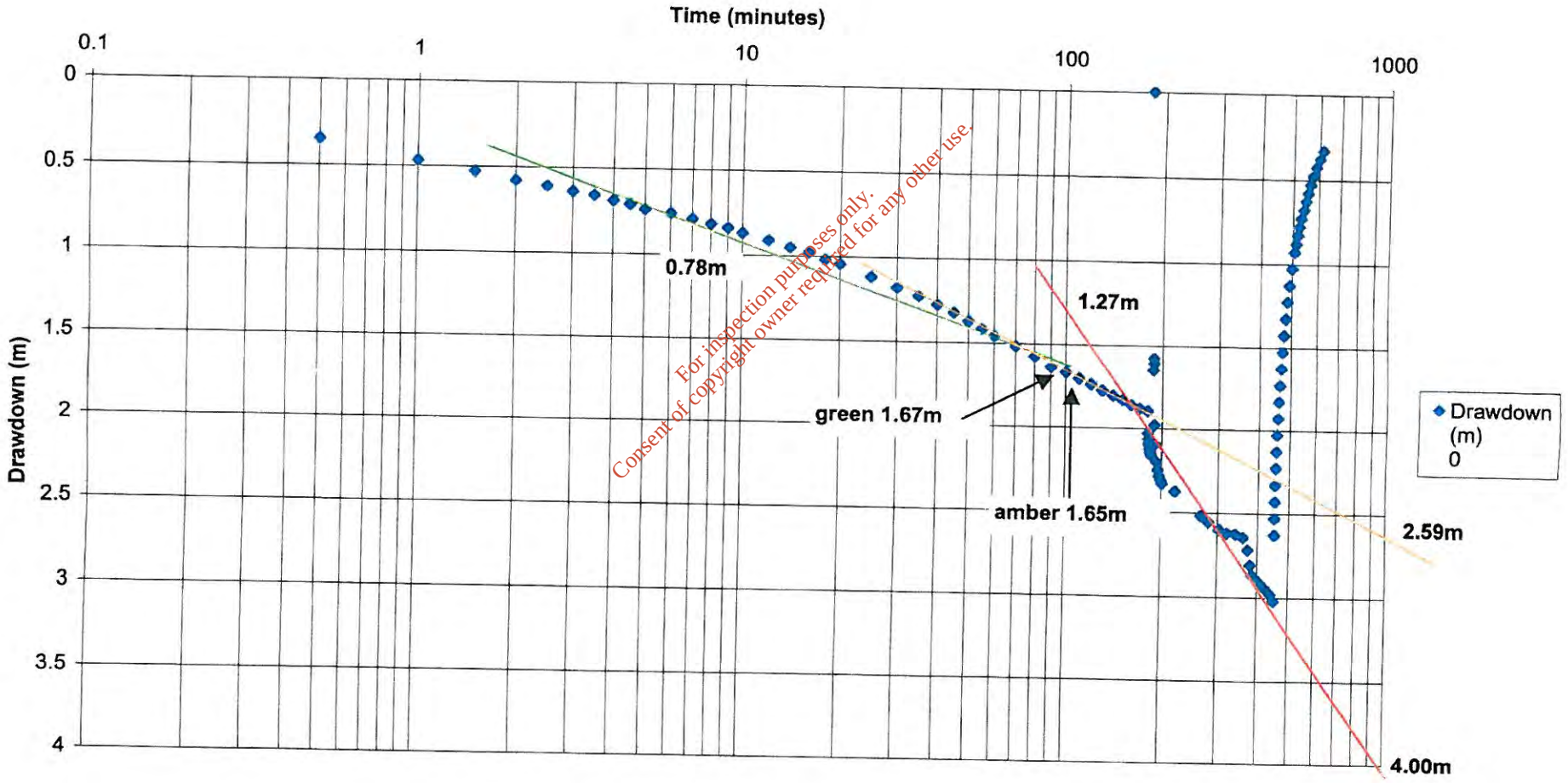
$T = 0.927 m^2/d$

$T = 1.069 m^2/d$

MEAN $T = 0.998 m^2/d$

$T = 1 m^2/d$

Pump Test Drawdown & Recovery Plot FTC Borehole BH9 Drehid
TES PLOT



TES Consulting Engineers

Project Sheet:

TES

Project: BNM - DREHID LANDFILL

Element: FTC - BH9 PUMP TEST

DRAWDOWN DATA T-CALCS

Job No: 1131

Prepared: KM

JACOB STRAIGHT LINE FORMULA

$$T = \frac{2.3Q}{4\pi\Delta s}$$

Q = PUMPING RATE (m^3/d)

Δs = DRAWDOWN PER LOG CYCLE (m)

① EARLY TIME

$Q = 136.12 m^3/d$

$\Delta s_{10-100} = 1.67m - 0.78m = 0.87m$ (FROM GRAPH)

$$T = \frac{2.3 \times 136.12 m^3/d}{4\pi \times 0.87m} = 28.64 m^2/d$$

② MID TIME

$Q = 170.24 m^3/d$

$\Delta s_{10-100} = 2.59m - 1.65m = 0.94m$ (FROM GRAPH)

$$T = \frac{2.3 \times 170.24 m^3/d}{4\pi \times 0.94} = 33.15 m^2/d$$

③ LATE TIME

$Q = 170.24 m^3/d$

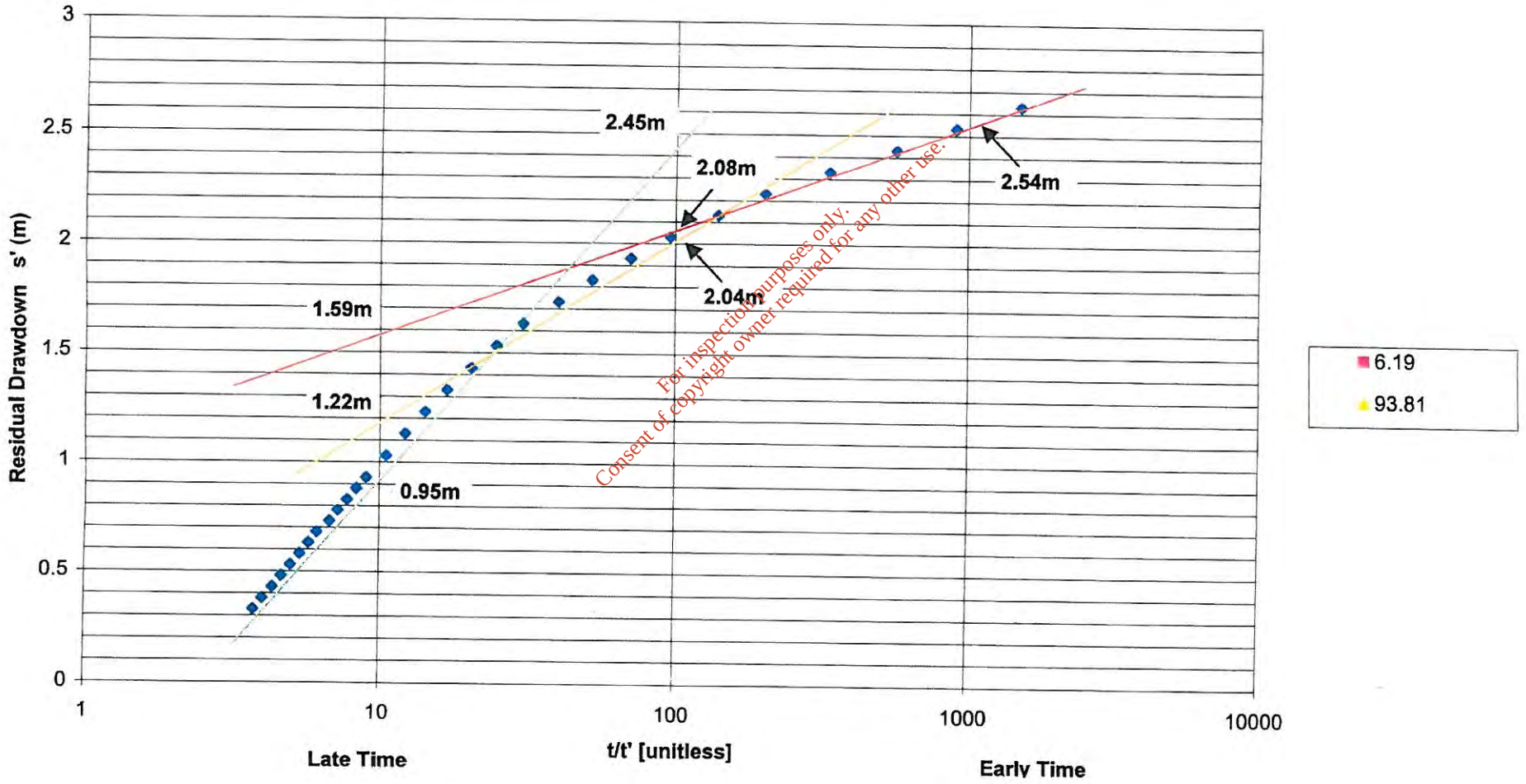
$\Delta s_{100-1000} = 4.00m - 1.27m = 2.73m$ (FROM GRAPH)

$$T = \frac{2.3 \times 170.24 m^3/d}{4\pi \times 2.73} = 11.41 m^2/d$$

RESULTS:

EARLY TIME	$T =$	$28.64 m^2/d$
MID TIME	$T =$	$33.15 m^2/d$
LATE TIME	$T =$	$11.41 m^2/d$
MEAN	$T =$	$24.40 m^2/d$

Recovery Data Plot FTC Borehole BH9 Drehid Showing Jacon Slopes used for Calculations
TES PLOT



TES Consulting Engineers

Project Sheet

TES

BNM – DREHID LAND FILL

FTC-849 PUMPTEST

1131 RECOVERY DATA T-CALC

KM

JACOBS STRAIGHT LINE RECOVERY FORMULA

$$T = \frac{2.3Q}{4\pi \times \Delta s'}$$

$\Delta s'$ = change in residual drawdown (s') per log cycle (m)

Q = $\bar{Q}$ (AVERAGE PUMP RATE FOR TEST) (m^3/d)

48,145 l over 450 minutes pumping (FTC DATA SHEET)

$$\frac{48,145 l}{450 min} = 106.99 l/min = 154.06 m^3/d$$

LATE TIME

$\Delta s' = 2.45_m - 0.95_m = 1.5m$

$$T = \frac{2.3 \times 154.06 m^3/d}{4\pi \times 1.5m} = 18.79 m^2/d$$

MID TIME

$\Delta s' = 2.04_m - 1.22_m = 0.82m$

$$T = \frac{2.3 \times 154.06 m^3/d}{4\pi \times 0.82} = 34.40 m^2/d$$

EARLY TIME

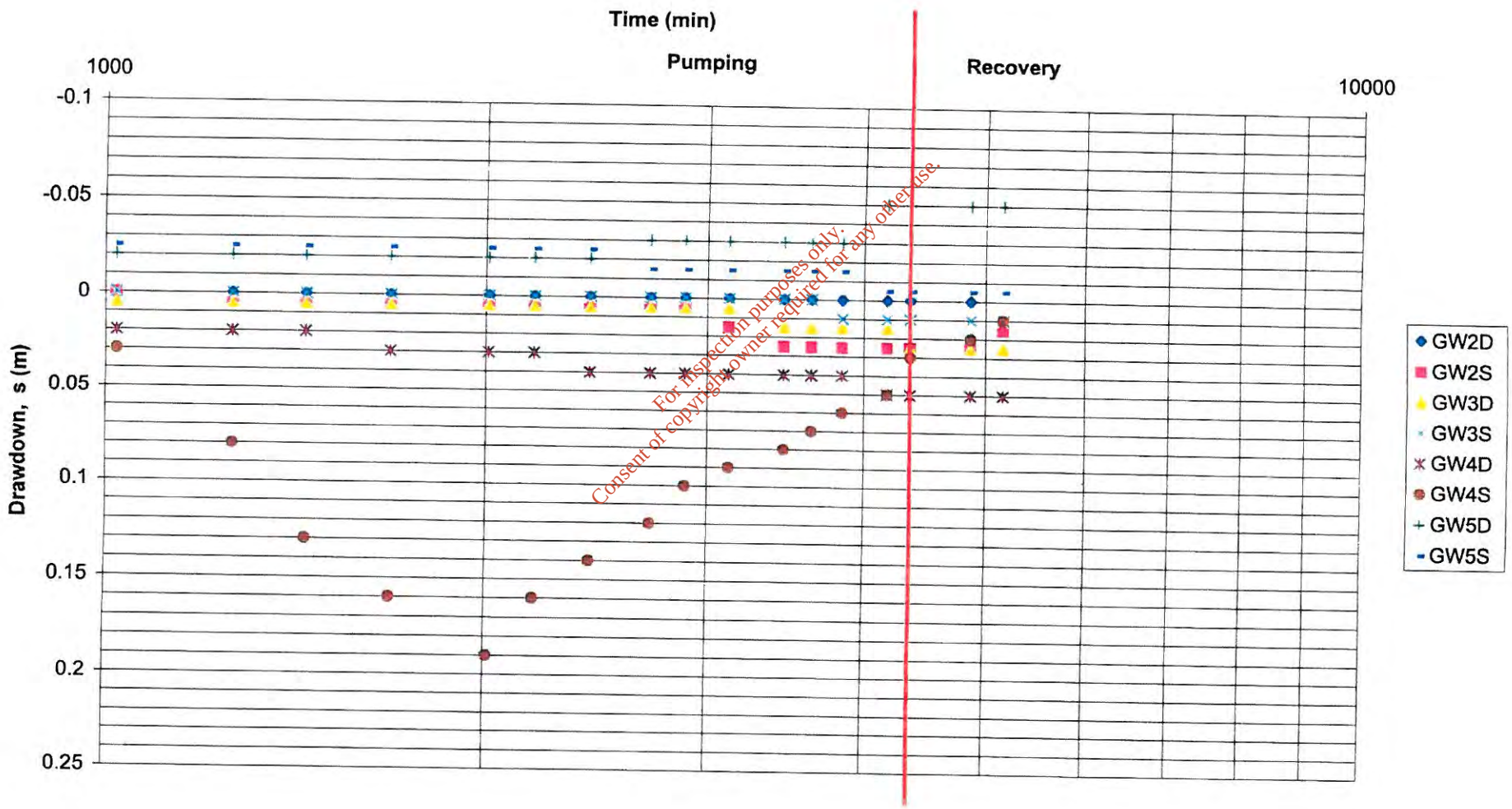
$\Delta s' = 2.54_m - 2.08_m = 0.46m$

$$T = \frac{2.3 \times 154.06}{4\pi \times 0.46} = 61.3 m^2/d$$

RESULTS:

EARLY TIME	$T = 61.3 m^2/d$
MID TIME	$T = 34.40 m^2/d$
LATE TIME	$T = 18.79 m^2/d$
MEAN	$T = 38.16$

Drawdown at Piezometers Drehid Pump Test



APPENDIX B

Air Emissions Tables
(Tables E.1(ii) and E.1(iii))

ANNEX 1 STANDARD FORMS

Standard forms are provided in this section for the recording and presentation of environmental monitoring and site investigation results

TABLE E.1(i) LANDFILL GAS FLARE EMISSIONS TO ATMOSPHERE
Emission Point: Not Applicable

Emission Point Ref. N^{o}:	Not Applicable
Location :	
Grid Ref. (12 digit, 6E,6N):	
Vent Details Diameter: Height above Ground(m):	
Date of commencement of emission:	

Characteristics of Emission :

CO		mg/m^3
Total organic carbon (TOC)		mg/m^3
NOx		mg/Nm^3 0^{o}C. 3% O_2(Liquid or Gas), 6% O_2(Solid Fuel)
Maximum volume of emission		m^3/hr
Temperature	^{o}C(max) ^{o}C(min)	^{o}C(avg)

(i) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up/shutdown to be included):*

Periods of Emission (avg)	_____min/hr _____hr/day _____day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-7A* (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	CHP
Location :	CHP Building (Refer to Figure 3B in Appendix 6 of the Waste Licence Application Attachments)
Grid Ref. (12 digit, 6E,6N):	274695E, 230602N
Vent Details Diameter: Height above Ground(m):	 0.5 20
Date of commencement:	TBC

*CHP Emission Points A2-7A & A2-7B feed into a single stack.

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	74,712 m^3/d
Maximum rate/hour	3113 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	427^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry. $5\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-7B* (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	CHP
Location :	CHP Building (Refer to Figure 3B in Appendix 6 of the Waste Licence Application Attachments)
Grid Ref. (12 digit, 6E,6N):	274695E, 230602N
Vent Details Diameter: Height above Ground(m):	 0.5 20
Date of commencement:	TBC

*CHP Emission Points A2-7A & A2-7B feed into a single stack.

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	74,712 m^3/d
Maximum rate/hour	3113 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	427^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry. $5\%O_2$			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-1 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.1
Grid Ref. (12 digit, 6E,6N):	274760E, 230585N
Vent Details Diameter: Height above Ground(m):	 1.5 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,245,608 m^3/d
Maximum rate/hour	93567 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-2 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.1
Grid Ref. (12 digit, 6E,6N):	274783E, 230585N
Vent Details Diameter: Height above Ground(m):	 1.5 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,245,608 m^3/d
Maximum rate/hour	93567 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-3 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.2
Grid Ref. (12 digit, 6E,6N):	274872E, 230585N
Vent Details Diameter: Height above Ground(m):	 0.9 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	1,146,288 m^3/d
Maximum rate/hour	47762 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-4 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.2
Grid Ref. (12 digit, 6E,6N):	274885E, 230585N
Vent Details Diameter: Height above Ground(m):	 0.9 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	1,146,288 m^3/d
Maximum rate/hour	47762 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-5 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.3
Grid Ref. (12 digit, 6E,6N):	274798E, 230756N
Vent Details Diameter: Height above Ground(m):	 1.4 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,250,384 m^3/d
Maximum rate/hour	93766 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-6 (MBT Configuration A) Refer to Figure 3A (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.3
Grid Ref. (12 digit, 6E,6N):	274821E, 230756N
Vent Details Diameter: Height above Ground(m):	 1.4 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,250,384 m^3/d
Maximum rate/hour	93766 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-1 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.1
Grid Ref. (12 digit, 6E,6N):	274760E, 230585N
Vent Details Diameter: Height above Ground(m):	 1.5 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,414,040 m^3/d
Maximum rate/hour	100585 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-2 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.1
Grid Ref. (12 digit, 6E,6N):	274783E, 230585N
Vent Details Diameter: Height above Ground(m):	 1.5 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,414,040 m^3/d
Maximum rate/hour	100585 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-3 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.2
Grid Ref. (12 digit, 6E,6N):	274872E, 230585N
Vent Details Diameter: Height above Ground(m):	 0.9 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	778,200 m^3/d
Maximum rate/hour	32425 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-4 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.2
Grid Ref. (12 digit, 6E,6N):	274885E, 230585N
Vent Details Diameter: Height above Ground(m):	 0.9 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	778,200 m^3/d
Maximum rate/hour	32425 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. N^{o}:	A2-5 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.3
Grid Ref. (12 digit, 6E,6N):	274798E, 230756N
Vent Details Diameter: Height above Ground(m):	 1.4 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,050,728 m^3/d
Maximum rate/hour	85447 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^{o}C(max)	^{o}C(min)	16^{o}C(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(ii) MAIN EMISSIONS TO ATMOSPHERE (1 Page for each emission point)

Emission Point Ref. Nº:	A2-6 (MBT Configuration B) Refer to Figure 3B (Appendix 6 of the Waste Licence Application Attachments)
Source of Emission:	Biofilter
Location :	Biofilter/Odour Abatement Building No.3
Grid Ref. (12 digit, 6E,6N):	274821E, 230756N
Vent Details Diameter: Height above Ground(m):	 1.4 20
Date of commencement:	TBC

Characteristics of Emission :

(i) Volume to be emitted:			
Average/day	m^3/d	Maximum/day	2,050,728 m^3/d
Maximum rate/hour	85447 m^3/h	Min efflux velocity	$m.sec^{-1}$
(ii) Other factors			
Temperature	^oC(max)	^oC(min)	16^oC(avg)
For Combustion Sources: Volume terms expressed as : ☐ wet. √dry.			

(iii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	60 min/hr	24	hr/day	365	day/yr

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-7A

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NO_X					N/A		500		1.56		13635
PM_{10}							50		0.16		1363
HCl							60		0.19		1636
HF							4		0.01		109
SO_2							200		0.62		5454
CO							100		0.31		2712
H_2S							50		0.16		1363

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-7B

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NO_X					N/A		500		1.56		13635
PM_{10}							50		0.16		1363
HCl							60		0.19		1636
HF							4		0.01		109
SO_2							200		0.62		5454
CO							100		0.31		2712
H_2S							50		0.16		1363

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C, 101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-1 (MBT Configuration A)

Parameter	Prior to treatment[1]				Brief description of treatment	As discharged[1]					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.68		40982
H_2S							5		0.47		4098
Mercaptans							5		0.47		4098

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-2 (MBT Configuration A)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.68		40982
H_2S							5		0.47		4098
Mercaptans							5		0.47		4098

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-3 (MBT Configuration A)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		2.39		20920
H_2S							5		0.24		2092
Mercaptans							5		0.24		2092

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-4 (MBT Configuration A)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		2.39		20920
H_2S							5		0.24		2092
Mercaptans							5		0.24		2092

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-5 (MBT Configuration A)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.69		41070
H_2S							5		0.47		4107
Mercaptans							5		0.47		4107

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-6 (MBT Configuration A)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.69		41070
H_2S							5		0.47		4107
Mercaptans							5		0.47		4107

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-1 (MBT Configuration B)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		5.03		44056
H_2S							5		0.50		4406
Mercaptans							5		0.50		4406

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-2 (MBT Configuration B)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		5.03		44056
H_2S							5		0.50		4406
Mercaptans							5		0.50		4406

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-3 (MBT Configuration B)

Parameter	Prior to treatment[1]				Brief description of treatment	As discharged[1]					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		1.62		14202
H_2S							5		0.16		1420
Mercaptans							5		0.16		1420

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-4 (MBT Configuration B)

Parameter	Prior to treatment[1]				Brief description of treatment	As discharged[1]					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		1.62		14202
H_2S							5		0.16		1420
Mercaptans							5		0.16		1420

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-5 (MBT Configuration B)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.27		37426
H_2S							5		0.43		3743
Mercaptans							5		0.43		3743

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

TABLE E.1(iii): MAIN EMISSIONS TO ATMOSPHERE - Chemical characteristics of the emission (1 table per emission point)

Emission Point Reference Number: A2-6 (MBT Configuration B)

Parameter	Prior to treatment(1)				Brief description of treatment	As discharged(1)					
	mg/Nm^3		kg/h			mg/Nm^3		kg/h.		kg/year	
	Avg	Max	Avg	Max		Avg	Max	Avg	Max	Avg	Max
NH_3					N/A		50		4.27		37426
H_2S							5		0.43		3743
Mercaptans							5		0.43		3743

1. Concentrations should be based on Normal conditions of temperature and pressure, (i.e. 0^{o}C,101.3kPa). Wet/dry should be the same as given in Table E.1(ii) unless clearly stated otherwise.

APPENDIX C

Water Emissions Tables
(Tables E.2(i) and E.2(ii))

Figure 3A, Figure 3B and Figure 6.3

TABLE E.2(i): EMISSIONS TO SURFACE WATERS
(One page for each emission)

Emission Point:

Emission Point Ref. N^{o}:	SW7 (SW Pond discharge pt)
Source of Emission:	Surface water Runoff
Location :	Drehid MBT Facility (Refer to Figure 3A and Figure 3B in Appendix 6 of the Waste Licence Application Attachments)
Grid Ref. (10 digit, 5E,5N):	E274415 N230850
Name of receiving waters:	Drainage Ditch leading to Cushaling River
Flow rate in receiving waters:	Not applicable
Available waste assimilative capacity:	Not Applicable

Emission Details:[1]

(i) Volume to be emitted (total of SW7 and SW8)

[1] Surface water runoff is discharge to the surface water lagoons and treated in parallel. Discharge is split between SW7 and SW8. Calculations for total runoff are included in the Engineering Services Report (Appendix 2.2 of the EIS).

Normal/day*	244 m^3	Maximum/day**	12,132 m^3
Maximum rate/hour	506 m^3		

*Based on EIS data – Area 26.9 hectares, Average runoff of 331mm/yr
**Based on Appendix 3 Engineering Services Report (Refer to Appendix 2.2, Volume IV of EIS), Attenuation Pond Calculation

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	min/hr	hr/day	day/yr
	Rainfall dependant	- 0 to 24 hr/day	365 days/yr

Emission Point:

Emission Point Ref. N^{o}:	SW8 (SW Pond discharge pt.)
Source of Emission:	Surface water Runoff
Location :	Drehid MBT Facility (Refer to Figure 3A and Figure 3B in Appendix 6 of the Waste Licence Application Attachments)
Grid Ref. (10 digit, 5E,5N):	E274760 N230470
Name of receiving waters:	Drainage Ditch leading to Cushaling River
Flow rate in receiving waters:	Not applicable
Available waste assimilative capacity:	Not applicable

Emission Details:

(i) Volume to be emitted (total of SW7 and SW8)			
Normal/day*	244 m^3	Maximum/day**	12,132 m^3
Maximum rate/hour	506 m^3		

*Based on EIS data – Area 26.9 hectares, Average runoff of 331mm/yr
**Based on Appendix 3 Engineering Services Report (Refer to Appendix 2.2, Volume IV of EIS), Attenuation Pond Calculation

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included):*

Periods of Emission (avg)	min/hr	hr/day	day/yr
	Rainfall dependant	- 0 to 24 hr/day	365 days/yr

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

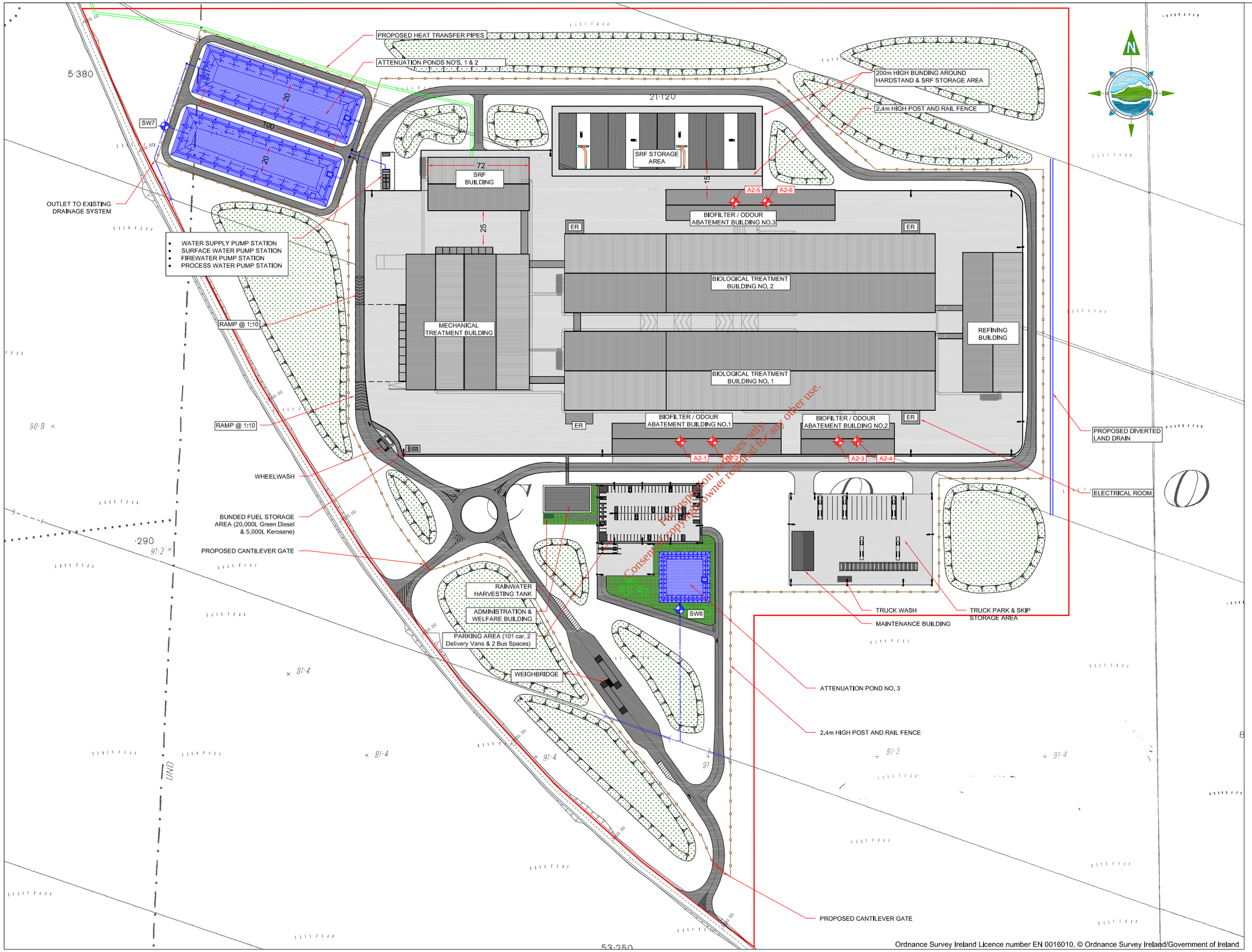
Emission point reference number : SW7

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Ammonia		≤0.5				≤0.5			
BOD		≤25				≤25			
pH		pH 6 to 9				pH 6 to 9			
Suspended Solids		Will vary				≤ 35			

TABLE E.2(ii): EMISSIONS TO SURFACE WATERS - Characteristics of the emission (1 table per emission point)

Emission point reference number : SW8

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
Ammonia		≤0.5				≤0.5			
BOD		≤25				≤25			
pH		pH 6 to 9				pH 6 to 9			
Suspended Solids		Will vary				≤ 35			



GENERAL LEGEND

ACTIVITY BOUNDARY

BIOFILTER STACK

SURFACE WATER EMISSION POINTS

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Issue	Date	Description	By	Chkd.
A	27.06.12	ISSUED FOR WASTE LICENCE	M.N.	D.C.

Client: BORD NA MÓNA

Project: DREHID MECHANICAL BIOLOGICAL TREATMENT (MBT) FACILITY

Title: EMISSION POINT LOCATIONS

(Configuration A: MBT with Composting)

Scale @ A3: 1:2,500

Prepared by:	Checked:	Date:
M. Nolan	D. Conneran	May 2012

Project Director: D. Grehan

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Drawing No.: Figure 3A

Issue: A