

Environmental Management System 5

Billinge Hill Quarry Closed Landfill Site: Maintenance Manual

Authorised by: Chief Executive

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Issue Number: 9

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MERSEYSIDE WASTE DISPOSAL AUTHORITY

Document Revision History

Issue: 09

Date of Issue: 12th March 2014

Issue	Author	Date	Amendments
09	ASB	12 th March 2014	Document redrafted to accommodate major alterations to Leachate Treatment apparatus

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1.0 Site Location and Access

1.1 Site location

- 1.1.1 The landfill site is located at the end of Beacon Road which is off Main Street (A571), the main road which passes through Billinge town centre. See Appendix I
- 1.1.2 Keys to the site are kept in offices of the Facilities Section on the 7th floor of 1 No Mann Island, Liverpool L3 1BP.

1.2 Access route

- 1.2.1 Access to the landfill site is gained via the gates at its south-east corner, which are located at the end of Beacon Road. An access track, approximately 1km long, leads from these gates and along the eastern side of the site. The Leachate Treatment compound is situated adjacent to the track approximately midway along its length. The track eventually leads to an entrance on farmland at the north-east corner of the site.

1.3 Access into the Leachate Compound and Housing Units

- 1.3.1 The Leachate Compound is covered by a manned CCTV system. Before entering into the compound, personnel shall inform the monitoring station of their presence and their intention to enter the compound.

Authorised access is password protected, the details of which are not included in this EMS. See member of the Waste Facilities Dept for access arrangements

- 1.3.2 Keys to the Leachate Compound, and Housing Units etc. are kept in the offices of the Facilities Section on the 7th floor of 1 No Mann Island, Liverpool L3 1BP
- 1.3.3 Housing Unit No.1 (situated further from the entrance gate into the compound) sits above the main leachate collection chamber and has been identified as a confined space. Access into Housing Unit No 1 can only be made in compliance with MWDA's Permit to Work system.
- 1.3.4 Housing Unit No.2 (situated nearer to the entrance gate into the compound) contains the principal apparatus and control panels. Access is via a padlocked double door. Before entering into the unit, it is usual (good practice) to switch on the housing extraction fan; the on/off switch is fixed to the external right hand wall adjacent to the door.

2.0 Purpose of Pumping Station and Aeration System

2.1 Background

Historical

- 2.1.1 Billinge Hill Quarry operated as a landfill site from the mid 1980's until 2001. It is approximately 10 hectares in area.
- 2.1.2 Prior to becoming a landfill, the site was a former quarry. It was approximately 30metres deep at its deepest point.
- 2.1.3 Merseyside Waste Disposal Authority (MWDA) operated the site from its commencement until 1995. Mersey Waste Holdings Ltd (MWHL), acting on behalf of MWDA, took over the operation in 1995 and handed back the site to MWDA in 2001.
- 2.1.4 The site is subject to the conditions of a Waste Management Licence issued by the Environment Agency (EA).
- 2.1.5 Also, between 2002 and 2006, MWDA:-
- capped the site following EA instructions,
 - Restored and landscaped the site in accordance with Planning conditions.
- 2.1.6 In 2007 the EA granted MWDA an Environmental Permit for the operation of the site's leachate aeration treatment plant.

Site Drainage and Aeration

- 2.1.7 Before landfilling commenced, the base of the quarry was sealed with quarry waste material. A basal leachate collection system, and a pumping chamber were then constructed on top of the seal; the chamber being built in stages as landfilling progressed.
- 2.1.8 Leachate which collects in the drainage system discharges into the base of the pumping chamber. It is then pumped up to the top of the chamber which is contained within a brick built housing unit (Housing Unit No.1).
- 2.1.9 From here, the leachate passes through an aeration and settlement process before being further pumped, via a rising main and gravity drain, to the public foul sewer at Downham Walk.
- 2.1.10 The control equipment required to operate the pumping and aeration processes is contained within a 2nd brick built housing unit (Housing Unit No.2) located adjacent to Housing Unit No.1.

2.2 Environment Agency

- 2.2.1 A Waste Management Licence (WML) for the site was originally issued by the EA. The main requirement of the Licence was that the leachate level at the bottom of the pumping chamber should not exceed 118.00metres A.O.D.
- 2.2.2 In 1999 the EA requested that a Regulation 15 Risk Assessment of the site be carried out. MWHL commissioned WS Atkins to undertake the Assessment and submit a report to the Environment Agency (EA).
- 2.2.3 Based on the report's findings, the EA instructed MWDA in 2001 that the site had to be capped with an impermeable membrane.

The capping work consisted of laying a "Bentonite 75" geosynthetic membrane on top of the existing subsoil materials, and placing another layer of restoration varying between 1.0metre and 1.5metre thick above the "Bentonite".

The capping works were completed in late 2003.

- 2.2.4 In 2007 the EA issued an Environmental Permit for the operation of the leachate treatment plant.
- 2.2.5 In 2008, a review of the Assessment was carried out by WS Atkins and submitted to the EA. Atkins concluded that the findings of the original Regulation 15 Assessment were still valid.

2.3 United Utilities

- 2.3.1 The leachate arising from the site is classified as trade waste, and as such a Trade Effluent Discharge Consent (Water Industry Act 1991) is required from United Utilities. This sets out the parameters with which the leachate must comply, in order for it to be discharged to foul sewer.
- 2.3.2 Limits are set upon the composition, volume and rate of discharge.
See Appendix II
- 2.3.3 Monitoring of the leachate composition and compliance with the TEDC is undertaken as part of the [Environmental Monitoring Procedure EMS 5](#)

2.4 Commercial Gas Extraction System

- 2.4.1 There is a commercial gas extraction system on the site. Gas rights are owned by Bidston Methane Ltd which is a joint venture company set up by MWDA and Novera Energy Ltd.
- 2.4.2 The maintenance of the entire Gas Extraction System is undertaken by the joint venture company.
- 2.4.3 The general arrangement of the layout of the gas lines and gas wells which make up the gas system infrastructure can be found in Appendix III.

3.0 Leachate Treatment System

3.1 Leachate treatment compound

3.1.1 Emergency electrical override

An emergency electrical override switch is located in a secure cabinet outside of the Compound. The Cabinet is located at a safe distance, but completely visible to and from the Compound.

3.1.2 The leachate treatment compound comprises of:

- 2 No brickwork Housing Units
- A submersible pump chamber
- The leachate aeration and settlement apparatus
- The discharge to sewer system
- A Methane Analyser

All of which are enclosed within a palisade fenced compound.

3.2 Equipment inventory

3.2.1 A full inventory of the system apparatus can be found on MWDA's Asset Register for the closed landfill sites. This is a live document that details the individual components and their locations, along with a source for their replacement.

3.2.2 A Store of standby components is kept at the Authority's storage unit at its South Sefton facility. An individual member of the Waste Facilities department is tasked with maintaining the stock in Stores as part of general duties. A list of Stores can be found in [Asset Register](#).

3.2.3 Apparatus in the Leachate Treatment compound:

- 1 No GRP Settlement tank (2.4 x 7.2m) plus ancillary pipe work
- 1 No Jetting tank including jetting nozzles (Mounted above the Settlement tank)
- 2 No brick built housing units (Nos 1 and 2)
- 1 No 5000ltr Stainless Steel Sparge tank, incorporating sparge pipework and jetting nozzles, and ancillary pipework.
- Methane Analyser

3.2.4 Equipment in Housing Unit No 1 (containing a 30m deep collection chamber):

- 1 No submersible (Supply) pump
- Nom 30 metre length of armoured hose
- 1 No Level transducer

3.2.5 Equipment in Housing Unit No 2:

- 2 No Centrifugal (Discharge) pumps
- 2 No Centrifugal (Discharge) pump control panels
- 2 No Centrifugal (Transfer) pump control panels

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- 1 No Flow meter
- 1 No Air Blower unit + hoses
- 1 No Air Blower unit control panel
- 1 No Submersible pump (Supply) control panel (for submersible pump located within Housing unit No 1)
- 1 No Level transducer control and readout panel (for level transducer located in Housing unit No 1)
- Telemetry system

3.2.6 Equipment in 5000ltr Sparge Tank:

- 100 No jetting nozzles
- 4.5m of sparge pipework
- 2 No Centrifugal (Transfer) pumps (Mounted on tank)
- 2 No Swing valves (Mounted on tank)
- 3 No Level probes

3.2.7 Equipment in Jetting Tank (Located directly above the Settlement tank):

- 2m sparge pipework
- 10 No jetting nozzles

3.2.8 Equipment in Settlement Tank (Divided into 6 No chambers)

- GRP Weir and Baffle plates to form the 6 No chambers
- 36 No aeration dome assemblies divided amongst the chambers.
- 3 No level probes
- Associated discharge and overflow pipework

3.3 Trace Heating and Insulation

All external process pipework which might hold static leachate has been fitted with trace heating, and is fully insulated against frost to prevent the Leachate Treatment System freezing up.

3.4 Telemetry System

A telemetry system is in place to enable the leachate level inside the submersible pump chamber to be monitored from MWDA's head office

3.5 Leachate Aeration process

3.5.1 The following drawings detail the apparatus assembly and process of the Leachate treatment system.

- MWDA.510-350-001. General arrangement
MWDA.510-350-002. Elevations
MWDA.510-350-003. Flow diagram

3.5.2 **Stage 1.** Leachate Collection (Pump Chamber):

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- 1 Leachate is collected via the landfill site basal drainage system, and flows into the Pump Chamber, located beneath the bricking housing (No 1).
- 2 Once the leachate level in the Pump Chamber rises to a pre-set point (picked up by the level transducer) the Supply pump, located in the bottom of the chamber, is automatically switched on. The Supply pump then discharges the leachate into the above ground Sparge tank, until the leachate level in the Pump Chamber is lowered to another pre-set level (again picked up by the level transducer) and the Supply pump stops running.

3.5.3 **Stage 2. Air Stripping (Sparge Tank)**

- 1 The leachate from the Pump Chamber is discharged by the Supply pump into the Sparge Tank where it is injected through the jetting nozzles, allowing the dissolved methane contained within the leachate to be released to air. The leachate then falls into the body of the Sparge tank.
- 2 As the leachate collects in the body of the Sparge Tank, it will rise to a pre-set level where the level probes activates one of the Transfer pumps; discharging the leachate from the Sparge Tank to the Jetting Tank. As the leachate level in the Sparge Tank is lowered to a pre-set point, the Transfer pump stops running.
- 3 The Transfer Pumps operate on a 'duty' and 'stand-by' rotation, with the pumps alternating in each operational cycle.

3.5.4 **Stage 3. Secondary Air Stripping (Jetting Tank)**

- 1 The discharged of the leachate from the Sparge tank via the Transfer pumps provides an opportunity to introduce a secondary air stripping stage; utilising the pressure from the Transfer Pumps as the leachate is discharged into the Settlement Tank.
- 2 The Jetting tank is mounted above the Settlement tank, and contains a short length of sparge pipe with jetting nozzles. As the leachate is discharged from the Sparge Tank into the Settlement tank, it is injected through the jetting nozzles, releasing any residual dissolved methane.
- 3 The Jetting tank is open at the bottom, and leachate falls through into the 1st chamber of the Settlement Tank.

3.5.5 **Stage 4. Settlement (Settlement Tank)**

- 1 The leachate released into the Settlement tank from the Jetting tank passes through a series of weir and baffles boards (formulating the 6 chambers in the tank) allowing for the settlement of any solids and the continued release of trapped air/gas to atmosphere.
- 2 The leachate in Chamber 6 is controlled by level probes connected to the Discharge pumps located in Housing Number 2.

When activated, the Discharge Pumps discharges the now fully treated leachate from Chamber 6, through the Flow Meter, and into the Public sewer located in Downham Walk.

- 3 The Discharge Pumps operate on a 'duty' and 'stand-by' rotation, with the pumps alternating in each operational cycle.

3.5.6 Stage 5. Tertiary Air Stripping (Air Blower)

- 1 The Methane Analyser serves to sample the dissolved methane content of the leachate, and controls the activation of the Air Blower. The Air Blower in turn is connected to 36No aeration domes, evenly distributed throughout the Settlement Tank.
- 2 Samples are taken by the Methane Analyser at predetermined intervals (typically every 30minutes). Should the Analyser record a dissolved methane content $>0.073\text{mg/l}$, it automatically switches on the Air Blower.
- 3 The Air Blower injects air through the aeration domes creating a continual stream of bubbles which flow through the body of the leachate, releasing dissolved methane.
- 4 The Air Blower will continue to operate until the Methane Analyser records a dissolved methane content of $<0.073\text{mg/l}$, and automatically switches the Air Blower off.

3.6 Emergency Isolation Switch

- 3.6.1 Otherwise known as a Kill Switch, an emergency isolation switch has been installed in a secure cabinet, and enables the electrical supply to the Leachate Treatment Compound to be terminated in the event of an emergency.
- 3.6.2 The switch is located at an appropriate safe distance from the Compound that enables it to be observed without getting too close to any emergency event.
- 3.6.3 In throwing the Kill Switch, all electrical power to the Treatment Compound will be isolated, shutting down all operational systems.
- 3.6.4 Access to the Kill Switch, located in the Sub-Station, is made as detailed in 1.2 above.

4.0 Checking, Monitoring and Maintenance

4.1 Meter Readings

- 4.1.1 Readings are taken of all the electrical and operation meters in order to monitor the performance and efficiency of the plant and apparatus; along with the electrical consumption of the facility.
- 4.1.2 The readings are generally undertaken by the Waste Facilities' Environmental Officers during the course of the Environmental Monitoring activities. When necessary, this shall be undertaken by other members of the Waste Facilities Department with a sufficient familiarity of the Leachate Treatment System.
- 4.1.3 Details, and the locations, of the meters to be read can be found in Meter Details and Locations – EMS 5. This is a pictorial guide to each meter and its location.
- 4.1.4 The meter readings are recorded by hand on the 'crib sheet' Meter Record Sheet – EMS 5. A store of blank hard copies are kept in Housing Unit No 2.
- 4.1.5 The readings are then archived on the spreadsheet Meter Reading – EMS 5. This automatically analyses successive readings for anomalies.
- 4.1.6 Anomalies could reflect blockages in the pipework, or pumps running inefficiently, and are investigated accordingly

4.2 Condition Monitoring and Maintenance

- 4.2.1 The Leachate Aeration system is an automatic system, requiring no manual operation.
- 4.2.2 The installation is visited by Waste Facilities' Environmental Officers during the course of the environmental monitoring activities, and by Waste Facilities' Mechanical Engineer as part of general duties.
- 4.2.3 Condition Monitoring and Maintenance work is generally undertaken by members of the Waste Facilities Department with a sufficient familiarity of the Leachate Treatment System; assisted by Contractors as and when required.
- 4.2.4 Contractors are selected from the Authority's list of authorised Contractors and Suppliers EMS 4
- 4.2.5 The frequency of the Condition Monitoring and Maintenance shall be in accordance with the Monitoring and Maintenance Schedule – EMS 5.
- 4.2.6 Flow Meter pipework
 - 1 In order to maintain MCERTS standard, the flow meter pipework shall be inspected for blockages or build up that might influence the effectiveness of the flow meter.
 - 2 The procedure for opening and inspecting the pipework can be found in Flow Meter Pipework Cleaning Protocol EMS 5.

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4.2.7 Sparge Tank Filter

- 1 The Filter is located on the incoming pipework mounted on the external face of the Sparge tank, and serves to filter out any small deposits in the leachate that might block the jetting nozzles.
- 2 The procedure for opening and inspecting the Filter can be found in [Flow Meter Pipework Cleaning Protocol EMS 5](#).

4.2.8 Pressure Gauge

- 1 A pressure gauge is mounted on the incoming pipe to the Sparge tank Filter to provide an indication of the condition of the sparge tank pipework.
- 2 The gauge contains a red tell-tale needle and black operating needle. If either needle is beyond the operating pressure, indicated by the blue mark on the gauge face, it indicates a blockage in either the Filter or the pipework.
- 3 Inspect the Filter condition in accordance with [Flow Meter Pipework Cleaning Protocol EMS 5](#).
- 4 If after inspecting the Filter the black operating needle is still beyond the blue mark, it indicates a blockage in the pipework. This shall be reported to the Facilities Mechanical Engineer for further investigation.
- 5 The Supply pump should be switched off at the control panel until the source of the blockage has been found and cleared.

4.2.9 Air Blower

- 1 The Blower is surface mounted, and located inside Housing Unit No2.
- 2 The service entails a check on fluid levels, and is undertaken by the Waste Facilities' Mechanical Engineer as part of general duties.

4.2.10 Submersible Pump (1No)

- 1 The submersible (Supply) pump is located at the bottom of the pump chamber (Nom30m deep) beneath Housing Unit No 1.
- 2 The lifting out and servicing of the submersible pump is undertaken by a Contractor on the Authority's behalf.

4.2.11 Centrifugal Pumps (4No) (2No Transfer and 2No Discharge)

- 1 The Centrifugal pumps are not subject servicing due to their low monetary value. (The servicing of these low value pumps is as costly as their replacement with new.)
- 2 The pumps operate until a mechanical fault develops. The pump is then replaced, with an identical pump kept in Stores, by Waste Facilities'

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Mechanical Engineer. The Stores pump is then replaced with a new identical pump.

- 3 The pump's mechanical fault shall be investigated to determine if the pump is worth repairing.

4.2.12 System Cleansing

- 1 Given the organic nature of the leachate; the aeration system can be subjected to the development of a biofilm on various elements of the system. This is particularly problematic to the jetting nozzles, where the biofilm can reduce their efficiency.
- 2 The Sparge tank and Jetting tank pipework shall be cleansed in accordance with Sparge Tank Cleansing procedure EMS 5.

4.2.13 Electrical Safety Testing

- 1 The entire Leachate Treatment facility is tested for safety and compliance by a specialist electrical contractor selected from the Authority's list of authorised [Contractors and Suppliers EMS 4](#)

4.2.14 Telemetry System

- 1 The telemetry system is serviced by the specialist company providing the online access to the telemetry records.

4.3 Engineering change log

- 4.3.1 Any alteration to the existing Leachate Treatment Installation shall be recorded and approved on the Change Log form prior to implementation.
- 4.3.2 The Change Log form shall record the proposed alterations, the reason behind the alteration, and any implications that may arise.
- 4.3.3 Authorisation to the proposed alterations shall be approved by the Waste Facilities Manager or Assistant Director of Operations, subject to the nature and/or cost of the alterations. The Waste Facilities Manager shall determine whether or not the alterations require Assistant Director's approval.
- 4.3.4 It should be noted that some alterations may require notification to the Environment Agency; subject to the conditions of the Environmental Permit reference WP 3538MD.

4.3.5 Re-Calibration:

Consideration shall be made to any changes in the operation, installation or pipework configuration which may influence the rate of flow through the discharge pipeline; or cause turbulence in or at the flow meter and its associated installation pipework. In such instances the flow meter shall be re-calibrated.

- 4.3.6 Completed Engineering Change Log forms shall be kept in [Engineers Change Log EMS 5](#).

4.4 Flowmeter Calibration

- 4.4.1 The flowmeter shall be calibrated on an annual basis, or when as described in clause 4.3.5
- 4.4.2 Immediately prior to the calibration exercise, the flowmeter and associated installation pipework shall be inspected and cleaned as detailed in [Flow Meter Pipework Cleaning Protocol EMS 5](#)
- 4.4.3 The flowmeter shall be calibrated for accuracy of flow rate/ readout by an independent accredited body.
- 4.4.4 If the flowmeter is taken off site for repair or service, the leachate system will be shut down until the flowmeter is returned; whilst maintaining the use of the telemetry system to ensure the level permitted in the Waste Management Licence is not breached.
- 4.4.5 Once re-installed or replaced, the flowmeter shall be subject re-calibration.
- 4.4.6 A Calibration Certificate shall be supplied, and filed for reference.
- 4.4.7 MCERTS:-

The Environmental Permit WP 3538MD Clause 3.6.3 states that flow meter installation shall have MCERTS certification/accreditation unless otherwise agreed in writing with the Agency.

The Environment Agency has agreed in writing that MCERTS is not required:-

"Having considered your proposals, we agree to your request to use the flow meter without MCERTS certification, providing the measures in your management system are followed. This may be subject to audit in future".

Su Crossland Environment Agency PPC Officer. 21st November 2011.

4.5 Procedures in event of System Failure

- 4.5.1 Typical events which have caused a system failure:-
- Power failure from electricity supplier.
 - Power failure from control panels to pumps, or pump failure.
 - Blocked discharge pipe work.
 - Acts of extreme vandalism.
 - Severe weather events.

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4.5.2 In the event of a system breakdown, carry out a visual inspection for evidence of the above. In the event of:

1 Power failure from electricity supplier

Inform the electricity supply company and request an immediate presence on site to investigate/re-establish the supply. Contact details can be found in the site portfolio held in the Waste Facilities dept.

If a long delay is expected before power supply is re-established, the following options for controlling the leachate level are available:-

- i) Request Maintenance service contractor to attend site with a portable generator. This can be coupled straight into the control panel. The aeration system should run on auto, as normal, provided the generator is periodically fuelled up.
- ii) Arrange for tankering of leachate off site. Leachate can be extracted from the Pump Chamber beneath Housing Unit No 1.

2 Power failure from control panel to submersible pump, or submersible pump failure.

- i) Commission an electrical contractor to investigate/rectify problem.
- ii) If the fault is due to a pump failure, and a long delay is expected before fault can be rectified, organise a contractor to replace the unserviceable with the standby pump from Stores.

3 Blocked discharge pipe work

Ensuring that the system is offline:

- i) Open all pipework at the various joints to locate the blockage, and arrange to have the pipeline jet cleaned to remove the blockage. The coaxial inner pipe can be accessed at each of the access chambers along the eastern track.
- ii) If the pipework has suffered a build up that cannot be jet cleared, arrange to have the relevant pipework replaced. Details of the pipework can be found on the Asset Register. The coaxial inner pipe is a flexible hose that can be uncoupled and withdrawn at each access chamber.
- iii) If the blockage is in the coaxial pipeline, consider temporary overland pipework to by-pass the effected pipework.

4 Acts of extreme vandalism

Acts of extreme vandalism are varied in their nature and the damage to the treatment system is unpredictable. In such instances remediation works will need to be relevant to the nature of the damage.

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When the vandalism entails a loss of power, it shall be rectified in accordance with procedures set out above for loss of power.

5 Severe weather events (*Freezing temperatures*)

Severe weather events in the form of very low temperatures have in the past resulted in the freezing of the pipework in and around the treatment compound.

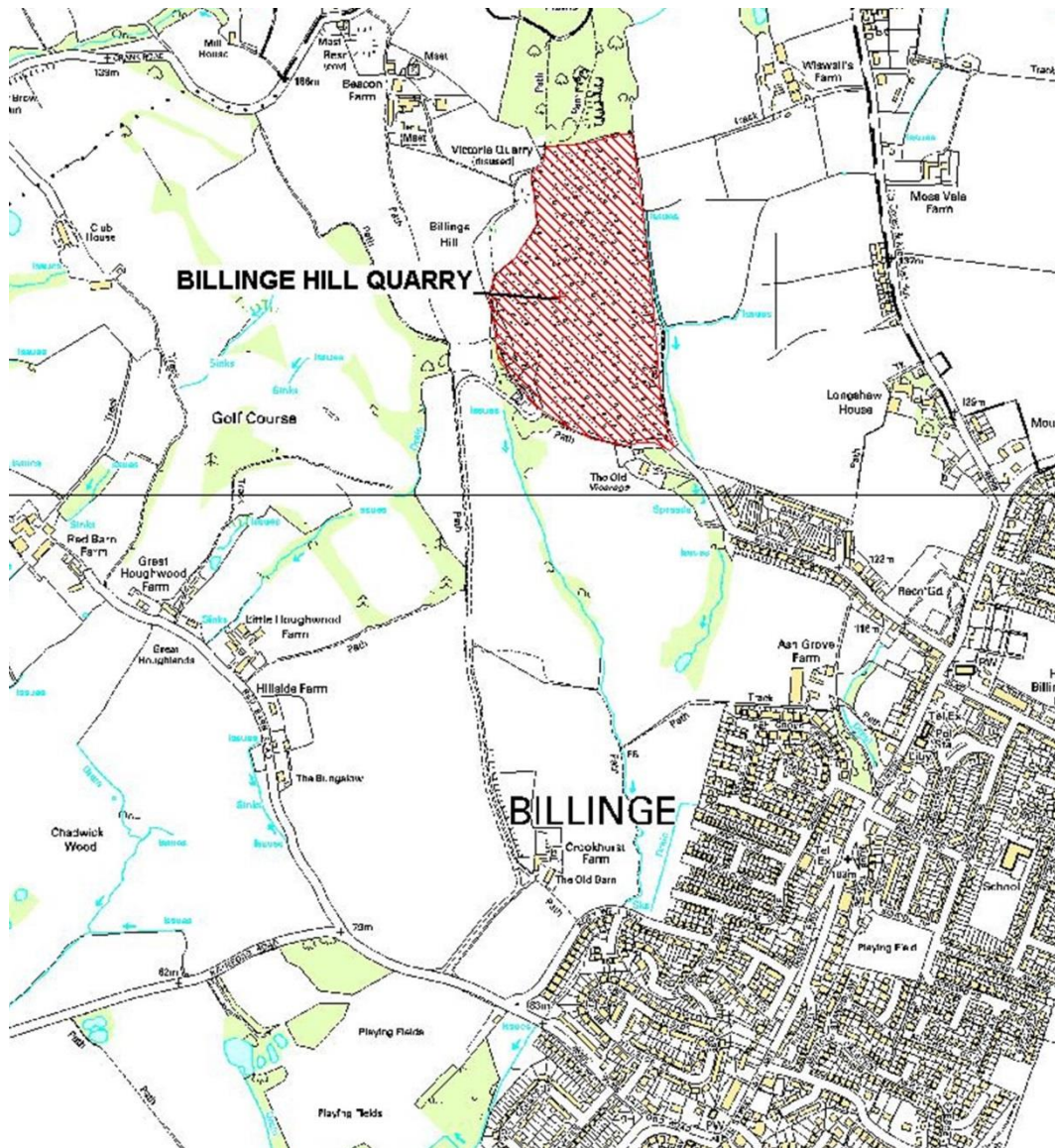
To combat this, protective measures in the form of thermostatic heaters and pipework insulation have been put in place.

Despite these protective measures being in place, there have been occurrences when extremely low temperatures have still resulted in freezing pipework.

In such low temperatures, it is unlikely that any remediation works would be practicable due to the physical difficulties presented by freezing weather conditions in getting plant and equipment to site, and the temporary cessation of the leachate treatment and discharge systems is the only option.

In such instance the Environment Agency shall be informed.

APPENDIX I Location Plan



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MAINTENANCE MANUAL

Billinge Hill Quarry

APPENDIX II Trade Effluent Discharge Consent



Document: Direction
WwTW: Wigan
Reference: 7025201264211

WATER INDUSTRY ACT 1991

NOTICE OF DIRECTION CONCERNING THE DISCHARGE OF TRADE EFFLUENT

To Merseyside Waste Disposal Authority

of 6th Floor North House
17 North John Street
Liverpool
Merseyside
L2 5QY

United Utilities Water PLC (hereinafter called "the Company") hereby give you Notice as owner/occupier of the trade premises situate at **Off Rainford Road Billinge Merseyside WN5 7PF**

that the Company in exercise of the powers conferred upon them by Section 124 of the above Act DIRECT that as from **01 October 2006** all conditions attaching the CONSENT dated the **05 April 2002** to the discharge of trade effluent into the public sewer from the said trade premises as requested by a Trade Effluent Notice dated the **17 November 2001** shall be annulled and the following conditions be substituted, namely:

Nature of discharge

- 1a) Subject to the provisions of conditions 6,7,8 and 9 below the nature or composition of the trade effluent to be discharged under this Consent shall be solely as specified in the said Trade Effluent Notice and shall consist solely of waste water derived from **closed landfill site**
- 1b) The trader shall give to the Company prior written notice of any change in the process or the process materials or any other circumstances likely to alter the constituents of the trade effluent as set out in condition 1(a). In such circumstances, no substance of which the Company has not had previous notice, may be discharged unless and until the Company has agreed to accept the substance at a limit imposed by the Company which shall then be deemed to be incorporated in this Consent by agreement and shall not prejudice the right of the Company to serve a Direction earlier than two years from the date of such incorporation.

The Trader shall also give not less than seven days written notice to the Company of any change in the name of the occupier or owner.

Sewer affected

2. The sewer into which the trade effluent may be discharged and the point of discharge is the foul sewer situate at **Upholland Road**.

Connections

3. No connections shall be made to the said sewer without the prior approval of the Company and all such connections shall be constructed and maintained to the satisfaction of the Company at the expense of the Trader

Document Control: EMS 2-Billinge Discharge of Trade Effluent Consent-FA-CON-03-LF-01

SDF129

United Utilities Water PLC
Registered in England & Wales No. 2366678
Registered office: Dawson House, Great Sankey
Warrington WA5 3JW

9/5027-9/01

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MAINTENANCE MANUAL

Billinge Hill Quarry



Document: Direction
WwTW: Wigan
Reference: 7025201264211

Maximum volume of discharge

4. The maximum amount of the trade effluent discharged in any one day of twenty four hours shall not exceed **200 m³** without prior written consent of the Company.

Maximum rate of discharge

5. The highest rate at which the trade effluent may be discharged shall not exceed **7 litre/sec.**

Matters to be eliminated prior to discharge to sewers

6. The following matters shall be eliminated from the trade effluent before it is discharged into the sewers of the Company:
- a) petroleum spirit;
 - b) calcium carbide;
 - c) carbon disulphide;
 - d) except as provided in paragraph 7 hereof, the prescribed substances listed in Schedule 1 to The Trade Effluents (Prescribed Processes and Substances) Regulations 1989, as amended from time to time, insofar as they are in concentration greater than the background concentration (as defined in the said Regulations);
 - e) where the trade effluent derives from a prescribed process mentioned in Schedule 2 to the said Regulations, and except as provided in paragraph 7 hereof, asbestos (as defined in the said Regulations) and chloroform in a concentration greater than the background concentration (as defined in the said Regulations);
 - f) organo-halogen compounds including pesticide residues and degreasing agents;
 - g) any substances which either alone or in combination with each other or with any other matter lawfully present in the said sewers would be likely to;
 - i cause a nuisance or produce flammable, harmful or toxic vapours either in the sewers or at the sewage works of the Company;
 - ii injure the sewers or interfere with the free flow of their contents or affect prejudicially the treatment and disposal of their contents or have injurious effects on the sewage treatment works to which it is conveyed or upon any treatment plant there;
 - iii be dangerous to or cause injury to any person working in the sewers or at the sewage treatment works;
 - iv affect prejudicially any watercourse, estuary or coastal water into which the treated effluent will eventually be discharged.

Matters to be limited prior to discharge to the sewer

7. The trade effluent shall not contain
- a) sulphides, hydrosulphides, polysulphides and substances producing hydrogen sulphide on acidification in excess of **1 mg/l**
 - b) cyanides and cyanogen compounds which produce hydrogen cyanide on acidification in excess of **1 mg/l**

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Warrington WA5 3JW

9/5027 9/01

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MERSEYSIDE WASTE DISPOSAL AUTHORITY

MAINTENANCE MANUAL

Billinge Hill Quarry



**United
Utilities**

Document: Direction
WwTW: Wigan
Reference: 7025201264211

- | | | |
|---------------------------|-----|--|
| | c) | sulphates as SO ₄ in excess of 1000 mg/l |
| | d) | chemical oxygen demand (COD) load in excess of 100 kg in any one period of 24 hours, such load being determined by multiplying the COD concentration of the supernatant liquor of a composite sample of the trade effluent (after 1 hour's quiescent settlement at pH 7.0) taken during that 24 hour period and the volume of the trade effluent discharged during that 24 hour period. |
| | e) | toxic metals in excess of 10000 µg/l either individually or in total ie Antimony, Beryllium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Tin, Vanadium, Zinc; |
| | f) | separable grease and oil in excess of 100 mg/l |
| | g) | ammonia and its compounds as N in excess of 325 mg/l |
| | h) | methane in solution in excess of 0.14 mg/l |
| Temperature | 8. | No trade effluent shall be discharged which has a temperature higher than 43.3°C (110°F) |
| pH value | 9. | No trade effluent shall be discharged having a pH of less than 6 or greater than 10 |
| Inspection chamber | 10. | <p>a) An inspection chamber or manhole shall be provided and maintained by the Trader in a suitable position in connection with each pipe through which the trade effluent is discharged and shall be so constructed and maintained as to enable a person readily to obtain at any time samples of the trade effluent so discharged, to the approval of the Company.</p> <p>b) Suitable apparatus for measuring and automatically recording the volume and composition of trade effluent discharged shall be provided and maintained in working order by the Trader in connection with every such pipe, unless otherwise exempted in writing by the Company.</p> <p>c) If the measuring and recording apparatus as aforesaid ceases to function satisfactorily, then the Company shall have the right to make estimates of the volume and composition of the trade effluent until such time as the said apparatus is again operating to the satisfaction of the Company.</p> <p>d) Records shall be kept by the Trader of the volume, rate of discharge, nature and composition of the trade effluent discharged to the sewer, together with any records required to be kept by the Trader under the provisions of any Notice of Determination issued by the Secretary of State under Sections 120 and 132 of the Water Industry Act 1991. Such records shall be kept available for inspection at all reasonable times by an authorised officer of the Company and copies shall be sent to the Company on demand.</p> <p>e) The foregoing provision of this condition shall be deemed to be complied with if other methods of sampling the trade effluent, determining its nature and composition, and measuring and recording the discharge are agreed and confirmed in writing by the Company.</p> |

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Utilities**

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Payment

11. Payment shall be made to the Company on demand of charges in respect of the reception, conveyance, treatment and disposal of the trade effluent in accordance with the Company's Charges Scheme in force from time to time.

Dated **11 July 2006**

Issuing Office Asset Strategy and Planning
Lingley Mere
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

Signed

AREA PLANNING AND STRATEGY MANAGER
for and on behalf of United Utilities Water PLC

1. Your attention is drawn to the following provisions of Section 126 (1) of the Water Industry Act 1991 relating to Appeals to the Director General of Water Services. The owner or occupier of any trade premises may within two months of the giving to him under Subsection (5) of the Notice of a Direction under that Section, or with the written permission of the Director at any later time, appeal to the Director against the Direction.
2. The Notice of Direction must state the date, being a date not less than two months after the giving of the Notice on which the Direction is to take effect. If an appeal is brought under Section 126 (1) before that date the Direction shall not take effect until the appeal is withdrawn or finally disposed of. Provided that so far as a Direction which is the subject of an appeal relates to the making of Charges payable by the occupier of the trade premises, it may take effect on any date after the giving of the Notice.
On appeal under Section 126 (3) and (4) the Director General of Water Services shall have power to annul the Direction given by the Sewerage Undertaker and to substitute for it any other Direction, whether more or less favourable to the appellant and any Direction given by the Director of Water Services may include provision as to the charges to be made for any period between the giving of the Notice by the Sewerage Undertaker and the determination of the appeal.

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Warrington WA5 3LW

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**BILLINGE HILL QUARRY
SITE INFRASTRUCTURE**

Drawn: A3
ASB
NTS
MWD A.510-100-008
Rev: 1
Date: DEC 2013

ABOVE GROUND INFRASTRUCTURE

- MONITORING CHAMBER
- MONITORING BUZZER
- ACCESS CHAMBER/PANICLES

SUBTERRANEAN INFRASTRUCTURE

- GAS COLLECTION SYSTEM
- RESING MAIN

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APPENDIX IV

Photographs



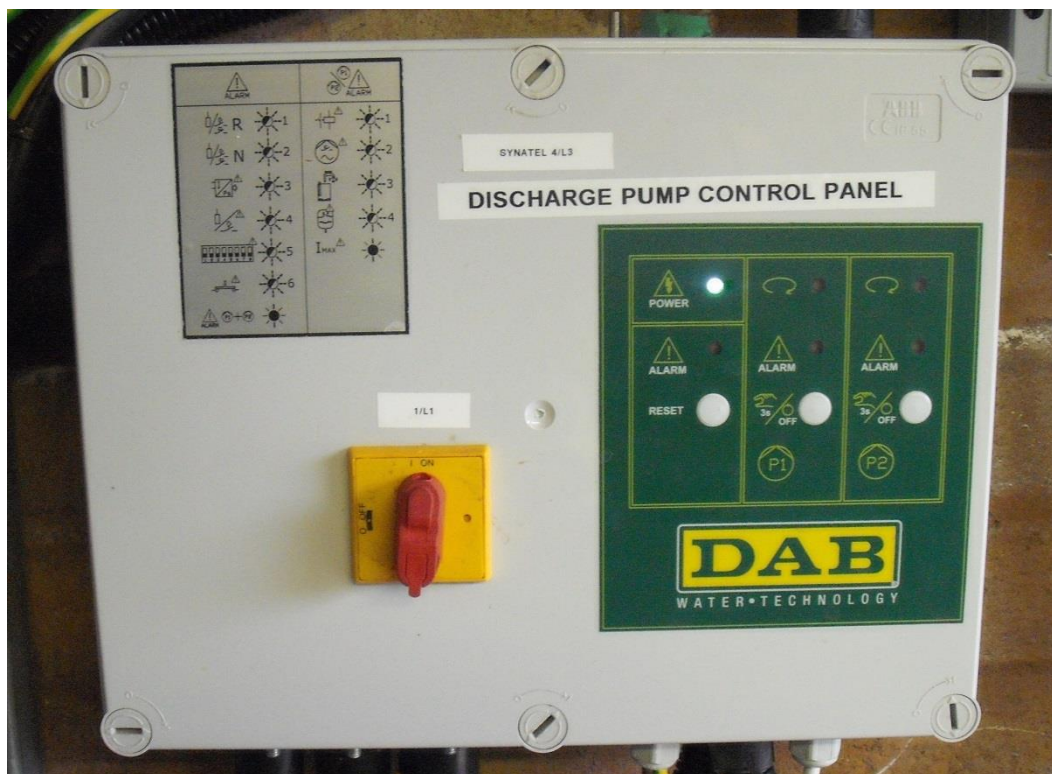
Inside Housing Unit No 2



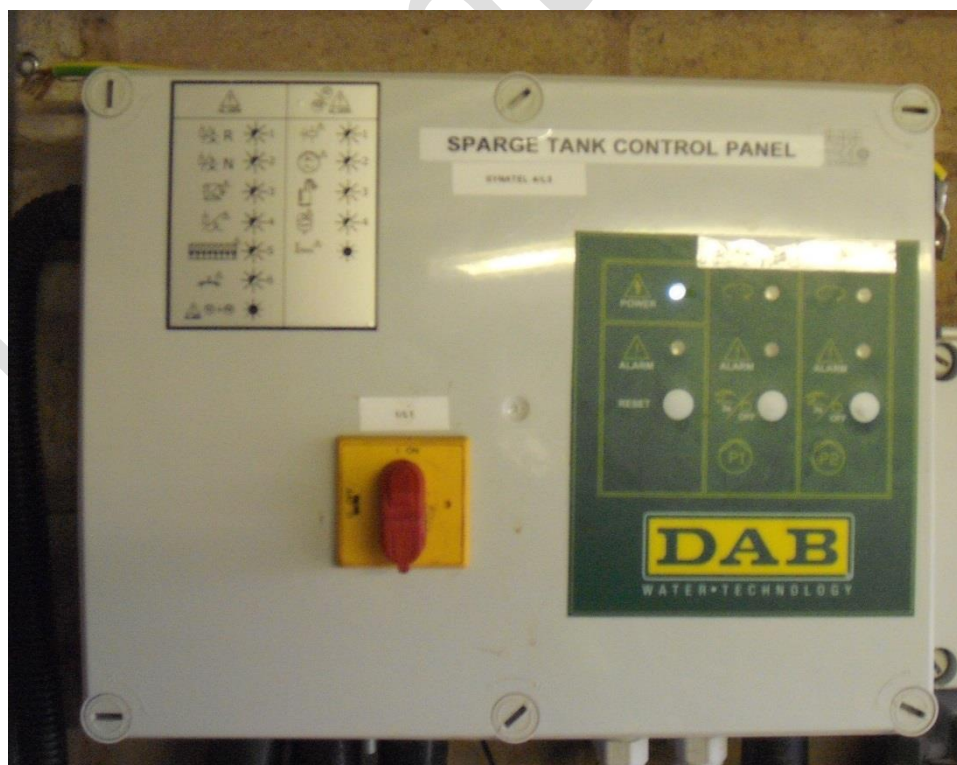
Mains distribution board



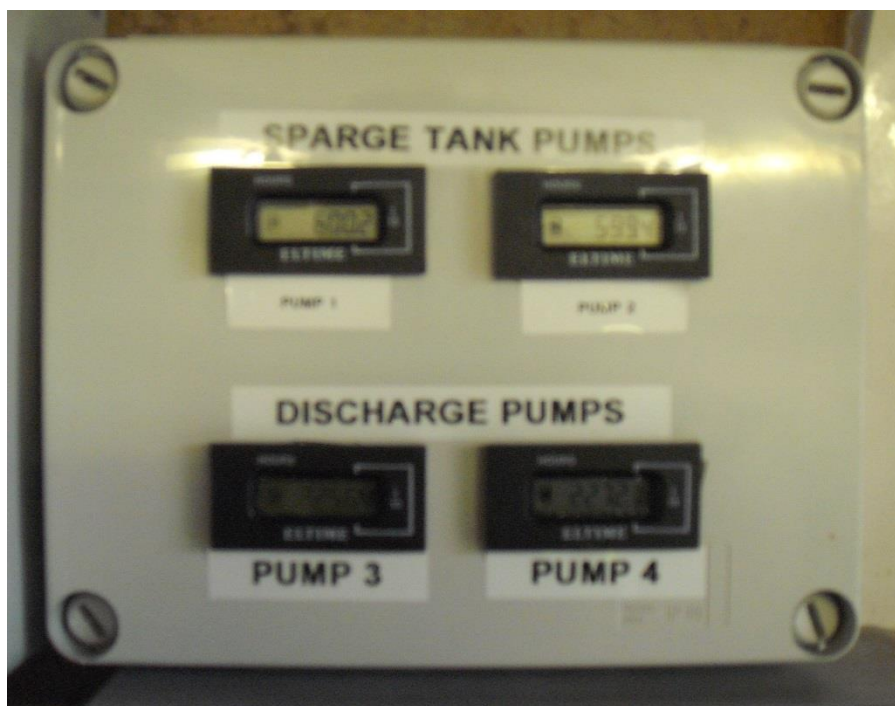
Air Blower control panel



Discharge Pumps control panel



Transfer Pumps control panel



Hours run meters for Discharge and Transfer pumps



Telemetry display panel



Submersible (Supply) pump control panel

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Flow meter and display panel



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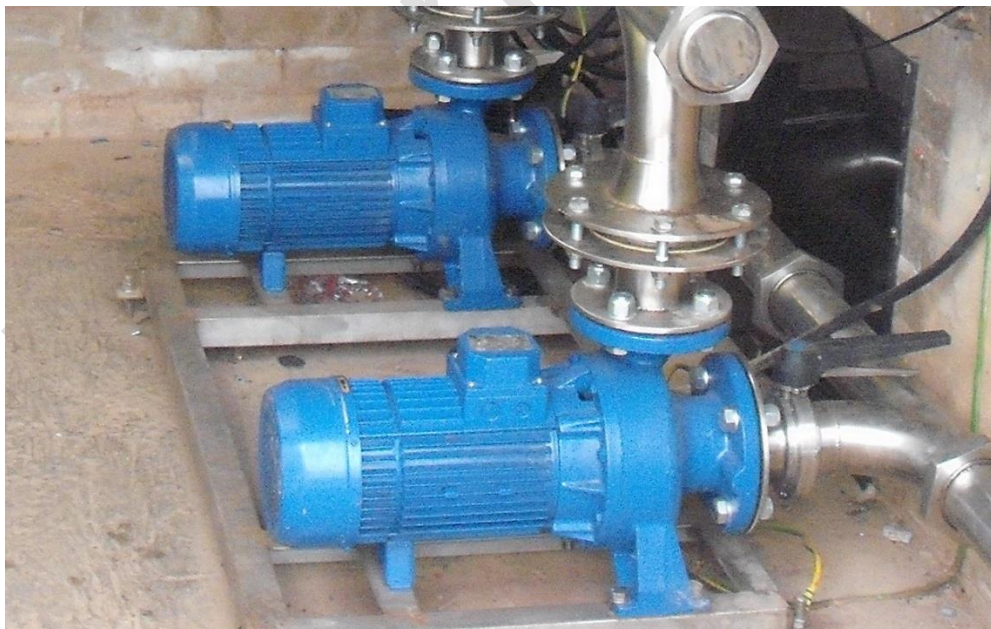
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Sparge tank Filter and Gauge



Centrifugal (Transfer) Pumps mounted onto Sparge tank



Centrifugal (Discharge) Pumps mounted onto floor of Housing Unit No 2



KILL SWITCH

KILL SWITCH CABINET

Emergency Isolation Switch