



MERSEYSIDE WASTE DISPOSAL AUTHORITY

Environmental Management System 5

Red Quarry Closed Landfill Site: Maintenance Manual

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1.0 Site Location and Access

1.1 Site location

- 1.1.1 The landfill site is located between Chester Lane (B5419) and Clockface Road (A569) in St Helens, Merseyside. See Appendix I

1.2 Access routes

To the landfill site

- 1.2.1 The site has been restored to a 'Public Open Space' and as such is fully accessible to the public. Access can be gained from either Chester Lane or Clockface road; with parking on the highway.
- 1.2.2 The site is unmanned.

1.3 Access to Discharge Chamber and the Gas Flare Compound

- 1.3.1 Access to the Leachate Compound is gained through the landfill site as detailed in 1.2 above, by way of the entrance located on Chester Lane; see Appendix III
- 1.3.2 Keys to the Discharge Chamber and Gas Flare Compound are kept in the offices of the Facilities Section on the 7th floor of 1 No Mann Island, Liverpool L3 1BP.

1.4 Access to the Domestic Flow pump chamber

- 1.4.1 Access to the Domestic Flow pump chamber is gained through the landfill site as detailed in 1.2 above, by way of the entrance located on Clockface Road; see Appendix III
- 1.4.2 This comprises of a secured subterranean pump chamber and a separate, adjacent, pump control panel located inside a secure cabinet.
- 1.4.3 Keys to the Domestic Flow pump chamber are kept in the offices of the Facilities Section on the 7th floor of 1 No Mann Island, Liverpool L3 1BP.



2.0 Purpose of Discharge Chamber, Domestic Flow Chamber and Gas Flare Compound

2.1 Background

Historical

2.1.1 Red Quarry was a former brick making quarry prior to becoming a landfill site. It operated as a landfill site between 1981 and 1983. It is approximately:-

- 2.75 hectares in area and,
- 10 metres deep at its deepest point.

2.1.2 The site was installed as a 'Dilute and Disperse', whereby any leachate arisings are allowed to disperse to groundwater.

2.1.3 A site licence for the site was issued in March 1981 and surrendered in April 1996.

2.1.4 Leachate from within the landfill was prevented from migrating towards the adjacent water course with the installation of a drainage system as described below.

2.1.5 Gas migration from the site had been evident since the site's closure; and a number of measures were put in place on the site to prevent the reoccurrence of the migration. However in recent years, evidence of gas on the site has become insignificant, with an occasional 'hot spot' being detected in BH 16 towards the northern boundary of the site.

2.1.6 In 2008 the Forestry Commission took over the infrastructure management of the site. This however excludes environmental responsibility with respect to matters originating from the former landfilling operations. This responsibility is retained by MWDA.

2.1.7 MWDA is therefore responsible for:-

- Implementation of any environmental remedial measures required on the site.
- Operation and maintenance of pump and gas extraction systems.

Site Drainage and Gas Extraction

2.1.8 The site was installed as a 'Dilute and Disperse', whereby any leachate arisings are allowed to disperse to groundwater. This was supplemented by the installation of a Trammel Drain and Cut-Off Drain; to protect Pendlebury Brook from potential horizontal migration of leachate.

2.1.9 The site also includes an historic discharge of domestic flow from properties on Clockface Road to public sewer.



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- 2.1.10 A gas extraction system is located on the western boundary and serves to control gas migration in the SW corner of the site. A former gas line running east west across the centre of the site has since been abandoned.

2.2 Environment Agency

The site is not subject to either an Environmental Permit or Waste Management Licence. Consequently there are no EA compliance limits/targets to attain.

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](#)
- 2.3.4 As there is no longer any release of leachate to public sewer (See section 3.0 following), and United Utilities have confirmed that the TEDC does not apply to domestic flow (see below), there is no sampling of any effluent released to sewer from the site at present.

From: Preston, Susan [<mailto:Susan.Preston@uuplc.co.uk>]

Sent: 26 April 2012 14:22

To: Tony Byers

Subject: RE: Re; Sefton meadows & Foul Lane

Hello Tony

.....You are correct in saying that foul water alone from domestic purposes only such as a toilet block would not need a TEDC

Thanks

Sue

*Susan Preston - RCTE West Lancs & Sefton
Blackburn WwTW*

Tel: 01925 674246

Fax: 01772 877334

Mob: 07802 902414

E-Mail: susan.preston@uuplc.co.uk



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- 2.3.5 To cover any future eventualities, the TEDC has not been surrendered. This ensures that MWDA still has the right to discharge leachate to public sewer, in the event that systems are needed to be brought back online.



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3.0 Leachate Treatment and Gas Extraction Systems

3.1 Leachate treatment

Discharge Chamber

- 3.1.1 A trammel drainage system was constructed at the time of the original site operation to contain the leachate within the site and prevent it from entering Pendlebury Brook along the northern boundary.
- 3.1.2 The trammel drain substantially failed soon after its installation, and was subsequently replaced by a conventional cut off drain.
- 3.1.3 The replacement gravity cut off drain was constructed along the northern site boundary at the top of the embankment leading down to Pendlebury Brook.
- 3.1.4 The leachate entering the cut off drain flows into the Discharge Chamber, where it is subjected to a simplified aeration process prior to discharging to public sewer.
- 3.1.5 The aeration process was subjected to substantial vandalism in 2009 and is no longer operational.
- 3.1.6 Whilst the drainage system is still intact, there is no longer any flow from the cut off drain into the Discharge Chamber. It is considered that any leachate flow from the site disperses to ground water as the original installation intended.
- 3.1.7 As there is no flow through the cut-off drain, the aeration system is considered to be superfluous, and will not be reinstated unless flow the cut off drain recommences.

Domestic Flow Chamber

- 3.1.8 The Domestic flow chamber serves to discharge the liquor from a neighboring septic tank located in the private properties of Nos 30 and 32 Clockface Road.
- 3.1.9 In addition, it served as the outfall for the original (redundant) trammel drain.
- 3.1.10 The combined flow was discharged from site via a rising main into the Discharge Chamber and subsequently to public sewer in Chester Lane.
- 3.1.11 Since the failure of the trammel drain, and the subsequent installation of the Cut Off drain, there is only the smallest infiltration of leachate into the Domestic Flow chamber. Subsequently, the chamber serves to discharge domestic flow to public sewer only.



3.2 Gas Extraction

- 3.2.1 The Gas Extraction compound is located at the western end of the site close to its boundary with Chester Lane, and is secured within a gated palisade fence.
- 3.2.2 The Gas Flare and its associated apparatus were subject to severe act of vandalism in 2009 which rendered the flare inoperable. The subterraneous extraction pipework remained intact.
- 3.2.3 Subsequent environmental monitoring revealed no increase in the levels of landfill gas in the perimeter boreholes, and it is considered that, with the exception of a 'hot spot' on the northern site boundary, the gas field is now depleted. Consequently there is no intention to reinstate the flare.
- 3.2.4 In the event of elevated gas levels occurring in the future, the flare has been reconfigured to act as a dispersal unit; connected to the existing subterraneous gas extraction infrastructure. When necessary, this can be activated and will extract and release to atmosphere any gases that may arise.
- 3.2.5 As a consequence of the vandalism in 2009, the flare compound is without a mains electrical supply. The works to reconfigure the flare to a dispersal unit included the fitting of a commando coupling to enable the connection of a generator to power the dispersal unit when necessary.
- 3.2.6 The dispersal unit is subjected to annual testing in accordance with [Environmental Monitoring Procedure EMS 5](#).

3.3 Equipment inventory

- 3.3.1 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.
- 3.3.2 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](#).
- 3.3.3 Apparatus to be found on site:

Discharge Chamber

Following the 2009 vandalism there is no serviceable apparatus within the Discharge Chamber



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Domestic Flow Chamber (Inc associated valve chamber)

- 1 No Submersible pump (Atex rated Eex (explosion proof))
- 2 No float switches with 10m cable in service (1 spare kept in control panel housing)
- 100mm hose lengths (pump to valves)
- 1 No non-return valve
- 1 No isolation valve
- 1 No Electrical control panel

Gas Extraction Compound

- Secure metal container (lock up unit)
- Dispersal unit

3.4 Trace Heating and Insulation

None on site

3.5 Telemetry System

None on site

3.6 Leachate Aeration process

As there is no flow through the cut-off drain, there is no functioning Leachate Aeration system on site.

An 'On the shelf' design is being prepared by facilities dept. for a replacement aeration System. In the event that aeration needs to be reintroduced, the design can be readily implemented.

3.7 Emergency Isolation Switch

None on site.

An isolation switch will be included as part of the Aeration System as and when necessary.



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 on site.
- 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

- 4.2.2 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.
- 4.2.9 Submersible Pump
 - 1 The submersible pump is located at the bottom of the Domestic Flow chamber, Nom 4.0m deep.
 - 2 The lifting out and servicing of the submersible pump is undertaken by a Contractor on the Authority's behalf.



4.2.13 Electrical Safety Testing

As there is no apparatus on site, there is no electrical safety testing. Pump systems are inspected as part of their periodic service.

4.2.14 Flowmeter Calibration

Flow meters are installed to record the volumes of leachate discharged to public sewer; and these need calibrating on an annual basis.

As there is no discharge from the site at present, the flow meter is not calibrated. This will be reintroduced as part of the Aeration System as and when necessary.

4.3 **Procedures in event of System Failure**

4.3.1 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.

4.3.2 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 a 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 the tankering of sewage off site. This can be extracted from the Domestic flow chamber.

(The reintroduction of an Aeration System will make provision for the ability to access and discharge leachate via a tanker).



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.
- 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.

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.

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

The domestic flow discharge system is entirely below ground, which in itself protects the pipeline from all but the most severe freezing conditions. No additional pipeline insulation is required on this particular apparatus.

Any new systems containing above ground pipework will include thermostatic heaters and pipework insulation.

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



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MAINTENANCE MANUAL

Red Quarry

plant and equipment to site, and the temporary cessation of discharge systems is the only option.

Uncontrolled

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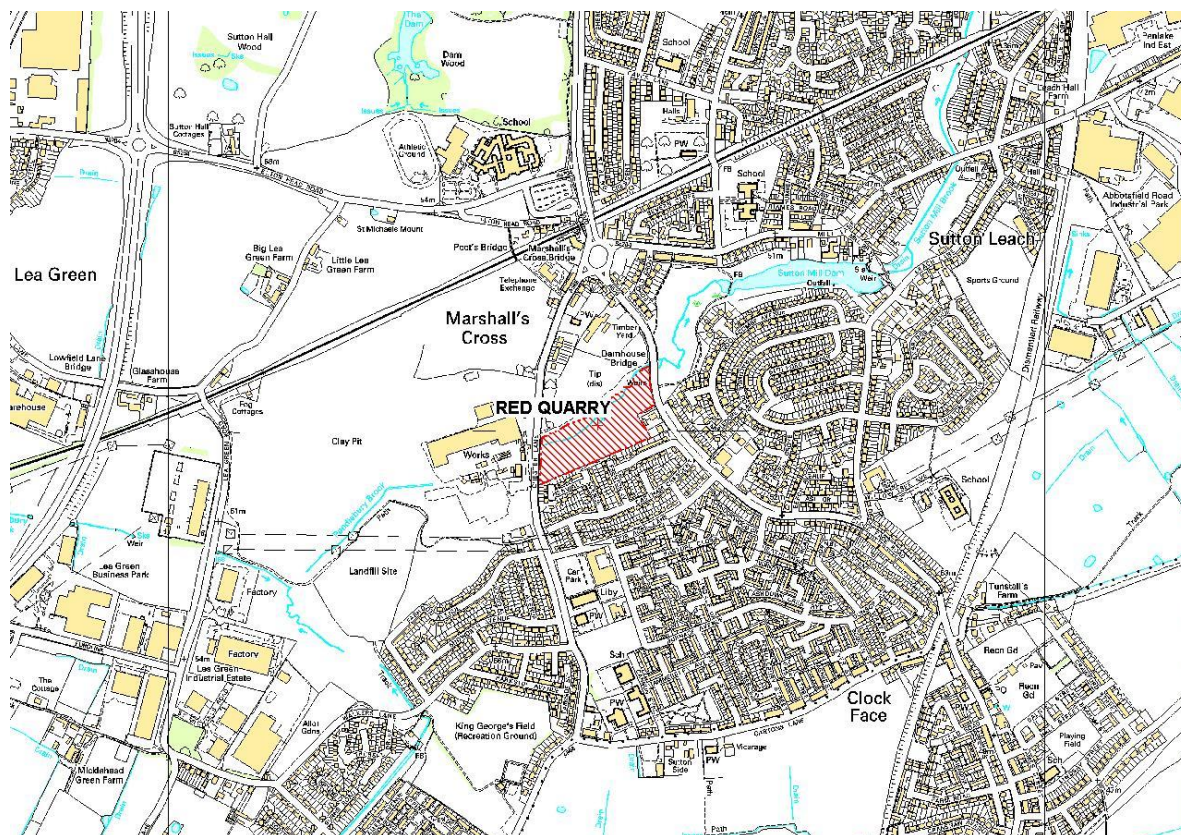
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APPENDIX I Location Plan



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APPENDIX II Trade Effluent Discharge Consent

St Helens
6925203084011



WATER INDUSTRY ACT 1991

NOTICE OF DIRECTION CONCERNING THE DISCHARGE OF TRADE EFFLUENT

To **Merseyside Waste Disposal Authority**

of **2nd Floor**
North House
17 North John Street
Liverpool L2 5QY

United Utilities Water PLC (hereinafter called "the Company") hereby give you Notice as **Owner/Occupier** of the trade premises situate at **Red Quarry Landfill Site Chester Lane St Helens Merseyside**

that the Company in exercise of the powers conferred upon them by Section 124 of the above Act DIRECT that as from **1 September 2002** all conditions attaching the CONSENT dated the **13 December 1982** to the discharge of trade effluent into the public sewer from the said trade premises as requested by a Trade Effluent Notice dated the **26 November 1982** shall be annulled and the following conditions be substituted, namely:

**Nature of
discharge**

- 1(a) 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**
- 1(b) 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 **Chester Lane**



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- 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
- Maximum volume of discharge** 4. The maximum amount of the trade effluent discharged in any one day of twenty four hours shall not exceed 70 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 7.5 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) separable grease and oil in excess of 100 mg/l
 - c) sulphates as SO₄ in excess of 1000 mg/l
 - d) toxic metals in excess of 10 mg/l

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- either individually or in total ie Antimony, Beryllium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Tin, Vanadium, Zinc;
- e) cyanides and cyanogen compounds which produce hydrogen cyanide on acidification in excess of 1 mg/l
 - f) 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.
 - g) methane in solution in excess of 0.14 mg/l
 - h) ammonia and its compounds in excess of 250 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** 10a) 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
- Measurement of the discharge** (b) There shall be provided, operated and maintained in working order by the Trader a meter in such a position and of such specification as shall be approved by UUWPLC such as will measure and provide a continuous record of the quantity and rate of discharge of any trade effluent being discharged from the premises into the said sewer and following the written request of UUWPLC to have the accuracy of the meter independently tested by an agreed body.
- 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.
 - 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.



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- 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.

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 **17 June 2002**
Issuing Office Asset Management
Asset Performance
Lingley Mere
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

Signed


REGIONAL ASSETS PERFORMANCE MANAGER
for and on behalf of United Utilities Water PLC

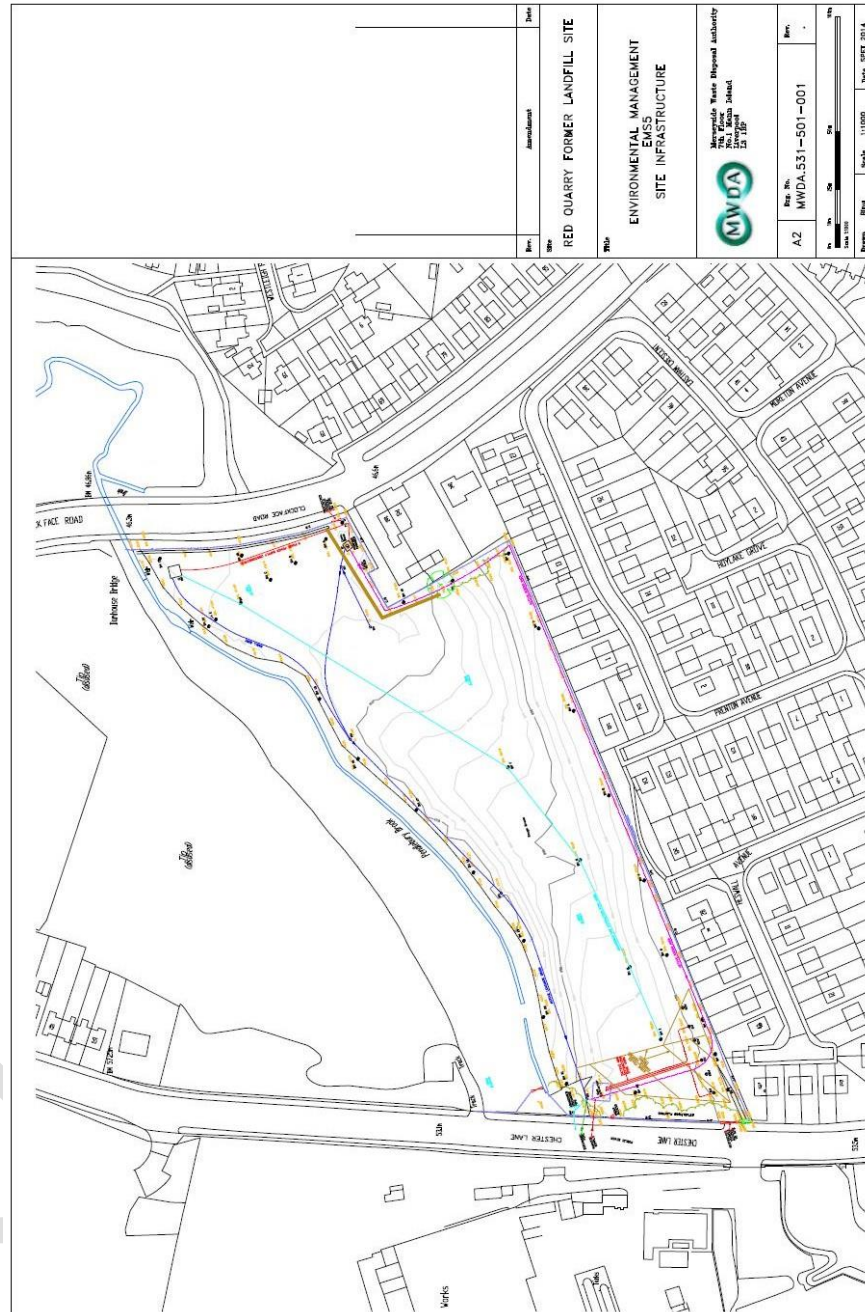
1. Your attention is drawn to the following provisions of Section 126 (1) of the Water Industry Act 1991 relating to Appeals to the Director General of Water Services.
The owner or occupier of any trade premises may within two months of the giving to him under Subsection (5) of the Notice of a Direction 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.

DirectA 9/97

United Utilities Water PLC
Registered in England and Wales: Registered No. 2366678
Registered Office: Dawson House, Great Sankey, Warrington WA5 3LW

APPENDIX III Site Infrastructure



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APPENDIX IV

Photographs

The following photographs are included in this section:-

Photograph no.	Description
No.1	Gas Compound
No. 2	Domestic Flow Chamber Pump Control Panel Housing
No. 3	Domestic Flow Chamber



Gas Compound



Domestic Flow Chamber Pump Control Panel Housing



Domestic Flow Chamber