



MERSEYSIDE WASTE DISPOSAL AUTHORITY

Environmental Management System 5

Sefton Meadows III Closed Landfill Site: Maintenance Manual

Authorised by: Director of Waste

Issued by: GH

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Document Revision History

Issue: 04

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Issue	Author	Date	Amendments
04	ASB	6 th November 2019	Revised to include the installation of a flow meter and pressure monitor
03	ASB	12th March 2014	Document redrafted to accommodate major alterations to Leachate Treatment apparatus on SM II

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1.0 Site location and Access

1.1 Site location

- 1.1.1 Sefton Meadows landfill site is located adjacent to the northern boundary of Sefton Meadows HWRC which in turn is situated off Sefton Lane (B 5422), Maghull, Merseyside. 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 onto the landfill site is made through Sefton Meadows HWRC
- 1.2.2 A stone trackway leading to the leachate pumping chamber is located on the east side of the landfill site adjacent to the River Alt. Access to it is gained via a road bridge which crosses over the river.
- 1.2.3. The control panel housing for the pumping equipment and a valve chamber are located close to the pumping chamber on the landfill side of the trackway. A pipe bridge over the River Alt which carries the discharge pipework from the pumping chamber is also located adjacent to the pumping chamber.



2.0 Purpose of Pumping Station

2.1 Background

Historical

- 2.1.1 Sefton Meadows No.3 landfill site was operational from 1984 to 1990. It is approximately 21.5 hectares in area.
- 2.1.2 Until recently the site was maintained by the Mersey Forest. Funding has since stopped, and there is no longer an aftercare programme for the site.
- 2.1.3 MWDA retains an environmental responsibility, and maintains the site infrastructure.

Drainage

- The site was installed as a dilute and disperse site, with no leachate drainage facility incorporated into its design.
- 2.1.4 Leachate migration from the site had originally been a problem, and a number of schemes have implemented to try and rectify the situation. Early schemes included the provision of a "Bentonite" slurry wall and the installation of a trammel drain to the westerly and northern boundaries of the site. The schemes were not totally effective.
 - 2.1.5 In 1992 a leachate cut off drain was constructed around approximately 70% of the site's boundary. See Appendix III
 - 2.1.6 Leachate from the drain discharges into the pumping chamber from where it is pumped via the pipe bridge, a rising main and gravity drain into the Leachate Treatment System on Sefton Meadows landfill site No.2, where it undergoes an airstripping process prior to discharging to public sewer.

2.2 Environment Agency

There is no requirement for the site to have an Environmental Permit.

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](#)

3.0 Leachate Collection System

3.1 General

3.1.1 The site was installed as a 'Dilute and Disperse', whereby any leachate arisings are allowed to disperse to groundwater. The leachate collection system, in the form of a perimeter cut off drain, prevents horizontal migration of leachate from contaminating the adjacent watercourses by intercepting and collecting any leachate before discharging it via a rising main into the treatment system on Sefton Meadows II

3.1.2 Emergency electrical override

An emergency electrical override switch is located in the meter cabinet outside of the Surface Water Lagoon gates.

3.1.3 The leachate collection system comprises of:

- A perimeter cut off drain enclosing the landfill site
- A submersible pump chamber with pump
- A pump control housing unit

3.2 Perimeter cut off drain

3.2.1 A gravity perimeter cut of drain encloses 70% of the site, and serves to protect the surrounding watercourse from contamination by migrating leachate.

3.2.2 The leachate intercepted by the cut off drain flows into the Pump Chamber.

3.3 Pump Chamber

3.3.1 The following drawings detail the pump chamber assembly.

MWDA.520.3-350-001 General arrangement

3.3.1 Once the leachate level rises to a pre-set level (picked up by the level transducer) the Supply pump, located in the bottom of the pump chamber, is automatically switched on. The Supply pump then discharges the leachate over the pipe bridge via a rising main and into the Leachate treatment system on Sefton Meadows II.

3.3.2 Once 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.

3.4 Flow Meter and Pressure Monitor

3.4.1 A flow meter and pressure monitor are located in a secure housing adjacent the pump chamber on the discharge pipeline.



4.0 Checking, Monitoring and Maintenance

4.1 Condition Monitoring and Maintenance

- 4.1.1 The Pump Chamber is an automatic system, requiring no manual operation.
- 4.1.2 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.
- 4.1.3 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.
- 4.1.4 Contractors are selected from the Authority's list of authorised [Contractors and Suppliers EMS 4](#)
- 4.1.5 The frequency of the Condition Monitoring and Maintenance shall be in accordance with the [Monitoring and Maintenance Schedule – EMS 5](#).
- 4.1.6 Submersible Pump
 - 1 The submersible (Supply) pump is located at the bottom of the pump chamber
 - 2 The lifting out and servicing of the submersible pump is undertaken by a Contractor on the Authority's behalf.
- 4.1.7 Flow Meter
 - 1 The Flow Meter is monitored by the Waste Facilities Officers for readings outside the standard deviation which could indicate a blockage in the pipework.
 - 2 The Flow Meter is calibrated to an accredited UK standard annually.
- 4.1.8 Pressure Monitor
 - 1 A pressure monitor is mounted on the discharge pipe from the submersible pump to provide an indication of the condition of the associated pipework.
 - 2 The monitor provides a constant display of the pressure inside the pipeline. Any increase in pressure reading indicates a blockage in the pipe, and any decrease, (against a closed head), will indicate a failure/fracture in the pipeline.
 - 3 Any variation to the pressure display, outside a standard deviation, should be reported to the Authority's Mech Eng service provider for attention.

4.2 Procedures in event of System Failure

4.2.1 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.

4.2.2 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.
- ii) Arrange for tankering of leachate off site. Leachate can be extracted from the Pump Chamber.

2 Power failure from control panel to pump, or 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 of the pipework.

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

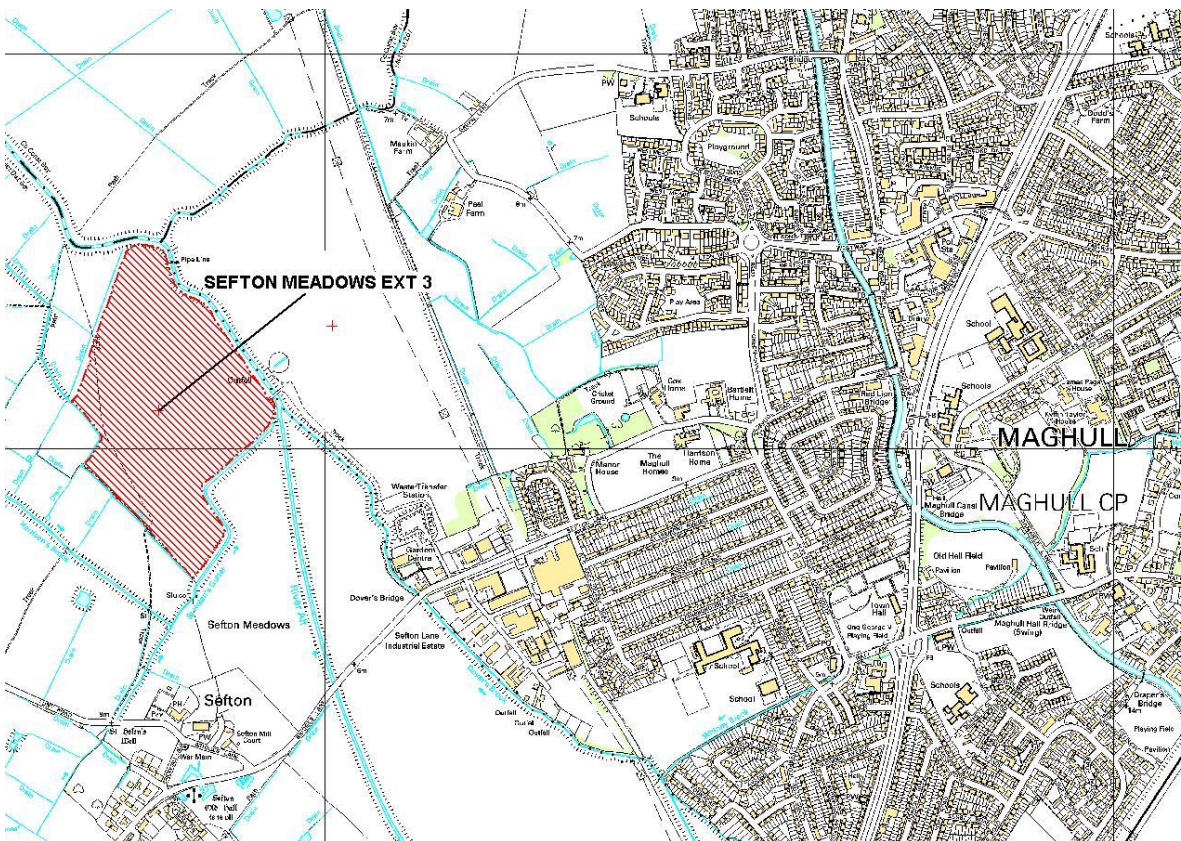
Despite these protective measures being in place, there have been occurrences when extremely low temperatures have still resulted in freezing pipework.

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.



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APPENDIX I Location Plan



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APPENDIX II

Trade Effluent Discharge Consent



Hillhouse WwTW
693T06054HIL1

WATER INDUSTRY ACT 1991

CONSENT TO THE DISCHARGE OF TRADE EFFLUENT

Whereas **Merseyside Waste Disposal Authority**

(hereinafter called "the Trader" whose Head Office or Registered Office is at

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

Is the **Owner/Occupier** of the trade premises at:

Sefton Meadows Landfill Site 2A/3

Off Sefton Lane

Maghull Merseyside

and by the Trade Effluent Notice dated **24 January 2001**

Have applied to **NORTH WEST WATER LTD** (hereinafter called "the Company") for consent to discharge trade effluent from the said trade premises into the sewers.

Under the provisions of the above mentioned Act the discharge of trade effluent in accordance with the said Trade Effluent Notice would not be lawful without the consent of the Company.

NOW THEREFORE in exercise of the powers conferred upon them by the above Act the Company HEREBY CONSENT to the discharge of trade effluent by the Trader from the said premises into their sewers **SUBJECT TO THE FOLLOWING CONDITIONS:**

**ure 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 **Landfill Leachate**
- 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.



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Sewer affected	2. The sewer into which the trade effluent may be discharged and the point of discharge is the foul sewer situate at Hillhouse Public Foul Sewer
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 1300 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 20 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: <ul style="list-style-type: none">a) Petroleum spirit;b) Calcium carbide;c) Carbon disulphided) 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 present at a 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 concentration greater than the background concentration (as defined in the said Regulations);f) Organo-halogen compounds including pesticide residues and degreasing agents;g) any substance which either alone or in combination with each other or with any other matter lawfully present in the said sewers would be likely to;<ul style="list-style-type: none">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.



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Matter to be limited prior to discharge to the sewer	<p>7. The trade effluent shall not contain</p> <ul style="list-style-type: none"> 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 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) Methane in solution in excess of 0.14 mg/l g) Ammonia in excess of 250 mg/l
Temperature	<p>8. No trade effluent shall be discharged which has a temperature higher than 43.3°C (110°F)</p>
pH value	<p>9. No trade effluent shall be discharged having a pH of less than 6 or greater than 10</p>
Inspection chamber	<p>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</p>
Measurement of the discharge	<ul style="list-style-type: none"> (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 NWWL 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 NWWL to have the accuracy of the meter independently tested by an agreed body. c) If the measuring and recording apparatus 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. 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.



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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 16 March 2001

Issuing Office Asset Management
Asset Strategy – Wastewater Trade Effluent
Lingley Mere
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

Signed

BUSINESS MANAGER

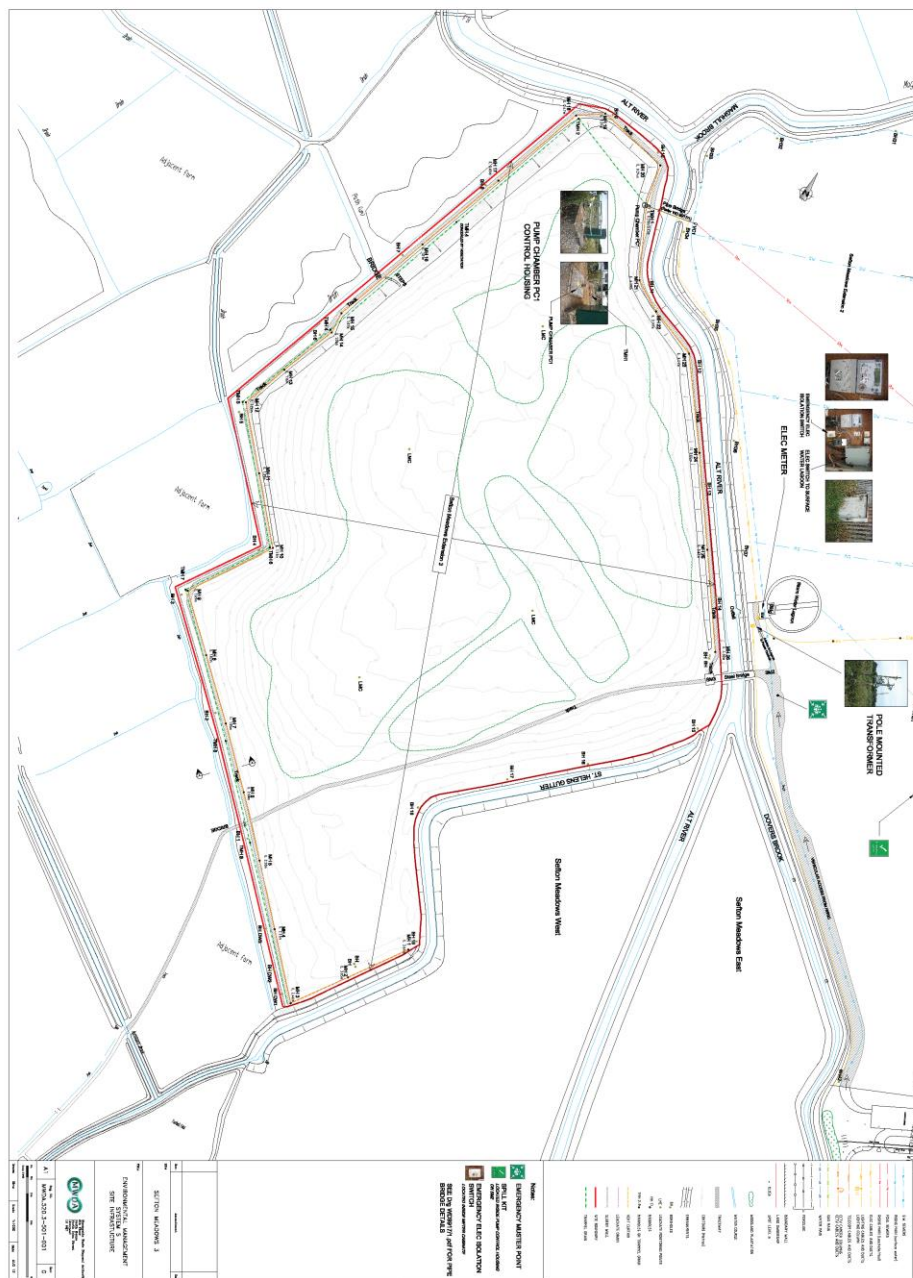
for and on behalf of North West Water Limited

Your attention is drawn to of Section 122 of the Water Industry Act 1991 which provides that any person aggrieved by any conditions attached to this Consent may appeal to the Director General of Water Services.

Consent.9/97

North West Water Ltd
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



Pump Chamber

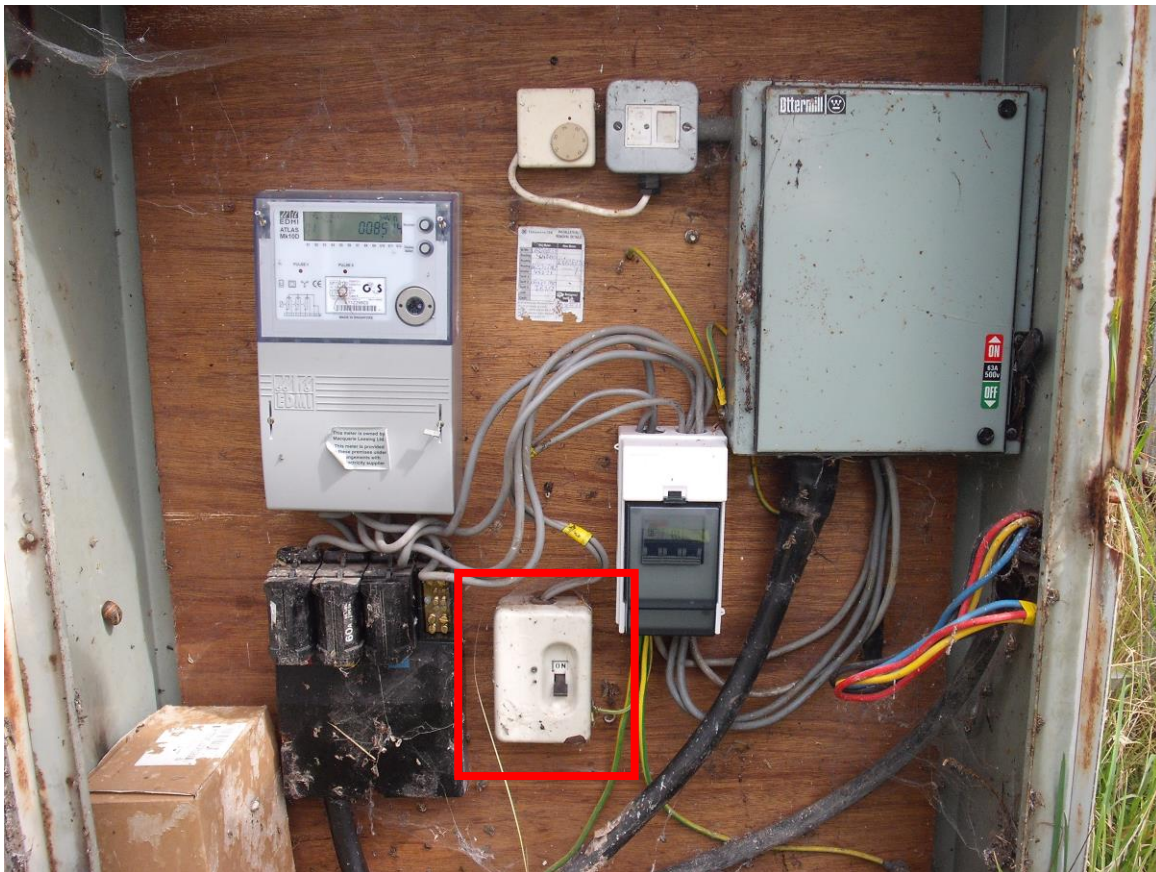


Pump Control Panel



LAGOON BUILDING

Electrical Meter Cabinet



Kill Switch inside Electrical Meter Cabinet