

# Technical Note

<b>Project:</b>	P18-669 Glan Llyn Development		
<b>Subject:</b>	Summary of SWPSI Management Protocols		
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<b>Document Ref:</b>	18669-RLL-25-XX-RP-O-0760	<b>Revision:</b>	P01

## 1 Introduction

This technical note presents a summary of information relevant to the management of surface water pumping station SWPS1 at Glan Llyn. Surface water pumping station SWPS1 is designed to convey water from the surface water reed system in the developed areas of Glan Llyn to Monks Ditch, via Monks Lake, a settlement lagoon. SWPS1 is a standalone pumping station with no associated treatment plant.

A comprehensive operation and maintenance manual will be in place prior to the commencement of operation, however details relating to the approved drainage strategy and pumping station technical information is presented in the following reports:

- Glan Llyn Site Wide Surface Water Drainage Strategy (Rodgers Leask, August 2016);
- Implementation of Strategic Surface Water System & Discharge into Monks Ditch (Rodgers Leask, November 2016); and
- Llanwern, Newport, Surface Water Pumping Station (Phil Jones Associates, September 2017).

## 2 Roles and Responsibilities

The key roles and responsibilities are summarised in Table 1:

Role	Key Responsibilities
Operator – Glan Llyn Estate Management  Key personnel are Elise Coalter and James Gibbons.	Elise Coalter has oversight of the overall Glan Llyn Development and James Gibbons is responsible for the day to day management of the completed development areas.  Their wider Glan Llyn responsibilities will extend to ensuring compliance with the SWPS1 environmental permit and they will

	<p>have overall control of the operation and maintenance of SWPS1 and implementation of contingency measures in the event of an emergency.</p>
<p><b>Maintenance Contractor</b> - P M Harris</p>	<p>PM Harris are a civil engineering contractor responsible for constructing and installing SWPS1. They are appointed by Glan Llyn Estate Management to undertake ongoing infrastructure works on the wider Glan Llyn development site.</p> <p>PM Harris will undertake all routine and emergency maintenance activities on SPWS1 and in the surface water drainage network.</p> <p>The maintenance contract is proposed to be reviewed based on performance reviews or annually. If a Contractor change is required, O&amp;M documentation shall be provided and a competence audit undertaken by Glan Llyn Estate Management using appropriate technical consultants.</p>

### 3 Design Elements

Pumping station SWPS1 will run on mains electricity and comprises a main belowground pump chamber and associated valve chambers, a rising main which discharges into Monks Ditch, and an aboveground control kiosk. A general arrangement plan of the pumping station is shown on Drawing 02554-B-201-C8, Drawing 18669-RLL-25-XX-DR-O-0742-P02 and shows the location of SWPS1 and Monks Lake in relation to the wider drainage network following enactment of the permit.

The main chamber comprises a fibre-reinforced concrete caisson shaft with a reinforced concrete base slab and a reinforced concrete roof slab.

The pumping station consists of two submersible pumps (one with capacity to pump at a flow rate of 750l/s and the other at 250l/s), which are designed to discharge through ductile iron internal pipework into Monks Ditch. The pumps are situated within a wet well, with a separate valve chamber accommodating non-return valves, gate valves and pipework connecting it to Monks Ditch.

## 4 Operation

It is anticipated that SWPS1 will operate daily, on an intermittent basis rather than continuously. Operation of SWPS1 will primarily be automatic and dependent upon water levels within Monks Ditch which will be monitored downstream at an off-site location to the south of the site. Realtime telemetry from the downstream monitoring device will determine when water levels are sufficiently low for SWPS1 to safely operate.

Details relating to the water levels monitoring in Monks Ditch and how the pumps are telemetrically operated is presented in the Rodgers Leask Implementation of Strategic Surface Water System & Discharge into Monks Ditch technical Note (2016).

The design of SWPS1 means that it will also be possible for it to be operated manually, as required.

The appointed maintenance contractor will carry out monthly inspections to check the telemetry apparatus (for example the battery status and accuracy of water level measurement) and carry out checks of SWPS1 in accordance with the requirements of the operation and maintenance manual.

The named maintenance contractor will keep records of their inspections.

## 5 Cleaning and Maintenance

### 5.1 SWPS1

A penstock has been installed at the SWPS1 inlet to allow cleaning and maintenance of the pumping station to be undertaken in a dry environment in isolation from Monks Lake and Monks Ditch.

A trash screen is located on the outside of the penstock. Accumulated debris shall be cleared regularly from the screen. Fencing has been installed to ensure that clearance can be carried out safely.

Cleaning will be undertaken by the appointed maintenance contractor under the normal Health and Safety requirements in line with a site specific risk assessment and method statement.

Routine maintenance is likely to comprise servicing of the pumps and this will be planned to coincide with periods when low water levels are expected in the drainage system. More major maintenance is likely to be very infrequent.

Replacement of specific components will be completed, as required, at pre-determined intervals.

Maintenance of the off-site monitoring points should be infrequent, but the batteries will require replacing at infrequent intervals.

All maintenance of SWPS1 will be carried out in line with the manufacturer and construction contractor's requirements.

The appointed maintenance contractor will keep records of their maintenance activities.

The maintenance contract is proposed to be reviewed based on performance reviews or annually. If a Contractor change is required, O&M documentation shall be provided and a competence audit undertaken by Glan Llyn Estate Management using appropriate technical consultants.

An appropriate technically competent manager will be in place to oversee the management of the pumping station appointed by Glan Llyn Estate Management.

## 5.2 Sediment Removal

Inspection of sediment accumulation will be undertaken biennially and sediment will be removed if there is a recoverable thickness present. SWPS1 will not be operational during and immediately after silt removal to ensure that mobilised sediment cannot discharge to Monks Ditch.

To align with the ecological management plan for the Glan Llyn Development, sediment that has been removed will be temporarily placed on flat ground near the watercourse (maintenance tracks) to allow for fauna to escape the arisings and re-enter the watercourse. After a period of c.24 hours the arisings shall be collected and re-located away from the watercourses. A D1 exemption will be applied for, if required.

## 6 Compliance Testing

Compliance sampling shall be undertaken at the existing positions upstream of SWPS-1 every 2-weeks, in addition to this weekday sampling shall be undertaken at the discharge point at SWPS-1; this shall be the compliance point. The sample positions and network are shown on drawing 18669-RLL-25-XX-DR-O-0742-P02.

Samples will continue to be obtained from Monks Ditch, both upstream and downstream of the discharge position every two weeks to identify any impact that surface waters may be having on the water within Monks Ditch.

It is proposed that a summary is presented quarterly to the Environmental Officer alongside results presented in excel format. In the event of a permit threshold being exceeded at the discharge point (SWPS-1), NRW shall be notified on receipt of the results.

All sampling will continue to be undertaken in accordance with BS EN ISO 5667:2006 and processed at a UKAS accredited laboratory. All sampling will be carried out by the operator's appointed Geo-Environmental Engineer and results managed by Glan Llyn Estate Management.

It is recommended that the sampling frequency is reviewed every three months based on the evolving dataset with the potential to drop the frequency of sampling.

The sample positions once the permit has been enacted (ie the surface water network in its completed state) are shown on drawing 18669-RLL-25-XX-DR-O-0742-P02. National grid references of the Sampling positions are presented below:

- D2-S: 335473.0155, 186533.2014
- D2-C: 335510.5957, 187064.8323
- ELLENS REEN: 335872.9824, 187314.0079
- KWC + KWS: 336516.2444, 186898.6917
- SWPS1: 336732.2449, 186792.9095
- MD-D: 336735.4355, 186345.9111
- MD-U: 336640.8339, 187268.0653

## 7 Contingency Plans

### 7.1 Power Supply Failure

In the event of failure of the mains electricity supply, SWPS1 will not operate, there will be no discharge of water via the Monks Ditch outfall and the surface water drainage system at the Glan Llyn site will store water in line with its design. Temporary pumps will be delivered to the site within 24 hours, if required.

On restoration of mains electricity, the pumps will be re-started in accordance with the operation and maintenance manual.

## 7.2 Pump failure

In the event of a catastrophic failure of the pumping station, the surface water drainage system at the Glan Llyn site will store water in line with its design. Temporary pumps will be delivered to the site within 24 hours, if required.

The pumps will be re-started in accordance with the operation and maintenance manual.

## 7.3 Flooding

In the event of an extreme flooding event of Monks Ditch and the wider area beyond Glan Llyn which would mean that SWPS1 cannot operate, NRW will be contacted to discuss opening of the Monks Ditch tidal flap to allow discharge of water to the Severn Estuary.

## 7.4 Non-conformances with Environmental Permit Thresholds

In the event of non-conformances with the permit thresholds at the established SWPS1 discharge sampling location, the pumping station will be manually switched off and re-sampling will be undertaken within 48 hours of receipt of the laboratory analytical data via temporary operation of the pumping station.

It is proposed that sampling of water quality is undertaken on a regular basis upstream of Monks Lake and SWPS1 within the Glan Llyn site, at various locations shown on Drawing 18669-RLL-25-XX-DR-O-0742-P02. This water quality dataset can therefore be reviewed if non-conformances are identified at the SWPS1 discharge sampling location, to determine if there is an identifiable cause.

Re-sampling will continue at the established SWPS1 discharge sampling location within 48 hours of receipt of each set of laboratory analytical results which do not fully comply with permit thresholds, until two consecutive samples pass the thresholds in full. Automatic operation of SWPS1 will then re-commence.

In the event of continued non-conformances of the permit thresholds at the sampling location, the options for treatment of the surface water will be discussed with Natural Resources Wales.

All sampling will be carried out by the operator's appointed geo-environmental consultant.

## 8 Complaints Procedure

Complaints received will be escalated to the operator and investigated to determine if there is an identifiable issue to be resolved and the actions required.

## 9 Summary of Required Record Keeping

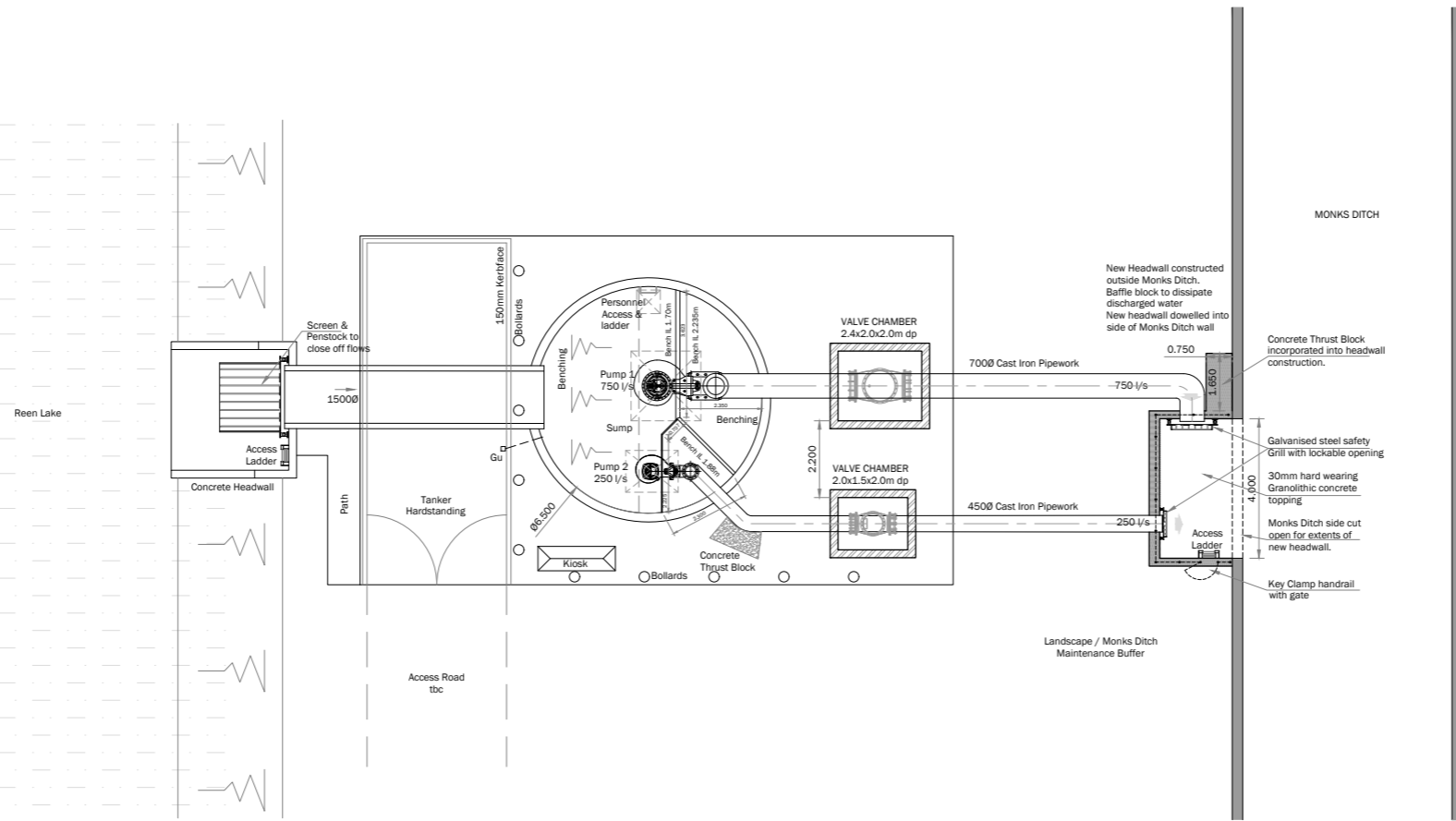
Records will be kept of:

- all operating procedures and maintenance schedules;
- staff competence and training records;
- water quality sampling results;
- non-conformances and actions taken;
- maintenance works completed;
- complaints received, findings of subsequent investigation and actions taken; and
- any audits undertaken.

## 10 Review

Management protocols will be reviewed annually by the operator, or sooner if the nature of the surface water discharge activity or associated risks change.

# Drawings



**Pump Design Parameters:**  
 Duty Pump Rate 750 l/s  
 Standby Pump Rate 250 l/s  
 Min pump operating period 1 hour

**Pump control in PS (reen)**  
 Pump Start Level - 4.10 AOD in Reen  
 Pump Stop Level - 3.10 AOD in Reen  
 Max water level in Reen 6.10m AOD before emergency operations considered

**Offsite Control - Monks Croft Stop Board**  
 Pump at 750 l/s when W.L is ≤ 5.502m AOD  
 Pump at 250 l/s when W.L is ≤ 5.72m AOD

**Tidal Lock**  
 Tide data for Goldcliff required.  
 No pumping when Goldcliff tide levels exceed 5.50m AOD

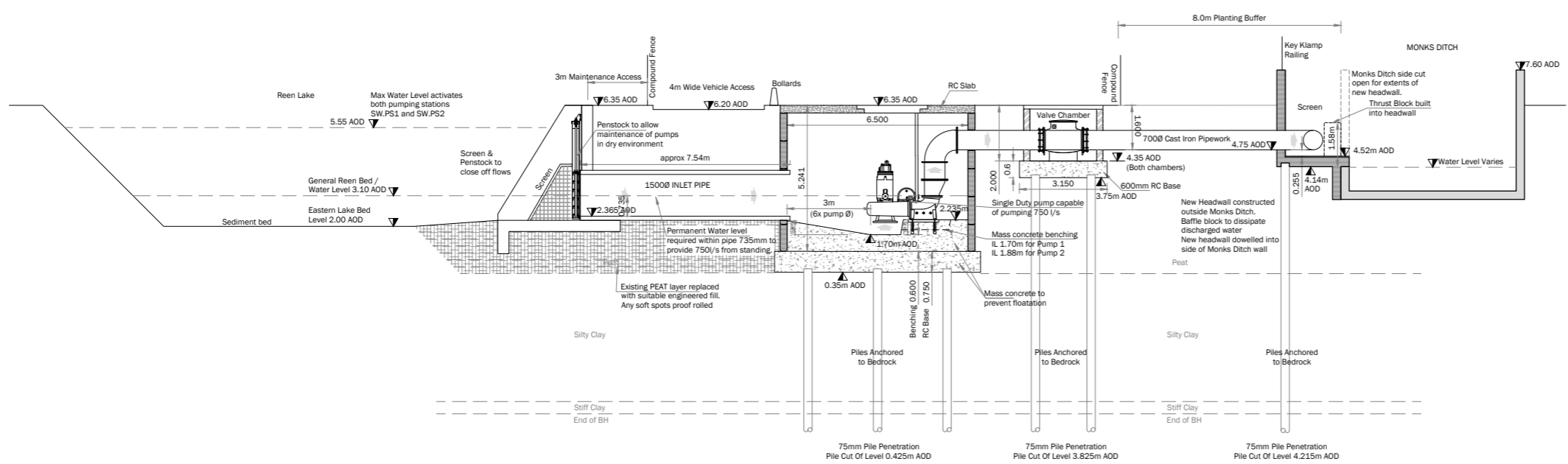
**Telemetry required**  
 - With second SW pumping Station  
 - With Offsite Control Point at Monks Croft Stop Boards

- Monks Ditch Water Level monitored only for performance data gathering, alarm to signal when W.L. exceeds 5.90m AOD

**Pumping operation alternated between SW.PS1 and SW.PS2.**  
 When Water level in REEN reaches 5.55m AOD, both SW.PS1 and SW.PS2 to operate simultaneously.

**Additional emergency manual operation to activate Standby Pump, equating to total discharge of 1,000 l/s**

**Reen storage network capable of total storage volume equal to >7 days of non-pumping.**



REV	DATE	REVISION NOTE	BY
C8	01.04.20	As Built	DMcC
C7	15.01.18	Pile cut off levels added	DMcC
C6	26.10.17	Coordinated to structural drawings	DMcC
C5	04.10.17	Pump benching amended	DMcC
T4	26.09.17	Layout mirrored to outfall downstream	DMcC
T3	13.09.17	M&E details updated, outfall reconfigured	DMcC
P2	07.2017	Connection to Monks Ditch amended	DMcC
P1	27.04.17	Updated to latest design criteria	DMcC

**PJA ENGINEERING**  
 Seven House, 18 High Street, Longbridge, Birmingham B31 2UG, Tel: 0121 516 5154  
 CLIENT

**St Modwen Developments**

PROJECT  
**Llanwern Newport**

DRAWING TITLE  
**Surface Water Pumping Station No.1 Eastern Sub - Residential**

DRAWING ISSUE STATUS  
**As Built**

JOB CODE STAGE DRAWING NO. REVISION  
**2554 - B - 201 - C8**

Revision State : P - Prelim / T - Tender / C - Construction  
 CLIENT REF

SCALE DESIGNED CHECKED DATE  
**A1@ 1:100 DMcC 02.2017**

**GENERAL NOTES**

NO DIMENSIONS TO BE SCALED OFF THIS DRAWING.  
 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DRAWINGS.  
 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.  
 ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.  
 ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.



**KEY:**

- MONKS DITCH
- SURFACE WATER SYSTEM
- PROPOSED COMPLIANT TESTING POINT (SWPS1)
- INFLUENT DRAINAGE
- TATA DRAIN
- BLOCKED OFF DRAIN
- PHASE BOUNDARIES
- SURFACE WATER SAMPLING LOCATION



Rev	Date	Amendments	By	Chk
P02	04.07.25	Amended Discharge Point	AMS	CW
P01	15.05.25	First Issue	ET	CW



Client  
**Revantage**

Project  
**P18-669 Llanwern Reclamation**

Drawing Title  
**Glan Llyn Surface Water System**

**INFORMATION**

Drawn	Checked	Date
NTS	ET	CW
15/05/25		

Drawing No. 18669-RLL-25-XX-DR-O-0742 P02

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