ENVIRONMENTAL PERMIT APPLICATION- Non Technical Summary

SITE NAME	Llangennech Train Derailment Site
DATE	12/01/2020
REPORT REFERENCE	R001.EPA – FJ6178
WRITTEN BY	Samantha Barton Technical Consultant
QA/QC BY	

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REVIEWS AND REVISIONS

REVISION NUMBER	DATE	DETAILS	CONSULTANT

1.0 INTRODUCTION

In August 2020, following a train derailment, an estimated 250,000 to 400,000 litres of diesel was lost to the environment near Llangennech, Carmarthenshire. The fuel loss impacted the local ground, groundwater, surface watercourses and the wider Loughor Estuary, a highly sensitive saltmarsh and intertidal zone comprising river and estuarine environments that are protected under various statutory instruments.

Adler and Allan (A&A) has led the environmental response works, including the recovery of oil from the train wagons, recovery of oil from the environment, the installation of an extensive network of containment measures to limit the migration of oil, and monitoring, sampling and surveying of the area.

Subsequent site investigation has been undertaken to inform the environmental risk assessment and a proposed remediation strategy has been submitted to NRW, there are ongoing refinements of the remediation strategy as further investigation is ongoing. The strategy outlined and agreed with NRW to date involves the removal of source impacted soil by excavation, as part of these works and the subsequent longer term strategy to remove/contain/monitor any residual impacts, management of the surface water flows across the site will be required.

Adler&Allan are applying for a Bespoke Environmental Permit for the purpose of management of surface water discharges at the site whilst undertaking remediation.

The site location is shown on Figure 1. A green line boundary of the site is presented in Figure 2 which covers the area identified for further containment and remedial works.

2. BACKGROUND AND PROPOSED REMEDIATION

Upon instruction Adler & Allan commenced responsive mitigation and investigation works which is detailed in full in the following reports:

- Llangennech Preliminary Environmental Assessment Report dated 8th October 2020; and
- Ground Investigation Report dated October 2020.

The investigation works carried out confirmed the presence of soil contamination, presence of LNAPL and dissolved phase impacts. The extent of the impacts are centred around the derailment site and extends for the full width of the rail area and into the wooded areas to the north and northwest of the rail line. Impacts to soils were most prevalent in the upper 1.0-2.0m below ground level. Depths to groundwater are variable (0.5-2.0m bgl) and are under tidal influence, the hydrology/hydrogeological regimes have not been fully evaluated as further investigation is required.

A detailed environmental risk assessment (i.e fully quantified) has not been carried out at this stage as the evidence of contaminations clearly presents an unacceptable risk and remediation is clearly required. At this stage it is considered that the priority would be to remove as much of the source area as is practically possible. A detailed environmental risk assessment will be needed once initial source removal has taken place as apart of the overall remediation strategy, this assessment may identify the need for further remediation work.

A preliminary conceptual site model and risk assessment is presented in the preliminary risk assessment report, this report along with the ground investigation report is included as supporting documents for the permit application, an updated environmental risks assessment will be undertaken as per the permit application requirements to take in to account current site remedial activities onsite.

A specific risk assessment will be undertaken for bespoke permit application of discharge to surface water in line with the guidance (EPR-H1).

A remediation strategy report was completed based on the works to date (dated 13th October 2020), the strategy was based on the previous PRA and GI reports and the following documents.

- Outline Remediation Options Appraisal, Llangennech, dated 29th September 2020;
- Llangennech Habitat Restoration Proposal, dated 12th October 2020;
- Llangennech Ecological Monitoring Programme Proposal, dated 12th October 2020; and
- Excavation Method Statement, Llangennech Project, dated October 2020.

The proposed remedial excavation areas details are presented on Figure 3.

3. SURFACE WATER MANAGEMENT

Current

Surface water flows from north-east to south-west into the River Morlais. There is a surface water ditch that runs parallel with the Coal Authority access road which drains the north-east woodland and enters the River Morlais upstream of the rail bridge. Along this ditch there is a suspected mine water upwelling which was identified by the Coal Authority. There is a second surface water ditch which originates in the north-east woodland and flows parallel with the access road before it enters the larger (most northern) surface water ditch.

To the south of the site, surface water flows along the southern edge of the railway line (ref: Ditch 1) before it enters a culvert and the interception trench. Water also flows from the nearby wetland into the most westerly end of the interception trench. There is a suspected mine water upwelling in Ditch 1 which was identified by the Coal Authority. The interception trench enters the River Morlais downstream of the railway bridge.

Water from the disused mine exits the shaft under artesian pressure and is diverted into the Mine Water Treatment System (MWTS) via a concrete channel in the north-east of the site. Mine water flows through two lagoons and three reedbeds before discharging into the River Morlais upstream of the incident area and any other existing surface water discharges.

Proposed

Two interceptors will be installed on site, one in the ditch running parallel with the MWTS access road and the other in the interception trench along the boundary with Network Rail and the SSSI.

The below proposed water management on site will be undertaken until a discharge consent is obtained from NRW for the interceptors.

The Coal Authority have advised that the MWTS is designed to receive 200 l/sec and have given consent for 10% of the total to be inputted which would total 220 l/second. Current on-site measurements suggest a flow of 190 l/second which equates to 20 – 30 l/second capacity.

Surface water will be isolated as it enters the interception trench and either over pumped or culverted into the River Morlais with NRW approval. This will prevent the water from becoming contaminated as it flows through the interception trench. The current flow along the interception trench is in the region of 7 l/second which will be over pumped into the River Morlais.

Surface water, rainfall and mine water upwelling will flow through the ditches in the woodland into the interceptor which will act a series of oil water separators. It is proposed to over pump this clean water from the interceptor into the MWTS via a series of oil water separators if required. The current flow through the woodland ditches on Coal Authority land is in the region of 11 l/second.

The over pumped water will be added to channel from the mine shaft before it enters the top lagoon. A flow measurement will be taken three times a day to ensure the flow is kept below 220 l/second. The oil

water separators will be visually inspected to ensure that no hydrocarbons enter the MWTS and the outflow from the reedbeds to the River Morlais will continue to be tested daily for hydrocarbons.

A summary of the surface water management plan is presented below, a plan of the surface water flows onsite is presented as Figure 4, locations as set out below are presented on Figure 5.

Surface Water Flows	Receiving water	Permit Required
Upstream surface water input (clean water from Ditch 1)	Afon Morlais.	No- It has been confirmed in discussions with NRW and the operation site manager that this will not require a permit.
Water draining from Coal Authority Land into the Afon Morlais (Via pipe dam 4)	Water will discharge through the interceptor to the ditch (pre-existing ditch) which then intern flows into the Afon Morlais- Located near the boundary of the transitional waters of the Loughor estuary.	Yes- Currently discharge through pipe dam 4 is exempt from a discharge consent as it was installed during emergency works. The interceptor has not yet been installed, once installed this will trigger the need for a permit.
Remaining water in remedial excavations/ditches (north)	Currently being collected for disposal offsite, the long-term plan is to pump these back to the Coal Authority mine water treatment works.	No- Currently being disposed of, in the longer term water will be discharged through the existing permit for the mine water treatment works.
Remaining water in remedial excavations/ditches (south)	Waters discharging in the southern area of the site will be passively discharged via an interceptor located in a drainage ditch to the south of the excavation area(this is referred to on plans as Interception Ditch), the interceptor will discharge to the ditch (pre-existing ditch) which then discharges into the Afon Morlais, this section of the Afon Morlais is designated within the transitional waters of the Loughor Estuary. Surface water in this area is currently discharged to the Afon Morlais through pipe dam 3 which was installed as part of the emergency work to contain the oil spill, the installation of the interceptor at this location will trigger a need for a bespoke permit.	Yes- waters currently being diverted at the upstream area of the ditch and then discharged to Afon Morlais, the interceptor has been installed but no waters are being discharged through this at present, any residual surface water flow entering the interceptor is being tankered away for disposal.

4.0 DESIGN PROCESS AND TREATMENT DESCRIPTION

This section sets out the design of the interceptor to be installed in the northern (discharge point proposed at pipe dam 4) and southern ditches (discharge point pipe dam 3), no further details are given on the treatment processes of other surface water flows as set out in section 3, as no permit is required for these.

The design of the interceptor to be installed in presented as Appendix C, the location of the interceptor (Northern and southern ditch) is shown on Figure 3.

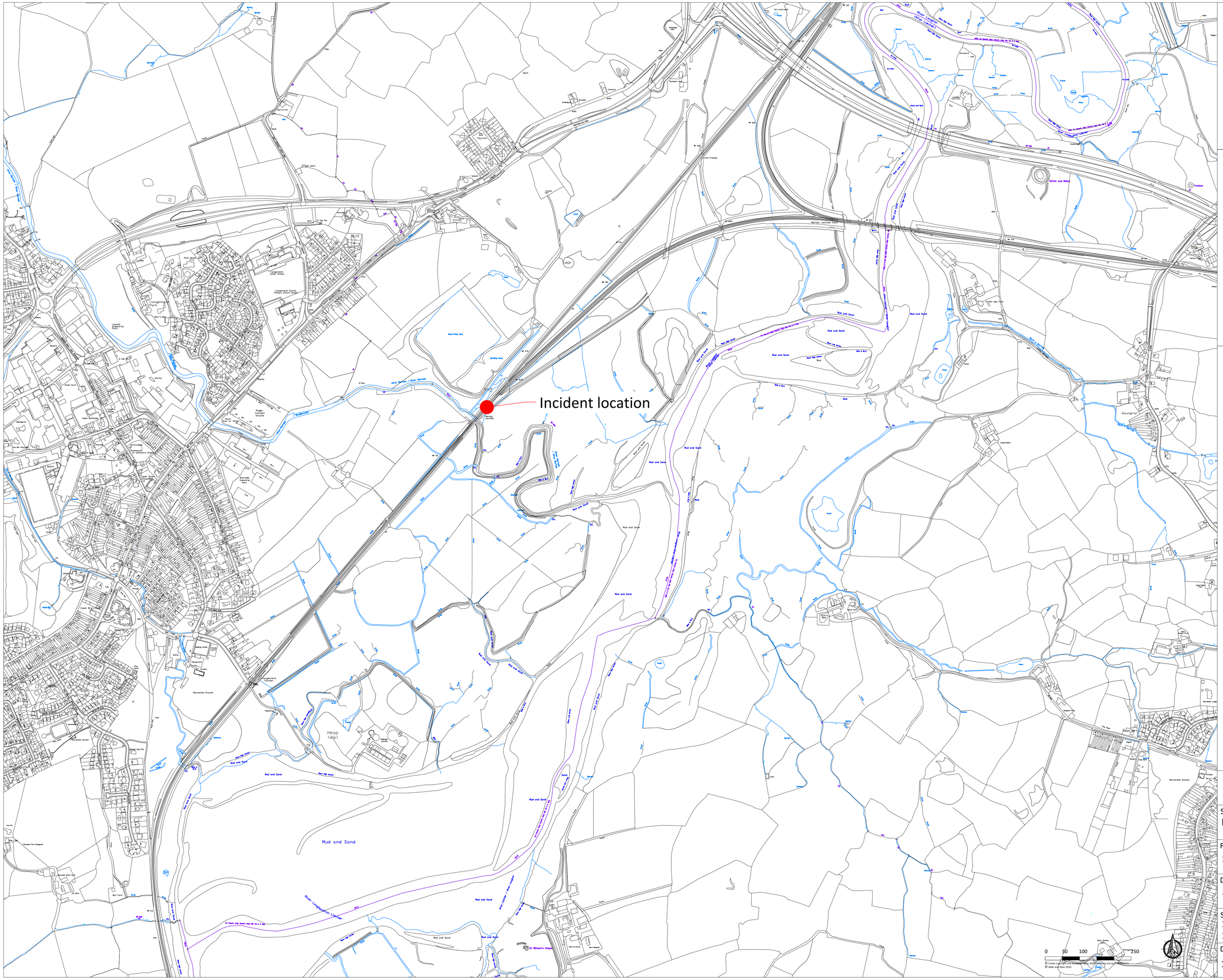
4.1 Effluent Discharge

Water is proposed to be discharged via pipe dam 3 and 4 to the transitional waters of the Afon Morlais. Surface water sampling is and has been undertaken at various points across the site including from pipe dam 3 and pipe dam 4 (proposed discharge points) as part of the emergency works and ongoing remedial and investigation works.

Discharge would be monitored as part of the long term remedial strategy, it is anticipated this would include the discharge points, upstream and downstream sampling, due to the nature of the ongoing emergency remedial excavation and further investigation, the exact frequency of monitoring can not be set out and will be dependant upon the nature of the remaining risk from any residual impact at the site, though it is anticipated at a minimum, this would be on quarterly basis whilst ongoing remediation of the site was been undertaken, upon completion of remedial works, the discharge permit would likely no longer be required with the interceptors removed and natural drainage returned to the site. Analysis of samples is anticipated to include:

- *Dissolved Metals;*
- *Total and carbonate alkalinity as CaCO3;*
- *VOCs;*
- *TPHCWG;*
- *PAHs;*
- *pH;*
- *Fluoride;*
- *Sulphate as SO_4;*
- *Nitrite;*
- *Nitrate;*
- *Ortho Phosphate as PO_4; and*
- *Chloride.*

Water quality parameters and flow observations will be recorded during future monitoring and sampling, a sond has been installed in the Afon Morlais to continuously monitor some water quality parameters, downstream of the impacted area (located at SW4). The interceptor is not specifically designed to reduce the discharge quality to any specified limit, it is designed to provide betterment and reduce the impact of the surface water naturally draining from the pre-existing ditches in to the Afon Morlais which has been impacted as a result of the diesel spill on to the land adjacent to the railway and any additional mobilisation of contaminants of concern as a result of the remedial works, though it should be noted that the remedial works will result in continuing reduction of the source and therefore continuing improvement of impacts to surface water. Additional containment measures and monitoring will proceed in addition to this whilst an unacceptable risk remains to surface waters.



Adler & Allan
ENVIRONMENTAL RISK REDUCTION

Adler & Allan,
80, Station Road,
Harrogate, HG1 1HQ

LEGEND

Notes

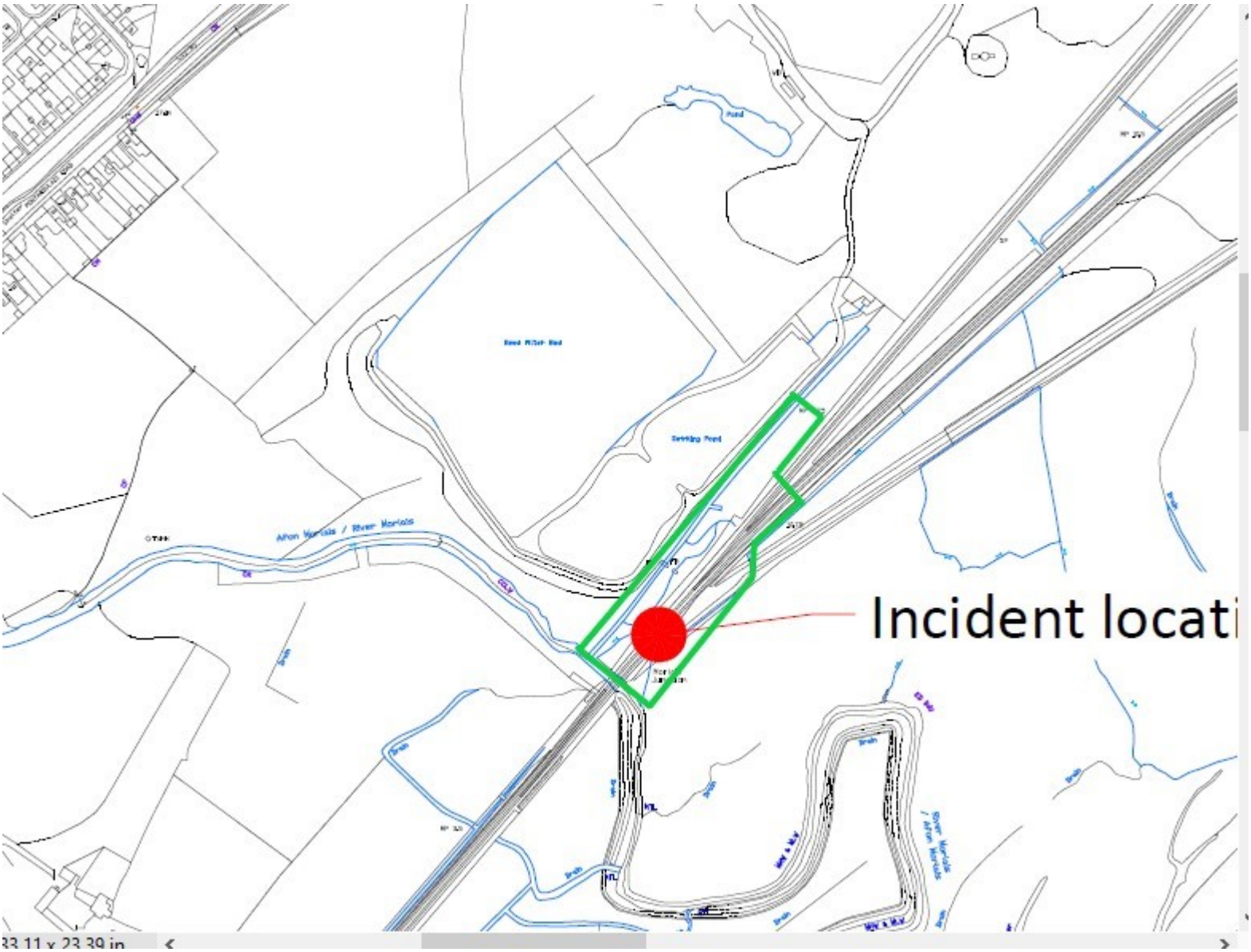
Work in Progress

Site name:
Llangennech

Figure:
Site Location

Drawing No.:
J000148748-AA-IG-SW-201a

Scale:	Revision:	
1:5,000 @ A1 1:10,000 @ A3	1	
Date:	Drawn:	Checked:
15/10/2020	RLJ	CR


Incident locati

EXCAVATION WORKS WITHIN PROXIMITY OF THE EXISTING BRIDGE STRUCTURE TO BE AGREED ON SITE WITH NETWORK RAIL

4 X 2 INTERCEPTOR (REFER TO INSET 2)

Excavation to be limited to extent of outside ditch bank

Integrity of inside bank to be protected at all times during excavation / reinstatement works

RIVER

6 X 4 INTERCEPTOR (REFER TO INSET 1)

Existing ditches to be reprofile / graded to allow natural linear fall

Line of track to be reinstated

Historic Culvert to be removed and ditch extended to create single drainage channel

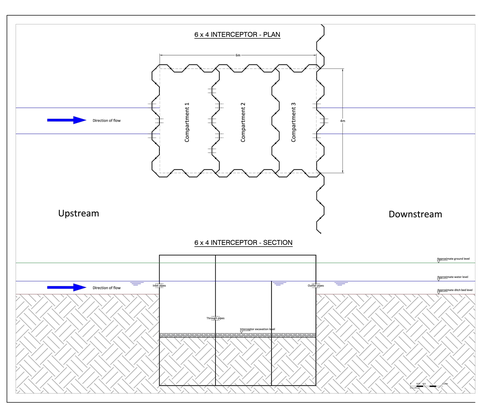
Plan
SCALE 1:250

LEGEND

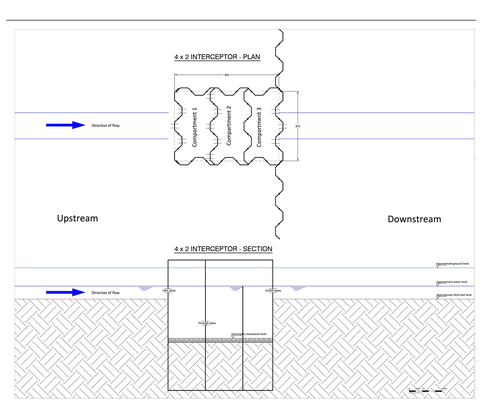
- ESTIMATED EXTENT OF PLUME
- SECONDARY REMEDIATION EXCAVATION
- PHASE 1 EXCAVATION SEQUENCE
- PHASE 2 EXCAVATION SEQUENCE
- PHASE 3 EXCAVATION SEQUENCE
- NETWORK RAIL PERMANENT WAY REINSTATMENT WORKS EXTENT
- SURFACE WATER DISCHARGE ROUTE

INDIVIDUAL EXCAVATION CELLS BASED ON 450m³ EXCAVATION VOLUME

FINAL EXTENT AND DEPTHS OF EXCAVATIONS AND REINSTATEMENT TO BE AGREED ON SITE FOLLOWING DETERMINATION OF CONTAMINATION AND REMEDIATION WORKS



6 x 4 INTERCEPTOR - INSET 1



4 x 2 INTERCEPTOR - INSET 2

FOR PRELIMINARY PURPOSES ONLY

SUBJECT TO DETAILED DESIGN AND FURTHER DISCUSSION WITH NRW AND NETWORK RAIL

Rev	Date	Description	By
B	10.11.20	TYPICAL INTERCEPTOR DETAILS ADDED	ML
A	22.10.20	DG SEQUENCE REVISED TO SUIT A & A COMMENTS	ACV

Dimensions to be verified on site.
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Client: Adler&Allan ENVIRONMENTAL RISK REDUCTION

Project: LLANGENNECH DERAILMENT

Title: EXCAVATION SCHEDULE

Drawing Status: PRELIMINARY

Designed by	Drawn by	Checked by	Date	Scales @ A0 size
ML	ACV	CGU	OCT 20	1:250

Drawing No: 20338-C-001-B

File name: 20338-C-001-Preliminary Excavation Schedule & Ring

Settling Pond

Approximate mine water upwelling

Possible upwelling (Mine water)

MP 10.75

MP 3.75

Morlais Junction

LLA 3m53

LLA 3m54

01 02 03 04 05 06 07 08 09 10 11

0 5 10 25m

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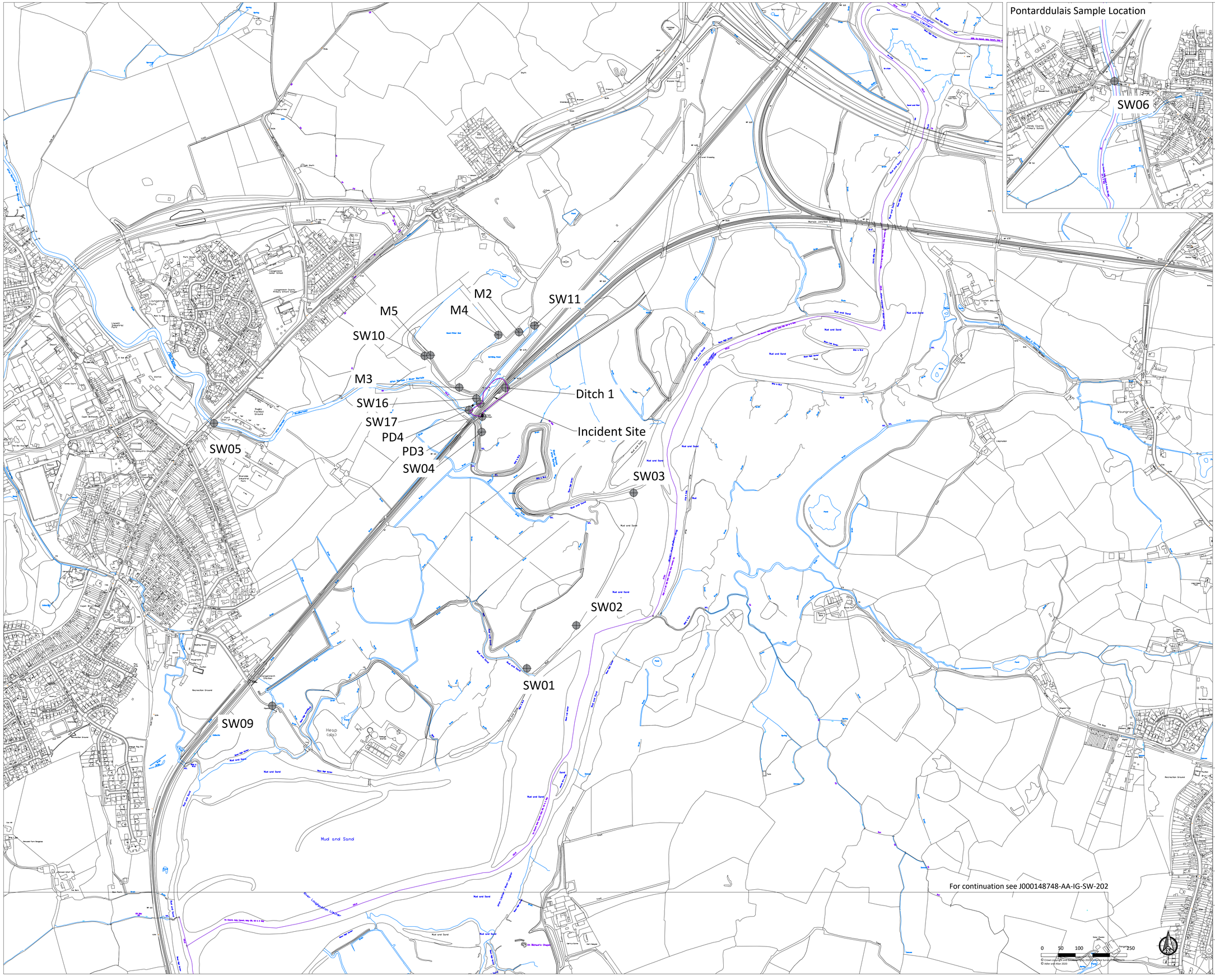
LEGEND

- Pipe dam locations
- Interception ditch location
- Sample point locations
- Fence/Absorbent boom/ Bubble barrier locations
- Flood boom
- Absorbent locations
- Site access track locations
- Product blooms
- Approximate extent of burnt woodland
- Pedestrian safe zone
- Direction of flow

Notes

Work in Progress

Site name: Llangennech		
Figure: Flow Regime - Existing		
Drawing No.: J000148748-AA-RM-WR-334		
Scale: 1:500 @ A1	**Revision:** 1.0	
Date: 19/11/2020	**Drawn:** RLJ	**Checked:** AP



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LEGEND

Sample point locations

Notes

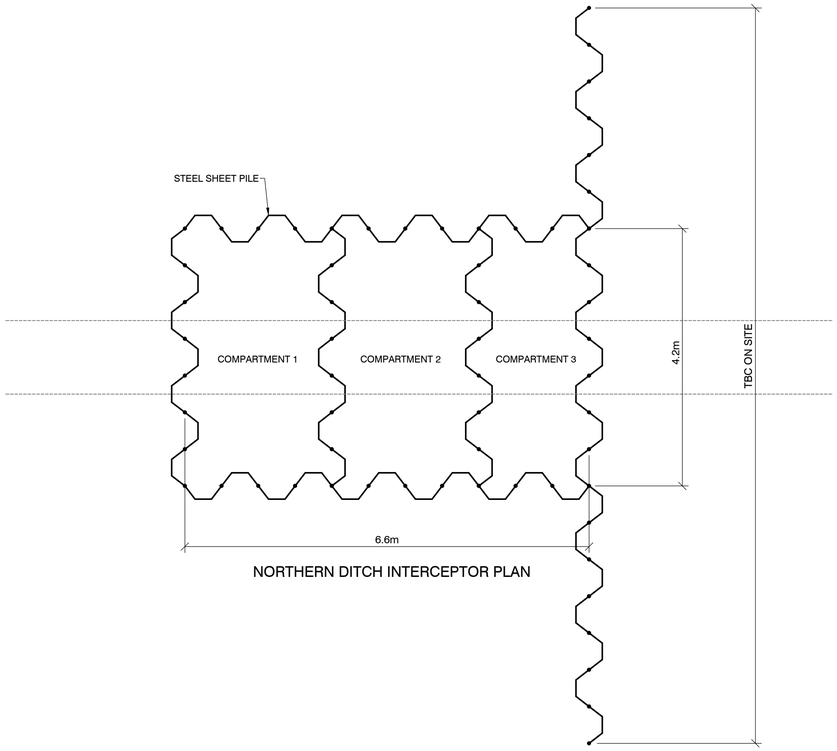
Work in Progress

Site name:
Llangennech

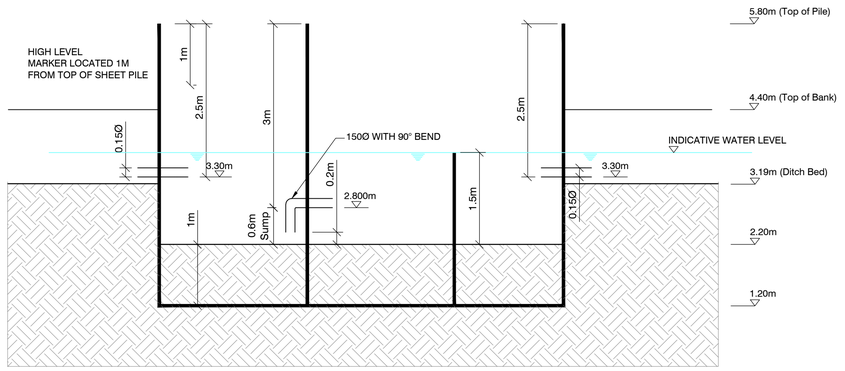
Figure:
Sample Point Locations

Drawing No.:
J000148748-AA-IG-SW-201

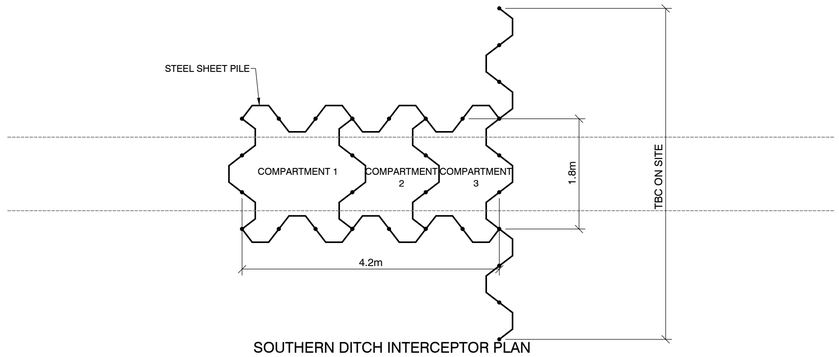
Scale:	Revision:	
1:5,000 @ A1 1:10,000 @ A3	1.6	
Date:	Drawn:	Checked:
13/01/2021	RLJ	AP



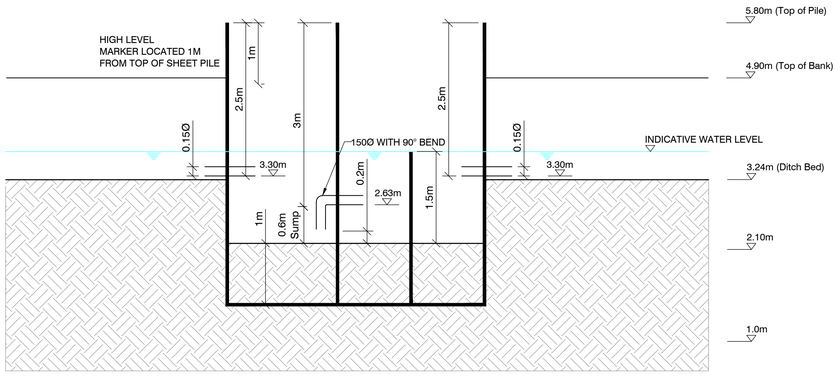
NORTHERN DITCH INTERCEPTOR PLAN



NORTHERN DITCH INTERCEPTOR DETAIL



SOUTHERN DITCH INTERCEPTOR PLAN



SOUTHERN DITCH INTERCEPTOR DETAIL

FINAL EXTENT AND DEPTHS OF EXCAVATIONS AND REINSTATEMENT TO BE AGREED ON SITE FOLLOWING DETERMINATION OF CONTAMINATION AND REMEDIATION WORKS

REFER TO DRAWING 20338-002 FOR REINSTATEMENT EXTENT PLAN DETAILS

Rev	Date	Description	By

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Client: Adler & Allan ENVIRONMENTAL RISK REDUCTION

Project: LLANGENNECH DERAILMENT

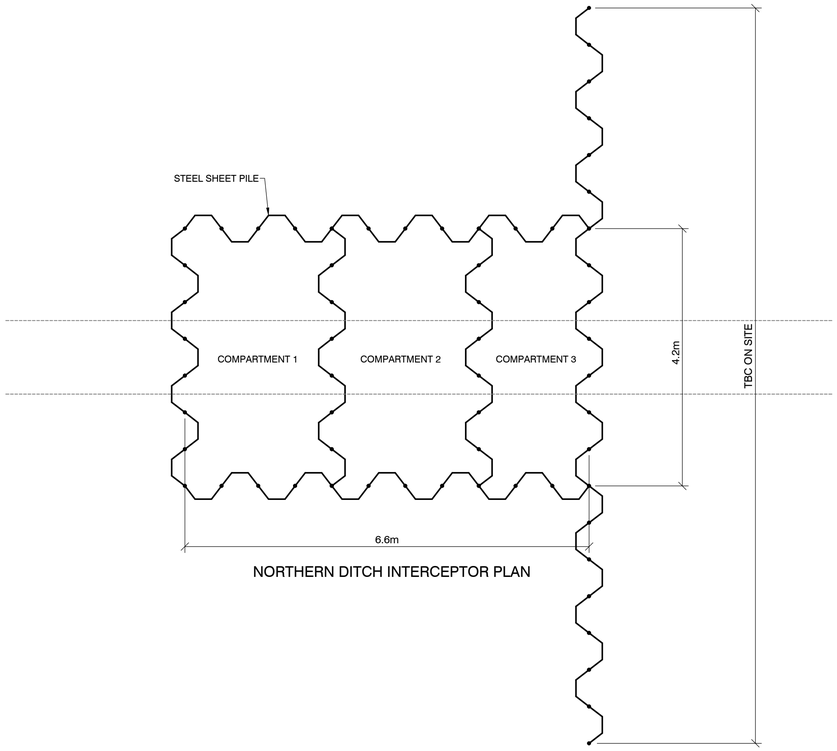
Title: INTERCEPTOR DETAILS

Drawing Status: PRELIMINARY

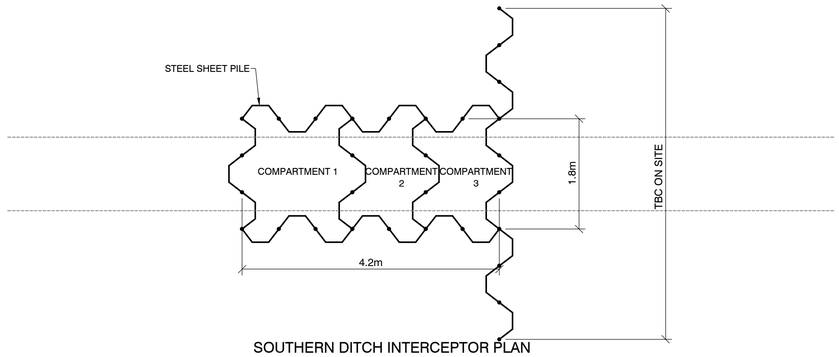
Designed by	Drawn by	Checked by	Date	Scales @ A1 size
ML	ACV	CGU	Nov 20	1:50

Drawing No: 20338-C-004 - 0

File name: 20338-C-004-Preliminary Interceptor Details-0.dwg

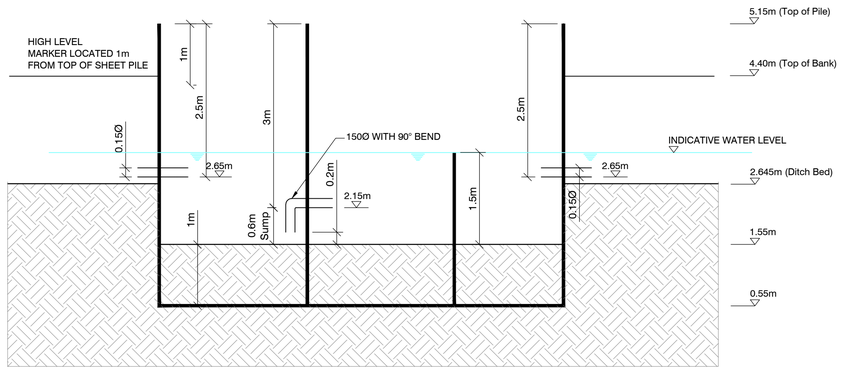


NORTHERN DITCH INTERCEPTOR PLAN

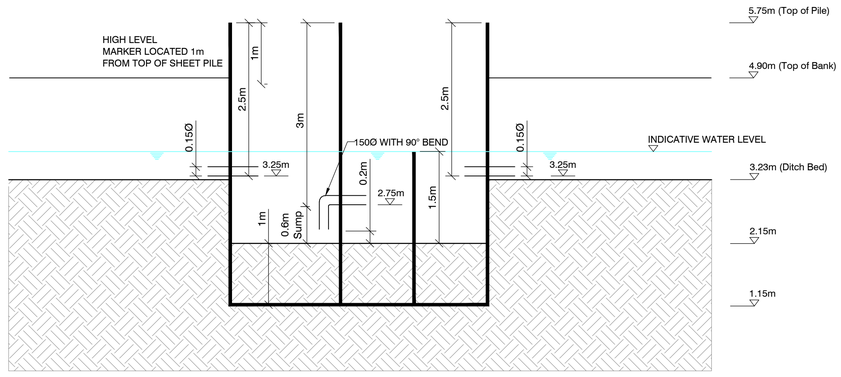


SOUTHERN DITCH INTERCEPTOR PLAN

INTERCEPTOR DETAILS FOR LEVEL PURPOSES ONLY, FINAL DESIGN BY OTHERS. DETAIL ASSUMES PREFABRICATED UNITS.



NORTHERN DITCH INTERCEPTOR DETAIL



SOUTHERN DITCH INTERCEPTOR DETAIL

FINAL EXTENT AND DEPTHS OF EXCAVATIONS AND REINSTATEMENT TO BE AGREED ON SITE FOLLOWING DETERMINATION OF CONTAMINATION AND REMEDIATION WORKS

REFER TO DRAWING 20338-002 FOR REINSTATEMENT EXTENT PLAN DETAILS

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A	16.11.20	LEVEL REVISED	ML

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Project: LLANGENNECH DERAILMENT

Title: INTERCEPTOR DETAILS

Drawing Status: PRELIMINARY

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ML	ACV	CGU	Nov 20	1:50

Drawing No: 20338-C-004 - A

File name: 20338-C-004-Preliminary Interceptor Details-A.dwg