

**West Offaly Power Ash Disposal Facility
Phased Transition to Biomass
Flood Risk Assessment**

Prepared by





DOCUMENT CONTROL SHEET

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Note

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1. Introduction

It is proposed to extend the existing West Offaly Power Ash Disposal Facility at Clonfinlough and Derrylahan, Co.Offaly to facilitate the continued operation and phased transition of the West Offaly Power (WOP) station to exclusively firing on biomass. A planning application for this development will be submitted to An Bord Pleanala. As part of the planning process this Flood Risk Assessment (FRA) has been prepared for the Ash Disposal Facility. This assessment has been prepared in accordance with the document *The Planning System and Flood Risk Management, Guidelines for Planning Authorities* issued to Planning Authorities in 2009 by the Department of Environment, Heritage and Local Government. (DoEHLG).

1.1 Scope

In accordance with the DoEHLG guidelines, this Flood Risk Assessment considers the following:

- Potential sources of flood risk and their impact on the proposed development
- Review of available flood mapping and data on recorded historic floods;
- Risk of flooding to the site due to flood flow from local water courses (fluvial);
- Risk of flooding due to direct rainfall (pluvial);
- Risk of flooding from groundwater;
- Impact of the proposed development on the existing flood regime at the proposed site.

Due to the distance of the site from the sea, the risk of flooding from tidal sources will not be considered.

1.2 Planning Guidelines

The core objectives of the 2009 Flood Risk Assessment Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic growth;
- Improve the understanding of flood risk among relevant stakeholders;
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

The Guidelines state that a staged approach should be adopted and the stages of appraisal and assessment are as follows:

Stage 1 Flood Risk Identification:- to identify whether there may be any flooding or surface water management issues related to either the area of regional planning guidelines, development plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower level plan or planning application levels;

Stage 2 Initial Flood Risk Assessment – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing indicative flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of mitigation measures can be assessed. In addition, the requirements of the detailed assessment should be scoped; and

Stage 3 Detailed Flood Risk Assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any mitigation measures.

Flood zones are defined in the guidelines as geographical areas within which the likelihood of flooding is within a particular range and the guidelines set out three types of flood zones:

Flood Zone A – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Flood Zone B – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 year and 0.5% and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

Flood Zone C – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all the areas of the plan which are not in Zones A and B.

The principles of the risk-based sequential approach to managing flood risk in the planning system are set out in the guidelines as:

Avoid: Preferably choose lower risk flood zones for new development;

Substitute: Ensure the type of development is not especially vulnerable to the adverse impacts of flooding;

Justify: Ensure that the development is being considered for strategic reasons;

Mitigate: Ensure the flood risk is reduced to acceptable levels;

Proceed: Only where justification test is passed. Ensure emergency planning procedures are in place.

The guidelines advise that most types of development are inappropriate for Zone A and development should only be considered in this zone in exceptional circumstances. Highly vulnerable development would generally be considered inappropriate for Flood Zone B unless the requirements of a justification test can be met. Development in Zone C is appropriate from a flood risk perspective.

The types of development that are considered Highly Vulnerable are set out in table 3.1 of the guidelines and includes 'essential infrastructure including electricity generating power stations and sub-stations'.

As the operation of the power station is dependent on the ability to dispose of the ash generated, this Ash Disposal Facility can be considered highly vulnerable development.

Table 1.1 below sets out the types of development that would be appropriate to each flood zone and those that would be required to meet the Justification test. The guidelines state that inappropriate development that does not meet the criteria of the Justification Test should not be considered at the plan-making stage or approved within the development management process.

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

Table 1: Extract from planning Guideline – matrix of Vulnerability versus flood zone.

2. Site Description

The West Offaly Power Ash Disposal Facility has been in use as the Ash Disposal Facility (ADF) for West Offaly Power station since 2004 and is situated on a cutaway bog in the townlands of Clonfinlough. The site is currently used to store the ash generated from burning of peat at the West Offaly Power Station and the site is operated under Industrial Emissions License No. P0611-02. The current planning permission for the power station will expire at the end of 2020. Planning permission is required for the continued operation of the existing WOP station and ADF beyond the permitted date and the phased transition of the WOP station to firing exclusively on biomass.

The site currently has planning permission to accept 825,000 tonnes of ash and this will be adequate to accommodate all the ash that may be generated from the burning of peat to the end of 2020.

The ADF extension required to accept ash will comprise of seven sealed ash containment cells within constructed embankments capped to a maximum height of 47.5mOD. The existing ground level in the location of the proposed cell locations ranges from 41.5mOD to 37.4mOD.

The overall area of the site including the completed cells is 59.2 Ha and this includes this area includes the existing access track which is approximately 3 km in length. The proposed works include the provision of seven cells for the storage of ash, two leachate storage lagoons (one existing and one proposed), hardstanding gravel areas for car parking, storage of plant and equipment and welfare facilities and the existing access track to the site. A copy of the proposed layout plan is included in Appendix A.

3. Site Location

The WOP Ash Disposal Facility (ADF) is located approximately 6.5km north east of Shannonbridge village. The site is accessed via a 3km gravel access track which is linked to the R357 east of Shannonbridge via a local road. The site is bordered on all sides by Bord na Móna production fields the majority of which are inactive. Ash is delivered to the site via a Bord na Móna rail line that runs from the West Offaly Power station to the site adjacent to the access track for much of its length.

The Gowlan River runs to the north and west of the site as it flows in a southerly direction to the River Blackwater and subsequently to the River Shannon. There is a water body located approximately a kilometre south-west of the site adjacent to the existing rail line and access track which was created by the blocking of drains and flooding of a former Bord na Móna bog in the 1990s. There is water body visible on the Discovery map to the north of the site identified as Finlough which is a Special Area of Conservation as it “supports a relatively extensive area of alkaline fen”.

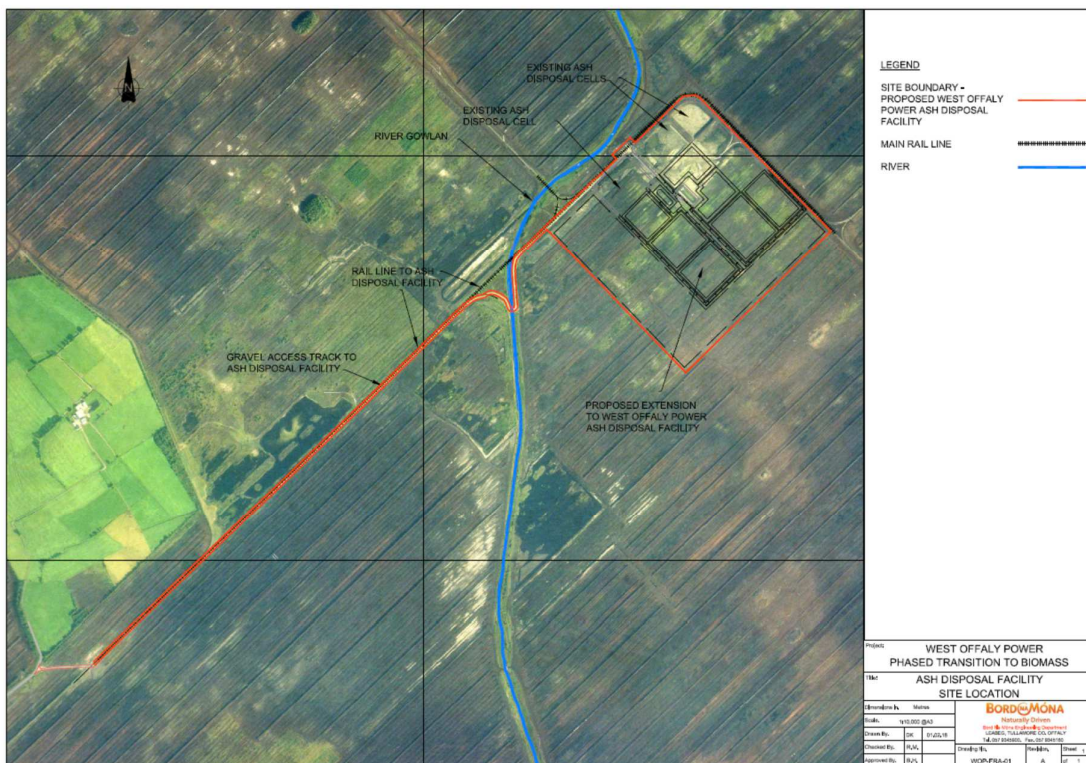


Figure 3.1: Site Location Plan

4. Flood Risk Assessment

The flood risk at the site is analysed under the following criteria:

- Fluvial risk – Inundation from local water courses
- Pluvial risk – flooding due to direct rainfall
- Groundwater risk

The existing ground levels at the location of the new ash cells in the proposed WOP ADF range from 37.4mOD to 41.5mOD. When the ash cells are constructed the finished elevation of the ash disposal cells will range from 41.2mOD to 47.5 mOD and the lowest elevation of the access track and storage areas within the site, other than the 3km access track, will be 38.0mOD. The elevation of the existing 3km access track generally ranges from 42.mOD to 38.5mOD, however it dips to 36.5mOD where it crosses the River Gowlan.

The elevation of the banks of the Gowlan River are around 35.5mOD where the River Gowlan flows into the River Blackwater approximately 2km south of the site boundary. The elevation of the river banks gradually rise so that they are 37.7mOD where the Gowlan is closest to the site. From a Lidar survey carried out by Bord na Mona in 2008, the elevation of the peat production bog to the north-west of the Ash Disposal Facility and the River Gowlan is at a lower elevation than the proposed site with existing ground levels of 35.5mOD to 36.0mOD. The elevation of the ground between the River and the site boundary is higher with elevations in the region of 37.5mOD to 39.0mOD and in the event of the River Gowlan bursting its banks in this area it is likely that the lower lying areas to the north-west of the river will act as a buffer providing a storage area for the flood waters.

To the south-west of the site the Lidar survey shows that the ground between the River Gowlan and the site boundary is at a lower elevation than the site with elevations of 35.8mOD to 37mOD and it also appears that the areas to the west of the River Gowlan in this area are low lying. Again these areas will provide buffer storage areas in the event of a flood event. The proposed embankments that form the ash cells will provide a barrier to flood waters from the south of the site or from the north or east. It should be noted that the proposed ash cells will be fully lined along the base of each cell and to the full height of the embankments with a geosynthetic clay liner.

From the historical flood mapping of the area, fluvial flooding from the River Gowlan has taken place to the south-west of the site. In the event of an increase in the level or extent of this flooding the site will be protected from flooding in this direction by the ash cell embankments.

Given the proposed elevations of the site and the ash cells relative to the surrounding lands and the buffer areas available in the vicinity of the site, as well as the protection that can be provided by the ash cell embankments, fluvial flooding of the proposed ADF site is not considered a risk.

4.2 Review of OPW Flood Risk Mapping

To ensure compliance with Ireland's obligations set out in the EU Flood Directive 2007, the OPW is in the process of compiling new flood plain mapping under its Catchment Flood Risk Assessment Management Studies (CFRAMS).

The West Offaly Power Ash Disposal Facility site falls within the area covered by the Shannon CFRAMS. At present there are no flood risk maps available for the area in which the site is located. The

closest mapped area available at the time of compilation of this report is the Draft Flood Risk map for Shannonbridge, Co. Offaly located a distance of 6km from the site.

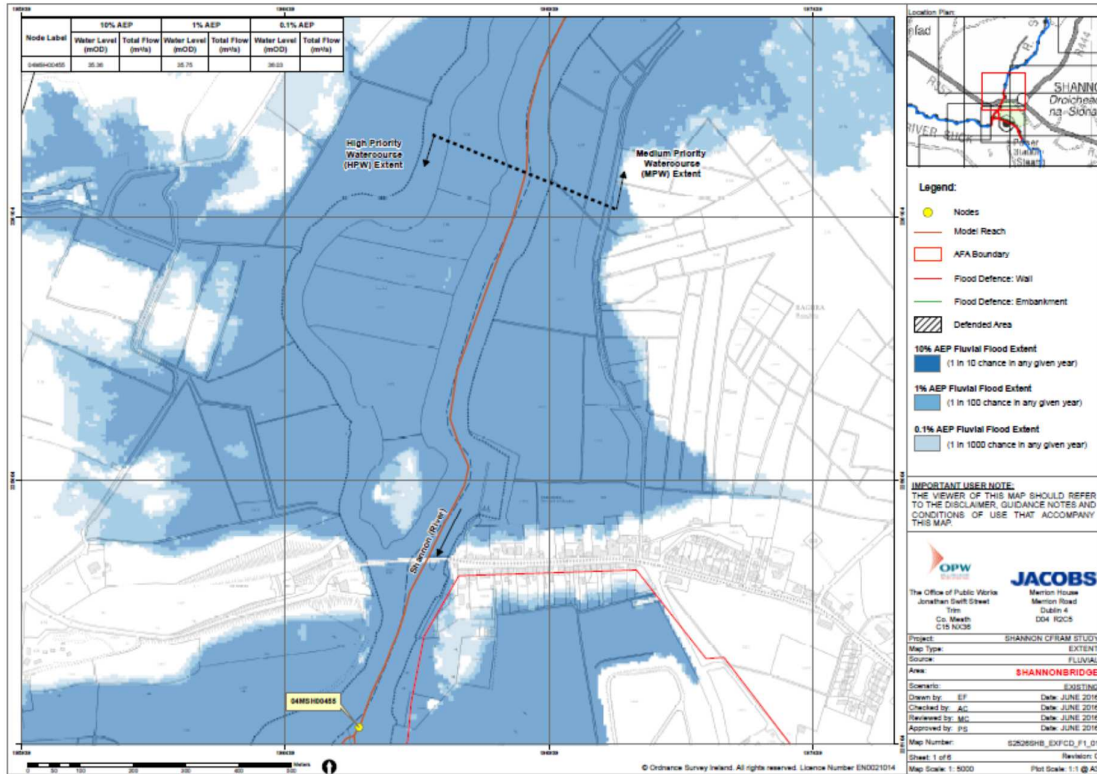


Figure 4.2: Shannon CFRAMS draft flood map showing theoretical flood extents in Shannonbridge

The draft flood risk map for Shannonbridge shows the River Shannon water level for a 1 in 1000 year flood event at approximately 36.03 mOD. Levels of the completed ash cells will range from 37.4m OD at the base of embankments to 47.5m OD at the highest point of the completed and capped cells. These levels are higher than the draft flood predictions for the River Shannon in the vicinity of the Ash Disposal Facility.

The OPW have also carried out Preliminary Flood Risk Assessment (PFRA) and mapping of the total country. The purpose of the PFRA which was carried out in 2011 was to identify areas at risk of significant flooding. These areas (referred to as Areas for Further Assessment, or 'AFAs') are where more detailed assessment is required on the extent and degree of flood risk under the CFRAM Studies. Fig 4.3 below shows the PFRA map for the area of the West Offaly Power Ash Disposal Facility and as can be seen from this map the site is outside all of the flood event areas and is not located close to an area considered as a Probable or Possible Area for Further Assessment.

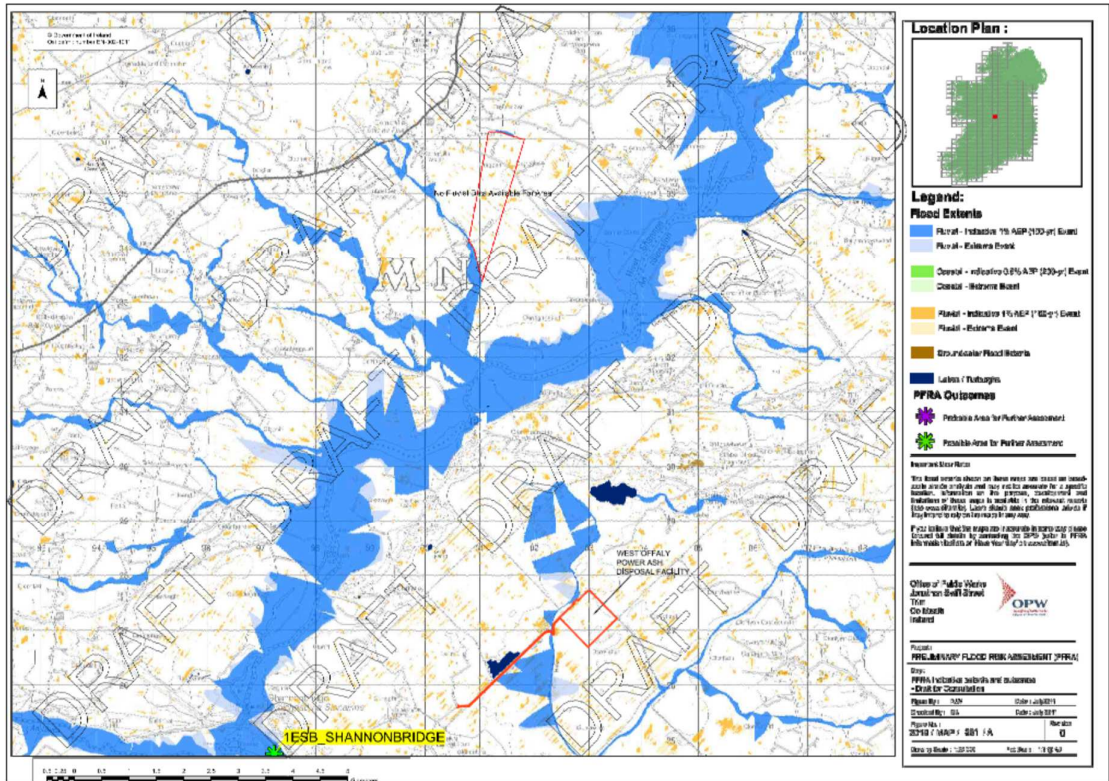
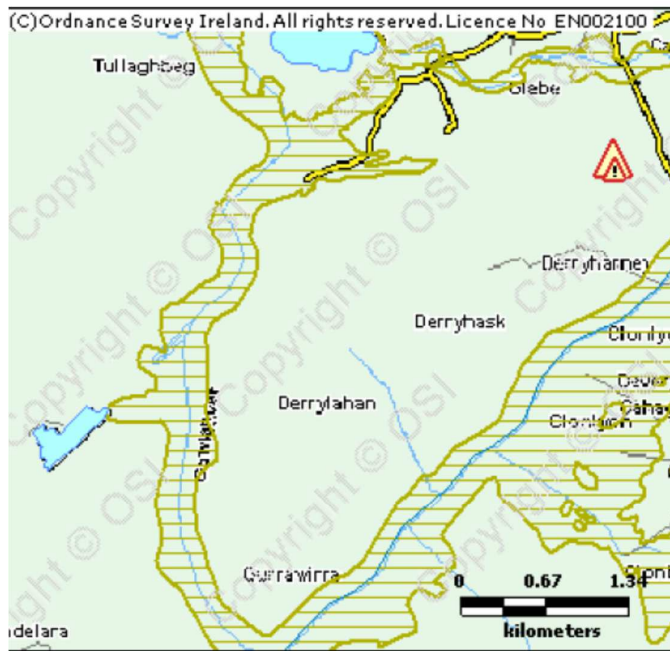


Figure 4.3: Preliminary Flood Risk Assessment – WOP ADF

4.3 Historical Flooding

The OPW website provides information on flood records throughout the country. Figure 4.4 below shows the flood records contained for the vicinity of the WOP ADF. As can be seen there is no record of any flood events at the site. There is multiple/recurring flood area identified on this map, however this is in excess of 2km from the site boundary.



Map Scale 1:55,665

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained in the Glossary.

Figure 4.4: OPW Flood Map

In terms of historical flooding, December 2015 was the wettest December over Ireland since 1850 and followed on from a November in which parts of the Midlands experienced twice the average November rainfall. During this period Ireland experienced exceptional and widespread flooding. Mapping of this flooding was carried out by satellite on 28th December 2015 and the extent of the flooding on this day is shown on Figure 4.5 below.

As can be seen from Figure 4.5 below, there was significant flooding in the area to the south, north and west of the site. There was no flooding however within the site boundary. The flooding that occurred in 2015 is as would be expected based on the ground levels of the surrounding lands. Access was maintained to the site by road and by rail at all times during this flood event and operations continued as normal during this period.

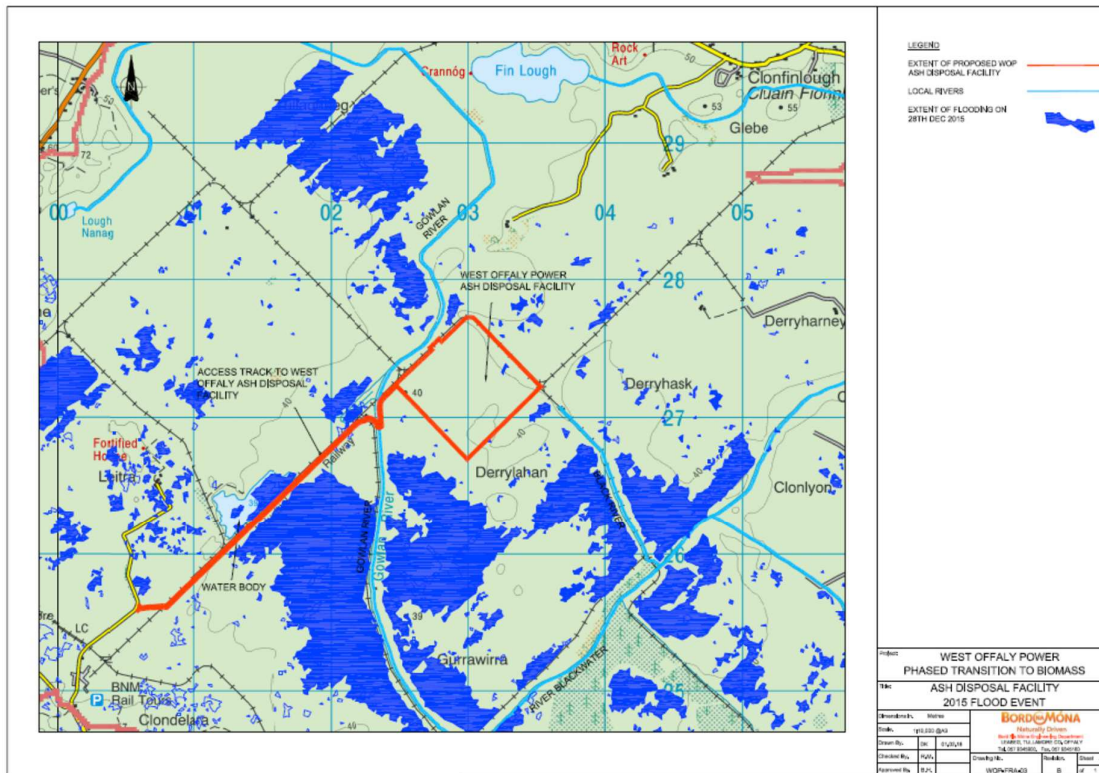


Figure 4.5: Extent of Flooding on 28th December 2015

4.4 Pluvial Flood Risk

Pluvial flooding occurs when the extreme rainfall causes excess rainfall to pond above ground at low points in the topography.

The proposed surface water regime will utilise the existing open drainage network available on site where this is retained and new open drains proposed as part of the site development works. There is currently a network of parallel surface water drains running at 15 metre centres in a north-east to south-westerly direction previously constructed by Bord na Móna to drain the former peat production fields. These drains discharge into the River Gowlan via silt ponds. The main drainage from the site is via an existing surface water drain that runs in a north-westerly direction adjacent to the existing access track through the site. It is proposed to extend this existing drain to serve the proposed extension as shown in Figure 4.6 below. A piped drainage network will be constructed under the lined ash cells to provide undercell drainage and this will also discharge into this main drain. Pipes along the top of the ash cell embankments will collect surface water runoff from the top of the capped ash cells and these pipes will also discharge into this drain.

In general, there will be one ash cell operational at a time, although as one cell is nearing completion and the adjacent cell is lined there will be a period when two cells will be operational. Each ash cell will be lined with an GCL liner with extremely low permeability along the base and the full height of the

embankment. All rainfall on the operational cells will be collected and diverted into a lined lagoon on the site for recirculation within operational cells, or discharge into the River Gowlan in accordance with EPA licencing requirements. On completion, each cell will be capped with a geosynthetic clay liner and this liner will be overlain with a drainage layer and covered with a 1m deep layer of peat/soil. This will allow the re-establishment of natural vegetation and thereby reduce runoff to green field levels ensuring that surface water runoff from the cell area is not increased by the proposed development. All existing cells are capped in this manner. All surface water runoff from the completed capped cells will be directed to surface water drains located at the base of the cell embankments. Details of the main drainage is shown in Figure 4.6 below.

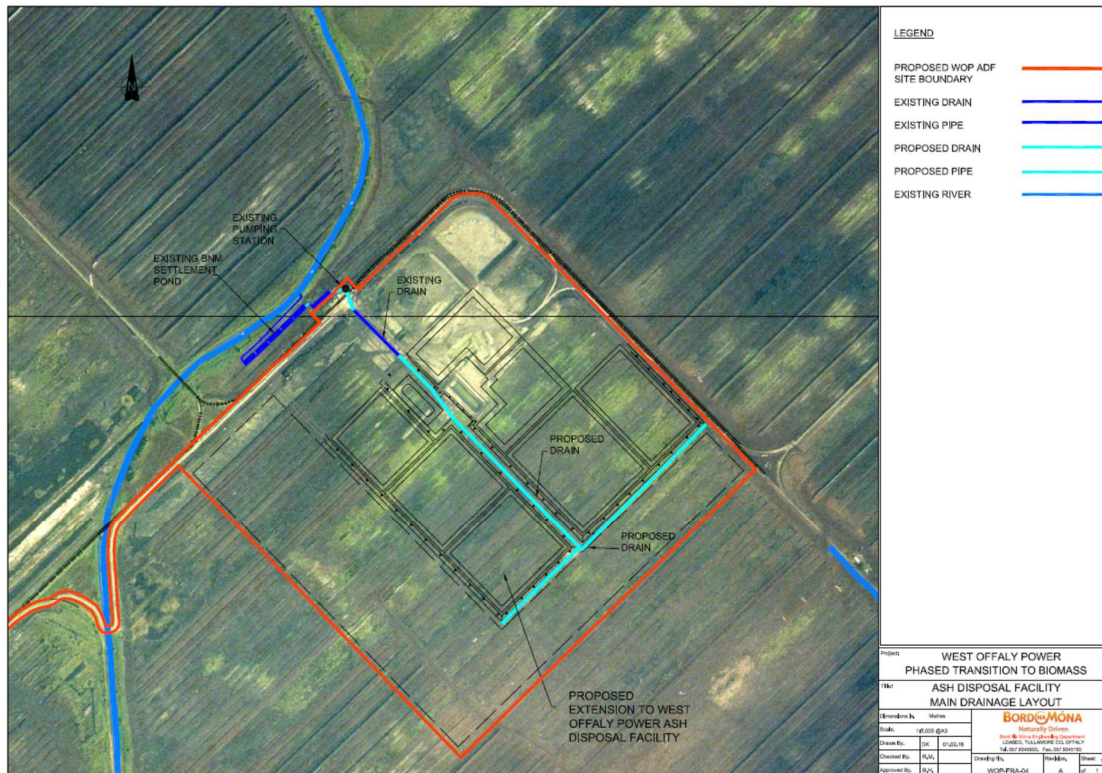


Figure 4.6: Main Drainage at WOP ADF

The surface water from the site discharges into an existing drain and this flows by pipe under the rail line into an existing pumping station. At the pumping station, water is pumped into an existing Bord na Móna silt settlement pond and from here flows into the River Gowlan via additional settlement ponds. The outfall into the River Gowlan is monitored for pH and suspended solids under the current Industrial Emissions Licence and samples are analysed on a weekly basis. The pump cut in level is 35.33mOD and the cut-out level is 35.03mOD. The invert of the pipe discharging from the pump sump to the settlement pond is 37.5mOD resulting in a 2.5m lift in water levels from the pumping station to the settlement pond.

The PFRA map in Figure 4.3 above shows that small areas to the south of the site are at risk of pluvial flooding. This may be due to existing topography of the site and the existence of localised low points.

Any flooding in this area prior to the construction of the cells will not impact on the operation of the facility and the elevation of the completed ash cells in this area will prevent this flooding on completion of the works. All completed cells will have a slightly domed construction to prevent prolonged ponding of water on the top of the capped ash cells. It is proposed to raise the level of the existing access track through the site to 38.0m OD to remove an existing low point on this track.

Given the drainage network in place and the proposed elevation of the site, the West Offaly Power Ash Disposal Facility is not considered to be at risk of pluvial flooding.

4.5 Groundwater Flood Risk

Groundwater flooding can occur during lengthy periods of heavy rainfall, when the groundwater table is already high. If groundwater level rises above surface level it can pond and cause flooding.

From GSI mapping the northern corner of the site (north of the existing leachate lagoon) is underlain by Navan Beds Formation described by the GSI as dark limestone, mudstone and sandstone. Meath Formation described as Limestone and calcareous Sandstone. The remainder of the site is Ballysteen Formation described as dark muddy limestone, shale. The groundwater aquifer in the area is classified as a Locally Important aquifer with bedrock which is moderately productive only in local zones.

In Spring 2017 a site investigation was carried out on the site which included the excavation of ten trial pits and four boreholes. A water strike was recorded in two bore holes (BH01 and BH034A) both located south west of the proposed ash cells. The depth recorded for the water strike was 3.8mbgl and 7mbgl. Water was recorded in six of the trial holes with the depth ranging from slow inflow in TP04 at 0.9mbgl to fast inflow at 2.58mbgl at TP08. Subsequent dipping of the water levels in three of the boreholes showed water levels ranging from 0.62mbgl to 3.12mbgl.

A report Investigation of Soil and Groundwater prepared by ESBI in November 2000 and included in the Environmental Impact Assessment for the original Ash Disposal Facility states that “the site is underlain by glacial deposits of a mean thickness of 3.85m which has a permeability of 10^{-7} m/s. The ground water is believed to be confined by the glacial deposits ...”.

From the extensive drainage system at the site, the elevation of the site and the low permeability barrier provided by the overburden material it is unlikely that the development will be impacted by groundwater flooding. In addition the PFRA mapping in Figure 4.3 above does not show any history of ground water flood events in the area.

5. Impact of Development on Current Flood Regime at Site

As part of the development of the Ash Disposal Facility a GCL liner will replace permeable peat ground in each of the ash containment cells. However, as all ash containment cells will be capped with a liner overlain by one metre depth of soil / peat on completion, the surface water runoff from the cells will not increase once vegetation has been established on the completed cells. All surface water generated

within the lined cells will be collected and contained within a leachate lagoon and will not impact on the drainage regime at the site. Operations at the site shall be carried out so as to ensure that cells are capped as soon as possible after completion and in so far as possible only one ash cell is active at any one time. All water that comes into contact with ash in the cells will be collected and contained in the leachate lagoon and as the ash cells will be fully lined no leachate run off from the ash cells will enter either the surface water or ground water network. All completed ash cells are capped as described above.

There will be some additional surface water runoff from the site due to the provision of a gravel hardstanding storage area and access track, however as these surfaces will not be sealed, the additional run-off will be minimal and will not be a flood risk. A surface water system will be designed to best practice throughout the site to ensure the site is adequately drained.

6. Climate Change

The 2009 Planning Guidelines identifies that there is a great deal of uncertainty in relation to the potential effects of climate change and therefore recommends that a precautionary approach should be taken in relation to Flood Risk Assessment. This precautionary approach includes recognising that significant changes in the flood extent may arise from an increase in rainfall or tide events, that levels of structures such as flood defences are sufficient to cope with the effects of climate change and ensuring that structure and the development are capable of adaptation to the effects of climate change.

The provision of an additional leachate storage lagoon at the West Offaly Power Ash Disposal Facility will provide additional leachate storage capacity to store excess leachate in the event of an extreme rainfall event. The existing leachate lagoon which has a capacity of 4,200 cubic metres, has been adequate for the storage of excess leachate generated in active ash cells for the lifetime of the facility to date and the new lagoon will increase this storage capacity by an additional 4,500 cubic metres.

Given the additional leachate storage capacity, the elevation of the site relative to the surrounding lands, the height of the cell embankments, the provision of a geosynthetic liner in each ash cell to the full height of the embankment and the existing and proposed drainage network it is envisaged that the increase in flows due to climate change will not impact on the West Offaly Power Ash Disposal Facility.

7. Conclusions

From the investigations carried out and the evidence available it appears that the West Offaly Power Ash Disposal facility is located in Flood Zone C and therefore has a low risk of flooding. In addition the risk of pluvial and groundwater flooding are considered minimal and the design and operation of the facility will ensure there is no increased flood risk elsewhere due to the proposed development.

The development is therefore considered to be in overall compliance with the objectives of the Planning and Flood Risk Management Guidelines.

Appendix A

Figure 3.1 Site Location Plan

Figure 4.1 Rivers and Catchments

Figure 4.2 Draft CFRAMS Flood Map – Shannonbridge

Figure 4.3 Preliminary Flood Risk Assessment Map

Figure 4.4 Historical Flooding 28th December 2015

Figure 4.5 Main Drainage WOP ADF

Drg QS-000206-01-D460-103 – Proposed Site Layout Plan



LEGEND

- SITE BOUNDARY - PROPOSED WEST OFFALY POWER ASH DISPOSAL FACILITY ———
- MAIN RAIL LINE
- RIVER

Project:		WEST OFFALY POWER PHASED TRANSITION TO BIOMASS		
Title:		ASH DISPOSAL FACILITY SITE LOCATION		
Dimensions in.	Metres	Naturally Driven <small>Bord Na Móna Engineering Department LEABEG, TULLAMORE CO. OFFALY Tel. 057 9345900. Fax. 057 9345160</small>		
Scale.	1:10,000 @A3			
Drawn By.	DK 01.02.18			
Checked By.	R.M.			
Approved By.	B.H.	Drawing No.	Revision.	Sheet
		WOP-FRA-01	A	1



LEGEND

- EXTENT OF PROPOSED WOP ASH DISPOSAL FACILITY ———
- EXISTING RIVERS AND STREAMS ———
- EXISTING CATCHMENTS ———

Project: **WEST OFFALY POWER PHASED TRANSITION TO BIOMASS**

Title: **ASH DISPOSAL FACILITY RIVERS AND CATCHMENTS**

Dimensions in.	Metres
Scale.	1:50,000 @A3
Drawn By.	DK 01.02.18
Checked By.	R.M.
Approved By.	B.H.

BORD NA MÓNA
Naturally Driven
Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900. Fax. 057 9345160

Drawing No.	Revision.	Sheet
WOP-FRA-01	B	1 of 1

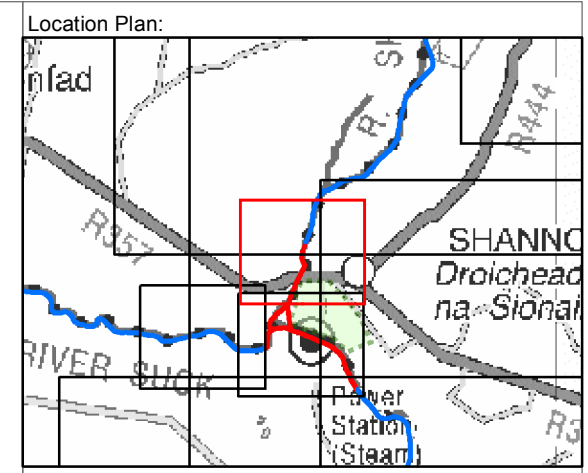
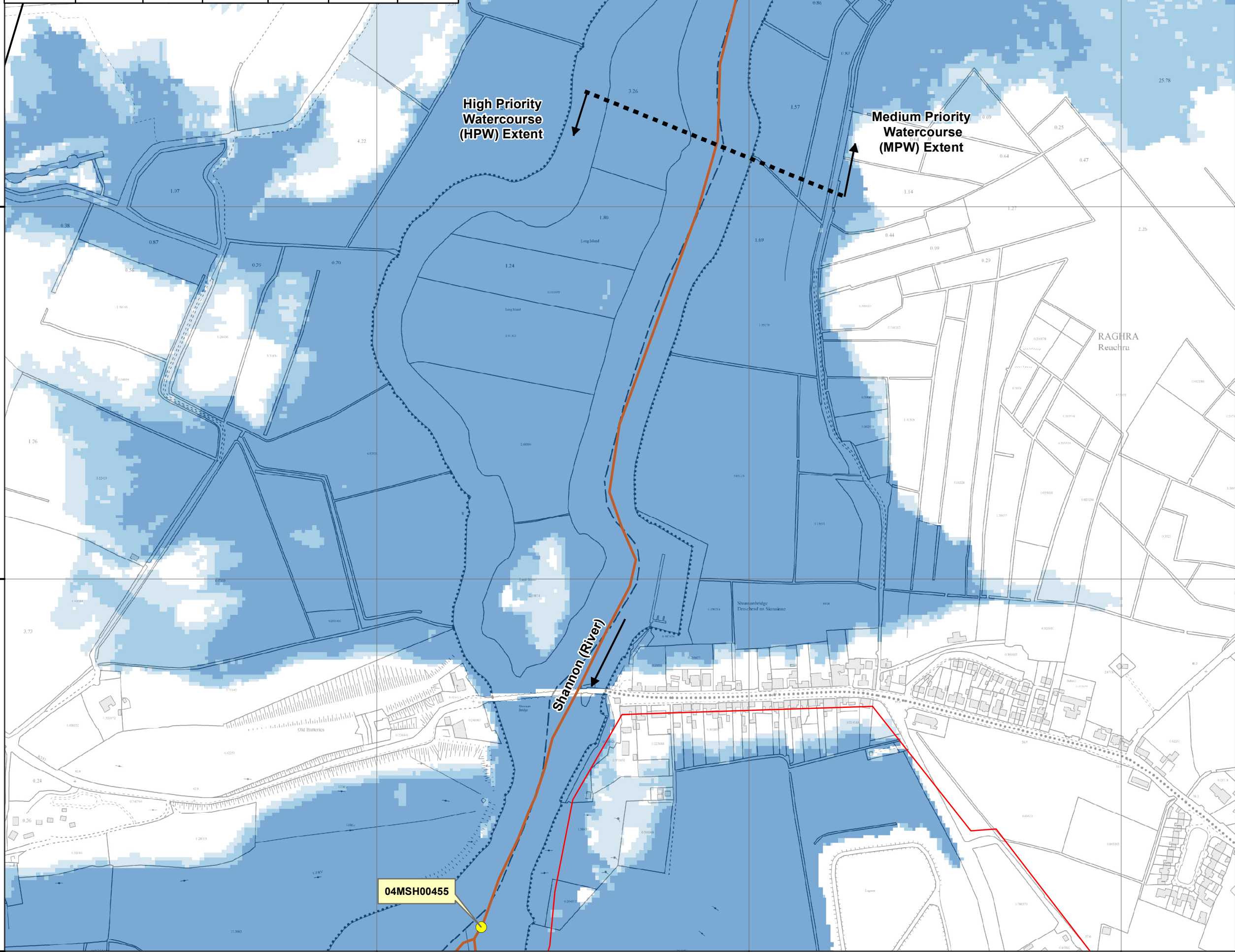
195939

196439

196939

197439

Node Label	10% AEP		1% AEP		0.1% AEP	
	Water Level (mOD)	Total Flow (m³/s)	Water Level (mOD)	Total Flow (m³/s)	Water Level (mOD)	Total Flow (m³/s)
04MSH00455	35.36		35.75		36.03	



Legend:

- Nodes
 - Model Reach
 - AFA Boundary
 - Flood Defence: Wall
 - Flood Defence: Embankment
 - Defended Area
- 10% AEP Fluvial Flood Extent**
 (1 in 10 chance in any given year)
- 1% AEP Fluvial Flood Extent**
 (1 in 100 chance in any given year)
- 0.1% AEP Fluvial Flood Extent**
 (1 in 1000 chance in any given year)

IMPORTANT USER NOTE:
 THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.



The Office of Public Works
 Jonathan Swift Street
 Trim
 Co. Meath
 C15 NX36

Merrion House
 Merrion Road
 Dublin 4
 D04 R2C5

Project:	SHANNON CFRAM STUDY
Map Type:	EXTENT
Source:	FLUVIAL
Area:	SHANNONBRIDGE
Scenario:	EXISTING
Drawn by:	EF Date: JUNE 2016
Checked by:	AC Date: JUNE 2016
Reviewed by:	MC Date: JUNE 2016
Approved by:	PS Date: JUNE 2016

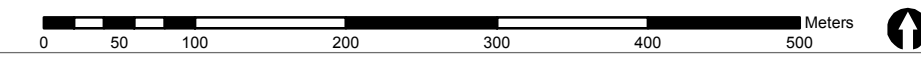
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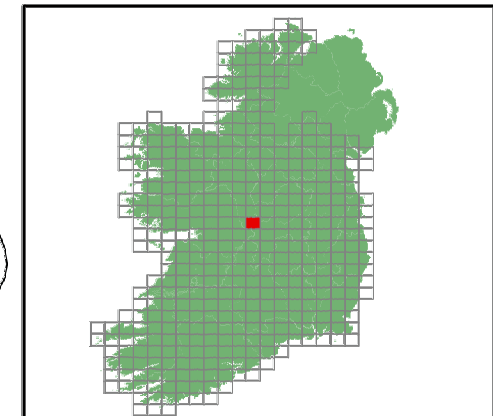
© Government of Ireland
Osi permit number EN-002-1011

No Fluvial Data Available For Area

WEST OFFALY
POWER ASH
DISPOSAL FACILITY

1ESB SHANNONBRIDGE

Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents

■ Lakes / Turloughs

PFRA Outcomes

- ✱ Probable Area for Further Assessment
- ✱ Possible Area for Further Assessment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland



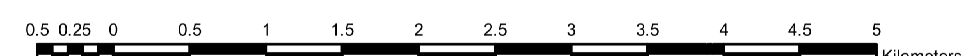
Project:
PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

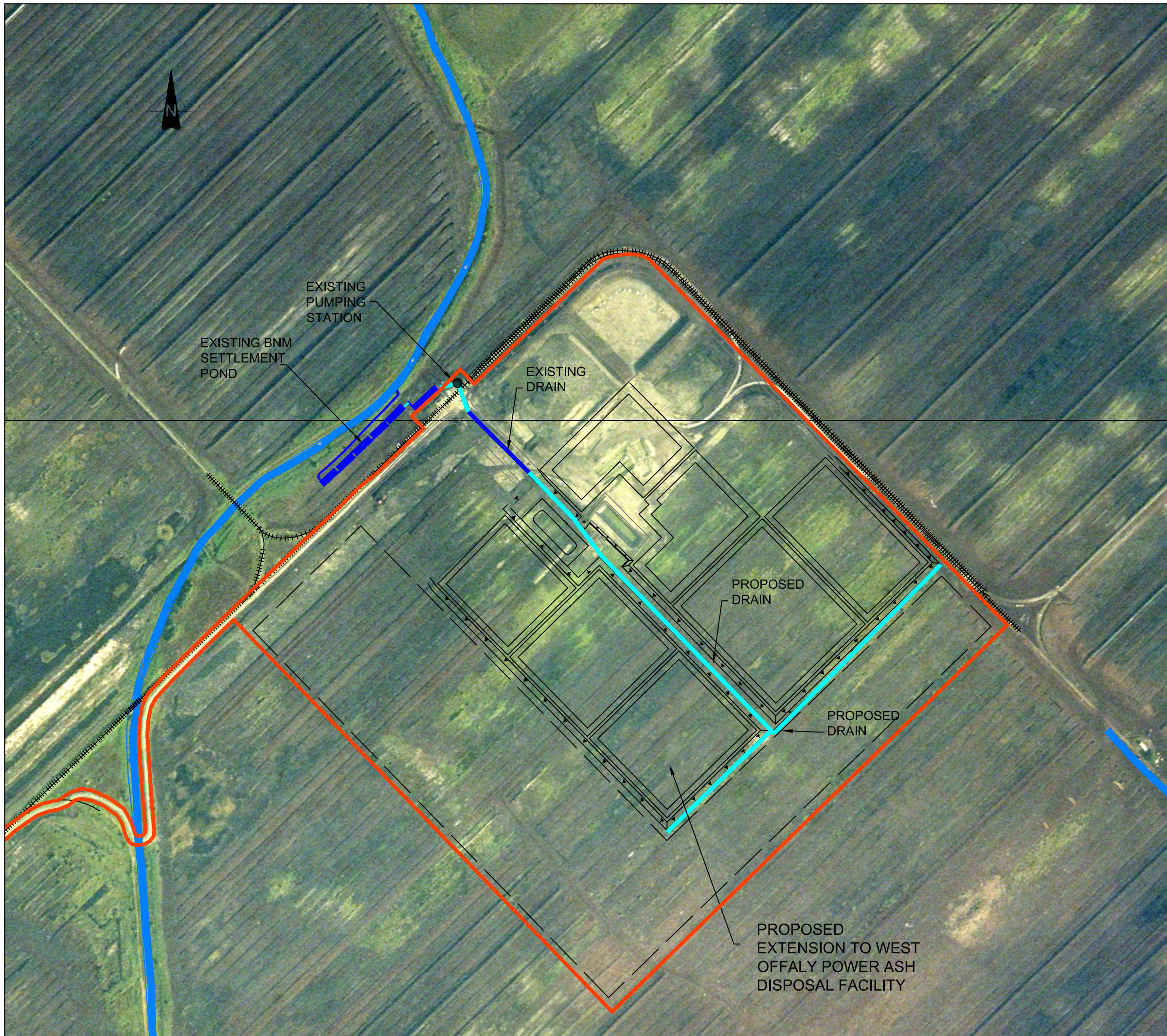
Map:
**PFRA Indicative extents and outcomes
- Draft for Consultation**

Figure By: PJW Date: July 2011
Checked By: MA Date: July 2011

Figure No.: 2019 / MAP / 231 / A Revision: 0

Drawing Scale : 1:50,000 Plot Scale : 1:1 @ A3





LEGEND

- PROPOSED WOP ADF SITE BOUNDARY ———
- EXISTING DRAIN ———
- EXISTING PIPE ———
- PROPOSED DRAIN ———
- PROPOSED PIPE ———
- EXISTING RIVER ———

EXISTING PUMPING STATION
EXISTING BNM SETTLEMENT POND

EXISTING DRAIN

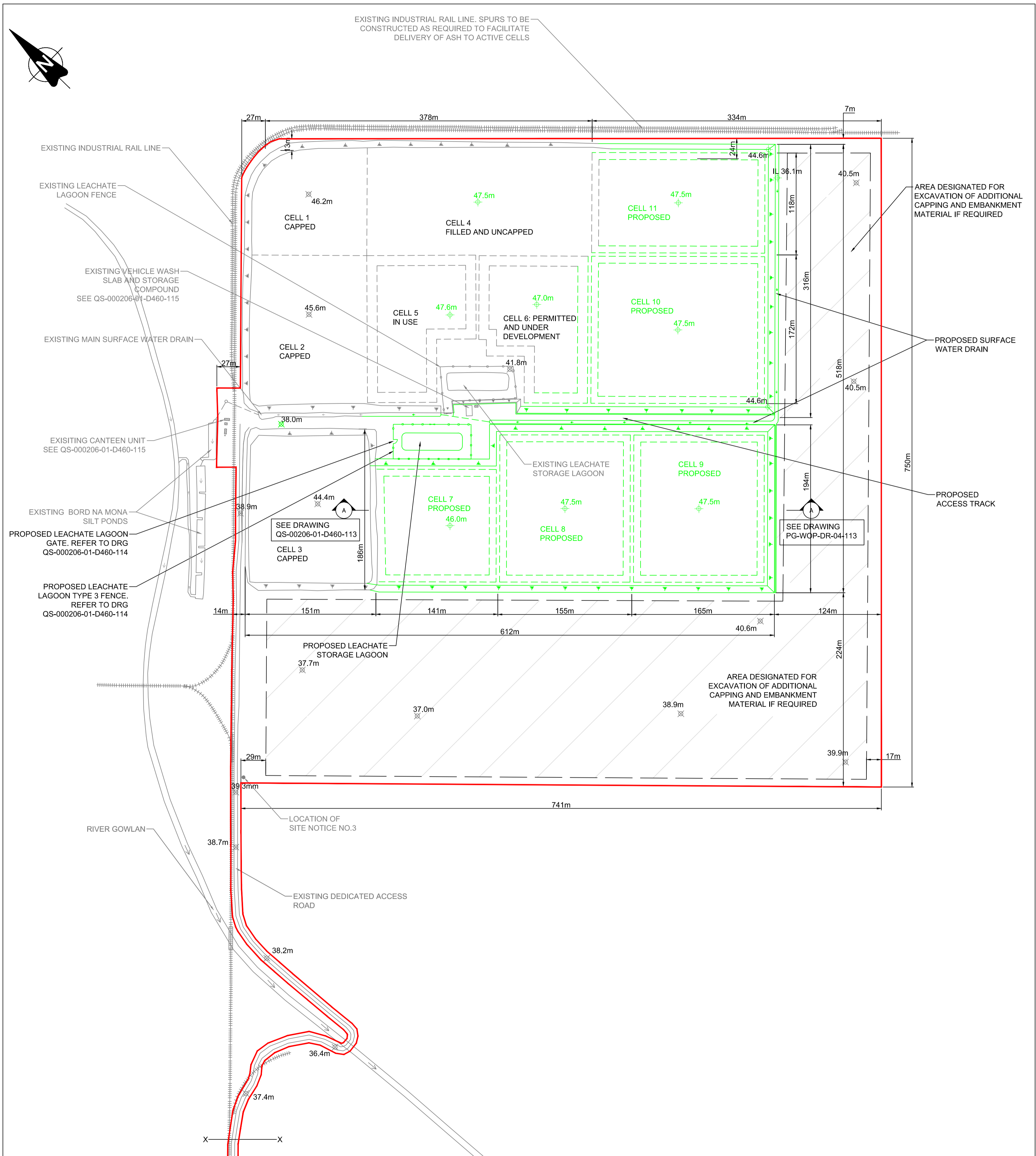
PROPOSED DRAIN

PROPOSED DRAIN

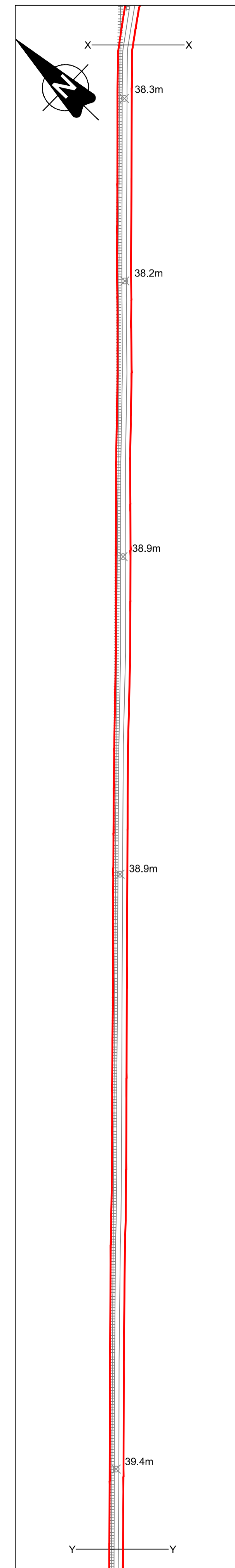
PROPOSED EXTENSION TO WEST OFFALY POWER ASH DISPOSAL FACILITY

Project:		WEST OFFALY POWER PHASED TRANSITION TO BIOMASS		
Title:		ASH DISPOSAL FACILITY MAIN DRAINAGE LAYOUT		
Dimensions in.	Metres			
Scale:	1:5,000 @A3			
Drawn By.	DK	01.02.18		
Checked By.	R.M.			
Approved By.	B.H.	Drawing No.	Revision.	Sheet 1 of 1
		WOP-FRA-04	A	

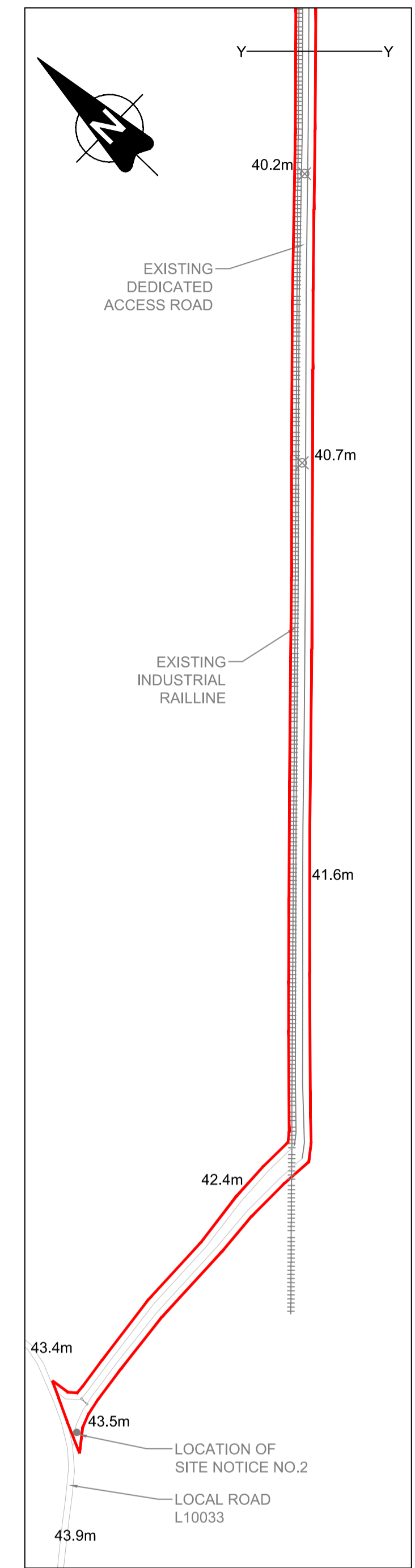




PLAN 1
SCALE 1:2500



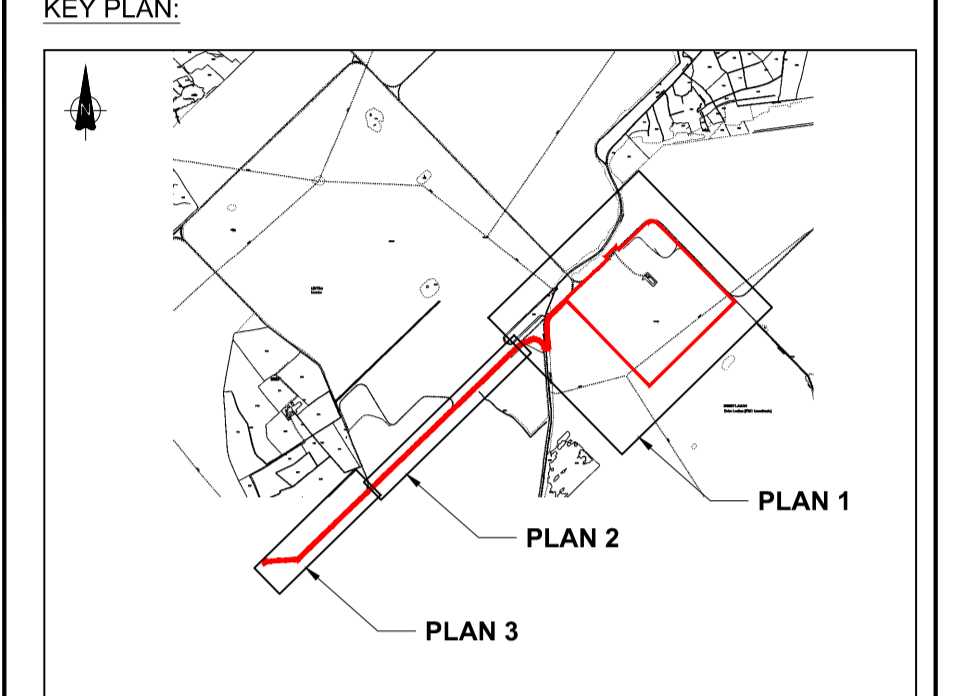
PLAN 2
SCALE 1:2500



PLAN 3
SCALE 1:2500

GENERAL LEGEND

DEVELOPMENT BOUNDARY	
EXISTING STRUCTURES	
PROPOSED STRUCTURES	
EXISTING CELL DIVISIONS	
PROPOSED CELL DIVISIONS	
EXISTING LEVEL	
PROPOSED LEVEL	
EXISTING EMBANKMENT SLOPE	
PROPOSED EMBANKMENT SLOPE	
EXISTING FENCE	
PROPOSED FENCE	



- NOTES:**
1. THIS DRAWING IS FOR PLANNING APPLICATION PURPOSES ONLY.
 2. 1. DRAWING NOT TO BE SCALED. FIGURED DIMENSIONS ONLY TO BE USED.
 3. 2. ALL LEVELS TO MALIN HEAD METRES ABOVE DATUM
 4. 3. PROPOSED LEVELS ARE OF FILLED & CAPPED CELLS
 5. 4. PLANS AND LAYOUT DRAWINGS SHOW PRINCIPLE FEATURES AND STRUCTURES OF THE SITE. AS WITH ALL INDUSTRIAL SITES, ON-GOING OPERATIONS AND MAINTENANCE OCCASIONALLY NECESSITATE THE TEMPORARY USE OF MODULAR UNITS SUCH AS PORTACABINS FOR WELFARE FACILITIES, STORAGE ETC. THEIR USE IS TYPICALLY SHORT-TERM, RELATED TO PARTICULAR ACTIVITIES AND DOES NOT CHANGE THE NATURE OR INTENSITY OF ACTIVITIES ON THE SITE

REV	DATE	REVISION DESCRIPTION	DRN	VER	APP	DRN	VER	APP
0	18.10.18	ISSUED FOR PLANNING						

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PURPOSE OF ISSUE - PRELIMINARY UNLESS INDICATED
 CLIENT APPROVAL PLANNING TENDER CONSTRUCTION AS-BUILT

CLIENT: ESB

PROJECT: WEST OFFALY POWER TRANSITION TO BIOMASS

ENGINEER DESIGN: **BORD NA MÓNA** Naturally Driven
 Engineering Department, Leabeg, Tullamore, Co. Offaly. Tel: 057 9345900

CONTRACT: WOP: ASH DISPOSAL FACILITY (ADF)

DRAWING TITLE: PROPOSED SITE LAYOUT PLAN (1:2500 SCALE) AT CLONFINLOUGH, DERRYLAHAN, LEITRA AND CLONDELARA

PRODUCTION UNIT: CIVIL & ENVIRONMENTAL ENGINEERING

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DRAWN	VERIFIED	APPROVED	APPROVAL DATE
NH	H.O.K	PK	18.10.18
CLIENT REF	NO. OF SHTS	SIZE	SCALE
	1	A1	1:2500 @ A1

DRAWING NUMBER: **QS-000206-01-D460-103** REV: 0