Pollution Prevention Notes:

1. Site management and drainage proposals are intended to ensure protection of surface water and groundwater and to minimise the risk of pollution, siltation and erosion.
2. Appropriate drainage and pollution control measures shall be installed prior to, or in conjunction with, construction works and shall be maintained for the duration of the works.
3. Silty water may arise from excavation dewatering, erosion of exposed or disturbed ground, temporary stockpiles, plant and wheel washing, proposed internal access roads and disturbance of existing field drains and ditches.

Discharges

4. Water containing elevated suspended sediment shall not be pumped or discharged directly to any natural watercourse. Construction runoff and excavation dewatering shall be appropriately treated prior to discharge to the existing bog drainage network.
5. No excavated material or temporary stockpiles shall be stored within the prescribed surface water buffer zones.
6. Runoff from construction areas shall be collected in collector drains and directed to appropriate treatment measures, including silt traps, check dams, settlement ponds, vegetated buffer areas and/or other suitable treatment systems, prior to discharge to existing field drains or main drains.
7. Clean surface water runoff shall, where practicable, be intercepted up-gradient of construction areas using interceptor drains and directed around the works before being redistributed to downstream field drains. Existing field drains may be utilised for this purpose where appropriate.
8. Pumping of clean water from excavations, or over-pumping of drains, ditches or watercourses, shall be undertaken in a manner which does not cause scour or erosion at the point of discharge. Flow velocities shall be controlled using appropriate measures such as splash plates or other suitable discharge controls.
9. Existing drains and ditches shall be retained and protected where practicable. Vegetation shall not be removed from existing drains unless required to facilitate the works.
10. All surface water runoff from the Proposed Project shall ultimately pass through the existing IPC licence settlement ponds at the bog outfall locations prior to discharge to the receiving stream and river network.

Excavations

11. Where excavations are proposed, interceptor/cut-off drains shall be installed where required to minimise the volume of clean surface water entering the excavation. This shall include turbine base excavations where appropriate.
12. Where temporary dewatering of excavations is required, pumped water shall be treated using appropriate measures such as dewatering silt bags, settlement ponds or specialist treatment systems prior to discharge to the existing drainage network.

Exposed Ground & Stockpiles

13. The extent of exposed ground and the volume and duration of temporary stockpiles shall be minimised as far as practicable.
14. Construction activities involving significant areas of exposed peat or soil shall be scaled back or suspended during periods of heavy rainfall or where heavy rainfall is forecast.

Proposed Internal Access Roads

15. Collector drains shall be provided alongside proposed internal access roads where required to collect construction runoff and convey it to appropriate treatment measures.
16. On steeper sections of proposed internal access road, transverse drains or grips shall be installed where appropriate to intercept road runoff and divert it to adjacent roadside collector drains.
17. Check dams shall be installed within collector drains where appropriate to reduce flow velocities and promote settlement of suspended sediment. Check dams shall comprise 6/40 mm non-friable crushed rock and shall generally be installed at 25 m or 50 m intervals depending on local gradient.
18. Silt traps, check dams, settlement ponds and other drainage treatment measures shall be regularly inspected and maintained, particularly during and following periods of heavy rainfall.

Refuelling

19. Refuelling and maintenance of mobile plant shall, where practicable, be undertaken off-site. Where required on-site, refuelling shall only be undertaken within designated areas and in accordance with the CEMP and appropriate pollution prevention procedures.
20. Refuelling areas shall be located away from natural watercourses and drainage features. Spill kits and drip trays shall be readily available for use as required.
21. Fuel and other potentially polluting substances shall be stored in appropriately bunded areas in accordance with the CEMP.

Concrete

22. Concrete works shall be managed to prevent the discharge of cementitious material or concrete-contaminated water to the surface water drainage system, groundwater or natural watercourses.
23. Concrete wash water and waste concrete shall be contained and managed in accordance with the CEMP and shall not be discharged to the site drainage system or natural watercourses.

If water pollution is identified the following actions will be taken:

STOP - works in the immediate area will be stopped and the source of the pollution will be identified.

CONTAIN - the source of the pollution will be contained using appropriate measures to prevent further release. Where necessary, drainage pathways shall be temporarily isolated or diverted to prevent contaminated water reaching downstream receptors.

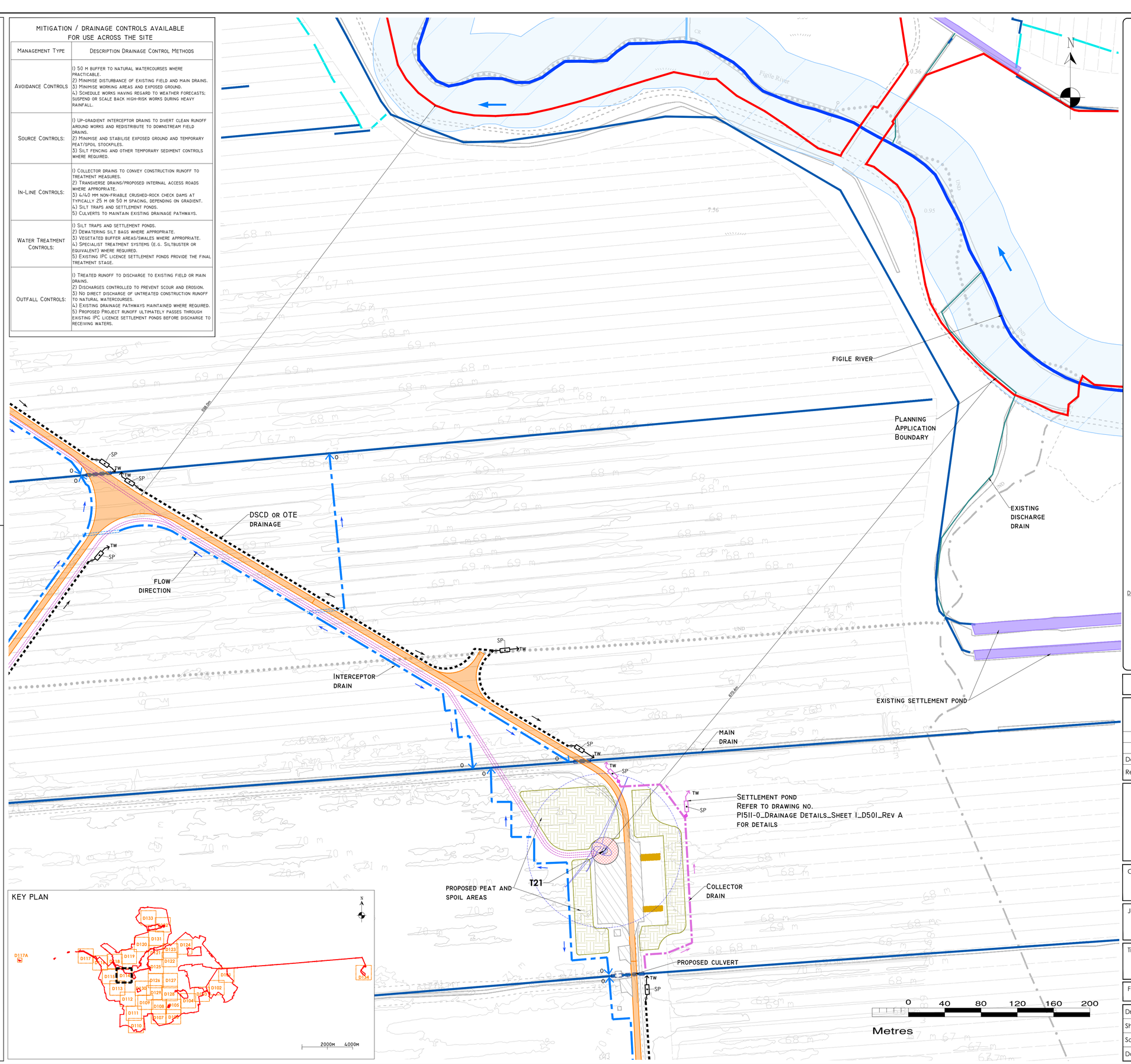
NOTIFY - The Site Manager and Environmental Clerk of Works shall be notified immediately. Relevant statutory authorities and other bodies shall be notified where required in accordance with the CEMP and the Project Emergency Response Procedure.

Drainage Notes:

1. Roadway surfacing design and construction shall be to the Engineer's Specification.
2. Spare silt fencing, straw bales or similar approved pollution control materials shall be stored on site. Suspended sediment in runoff shall be visually monitored during construction. Where elevated silt levels are observed, additional temporary controls such as silt fences, straw bales, silt traps or check dams shall be installed as required. A mobile water treatment system (e.g. Siltbuster or equivalent) shall be available on site for use where required.
3. The proposed drainage system shall be constructed prior to, or in conjunction with, the associated proposed internal access roads and other infrastructure. Temporary drainage and sediment control measures shall be installed where required during construction to prevent elevated suspended sediment concentrations in runoff.
4. Appropriate drainage and pollution prevention measures shall be maintained at all times to prevent the conveyance of significant volumes of sediment to receiving watercourses. Refer also to Pollution Prevention Notes.
5. Interceptor drains shall be installed up-gradient of proposed infrastructure, where required, to intercept clean surface water runoff and minimise the volume of runoff entering construction areas. Intercepted clean water shall be directed around the works and redistributed to downstream field drains. Existing field drains shall be utilised for this purpose where practicable.
6. Collector drains shall be installed downstream of proposed internal access roads and other construction areas, where required, to collect runoff where suspended sediment may become entrained. Runoff shall be conveyed to appropriate treatment measures, including silt traps, check dams, vegetated areas and settlement ponds, prior to discharge to the existing field drain or main drain network.
7. Transverse drains ('grips') shall be installed on sections of proposed internal access roads, where appropriate, to intercept Proposed internal access road runoff and divert it to adjacent roadside collector drains. The locations of transverse drains shall be determined having regard to local gradient and drainage conditions.
8. Direct discharge of untreated construction runoff to natural watercourses shall not be permitted. Treated runoff shall be discharged to the existing bog drainage network in accordance with the drainage design.
9. Batters of proposed drains shall generally have side slopes appropriate to their depth and local ground conditions and shall be left to naturally re-vegetate or shall be stabilised using suitable locally sourced vegetation where required.
10. Collector drains shall be shallow and constructed with moderate gradients where practicable to minimise scour. Check dams shall be installed where appropriate to reduce flow velocities and promote settlement of suspended sediment.
11. Settlement ponds shall be provided downstream of proposed internal access roads sections and at proposed turbine/hardstand locations where required. Settlement ponds shall provide treatment and temporary attenuation of runoff prior to discharge to the existing bog drainage network. Pond sizing shall be appropriate to the contributing catchment area. Typical pond details are shown on Drawing D501.
12. Silt fencing or other appropriate sediment control measures shall be installed around temporary peat/spoil stockpiles where required to prevent sediment-laden runoff entering the drainage network. Temporary controls may be removed once the disturbed area has been adequately stabilised.
13. Temporary silt fencing shall be installed where required between construction works and existing drainage features or natural watercourses, particularly where works occur within the prescribed surface water buffer zones.
14. Drain slopes and other exposed surfaces shall be protected from erosion until adequately stabilised. Suitable stripped vegetative material, including peat sod/scraw where available, may be reused locally to assist stabilisation and re-vegetation.
15. The extent and duration of exposed ground shall be minimised as far as practicable.
16. Check dams shall comprise 6/40 mm non-friable crushed rock and shall be installed within collector drains where appropriate. Check dams shall generally be installed at 25 m or 50 m intervals, depending on the local longitudinal gradient and site conditions.
17. Check dams, silt traps and settlement ponds shall be visually inspected and maintained as part of the construction-phase drainage maintenance programme, particularly during and following periods of heavy rainfall. Accumulated sediment shall be removed and disposed of appropriately.
18. Where check dams become clogged with sediment or vegetation, they shall be cleaned or replaced as required to maintain their hydraulic and sediment-control function.
19. The construction-phase drainage infrastructure will generally form the basis of the operational drainage system. Collector drains, settlement ponds and other treatment/attenuation features will be retained and maintained where required. Local settlement ponds may be infilled or decommissioned following the construction phase, subject to confirmation by the site engineer.
20. Where temporary dewatering of excavations is required, silt bags and/or other appropriate treatment measures shall be used as necessary. Discharge from dewatering silt bags shall be directed to settlement ponds or other suitable treatment measures prior to discharge to existing field drains or main drains.
21. Fuel and other potentially polluting substances shall be stored in appropriately bunded containment areas in accordance with the CEMP and Pollution Prevention Notes.
22. Culverts shall be provided where proposed internal access roads or hardstands cross existing main bog drainage pathways. Culverts shall be appropriately sized and installed to maintain existing drainage connectivity and shall be regularly inspected and maintained.
23. All surface water runoff from the Proposed Project shall ultimately pass through the existing IPC licence settlement ponds at the bog outfall locations prior to onward discharge to the surrounding stream and river network.

Mitigation / Drainage Controls Available for Use Across the Site

Management Type	Description Drainage Control Methods
Avoidance Controls	1) 50 m buffer to natural watercourses where practicable. 2) Minimise disturbance of existing field and main drains. 3) Minimise working areas and exposed ground. 4) Schedule works having regard to weather forecasts; suspend or scale back high-risk works during heavy rainfall.
Source Controls:	1) Up-gradient interceptor drains to divert clean runoff around works and redistribute to downstream field drains. 2) Minimise and stabilise exposed ground and temporary peat/spoil stockpiles. 3) Silt fencing and other temporary sediment controls where required.
In-Line Controls:	1) Collector drains to convey construction runoff to treatment measures. 2) Transverse drains/proposed internal access roads where appropriate. 3) 4/40 mm non-friable crushed-rock check dams at typically 25 m or 50 m spacing, depending on gradient. 4) Silt traps and settlement ponds. 5) Culverts to maintain existing drainage pathways.
Water Treatment Controls:	1) Silt traps and settlement ponds. 2) Dewatering silt bags where appropriate. 3) Vegetated buffer areas/swales where appropriate. 4) Specialist treatment systems (e.g. Siltbuster or equivalent) where required. 5) Existing IPC Licence settlement ponds provide the final treatment stage.
Outfall Controls:	1) Treated runoff to discharge to existing field or main drains. 2) Discharges controlled to prevent scour and erosion. 3) No direct discharge of untreated construction runoff to natural watercourses. 4) Existing drainage pathways maintained where required. 5) Proposed Project runoff ultimately passes through existing IPC Licence settlement ponds before discharge to receiving waters.



KEY PLAN

Drawing Legend:

- Existing Drainage
  - Watercourses
  - Watercourses 50m buffer
  - Stream flow direction
  - Existing main drains
  - Redirected main drains
  - Existing piped drains
  - Existing discharge drains
  - Existing boundary drains
  - Field drain
  - Existing settlement ponds
  - Existing WC crossing/culvert
- Proposed Drainage
  - Upstream interceptor drain
  - Downstream collector drain (DSCD)
  - DSCD or Over The Edge (OTE)
  - Direction of flow
  - Silt fences
  - Double silt fences
  - WF settlement pond
  - Level spreader
  - Proposed WC crossing/culvert
  - Interceptor ditch culvert
  - Collector ditch culvert
  - Watercourse drain protection berm
  - O Overland flow discharge
  - TW Treated water discharge
  - SP New settlement pond
- Planning Application Boundary
- Existing ground surface minor contour (1 m interval)
- Turbine 220, turbine foundation and swept area
- Turbine 200, turbine foundation and swept area
- Turbine foundation
- Crane platform
- Blade setdown areas
- Upgrades to existing tracks
- Proposed internal access roads and turning bay
- Proposed internal 33kV cabling
- Proposed grid connection underground 220kV electrical cabling
- Proposed on-site substation
- Proposed off-site substation
- Proposed met mast
- Proposed relay mast
- Temporary construction compounds
- Proposed car parking
- Proposed peat and spoil areas
- Proposed passing bays
- Proposed dedicated amenity track
- Proposed dedicated amenity board walk
- Scrub mosaic creation area
- Pollinator foraging habitat enhancement area
- Peatland enhancement area
- Native tree (woodland and scrub) planting area
- Marsh fritillary enhancement area
- Lodge Bog Enhancement area

Basemap Note: These drawings use 1:5,000 scale Ordnance Survey Ireland (OSi) basemaps as an underlay. For clarity, the basemap features are not included in the drawing legend and are displayed in light grey with partial transparency to distinguish them from the proposed development features.

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Date	Description	Chkd	Signed

Revisions

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Client: Bord na Móna Powergen Ltd

Job: Ballydermot WF, Co. Offaly/Co. Kildare

Title: Proposed Construction Phase and Operational Phase Drainage Layout

Figure No: DII4

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