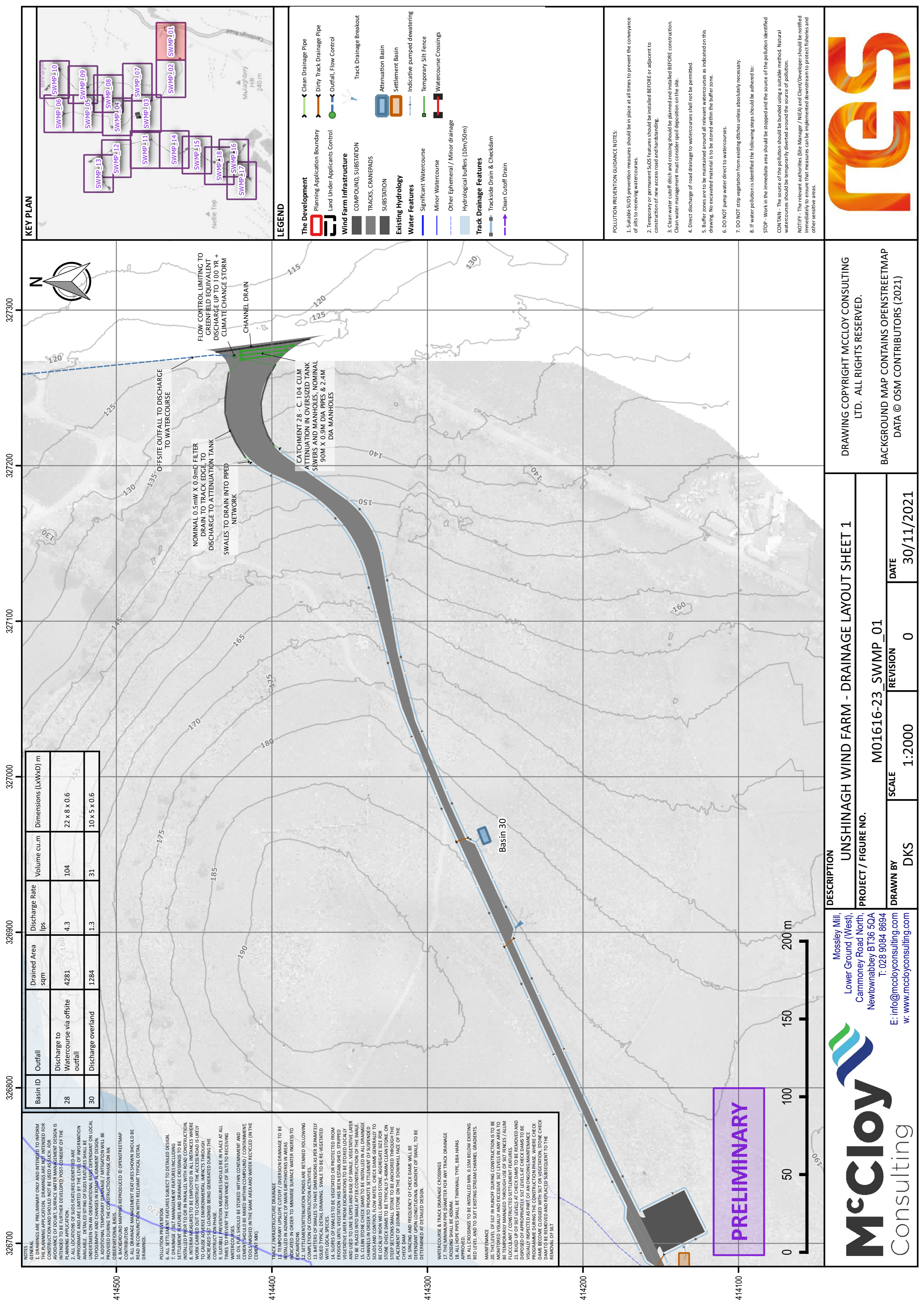
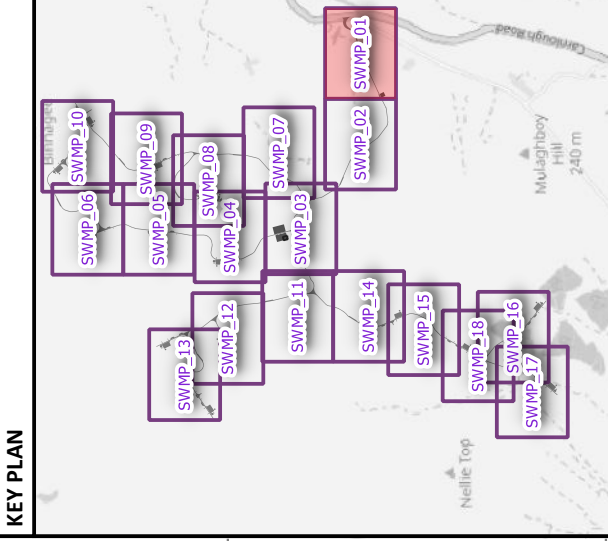


Appendix B

Preliminary Drainage Layouts



Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m
28	Discharge to Watercourse via offsite outfall	4281	4.3	104	22 x 8 x 0.6
30	Discharge overland	1284	1.3	31	10 x 5 x 0.6



LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Water Features
- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Water Features

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control
- Track Drainage Breakout
- Attenuation Basin
- Settlement Basin
- Indicative pumped dewatering
- Temporary Silt Fence
- Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and hardstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

NOTES

GENERAL

- DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. SURFACE WATER MANAGEMENT DESIGN IS INTENDING TO BE FURTHER DEVELOPED. POST-CONSENT OF THE PLANNING APPLICATION.
- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGN OF SUDS FEATURES IS BASED ON LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- ALL SUDS FEATURES SHOULD BE STORED WITHIN CONFINEMENT AND CLEANED REGULARLY. ALL SUDS FEATURES SHOULD BE MAINTAINED TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MK).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SUDS FEATURES (CONVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS)
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- ALL SUDS FEATURES SHOULD BE MAINTAINED AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED AS A TOP SOIL LAYER OR TO BE RE-VEGETATED WITH LOCAL SPECIES.
- CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-40MM CLEAN STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HPAS APPROVED.
- CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY. ALL SUDS FEATURES / ALUMINUM FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE MAINTAINED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.

FLOW CONTROL LIMITING TO GREENFIELD EQUIVALENT DISCHARGE UP TO 100 YR + CLIMATE CHANGE STORM

CHANNEL DRAIN

NOMINAL 0.5 MW X 0.9 M FILTER DRAIN TO TRACK EDGE, TO DISCHARGE TO ATTENUATION TANK

SWALES TO DRAIN INTO PIPED NETWORK

CATCHMENT 28 - C. 104 CLM ATTENUATION IN OVERSIZED TANK SEWERS AND MANHOLES, NOMINAL 90M X 0.9M DIA PIPES & 2.4M DIA MANHOLES

OFFSITE OUTFALL TO DISCHARGE TO WATERCOURSE

KEY PLAN

SWMP_01, SWMP_02, SWMP_03, SWMP_04, SWMP_05, SWMP_06, SWMP_07, SWMP_08, SWMP_09, SWMP_10, SWMP_11, SWMP_12, SWMP_13, SWMP_14, SWMP_15, SWMP_16, SWMP_17

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 1

PROJECT / FIGURE NO. M01616-23_SWMP_01

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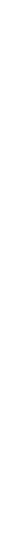
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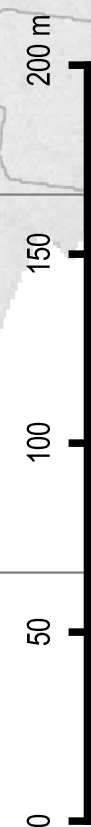
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8. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
9. ALL SILT TO BE STORED WITHIN CONFINEMENT AND CARRY SHOULD BE AWKED WITHIN CONFINEMENT / CONTAINMENT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

10. TRACKS / INFRASTRUCTURE FRAMEWORK
11. TEMPORARY SLOPE CUTSLOPE / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS
12. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES
13. ALL TRACKS / INFRASTRUCTURE FRAMEWORKS TO BE ISSUED TYPICAL DETAIL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
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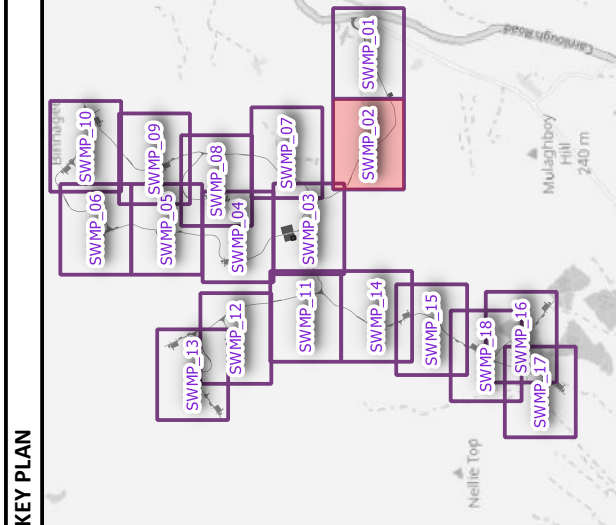
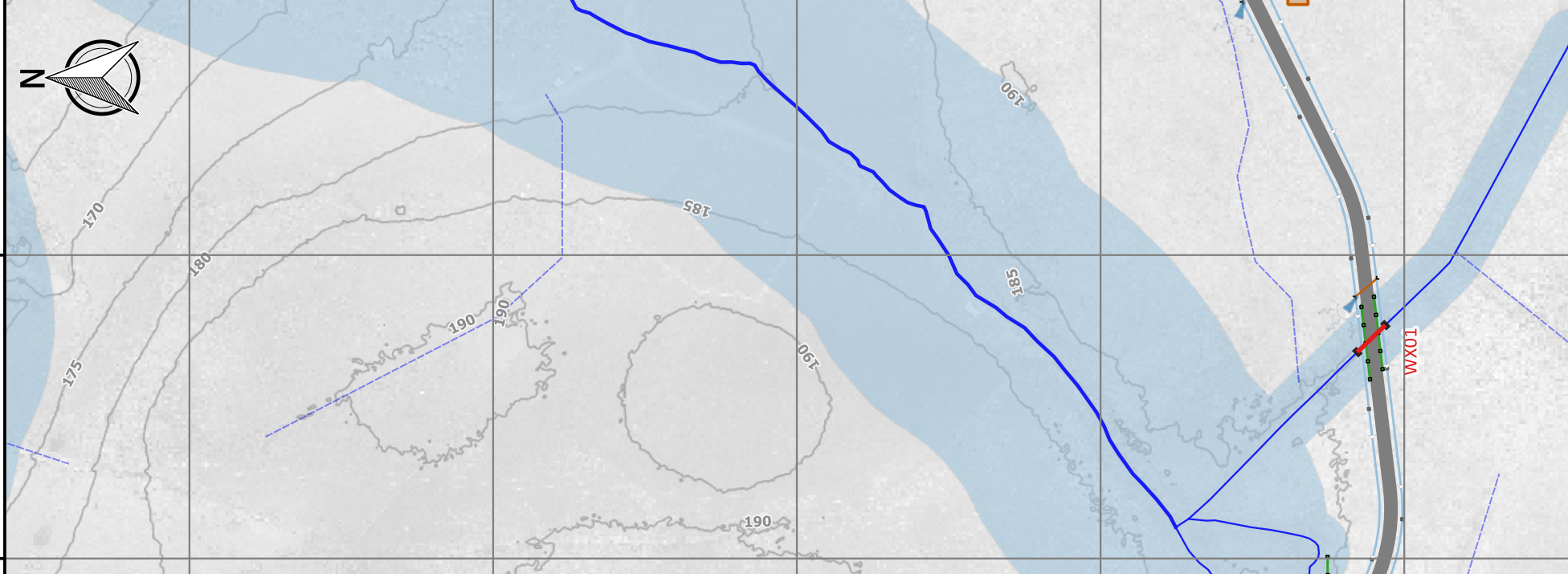
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18. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
19. ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HP4PS
20. PROVIDE CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS

21. MAINTENANCE
22. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY BY THE CONTRACTOR USING 'ALUM FLOCCULANT' CONSTRUCTED SETTLEMENT FEATURES.
23. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT

PRELIMINARY



Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	REF	DESCRIPTION
29	Discharge to Drain / Watercourse	5795	5.8	141	29 x 8 x 0.6	WX01	NEW MIN 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT), SUBJECT TO DESIGN POST PLANNING APPROVAL.
						WX02	NEW MIN 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT), SUBJECT TO DESIGN POST PLANNING APPROVAL.



LEGEND

- The Development**
- Planning Application Boundary
 - Land Under Applicants Control
- Wind Farm Infrastructure**
- COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology**
- Watercourse
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features**
- Trackside Drain & Checkdam
 - Clean Cutoff Drain
 - Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control
 - Track Drainage Breakout
 - Attenuation Basin
 - Settlement Basin
 - Indicative pumped dewatering
 - Temporary Silt Fence
 - Watercourse Crossings

- POLLUTION PREVENTION GUIDANCE NOTES:**
1. Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
 2. Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
 3. Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
 4. Direct discharge of road drainage to watercourses shall not be permitted.
 5. Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
 6. DO NOT pump water direct to watercourses.
 7. DO NOT strip vegetation from existing ditches unless absolutely necessary.
 8. If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be bounded using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



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BACKGROUND MAP CONTAINS OPENSTREETMAP DATA © OSM CONTRIBUTORS (2021)

DESCRIPTION	
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 2	
PROJECT / FIGURE NO. M01616-23_SWMP_02	
DRAWN BY	DKS
SCALE	1:2000
REVISION	0
DATE	30/11/2021

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325500

325600

325700

325800

325900

326000

NOTES

GENERAL

1. DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. SURFACE WATER MANAGEMENT DESIGN IS INTENDED TO BE FURTHER DEVELOPED POST-CONSENT OF THE PLANNING APPLICATION.

2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. LOCAL CONDITIONS, INCLUDING LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN, MAY REQUIRE REVISIONS TO THE SUDS DESIGN.

3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.

4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP

5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

6. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.

7. DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.

8. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SITE LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.

9. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.

10. ALL SILT AND DEBRIS SHOULD BE STORED WITHIN CONFINEMENT, AND CLEAN SHOULD BE AWAY FROM CONFINEMENT / CONTAMINANT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

11. TRACK / INFRASTRUCTURE DRAINAGE

12. TEMPORARY SLOPE CUTOFFS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.

13. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES, AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.

14. SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND REUSED TO RE-VEGETATE SLOPES. VEGETATIVE LAYER TO BE LAYED ON SWALE AFTER BACKFILLING HAS COMPLETED.

15. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WORK WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-40MM CLEAN STONE. ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.

16. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

17. WATERCOURSE & TRACK DRAINAGE CROSSINGS

18. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.

19. ALL HOPE PIPES SHALL BE TWIN WALL TYPE. BDD 046461, 23 APPROVED.

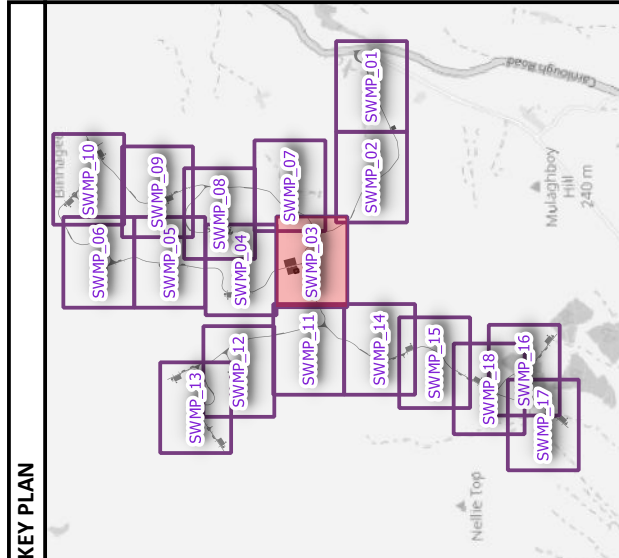
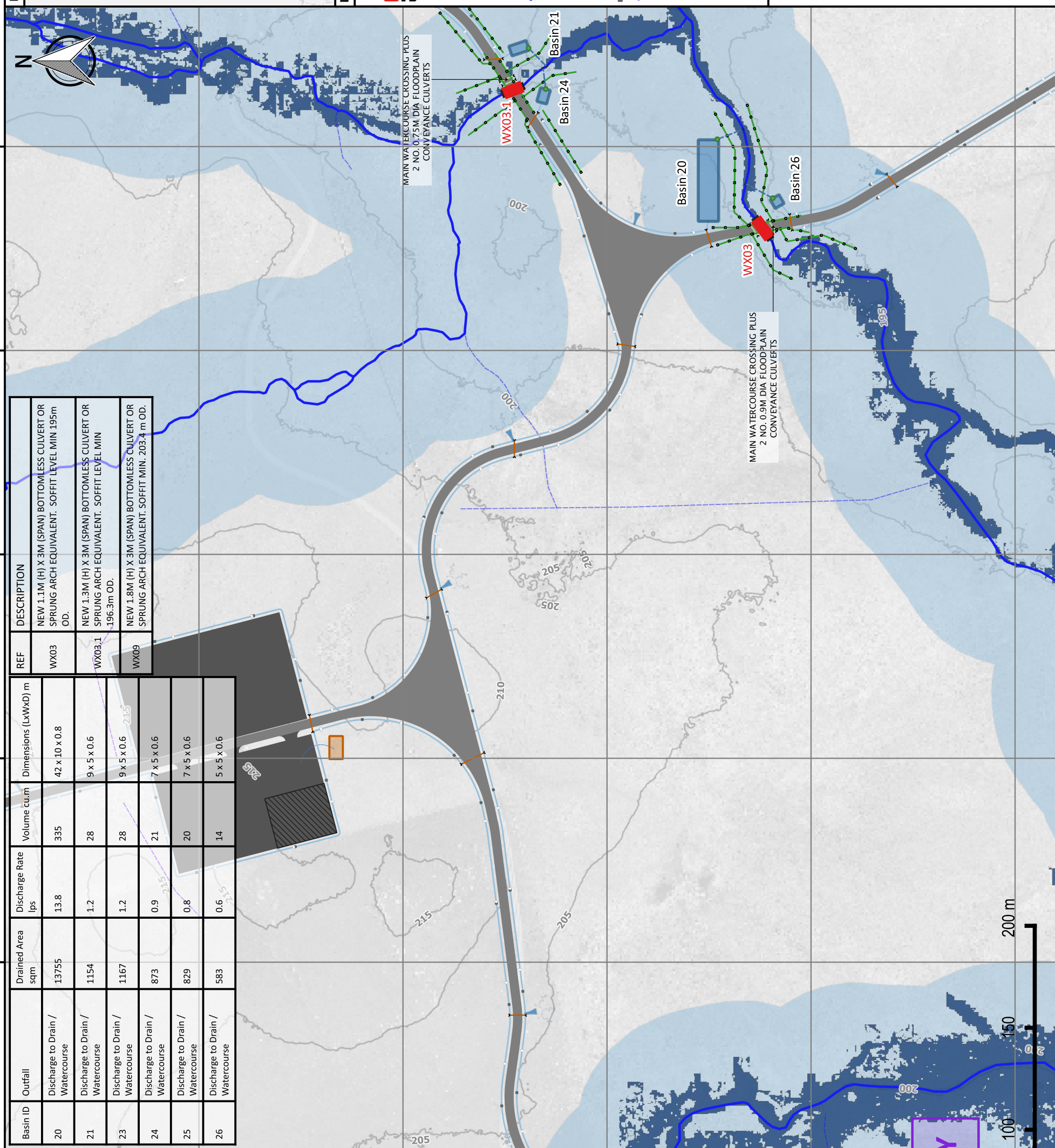
20. CHECK DAMS TO BE INSTALLED MIN. 0.15M BEYOND EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

21. THE LEVEL OF SILT IN RIGID-FLOUNDER CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED BY HAND OR USING SUITABLE MEANS. EXCESSIVE FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.

22. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS SHOULD BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	REF	DESCRIPTION
20	Discharge to Drain / Watercourse	13755	13.8	335	42 x 10 x 0.8	WX03	NEW 1.1M (H) X 3M (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT. SOFFIT LEVEL MIN 195m OD.
21	Discharge to Drain / Watercourse	1154	1.2	28	9 x 5 x 0.6	WX03.1	NEW 1.3M (H) X 3M (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT. SOFFIT LEVEL MIN 196.3m OD.
23	Discharge to Drain / Watercourse	1167	1.2	28	9 x 5 x 0.6	WX09	NEW 1.8M (H) X 3M (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT. SOFFIT MIN. 203.4 m OD.
24	Discharge to Drain / Watercourse	873	0.9	21	7 x 5 x 0.6		
25	Discharge to Drain / Watercourse	829	0.8	20	7 x 5 x 0.6		
26	Discharge to Drain / Watercourse	583	0.6	14	5 x 5 x 0.6		



LEGEND

- The Development**
- Planning Application Boundary
 - Land Under Applicants Control
- Wind Farm Infrastructure**
- COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology**
- Watercourse
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features**
- Trackside Drain & Checkdam
 - Clean Cutoff Drain
- Water Features**
- Attenuation Basin
 - Settlement Basin
 - Indicative pumped dewatering
 - Temporary Silt Fence
 - Watercourse Crossings
- Track Drainage Breakout**
- Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



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DESCRIPTION	
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 3	
PROJECT / FIGURE NO. M01616-23_SWMP_03	
DRAWN BY	SCALE
DKS	1:2000
REVISION	DATE
0	30/11/2021

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NOTES

GENERAL
1. DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR AVOIDANCE OF COURT. SURFACE WATER MANAGEMENT DESIGN IS INTENDED TO BE FURTHER DEVELOPED POST-CONSENT OF THE PLANNING APPLICATION.
2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGN OF SUDS FEATURES SHOULD BE BASED ON LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

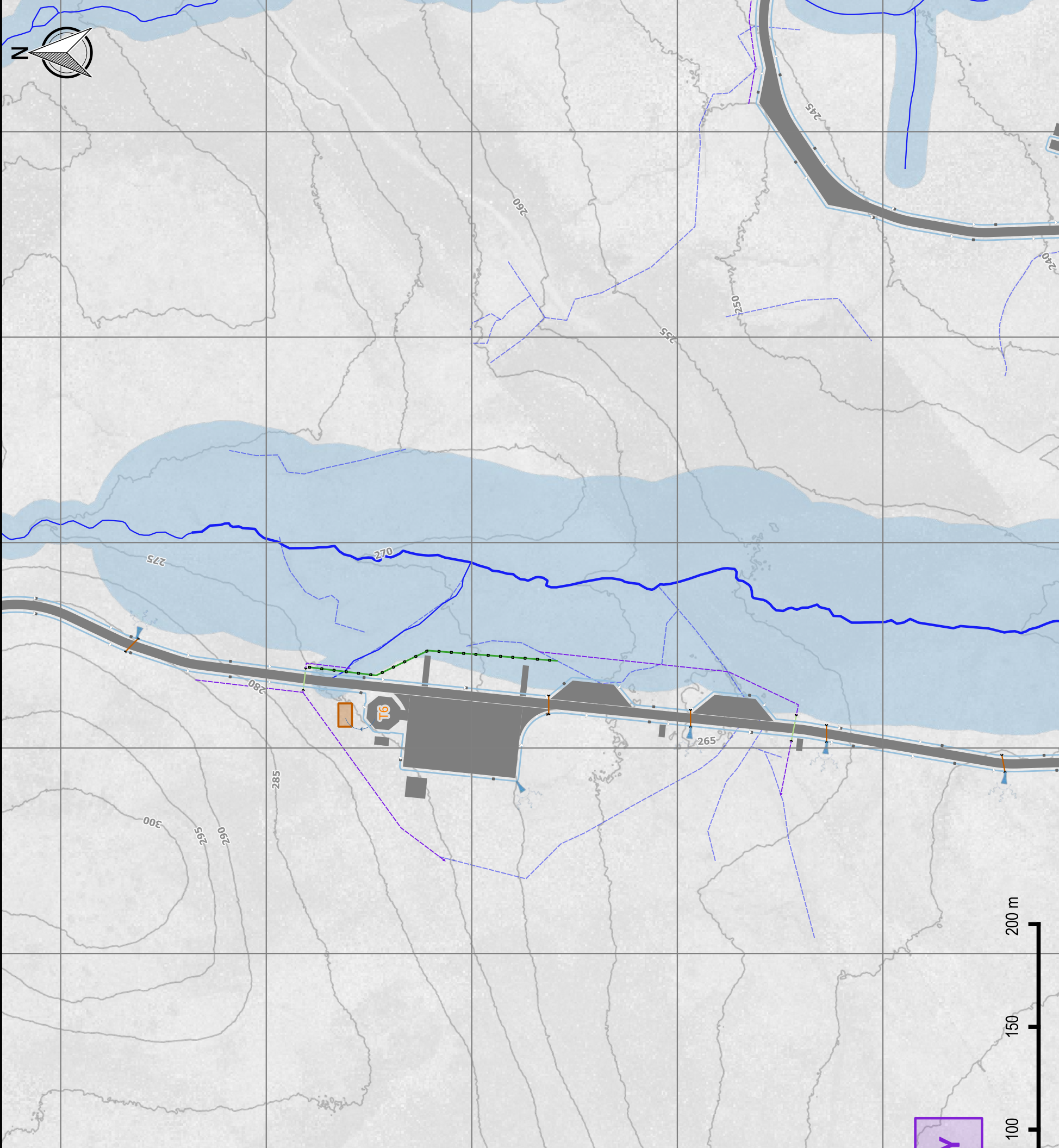
POLLUTION PREVENTION
6. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
7. DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
8. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
9. ALL SUDS FEATURES SHOULD BE STORED WITHIN CONFINEMENT AND CEASEMENT SHOULD BE AIDED WITH COMPOUND / CONTAMINANT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACKS / INFRASTRUCTURE DRAINAGE
10. TEMPORARY SLOPE CUTOFFS / CONVEYANCE DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS
11. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES
12. SUDS FEATURES TO BE INSTALLED AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
13. SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO REVEGETATE SLOPES OF SWALES. VEGETATIVE WATER TO BE STORED UNTIL VEGETATION IS ESTABLISHED.
14. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-40MM CLEAN STONE ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM
15. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

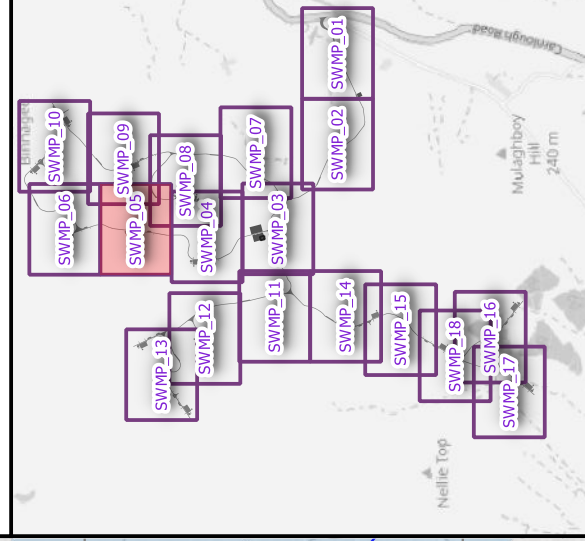
WATERCOURSE & TRACK DRAINAGE CROSSINGS
16. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
17. ALL HOPE PIPES SHALL BE TWINWALL TYPE. BBA HPAS APPROVED CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE
18. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
19. FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES TO BE DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS SHOULD BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

PRELIMINARY



KEY PLAN



LEGEND

- The Development**
 - Planning Application Boundary
 - Land Under Applicants Control
- Wind Farm Infrastructure**
 - COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology**
- Water Features**
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features**
 - Trackside Drain & Checkdam
 - Clean Cutoff Drain
- Watercourse Crossings**
 - Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control
- Attenuation Basin**
- Settlement Basin**
- Indicative pumped dewatering**
 - Temporary Silt Fence
 - Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
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 - CONTAIN - The source of the pollution should be bounded using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



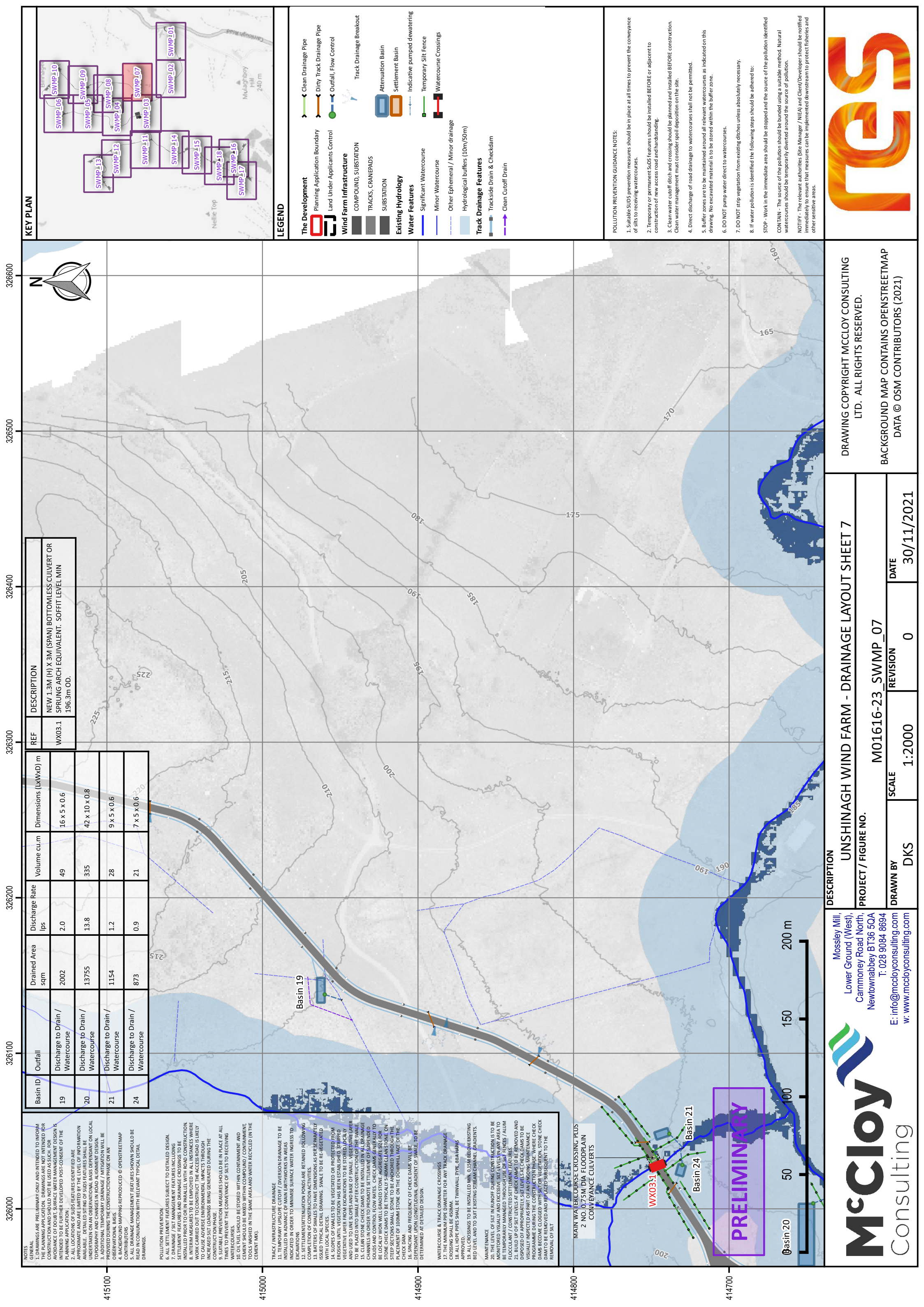
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BACKGROUND MAP CONTAINS OPENSTREETMAP DATA © OSM CONTRIBUTORS (2021)

DESCRIPTION	
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 5	
PROJECT / FIGURE NO. M01616-23_SWMP_05	
DRAWN BY	SCALE
DKS	1:2000
REVISION	DATE
0	30/11/2021

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NOTES
 GENERAL
 1. DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION.
 2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE.
 3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
 4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
 5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.
 POLLUTION PREVENTION
 6. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
 7. DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
 8. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
 9. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
 10. ALL MATERIALS TO BE STORED WITHIN CONFINEMENT, AND CARE SHOULD BE TAKEN TO PREVENT POLLUTION OF CONTAMINANT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).
 TRACK / INFRASTRUCTURE DRAINAGE
 11. TEMPORARY SLOPE CUTS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
 12. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
 13. ALL TRACKS AND TRACK DRAINAGE FEATURES AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
 14. SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO RE-VEGETATE SLOPES.
 15. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-10MM CLEAN STONE ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
 16. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE, TO BE DETERMINED AT DETAILED DESIGN.
 WATERCOURSE & TRACK DRAINAGE CROSSINGS
 17. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
 18. ALL HOPE PIPES SHALL BE TWINWALL TYPE. BARRIERS APPROVED.
 19. ALL HOPE PIPES TO BE INSTALLED WITH 0.15M BE OVEREXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.
 MAINTENANCE
 20. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
 21. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED IMMEDIATELY TO THE REMOVAL OF SILT.

Basin 19
 Discharge to Drain / Watercourse
 2002 sqm
 2.0 lps
 49 cu.m
 16 x 5 x 0.6 m

Basin 20
 Discharge to Drain / Watercourse
 13755 sqm
 13.8 lps
 335 cu.m
 42 x 10 x 0.8 m

Basin 21
 Discharge to Drain / Watercourse
 1154 sqm
 1.2 lps
 28 cu.m
 9 x 5 x 0.6 m

Basin 24
 Discharge to Drain / Watercourse
 873 sqm
 0.9 lps
 21 cu.m
 7 x 5 x 0.6 m

Basin 19
 Discharge to Drain / Watercourse
 2002 sqm
 2.0 lps
 49 cu.m
 16 x 5 x 0.6 m

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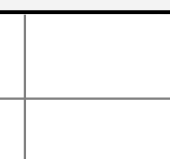
Basin 21
 Discharge to Drain / Watercourse
 1154 sqm
 1.2 lps
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 Discharge to Drain / Watercourse
 873 sqm
 0.9 lps
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 7 x 5 x 0.6 m

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 Discharge to Drain / Watercourse
 2002 sqm
 2.0 lps
 49 cu.m
 16 x 5 x 0.6 m

Basin 20
 Discharge to Drain / Watercourse
 13755 sqm
 13.8 lps
 335 cu.m
 42 x 10 x 0.8 m

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	REF	DESCRIPTION
19	Discharge to Drain / Watercourse	2002	2.0	49	16 x 5 x 0.6	WX03.1	NEW 1.3M (H) X 3M (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT. SOFFIT LEVEL MIN 196.3m OD.
20	Discharge to Drain / Watercourse	13755	13.8	335	42 x 10 x 0.8		
21	Discharge to Drain / Watercourse	1154	1.2	28	9 x 5 x 0.6		
24	Discharge to Drain / Watercourse	873	0.9	21	7 x 5 x 0.6		



The Development
 Planning Application Boundary
 Land Under Applicants Control

Wind Farm Infrastructure
 COMPOUND, SUBSTATION
 TRACKS, CRANEPADS
 SUBSTATION

Existing Hydrology
 Significant Watercourse
 Minor Watercourse
 Other Ephemeral / Minor drainage
 Hydrological buffers (10m/50m)

Water Features
 Trackside Drain & Checkdam
 Clean Cutoff Drain

Track Drainage Features
 Clean Drainage Pipe
 Dirty Track Drainage Pipe
 Outfall, Flow Control
 Track Drainage Breakout
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 Settlement Basin
 Indicative pumped dewatering
 Temporary Silt Fence
 Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:
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 NOTIFY - The relevant authorities (Site Manager / NEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

DESCRIPTION
 UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 7
 PROJECT / FIGURE NO.
 M01616-23_SWMP_07

DRAWN BY
 DKS

SCALE
 1:2000

REVISION
 0

DATE
 30/11/2021

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McClroy Consulting

PRELIMINARY

**MAIN WATERCOURSE CROSSING PLUS
 2 NO. 0.75M DIA FLOODPLAIN
 CONVEYANCE CULVERTS**

Basin 19
 Discharge to Drain / Watercourse
 2002 sqm
 2.0 lps
 49 cu.m
 16 x 5 x 0.6 m

Basin 20
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 13.8 lps
 335 cu.m
 42 x 10 x 0.8 m

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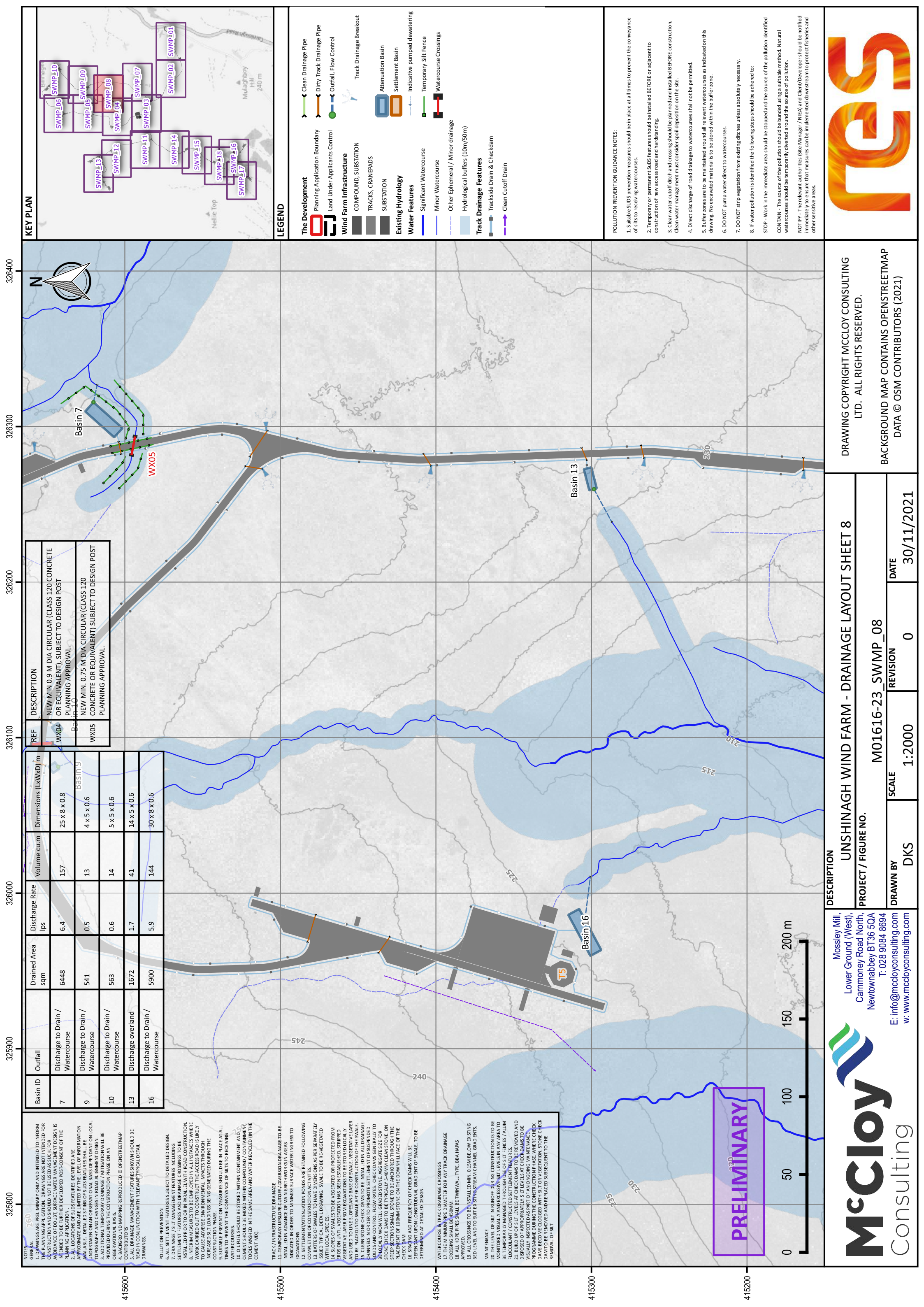
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REF	DESCRIPTION
WX04	NEW MIN 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT), SUBJECT TO DESIGN POST PLANNING APPROVAL.
WX05	NEW MIN. 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m
7	Discharge to Drain / Watercourse	6448	6.4	157	25 x 8 x 0.8
9	Discharge to Drain / Watercourse	541	0.5	13	4 x 5 x 0.6
10	Discharge to Drain / Watercourse	563	0.6	14	5 x 5 x 0.6
13	Discharge overland	1672	1.7	41	14 x 5 x 0.6
16	Discharge to Drain / Watercourse	5900	5.9	144	30 x 8 x 0.6

NOTES

GENERAL

- DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. SURFACE WATER MANAGEMENT DESIGN IS INTENDED TO BE FURTHER DEVELOPED POST-CONSENT OF THE PLANNING APPLICATION.
- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. LOCAL TOPOGRAPHY, GEOTECHNICAL DATA, LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN UNDER TAKE ON OPERATIONAL BASIS REFERENCE TO LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- ALL SUDS FEATURES SHOULD BE STORED WITHIN CONFINEMENT AND CEASEMENT SHOULD BE AVOIDED WITHIN CONFINEMENT / CONTAINMENT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SURFACE CUTOFFS / CONVEYANCE DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- TEMPORARY SURFACE CUTOFFS / CONVEYANCE DRAINAGE TO BE ISSUED IN TYPICAL DETAIL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO REVEGETATE SLOPES OF SWALES. VEGETATIVE LAYER TO BE STORED WITHIN CONFINEMENT AND CEASEMENT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).
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- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE. BBA HPMS APPROVED.
- CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY. EXCESSIVE SILT LEVELS TO BE REMOVED BY 'FLOCCULANT' CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and hardstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - Work in the immediate area should be stopped and the source of the pollution identified
 - The source of the pollution should be bundled using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

TRACK / INFRASTRUCTURE DRAINAGE

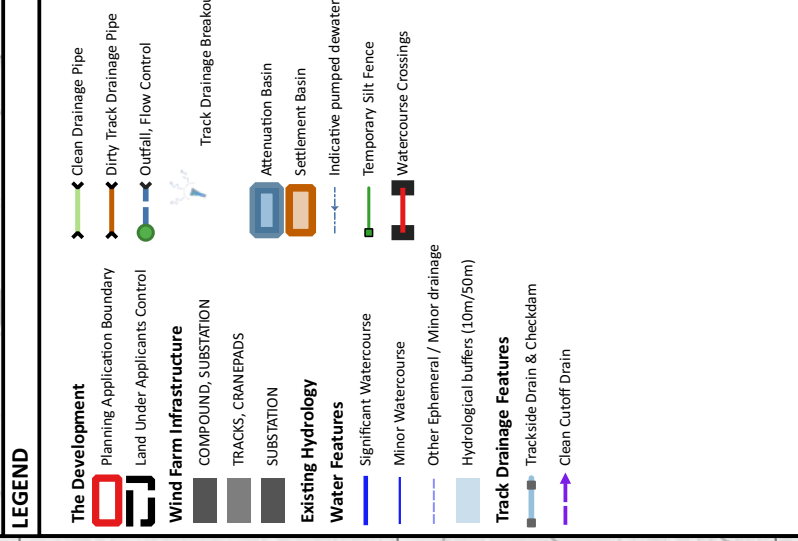
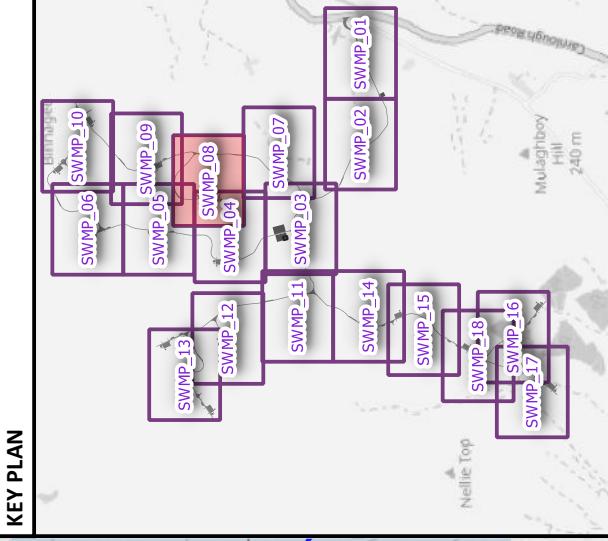
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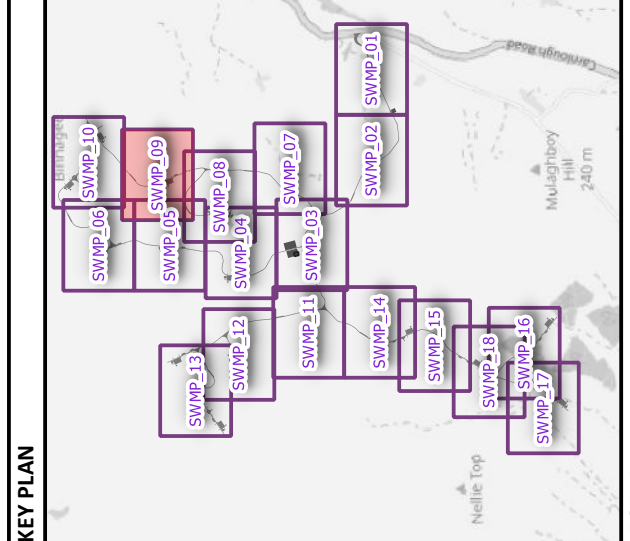
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21. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	REF	DESCRIPTION
5	Discharge to Drain / Watercourse	630	0.6	15	5 x 5 x 0.6	WX04	NEW MIN 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT), SUBJECT TO DESIGN POST PLANNING APPROVAL.
7	Discharge to Drain / Watercourse	6448	6.4	157	25 x 8 x 0.8		
9	Discharge to Drain / Watercourse	541	0.5	13	4 x 5 x 0.6		
10	Discharge to Drain / Watercourse	563	0.6	14	5 x 5 x 0.6		



LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control
- Wind Farm Infrastructure
 - COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology
- Water Features
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features
 - Trackside Drain & Checkdam
 - Clean Cutoff Drain
- Track Drainage Breakout
 - Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control
 - Attenuation Basin
 - Settlement Basin
 - Indicative pumped dewatering
 - Temporary Silt Fence
 - Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

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UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 9
PROJECT / FIGURE NO. M01616-23_SWMP_09

DESCRIPTION
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 9
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DRAWN BY DKS
SCALE 1:2000
REVISION 0
DATE 30/11/2021

MCCLOY Consulting

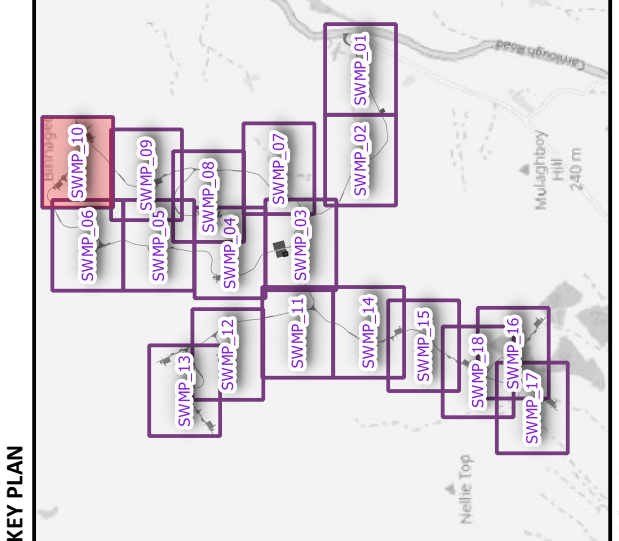
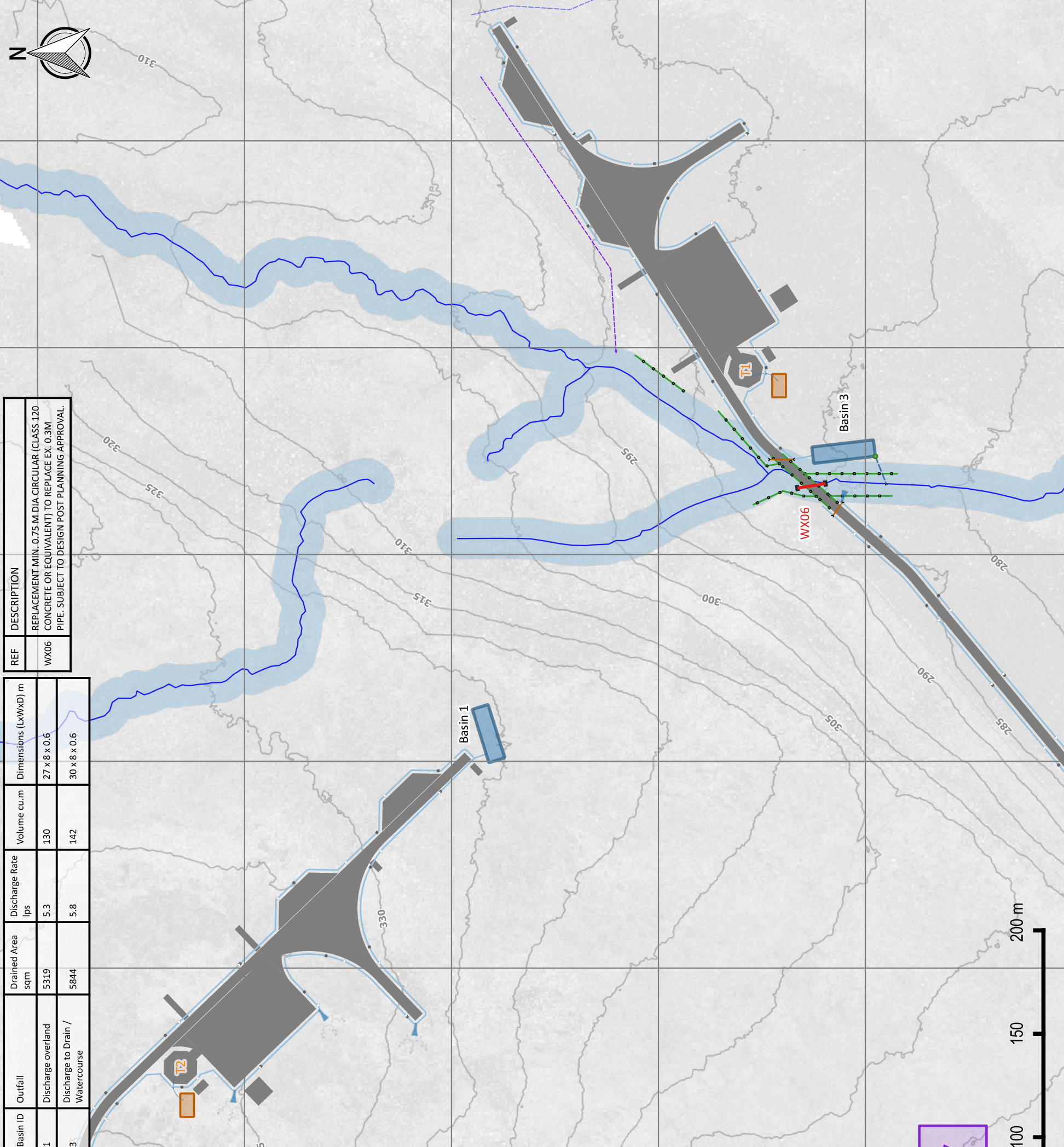
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NOTES

- GENERAL
1. DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR CONSTRUCTION. SURFACE WATER MANAGEMENT DESIGN IS INTENDED TO BE FURTHER DEVELOPED POST-CONSENT OF THE PLANNING APPLICATION.
2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE LOCATION OF SUDS FEATURES SHOULD BE VERIFIED ON THE GROUND PRIOR TO CONSTRUCTION. REFERENCE TO LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN SHOULD BE TAKEN INTO ACCOUNT.
3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.
6. POLLUTION PREVENTION
7. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
8. DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
9. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
10. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
11. MATERIALS SHOULD BE STORED WITHIN CONFINEMENT, AND CARE SHOULD BE TAKEN TO PREVENT SPILLAGE / CONTAMINATION TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).
12. TRACK / INFRASTRUCTURE DRAINAGE
13. TEMPORARY SLOPE CUTOFFS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
14. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
15. SUDS FEATURES TO BE INSTALLED AS PER SEPARATELY ISSUED TYPICAL DRAWING. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
16. SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO RE-VEGETATE SWALES. VEGETATIVE LAYER TO BE PLANTED AT THE END OF SWALE. VEGETATIVE LAYER TO BE PLANTED AT THE END OF SWALE.
17. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-50MM CLEANSING STONE ON DOWNHILL FACE OF CHECK DAM.
18. CHECK DAMS TO BE INSTALLED ON THE DOWNHILL FACE OF THE CHECK DAM.
19. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.
20. WATERCOURSE & TRACK DRAINAGE CROSSINGS
21. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
22. ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HPAS
23. APPROVED CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.
24. MAINTENANCE
25. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
26. FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.
27. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m
1	Discharge to Drain / Watercourse	5319	5.3	130	27 x 8 x 0.6
3	Discharge to Drain / Watercourse	5844	5.8	142	30 x 8 x 0.6

REF	DESCRIPTION
WX06	REPLACEMENT MIN. 0.75 M DIA. CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) TO REPLACE EX. 0.3M PIPE. SUBJECT TO DESIGN POST PLANNING APPROVAL.



LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control
- Wind Farm Infrastructure
 - COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology
- Water Features
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features
 - Trackside Drain & Checkdam
 - Clean Cutoff Drain

Water Features

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control
- Track Drainage Breakout
- Attenuation Basin
- Settlement Basin
- Indicative pumped dewatering
- Temporary Silt Fence
- Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
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 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



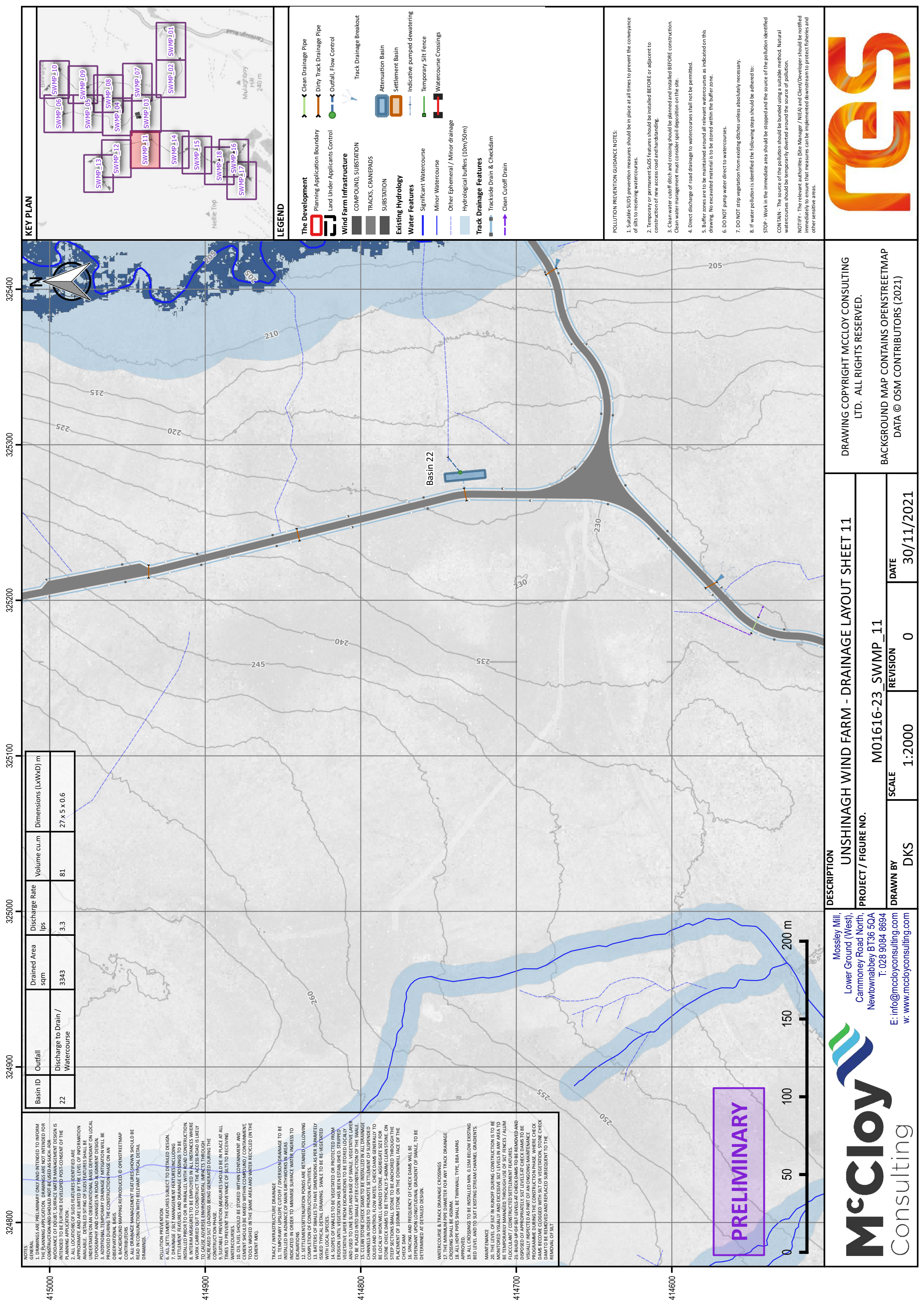
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DESCRIPTION	SCALE	REVISION	DATE
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 10 PROJECT / FIGURE NO.	1:2000	0	30/11/2021
DRAWN BY	DKS		

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Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m
22	Discharge to Drain / Watercourse	3343	3.3	81	27 x 5 x 0.6

NOTES

GENERAL

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- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGN OF SUDS FEATURES SHOULD BE BASED ON LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
- INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- ALL SILT SHOULD BE STORED WITHIN CONTAINMENT, AND CARE SHOULD BE TAKEN TO AVOID SPILLAGE OF CONTAMINANT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

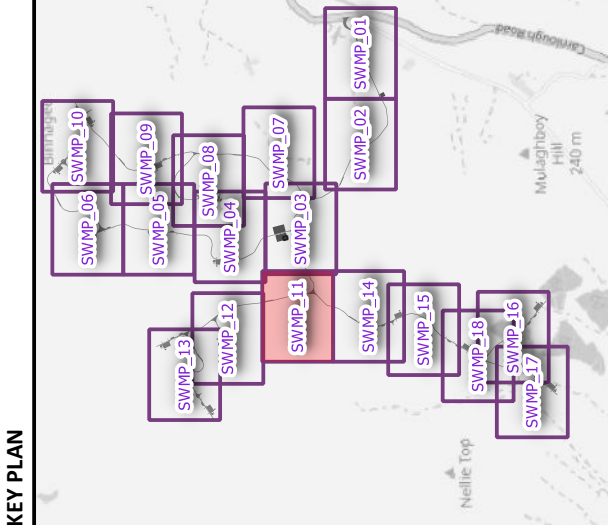
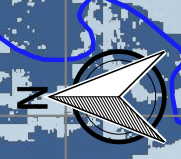
- TEMPORARY SLOPE CUTS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- ALL TRACKS AND SUBSTATIONS ARE TO BE SEPARATELY ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-GENERATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO RE-GENERATE SWALE VEGETATIVE LAYER.
- CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW PATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-50MM CLEAN STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE. BBA HPAS APPROVED.
- CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.



LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Watercourse
- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Water Features

- Attenuation Basin
- Settlement Basin
- Indicative pumped dewatering
- Temporary Silt Fence
- Watercourse Crossings

Track Drainage Breakout

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
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- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be bounded using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



DESCRIPTION

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 11

PROJECT / FIGURE NO. M01616-23_SWMP_11

DRAWN BY DKS

SCALE 1:2000

REVISION 0

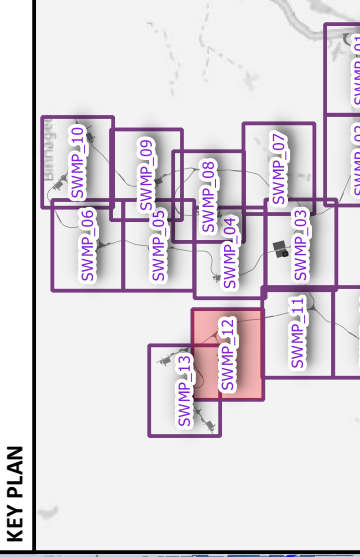
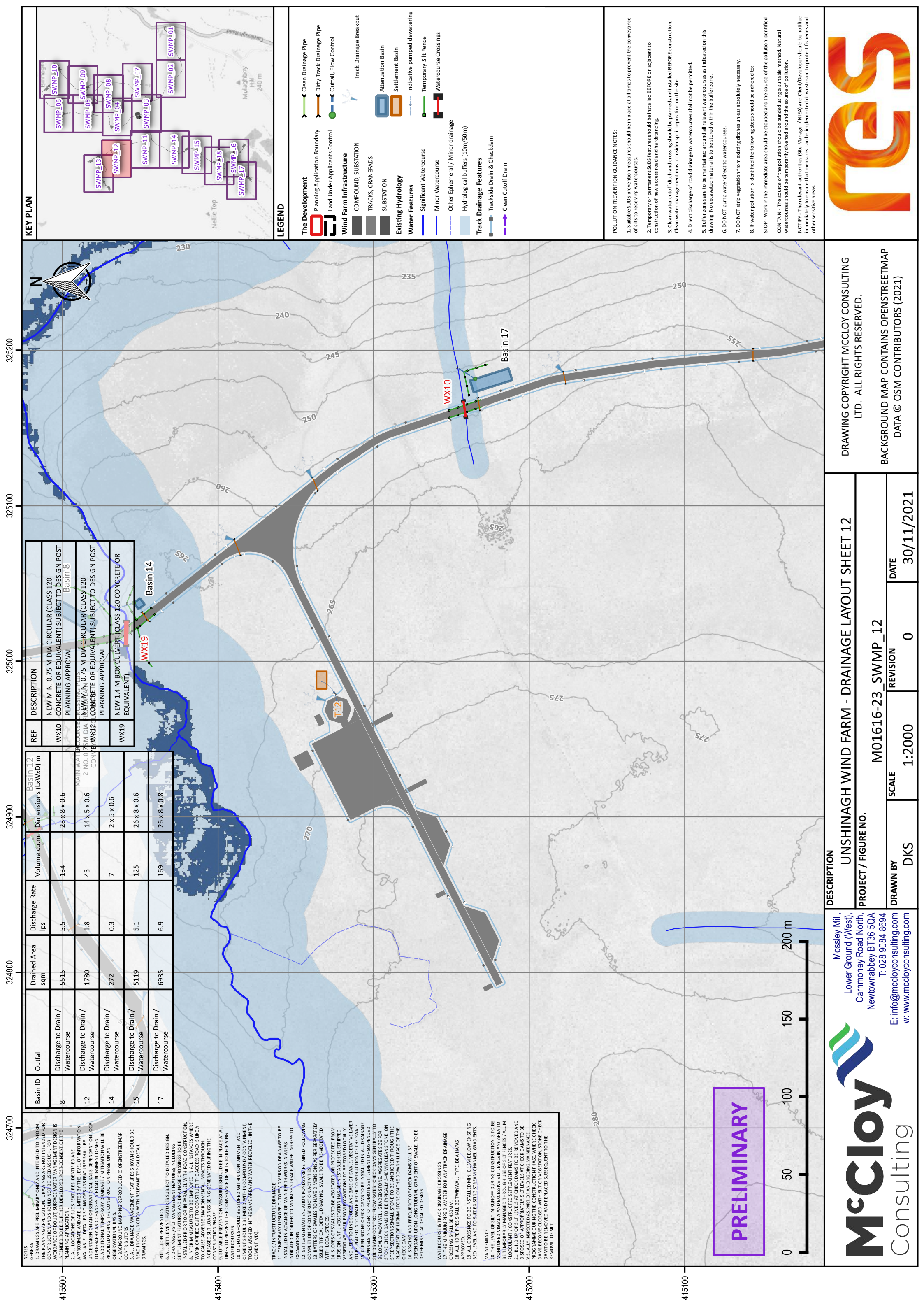
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LEGEND

	The Development
	Clean Drainage Pipe
	Dirty Track Drainage Pipe
	Outfall, Flow Control
	Planning Application Boundary
	Land Under Applicants Control
	Wind Farm Infrastructure
	COMPOUND, SUBSTATION
	TRACKS, CRANEPADS
	SUBSTATION
	Existing Hydrology
	Water Features
	Significant Watercourse
	Minor Watercourse
	Other Ephemeral / Minor drainage
	Hydrological buffers (10m/50m)
	Track Drainage Features
	Trackside Drain & Checkdam
	Clean Cutoff Drain
	Clean Drainage Pipe
	Dirty Track Drainage Pipe
	Outfall, Flow Control
	Track Drainage Breakout
	Attenuation Basin
	Settlement Basin
	Indicative pumped dewatering
	Temporary Silt Fence
	Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

1. Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
2. Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
3. Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
4. Direct discharge of road drainage to watercourses shall not be permitted.
5. Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
6. DO NOT pump water direct to watercourses.
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Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	DESCRIPTION
8	Discharge to Drain / Watercourse	5515	5.5	134	28 x 8 x 0.6	NEW MIN. 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL. Basin 8
12	Discharge to Drain / Watercourse	1780	1.8	43	14 x 5 x 0.6	NEW MIN. 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
14	Discharge to Drain / Watercourse	272	0.3	7	2 x 3 x 0.6	NEW 1.4 M BOX CULVERT (CLASS 120 CONCRETE OR EQUIVALENT)
15	Discharge to Drain / Watercourse	5119	5.1	125	26 x 8 x 0.6	
17	Discharge to Drain / Watercourse	6935	6.9	169	26 x 8 x 0.8	

NOTES

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2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGNER HAS CONDUCTED VISUAL LOCAL UNDERGROUND MAPPING AND OBSERVATIONS OF LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.
6. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
7. DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
8. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
9. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
10. ALL MATERIALS TO BE STORED WITHIN CONFINEMENT, AND CEMENT SHOULD BE AWAY FROM CONTOUR / CONTAMINATION TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MK).
11. TRACK / INFRASTRUCTURE DRAINAGE
12. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
13. TEMPORARY SLOPE CUTOFF / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
14. LOCAL SLOPES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-APPLIED TO THE SLOPE OF SILENT VEGETATION WATER TO BE STORED IN A SILENT VEGETATION WATER.
15. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW PATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-50MM CLEAN STONE ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
16. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDANT UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.
17. WATERCOURSE & TRACK DRAINAGE CROSSINGS
18. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
19. ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HPAPS PROVIDED.
20. CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.
21. MAINTENANCE
22. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
23. 'FLOCCULANT' CONSTRUCTED SETTLEMENT FEATURES.
24. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.

DESCRIPTION

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 12

PROJECT / FIGURE NO. M01616-23_SWMP_12

DRAWN BY DKS

SCALE 1:2000

REVISION 0

DATE 30/11/2021

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PRELIMINARY

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 12

PROJECT / FIGURE NO. M01616-23_SWMP_12

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SCALE 1:2000

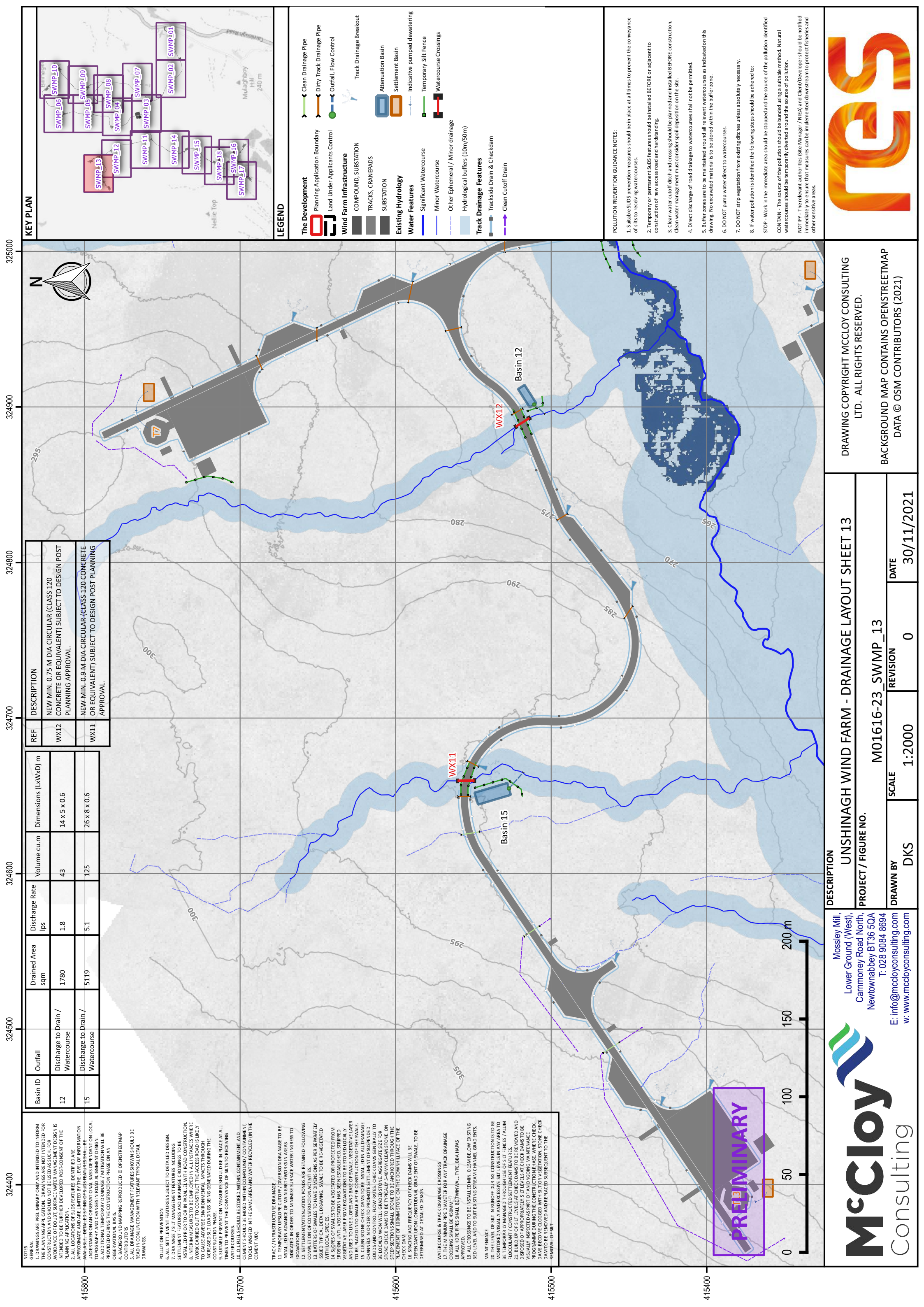
REVISION 0

DATE 30/11/2021

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Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	REF	DESCRIPTION
12	Discharge to Drain / Watercourse	1780	1.8	43	14 x 5 x 0.6	WX12	NEW MIN. 0.75 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
15	Discharge to Drain / Watercourse	5119	5.1	125	26 x 8 x 0.6	WX11	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.

NOTES
GENERAL
1. DRAWINGS ARE PRELIMINARY ONLY AND INTENDED TO INFORM THE PLANNING APPLICATION. DRAWINGS ARE NOT INTENDED FOR AVOIDANCE OF LIABILITY. SURFACE WATER MANAGEMENT DESIGN IS INTENDED TO BE FURTHER DEVELOPED POST-CONSENT OF THE PLANNING APPLICATION.
2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE EXACT LOCATION OF SUDS FEATURES SHOULD BE DETERMINED BY THE DESIGNER IN CONSULTATION WITH LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
4. BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
5. ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.
POLLUTION PREVENTION
6. ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
7. DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
8. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
9. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
10. ALL DRAINAGE MANAGEMENT FEATURES SHOULD BE STORED WITHIN CONFINEMENT AND CELESTIAL TOOLS SHOULD BE AWAY FROM CONSTRUCTION / CONTAMINATION TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).
TRACKS / INFRASTRUCTURE DRAINAGE
11. TEMPORARY SLOPE CUTOFFS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
12. SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
13. TRACKS / INFRASTRUCTURE DRAINAGE FEATURES AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
14. SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED TO REVEGETATE SLOPES OF SWALES.
15. CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-40MM CLEAN STONE. ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
16. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED IN DETAILED DESIGN.
WATERCOURSE & TRACK DRAINAGE CROSSINGS
17. THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
18. ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HPAS
19. ALL DRAINAGE CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.
MAINTENANCE
20. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED BY 'FLOCCULANT' CONSTRUCTED SETTLEMENT FEATURES.
21. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.
22. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED BY 'FLOCCULANT' CONSTRUCTED SETTLEMENT FEATURES.
23. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

KEY PLAN

LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Watercourse
- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Water Features

- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Watercourse Crossings

- Watercourse Crossings
- Temporary Silt Fence
- Indicative pumped dewatering
- Settlement Basin
- Attenuation Basin

Track Drainage Breakout

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
STOP - Work in the immediate area should be stopped and the source of the pollution identified
CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 13
PROJECT / FIGURE NO.
M01616-23_SWMP_13

DESCRIPTION
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 13
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DRAWN BY DKS
SCALE 1:2000
REVISION 0
DATE 30/11/2021

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331800

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332400

332600

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NOTES
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 2. ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE LEVEL OF INFORMATION AVAILABLE ON LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN UNDERGROUNDS, UNDERGROUNDS, BASES, PERMANENT LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN 3. ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
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 MAINTENANCE
 20. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
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Basin ID
27

Outfall
Discharge to Drain / Watercourse

Volume cu.m
63

Discharge Rate
lps
2.6

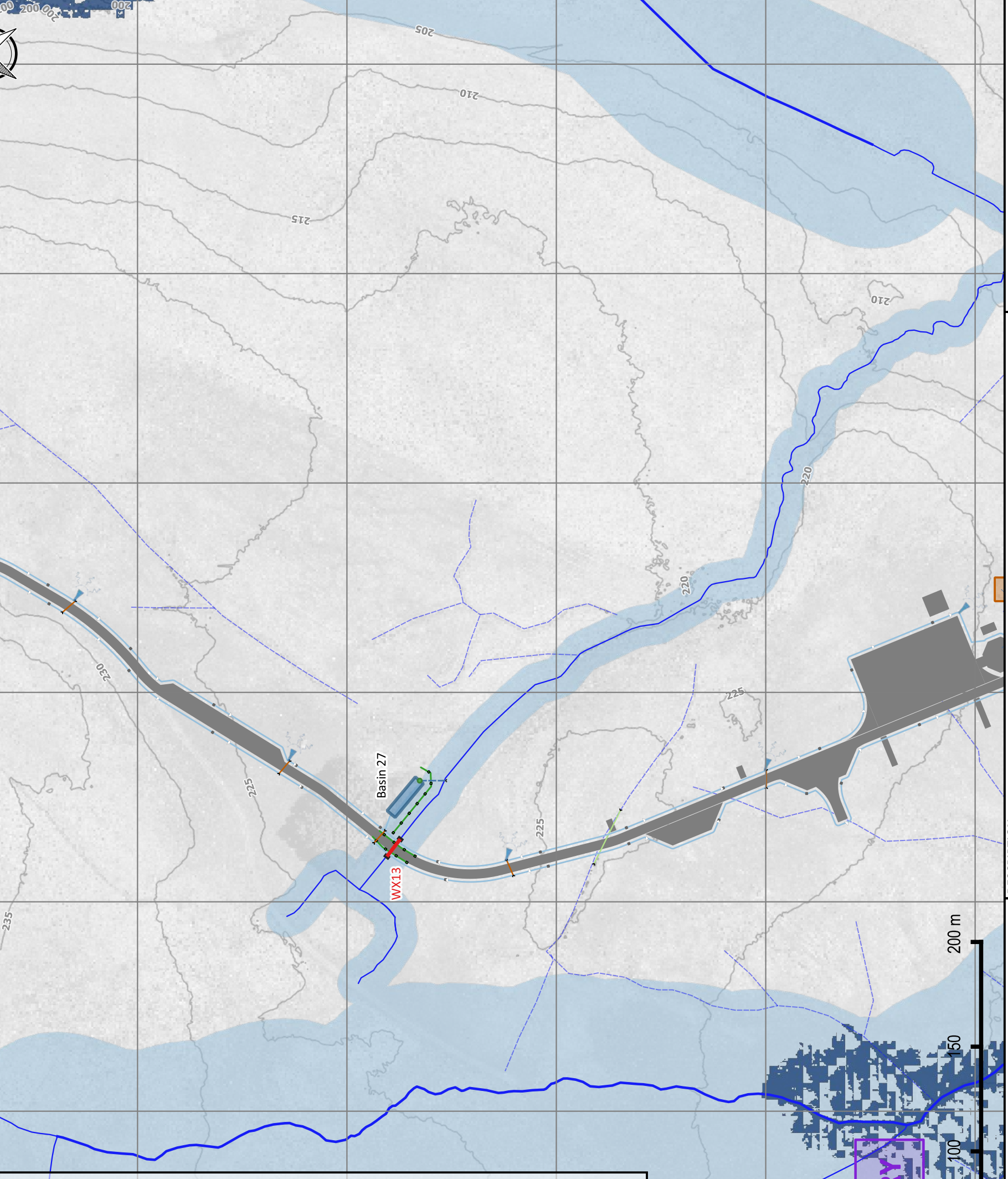
Dained Area
sqm
2601

Dimensions (LxWxD) m
21.1 x 5 x 0.6

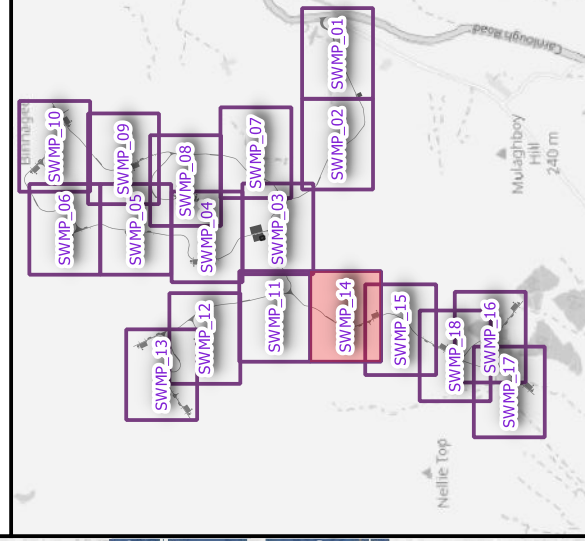
REF
WX13

DESCRIPTION
NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.

Basin ID	27
Outfall	Discharge to Drain / Watercourse
Volume cu.m	63
Discharge Rate	lps 2.6
Dained Area	sqm 2601
Dimensions (LxWxD) m	21.1 x 5 x 0.6
REF	WX13
DESCRIPTION	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.



KEY PLAN



LEGEND

- The Development**
- Planning Application Boundary
 - Land Under Applicants Control
- Wind Farm Infrastructure**
- COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology**
- Watercourse
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features**
- Trackside Drain & Checkdam
 - Clean Cutoff Drain
- Water Features**
- Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control
 - Track Drainage Breakout
 - Attenuation Basin
 - Settlement Basin
 - Indicative pumped dewatering
 - Temporary Silt Fence
 - Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
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- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
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- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
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- If water pollution is identified the following steps should be adhered to:
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 NOTIFY - The relevant authorities (Site Manager / NEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



DESCRIPTION
 UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 14
 PROJECT / FIGURE NO.
 M01616-23_SWMP_14

DRAWN BY
DKS

SCALE
1:2000

REVISION
0

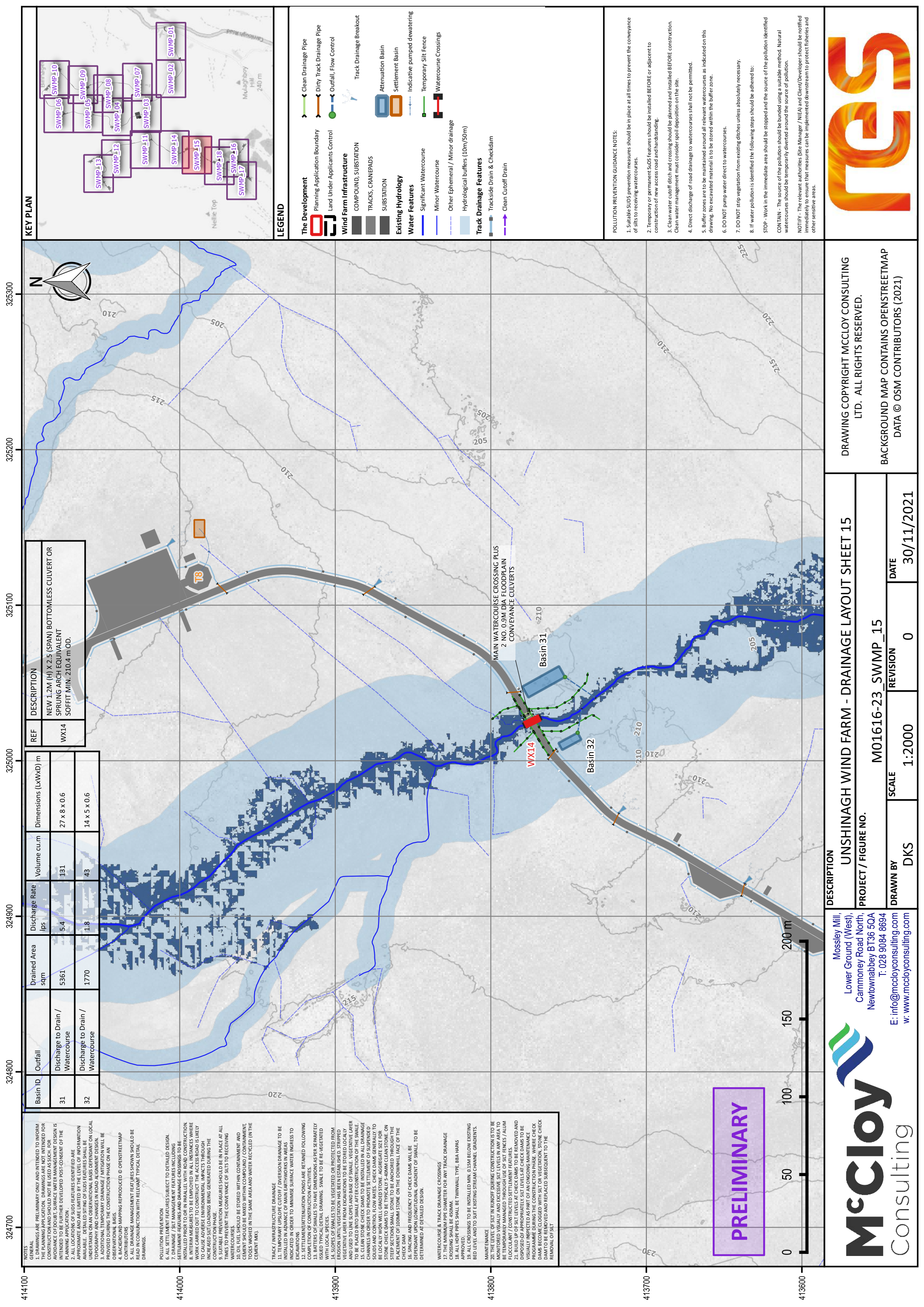
DATE
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 w: www.mccloyconsulting.com

PRELIMINARY



LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Watercourse

Water Features

- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Watercourse Crossings

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control

Watercourse

- Atenuation Basin
- Settlement Basin
- Indicative pumped dewatering
- Temporary Silt Fence
- Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and hardstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be bounded using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m
31	Discharge to Drain / Watercourse	5361	5.4	131	27 x 8 x 0.6
32	Discharge to Drain / Watercourse	1770	1.8	43	14 x 5 x 0.6

REF	DESCRIPTION
WX14	NEW 1.2M (H) X 2.5 (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT SOFFIT MIN. 210.4 m OD.

NOTES

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- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGNER HAS CONDUCTED VISUAL LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP.
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO CAUSE INCREASED SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- ALL DRAINAGE MANAGEMENT FEATURES SHOULD BE STORED WITHIN CONFINEMENT, AND ALL DRAINAGE MANAGEMENT TOOLS SHOULD BE WASHED WITHIN CONFINEMENT / CONTAINMENT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SLOPE CUTOFF / CONVEYANCE DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- ALL DRAINAGE MANAGEMENT FEATURES AS PER SEPARATELY ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED AS MULCH AT THE EDGE OF SWALE. VEGETATIVE WATER TO BE STORED IN TRUCKS OR AT THE EDGE OF SWALE.
- CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-50MM CLEAN STONE. ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE. BBA HPAPS PROVIDED.
- CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED BY CLEANING. ALL CHECK DAMS / FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

DESCRIPTION

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 15

PROJECT / FIGURE NO. M01616-23_SWMP_15

DRAWN BY DKS

SCALE 1:2000

REVISION 0

DATE 30/11/2021

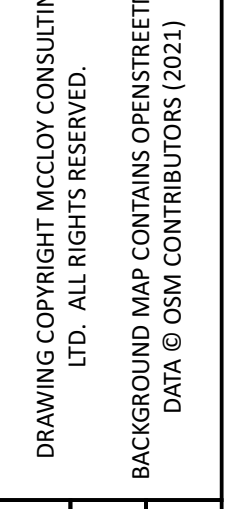
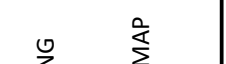
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MCCLOY
Consulting

PRELIMINARY



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NOTES

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POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SUDS MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SUDS LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
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- WATERCOURSES SHOULD BE STORED WITHIN CONFINEMENT AND TANKS SHOULD BE AISKED WITHIN CONFINEMENT / CONTAINMENT TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SLOPE CUTOFF / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- TEMPORARY SLOPE CUTOFFS / DIVERSION DRAINAGE TO BE ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STOCKED LOCALLY AND RE-USED AS BACKFILL. VEGETATIVE LAYER TO BE STOCKED UNTIL VEGETATION HAS BEEN ESTABLISHED.
- CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR A16 TO BE TYPICALLY 5-40MM CLEAN STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED AT DETAILED DESIGN.

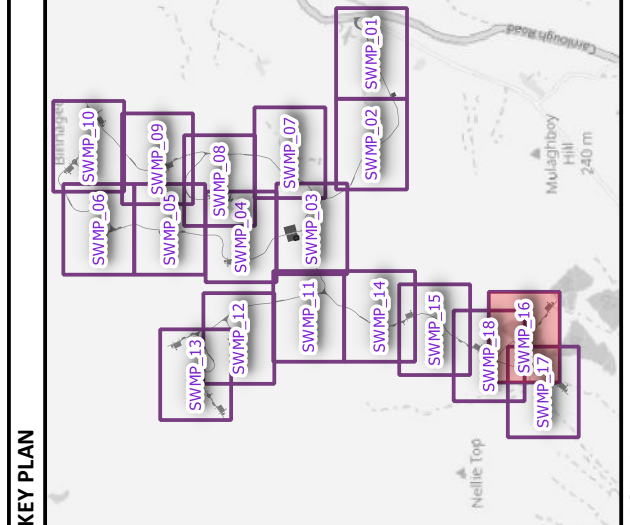
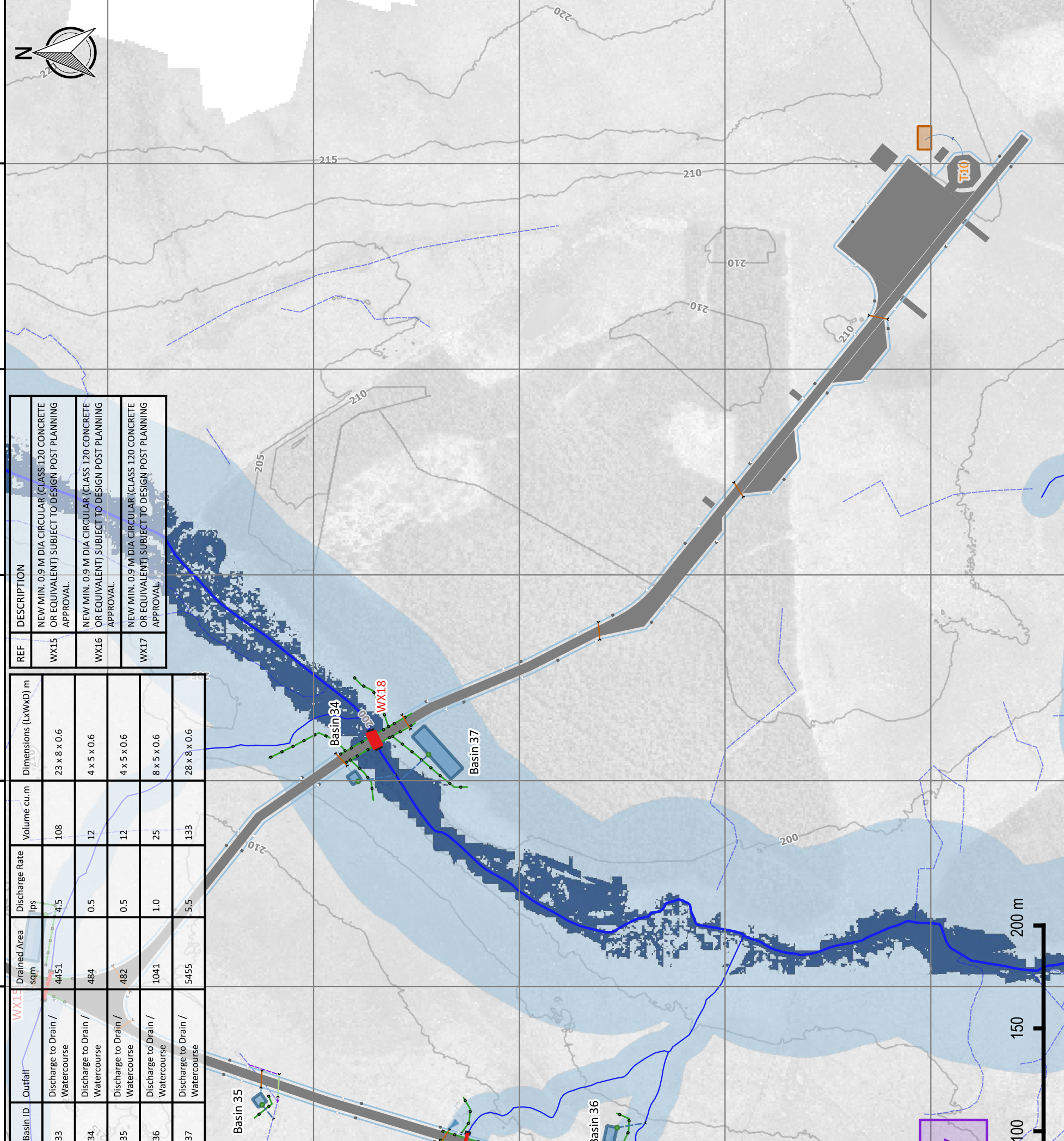
WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE. BBA HAPAS APPROVED.
- CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
- CONSTRUCTED SETTLEMENT FEATURES / ALUMI FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	DESCRIPTION
33	Discharge to Drain / Watercourse	4451	4.5	108	23 x 8 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
34	Discharge to Drain / Watercourse	484	0.5	12	4 x 5 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
35	Discharge to Drain / Watercourse	482	0.5	12	4 x 5 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
36	Discharge to Drain / Watercourse	1041	1.0	25	8 x 5 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
37	Discharge to Drain / Watercourse	5455	5.5	133	28 x 8 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.



LEGEND

- The Development**
- Planning Application Boundary
 - Land Under Applicants Control
- Wind Farm Infrastructure**
- COMPOUND, SUBSTATION
 - TRACKS, CRANEPADS
 - SUBSTATION
- Existing Hydrology**
- Watercourse
 - Significant Watercourse
 - Minor Watercourse
 - Other Ephemeral / Minor drainage
 - Hydrological buffers (10m/50m)
- Track Drainage Features**
- Trackside Drain & Checkdam
 - Clean Cutoff Drain
- Water Features**
- Attenuation Basin
 - Settlement Basin
 - Indicative pumped dewatering
 - Temporary Silt Fence
 - Watercourse Crossings
- Track Drainage Breakout**
- Clean Drainage Pipe
 - Dirty Track Drainage Pipe
 - Outfall, Flow Control

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



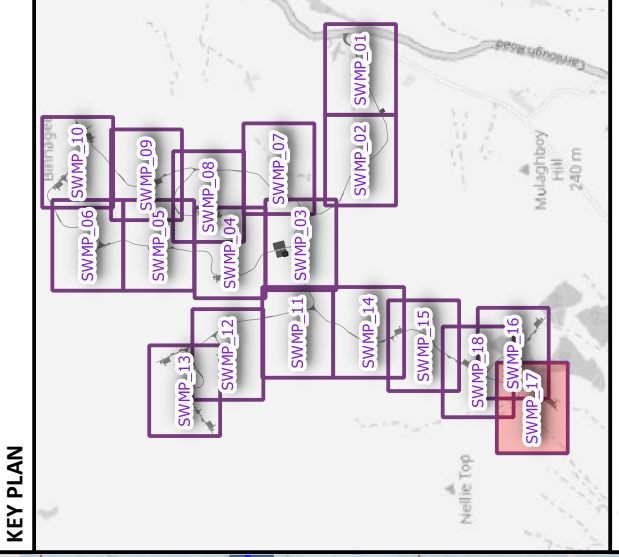
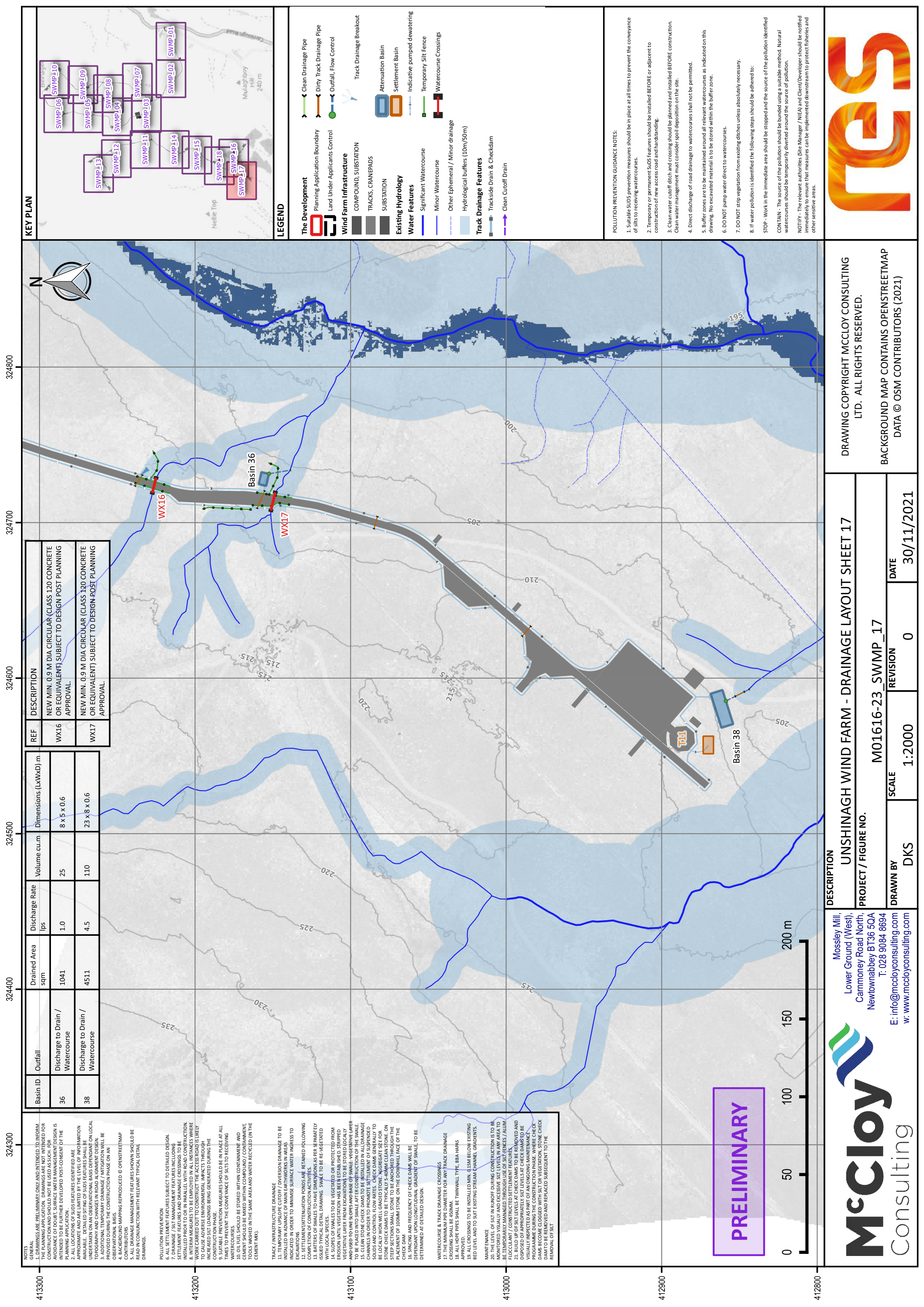
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DESCRIPTION	SCALE	REVISION	DATE
UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 16 PROJECT / FIGURE NO.	1:2000	0	30/11/2021
M01616-23_SWMP_16	DKS		

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LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Water Features
- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Track Drainage Breakout

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control

Water Features

- Attenuation Basin
- Settlement Basin
- Indicative pumped dewatering
- Temporary Silt Fence
- Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
- If water pollution is identified the following steps should be adhered to:
 - STOP - Work in the immediate area should be stopped and the source of the pollution identified
 - CONTAIN - The source of the pollution should be contained using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.
 - NOTIFY - The relevant authorities (Site Manager / NIEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.



Basin ID	Outfall	Drained Area sqm	Discharge Rate lps	Volume cu.m	Dimensions (LxWxD) m	DESCRIPTION
36	Discharge to Drain / Watercourse	1041	1.0	25	8 x 5 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.
38	Discharge to Drain / Watercourse	4511	4.5	110	23 x 8 x 0.6	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.

NOTES

GENERAL

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- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE LEVEL OF INFORMATION IS BASED ON LOCAL UNDERSTANDING OF THE SITE AND SHOULD BE VERIFIED ON LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION. WORK CARRIED OUT TO CONSTRUCT THE ACCESS ROAD IS LIKELY TO INCREASE SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- ALL SILT SHOULD BE STORED WITHIN CONFINEMENT, AND CARE SHOULD BE TAKEN TO PREVENT POLLUTION / CONTAMINATION TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SLOPE CUTOFF / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- ALL SUDS FEATURES SHOULD BE SEPARATELY ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND RE-USED ON SITE.
- ALL SUDS FEATURES SHOULD BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUBMERGED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-40MM CLEAN STONE. ON SLOPES OF 1:1 TO 1:3 THE PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HAPRS.
- PROVIDED CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE IDENTIFIED AND REMOVED IMMEDIATELY.
- FLOCCULANT CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS SHOULD BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.

DESCRIPTION

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 17

PROJECT / FIGURE NO. M01616-23_SWMP_17

DRAWN BY DKS

SCALE 1:2000

REVISION 0

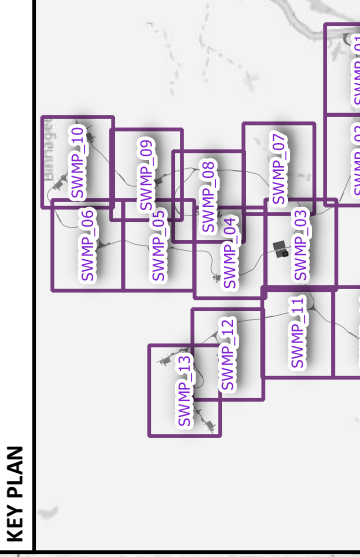
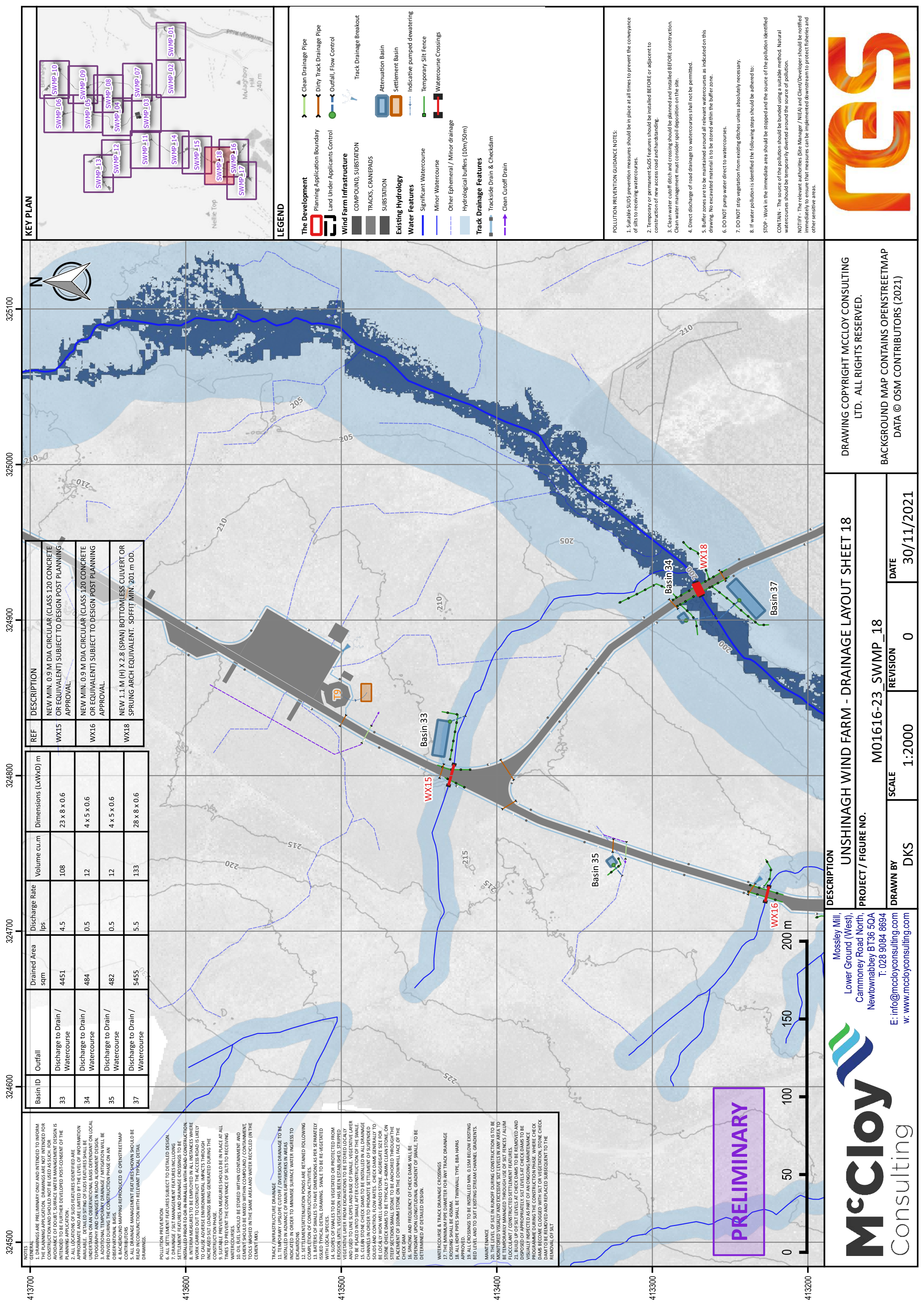
DATE 30/11/2021

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PRELIMINARY

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LEGEND

The Development

- Planning Application Boundary
- Land Under Applicants Control

Wind Farm Infrastructure

- COMPOUND, SUBSTATION
- TRACKS, CRANEPADS
- SUBSTATION

Existing Hydrology

- Water Features
- Significant Watercourse
- Minor Watercourse
- Other Ephemeral / Minor drainage
- Hydrological buffers (10m/50m)

Track Drainage Features

- Trackside Drain & Checkdam
- Clean Cutoff Drain

Track Drainage Breakout

- Clean Drainage Pipe
- Dirty Track Drainage Pipe
- Outfall, Flow Control
- Attenuation Basin
- Settlement Basin
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- Temporary Silt Fence
- Watercourse Crossings

POLLUTION PREVENTION GUIDANCE NOTES:

- Suitable SUDS prevention measures should be in place at all times to prevent the conveyance of silts to receiving watercourses.
- Temporary or permanent SUDS features should be installed BEFORE or adjacent to construction of new access road and handstanding.
- Clean water cutoff ditch and crossing should be planned and installed BEFORE construction. Clean water management must consider spoil deposition on the site.
- Direct discharge of road drainage to watercourses shall not be permitted.
- Buffer zones are to be maintained around all relevant watercourses as indicated on this drawing. No excavated material is to be stored within the buffer zone.
- DO NOT pump water direct to watercourses.
- DO NOT strip vegetation from existing ditches unless absolutely necessary.
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 - NOTIFY - The relevant authorities (Site Manager / NEA) and Client/Developer should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

REF	DESCRIPTION	Dimensions (LxWxD) m	Volume cu.m	Discharge Rate lps	Drained Area sqm	Outfall
WX15	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.	23 x 8 x 0.6	108	4.5	4451	Discharge to Drain / Watercourse
WX16	NEW MIN. 0.9 M DIA CIRCULAR (CLASS 120 CONCRETE OR EQUIVALENT) SUBJECT TO DESIGN POST PLANNING APPROVAL.	4 x 5 x 0.6	12	0.5	484	Discharge to Drain / Watercourse
WX18	NEW 1.1 M (H) X 2.8 (SPAN) BOTTOMLESS CULVERT OR SPRUNG ARCH EQUIVALENT. SOFFIT MIN. 201 m OD.	4 x 5 x 0.6	12	0.5	482	Discharge to Drain / Watercourse
		28 x 8 x 0.6	133	5.5	5455	Discharge to Drain / Watercourse

NOTES

GENERAL

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- ALL LOCATIONS OF SUDS FEATURES IDENTIFIED ARE APPROXIMATE AND ARE LIMITED BY THE LEVEL OF INFORMATION AVAILABLE. THE DESIGN OF SUDS FEATURES IS SUBJECT TO LOCAL UNDERGROUND CONDITIONS, LOCAL BASEFLOODING, LOCAL TOPOGRAPHY AND CHANGES IN ROAD ALIGNMENT DESIGN.
- ADDITIONAL TEMPORARY DRAINAGE / MITIGATION WILL BE PROVIDED DURING THE CONSTRUCTION PHASE ON AN OBSERVATIONAL BASIS.
- BACKGROUND MAPPING REPRODUCED © OPENSTREETMAP
- ALL DRAINAGE MANAGEMENT FEATURES SHOWN SHOULD BE READ IN CONJUNCTION WITH RELEVANT TYPICAL DETAIL DRAWINGS.

POLLUTION PREVENTION

- ALL SETTLEMENT FEATURES SUBJECT TO DETAILED DESIGN.
- DRAINAGE / SILT MANAGEMENT FEATURES INCLUDING SETTLEMENT FEATURES AND DRAINAGE CROSSINGS TO BE INSTALLED PRIOR TO OR IN PARALLEL WITH ROAD CONSTRUCTION.
- INTERIM MEASURES TO BE EMPLOYED IN ALL INSTANCES WHERE INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
- WATERCOURSES SHOULD BE STORED WITHIN CONFINEMENT, AND CARE SHOULD BE TAKEN WITH ACCUMULATED / CONTAMINATED TOOLS WASHED IN THE SAME AREA AND WATER RECYCLED (IN THE CEMENT MIX).

TRACK / INFRASTRUCTURE DRAINAGE

- TEMPORARY SLOPE CUTOFFS / DIVERSION DRAINAGE TO BE INSTALLED IN ADVANCE OF MAIN EARTHWORKS IN AREAS INDICATED IN ORDER TO MINIMISE SURFACE WATER INGRESS TO EXCAVATIONS.
- SETTLEMENT/ATTENUATION PONDS ARE RETAINED FOLLOWING COMPLETION OF CONSTRUCTION ACTIVITIES.
- WATERCOURSES TO BE INSTALLED IN ACCORDANCE WITH ISSUED TYPICAL DETAIL DRAWINGS. SWALE TO BE RE-VEGETATED WITH LOCAL SPECIES.
- SLOPES OF SWALES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND NOT TO BE USED AS FILL OR SPILL. VEGETATIVE LAYER TO BE STORED IN A CONTAINED AREA.
- CLEAN STONE CHECK DAMS TO BE INSTALLED IN ALL DRAINAGE CHANNELS IN ORDER TO PROMOTE SETTLEMENT OF SUSPENDED SOLIDS AND CONTROL FLOW RATES. CHECK DAMS GENERALLY TO BE LOCALLY WON WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5-30MM CLEAN STONE. ON PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DETERMINED UPON LONGITUDINAL GRADIENT OF SWALE. TO BE DETERMINED AT DETAILED DESIGN.

WATERCOURSE & TRACK DRAINAGE CROSSINGS

- THE MINIMUM PIPE DIAMETER FOR ANY TRACK DRAINAGE CROSSING SHALL BE 450MM.
- ALL HOPE PIPES SHALL BE TWINWALL TYPE, BBA HPMS APPROVED.
- APPROVED CROSSINGS TO BE INSTALLED MIN. 0.15M BELOW EXISTING BED LEVEL AND TO SUIT EXISTING STREAM CHANNEL GRADIENTS.

MAINTENANCE

- THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE REMOVED IMMEDIATELY.
- FLOCCULANT / CONSTRUCTED SETTLEMENT FEATURES.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENTLY TO THE REMOVAL OF SILT.

DESCRIPTION

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 18

PROJECT / FIGURE NO. M01616-23_SWMP_18

DRAWN BY DKS

SCALE 1:2000

REVISION 0

DATE 30/11/2021

UNSHINAGH WIND FARM - DRAINAGE LAYOUT SHEET 18

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PRELIMINARY

McClroy Consulting

McClroy Consulting

McClroy Consulting

McClroy Consulting

