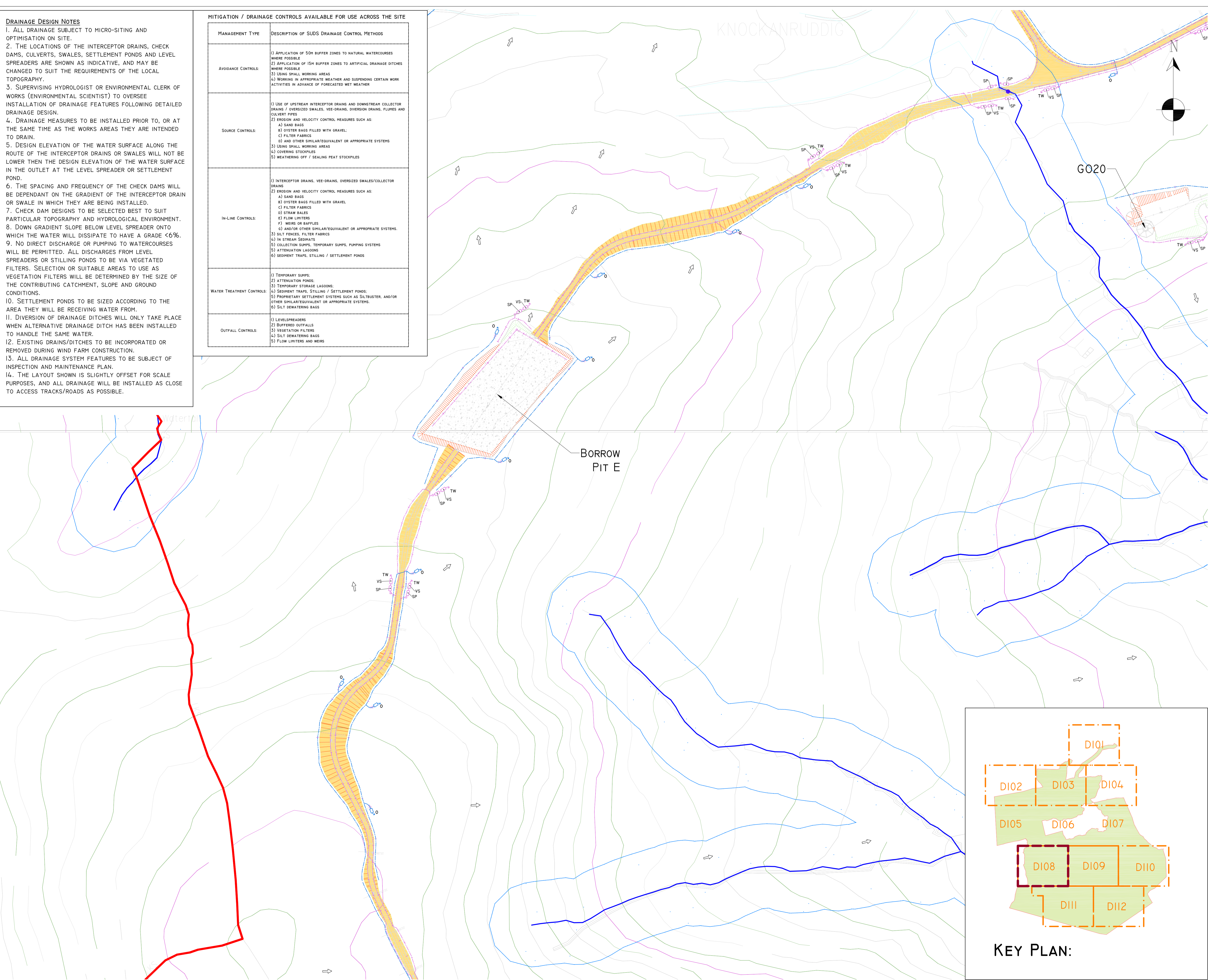


DRAINAGE DESIGN NOTES

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED DRAINAGE DESIGN.
4. DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS AREAS THEY ARE INTENDED TO DRAIN.
5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
7. CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISSIPATE TO HAVE A GRADE <6%.
9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OR SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
10. SETTLEMENT PONDS TO BE SIZED ACCORDING TO THE AREA THEY WILL BE RECEIVING WATER FROM.
11. DIVERSION OF DRAINAGE DITCHES WILL ONLY TAKE PLACE WHEN ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER.
12. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WILL BE INSTALLED AS CLOSE TO ACCESS TRACKS/ROADS AS POSSIBLE.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS:	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 15M BUFFER ZONES TO ARTIFICIAL DRAINAGE DITCHES WHERE POSSIBLE 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
SOURCE CONTROLS:	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING FEAT STOCKPILES
IN-LINE CONTROLS:	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) STRAW BALES E) FLOW LIMITERS F) WEIRS OR RAFFLES G) AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 3) SILT FENCES, FILTER FABRICS 4) IN-STREAM SEDIMENTS 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS 6) ATTENUATION LAGOONS 7) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	1) TEMPORARY SUMPS 2) ATTENUATION PONDS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
OUTFALL CONTROLS:	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS



PROJECT DESIGN DRAWING NOTES

1. DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
2. DRAWINGS NOT TO BE USED FOR CONSTRUCTION / CONTRACT CONDITIONS. TENDER PACKAGE TO BE PREPARED FOLLOWING PLANNING PHASE.
3. COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
4. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
5. ALL CONTRACTORS, WEATHER MAIN OR SUB-CONTRACTORS, MUST VISIT THE SITE AND ARE RESPONSIBLE FOR TAKING AND CHECKING ANY AND ALL DIMENSIONS AND LEVELS THAT RELATE TO THE WORKS.
6. THE USE OF OR RELIANCE UPON THIS DRAWING SHALL BE DEEMED TO BE ACCEPTANCE OF THESE CONDITIONS OF USE UNLESS OTHERWISE AGREED IN WRITING. SUCH WRITTEN AGREEMENT TO BE SOUGHT FROM AND ISSUED BY THE COPYRIGHT HOLDER TO THE USE OR RELIANCE UPON THIS DRAWING.

LEGEND

- APPLICATION BOUNDARY
- WORKS AREA
- BORROW PIT
- TURBINE FOUNDATION
- SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO MOD MALIN HEAD
- SLOPE / DRAINAGE DIRECTION
- EXISTING RIVER \ STREAM \ LAKE
- RIVER \ STREAM BUFFER 50M
- LAKES
- LAKES 50M BUFFER
- DRAINS / DITCHES
- UPSTREAM INTERCEPTOR DRAIN
- SWALES / DOWNSTREAM COLLECTOR DRAIN
- SILT FENCES
- DOUBLE / TRIPLE SILT FENCES
- SETTLEMENT POND - VEGETATION FILTER - LEVEL SPREADER
- SETTLEMENT POND - LEVEL SPREADER
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERTS / BRIDGES
- INTERCEPTOR DITCH CULVERT
- COLLECTOR DITCH CULVERT
- OVERLAND FLOW DISCHARGE
- TW TREATED WATER DISCHARGE
- SP SETTLEMENT POND
- VS SEMI-NATURAL VEGETATION SWALE / FILTER BED / SECONDARY SP
- PUMPING SUMP

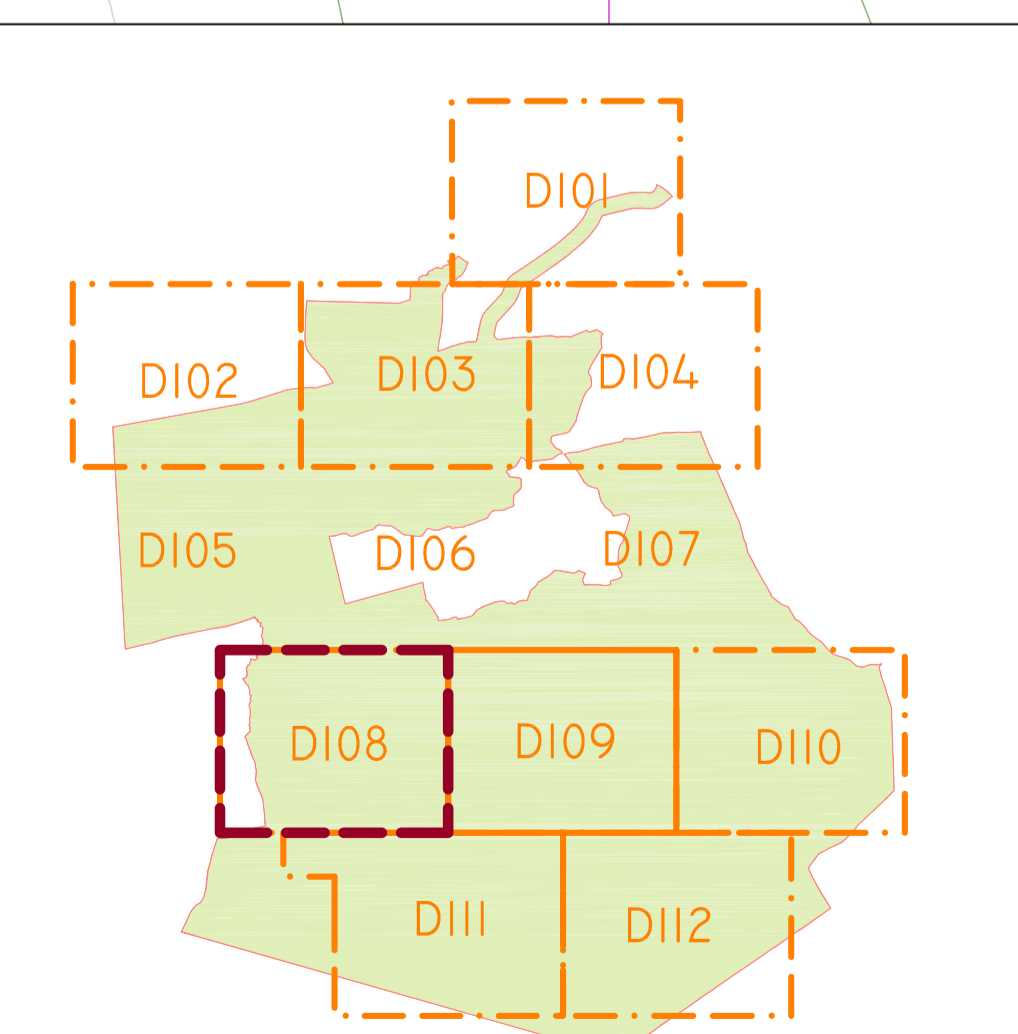
Date	Description	Chkd	Signed
21.08.15	Issue for Planning	M.G.	<i>Michael Gill</i>

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Client:	ESBi
Job:	GROUSEMOUNT WIND FARM PLANNING APPLICATION
Title:	DRAINAGE PLAN SHEET 8 OF 12
Figure No.:	D108
Drawing No.:	P1293-0815-A1-D108-00A
Sheet Size: A1	Project No.: P1293
Scale: 1:2,000 (A1)	Drawn By: M.Gill
Date: 21/08/2015	Checked By: M.G.



KEY PLAN: