APPENDIX

C

Noise and vibration technical information

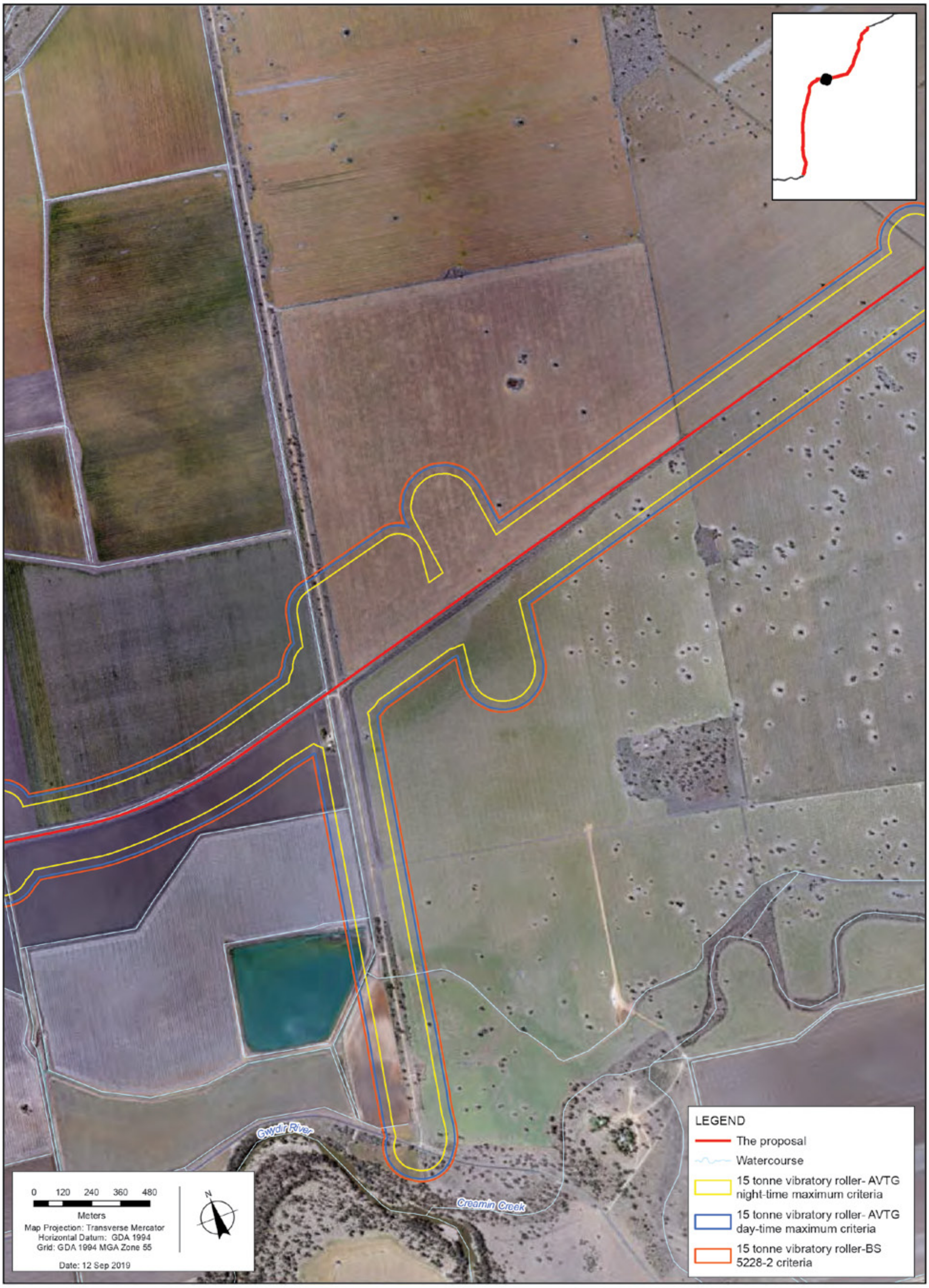
PART 3 OF 3

NARRABRI TO NORTH STAR SUBMISSIONS PREFERRED INFRASTRUCTURE REPORT

IR_1432

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2am



G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2an


LEGEND
The proposal
Watercourse
15 tonne vibratory roller- AVTG night-time maximum criteria
15 tonne vibratory roller- AVTG day-time maximum criteria
15 tonne vibratory roller-BS 5228-2 criteria
0 120 240 360 480
Meters
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55
Date: 12 Sep 2019
N
G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd
Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2ao

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2ap

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2aq

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

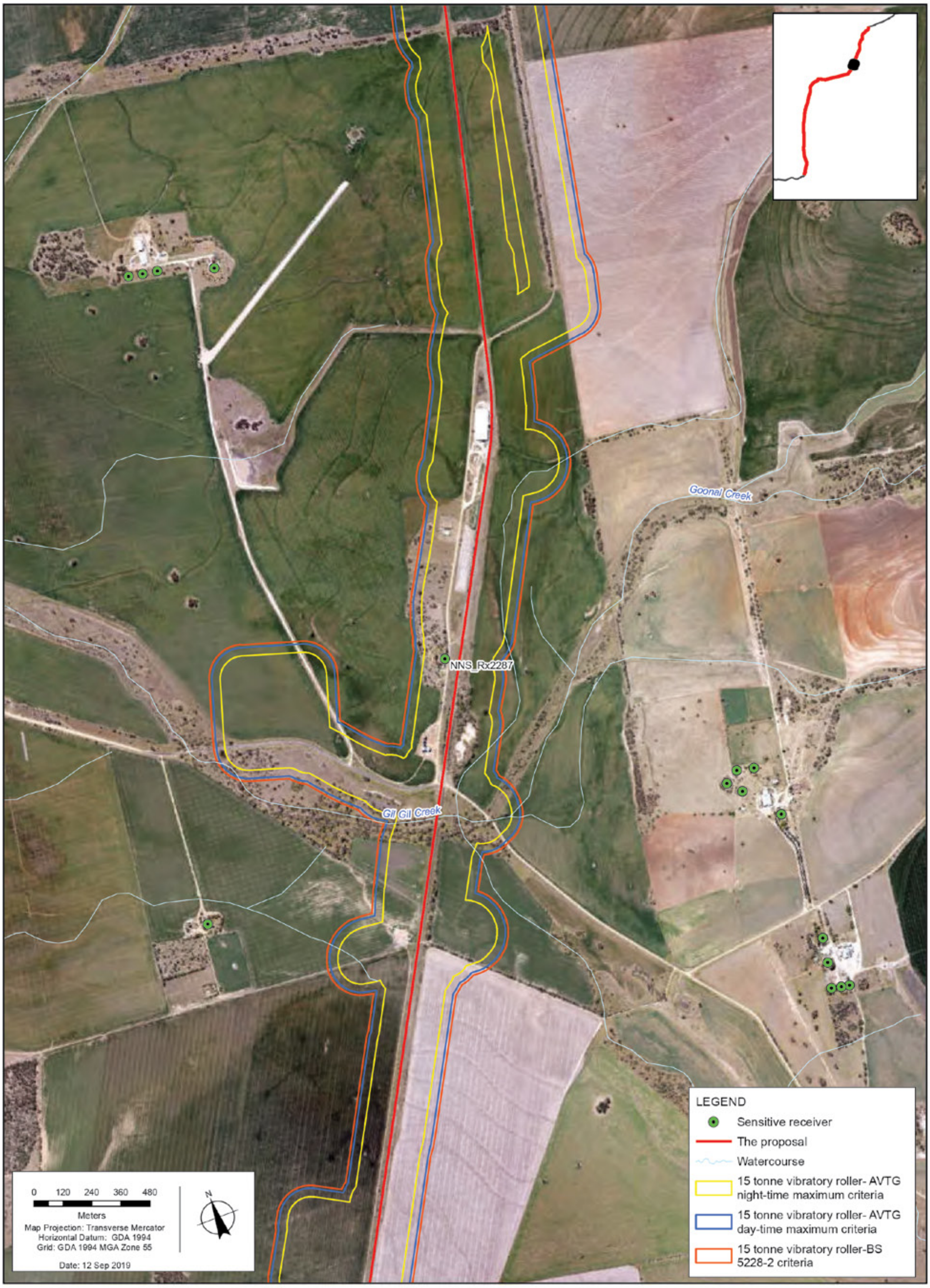
Figure C.2ar

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2as

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2at

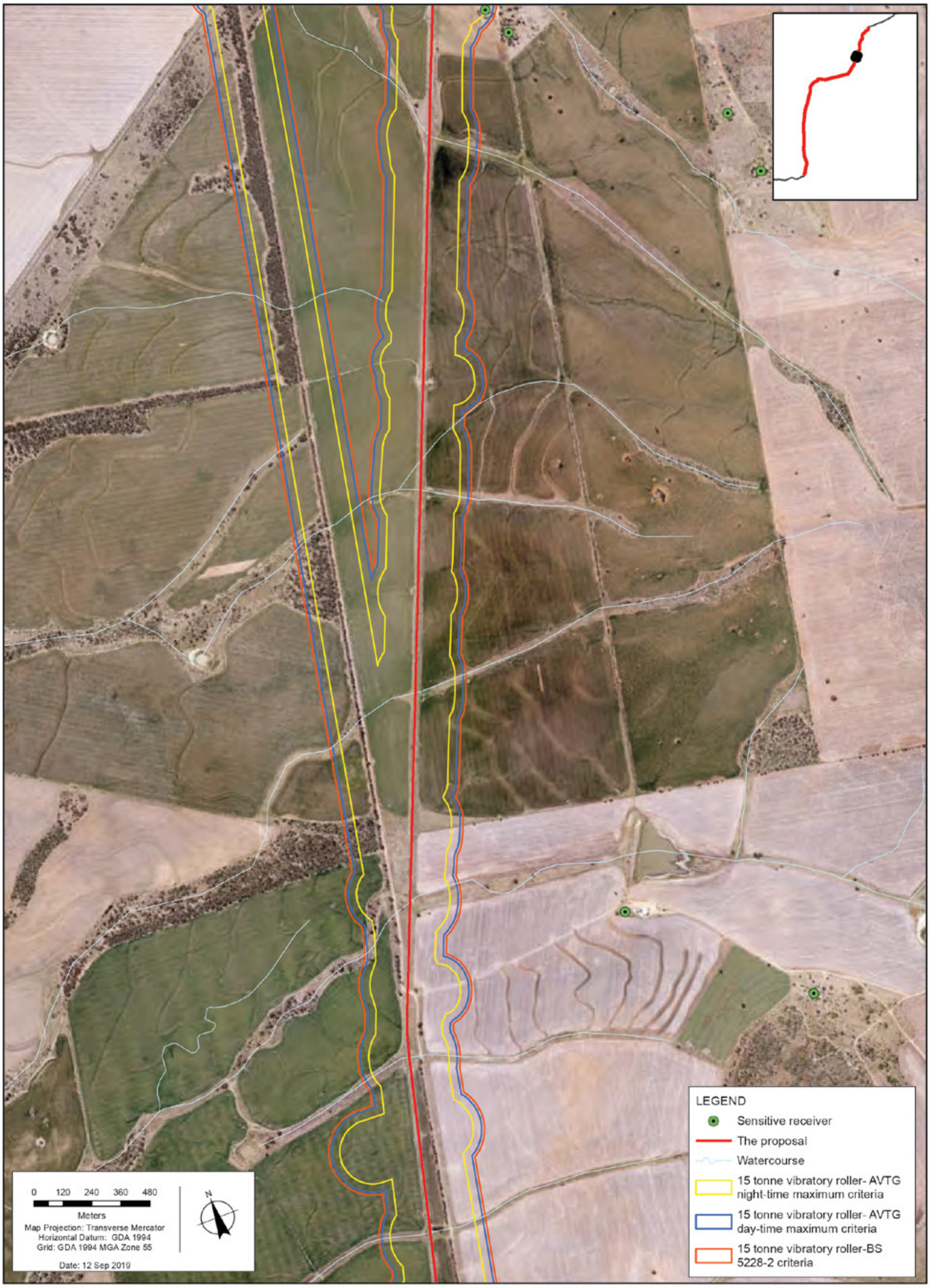


G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2au

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2av

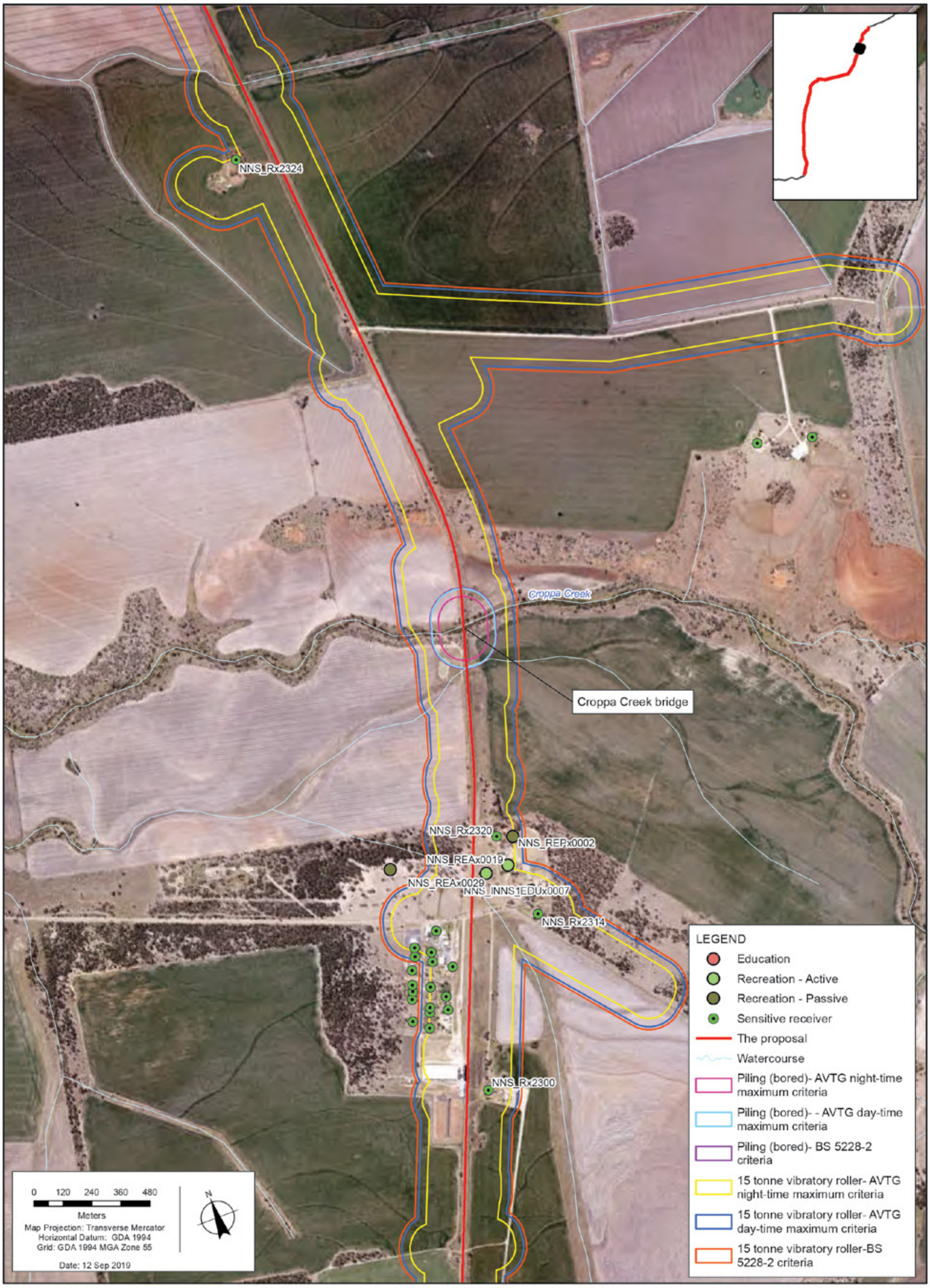


G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2aw


NNS_Rx2299
NNS_Rx2298
LEGEND
Sensitive receiver
The proposal
Watercourse
15 tonne vibratory roller- AVTG night-time maximum criteria
15 tonne vibratory roller- AVTG day-time maximum criteria
15 tonne vibratory roller-BS 5228-2 criteria
0 120 240 360 480
Meters
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55
Date: 12 Sep 2019
N
G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd
Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2ax



G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2ay

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2az

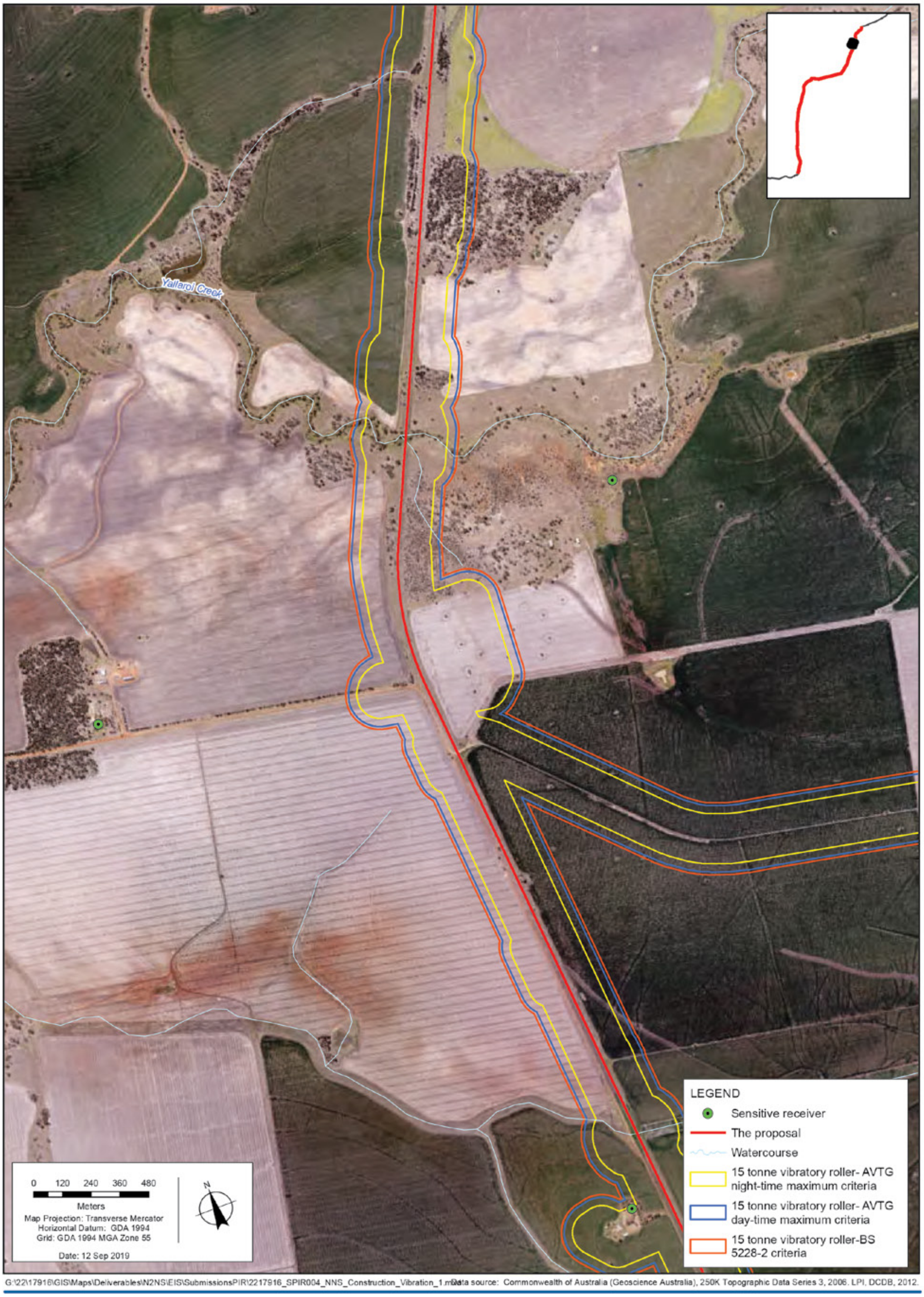

Yallaroi Creek
LEGEND
Sensitive receiver
The proposal
Watercourse
15 tonne vibratory roller- AVTG night-time maximum criteria
15 tonne vibratory roller- AVTG day-time maximum criteria
15 tonne vibratory roller-BS 5228-2 criteria
0 120 240 360 480
Meters
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55
Date: 12 Sep 2019
N
G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd
Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2ba

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bb

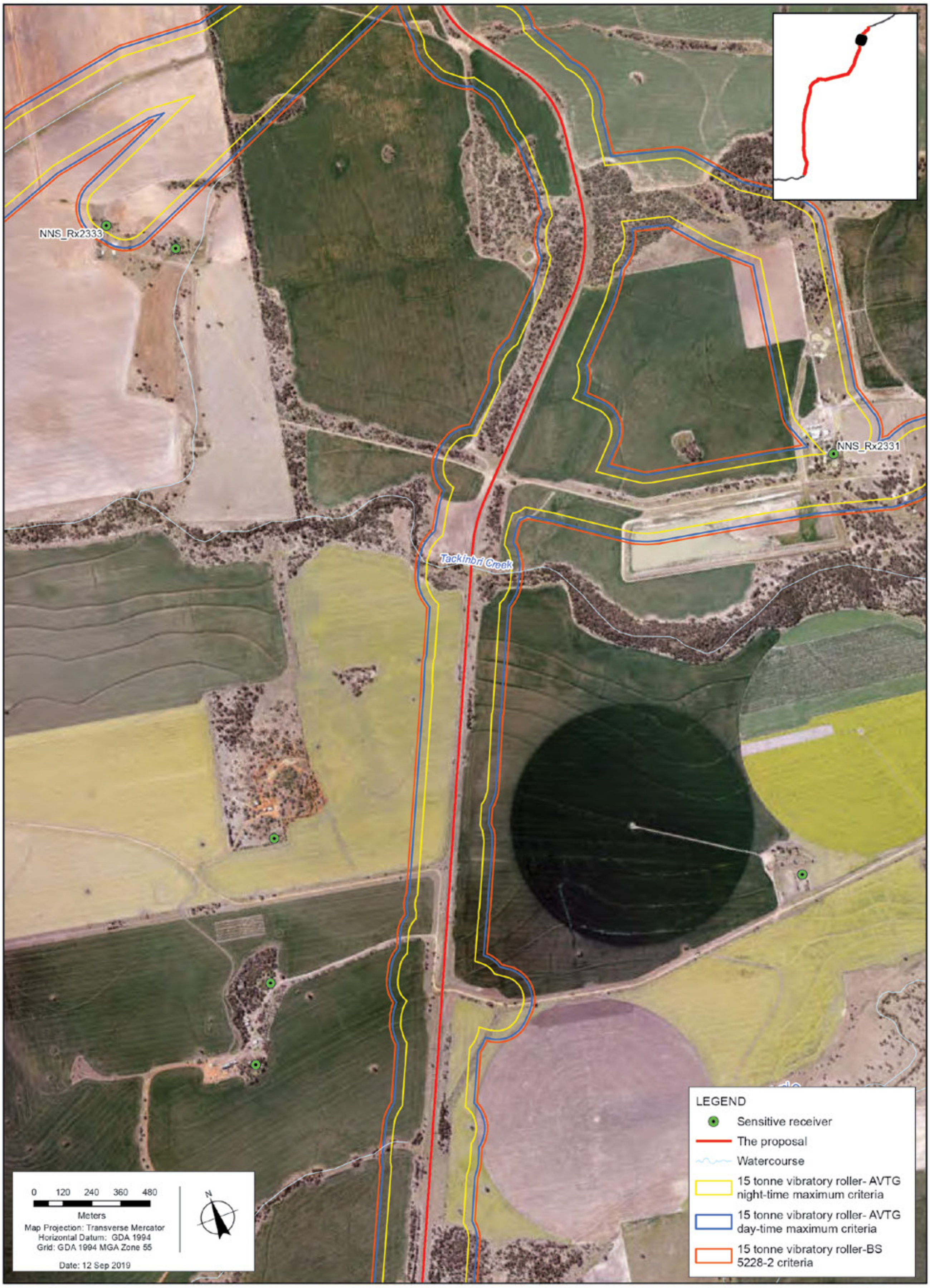

NNS_Rx2333
NNS_Rx2331
Tackinbri Creek
LEGEND
Sensitive receiver
The proposal
Watercourse
15 tonne vibratory roller- AVTG night-time maximum criteria
15 tonne vibratory roller- AVTG day-time maximum criteria
15 tonne vibratory roller-BS 5228-2 criteria
0 120 240 360 480
Meters
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55
Date: 12 Sep 2019
N
G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd
Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bc

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

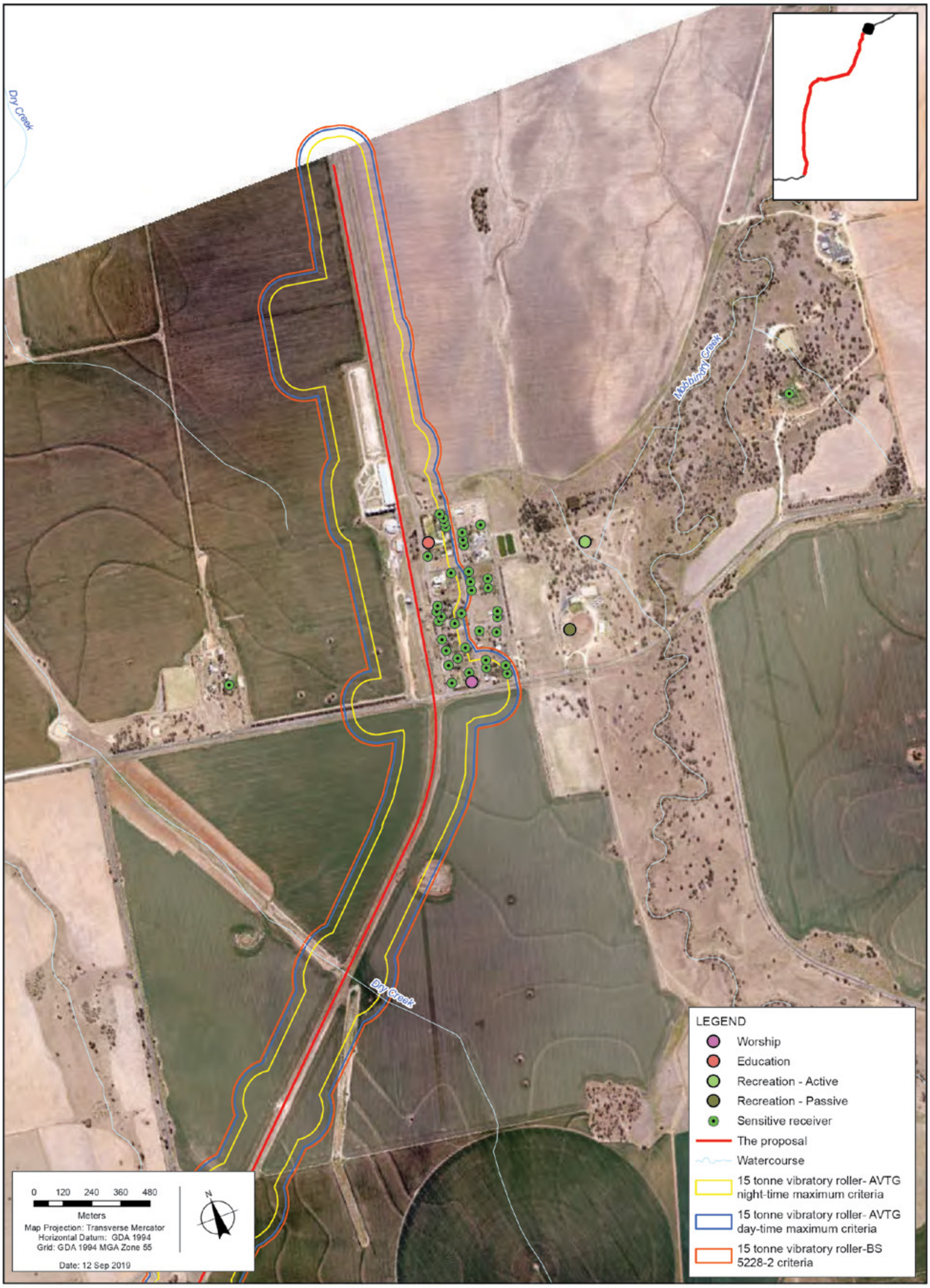
Figure C.2bd

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2be

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bf



G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bg

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bh

G:\22\17916\GIS\Maps\Deliverables\N2NS\EIS\SubmissionsPIR\2217916_SPIR004_NNS_Construction_Vibration_1.mxd Data source: Commonwealth of Australia (Geoscience Australia), 250K Topographic Data Series 3, 2006. LPI, DCDB, 2012.

Figure C.2bi

TABLE C.24: VIBRATION BUFFER DISTANCES – INTERMITTENT VIBRATION

EQUIPMENT	HUMAN COMFORT CRITERIA BASED ON BS 5228-2.2009 (1.0 MM/S)	HUMAN COMFORT BASED ON AVTG VIBRATION DOSE VALUE) (M/S1.75)			
		DAY PREFERRED VALUE 0.2 M/S1.75	DAY MAXIMUM VALUE 0.4 M/S1.75	NIGHT PREFERRED VALUE 0.13 M/S1.75	NIGHT MAXIMUM VALUE 0.26 M/S1.75
Roller	90 m	212 m	89 m	156 m	65 m
15 tonne vibratory roller	140 m	303 m	128 m	223 m	94 m
7 tonne compactor	90 m	212 m	89 m	156 m	65 m
Dozer	60 m	128 m	54 m	94 m	39 m
Backhoe	10 m	23 m	9 m	17 m	7 m
Excavator	25 m	57 m	24 m	42 m	18 m
Piling impact)	700 m	1583 m	666 m	1164 m	489 m
Piling (vibratory)[1]	110 m	767 m	101 m	147 m	83 m
Piling (bored)	120 m	275 m	116 m	202 m	85 m

Notes
1: Based on levels derived from BS 5228-2. Vibratory piling based on d-1.2 propagation relationship
2: Vibration may be amplified in multi-level buildings through the structure to the upper floors. A doubling of the buffer distances provided in Table 1 would provide a conservative allowance for this possible effect where multi storey buildings are identified.

TABLE C.25:IDS OF SENSITIVE RECEIVERS WITHIN HUMAN COMFORT BUFFER DISTANCES

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_WORx0002	NNS_WORx0002	NNS_WORx0002	NNS_Rx1313	NNS_Rx1313	NNS_Rx1313
NNS_WORx0003	NNS_WORx0003	NNS_WORx0003	NNS_Rx1316	NNS_Rx1316	NNS_Rx1316
NNS_WORx0007	NNS_WORx0007	NNS_WORx0007	NNS_Rx1320	NNS_Rx1320	NNS_Rx1320
NNS_EDUx0006	NNS_EDUx0006	NNS_EDUx0006	NNS_Rx1322	NNS_Rx1322	NNS_Rx1322
NNS_EDUx0007	NNS_EDUx0007	NNS_EDUx0007	NNS_Rx1323	NNS_Rx1323	NNS_Rx1323
NNS_REAx0016	NNS_REAx0019	NNS_REAx0019	NNS_Rx1324	NNS_Rx1330	NNS_Rx1324
NNS_REAx0019	NNS_REAx0025	NNS_REAx0029	NNS_Rx1330	NNS_Rx1331	NNS_Rx1330
NNS_REAx0025	NNS_REAx0029	NNS_REPx0002	NNS_Rx1331	NNS_Rx1332	NNS_Rx1331
NNS_REAx0029	NNS_REPx0002	NNS_REPx0005	NNS_Rx1332	NNS_Rx1335	NNS_Rx1332
NNS_REPx0002	NNS_REPx0005	NNS_REPx0014	NNS_Rx1335	NNS_Rx1344	NNS_Rx1335
NNS_REPx0005	NNS_REPx0012	NNS_Rx0725	NNS_Rx1336	NNS_Rx1350	NNS_Rx1336
NNS_REPx0012	NNS_REPx0014	NNS_Rx0744	NNS_Rx1344	NNS_Rx1353	NNS_Rx1344
NNS_REPx0014	NNS_Rx0725	NNS_Rx0745	NNS_Rx1350	NNS_Rx1356	NNS_Rx1350
NNS_Rx0725	NNS_Rx0741	NNS_Rx0748	NNS_Rx1352	NNS_Rx1358	NNS_Rx1352
NNS_Rx0741	NNS_Rx0744	NNS_Rx0766	NNS_Rx1353	NNS_Rx1361	NNS_Rx1353
NNS_Rx0744	NNS_Rx0745	NNS_Rx0767	NNS_Rx1356	NNS_Rx1365	NNS_Rx1356
NNS_Rx0745	NNS_Rx0748	NNS_Rx0778	NNS_Rx1357	NNS_Rx1366	NNS_Rx1357
NNS_Rx0748	NNS_Rx0766	NNS_Rx0786	NNS_Rx1358	NNS_Rx1370	NNS_Rx1358

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	**15 TONNE VIBRATORY ROLLER** (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	**15 TONNE VIBRATORY ROLLER** (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	**PILING (BORED)** (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	**PILING (BORED)** (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	**PILING (BORED)** (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx0766	NNS_Rx0767	NNS_Rx0794	NNS_Rx1361	NNS_Rx1372	NNS_Rx1361
NNS_Rx0767	NNS_Rx0778	NNS_Rx0797	NNS_Rx1365	NNS_Rx1374	NNS_Rx1365
NNS_Rx0778	NNS_Rx0783	NNS_Rx0800	NNS_Rx1366	NNS_Rx1376	NNS_Rx1366
NNS_Rx0783	NNS_Rx0786	NNS_Rx0805	NNS_Rx1368	NNS_Rx1380	NNS_Rx1368
NNS_Rx0786	NNS_Rx0790	NNS_Rx0806	NNS_Rx1370	NNS_Rx1382	NNS_Rx1370
NNS_Rx0790	NNS_Rx0794	NNS_Rx0812	NNS_Rx1371	NNS_Rx1387	NNS_Rx1371
NNS_Rx0794	NNS_Rx0795	NNS_Rx0817	NNS_Rx1372	NNS_Rx2452	NNS_Rx1372
NNS_Rx0795	NNS_Rx0797	NNS_Rx0819	NNS_Rx1373		NNS_Rx1373
NNS_Rx0797	NNS_Rx0798	NNS_Rx0822	NNS_Rx1374		NNS_Rx1374
NNS_Rx0798	NNS_Rx0800	NNS_Rx0823	NNS_Rx1376		NNS_Rx1376
NNS_Rx0800	NNS_Rx0805	NNS_Rx0827	NNS_Rx1380		NNS_Rx1380
NNS_Rx0805	NNS_Rx0806	NNS_Rx0830	NNS_Rx1381		NNS_Rx1381
NNS_Rx0806	NNS_Rx0812	NNS_Rx0832	NNS_Rx1382		NNS_Rx1382
NNS_Rx0812	NNS_Rx0813	NNS_Rx0833	NNS_Rx1387		NNS_Rx1387
NNS_Rx0813	NNS_Rx0816	NNS_Rx0834	NNS_Rx1392		NNS_Rx1392
NNS_Rx0816	NNS_Rx0817	NNS_Rx0835	NNS_Rx1396		NNS_Rx1394
NNS_Rx0817	NNS_Rx0819	NNS_Rx0836	NNS_Rx1398		NNS_Rx1396
NNS_Rx0819	NNS_Rx0822	NNS_Rx0837	NNS_Rx1412		NNS_Rx1398
NNS_Rx0822	NNS_Rx0823	NNS_Rx0838	NNS_Rx2452		NNS_Rx1412
NNS_Rx0823	NNS_Rx0824	NNS_Rx0841			NNS_Rx1420
NNS_Rx0824	NNS_Rx0827	NNS_Rx0843			NNS_Rx2452
NNS_Rx0827	NNS_Rx0830	NNS_Rx0859			
NNS_Rx0829	NNS_Rx0831	NNS_Rx0860			
NNS_Rx0830	NNS_Rx0832	NNS_Rx0861			
NNS_Rx0831	NNS_Rx0833	NNS_Rx0862			
NNS_Rx0832	NNS_Rx0834	NNS_Rx0863			
NNS_Rx0833	NNS_Rx0835	NNS_Rx0867			
NNS_Rx0834	NNS_Rx0836	NNS_Rx0887			
NNS_Rx0835	NNS_Rx0837	NNS_Rx0888			
NNS_Rx0836	NNS_Rx0838	NNS_Rx0889			
NNS_Rx0837	NNS_Rx0841	NNS_Rx0890			
NNS_Rx0838	NNS_Rx0843	NNS_Rx0891			
NNS_Rx0841	NNS_Rx0859	NNS_Rx0892			
NNS_Rx0843	NNS_Rx0860	NNS_Rx0893			
NNS_Rx0859	NNS_Rx0861	NNS_Rx0894			
NNS_Rx0860	NNS_Rx0862	NNS_Rx0895			
NNS_Rx0861	NNS_Rx0863	NNS_Rx0896			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx0862	NNS_Rx0867	NNS_Rx0897			
NNS_Rx0863	NNS_Rx0868	NNS_Rx0898			
NNS_Rx0867	NNS_Rx0885	NNS_Rx1257			
NNS_Rx0868	NNS_Rx0887	NNS_Rx1259			
NNS_Rx0885	NNS_Rx0888	NNS_Rx1313			
NNS_Rx0887	NNS_Rx0889	NNS_Rx1316			
NNS_Rx0888	NNS_Rx0890	NNS_Rx1320			
NNS_Rx0889	NNS_Rx0891	NNS_Rx1322			
NNS_Rx0890	NNS_Rx0892	NNS_Rx1323			
NNS_Rx0891	NNS_Rx0893	NNS_Rx1324			
NNS_Rx0892	NNS_Rx0894	NNS_Rx1330			
NNS_Rx0893	NNS_Rx0895	NNS_Rx1331			
NNS_Rx0894	NNS_Rx0896	NNS_Rx1332			
NNS_Rx0895	NNS_Rx0897	NNS_Rx1335			
NNS_Rx0896	NNS_Rx0898	NNS_Rx1336			
NNS_Rx0897	NNS_Rx1257	NNS_Rx1344			
NNS_Rx0898	NNS_Rx1259	NNS_Rx1350			
NNS_Rx1257	NNS_Rx1313	NNS_Rx1352			
NNS_Rx1259	NNS_Rx1316	NNS_Rx1353			
NNS_Rx1313	NNS_Rx1320	NNS_Rx1356			
NNS_Rx1316	NNS_Rx1322	NNS_Rx1357			
NNS_Rx1320	NNS_Rx1323	NNS_Rx1358			
NNS_Rx1322	NNS_Rx1324	NNS_Rx1361			
NNS_Rx1323	NNS_Rx1330	NNS_Rx1365			
NNS_Rx1324	NNS_Rx1331	NNS_Rx1366			
NNS_Rx1330	NNS_Rx1332	NNS_Rx1368			
NNS_Rx1331	NNS_Rx1334	NNS_Rx1370			
NNS_Rx1332	NNS_Rx1335	NNS_Rx1371			
NNS_Rx1334	NNS_Rx1336	NNS_Rx1372			
NNS_Rx1335	NNS_Rx1344	NNS_Rx1373			
NNS_Rx1336	NNS_Rx1350	NNS_Rx1374			
NNS_Rx1344	NNS_Rx1351	NNS_Rx1376			
NNS_Rx1350	NNS_Rx1352	NNS_Rx1380			
NNS_Rx1351	NNS_Rx1353	NNS_Rx1381			
NNS_Rx1352	NNS_Rx1355	NNS_Rx1382			
NNS_Rx1353	NNS_Rx1356	NNS_Rx1387			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx1355	NNS_Rx1357	NNS_Rx1392			
NNS_Rx1356	NNS_Rx1358	NNS_Rx1394			
NNS_Rx1357	NNS_Rx1361	NNS_Rx1396			
NNS_Rx1358	NNS_Rx1365	NNS_Rx1398			
NNS_Rx1361	NNS_Rx1366	NNS_Rx1401			
NNS_Rx1363	NNS_Rx1368	NNS_Rx1403			
NNS_Rx1365	NNS_Rx1370	NNS_Rx1404			
NNS_Rx1366	NNS_Rx1371	NNS_Rx1406			
NNS_Rx1368	NNS_Rx1372	NNS_Rx1407			
NNS_Rx1370	NNS_Rx1373	NNS_Rx1411			
NNS_Rx1371	NNS_Rx1374	NNS_Rx1412			
NNS_Rx1372	NNS_Rx1376	NNS_Rx1414			
NNS_Rx1373	NNS_Rx1380	NNS_Rx1419			
NNS_Rx1374	NNS_Rx1381	NNS_Rx1420			
NNS_Rx1376	NNS_Rx1382	NNS_Rx1422			
NNS_Rx1380	NNS_Rx1387	NNS_Rx1429			
NNS_Rx1381	NNS_Rx1388	NNS_Rx1430			
NNS_Rx1382	NNS_Rx1392	NNS_Rx1445			
NNS_Rx1387	NNS_Rx1394	NNS_Rx1493			
NNS_Rx1388	NNS_Rx1396	NNS_Rx1508			
NNS_Rx1392	NNS_Rx1398	NNS_Rx1526			
NNS_Rx1394	NNS_Rx1401	NNS_Rx1544			
NNS_Rx1396	NNS_Rx1402	NNS_Rx1548			
NNS_Rx1398	NNS_Rx1403	NNS_Rx1552			
NNS_Rx1401	NNS_Rx1404	NNS_Rx1574			
NNS_Rx1402	NNS_Rx1406	NNS_Rx1578			
NNS_Rx1403	NNS_Rx1407	NNS_Rx1591			
NNS_Rx1404	NNS_Rx1409	NNS_Rx1592			
NNS_Rx1406	NNS_Rx1411	NNS_Rx1610			
NNS_Rx1407	NNS_Rx1412	NNS_Rx1613			
NNS_Rx1409	NNS_Rx1413	NNS_Rx1618			
NNS_Rx1411	NNS_Rx1414	NNS_Rx1630			
NNS_Rx1412	NNS_Rx1419	NNS_Rx1634			
NNS_Rx1413	NNS_Rx1420	NNS_Rx1635			
NNS_Rx1414	NNS_Rx1422	NNS_Rx1648			
NNS_Rx1419	NNS_Rx1429	NNS_Rx1649			
NNS_Rx1420	NNS_Rx1430	NNS_Rx1664			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx1422	NNS_Rx1436	NNS_Rx1679			
NNS_Rx1426	NNS_Rx1437	NNS_Rx1685			
NNS_Rx1429	NNS_Rx1445	NNS_Rx1699			
NNS_Rx1430	NNS_Rx1450	NNS_Rx1705			
NNS_Rx1436	NNS_Rx1451	NNS_Rx1715			
NNS_Rx1437	NNS_Rx1482	NNS_Rx1721			
NNS_Rx1445	NNS_Rx1493	NNS_Rx1725			
NNS_Rx1450	NNS_Rx1508	NNS_Rx1733			
NNS_Rx1451	NNS_Rx1526	NNS_Rx1741			
NNS_Rx1463	NNS_Rx1544	NNS_Rx1743			
NNS_Rx1464	NNS_Rx1548	NNS_Rx1766			
NNS_Rx1482	NNS_Rx1552	NNS_Rx1770			
NNS_Rx1493	NNS_Rx1574	NNS_Rx1772			
NNS_Rx1508	NNS_Rx1575	NNS_Rx1774			
NNS_Rx1526	NNS_Rx1578	NNS_Rx1790			
NNS_Rx1542	NNS_Rx1591	NNS_Rx1793			
NNS_Rx1544	NNS_Rx1592	NNS_Rx1797			
NNS_Rx1548	NNS_Rx1610	NNS_Rx1801			
NNS_Rx1552	NNS_Rx1613	NNS_Rx1820			
NNS_Rx1574	NNS_Rx1618	NNS_Rx1833			
NNS_Rx1575	NNS_Rx1630	NNS_Rx1834			
NNS_Rx1578	NNS_Rx1634	NNS_Rx1848			
NNS_Rx1590	NNS_Rx1635	NNS_Rx1853			
NNS_Rx1591	NNS_Rx1648	NNS_Rx1861			
NNS_Rx1592	NNS_Rx1649	NNS_Rx1862			
NNS_Rx1610	NNS_Rx1656	NNS_Rx1872			
NNS_Rx1613	NNS_Rx1664	NNS_Rx1876			
NNS_Rx1618	NNS_Rx1671	NNS_Rx1884			
NNS_Rx1630	NNS_Rx1679	NNS_Rx1886			
NNS_Rx1634	NNS_Rx1685	NNS_Rx1892			
NNS_Rx1635	NNS_Rx1686	NNS_Rx1897			
NNS_Rx1648	NNS_Rx1699	NNS_Rx1903			
NNS_Rx1649	NNS_Rx1705	NNS_Rx1908			
NNS_Rx1656	NNS_Rx1709	NNS_Rx1914			
NNS_Rx1664	NNS_Rx1715	NNS_Rx1915			
NNS_Rx1671	NNS_Rx1721	NNS_Rx1918			
NNS_Rx1679	NNS_Rx1725	NNS_Rx1920			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx1685	NNS_Rx1733	NNS_Rx1925			
NNS_Rx1686	NNS_Rx1741	NNS_Rx1926			
NNS_Rx1699	NNS_Rx1743	NNS_Rx1928			
NNS_Rx1705	NNS_Rx1753	NNS_Rx1945			
NNS_Rx1709	NNS_Rx1766	NNS_Rx1946			
NNS_Rx1715	NNS_Rx1767	NNS_Rx1951			
NNS_Rx1721	NNS_Rx1770	NNS_Rx1953			
NNS_Rx1725	NNS_Rx1772	NNS_Rx1954			
NNS_Rx1733	NNS_Rx1774	NNS_Rx1955			
NNS_Rx1741	NNS_Rx1790	NNS_Rx1956			
NNS_Rx1743	NNS_Rx1792	NNS_Rx1957			
NNS_Rx1753	NNS_Rx1793	NNS_Rx1958			
NNS_Rx1766	NNS_Rx1797	NNS_Rx1959			
NNS_Rx1767	NNS_Rx1801	NNS_Rx1960			
NNS_Rx1770	NNS_Rx1802	NNS_Rx1961			
NNS_Rx1772	NNS_Rx1817	NNS_Rx1962			
NNS_Rx1774	NNS_Rx1820	NNS_Rx1965			
NNS_Rx1790	NNS_Rx1833	NNS_Rx1967			
NNS_Rx1792	NNS_Rx1834	NNS_Rx1968			
NNS_Rx1793	NNS_Rx1848	NNS_Rx1970			
NNS_Rx1797	NNS_Rx1853	NNS_Rx1972			
NNS_Rx1801	NNS_Rx1861	NNS_Rx1975			
NNS_Rx1802	NNS_Rx1862	NNS_Rx1978			
NNS_Rx1817	NNS_Rx1872	NNS_Rx1979			
NNS_Rx1820	NNS_Rx1876	NNS_Rx1982			
NNS_Rx1828	NNS_Rx1884	NNS_Rx1983			
NNS_Rx1833	NNS_Rx1886	NNS_Rx1984			
NNS_Rx1834	NNS_Rx1892	NNS_Rx1986			
NNS_Rx1848	NNS_Rx1897	NNS_Rx1987			
NNS_Rx1853	NNS_Rx1903	NNS_Rx1989			
NNS_Rx1861	NNS_Rx1908	NNS_Rx1990			
NNS_Rx1862	NNS_Rx1914	NNS_Rx1993			
NNS_Rx1864	NNS_Rx1915	NNS_Rx1994			
NNS_Rx1872	NNS_Rx1918	NNS_Rx1997			
NNS_Rx1876	NNS_Rx1920	NNS_Rx1998			
NNS_Rx1884	NNS_Rx1925	NNS_Rx1999			
NNS_Rx1886	NNS_Rx1926	NNS_Rx2001			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	**15 TONNE VIBRATORY ROLLER** (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	**15 TONNE VIBRATORY ROLLER** (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	**PILING (BORED)** (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	**PILING (BORED)** (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	**PILING (BORED)** (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx1892	NNS_Rx1927	NNS_Rx2002			
NNS_Rx1897	NNS_Rx1928	NNS_Rx2266			
NNS_Rx1903	NNS_Rx1945	NNS_Rx2267			
NNS_Rx1908	NNS_Rx1946	NNS_Rx2270			
NNS_Rx1914	NNS_Rx1951	NNS_Rx2287			
NNS_Rx1915	NNS_Rx1953	NNS_Rx2299			
NNS_Rx1918	NNS_Rx1954	NNS_Rx2300			
NNS_Rx1920	NNS_Rx1955	NNS_Rx2301			
NNS_Rx1925	NNS_Rx1956	NNS_Rx2302			
NNS_Rx1926	NNS_Rx1957	NNS_Rx2304			
NNS_Rx1927	NNS_Rx1958	NNS_Rx2305			
NNS_Rx1928	NNS_Rx1959	NNS_Rx2306			
NNS_Rx1930	NNS_Rx1960	NNS_Rx2308			
NNS_Rx1945	NNS_Rx1961	NNS_Rx2311			
NNS_Rx1946	NNS_Rx1962	NNS_Rx2313			
NNS_Rx1951	NNS_Rx1964	NNS_Rx2314			
NNS_Rx1953	NNS_Rx1965	NNS_Rx2315			
NNS_Rx1954	NNS_Rx1966	NNS_Rx2317			
NNS_Rx1955	NNS_Rx1967	NNS_Rx2318			
NNS_Rx1956	NNS_Rx1968	NNS_Rx2319			
NNS_Rx1957	NNS_Rx1969	NNS_Rx2320			
NNS_Rx1958	NNS_Rx1970	NNS_Rx2324			
NNS_Rx1959	NNS_Rx1972	NNS_Rx2331			
NNS_Rx1960	NNS_Rx1973	NNS_Rx2333			
NNS_Rx1961	NNS_Rx1975	NNS_Rx2334			
NNS_Rx1962	NNS_Rx1977	NNS_Rx2342			
NNS_Rx1964	NNS_Rx1978	NNS_Rx2343			
NNS_Rx1965	NNS_Rx1979	NNS_Rx2344			
NNS_Rx1966	NNS_Rx1980	NNS_Rx2345			
NNS_Rx1967	NNS_Rx1982	NNS_Rx2346			
NNS_Rx1968	NNS_Rx1983	NNS_Rx2347			
NNS_Rx1969	NNS_Rx1984	NNS_Rx2350			
NNS_Rx1970	NNS_Rx1986	NNS_Rx2352			
NNS_Rx1971	NNS_Rx1987	NNS_Rx2355			
NNS_Rx1972	NNS_Rx1989	NNS_Rx2356			
NNS_Rx1973	NNS_Rx1990	NNS_Rx2358			
NNS_Rx1974	NNS_Rx1993	NNS_Rx2359			

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx1975	NNS_Rx1994	NNS_Rx2361			
NNS_Rx1977	NNS_Rx1997	NNS_Rx2367			
NNS_Rx1978	NNS_Rx1998	NNS_Rx2369			
NNS_Rx1979	NNS_Rx1999	NNS_Rx2452			
NNS_Rx1980	NNS_Rx2001	NNS_Rx2453			
NNS_Rx1982	NNS_Rx2002	NNS_Rx2455			
NNS_Rx1983	NNS_Rx2266	NNS_Rx2457			
NNS_Rx1984	NNS_Rx2267	NNS_Rx2467			
NNS_Rx1985	NNS_Rx2270	NNS_Rx2481			
NNS_Rx1986	NNS_Rx2272	NNS_Rx2482			
NNS_Rx1987	NNS_Rx2287				
NNS_Rx1989	NNS_Rx2298				
NNS_Rx1990	NNS_Rx2299				
NNS_Rx1991	NNS_Rx2300				
NNS_Rx1993	NNS_Rx2301				
NNS_Rx1994	NNS_Rx2302				
NNS_Rx1995	NNS_Rx2304				
NNS_Rx1997	NNS_Rx2305				
NNS_Rx1998	NNS_Rx2306				
NNS_Rx1999	NNS_Rx2308				
NNS_Rx2001	NNS_Rx2311				
NNS_Rx2002	NNS_Rx2313				
NNS_Rx2266	NNS_Rx2314				
NNS_Rx2267	NNS_Rx2315				
NNS_Rx2270	NNS_Rx2316				
NNS_Rx2272	NNS_Rx2317				
NNS_Rx2287	NNS_Rx2318				
NNS_Rx2298	NNS_Rx2319				
NNS_Rx2299	NNS_Rx2320				
NNS_Rx2300	NNS_Rx2324				
NNS_Rx2301	NNS_Rx2331				
NNS_Rx2302	NNS_Rx2333				
NNS_Rx2304	NNS_Rx2334				
NNS_Rx2305	NNS_Rx2340				
NNS_Rx2306	NNS_Rx2341				
NNS_Rx2308	NNS_Rx2342				
NNS_Rx2311	NNS_Rx2343				

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx2313	NNS_Rx2344				
NNS_Rx2314	NNS_Rx2345				
NNS_Rx2315	NNS_Rx2346				
NNS_Rx2316	NNS_Rx2347				
NNS_Rx2317	NNS_Rx2348				
NNS_Rx2318	NNS_Rx2350				
NNS_Rx2319	NNS_Rx2352				
NNS_Rx2320	NNS_Rx2355				
NNS_Rx2324	NNS_Rx2356				
NNS_Rx2331	NNS_Rx2357				
NNS_Rx2333	NNS_Rx2358				
NNS_Rx2334	NNS_Rx2359				
NNS_Rx2340	NNS_Rx2361				
NNS_Rx2341	NNS_Rx2367				
NNS_Rx2342	NNS_Rx2369				
NNS_Rx2343	NNS_Rx2373				
NNS_Rx2344	NNS_Rx2375				
NNS_Rx2345	NNS_Rx2376				
NNS_Rx2346	NNS_Rx2377				
NNS_Rx2347	NNS_Rx2452				
NNS_Rx2348	NNS_Rx2453				
NNS_Rx2350	NNS_Rx2455				
NNS_Rx2352	NNS_Rx2457				
NNS_Rx2355	NNS_Rx2467				
NNS_Rx2356	NNS_Rx2481				
NNS_Rx2357	NNS_Rx2482				
NNS_Rx2358	NNS_Rx2484				
NNS_Rx2359					
NNS_Rx2361					
NNS_Rx2367					
NNS_Rx2369					
NNS_Rx2373					
NNS_Rx2375					
NNS_Rx2376					
NNS_Rx2377					
NNS_Rx2452					
NNS_Rx2453					

15 TONNE VIBRATORY ROLLER (BS 5228-2:2009 CRITERIA 140 M FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG DAY-TIME MAX CRITERIA 128 FROM ROLLER)	15 TONNE VIBRATORY ROLLER (AVTG NIGHT-TIME MAX CRITERIA 94 M FROM ROLLER)	PILING (BORED) (AVTG DAY-TIME MAX CRITERIA 116 M FROM BRIDGES)	PILING (BORED) (VTG NIGHT-TIME MAX CRITERIA 85 M FROM BRIDGE)	PILING (BORED) (BS 5228-2:2009 CRITERIA 120 M FROM BRIDGES)
NNS_Rx2455					
NNS_Rx2457					
NNS_Rx2460					
NNS_Rx2467					
NNS_Rx2481					
NNS_Rx2482					
NNS_Rx2484					