

Appendix D – Regional Ecosystem Clearing Information



**Gladstone Area
Water Board**



Areas of Regional Ecosystem Impacted by the ROW

Details are provided for all areas of RE that are impacted by the ROW (See table below). VCS 1 – 24, 31 and 32 are within the Brigalow Belt and New England Tablelands Bioregion whilst VCS 26 - 29, and 33 exist within the South-East Queensland Bioregion. Thus, two Regional Vegetation Management Codes (RVM Codes) apply. Maps showing the pipeline alignment and each VCS are also provided below.

VCS* Number	RE Label	Vegetation Management Status and Description	Description, and Details from EIS Field Work **	Area to be cleared (m ²)	Map Ref.	Drawing Ref. and Chainage***
Areas outside of the State Development Areas						
1	11.3.25 / 11.3.27c	<i>Not Of Concern</i> 11.3.25: <i>Not Of Concern</i>. 80% coverage. <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines 11.3.27c: <i>Not Of Concern</i>. 20% coverage. Palustrine wetland (e.g. vegetated swamp). Mixed grassland or sedgeland with areas of open water +/- aquatic species. Dominated by a range of species including <i>Eleocharis</i> spp., <i>Nymphoides</i> spp. and sometimes <i>Phragmites australis</i>. Occurs on closed depressions on alluvial plains that are intermittently flooded in inlands parts of the bioregion. This area is considered a 'significant wetland' due to the existence of RE11.3.27 (see table 14 of the RVM Code for Brigalow Belt and New England Tablelands Bioregions), the existence of aquatic species, and also due to the fact that it is mapped as a Lake as per the 1:250 000	Detailed Site 2 (120m to the south-east), (Lagoon 1): There was an area of wetland mapped on RE mapping (EPA 2005b) past the end of Tyrrel Road, which occurred mainly on Lot 102 LN176. Due to restricted access to this property, the adjacent property to the west was sampled (Lot 3 RP843225), with access from the southern edge of the wetland. Aquatic vegetation at the site was in good general condition (i.e. inundated, native aquatic vegetation with limited aquatic weed infestation). However, approximately 100 m north of this location (the northern edge), sampling by aquatic ecologists (2007), found that the banks were infested by fireweed (<i>Senecio madagascariensis</i>). Although clearing has probably occurred around the lagoon, it is possible that riparian trees were originally sparse or absent close to the edge of the lagoon in this area. This VSC exists on two Freehold properties. Construction method: This area will be trenched.	6,963	001	08164-DWG-24100-C-4120. Chainage 7320 to 7554

		Geoscience Australia Topographic Mapping.				
2	11.3.3 / 11.3.4	<i>Of Concern - dominant</i> 11.3.3: <i>Of Concern</i>. 50% coverage, <i>Eucalyptus coolabah</i> woodland on alluvial plains. 11.3.4: <i>Of Concern</i>. 50% coverage, <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus spp.</i> tall woodland on alluvial plains Lion Creek is considered a watercourse as per the definition of watercourse in the RVM Code for Brigalow Belt and New England Tablelands Bioregions (it is mapped as a minor river on the 1:100 000 Geoscience Australia Topographic Mapping). Based on the 1:100 000 Geoscience Australia Topographic Mapping, it appears that the pipeline alignment does not cross lion creek within the area of RE. However, based on the aerial photography, it appears that Lion Creek exists within the RE. Ground truthing is needed to verify the exact location of Lion Creek. In addition, Lion Creek is a watercourse with a stream order of 4 as per the 1:100 000 Geoscience Australia Topographic Mapping.	This VCS is near Lion Creek. Detailed Site 3a: An area of Blue Gum (<i>Eucalyptus tereticornis</i>) and Coolabah (<i>Eucalyptus coolabah</i>) was observed near the T-junction of Malchi Nine Mile Road and Fairy Bower Road, conforming with the representation on mapping as <i>Of Concern</i> RE 11.3.3 (EPA 2005b). This area had few trees, indicating the diffuse edge of the very open woodland, and/or selective clearing. Only a few individual trees occurred in the proposed corridor. Lion Creek is an ephemeral drainage path. Lion Creek provides marginal, temporary habitat (during flows) for several fish species of conservation significance, none of which are protected under legislation. During non-flood periods, particularly during drought, the small size of the creek is likely to limit fisheries habitat values of these lagoons. At the time of sampling, the creek did not contain surface water. A small (approximately 50m long) ephemeral pool/floodway, with very low habitat values, was present approximately 200m away from the proposed corridor route, but would not be directly affected by the project. Stream bed sediments consisted of compacted clays and silts. No aquatic macrophytes and little riparian vegetation were present, with surrounding lands mostly cleared for grazing. The weed species Parthenium (<i>Parthenium hysterophorus</i>) and Fireweed (<i>Senecio madagascariensis</i>) formed a dense cover on both banks. This area covers two Freehold properties and a road reserve at the southern extent of the VCS. Vegetation clearing within the road reserve will be avoided.	21,742	002	08164-DWG-24100-C-4046 and 08164-DWG-24100-C-4047. Chainage 10069 to 10800

3	11.3.27	11.3.27b: <i>Not Of Concern</i>. Palustrine wetland (e.g. vegetated swamp). Vegetation ranges from open water ± aquatics and emergents such as <i>Potamogeton crispus</i>, <i>Myriophyllum verrucosum</i>, <i>Chara</i> spp., <i>Nitella</i> spp., <i>Nymphaea violacea</i>, <i>Ottelia ovalifolia</i>, <i>Nymphoides indica</i>, <i>N. crenata</i>, <i>Potamogeton tricarlinatus</i>, <i>Cyperus difformis</i>, <i>Vallisneria spiralis</i> and <i>Hydrilla verticillata</i>. Often with fringing woodland, commonly <i>Eucalyptus camaldulensis</i> or <i>E. coolabah</i> but also a wide range of other species including <i>Eucalyptus platyphylla</i>, <i>E. tereticornis</i>, <i>Melaleuca</i> spp., <i>Acacia holosericea</i> or other <i>Acacia</i> spp. Occurs on billabongs no longer connected to the channel flow. This area is considered a 'significant wetland' due to the existence of RE11.3.27 (see table 14 of the RVM Code for Brigalow Belt and New England Tablelands Bioregions), the existence of aquatic species, and also due to the fact that it is mapped as a Wetland as per the 1:250 000 Geoscience Australia Topographic Mapping.	Construction method: This area will be trenched.	19	003	08164-DWG-24100-C-4049. Approx Chainage 14049 to 14057
Areas inside the SGICSDA						
4	11.3.27	11.3.27b, As above. This area is considered a 'significant wetland' due to the existence of RE11.3.27 (see table 14 of the RVM Code for Brigalow Belt and New England Tablelands Bioregions), the	Detailed Site 5, Lagoon 2: There was a small wetland north of Fairy Bower Road, represented on RE mapping as <i>Not Of Concern</i> RE 11.3.27 (EPA 2005a) about 400 m west of Fogarty Road, on Lot 248 LIV401036. The wetland was a highly disturbed lagoon, with a high degree of weed	2,037	004	08164-DWG-24100-C-4051 and 08164-DWG-24000-C-0220. Chainage

		existence of aquatic species, and also due to the fact that it is mapped as a Lake as per the 1:250 000 Geoscience Australia Topographic Mapping.	infestation and limited native aquatic vegetation. Weed infestation was unidentifiable, however were known to be weeds due to invasive growth habit. There was also a lagoon several hundred metres to the east, of similar condition, but it had been dammed, and was not of original wetland form (i.e. artificial water level). Construction method: This area will be microtunnelled and the RE will be avoided.			17661 to 17731
5	11.3.25 / 11.3.27	<i>Not Of Concern</i> 11.3.25: <i>Not Of Concern</i>. 80% coverage. <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines 11.3.27c: <i>Not Of Concern</i>. 20% coverage. Palustrine wetland (e.g. vegetated swamp). Mixed grassland or sedgeland with areas of open water +/- aquatic species. Dominated by a range of species including <i>Eleocharis spp.</i>, <i>Nymphoides spp.</i> and sometimes <i>Phragmites australis</i>. Occurs on closed depressions on alluvial plains that are intermittently flooded in inland parts of the bioregion. This area is considered a Wetland due to the existence of RE11.3.27 (see table 14 of the RVM Code for Brigalow Belt and New England Tablelands Bioregions).	Gavial Creek. No field survey data is currently available.. Construction method: This area will be microtunnelled. The northern microtunnelling pit will be just outside the area of RE, however the southern pit will be within the area of RE by 2m. Based on aerial photography, no trees will be affected and only ground layer flora species will be cleared.	2,196	005	08164-DWG-24100-C-4058 and 08164-DWG-24000-C-0225 Chainage 29125 to 29196
6	11.1.4	11.1.4d: <i>Not Of Concern</i>. Estuarine wetlands (e.g. mangroves). Dominated by a range of species from genera such as from <i>Avicennia sp.</i>, <i>Cerlops sp.</i>, <i>Rhizophora sp.</i> and <i>Bruguiera sp.</i> which form a closed forest. A low shrub layer composed of	Inkerman Creek No field survey data is currently available. Construction method: This area will be microtunnelled to avoid the RE. The microtunnelling pit for the pipeline entry will not be within the area of RE, however, the pit for the	2,942	006	08164-DWG-24100-C-4093 and 08164-DWG-24100-C-4145. Chainage 56903 to

		species such as <i>Acanthus ilicifolius</i> , <i>Acrostichum speciosum</i> , <i>Crinum pedunculatum</i> or juvenile canopy species is often present. Epiphytes on the canopy are common. Occurs on the landward edge of the tidal flats and in the upper tidal reaches of creeks and rivers where there is a high freshwater influence. This is considered to be part of the coastal region of the Brigalow Belt Region (Townsville Plains subregion, 11.1). See definition of 'coastal subregions of the Brigalow Belt Bioregion' in the RVM Code for Brigalow Belt and New England Tablelands Bioregions.	pipeline exit will be.			57004
7	11.11.16 / 11.3.26	<i>Of Concern - dominant</i> 11.11.16: <i>Of Concern</i> . 90% coverage. <i>Eucalyptus cambageana</i> , <i>Acacia harpophylla</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding. Lowlands. 11.3.26: <i>Not Of Concern</i> . 10% Coverage. <i>Eucalyptus moluccana</i> or <i>E. microcarpa</i> woodland to open forest on margins of alluvial plains	Detailed Site 10a and Short Site 10c: RE mapping shows a remnant <i>Of Concern</i> community off the Toonda Port Alma Road of Northern Blackbutt (<i>Eucalyptus cambageana</i>) with Brigalow (<i>Acacia harpophylla</i>), mosaiced with Grey Box (<i>Eucalyptus moluccana</i>) on Lot 98 DS186 and Lot 99 DS186. However, site inspection found that the remnant was mostly low Brigalow (<i>Acacia harpophylla</i>) (probably regrowth) and some Belah (<i>Casuarina cristata</i>). There was an infestation of Rubber Vine (<i>Cryptostegia grandiflora</i>) around much of the edge of the remnant Construction method: This area will be trenched.	23,939	007	08164-DWG-24100-C-4078. Chainage 60190 to 61015
8	11.1.2	11.1.2a: <i>Not Of Concern</i> . Estuarine wetlands (e.g. mangroves). Bare mud flats on Quaternary estuarine deposits, with very isolated individual stunted mangroves such as <i>Avicennia marina</i> and/or <i>Ceriops tagal</i> . May have obvious salt crusts on the soil	Detailed site 11a: Marine drainages north of the Twelve Mile Road were identified for sampling although vegetation appeared sparse on aerial photos. Site 11a was located on a road reserve between Lot 84 DS185 and Lot 85 DS185, along a minor creek with marine influence. The site is 650 metres west from Twelve Mile Creek.	45	008	08164-DWG-24100-C-4080. Chainage 64891 to 64905

		surface. This is considered to be part of the coastal region of the Brigalow Belt Region (Townsville Plains subregion, 11.1). See definition of 'coastal subregions of the Brigalow Belt Bioregion' in the RVM Code for Brigalow Belt and New England Tablelands Bioregions.	Although mapped as <i>Not Of Concern</i> (EPA 2005b), a eucalypt regeneration area, fenced off from grazing stock, was observed at the site. Blue Gums (<i>Eucalyptus tereticornis</i>) in this enclosure were a maximum of about 4 m tall, with some scattered mature individuals. Construction method: This area will be trenched. As this area of RE enters the 6m into the width of the ROW, most of the clearing of this area will be completely avoided by reducing the width of the construction footprint by 5m.			
9	11.1.4 / 11.3.4	<i>Of Concern</i> - Subdominant 11.1.4: <i>Not Of Concern</i> . 85% coverage. Mangrove forest/woodland on marine clay plains. 11.3.4: <i>Of Concern</i> . 15% coverage. <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains	Area adjacent to Horrigan Creek. For VCS 9, 10 and 11: Near Detailed Site 16b: In the Horrigan Creek (Short sites 16a and 16b) and Raglan Creek (Short site 17) area, RE mapping identifies extensive areas of <i>Of Concern</i> mangroves, observed to be dominated by Blind Your Eyes Mangrove (<i>Excoecaria agallocha</i>) and Grey Mangrove (<i>Avicennia marina</i>). A large area of mangroves in good condition was observed on Raglan Creek at Site 17, in conformance with representation on mapping as <i>Not Of Concern</i> RE 11.1.4. An adjacent unmapped, disturbed area of Narrow-leafed Ironbark (<i>Eucalyptus crebra</i>) was observed to be in poor condition due to heavy recreational use and dumping. Construction method: Although the crossing at Horrigan Creek will be microtunnelled, this area (which lies further to the east) will be trenched. This area of RE enters the construction footprint by a maximum of 16m. Clearing of this area will be minimised by reducing the width of the construction footprint by 5m from the northern edge.	1,251	009	08164-DWG-24100-C-4085 and 08164-DWG-24100-C-4160. Chainage 72439 to 72555
10	11.1.4 / 11.3.4	As above	Area Adjacent to Raglan Creek. For field survey information, see above for VCS	3,610	009	08164-DWG-24100-C-4086.

			9. Construction method: This area will be trenched.				Chainage 73183 to 73353
11	11.1.4 / 11.3.4	As above	Raglan Creek For field survey information, see above for VCS 9. Construction method: This area will be microtunnelled. The microtunnelling pits are within the area of RE; however, based on aerial photography, only a few trees will be cleared, with clearing mainly affecting ground layer flora species.	4,113	009	08164-DWG- 24100-C-4165 and 08164-DWG- 24100-C- 4086. Chainage 73389 to 73559	
12	11.3.26 / 11.3.4	<i>Of Concern</i> - Subdominant 11.3.26: <i>Not Of Concern</i> . 80% coverage. <i>Eucalyptus moluccana</i> or <i>E.</i> <i>microcarpa</i> woodland to open forest on margins of alluvial plains 11.3.4: <i>Of Concern</i> . 20% coverage. <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains	No field survey data is currently available. Construction method: This area will be trenched.	2,604	010	08164-DWG- 24200-C- 6016. Chainage 85332 to 85439	
13	11.3.26 / 11.3.4	As above	Detailed Site 23: Remnant Grey Box (<i>Eucalyptus moluccana</i>) forest in good condition was observed on Lot 114 DS256 and Lot 6 RP214228. Construction method: This area will be trenched.	25,368	011	08164-DWG- 24200-C-6043 and 08164- DWG-24200- C-604. Chainage 90277 to 91355	
Areas inside the GSDA							
14	11.3.26 / 11.3.4	<i>Of Concern</i> - Subdominant 11.3.26: <i>Not Of Concern</i> . 60% coverage. <i>Eucalyptus moluccana</i> or <i>E.</i> <i>microcarpa</i> woodland to open forest	Predicted Short Site 29a and b (over 300m to the north-west): Short sites 29a and 29b confirmed RE mapping of <i>Not Of Concern</i> Grey Box (<i>Eucalyptus moluccana</i>), which was in good condition. Note that access permission for this	4,221	012	08164-DWG- 24200-C- 6051. Chainage 102167 to	

		on margins of alluvial plains 11.3.4: <i>Of Concern</i> . 40% coverage. <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains	site was not granted, and it was not visible from off-site. Construction method: This area will be trenched.			102416
15	11.11.15	11.11.15: <i>Not Of Concern</i> . <i>Eucalyptus crebra</i> woodland on deformed and metamorphosed sediments and interbedded volcanics.	Site 32: A large remnant was observed over these three sites, which confirmed that the RE mapping was correct, with predominantly Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>) at Site 32 (as <i>Not Of Concern</i> RE 11.11.15), Spotted Gum (<i>Corymbia citriodora</i>) at Site 33 (as <i>Not Of Concern</i> RE 11.11.4) and Grey Box (<i>Eucalyptus moluccana</i>) at Site 34 (as <i>Of Concern</i> RE 11.2.26). Site 32 (100m to the south-east): A large remnant was observed over the three sites (32, 33 and 34), which confirmed that the RE mapping was correct, with predominantly Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>) at Site 32 (as <i>Not Of Concern</i> RE 11.11.15). Construction method: This area will be trenched.	6,198	013	08164-DWG-24200-C-6053. and 08164-DWG-24200-C-6054. Chainage 106096 to 106309
16	11.3.26 / 11.11.4 / 11.3.4	<i>Of Concern</i> - Sub-dominant 11.3.26: <i>Not Of Concern</i> . 40% coverage. <i>Eucalyptus moluccana</i> or <i>E. microcarpa</i> woodland to open forest on margins of alluvial plains 11.11.4c: <i>Not Of Concern</i> . 40% coverage. <i>Eucalyptus moluccana</i> dominated woodland. Other tree species listed as part of 11.11.4 may occur as sub or co-dominant species. 11.3.4. <i>Of Concern</i> . 20% Coverage. <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains.	Site 32 (70m to the south): A large remnant was observed over the three sites (32, 33 and 34), which confirmed that the RE mapping was correct, with predominantly Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>) at Site 32 Construction method: This area will be trenched.	4,213	013	08164-DWG-24200-C-6053. and 08164-DWG-24200-C-6054. Chainage 106304 to 106448
17	11.11.4 / 11.11.15 /	<i>Not Of Concern</i> 11.11.4: <i>Not Of Concern</i> . 70%	Site 33 (50m to the south): A large remnant was observed over the three sites (32, 33 and 34),	14,191	013	08164-DWG-24200-C-

	11.11.5	coverage. <i>Eucalyptus crebra</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding. 11.11.4 lies within coastal ranges. 11.11.4c: <i>Not Of Concern</i>. 10% coverage. <i>Eucalyptus moluccana</i> dominated woodland. Other tree species listed as part of 11.11.4 may occur as sub or co-dominant species. 11.11.15: <i>Not Of Concern</i>. 10% Coverage. <i>Eucalyptus crebra</i> woodland on deformed and metamorphosed sediments and interbedded volcanics. 11.11.5 <i>Not Of Concern</i>. 10% coverage. Microphyll vine forest ± <i>Araucaria cunninghamii</i> on old sedimentary rocks with varying degrees of metamorphism and folding The western portion of VCS 17 covers 3,176m² of essential habitat.	which confirmed that the RE mapping was correct, with Spotted Gum (<i>Corymbia citriodora</i>) at Site 33 (as <i>Not Of Concern</i> RE 11.11.4). Construction method: This area will be trenched.			6053. and 08164-DWG- 24200-C- 6054. Chainage 106445 to 106922
18	11.3.26 / 11.11.4 / 11.3.4	<i>Of Concern</i> - Sub-dominant 11.3.26: <i>Not Of Concern</i>. 40% coverage. <i>Eucalyptus moluccana</i> or <i>E. microcarpa</i> woodland to open forest on margins of alluvial plains 11.11.4c: <i>Not Of Concern</i>. 40% coverage. <i>Eucalyptus moluccana</i> dominated woodland. Other tree species listed as part of 11.11.4 may occur as sub or co-dominant species. 11.3.4. <i>Of Concern</i>. 20% Coverage. <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains. This VCS is essential habitat.	Site 34 (50m to the south): A large remnant was observed over the three sites (32, 33 and 34), which confirmed that the RE mapping was correct, with Grey Box (<i>Eucalyptus moluccana</i>) at Site 34 (as <i>Of Concern</i> RE 11.2.26). Construction method: This area will be trenched.	2,343	013	08164-DWG- 24200-C- 6053. and 08164-DWG- 24200-C- 6054. Chainage 107627 to 107879

19	11.3.26 / 11.11.4 / 11.3.4	As above This VCS is essential habitat.	No field survey data is currently available. Construction method: This area will be trenched.	6,655	014	08164-DWG- 24200-C- 6054. Chainage 107575 to 107825
20	11.11.4 / 11.11.15 / 11.11.5 / 11.11.18	<i>Endangered</i> - Sub-dominant 11.11.4: <i>Not Of Concern</i> . 35% coverage. <i>Eucalyptus crebra</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding. 11.11.4 lies within coastal ranges. 11.11.15: <i>Not Of Concern</i> . 35% Coverage. <i>Eucalyptus crebra</i> woodland on deformed and metamorphosed sediments and interbedded volcanics. 11.11.4c: <i>Not Of Concern</i> . 10% coverage. <i>Eucalyptus moluccana</i> dominated woodland. Other tree species listed as part of 11.11.4 may occur as sub or co-dominant species. 11.11.5 <i>Not Of Concern</i> . 10% coverage. Microphyll vine forest ± <i>Araucaria cunninghamii</i> on old sedimentary rocks with varying degrees of metamorphism and folding 11.11.18: <i>Endangered</i> . 10% coverage. Semi-evergreen vine thicket on old sedimentary rocks with varying degrees of metamorphism and folding.	Detailed Site 36 is the closest site to Vegetation Clearing Site (VCS) 20, lying approximately 150m to the south of the VCS. The vegetation on and around this site was in fair to poor condition due to structural disturbance and some fragmentation. All vegetation represented by this site was Not Of Concern. Short site 37b (see below) was the next nearest site, was a very small and un-mappable patch of softwood scrub species with no remnant structure. It was a group of trees which was too small and discontinuous to constitute a remnant of the Endangered 11.11.18. The group of trees was only about two trees wide and about ten trees long, with an open disturbed canopy. No Threatened Species were found on these sites. The Endangered 11.11.18 <u>does not</u> occur as a remnant in this area of RE and this area of RE would more correctly labelled as Not of concern. Therefore, VCS 20 will not contain RE 11.11.18. Construction method: This area will be trenched.	3,685	015	08164-DWG- 24300-C-8041 Chainage 109900 to 110034
21	11.3.25	11.3.25: <i>Not Of Concern</i> . <i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	Detailed Site 37a and Short Site 37 b are the closest sites to VCS 21, lying approximately 70m to the south of the VCS. The vegetation on and around these sites was in fair condition due to structural disturbance and	9,583	015	08164-DWG- 24300-C-8041 Chainage 110024 to 110391

			some fragmentation. All vegetation represented by these sites was Not Of Concern. Short site 37b was a very small and un-mappable patch of softwood scrub species with no remnant structure. The softwood scrub species observed at this site can occur in Endangered RE 11.11.18, but in this case, cannot be classified as an Endangered remnant. Vegetation at Short Site 37b is Not Of Concern because it is non-remnant and un-mappable (see above for VCS 20). Also, no Threatened Species were found on this site. It should be noted that the RE mapping polygon on which Short Site 37b occurs is currently incorrectly mapped as solely 11.3.25 (riverine and alluvial vegetation). It also contains remnant traces of 11.11.4/11.11.15, and in the case of site 37b, non-remnant traces of 11.11.18 (significantly less than 5% of the polygon's area). This information does not change the status of the RE from being Not of Concern. These additional REs are mapped as occurring within the adjacent <u>pre-clearing</u> polygon on which site 36 occurs. The Endangered 11.11.18 <u>does not</u> occur as a remnant in either of these polygons. Therefore, no remnant RE 11.11.18 will occur in VCS 21 and it is also unlikely that <u>non-remnant</u> RE 11.11.18 will occur in VCS 21 due to its landform (this RE was observed to occur only on the steeper hills south of the existing slurry pipeline). Construction method: This area will be trenched.			
22	11.3.25	As above	Sandy Creek. Short Site 38 is the closest site to VCS 20, lying approximately 400m to the north-east of the VCS. Remnant fragments were observed on Detailed Sites 36 and 37a, and Short sites 37b and 38,	674	016	08164-DWG-24300-C-8042. Chainage 111203 to 111274

				and were in poor condition due to structural disturbance and fragmentation. All vegetation represented by these sites was <i>Not Of Concern</i> . Construction method: This area will be trenched. This area of RE enters the construction footprint by a maximum of 13m. Clearing of this area will be minimised by reducing the width of the construction footprint by 5m from the southern edge.				
23	11.3.25	As above		Sandy Creek. Short Site 38 is the closet site to VCS 23, lying approximately 50m to the north-east of the VCS. Remnant fragments were observed on Detailed Sites 36 and 37a, and Short sites 37b and 38, and were in poor condition due to structural disturbance and fragmentation. All vegetation represented by these sites was <i>Not Of Concern</i> . Construction method: This area will be trenched.	2,740	016	08164-DWG-24300-C-8042. Chainage 111736 to 111948	
24	11.11.4	11.11.4: <i>Not Of Concern</i> . <i>Eucalyptus crebra</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding. 11.11.4 lies within coastal ranges.		No field survey data is currently available. Construction method: This area will be trenched. This area of RE enters the construction footprint by a maximum of 0.5m. Clearing of this area will be completely avoided by reducing the width of the construction footprint.	1	016	08164-DWG-24300-C-8042. Chainage 112522 to 112524	
25	11.3.4	11.3.4: <i>Of Concern</i> . <i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains		No field survey data is currently available. Construction method: This area will be trenched.	1,997	017	08164-DWG-24300-C-8043. Chainage 113399 to 113478	
26	12.11.6 / 12.11.14	<i>Of Concern</i> - Sub-dominant 12.11.6: <i>Not Of Concern</i> . 95% coverage. Open-forest to woodland of <i>Corymbia citriodora</i> generally with <i>Eucalyptus crebra</i> on metamorphics ± interbedded volcanics.		No field survey data is currently available. Construction method: This area will be trenched.	30,019	018	08164-DWG-24300-C-8043. Chainage 113951 to 115052	

		12.11.14: <i>Of Concern</i> . 5% coverage. <i>Eucalyptus crebra</i> , <i>E. tereticornis</i> grassy woodland on metamorphics ± interbedded volcanics				
27	12.11.6 / 12.11.14	As above	No field survey data is currently available. Construction method: This area will be trenched.	1,585	019	08164-DWG-24300-C-8044 Chainage 115155 to 115227
28	12.11.14	12.11.14: <i>Of Concern</i> . <i>Eucalyptus crebra</i> , <i>E. tereticornis</i> grassy woodland on metamorphics ± interbedded volcanics	Detailed Site 39a is the closest site to VCS 28, lying approximately 150m to the north of the VCS. A large area of remnant vegetation was observed East of Yarwun. These sites (Detailed Site 39a and Short Site 39b) confirmed that <i>Of Concern</i> RE 12.11.14 and <i>Not Of Concern</i> RE 12.11.6 (respectively) were correctly mapped (the change to REs starting with 12 indicates the Southeast Queensland Bioregion, rather than the Brigalow Belt South Bioregion). These communities were dominated by Narrowleafed Ironbark (<i>Eucalyptus crebra</i>) and Spotted Gum (<i>Corymbia citriodora</i>) respectively. <i>Macrozamia</i> sp. were seen in the understorey in places (Brief site 134), but not along the proposed corridor itself. Construction method: This area will be trenched.	18,428	019	08164-DWG-24300-C-8044 Chainage 115224 to 115852
29	12.11.6 / 12.11.14	<i>Of Concern</i> - Sub-dominant 12.11.6: <i>Not Of Concern</i> . 95% coverage. Open-forest to woodland of <i>Corymbia citriodora</i> generally with <i>Eucalyptus crebra</i> on metamorphics ± interbedded volcanics. 12.11.14: <i>Of Concern</i> . 5% coverage. <i>Eucalyptus crebra</i> , <i>E. tereticornis</i> grassy woodland on metamorphics ± interbedded volcanics	Detailed Site 39b is the closest site to VCS 29, lying approximately 300m to the east of the VCS. A large area of remnant vegetation was observed East of Yarwun. These sites (Detailed Site 39a and Short Site 39b) confirmed that <i>Of Concern</i> RE 12.11.14 and <i>Not Of Concern</i> RE 12.11.6 (respectively) were correctly mapped (the change to REs starting with 12 indicates the Southeast Queensland Bioregion, rather than the Brigalow Belt South Bioregion). These communities were dominated by Narrowleafed	12,870	019	08164-DWG-24300-C-8044 Chainage 115836 to 116346

			Ironbark (<i>Eucalyptus crebra</i>) and Spotted Gum (<i>Corymbia citriodora</i>) respectively. <i>Macrozamia</i> sp. were seen in the understorey in places (Brief site 134), but not along the proposed corridor itself. Construction method: This area will be trenched.			
30	11.3.29	11.3.29: <i>Not Of Concern</i> . <i>Eucalyptus crebra</i> , <i>E. exserta</i> , <i>Melaleuca</i> spp. woodland on alluvial plains This RE is at risk of falling below 30% of its pre-clearing extent, or having a remnant extent of less than 10 000 ha (See table 5 of the RVM Code for Brigalow Belt and New England Tablelands Bioregions).	Detailed Site 39b is the closest site to VCS 30, lying approximately 200m to the east of the VCS. A large area of remnant vegetation was observed East of Yarwun. These sites (Detailed Site 39a and Short Site 39b) confirmed that <i>Of Concern</i> RE 12.11.14 and <i>Not Of Concern</i> RE 12.11.6 (respectively) were correctly mapped (the change to REs starting with 12 indicates the Southeast Queensland Bioregion, rather than the Brigalow Belt South Bioregion). These communities were dominated by Narrowleafed Ironbark (<i>Eucalyptus crebra</i>) and Spotted Gum (<i>Corymbia citriodora</i>) respectively. <i>Macrozamia</i> sp. were seen in the understorey in places (Brief site 134), but not along the proposed corridor itself. Aerial photography indicates that 1,324m ² (61%) of this area has been previously cleared due to the construction of a powerline easement. Construction method: This area will be trenched.	2,174	019	08164-DWG-24300-C-8044 Chainage 116155 to 116353
31	11.3.29	As above	No field survey data is currently available. Construction method: This area will be trenched. This area of RE enters the construction footprint by a maximum of 3m. Clearing of this area will be completely avoided by reducing the width of the construction footprint.	83	020	08164-DWG-24300-C-8045 Chainage 116556 to 116609
32	11.3.29	As above	No field survey data is currently available. Construction method: This area will be trenched. This area of RE enters the construction footprint by a maximum of 13m. Clearing of this area will be minimised by reducing the width of the	1,014	020	08164-DWG-24300-C-8045 Chainage 116731 to 116877

33	12.11.6 / 12.11.14	<i>Of Concern</i> - Sub-dominant 12.11.6: <i>Not Of Concern</i>. 95% coverage. Open-forest to woodland of <i>Corymbia citriodora</i> generally with <i>Eucalyptus crebra</i> on metamorphics ± interbedded volcanics. 12.11.14: <i>Of Concern</i>. 5% coverage. <i>Eucalyptus crebra</i>, <i>E. tereticornis</i> grassy woodland on metamorphics ± interbedded volcanics	construction footprint by 5m from the southern edge. No field survey data is currently available. Construction method: This area will be trenched. This area of RE enters the construction footprint by a maximum of 6m. Clearing of this area will be minimised by reducing the width of the construction footprint by 5m from the southern edge.	1,089	020	08164-DWG-24300-C-8045 Chainage 116856 to 117091
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* VCS = Vegetation Clearing Site.

** See EIS Chapter 6. This chapter also gives explanations on the different survey methods for “Brief Sites”, “Short Sites” and “Detailed Sites” (see EIS Section 6.3.4).

*** Chainages have been updated based on the four changes to the preferred pipeline alignment that have occurred post-EIS publication (see the Supplementary Report to the EIS). The chainage data has been modified manually by Arup and may not reflect the actual chainages once the engineering drawings are updated with the four pipeline alignment changes.

Management of Remnant Regional Ecosystems

As mentioned in Section 4.3.4 of the Supplementary Report to the EIS, GAWB is currently considering four options for the management of Remnant Regional Ecosystems. In the table below, each of these four options is listed in order of preference and discussed.

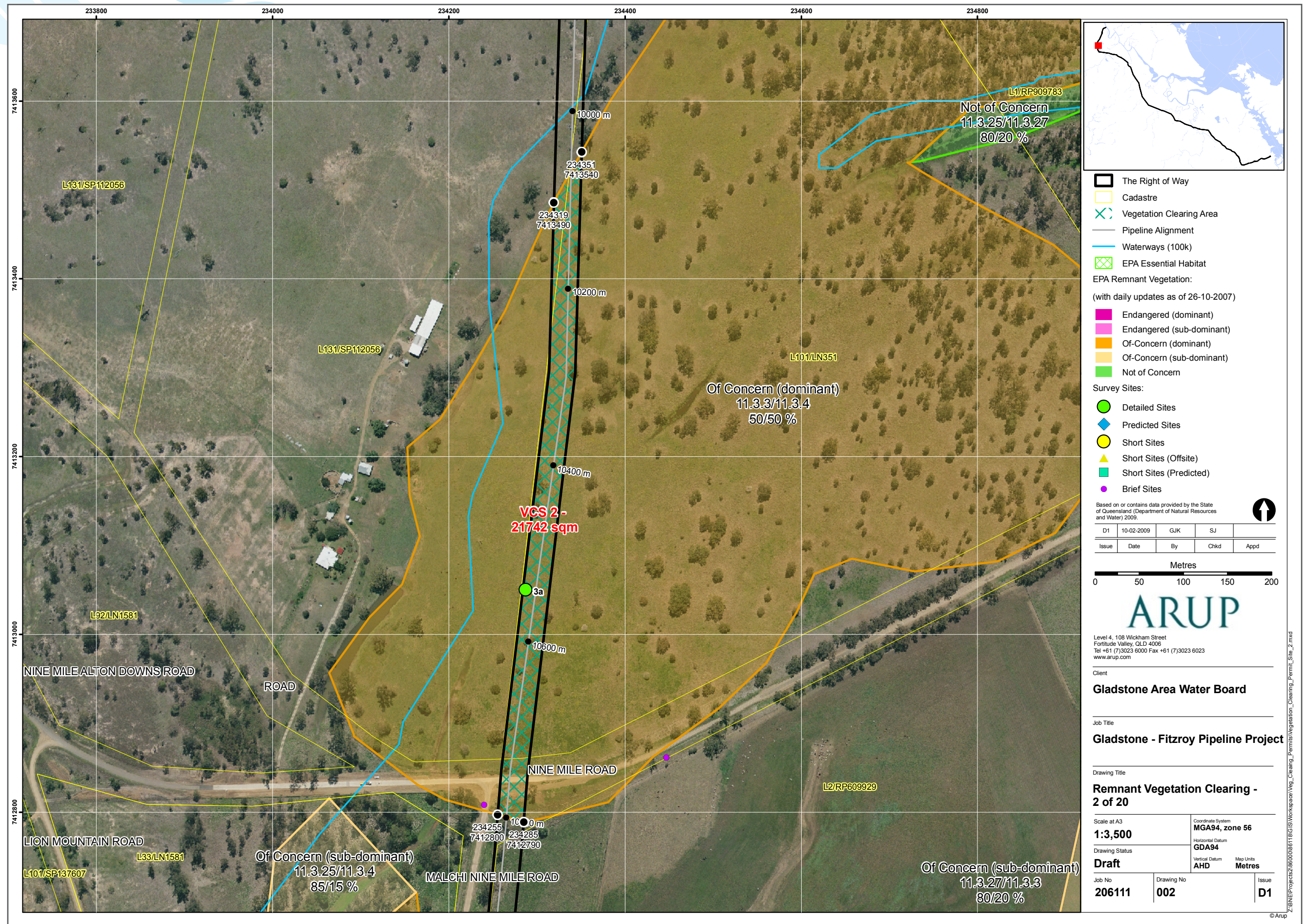
Option 1 – Amendment of IPA	
Description and Rationale	- Through the Department of Infrastructure and Planning (DIP), GAWB wishes to seek an amendment to the definition of 'specified activity' within the <i>Integrated Planning Act 1997</i> (IPA) to include the State Development Areas (SDAs) or water infrastructure or both. The rationale behind this is that other activities of a similar nature are currently included in the definition of 'specified activities' (e.g. mining activities or core airport infrastructure) and inclusion of either the SDAs or the Project or both under the definition would be consistent with other activities currently under the definition. - GAWB will be pursuing this option in preference to the other options below.
Discussion of Benefits and Disadvantages	- At the time of writing, the IPA is currently under review and this affords an opportunity for GAWB to suggest these potential amendments. - Consideration must also be given to the timeframes associated with the amended legislation and whether this fits into the timeframes of the Project. - If the Project is to be deemed a 'specified activity', it is likely that a broad classification of similar activities will be needed, as the Project itself cannot be deemed a 'specified activity' in its own right. For instance, the definition of 'specified activity' could be amended to encompass activities associated with the development of water infrastructure or certain forms of State Significant Projects under the <i>State Development and Public Works Organisation Act 1971</i>. However, if an amendment is adopted, care must be taken not to significantly erode the purposes of environmental legislation such as the VM Act or other legislation. - If the Project can be classified as a 'specified activity' due to being water infrastructure or perhaps a Significant Project (see the dot point above), all Vegetation Clearing Sites (VCS) will be exempt from requiring Vegetation Clearing Permits (Operational Works), in accordance with Schedule 8, Table 4 of the IPA. However, if <u>only the SDAs are deemed</u> to be 'specified activities', only the VCS within the SDAs will be exempt from requiring Vegetation Clearing Permits and Vegetation Clearing Permits will be required in the Alton Downs Easement. - A benefit of Option 1 is that it will lower the cost of obtaining approvals and simplify the approvals process for DIP and GAWB. - If all activities within the SDAs are to be included in the definition of 'specified activity', consideration should be given to the flow on effects that may arise. For example, SDAs have numerous activities within them and hence the exemption will result in a broad coverage of activities. For this reason, consideration should be given to, for instance, including only those activities within <u>SDA Infrastructure Corridors</u> as 'specified activities'. - If the Project or parts of the Project in the SDAs become exempt, vegetation clearing will not be subject to vegetation management usually required for the clearing of Remnant Regional Ecosystems (e.g. those measures within the <i>Regional Vegetation Management Code</i>, or the <i>Policy for Vegetation Management Offsets</i>). Hence,

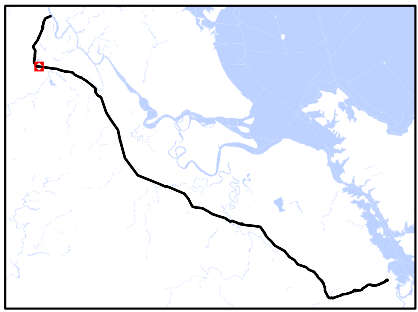
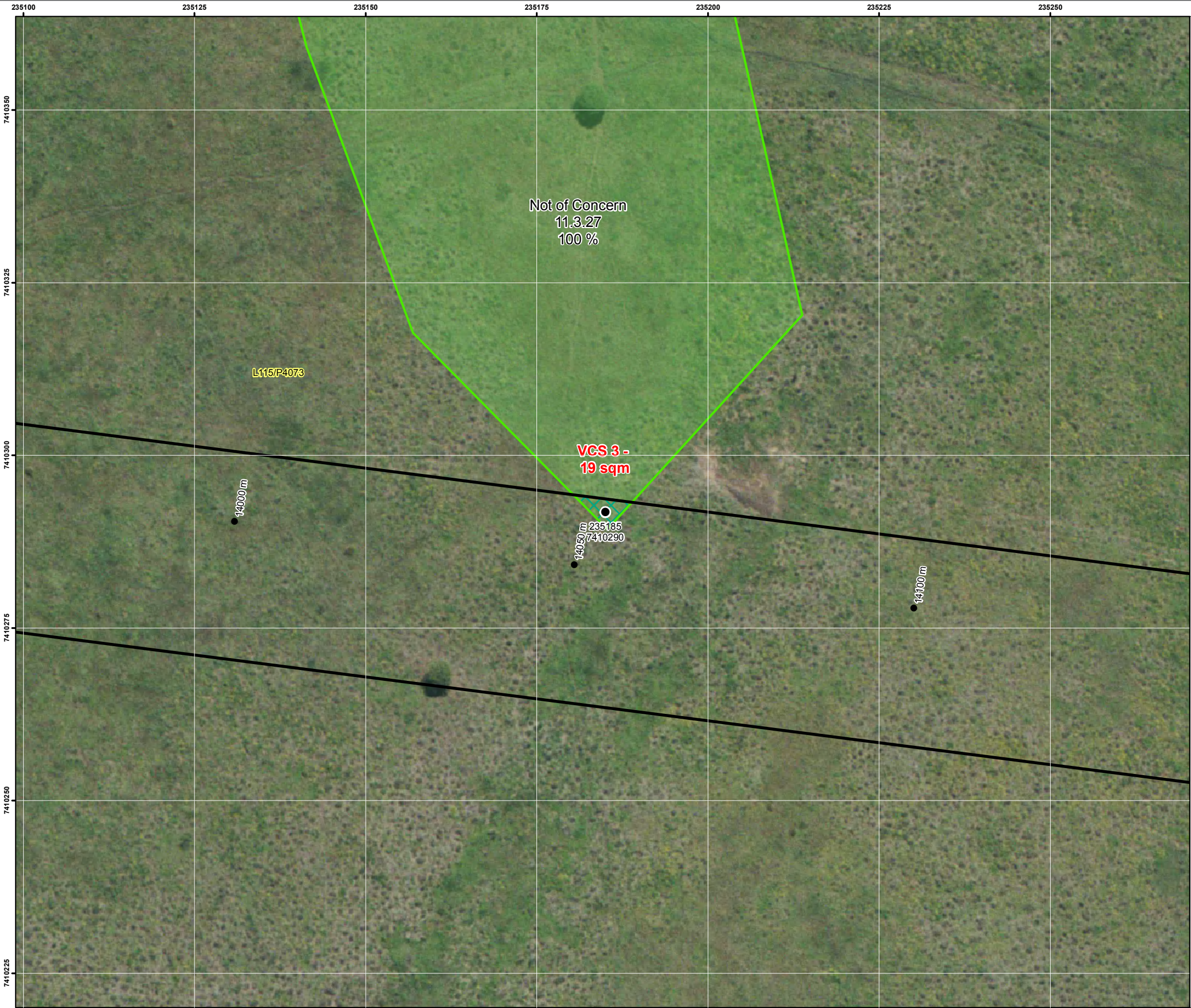
	environmentally beneficial management measures under the exemption may not be as robust as they would be without the exemption. • There is a risk that the amendment will not be accepted by DIP and therefore, Option 2 will need to be pursued. • As part of the current review of the IPA, GAWB will need to make a submission to the Planning Group and Local Government Group of DIP outlining the rationale for the change.
Process Required	
Option 2 – DIP Responsibility for Vegetation Clearing Approvals in the SDAs	
Description and Rationale	• Under this option, it is agreed between GAWB and DIP that DIP will prepare and obtain the Vegetation Clearing Permits under the VM Act for all land within the Stanwell-Gladstone Infrastructure Corridor SDA (SGICSDA) and the Gladstone SDA (GSDA). It is also agreed between GAWB and DIP that DIP will carry out the associated requirements of the Vegetation Clearing Permits (e.g. manage any potential vegetation offsets). • The rationale for this option in that clearing of Remnant Regional Ecosystems in the SDAs is best managed by DIP as it is responsible for ensuring the viability of the corridors for multiple users, and is best placed to manage the associated risks. • GAWB will pursue this option as a second preference to Option 1.
Discussion of Benefits and Disadvantages	• The benefits of this option is that there are economies of scale for social, economic and environmental costs. For example: (a) It will be cheaper to prepare Vegetation Clearing Permits for the whole SGICSDA rather than relying on several proponents to prepare and obtain clearing permits in a piecemeal manner. It also saves on Department of Environment and Resource Management (DERM) administration costs (e.g. permit assessment and administration). (b) It will be cheaper to manage any potential vegetation offsets in a holistic manner rather than having a piecemeal approach. It also saves on DERM administration costs (e.g. offset assessment and administration). (c) Through holistic coordination of vegetation offsets, DIP can also achieve better environmental outcomes. For example, larger areas of offsets are considered better than several small offsets because large areas can aid connectivity, increase core habitat area and reduce edge effects. • Costs associated with approvals and vegetation offsets can be re-couped through the licensing of GAWB and any other project proponents who wish to use the corridors. • Care must be taken to ensure timeframes for the Project and for DIP to obtain Vegetation Clearing Permits are complementary. In addition, care must be taken to ensure permits do not expire (they have a life of 5 years) before the Project is constructed. • It is also worth noting that DERM advises that Freehold and Indigenous Land within the GSDA is currently considered an 'urban area', as it is shown on the planning scheme as existing for an 'urban purpose'. As the Project is considered an 'urban purpose' within an 'urban area', it falls under the exemption in Schedule 8, Table 4 of the IPA. Therefore, the Project does not require a Vegetation Clearing Permit (Operational Works) for clearing of <i>Of Concern</i> and <i>Not Of Concern</i> Regional Ecosystem in the GSDA. Nonetheless, any areas of <i>Endangered</i> Regional Ecosystem in the GSDA that require clearing will require a Permit. Likewise, areas of Remnant Regional Ecosystem

	in the SGICSDA may require clearing permits. There is a risk that DIP will decide not to prepare the Vegetation Clearing Permits or delay the process, placing the requirement upon GAWB. If this occurs, Option 3 will be pursued.
Process Required	- Under this option, DIP would prepare the materials for the Vegetation Clearing Permit Application. - As DIP will need to satisfy the Regional Vegetation Management Codes for the Vegetation Clearing Permit Application, they will need to suggest management and mitigation methods to help reduce the impact of the clearing in the SDAs. Vegetation clearing approval will be granted subject to the implementation of these mitigation and management methods. In order to ensure compliance to the permit conditions, we suggest that DIP provide GAWB (and other corridor users) with a protocol for vegetation management within the SDAs. GAWB and Arup could assist in preparing the applications and protocols to ensure they occur within timeframes suitable to both DIP and GAWB.
Option 3 - SGIC and GSDA exemptions	
Description and Rationale	Under this option, GAWB will seek that the SGICSDA be treated as an 'urban area' under the IPA, similarly to the treatment of the GSDA. This therefore exempts the requirement for Vegetation Clearing Permits under the VM Act on Freehold and Indigenous Land within the SGICSDA as well as the GSDA. The reasoning behind this is explained below: Normally, vegetation clearing of mapped 'remnant vegetation' is 'assessable development' requiring a development permit for operational work under the IPA, subject to a list of exemptions. The exemptions are set out in Schedule 8, Part 1, Table 4 of the IPA and they vary depending on the tenure of the land. One of the exemptions is clearing 'for urban purposes in an 'urban area' – Table 4, Item (g). This exemption is not applicable to 'Endangered Regional Ecosystems', but is applicable to other types of mapped remnant vegetation. Also, this exemption is only applicable to 'Freehold Land and Indigenous Land' and is not applicable to Crown land such as pastoral leasehold under the <i>Land Act 1994</i>. The definition of 'urban purposes' is in Schedule 10 of the IPA: urban purposes means purposes for which land is used in cities or towns, including residential, industrial, sporting, recreation and commercial purposes, but not including environmental, conservation, rural, natural or wilderness area purposes. The definition of 'urban area' is more problematic (again, in Schedule 10 of the IPA): urban area means— (a) an area, other than a rural residential or future rural residential area, identified as a priority infrastructure area in a priority infrastructure plan; or (b) if no priority infrastructure area exists, an area identified in a gazette notice by the chief executive under VMA as an urban area; or (c) if no priority infrastructure area exists or gazette notice has been published—an area identified on a map in a planning scheme as an area for urban purposes, including future urban purposes, but not rural residential or future rural residential purposes.

	For the GSDA, paragraphs (a) and (b) are inapplicable, so we turn to (c). If it is accepted that SDA infrastructure is an 'urban purpose' (which DERM has accepted for the GSDA), then it would logically follow that if the SGICSDA was noted on the planning scheme maps, this would be a notation for an 'urban purpose'. Thus this would make it an 'urban area'. The difficulty for DERM is that obviously it is not the business of a planning scheme to identify land as being for any purpose at all, if the planning scheme has been overridden by an SDA. However, after a while, local governments usually make a notation on their planning schemes that an SDA exists, so that the public is aware that the planning scheme does not apply to that area. It is the view of GAWB that it does not matter whether or not a local government has had time yet to include a description of the SDA in its planning scheme because there is a deeming provision in Section 84 of the State Development and Public Works Organisation Act 1971 that, <i>'should the case require it, it shall be deemed that the material local government or other authority concerned with the control of use of the land has duly permitted such use.'</i> Therefore, GAWB suggests that the SGICSDA should be treated the same as the GSDA in terms of being an 'urban area'. • GAWB will pursue this option in third preference to the options above.
Discussion of Benefits and Disadvantages	• Under this option, GAWB is required to prepare and obtain Vegetation Clearing Permits (Operational Works) for areas of Remnant Regional Ecosystem that are required to be cleared for the Project and that are not exempted under Schedule 8, Table 4 of the IPA. The non-exempt areas includes areas of Remnant Regional Ecosystem that are required to be cleared as part of the Project and are: (a) not on Freehold or Indigenous land; (b) areas of <i>Endangered</i> Regional Ecosystem within the SDAs; and (c) within the Alton Downs Easement. • A benefit of this option is that it will lower the cost of obtaining approvals and simplify the approvals process for GAWB as there are less areas of vegetation that require Vegetation Clearing Permits. • With the exemption in the SGICSDA, vegetation clearing will not be subject to vegetation management usually required for the clearing of Remnant Regional Ecosystems (e.g. those measures within the Regional Vegetation Management Codes, or the Policy for Vegetation Management Offsets). Hence, environmentally beneficial management measures under the exemption may not be as robust as they would be without the exemption.
Process Required	• GAWB is to ask DIP to advise DERM that DIP considers that DERM's statutory interpretation of the available exemptions is incorrect and logically inconsistent with DERM's interpretation of the applicable exemption for the GSDA. • For this option to be proceed, DERM is required to agree with GAWB's interpretation and communicate this to DIP and GAWB.
Option 4 – GAWB Responsibility	
Description and Rationale	• If Options 1 to 3 above cannot be achieved, the fourth option is for GAWB to apply for Vegetation Clearing Permits for the Project within the current legislative framework and with DERM's current interpretation of exemptions

Discussion of Benefits and Disadvantages	• This option requires GAWB to obtain Vegetation Clearing Permits for areas of Remnant Regional Ecosystem that are required to be cleared as part of the Project and are: (a) in the GSDA and not on Freehold or Indigenous Land; (b) in the GSDA and are <i>Endangered</i> Regional Ecosystem; (c) within the SGICSDA; and (d) within the Alton Downs Easement. • This option is not favoured by GAWB because it is the most costly and time consuming option for GAWB.
Process Required	• GAWB is required to progress the preparation of the Vegetation Clearing Permits and obtain the necessary approvals prior to construction. This may include vegetation offsets under the Policy for Vegetation Management Offsets.





- The Right of Way
- Cadastre
- Vegetation Clearing Area
- Pipeline Alignment
- Waterways (100k)
- EPA Essential Habitat

EPA Remnant Vegetation:
(with daily updates as of 26-10-2007)

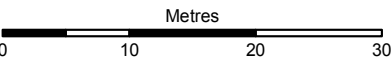
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- Endangered (sub-dominant)
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- Of-Concern (sub-dominant)
- Not of Concern

Survey Sites:

- Detailed Sites
- Predicted Sites
- Short Sites
- Short Sites (Offsite)
- Short Sites (Predicted)
- Brief Sites

Based on or contains data provided by the State of Queensland (Department of Natural Resources and Water) 2009.

D1	10-02-2009	GJK	SJ	
Issue	Date	By	Chkd	Appd



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Client

Gladstone Area Water Board

Job Title

Gladstone - Fitzroy Pipeline Project

Drawing Title

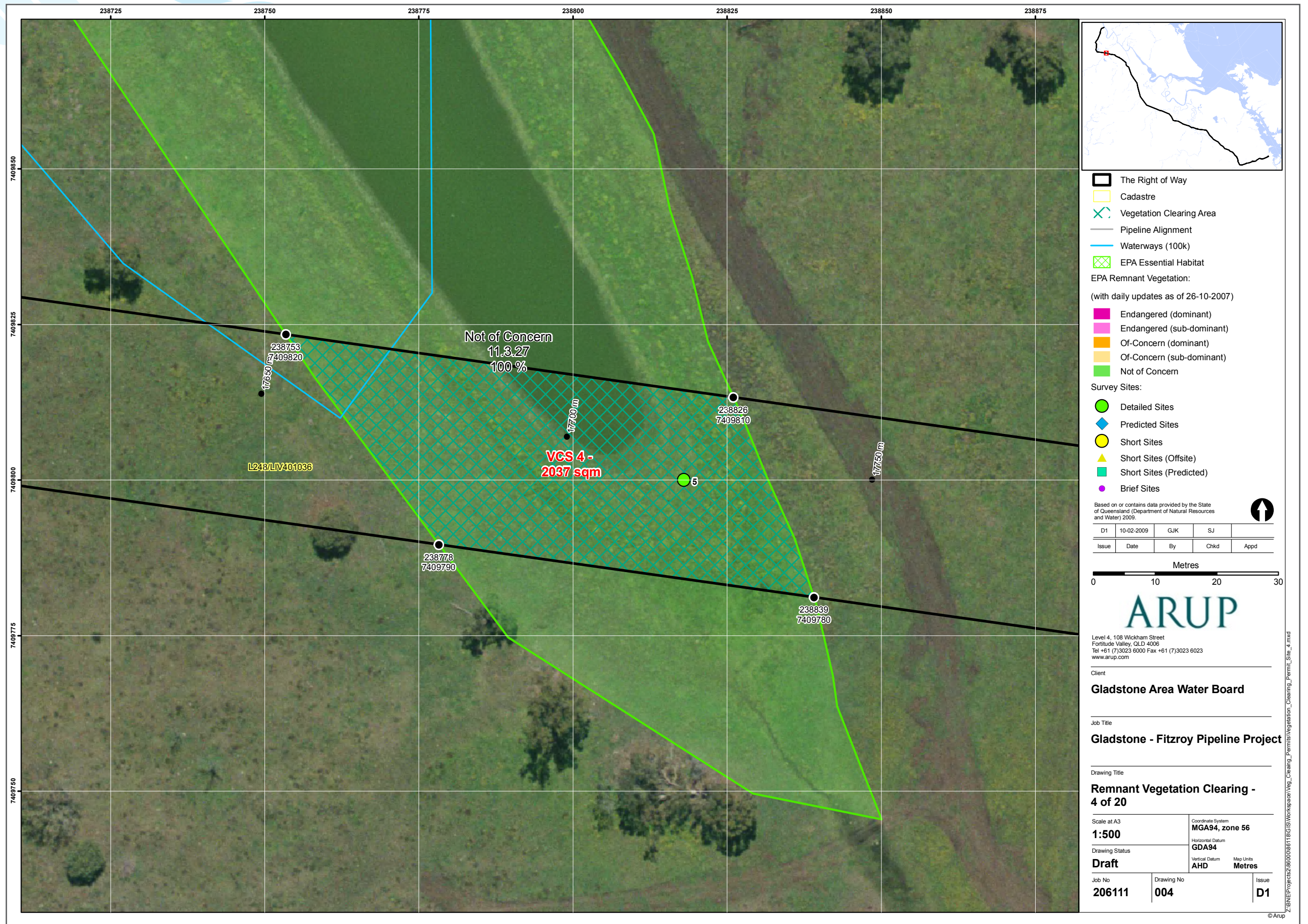
**Remnant Vegetation Clearing -
3 of 20**

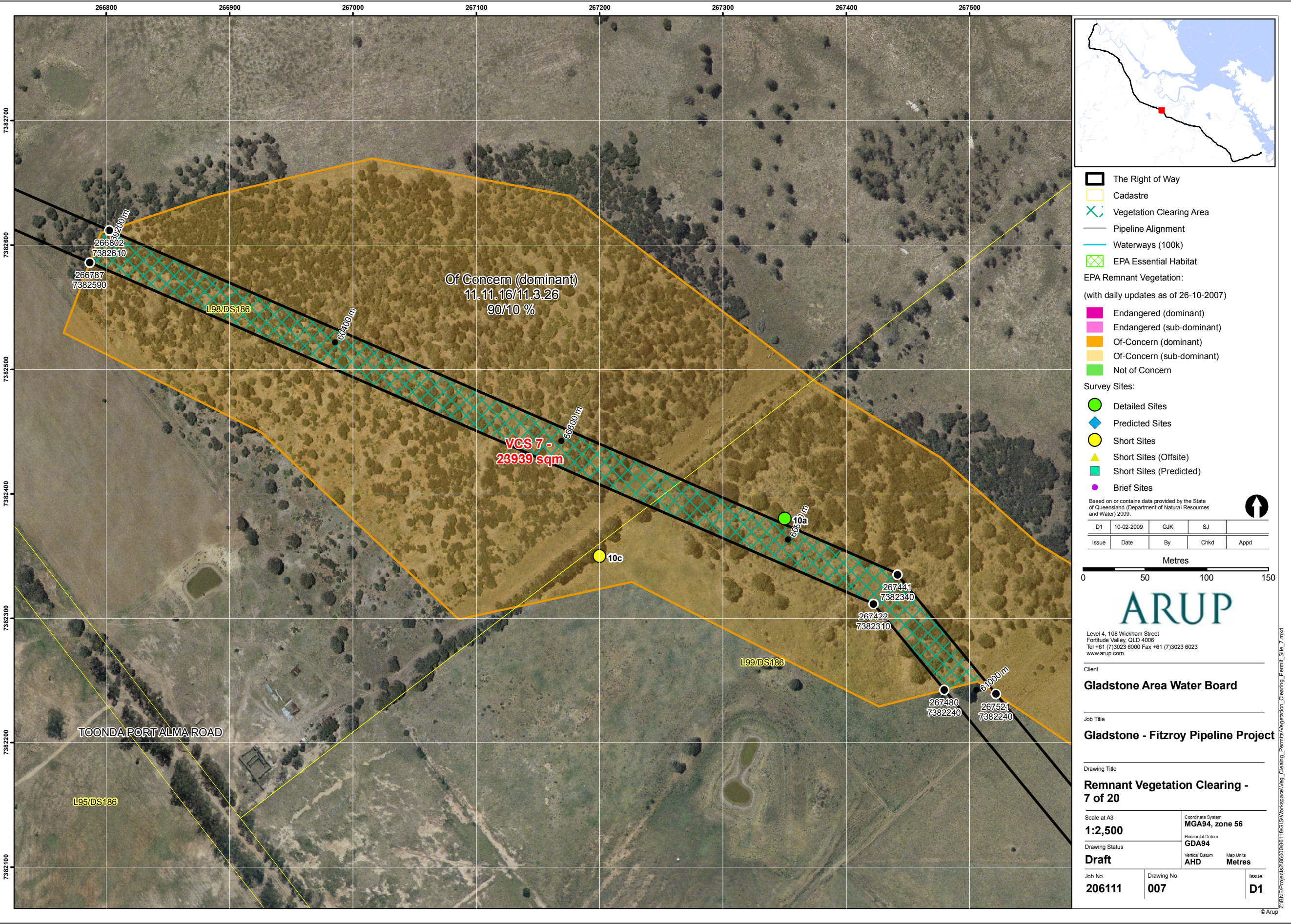
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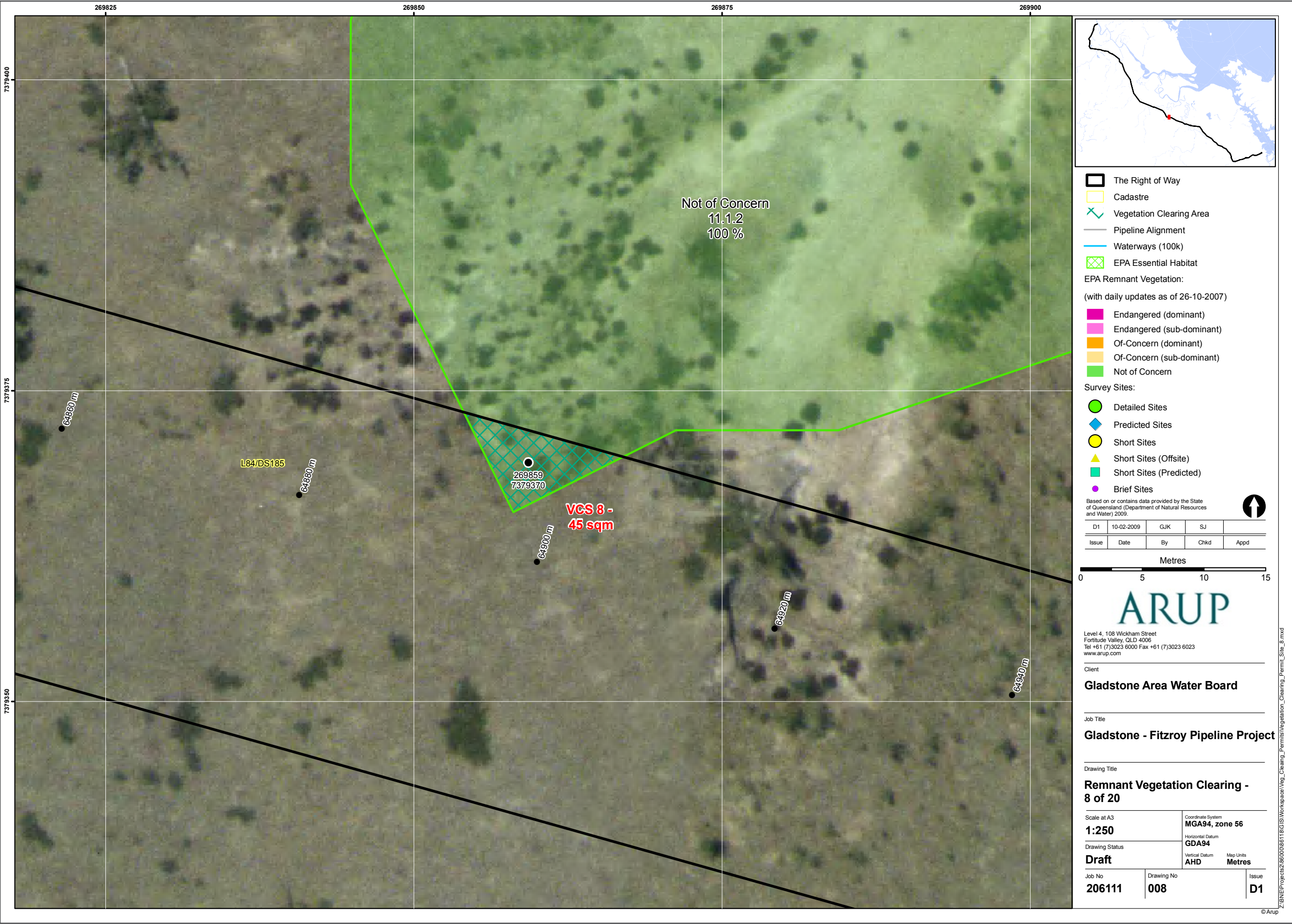
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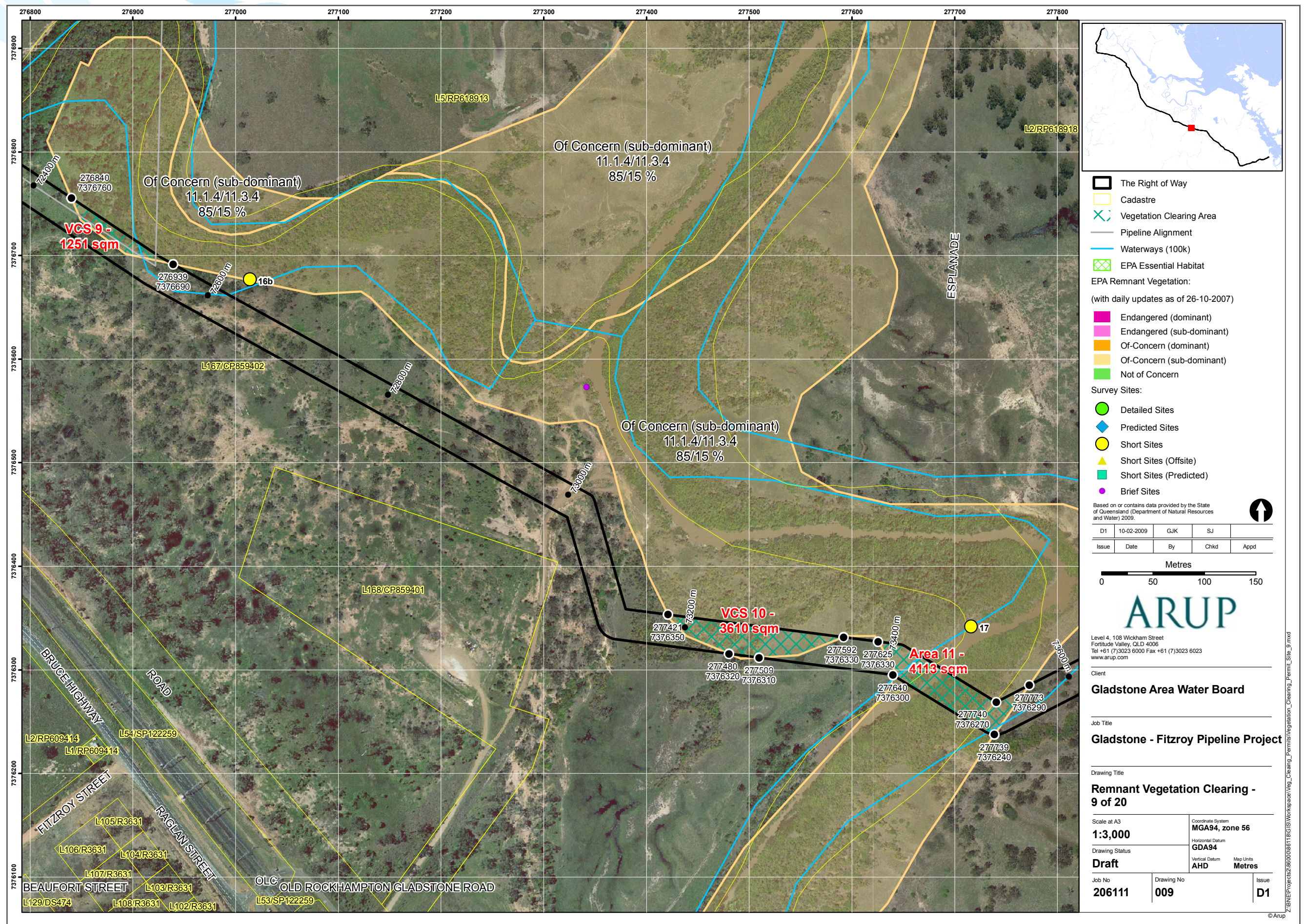
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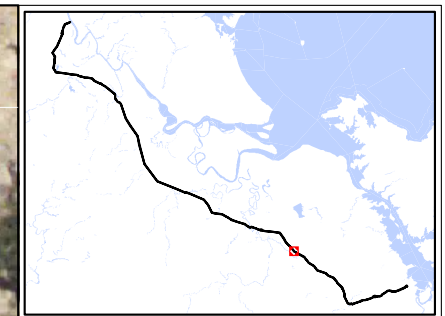
© Arup







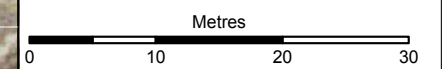




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 - Endangered (sub-dominant)
 - Of-Concern (dominant)
 - Of-Concern (sub-dominant)
 - Not of Concern
- Survey Sites:
- Detailed Sites
 - Predicted Sites
 - Short Sites
 - Short Sites (Offsite)
 - Short Sites (Predicted)
 - Brief Sites

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Drawing Title
Remnant Vegetation Clearing - 10 of 20

Scale at A3
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Drawing Status
Draft

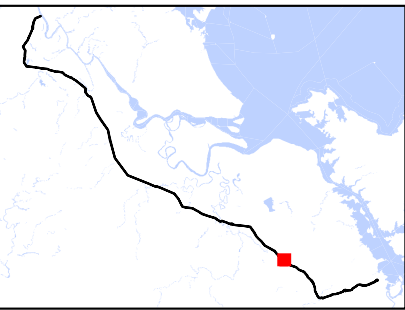
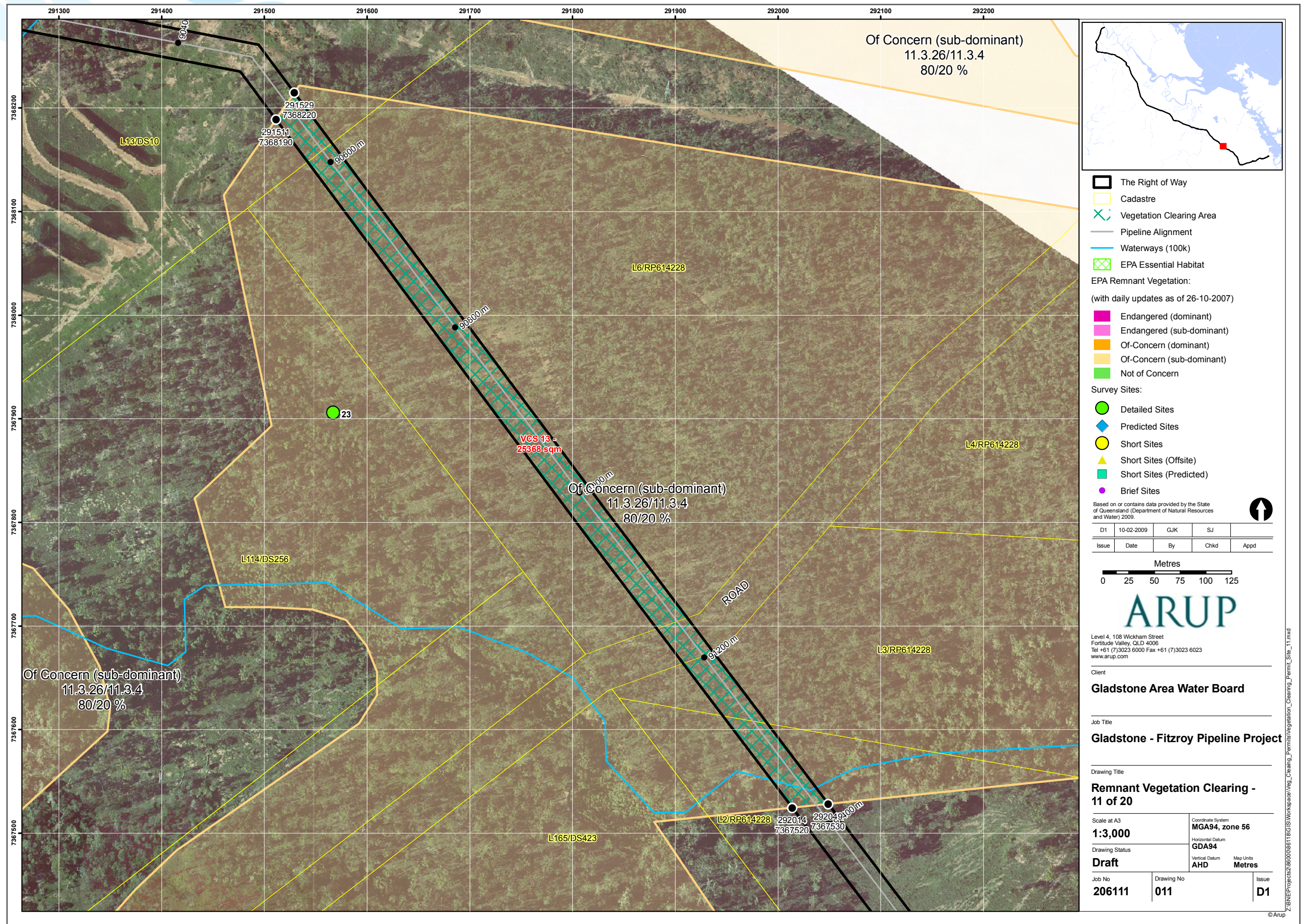
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Issue
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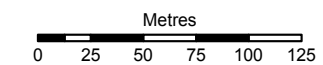
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- The Right of Way
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 - Predicted Sites
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 - Short Sites (Offsite)
 - Short Sites (Predicted)
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Job Title

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Drawing Title

Remnant Vegetation Clearing -
11 of 20

Scale at A3

1:3,000

Drawing Status

Draft

Job No

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Coordinate System

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Horizontal Datum

GDA94

Vertical Datum

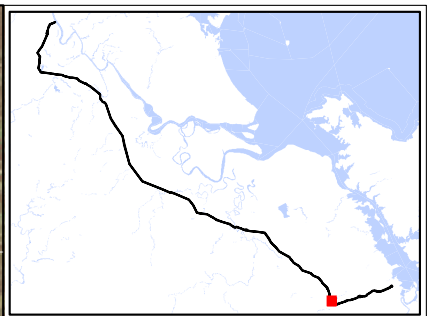
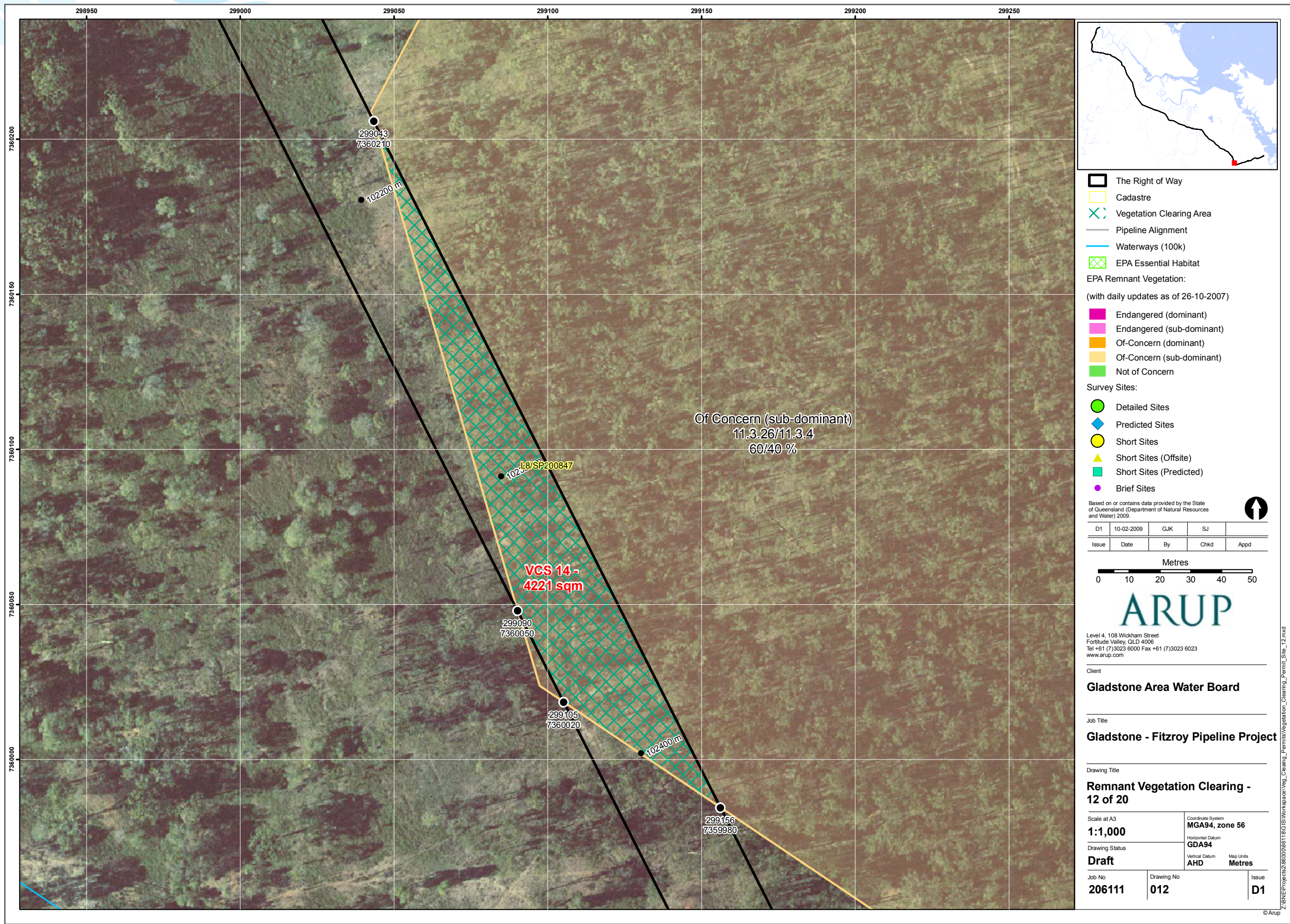
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Metres

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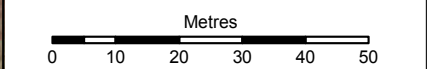
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- The Right of Way
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Job Title
Gladstone - Fitzroy Pipeline Project

Drawing Title
Remnant Vegetation Clearing - 12 of 20

Scale at A3
1:1,000

Coordinate System
MGA94, zone 56

Drawing Status
Draft

Horizontal Datum
GDA94

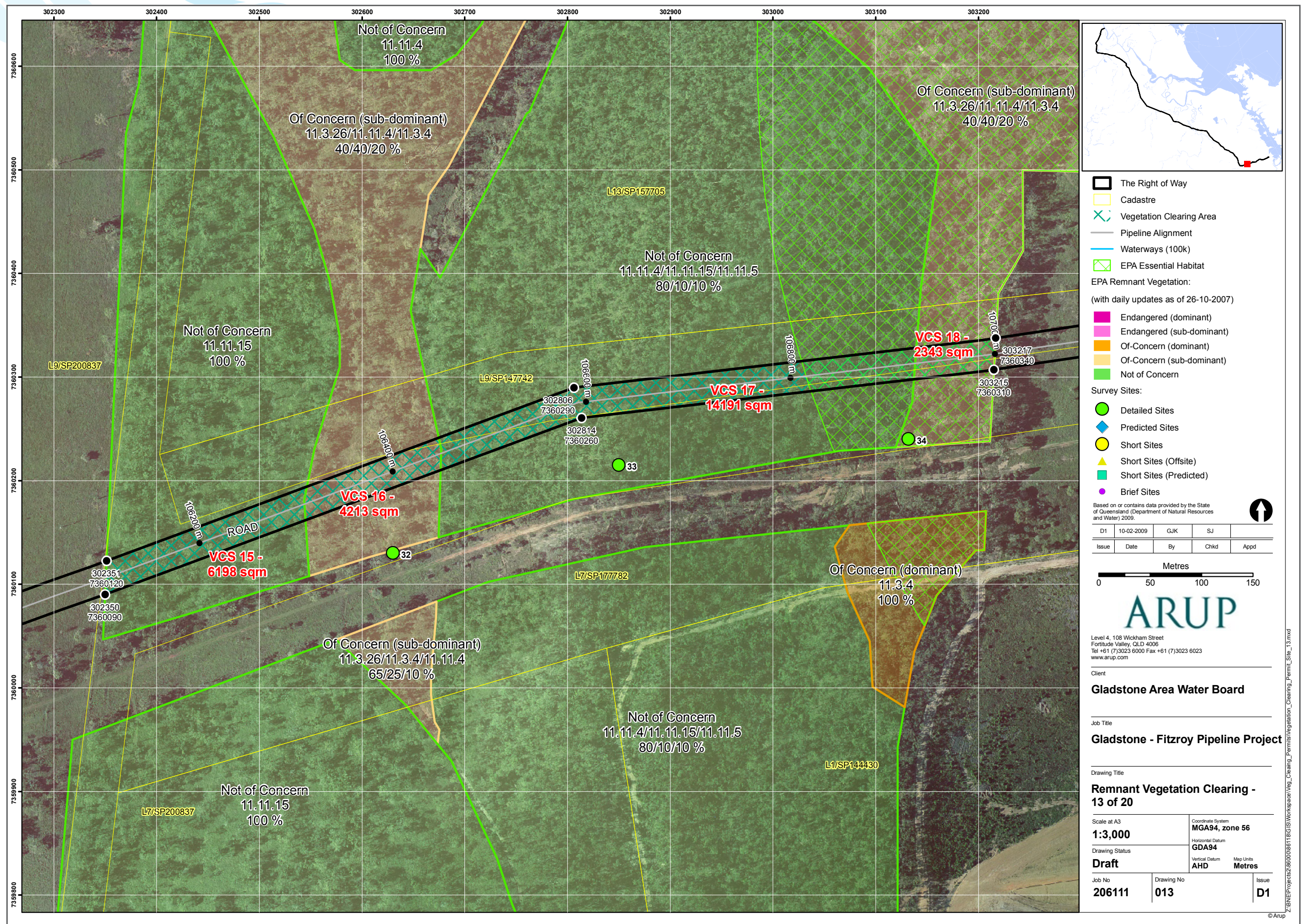
Vertical Datum
AHD

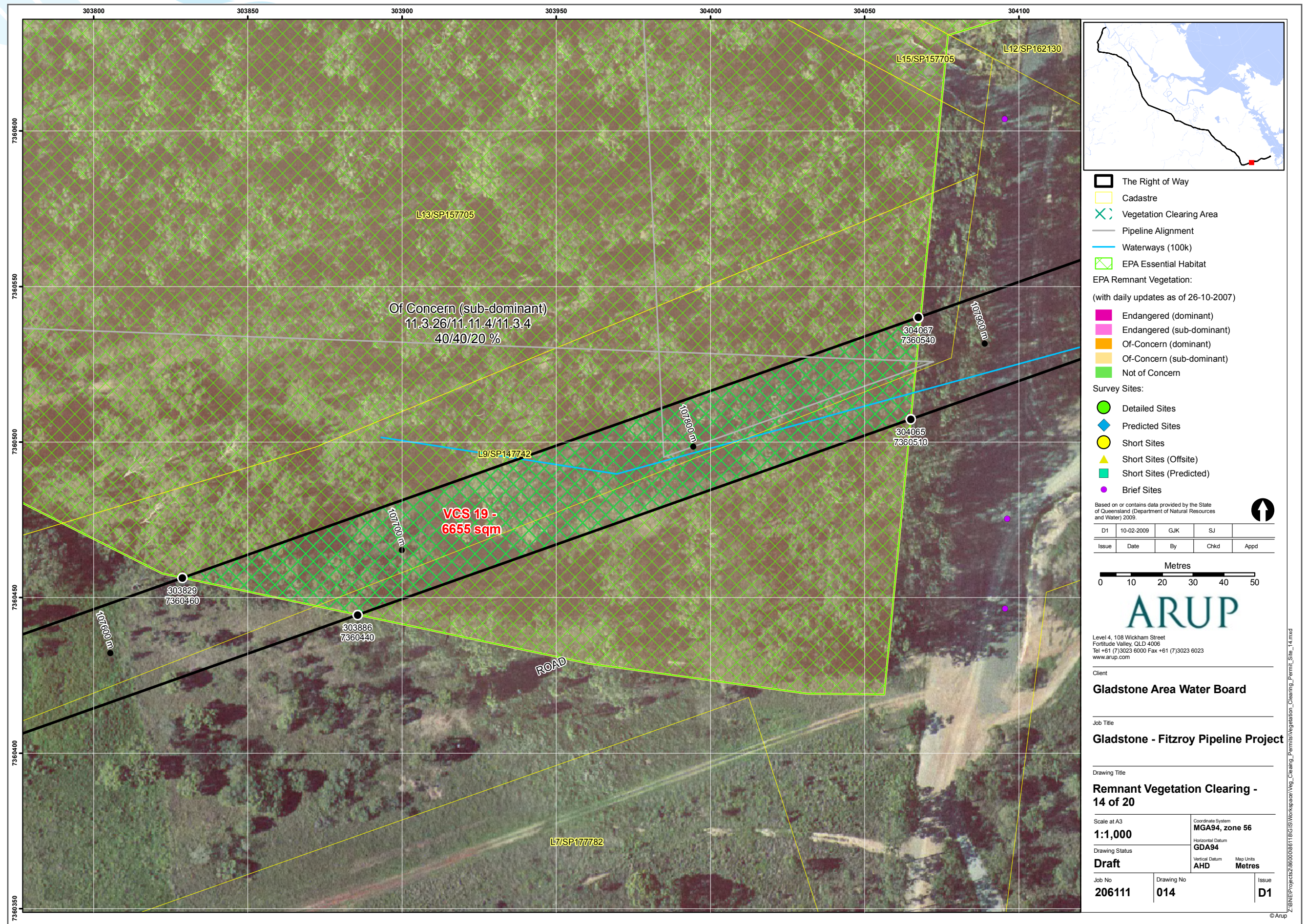
Map Units
Metres

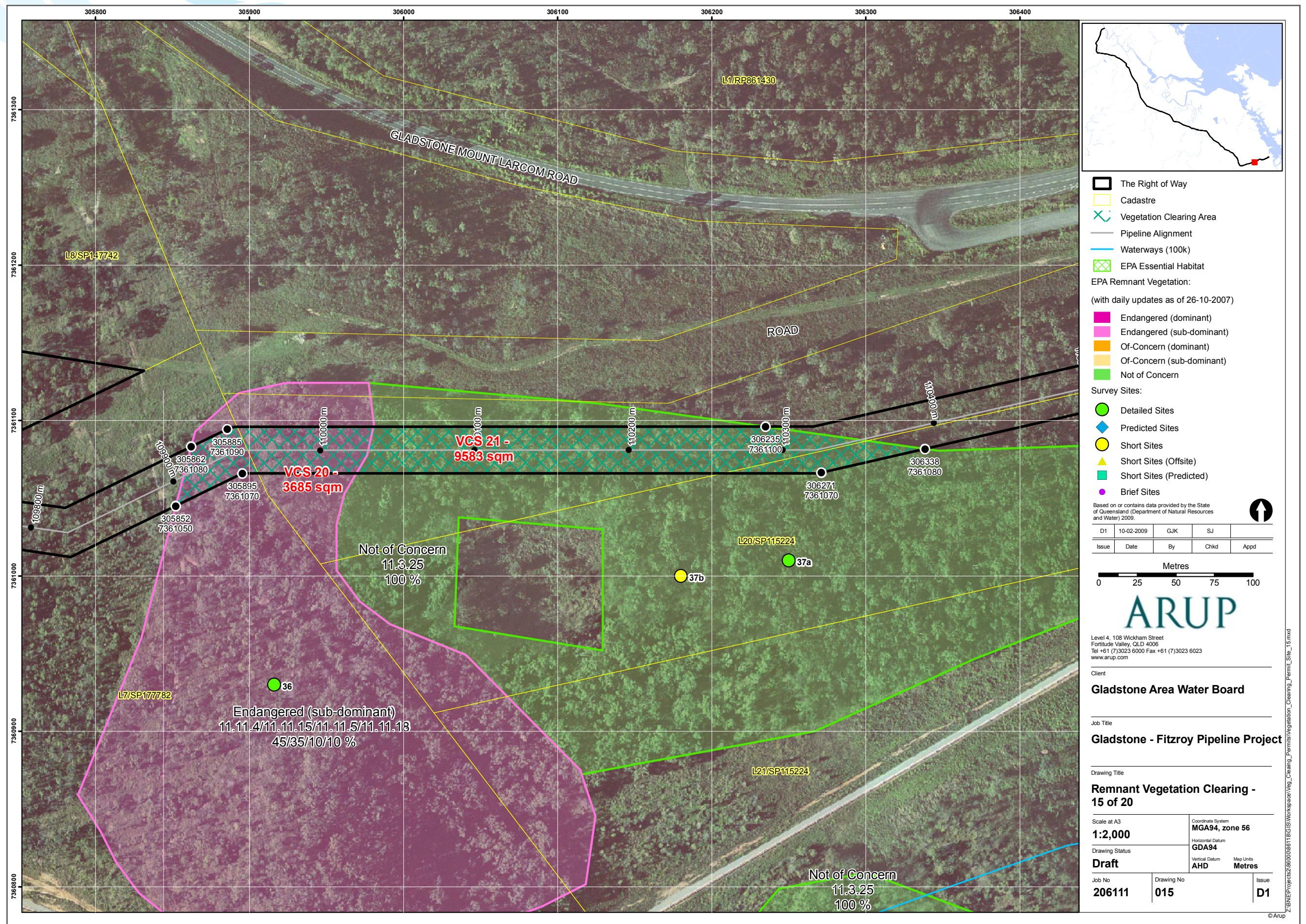
Job No
206111

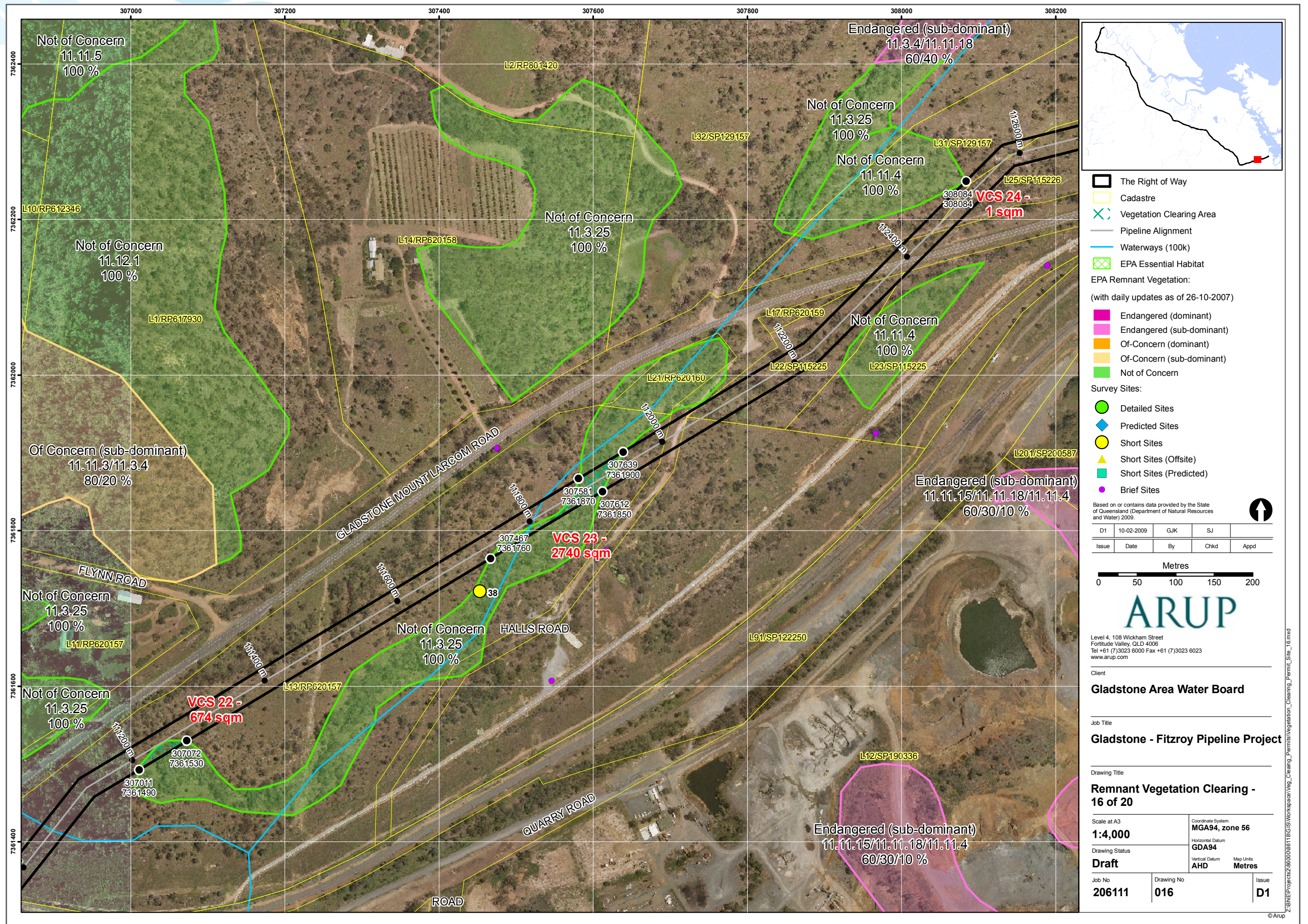
Drawing No
012

Issue
D1

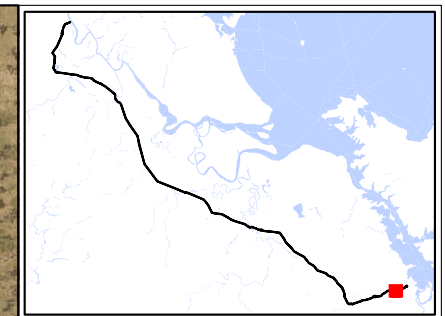
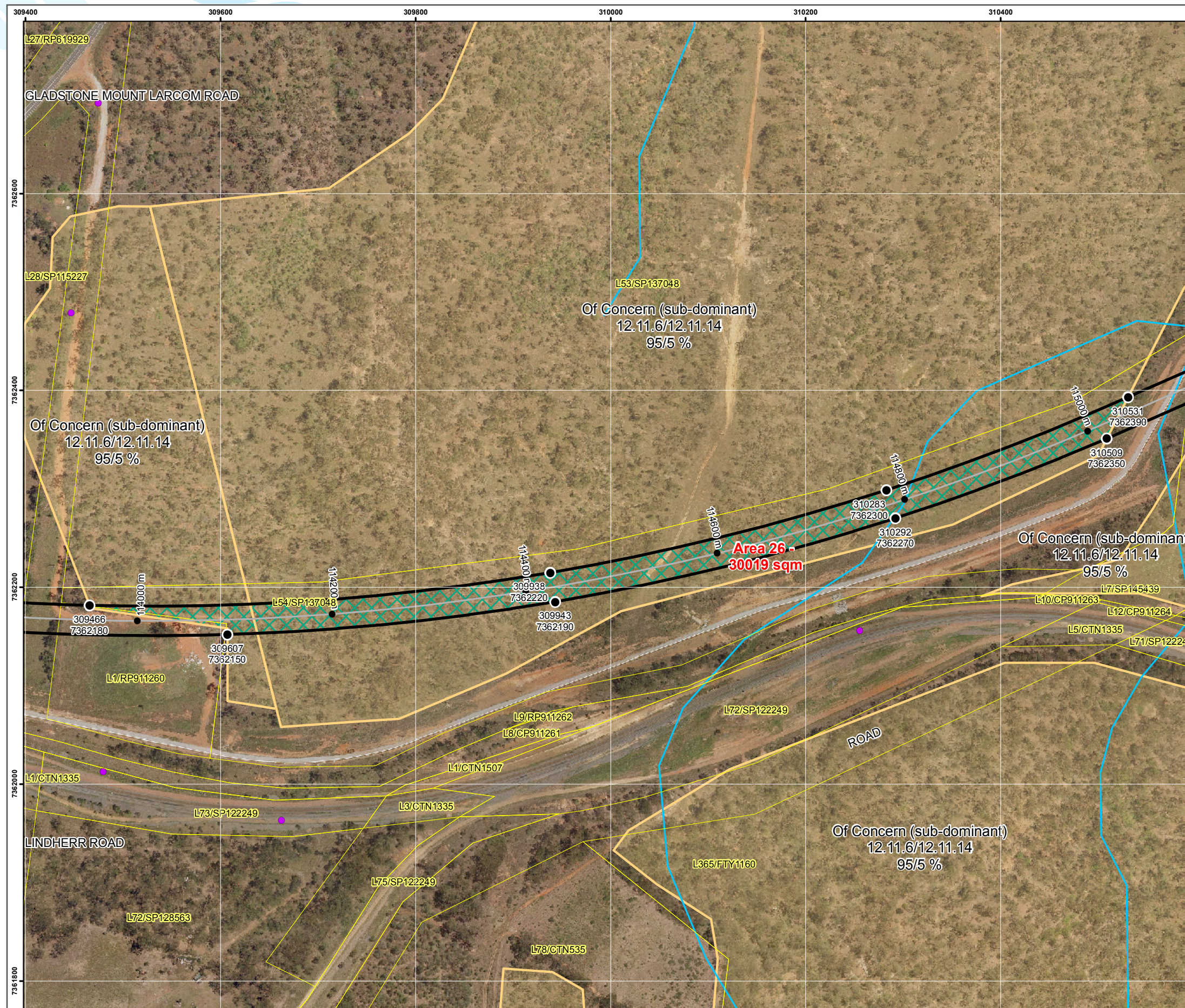








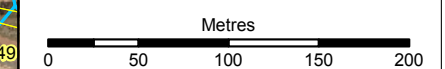




- The Right of Way
- Cadastre
- Vegetation Clearing Area
- Pipeline Alignment
- Waterways (100k)
- EPA Essential Habitat
- EPA Remnant Vegetation:
(with daily updates as of 26-10-2007)
 - Endangered (dominant)
 - Endangered (sub-dominant)
 - Of-Concern (dominant)
 - Of-Concern (sub-dominant)
 - Not of Concern
- Survey Sites:
 - Detailed Sites
 - Predicted Sites
 - Short Sites
 - Short Sites (Offsite)
 - Short Sites (Predicted)
 - Brief Sites

Based on or contains data provided by the State of Queensland (Department of Natural Resources and Water) 2009.

D1	10-02-2009	GJK	SJ	
Issue	Date	By	Chkd	Appd



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Client
Gladstone Area Water Board

Job Title
Gladstone - Fitzroy Pipeline Project

Drawing Title
Remnant Vegetation Clearing - 18 of 20

Scale at A3
1:3,500

Drawing Status
Draft

Job No
206111

Drawing No
018

Issue
D1

