Appendix C

Geology, Landforms and Soils along the Pipeline Route
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■ Table C-1 Technical Review of Geological Features Encountered along the TTP Pipeline Route

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP0-KP70	Primarily sand, soil, black soil, colluvium and alluvial material	Quaternary age (approximately 1.8 million years ago to present	United States Geological Survey (USGS) 2000.
	Siltstone, sandy siltstone, minor limestone, basal conglomerate and diamictite may also be encountered. This material its part of the Port Keats Group.	Permian-aged (approximately 280 to 225 million years ago)	United States Geological Survey (USGS, 2000).
KP70 - KP72	Sills of dolerite, quartz, diorite and gabbro, mostly amphibolitized, may be encountered		
KP70-KP80	Fine-to-medium-grained sandstone, siltstone and conglomerate of the Moyle River Formation which is part of the Fitzmanrice Group	Carpentarian age (approximately 1800 to 1350 million years ago	This feature encompasses the Chalanyi Creek Fault and several other minor faults. Within this feature, areas of alluvial material may be encountered. The proposed scraper facility and work camp appears to be located on this material.
KP 80 –KP210	Pisolitic laterite and ferruginous rubble	Quaternary age	
	Mullaman Beds Formation made up of sandstones, siltstones and porcelanite	Early Cretaceous age (approximately 136 to 100 million years ago)	USGS 2000
KP210 - KP212	Ferruginous sandstones, siltstones, some minor marl, dolomite and chert with abundant halite pseudomorphs of the Jinduckin formation. This formation is part of the Daly River Group	Middle Cambrian to lower Ordovician age (approximately 570 to 430 million years ago)	Active stream-bed alluvium, which may be associated with Whisky Spring Creek, may also be encountered (USGS, 2000)
KP212 - KP245	Residual sand, soil, colluvium and minor travertine	Quaternary age	Active stream-bed alluvium, which may be associated with Homestead Creek, Bradshaw Creek and Crocodile Creek, may also be encountered
KP245 -KP250	Similar geology to KP210 to KP212		
KP250 - 267	Residual sand, soil, colluvium and minor travertine	Quaternary age	Active stream-bed alluvium associated with the Daley River may also be encountered.

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP267 - KP297	Similar geology to KP210 to KP212		
KP297 - KP307	Pisolitic laterite and ferruginous rubble	Quaternary age	
	Mullaman Beds Formation consisting of sandstones siltstones and porcelanite	Early Cretaceous age	Active streambed alluvium associated with Gum Creek and Katherine River may also be encountered.
KP307 - KP309	White, yellow-brown, red-brown and black quartz, sandstone and ferruginous sandstone, silty sandstone, siltstone, claystone and minor pebble conglomerate	Cretaceous age.	
KP309 - KP312	Similar geology to KP297 to KP307		
KP312 - KP321	Maroon to green dolomitic siliclastic siltstone, ooid and cryptomicrobial dolostone and dolomitic quartz sandstone of the Jinduckin Formation.		
KP321 - KP322	White, yellow-brown, red-brown and black quartz, sandstone and ferruginous sandstone, silty sandstone, siltstone, claystone and minor pebble conglomerate	Cretaceous age.	
KP322 - KP330	Similar geology to KP297 to KP307		
KP330 - KP334	Similar geology to KP312 to KP321		
KP334 - KP336	Similar geology to KP297 to KP307		
KP336 - KP340	Similar geology to KP312 to KP321		
KP340 - KP398	*Overlaying material*: pisolitic laterite and ferruginous rubble	Quaternary age	
	Underlying material: grey, massive, bioclastic, mottled, oncoid and cryptomicrobial limestone, with minor grey mudstone and siltstone, minor vadolite and limestone breccia of the Tindal Limestone Group, which is part of the Daly River Group The underlaying material grades through to white, yellow-brown, red-brown and black quartz, sandstone and ferruginous sandstone, silty sandstone, siltstone, claystone and minor pebble conglomerate towards the east.		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP398 - KP399	Medium to coarse-grained, ripple-laminated quartz sandstone of the Bessie Creek Sandstone Formation	Calymmian age (approximately 1200 to 1400 million years ago	Active stream alluvium, associated with Beswick Creek, may also be encountered. (WordIQ.com, 2004)
KP399 - KP401	Overlying material: pisolitic laterite and ferruginous rubble	Quaternary age	
	Underlying material: the Mullaman Beds Formation consisting of sandstones, siltstones and porcelanite	Early Cretaceous age.	
KP401 - KP403	Undifferentiated McMinn Formation which is part of the Maiwok subgroup which is part of the Roper River Group.		
KP403 - KP418	Pisolitic laterite and ferruginous rubble with outcrops of Bessie Creek Sandstone as described above. Possible outcrops of Cambrian aged dark grey-green to purple-brown, vesicular and amygdaloidal basalt with minor sandstone interbeds and poorly-sorted basal conglomerates of the Antrim Plateau Volcanics may be encountered. In addition, possible outcrops of white to grey, very fine to medium-grained, ripple marked and crossbedded, quartz sandstone with minor interbedded claystone may also be encountered. Active streambed alluvium from several watercourses that are expected to be crossed in this section, may also be encountered.		
KP403 - KP418	Active streambed alluvium from the Waterhouse River.		
KP420 - KP431	Pisolitic laterite and ferruginous rubble with outcrops of sandstones, siltstones and porcelanite of the Mullaman Beds	Early Cretaceous age	
KP425	Outcrops of grey to pink, thinbedded calcarenite, intraclastic, glauconitic limestone, microbially-laminated limestone with interbedded green mudstone of the Abner Sandstone	Calymmian age	

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP431 - KP451	Interbedded quartz-rich siltstone, mudstone and very fine to medium grained sandstones of the Chambers River Formation which is part of the Maiwok subgroup.		Active streambed alluvium associated with tributaries of the Chambers River is expected be encountered at approximately KP435 to KP436, KP438 to KP440, KP442 to KP444 and KP445 to KP451.
KP451 - KP452	Sandstones siltstones, and porcelanite of the Mullaman Beds Formation.		
KP452 - KP455	Fine to medium-grained dolerite and diorite.	Ectasian aged (approximately 1200 to 1000 million years ago (WordIQ.com, 2004)) and referred to an Australian time reference as undifferentiated Proterozoic to Adelaidian aged	This material bordered by fine to coarsegrained, crossbedded, rippled and hummocky, cross-stratified, minor granular conglomerate of the Bukalorkmi Sandstone Member which is part of the McMinn Formation
KP455 - KP507	Active stream alluvium from various watercourses. Outcrops within this alluvial material at approximately KP475 are expected to consist of flaggy quartz sandstone, micaceous quartz greywacke siltstone and cone on cone dolomite of the Kyalla Member of the McMinn Formation. From KP480 to KP481 outcrops of similar geological material to KP475 and blocky coarse grained sandstone, inter-bedded siltstone and shale of the Moroak Sandstone Member of the McMinn Formation, bordered by pink calcareous greywacke, calcareous siltstone and laminated shale of the Velkerri Formation which is part of the Maiwok Group. Outcropping of the Velkerri Formation may also be encountered at KP487 and KP489 to KP491.		
KP507 - KP509	Siltstone, quartz sandstone, ferruginous conglomerate, porcelanite, with fresh and marine water fossils, bordered by flaggy limestone and brown marl, glauconitic in places.		
KP509 - KP510	Active stream alluvium		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP510 - KP520	Massive and flaggy slumped micaceous quartz, greywacke micaceous siltstone with a few glauconite bands of the Crawford Formation, which is part of the Roper River Group. Some outcropping of geology similar to KP507 to KP509 may be encountered at approximately KP513. Minor faults may be encountered at approximately KP518.		
KP520 - KP522	Dolerite sills.		
KP522 - KP529	Active stream alluvium.		
KP529 - KP530	Geology similar to KP510 to KP520.		
KP530 - KP531	Micaceous siltstone, blocky chert, pink to cream silicified siltstone of the Manoru Formation, which is part of the Roper River Group.		
KP531 - KP534	Active stream alluvium associated with Quibobikwi Creek.		
KP534 - KP535	Dolerite sills.		
KP535 - KP542	Geology similar to KP530 to KP531.		
KP542 - KP544	Active stream alluvium associated with Mainouru Creek.		
KP544 - KP545	Dolerite sills.		
KP545 - KP550	Fine to medium-grained dolerite sills and dykes of the Derim Derim Dolerite Formation.		
KP550 - KP555	Laminated calcareous siliclastic mudstone, laminated limestone, minor siltstone of the Showell Creek Member which is part of the Mainoru Formation. Active streambed alluvium associated with a local watercourse is expected to be encountered at approximately KP552.		
KP555 - KP560	Geology similar to KP545 to KP550, with some outcropping of the Showell Creek Member.		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP560 - KP563	Laminated mudstone, laminated and hummocky cross-stratified siltstone and micaceous glauconitic sandstone, minor limestone and dolostone of the Wooden Duck Member which is part of the Mainoru Formation		
KP563 - KP565	Gravel, sand and silt, minor limestone, undiffirenciated residual soil, colluvium, alluvial and spring deposits	Cainozoic age.	
KP565 - KP586	Active stream alluvium associated with Horse Creek, Lindsay Creek and other tributaries of the Wilton River.		
KP586 - KP592	Granule and pebble-rich quartz sandstones, overlain by fine to medium-grained quartz sandstones of the Limmen Formation, which is part of the Roper River Group. Some outcropping of fine to medium-grained dolerite sills and dykes of the Derim Derim Dolerite Formation may be encountered at KP588.		
KP592 - KP600	Dololutite, dolomitic siltstone and sandstone, stromatolitic and oolithic dolostone, siltstone and quartz sandstones of the Jamberline Sandstone Member. The Jamberline Sandstone Member is a part of the Dook Creek Formation, which is part of the Mount Rigg Group	Calymmian age.	
KP600 - KP601	Laminated calcareous siliclastic mudstone, laminated limestone and minor siltstone of the Showell Creek Member which is part of the Mainoru Formation.		
KP601 - KP604	Gravel, sand and silt, minor limestone, undifferentiated residual soil, colluvium, alluvial and spring deposits	Cainozoic age.	
KP604 - KP608	Geology similar to KP592 to KP600.		
KP608 - KP609	Geology similar to KP586 to KP592.		
KP609 - KP611	Active stream alluvium bordered by geology similar to KP592 to KP600.		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP611 - KP614	Fine to medium-grained, well-sorted quartz sand, (2) ferricrete and pisolitic laterite, lateritic capping and ferruginous soils, and (3) variably-ferruginous and clayey, medium-grained sandstone, some fine to coarse-grained sandstone, massive claystone and siltstone, minor conglomerate and breccia, and may contain fossils of marine fauna including pelecypods and ammonites. These three units are part of the Walker River Formation.		
KP614 - KP615	Granule and pebble-rich quartz sandstones overlain by fine to medium-grained quartz sandstones of the Limmen Formation, which is part of the Roper River Group.		
KP615 - KP618	Active stream alluvium		
KP618 - KP625	Gravel, sand and silt, minor limestone, undifferentiated residual soil, colluvium, alluvial and spring deposits of Cainozoic age. Outcrops of three geological units may be encountered in this section; (1) laminated mudstone, laminated and hummocky cross-stratified siltstone and micaceous glauconitic sandstone and minor limestone and dolostone of the Wooden Duck Member, which is part of the Mainoru Formation; (2) geology similar to KP611 to KP614; and possibly (3) calcareous and non-calcareous mudstone, glauconitic and micaceous siltstone sandstone and limestone of the Mainoru Formation.		
KP626 - KP630	Ferricrete and pisolitic laterite, lateritic capping and ferruginous soils.		
KP630 - KP642	Geology similar to KP611 to KP614.		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP642 - KP679	Undifferentiated Roper River Group and gravel, sand, silt, minor limestone and undifferentiated residual soil. Outcrops of fine to coarse-grained, gravelled dolerite and diorite sills and dykes are expected to be encountered at approximately KP662. In addition, outcrops of very-fine to fine-grained laminated, micaceous and glauconitic sandstone, mudstone, siltstone, thick-bedded medium to coarse-grained sandstone of the Jalboi Formation, which is part of the Roper River Group may be encountered at KP655, KP667 and KP669 to KP671. Some active stream alluvium may also be encountered in this section.		
KP679 - KP681	Active stream alluvium.		
KP681 - KP728	Gravel, sand, silt, ferruginous cemented detritus, ferricrete		
KP657 - KP659 and KP669 - KP670	Undifferentiated Cainozoic deposits with sand, alluvial deposits and residual sands		
KP695 - KP697	Outcrops of very-fine to fine-grained laminated, micaceous and glauconitic sandstone, mudstone, siltstone, thick-bedded medium to coarse-grained sandstone of the Jalboi Formation, which is part of the Roper River Group		
KP728 - KP775	Gravel, sand, silt, ferruginous cemented detritus, ferricrete and undifferentiated Cainozoic deposits.		

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
KP728 - KP735 and at KP747	Outcrops of quartz sandstone, white to pink, thin to thick-bedded, fine to medium-grained, flat-bedded to trough cross-bedded, rare mudstone, intra-clast conglomerate and cauliflower chert nodules of the Fleming Sandstone may be encountered.		Fleming Sandstone is Statherian aged and part of the Walker Trough, which is part of the Parson Range Group. This group forms part of the Mitchell Ranges In addition, outcrops of gneiss, foliated garnetiferous granite, meta-sedimentary, younger sedimentary and igneous rocks undivided with complex structural or intrusive relationships may be encountered at KP750 to KP751, KP753, KP754. The pipeline crosses the Donyoli Fault at approximately KP750, the Dhunganga Fault at approximately KP760, the Miraiimina Fault at approximately KP767, the Dhupuwamirri Fault at approximately KP771 and various other minor faults within this section.
KP775 - KP872	Gravel, sand, silt, ferruginous cemented detritus, ferricrete and undifferentiated Cainozoic deposits		Some active stream alluvium associated with various watercourses may also be encountered in this section.
KP872 - the outlet facility	Geology similar to KP775 to KP872		Outcrops are expected to be encountered at KP881 to KP883, KP886 to KP902 and KP917 to KP918 and consist of sandstone, white to pale-grey, fine to very-coarse-grained, massive to thick plannar-bedded, trough cross-bedded, rare chert pebbles and contain plant fossils. The geology in this section is part of the mesozoic aged Yirrkala Formation

Pipeline Kilometre Post (KP)	Geology Type	Geology Age	Description / comment/ reference
			In addition, outcrops of leucogranite, cordierite-garnet bearing, white, medium to coarse-grained, massive and foliated, granulite facies, meta-sedimentary mafic enclaves of the Drimmie Heads Granites may be encountered.

Geology Glossary

- Active stream bed alluvium – alluvial material consisting of black-brown humic soils, sand, silt and clay (Australia Geological Survey of Northern Territory (AGSNT), 1994).
- Alluvial material – *detritus* material transported by a river and deposited, usually temporarily, at points along the flood plain of a river (Whitten and Brooks, 1981).
- Ammonites – invertebrate animals of the family *Mollusca* (Whitten and Brooks, 1981).
- Amphibolitized – igneous rocks can become *amphibolitized* when, during formation, the parent rock forms silicate compounds either by parent components combining during an extended cooling period or by combining with non-parent rock material (Oxford University Press, 1990).
- Amygdaloidal – characterised by almond shaped cavities in lavas, infilled with secondary minerals such as calcite or quartz (Whitten and Brooks, 1981).
- Bedding plane - A surface parallel to the surface of deposition (Whitten and Brooks, 1981), marking the termination of one deposit and the beginning of another of different character. Rocks tend to break or separate along bedding planes.
- Bioclastic – term applied to sediments made up of broken fragments of organic skeletal material, the commonest being bioclastic limestone (Whitten and Brooks, 1981).
- Black soils – soils comprising grey to black clays generally derived from basalts. (Department of Environment and Heritage, 1995).
- Breccia – a sedimentary rock with cemented angular particles of greater than 2mm in size. The angularity of the particles implies that they have not been transported far from their origin before being cemented within the sedimentary rock (Oxford University Press, 1990).
- Calcarenite – a clastic limestone in which both clasts and matrix are calcareous. Characterised by a particle size of 0.006mm to 2mm diameter (Oxford University Press, 1990).
- Calcareous – containing sufficient calcium carbonate to effervesce with the addition of cold hydrochloric acid (Oxford University Press, 1990).
- Calcite – a common, widespread rock-forming mineral that is a major component of calcareous sedimentary rocks, such as limestone, and can be precipitated from seawater (Oxford University Press, 1990).
- Chert – a fine-grained rock consisting of beds of very fine aggregates of crystals, and may be of biogenic, volcanogenic or diagenetic origin. (Oxford University Press, 1990).
- Colluvium – weathered material transported by gravity (Whitten and Brooks, 1981)
- Cone on cone – a structure having the appearance of a series of cones packed on inside the other. Formed either by concretionary processes or the effects of pressure (Whitten and Brooks, 1981).
- Conglomerate – sedimentary rock containing rounded particles of rock greater than 2mm in size (Oxford University Press, 1990).

- Cordierite – a blue-coloured mineral of magnesium, aluminium, iron, silicon and oxygen (WordIQ.com, 2004).
- Cross-bedded – interchangeable with the term cross-stratification. Bedding planes (surfaces parallel to the surface of deposition) which formed having a strong relationship with the direction of current (either wind or water) flow. Often called current bedding (Oxford University Press, 1990).
- Cross-stratified – see *Cross-bedding.*
- Crypto-microbial – containing microbiological organisms that are only visible under high power magnification.
- Detritus – particles of minerals or rocks derived from pre-existing rock by processes of weathering and/or erosion (Whitten and Brooks, 1981).
- Diagenetic – of or relating to changes that take place in a sediment at low temperature and pressure after deposition. Diagenetic processes include compaction, dissolution, cementation, replacement and recrystallisation (Oxford University Press, 1990).
- Diamictite – a conglomeratic, siliciclastic rock that is unsorted, with sand and/or coarser particles dispersed through a mud matrix (Oxford University Press, 1990).
- Diorite – intermediate, coarse-grained plutonic igneous rock with up to 10% quartz (Oxford University Press, 1990).
- Dolerite – a dark coloured, medium-grained igneous rock, commonly found in shallow level intrusions such as sills (Oxford University Press, 1990).
- Dolomite – widely distributed rock forming mineral usually having formed by the action of magnesium-bearing solutions on limestone (Oxford University Press, 1990).
- Dolostone – a term suggested for a rock consisting entirely of the mineral dolomite (Whitten and Brooks, 1981).
- Enclaves – also known as xenoliths; an inclusion of a pre-existing rock in an igneous rock (Oxford University Press, 1990).
- Facies – sum total of features that reflect the specific environmental conditions under which a given rock was formed or deposited (Oxford University Press, 2004).
- Fault – a fracture in rock along which there has been an observable amount of displacement. (Whitten and Brooks, 1981).
- Ferruginous – containing iron particles (WordIQ.com, 2004).
- Flaggy – term used to describe sedimentary or metamorphic rocks that tend to split into layers that are 1-10 cm thick (Whitten and Brooks, 198).
- Foliated – having thin leaf-like layers or strata (Whitten and Brooks, 1981). Foliated materials are common in high-grade metamorphic rocks (Oxford University Press, 1990).
- Gabbro – a coarse grained basic igneous rock consisting of basic plagioclase, a pyroxine and, very commonly, olivine in substantial amounts (Whitten and Brooks, 1981).
- Garnetiferous – containing garnets (WordIQ.com, 2004).

- Glauconitic – of or containing glauconite, a green mineral consisting of hydrated silicate of potassium or iron or magnesium or aluminium (WordIQ.com, 2004).
- Granulite – a metamorphic rock of regional metamorphic origin, having a granular texture (Whitten and Brooks, 1981).
- Greywacke – texturally and mineralogically immature sandstones that contain more than 15% clay minerals (Oxford University Press, 1990).
- Halite – an evaporite mineral, NaCl, common salt (Whitten and Brooks, 1981).
- Humic – derived from the decomposition of animal or vegetable matter. (WordIQ.com, 2004).
- Hummocky – A form of cross-bedding which has both convex and concave-upwards forms (Oxford University Press, 1990).
- Igneous rocks – rock which formed directly from crystallisation of magma (Minefinders.com, 2004).
- Inter-bedded - beds lying between or alternating with beds of different character (Minefinders.com, 2004).
- Intraclastic – characterised by sedimentary particles composed of calcium carbonate derived by local erosion of the floor of a sedimentary basin (Whitten and Brooks, 1981).
- Laminate – comprising layers of material (Oxford University Press, 1990).
- Laterite – weathering product of rock, composed of mainly of hydrated iron and aluminium oxides. Formed in humid, tropical settings by the weathering of such rocks as basalts (Oxford University Press, 1990).
- Leucogranite – granite that is lighter than usual in colour.
- Mafic – an igneous rock composed chiefly of one or more dark-coloured ferromagnesian (iron-magnesium) minerals (Minefinders.com, 2004).
- Marl - a calcareous mudstone (Whitten and Brooks, 1981).
- Massive – lacking any form or structure, i.e. ‘massive’ beds are those without internal grading and lacking sedimentary structures (Oxford University Press, 1990).
- Meta-sedimentary – metamorphic rock of sedimentary origin (Minefinders.com, 2004).
- Micaceous – material rich in mica minerals. Mica minerals are often known as sheet minerals as they occur in thin sheets within a rock (Whitten and Brooks, 1981).
- Oncoid – spherical to sub-spherical particle, up to 5mm across, produced by the accretion of sedimentary material on to a mobile grain though the action of algae (Oxford University Press, 1990).
- Ooid – sand-sized carbonate particle that has concentric rings of calcium carbonate surrounding a nucleus of another particle (Oxford University Press, 1990).
- Oolithic – composed or largely composed of ooids (Oxford University Press, 1990).
- Outcrop – the part of a rock formation that is exposed at the surface (Oxford University Press, 1990).

- Pelecypods - marine or freshwater molluscs having a soft body with plate-like gills enclosed with two shells hinged together (WordIQ.com, 2004).
- Pisolitic – rich with spherical or semi spherical nodules of rock (Whitten and Brooks, 1981).
- Plagioclase – a rock-forming silicate mineral (Oxford University Press, 1990).
- Porcelanite – a semi-vitrified clay or shale (i.e. clay or shale partially converted to glass) (WordIQ.com, 2004).
- Pseudormorphs – secondary minerals or random aggregates of secondary minerals that have replaced an earlier mineral, but retained its shape (Oxford University Press, 1990).
- Ripple – small-scale ridge of sand produced by flowing water, wind motion or wave action (Oxford University Press, 1990).
- Sedimentary rocks – rocks formed from material from existing rocks by processes of weathering, transportation, and erosion. May include an organic content. (Whitten and Brooks, 1981).
- Siliclastic – applied to sediment that comprises particles composed of silicate minerals and rock fragments, e.g mudstones, sandstones and conglomerates (Oxford University Press, 1990).
- Sills – tabular igneous intrusions having concordant surfaces of contact with other rocks (Oxford University Press, 1990).
- Stromatolitic – containing *stromatolites* (domal structures formed over time by layers of cyanobacteria that trapped sedimentary material) (Fossil Museum, 2004).
- Travertine – a kind of calcium carbonate deposited by certain hot springs in volcanic regions (Whitten and Brooks, 1981).
- Trough – part of a cross-bedded structure with a concave-up shape.
- Vadolite – limestone formed in the vadose zone and characterised by diagenetic features.
- Vadose – occurring between the ground surface and the water table, i.e. within the unsaturated zone (Whitten and Brooks, 1981).
- Vesicular – characterised by small spherical or ellipsoidal cavities, formed by expansion of dissolved gases in molten rock (Whitten and Brooks, 1981).

■ Table C-2 Landforms, Soils And Erosion Along the Pipeline Route - West To East - Source: Golder 2004

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
74	0	Coastal plain	Very gentle slope	<1	Dense woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Sand	Not encountered
83	1	Coastal plain	Gentle slope	0	-	-	-	-	-	-	-	-
84	5	Coastal plain	Gentle slope	0	-	-	-	-	-	-	-	-
95	10	Broad coastal plain	Level	<1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Alluvium	Not encountered
96	14	Sandstone rises	Crest	<2	Tall woodland	Sparse	Some	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
97	18	Sandstone hills and slopes	Gentle lower slope	1	Woodland	Some	General	Slight sheet	Well drained	Moderate	Siltstone	Not encountered
98	22	Sandstone hills and slopes	Lower slope	1	Woodland	Sparse	Sparse	Slight sheet	Poorly drained	Moderate	Siltstone	Not encountered
94	31	Undulating on sst	Gentle slope	1	Tall woodland	Absent	Some	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
93	36	Gently Undulating	-	<1	Tall woodland	Absent	Absent	Absent	Well drained	Permeable	Sand	Not encountered
92	40	Gently Undulating	Level	<1	Tall woodland	Absent	Absent	Absent	Well drained	Moderate	Sandstone	Not encountered
91	44	Alluvial plain	Lower parts	<1	Woodland with palms	Absent	Absent	Slight sheet	Poorly drained	Impeded	Alluvium	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
86	48	Alluvial	Plain	<1	Open woodland	Absent	Absent	Slight sheet	Poorly drained	Impeded	Alluvium	Not encountered
85	53	Alluvial system	Plain	<1	Woodland - sand palms	Absent	Absent	Slight sheet	Poorly drained	Impeded	Very weak rock	Not encountered
87	55	Alluvial	Floodplain	<1	Closed woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Alluvium	Not encountered
88	60	Gently undulating on sst	Gentle slope	1	Low woodland	Absent	Absent	Slight sheet	Well drained	Impeded	Sandstone ?	Not encountered
1006	62	Alluvial	Floodplain	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Alluvium	Not observed
1007	63	-	-	-	-	-	-	-	-	-	-	-
89	66	Undulating	Gentle slope	1	Woodland	Absent	Absent	Slight sheet	Well drained	Impeded	Sandstone ?	Not encountered
90	70	Plain	Low-lying	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Sandstone	Not encountered
241	73	Undulating to low hilly	Lower slope	2	Woodland	Some	Some	Slight sheet	Well drained	Impeded	Sandstone	Not encountered
240	75	Alluvial complex of Moyle River	Crest of low rise	2	Woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Clayey sand	Not encountered
239	78	Wingate Plateau escarpment	Toe of slope	5	Tall woodland	Sparse	General	Absent	Well drained	Impeded	Sedimentary rock	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
238	79	Plateau edge	Low rise	2	Woodland	Some	General	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
237	83	Plateau surface	Gentle dissected slopes	2	Woodland	Some	Some	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
236	87	Plateau surface	Level - slightly low-lying	<1	Low woodland	Sparse	Sparse	Absent	Poorly drained	Permeable	Sandstone	Not encountered
235	92	Plateau surface	Level	<1	Woodland	Sparse	Some	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
234	92	Plateau surface	Stream crossing and marginal slopes	<5	Woodland	Some	Some	Slight sheet	Poorly drained	Impeded	Sandstone	
233	94	Plateau surface	Very gentle slope	1.5	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Silty clay	Not encountered
232	98	Plateau surface	Level	1	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Sandstone	Not encountered
231	103	Plateau surface	Level	<1	Woodland	Absent	Some	Slight sheet	Well drained	Impeded	Sandstone	Not encountered
230	108	Plateau surface	Very gentle slope close to minor stream	1.5	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Massive ferruginised very weak rock	Not encountered
229	111	Plateau surface	Very gentle slope	2	Tall woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Clay-sand	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
228	115	Plateau surface	Near level	1	Tall woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Very weak sandstone	Not encountered
227	120	Plateau surface	Near level	<1	Tall woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Massive weak laterite	Not encountered
226	124	Plateau surface	Very shallow depression	0	Sparse low shrubs/few trees	Absent	Some	Absent	Poorly drained	Impeded	Massive laterite	Not encountered
225	128	Plateau surface	Level	<1	Tall woodland	Absent	Sparse	Slight sheet	Poorly drained	Impeded	Weak massive laterite	Not encountered
224	133	Plateau surface	Very gentle slope	1	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Weak massive laterite	Not encountered
223	135	Plateau surface	Marginal slope	4	Tall woodland	Sparse	General	Slight sheet	Well drained	Permeable	Coarse gravel and massive laterite	Not encountered
222	140	Plateau surface (off line)	Edge of diffuse broad drainage line	0	Tall woodland	Absent	Absent	Absent	Poorly drained	Impeded	Clay-sand alluvium	Seepage
221	143	Plateau surface	Broad poorly-defined depressional drainage complex	<1	Tall woodland	Absent	Some	Absent	Poorly drained	Impeded	Weak sedimentary rock	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
220	148	Plateau surface	Very gentle slope	<1	Tall woodland	Absent	Absent	Absent	Poorly drained	Moderate	Clay-sand mix	Not encountered
219	153	Plateau surface	Very gentle slope	<1	Tall woodland	Absent	Absent	Absent	Poorly drained	Moderate	Sand-clay mix	Not encountered
218	158	Plateau surface	Level	<1	Tall woodland	Sparse	General	Slight sheet	Well drained	Impeded	Massive laterite	Not encountered
217	162	Plateau surface	Very gentle slope	<1	Tall woodland	Sparse	Some	Slight sheet	Well drained	Impeded	Massive weak laterite	Not encountered
214	163	Plateau surface	Near level	<1	Tall woodland	Some	General	Slight sheet	Well drained	Impeded	Massive laterite	Not encountered
213	165	Gullied area within plateau	Marginal slope	2	Tall woodland	Some	Some	Slight sheet	Well drained	Impeded	Sandstone	Not encountered
212	169	Plateau surface	Level	<1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Clay-sand mix	Not encountered
211	173	Plateau surface	Level	<1	Tall woodland	Absent	Sparse	Slight sheet	Poorly drained	Moderate	Sandy clay	Not encountered
210	178	Plateau surface	Level	0	Tall woodland	Absent	Some	Slight sheet	Poorly drained	Moderate	Sandy clay	Not encountered
117	183	Plateau surface	Near level	0	-	-	-	-	-	-	Sandy clay	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
209	183	Plateau surface	Level	0	Woodland tall	Absent	Absent	Absent	Poorly drained	Moderate	Clay sand	Not encountered
1010	188	Gullied plateau area	Gully in conglomerate	-	-	-	-	-	-	-	-	-
116	188	Gullied plateau area	Western margin of shallow but sharply incised gully	-	-	-	-	-	-	-	Conglomerate	Not encountered
115	191	Plateau surface	Near level	0	-	-	-	-	-	-	Clayey gravel	Not encountered
114	195	Plateau surface	Near level	0	-	-	-	-	-	-	Ferruginised sandstone	Not encountered
113	200	Plateau surface	Near level	0	-	-	-	-	-	-	Sandy clay	Not encountered
103	205	Plateau surface	Near level	0	-	-	-	-	-	-	Ferruginised sandstone	Not encountered
104	211	Plateau surface	Near level	0	-	-	-	-	-	-	Ferruginised sandstone	Not encountered
105	215	Plateau surface	Near level	0	-	-	-	-	-	-	Ferruginised sandstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
102	216	Escarpment and lower slopes	Lower slopes	2	Open woodland	Sparse	Sparse	Slight sheet	Well drained	Moderate	Colluvium	Not encountered
1008	216	-	-	-	-	-	-	-	-	-	-	-
101	222	Hills with gentle slopes between	Gentle slope	1	Woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Outwash	Not encountered
100	226	Hills with gentle slopes between	Gentle slope	<1	Low woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Probably outwash	Not encountered
99	231	Alluvial system	Levee	4	Open woodland	Absent	Sparse	Slight sheet	Poorly drained	Moderate	Alluvium	Standing water
106	236	Plain between Bradshaw Creek and Daly R	-	-	-	-	-	-	-	-	Silty clay	Not encountered
107	241	-	-	-	-	-	-	-	-	-	Sandstone	Not encountered
108	245	-	-	-	-	-	-	-	-	-	Silty clay	Not encountered
109	251	-	-	-	-	-	-	-	-	-	Clayey gravel	Not encountered
110	256	-	-	-	-	-	-	-	-	-	Weathered conglomerate	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
111	259	-	-	-	-	-	-	-	-	-	Silty clay	Not encountered
112	266	-	-	-	-	-	-	-	-	-	Clayey sand	Not encountered
1009	267	Daly River crossing	-	-	-	-	-	-	-	-	-	-
1011	266	Daly River main channel.	Major stream channel	<1	-	-	-	-	-	-	-	-
118	270	Low hills with minor depressional drainage lines	Depressional drainage	<1	Woodland	Sparse	Sparse	Slight sheet	Poorly drained	Moderate	Silicified limestone	Not encountered
119	275	-	-	<1	Woodland	Absent	Absent	Absent	Well drained	Impeded	Sandy clay	Not encountered
120	279	Gently undulating	Lower slope	1.5	Woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Sandstone most likely	Not encountered
121	285	Gently undulating	Near level	<1	Woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
122	290	Undulating	Gentle slope	<1	Woodland with spinifex	Absent	Absent	Slight sheet	Poorly drained	Permeable	Gravelly clay	Not encountered
124	293	Strongly undulating	Middle slope	2	Woodland	Absent	Sparse	Slight sheet	Well drained	Impeded	Silty sand	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
125	299	Undulating	Lower slope	1	Woodland	Absent	Sparse	Slight sheet	Poorly drained	Moderate	Clayey sana	Not encountered
123	309	Katherine River right bank	Near top of bank		Riparian woodland	Some	Sparse	Slight sheet	Well drained	Permeable	Silicified limestone	Not encountered
126	317	Low rises in limestone	Upper slope	3	Woodland	Sparse	Sparse	Slight sheet	Well drained	Poor	Limestone ?	Not encountered
127	321	Limestone rises	Middle slope	3	Woodland	Some	General	Slight sheet	Well drained	Moderate	Limestone	Not encountered
201	322	Undulating land on limestone	Very gentle slope	1.5	Woodland	Some	Some	Slight sheet	Well drained	Moderate	Limestone	Not encountered
202	322	Undulating land on limestone	Very gentle slope	1.5	Woodland	Sparse	Some	Slight sheet	Well drained	Moderate	Limestone	Not encountered
128	325	Rises in limestone	Middle slope	4	Woodland	Some	General	Severe sheet	Well drained	Moderate	Silicified limestone	Not encountered
129	330	Hilly in limestone	Middle slope	5	Woodland	Some	Some	Slight sheet	Well drained	Permeable	Limestone	Not encountered
130	333	Gently undulating	Near level	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Laterite	Not encountered
131	337	Hills with slopes between	Middle slope	6	Woodland	Sparse	Sparse	Slight sheet	Well drained	Impeded	Limestone over sandstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
132	343	Gently undulating Czs	Near level	1	Woodland	Absent	Absent	Absent	Poorly drained	Moderate	Sandy clay	Not encountered
133	347	Gently undulating	Plain	<1	Woodlana	Absent	Absent	Absent	Well drained	Moderate	Cza?	Not encountered
134	351	Strongly undulating	Gentle slope	1	Woodland	Absent	Sparse	Slight sheet	Poorly drained	Moderate	Sandstone or conglomerate	Not encountered
135	357	Low hilly	Middle slope	2	Woodland	Sparse	General	Slight sheet	Well drained	Impeded	Siltstone or claystone	Not encountered
136	362	Plain	Level	<1	Woodland	Absent	Absent	Absent	Well drained	Permeable	Sandy clay	Not encountered
137	366	Plain	Level	<1	Woodland	Absent	Absent	Absent	Well drained	Permeable	Sandy clay	Not encountered
138	370	Alluvial system - King River	Marginal slope	3	Woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Alluvial silty clay	Not encountered
139	375	Undulating	Lower slope	2	Woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Siltstone or sandstone	Not encountered
71	379	Gently undulating	Near level	<1	Woodland	Absent	Some	Slight sheet	Well drained	Permeable	Prob sandstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
70	384	Sandplain	Level	<1	Closed woodland	Absent	Absent	Absent	Well drained	Permeable	Probably sandstone	Not encountered
69	389	Undulating lateritic	Gentle slope	1	Woodland	Sparse	Sparse	Slight sheet	Well drained	Impeded	Lateritic sand soil	Not encountered
68	393	Sandplain	Plain	0	Tall woodland	Absent	Absent	Absent	Well drained	Permeable	Sand	Not encountered
67	398	Plain	Plain	0	Sparse low woodland	Absent	Some	Absent	Poorly drained	Poor	Clay	Not encountered
66	399	Low hills with plain areas	Crest of hill	<8	Woodland	Some	General	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
65	401	Alluvial plain	Level	0	-	-	-	-	-	-	-	-
64	406	Undulating	Crest of low rise		-	-	-	-	-	-	-	-
63	412	Gently undulating	Near level	0	-	-	-	-	-	-	-	-
62	415	Alluvial	Floodplain	<1	Scattered.trees	Sparse	General	Slight sheet	Poorly drained	Poor	Alluvium	Not encountered
61	419	Hills and slopes	Gentle middle slope	2	Woodland	Sparse	General	Slight sheet	Well drained	Moderate	Ferruginised siltstone	Not encountered
1005	424	Alluvial	River channel	<2	Forest	Absent	Absent		Poorly drained	Moderate	Sandy alluvium	

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
60	424	Alluvial system	Floodplain	<2	Fringing woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Alluvium	Not encountered
59	434	Broad gently undulating	Gentle slope	<1	Woodland	Sparse	Sparse	Slight sheet	Poorly drained	Impeded	Sandstone	Not encountered
58	437	Sandstone plateau	Level	5	Bloodwood woodland	Some	General	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
57	444	Low hilly	Slope of hill	2	Woodland	Absent	Absent	Absent	Well drained	Permeable	Sand	Not encountered
56	453	Low flat topped hills with slopes between	Middle slope	2	Eucalypt woodland	Sparse	Sparse	Slight sheet	Well drained	Permeable	Very weak EW sst	Not encountered
55	455	Slopes between low hills	Mid slope	4	Open woodland	Sparse	Sparse	-	-	-	EW conglom & sst	Not encountered
54	459	Slopes between hills	Lower slope	2	Open woodland	Sparse	Sparse	Severe gullying	Well drained	Moderate	Sandstone	Not encountered
53	463	Broad alluvium	Plain	<1	Sparse woodland	Absent	Sparse	Slight sheet	Poorly drained	Poor	Alluvium	Not encountered
200	466	Alluvial system	Plain, slightly elevated away from streams	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Deep sand-clay mix alluvium	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
199	470	Alluvial complex	Minor stream complex	<1	Woodland	Absent	Sparse	Slight sheet	Poorly drained	Moderate	Sandy clay alluvium	Not encountered
198	475	Major stream alluvium	Levee or floodplain	<1	Riparian woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Clay-sand mix alluvium	Not encountered
197	477	Alluvial system	Floodplain	0	Open woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Silty clay alluvium	Not encountered
196	480	Occasional hills with footslopes and lowland plains	Footslope of hill	5	Open woodland	Some	General	Slight sheet	Well drained	Impeded	Micaceous shale	Not encountered
195	485	Sandstone hills and slopes	Crest of low hill	8	Low woodland	Some	General	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
194	487	Plain	Very gentle middle slope	<1	woodland	Absent	Some	Absent	Well drained	Poor	Sedimentary rock?	Not encountered
193	491	Gentle slopes	Lower slope	<1	Low woodland	Sparse	General	Slight sheet	Well drained	Impeded	Sedimentary rock	Not encountered
192	494	Sandstone low hills with gentle slopes between	Lower slope	1	Low woodland	Sparse	Sparse	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
191	499	Alluvial system of Maiwok Creek	Floodplain	<1	Riparian woodland	Absent	Absent	Slight sheet	Poorly drained	Poor	Loamy clay alluvium	Standing water

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
190	504	High flat-topped hills with outwash slopes	Middle outwash slope	0.5	Woodland	Absent	Absent	Slight sheet	Well drained	Moderate	Gravelly slopewash	Not encountered
189	506	Alluvial system of Flying Fox Creek	Floodplain	0	Woodland, open in parts	Absent	Absent	Absent	Poorly drained	Poor	Heavy clay alluvium	Not encountered
188	511	Outwash slopes between flat-topped hills and Flying Fox creek system	Gentle slope	1	Low woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Gravel over sedimentary rock (limestone ?)	Not encountered
187	515	Long gentle slopes	Midslope	2	Low woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Mudstone or siltstone	Not encountered
186	519	Flat topped hills with scree-covered slopes between	Scree-covered middle slope	15	Low woodland	Some	General	Slight sheet	Well drained	Impeded	Clay over weak EW sedimentary rock	Not encountered
185	523	Hilly terrain in siltstone	Crest	0	Low woodland	Sparse	General	Slight sheet	Well drained	Moderate	Pink siltstone	Not encountered
184	526	Dolerite rises with outwash slopes	Mid-slope in outwash	1.5	Mixed low woodland	Absent	Some	Slight sheet	Well drained	Poor	Heavy clay over dolerite	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
183	529	Hills with footslopes and minor drainage lines	Lower outwash slope	1	Low woodland	Absent	Sparse	Slight sheet	Seasonal	Poor	Med-heavy clay over dolerite?	Not encountered
40	535	Broad outwash slope	Very gentle middle slope	1	Sparse low woodland	Absent	Absent	Slight sheet	Poorly drained	Moderate	Shale	Not encountered
37	542	Plain with dolerite rises	Lower slope of rise	4	Open woodland	Sparse	Some	Absent	Well drained	Moderate	Dolerite	Not encountered
38	546	Plain with dolerite rises	Gentle slope	1	Open woodland	Some	Some	Absent	Well drained	Moderate	Dolerite	Not encountered
39	549	Alluvial complex	Floodplain	1	Open eucalypt	Absent	Sparse	Slight sheet	Poorly drained	Poor	Alluvium	Not encountered
181	550	Mainoru River floodplain	Edge of floodplain near lower slope of dolerite hill	0	Open woodland	Sparse	Some	Slight sheet	Poorly drained	Poor	Weathered dolerite	Standing water
1	550	Hills and rises	Lower slope	7	-	Some	Sparse	Absent	Well drained	Poor	Sandstone	Not encountered
2	553	Alluvium	Floodplain	1	-	Absent	Absent	Slight sheet	Poorly drained	Poor	Alluvium	Not observed
3	556		Outwash fan	3	-	Absent	Sparse	Severe gullying	Well drained	Poor	Colluvium	Not encountered
180	560	Dolerite hills	Toe of quite steep hill	2	Low woodland	Some	General	Slight sheet	Well drained	Moderate	Dolerite	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
179	567	Very gently undulating	Plain	0	Grassland with patchy trees	Absent	Sparse	Slight sheet	Poorly drained	Poor	Weathered dolerite	Not encountered
178	570	Gently undulating	Plain	<1	Low woodland	Absent	Sparse	Slight sheet	Well drained	Poor	Weathered dolerite	Not encountered
177	576	Low hilly with quartzite outcrop areas	Gentle slope	<2	Woodland	Some	Sparse	Slight sheet	Well drained	Permeable	Red sand (over sandstone)	Not encountered
176	580	Gently undulating	Plain	1	Low woodland	Absent	Sparse	Slight sheet	Poorly drained	Impeded	Medium yellow clay	Not encountered
175	584	Plain	Level	<1	Woodland	Absent	Absent	Slight sheet	Seasonal	Moderate	Dark red medium clay	Not encountered
174	588	Gently undulating	Mid slope	1	Tall open woodland	Some	Sparse	Absent	Well drained	Permeable	Sandstone	Not encountered
173	593	Strongly undulating	Gentle slope	2	Woodland	Some	Some	Slight sheet	Well drained	Permeable	Ferruginised sandstone	Not encountered
172	596	Outwash fan - alluvial plain	Plain	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Impeded	Yellow high plasticity clay	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
171	600	Wilton River crossing point	Lower terrace or bank-bed interface	<30	Riparian woodland	Some	General	Slight gullying	Poorly drained	Moderate	Weak sandstone	Not encountered
170	604	Alluvial strip	Floodplain	<1	Open woodland	Absent	Absent	Slight sheet	Poorly drained	Poor	Clay alluvium	Not encountered
169	608	Gently undulating	Plain	<1	Tall woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Red sand	Not encountered
168	613	Hilly	Crest	2	Low woodland	General	General	Slight sheet	Well drained	Permeable	Silicified siltstone	Not encountered
167	617	Undulating with low rises	Plain	<1	Woodland	Some	Sparse	Slight sheet	Well drained	Permeable	Weak ferruginised sandstone and weathered sandstone	Not encountered
166	620	Low hilly	Upper slope	3	Tall woodland	Some	General	Slight sheet	Well drained	Permeable	Cobbly laterite over we sedimentary rock	Not encountered
165	624	Strongly undulating	Lower slope	3	Woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Platy siltstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
164	629	Gently undulating	Lower slope near a dry billabong	<1	Tall woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Red slightly cohesive sand	Not encountered
163	633	Gently undulating	Level crest.	<1	Tall woodland	Absent	Absent	Absent	Well drained	Permeable	Cohesive sand	Not encountered
159	638	Gently undulating	Plain	1	-	Absent	Absent	Slight sheet	Poorly drained	Permeable	Cohesive sand	Not encountered
160	642	Alluvial	Floodplain	0	-	Absent	Absent	Slight sheet	Poorly drained	Moderate	Mudstone	Not encountered
161	646	Gently undulating	Level	<1	Woodland	Sparse	Some	Absent	Well drained	Impeded	Massive laterite	Not encountered
162	652	Undulating	Edge of drainage depression	0	Sparse paperbark and grass	Absent	Absent	Absent	Poorly drained	Impeded	Very weak laterite	Not encountered
35	658	Strongly undulating	Lower slope	2	Woodland	Absent	Absent	Slight sheet	Well drained	Impeded	Siltstone	Not encountered
34	663	Gently undulating	Gentle lower slope	1	Open low woodland	Absent	Absent	Absent	Poorly drained	Moderate	Siltstone	Not encountered
33	668	Undulating	Level	<1	Low woodland	Sparse	General	Absent	Well drained	Impeded	Sandstone mudstone transition?	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
32	672	Undulating slopes in sandstone?	-	-	Woodland	Some	General	-	-	-	Ferruginised sandstone	-
31	676	Undulating slopes in sandstone	Slope leading away from low escarpment	5	Woodland	Sparse	General	Slight sheet	Well drained	Permeable	Ferruginised sandstone	Not encountered
30	680	Undulating sandstone rises	Crest or plain	<1	Open low woodland	Some	General	Slight sheet	Well drained	Permeable	Ferruginised sedimentary rock	Not encountered
29	685	Sandplain	-	<1	Woodland	Absent	Absent	Absent	Poorly drained	Permeable	Sandstone	Not encountered
274	704	Alluvial plain near Goyder River	Near level	<1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Sand	Not encountered
273	708	Very gentle slopes with some diffuse drainage lines	Near level	<1	Tall woodland	Absent	Some	Slight sheet	Poorly drained	Permeable	Sand and lateritic gravel	Not encountered
272	713	Very gently undulating	Level, low-lying	<1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Sand	Not encountered
271	719	Gently undulating	Near level, low-lying	<1	Tall woodland	Absent	Absent	Absent	Poorly drained	Permeable	Sand	Not encountered
270	725	Gently undulating	Gentle lower slope	<1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Sand	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
269	729	Gently undulating	Near level	1	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Sand	Not encountered
268	734	Gently undulating	Gentle lower slope adjacent to diffuse drainage line	<2	Tall woodland	Absent	Absent	Slight sheet	Poorly drained	Permeable	Sand (over sandstone ?)	Seepage
267	738	Strongly undulating with some rocky rises	Gentle slope	4	Tall woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Sand	Not encountered
266	744	Undulating	Gentle slope	1	Tall woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Sand .(over sandstone)	Not encountered
265	775	Undulating	Lower-middle slope	2	Woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Granitic rock	Not encountered
264	781	Low hills and strongly undulating	Footslope of hill	<4	Woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Massive laterite	Not encountered
263	785	Alluvial system	Floodplain	1	Mixed low woodland	Absent	Absent	Slight sheet	Poorly drained	Impeded	Sand/clay alluvium	Not encountered
140	785	Low hilly with adjacent stream	Lower slope	4	Woodland	Absent	General	Slight sheet	Well drained	Permeable	EW rock.	Not encountered
141	790	Strongly undulating	Upper slope	1	Open woodland	Absent	Sparse	Slight sheet	Well drained	Impeded	Sandy clay - ferruginous	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
142	795	Gently undulating	Plain	0	Tall eucalypt woodland	Absent	Some	Slight sheet	Poorly drained	Moderate	Red sandy clay	Not encountered
143	800	Gently undulating	Gentle mid slope	1.5	Woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Sandy clay with fine lat gravel	Not encountered
144	805	Low lateritic hills	Middle slope	2	Woodland	Sparse	General	Slight sheet	Well drained	Permeable	Laterite gravel, cemented	Not encountered
145	809	Gently undulating	Gentle slope	1	Tall woodland	Absent	Some	Slight sheet	Well drained	Moderate	Lateritic gravel	Not encountered
146	814	Low lateritic rises and undulations	Level	1	Woodland	Absent	General	Absent	Well drained	Permeable	Ferrug siltstone	Not encountered
147	819	Low hills in laterite	Upper slope	1	Woodland	Absent	General	Slight sheet	Well drained	Moderate	EW siltstone	Not encountered
148	825	Gently undulating	Very gentle slope	1	Woodland	Absent	General	Slight sheet	Well drained	Moderate	Siltstone and claystone	Not encountered
149	829	Gently undulating	Lower slope	1	Open woodland	Absent	General	Slight sheet	Poorly drained	Moderate	Siltstone, ferruginised	Not encountered
150	833	Plain	Level	<1	Woodland	Absent	General	Slight sheet	Well drained	Impeded	Siltstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
151	837	Floodout complex	Plain	<1	Woodland	Absent	Absent	Slight sheet	Poorly drained	Impeded	Sand/clay mix	Not encountered
152	842	Low hills in laterite	Lower slope between low hill in massive laterite & floodplain of minor stream	4	Low open paperbark	Absent	Absent	Slight sheet	Poorly drained	Poor	Highly plastic clay	Not encountered
153	846	Laterite rises and plains	Plain	0	Woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Massive laterite	Not encountered
155	850	Low rises in laterite	Gentle mid slope	1	Woodland	Absent	General	Slight sheet	Well drained	Permeable	Lat siltstone	Not encountered
154	851			<1	Tall open forest	Absent	Absent	Slight sheet	Poorly drained	Impeded	Alluvium	Not encountered
251	852	Alluvial system	Bank of Boggy Creek. Record of location only.	-	-	-	-	-	-	-	-	-
250	853	Low hilly	Upper slope	3	Tall woodland	Sparse	General	Slight sheet	Well drained	Permeable	Gravel with clay	Not encountered
249	859	Plain	Near level	<1	Tall woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Fe shale	Not encountered
252	859	Gently undulating	Plain. Record of observation and photos.	-	-	-	-	-	-	-	-	-

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
248	863	Strongly undulating	Middle slope	1	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Massive laterite	Not encountered
247	866	Gently undulating	Near level	1.5	Tall woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Lateritic gravel with clay	Not encountered
253	871	Plain	Near level	<1	Tall woodland	Absent	General	Slight sheet	Poorly drained	Impeded	Clayey gravel	Not encountered
254	873	Drainage complex	Marginal slope to unnamed creek	<10	Tall woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Clayey gravel (ferruginised rock)	Not encountered
246	883	Strongly undulating with a few stream channels	Floodplain	0	Woodland	Absent	Absent	Slight sheet	Poorly drained	Impeded	Clayey sand and fine gravel	Not encountered
245	888	Low hilly	Mid to lower slope with minor gullies	7	Tall woodland	Absent	General	Slight sheet	Well drained	Impeded	Weak massive laterite	Not encountered
260	895	Steep-sided hills and dissection gullies	Upper slope	5	Woodland	General	General	Slight sheet	Well drained	Impeded	Fine-grained lithic sandstone or mudstone	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
259	896	Dissected slopes	Lower slope	4	Tall woodland	Sparse	General	Slight sheet	Well drained	Moderate	Clay and gravel	Not encountered
258	901	Escarpment zone	Gentle footslope some distance from jumpup	2	Tall woodland	Sparse	General	Slight sheet	Well drained	Permeable	Sandstone	Not encountered
244	903	Gently undulating	Gentle mid slope	1.5	Tall woodland	Absent	Absent	Slight sheet	Well drained	Permeable	Clayey sand	Not encountered
243	907	Undulating	Gentle slope	2	Tall woodland	Sparse	General	Slight sheet	Well drained	Impeded	Clayey gravel, lateritic	Not encountered
242	912	Gently undulating	Near level	0	Tall woodland	Absent	Sparse	Absent	Poorly drained	Impeded	Weak massive laterite	Not encountered
156	913	Low hilly	Slope leading to Giddy River	5	Woodland	Absent	Sparse	Slight sheet	Well drained	Moderate	Coarse sand	Not encountered
157	917	Low hills and steep-sided ridges	Mid slope	3	Woodland	Absent	General	Slight sheet	Well drained	Permeable	Mottled zone siltstone	Not encountered
158	922	Gently undulating	Gentle lower slope	1	Fairly tall woodland	Absent	Some	Slight sheet	Poorly drained	Impeded	Plastic clay	Not encountered
255	922	Undulating to low hilly	Near level, possibly lakebed deposit	1	Tall woodland	Absent	Absent	Slight sheet	Well drained	Impeded	Mottled clay	Not encountered

Site No	Pipeline KP	General Land Units	Landform	Slope %	Vegetation	Rock Outcrop	Surface Stone	Erosion	Drainage Status	Soil Permeability	Substrate	Ground Water
256	925	Undulating	Gentle middle slope	2.5	Tall woodland	Sparse	General	Slight sheet	Well drained	Permeable	Laterite/bauxite	Not encountered
257	929	Plain	Near level	<1	Tall woodland	Absent	General	Absent	Poorly drained	Impeded	Clayey sand (ferruginised sandstone)	Not encountered
261	932	Undulating	Gentle slope	3	Sparse saplings (rehab)	Absent	General	Slight sheet	Well drained	Permeable	Massive laterite	Not encountered
262	938	Undulating, granite	Gentle slope	2	Grassland, occasional shrubs	Sparse	Absent	Slight sheet	Well drained	Impeded	Granitic rock	Not encountered

Source: Golder 2004