APPENDIX 3: ACID SULFATE SOIL INVESTIGATION AND MANAGEMENT PLAN

ACID SULFATE SOIL INVESTIGATION AND MANAGEMENT PLAN – YALYALUP MINERAL SANDS DEPOSIT

September 2017

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1. INTRODUCTION

1.1 BACKGROUND

Doral Mineral Sands Pty Ltd (Doral) propose to mine the Yalyalup Mineral Sands Deposit, located approximately 11km east southeast of Busselton (Figure 1) on the Swan Coastal Plain (i.e. the Site). The Yalyalup deposit has an approximate disturbance footprint of ~372.67ha within an 894.17ha Development Envelope and encompasses an area Doral have been granted Retention Licence R70/0052, which covers an area of approximately 2,290ha. (Figure 2). The deposit is also located ~4km southeast of the Wonnerup Mine Site (Cristal Mining Australia), ~2.5km northwest of the Tutunup Mine site (Iluka Resources Ltd) and ~6km northeast of the Yoongarillup Mine Site (Doral).

The deposit occurs in an area depicted on an Acid Sulfate Soil (ASS) risk map as Class II 'moderate to low risk of ASS occurring within 3m of natural soil surface'. Ore from the deposit will be mined progressively via a series of open-cut pits using dry mining techniques to an expected maximum depth of ~12mbgl. Dewatering of groundwater inflows into the mine pits will likely be required in some areas to enable dry mining to occur.

As mining will involve the disturbance of greater than $100m^3$ of soil or sediment from below the natural water table in a Class II ASS risk area and also the lowering of the water table in a Class II risk area, Doral have undertaken a targeted ASS investigation in accordance with the Department of Water and Environmental Regulation (DWER) guideline *Investigation and identification of acid sulfate soils and acidic landscapes* (DER, 2015a) to assist in determining the potential presence and distribution of ASS, and if present provide details of proposed management measures.

1.2 OBJECTIVES

The objective of the ASS investigation and management plan (ASSMP) was to:

- Conduct soil sampling to identify the presence or the absence of ASS in areas likely to be disturbed;
- Assess the net acidity (comprising both existing and potential acidity) of soil at locations where mining is likely to result in disturbance below the natural groundwater table;
- Assess the baseline quality of groundwater (from existing landowner and DWER bores) that will require dewatering;
- Provide appropriate management measures, where required.

1.3 SCOPE OF WORK

The scope of works for the ASS investigation was developed based on Doral's resource definition drilling program which comprised 31 exploration drill holes to approximately 2m below the maximum anticipated depth of disturbance. The scope of work included the following:

- Collection and logging of soil samples at 1m intervals from 31 targeted locations (i.e. deepest areas of excavation) to approximately 2m below the proposed maximum depth of excavation;
- Field testing of all soil samples for pH_F and pH_{FOX};
- Laboratory analysis using the Chromium Reducible Sulfur (CRS) method for samples with a pH_{FOX} less than three;

- Assessment of baseline groundwater quality from available existing groundwater monitoring wells;
- Preparation of an ASS investigation and management plan.

2. EXISITNG ENVIRONMENT

2.1 LOCATION AND LANDUSE

The Yalyalup deposit has a total disturbance area of approximately 372.67ha within an 894.17ha Development Envelope and is located within the City of Busselton ~11km east southeast of Busselton, WA (Figure 1). The Site currently encompasses an area Doral have been granted Retention Licence R70/0052, which covers an area of approximately 2,290ha. The ASS investigation was undertaken in areas south of Princefield Road, North of Yalyalup Road and between the Wonnerup South Road (west end) and Ludlow Hithergreen Road (eastern end) (Figure 2).

The Site is located in the Southern Perth Basin, approximately midway between the current coastline and the base of the Whicher Scarp. The Southern Perth Basin sediments are predominately Permian to Cretaceous aged with a thin cover of Pleistocene and Recent sediments.

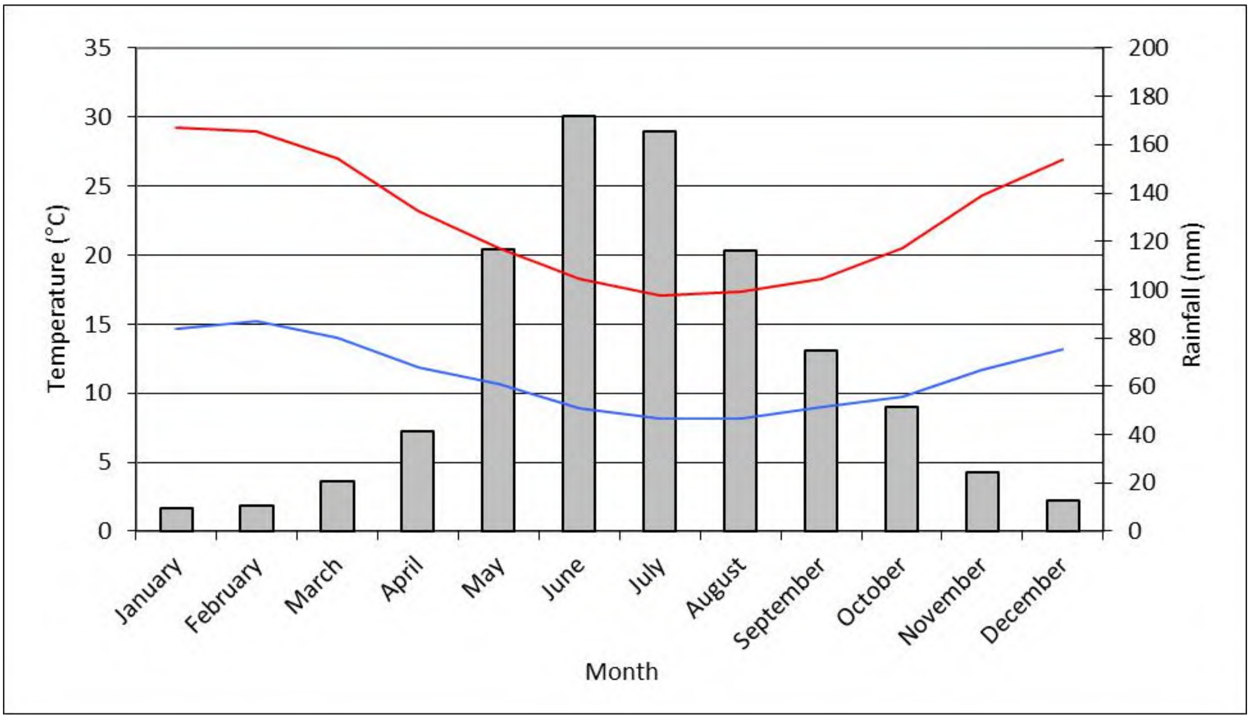
All land comprising the Site is zoned 'agricultural' in accordance with the City of Busselton's Local Planning Scheme (LPS) No. 21. The deposit has been extensively cleared in the past 50-100 years for agricultural purposes. The dominant land use at present is cattle grazing and hay production. Land has also been used for dairy production in recent years with minor irrigation of pasture with untreated effluent water (sourced from dairy within Lot 843). Localised excavation of farm dams has exposed minor areas of the underlying sediments to the atmosphere.

Remnant vegetation within the Site bounds is restricted mainly to road reserves and creek lines, with other scattered clusters of native vegetation occurring in paddocks. Several landholders have planted tree belts that include pine trees and other non-endemic eucalyptus species.

2.2 CLIMATE

The Busselton area experiences a Mediterranean climate with warm to hot dry summers, and mild wet winters. High pressure cells dominate climatic patterns during summer and the passage of cold fronts and associated low pressure cells dominate during winter. Strong sea breezes occur from late November to early March. The annual rainfall generally falls within the 800mm and 1000mm range, peaking in June and July, as shown in Chart 1. In summer the average maximum temperature is 28°C with an average minimum temperature of 12°C. In winter the average maximum temperature is 16°C with an average minimum temperature of 5°C (Bureau of Meteorology, 2017).

CHART 1: ANNUAL AVERAGE CLIMATE DATA



Source: Bureau of Meteorology Busselton Station (Weather Station 009515).

2.3 GEOLOGY

The Southern Perth Basin in Western Australia comprises of Permian to Recent sediments. Erosion of pre-Cambrian igneous rocks (Yilgarn Craton in the East, Leeuwin Naturaliste Block in the West) has contributed to the deposition of sediments bearing heavy minerals in the Yalyalup Road area. Heavy minerals have accumulated into economically viable strandlines and dunal systems due to the action of wind and waves on coastal shoreline areas.

The well-defined strandlines in the Yalyalup Deposit are largely contained within the Pleistocene aged Yoganup Formation. These strandlines generally run parallel to the present-day coastline of Geographe Bay. Strandlines typically form on wavecut platforms at recognised elevations over wide areas. On the down slope areas of these platforms, lower grade heavy mineral accumulation can also occur within the Yoganup formation. The Cretaceous aged Leederville Formation usually forms the ‘basement’ below the wave cut platform areas.

Dunal heavy mineral deposits are typically present above and inland from the main strandline locations. Aeolian deposits are found in various sections on top of the Guildford Formation and/or the Leederville basement within the two Yalyalup tenements. These are shown in Figure 3 and annotated as Ed4 (Degraded surface of Eolian origin, Bassendean Dunes). Dunal sands are often heavily altered and feature elevated levels of leucoxene and zircon.

Groundwater movements have allowed the formation of iron rich cementation horizons in some of the deposit. The cementation presents as pisolitic to massive iron oxide cemented sandstone. Within this cemented layer and above it, the heavy mineral assemblage is enriched in the alteration products of ilmenite (leucoxene and altered ilmenite). In this upper zone the ilmenite chemistry is often enriched in Al_2O_3. Below the cemented layer, the heavy mineral assemblage is more typical of the Yoganup Formation with a greater proportion of unaltered ilmenite with low Al_2O_3 content.

2.4 HYDROGEOLOGY

Groundwater is present in the area within a multi-layered aquifer system. The superficial deposits contain an unconfined aquifer with saturated thicknesses of generally less than 10m, whereas the Leederville and Yarragadee Formations contain multiple regional-scale confined and semi-confined aquifers.

Superficial Aquifer

Unconfined groundwater in the superficial formations occurs at approximately 1-3mBGL, with a consequent saturated thickness of approximately 10-14 m, based on water levels obtained from local bores by Doral during initial groundwater monitoring in May-June 2017 and ongoing monitoring. Seasonal variation in the water table, derived from existing DWER hydrographs in the area, is in the range of approximately 1-2m. A water table based on Doral measurements for the Superficial Aquifer is shown on Figure 4, although this is a preliminary estimate, pending re-surveying of these bores. Given the age and usage history of many of these private bores, their construction, current condition and the reliability of their elevation information may render them insufficient for monitoring purposes.

Regional groundwater flow is expected to occur to the northwest in the Site vicinity, as shown in Figure 4, which also indicates a hydraulic gradient within the superficial aquifer of approximately 0.0037 (HydroSolutions, 2017). The ultimate discharge point is likely to be Geographe Bay and the Vasse – Wonnerup RAMSAR wetland, ~4.6km to the northwest. Recharge occurs by rainfall, although a large proportion of this infiltration is likely to be lost due to evapotranspiration due to the shallow water table.

The superficial formations are variable across the region and hydraulic conductivities are site-specific. However, in general, hydraulic conductivities have been estimated to be in the range of 0.5-50m/d (Davidson, 1995) (Hirschberg, 1989), with an average of 15m/d, partially dependent on the percentage sand content. HydroSolutions (2014) pumping tests within the Bassendean Sand and sandy facies of the Guildford Formation in the Bunbury area indicated transmissivities of 483-731 m^2/d and corresponding hydraulic conductivities in the range of 23.3-32.5m/d. The superficial aquifer is underlain by a clay-dominated aquitard unit, which also forms a confining layer for the underlying Leederville aquifer; the two aquifers are not expected to be in hydraulic continuity with each other in the Site vicinity.

Leederville Aquifer

The Leederville aquifer is a multi-layered confined aquifer system comprising discontinuous interbedded sequences of sandstone and clay. The various sub-aquifers within the Leederville Formation are generally in hydrogeological continuity with each other. Its average thickness regionally is between 150 and 200m over most of the Hirschberg (1987) study area. The horizontal hydraulic conductivity of sandstone beds in the Leederville aquifer, derived from pumping tests (Davidson, 1995), is about 10m/d, and that of the siltstone and shale beds is assumed to be about 1×10^{-6} m/d. If the interbedded sandstones, siltstones and shales are laterally extensive, the average horizontal hydraulic conductivity of the aquifer will approach 5m/d (as the sandstones constitute approximately half the aquifer thickness). Sandy beds that comprise the Vasse Member constitute the main aquifer. The sandy beds underlie the Mowen Member which comprises an aquitard. Hirschberg (1989) reports that upward leakage occurs into the superficial aquifer from the confined aquifers in the vicinity of the Site, although later studies suggest that downward flows have also been occurring since that time, potentially due to ongoing regional abstraction from the Leederville Aquifer (Schafer, Johnson, & Kern, 2008). The Leederville aquifer extensively outcrops throughout the Blackwood Plateau (Schafer, Johnson, & Kern, 2008). The seasonal fluctuation of the potentiometric heads in the Leederville aquifer is generally in the range of 1 to 2m (Hirschberg, 1989). Discharge occurs offshore and, over an area of upward hydraulic gradient that extends several km inland, by upward leakage into the superficial aquifers (Hirschberg, 1989). Hirschberg (1987) notes that salinity in the upper 100m of the Leederville aquifer is generally less than 500 mg/L TDS and is again dominated by sodium and chloride ions. Silica is also noted as being generally greater than normal background concentrations, with a maximum of 50mg/L recorded by Hirschberg (1987) during his study. Water from the Leederville aquifer is used extensively for private and municipal water supplies.

Based on the measured groundwater levels for the Superficial and Leederville Aquifers shown on Figure 4 and Figure 5, there is generally a 2m or greater difference in equipotentials between the groundwater systems at the Site, with lower elevations recorded within the Leederville Aquifer. There are also some instances of upward hydraulic heads and artesian flows in the vicinity of the Site, including reportedly in one bore to the south of the Site (bore Lot 667_WM1).

Yarragadee Aquifer

The Yarragadee aquifer is composed primarily of non-marine fluvial feldspathic, poorly sorted sandstones which are porous and poorly cemented and, hence, allow for considerable groundwater reserves. It grades from a shale-siltstone dominated base to a cleaner sandstone in the upper portions of the Formation, probably representing increased subsidence or filling of the basin during the late Jurassic (Varma, 2009). Individual sandstone sections are typically 20m or more thick, and are separated by shale beds generally up to 10m thick (Hirschberg, 1989). The Yarragadee Formation is divided into four units. Unit 3, which underlays the Vasse Member in the proposed mining area is reported to be the most transmissive unit (Baddock, Vine, & Leathersich, 2005). However, isotopic dating of groundwater indicates an average hydraulic conductivity of 8m/d. Salinity in the Yarragadee aquifer is in the range of 230 to 900mg/L TDS and percentages of the major ions are similar to those in the Leederville aquifer, suggesting a close relationship between the two aquifers. Water from the Yarragadee aquifer is primarily for use in town drinking water and for heavy mineral sand processing in the area.

The Superficial and Leederville aquifers are located in close proximity to the proposed disturbances at the Yalyalup deposit. The Yarragadee aquifer is located several hundred metres below the proposed maximum depth of mining/dewatering (i.e.~12mbgl).

2.5 SURFACE WATER

Local Rivers

The Site is within the Wonnerup (Busselton Coast) Surface Water Management subarea and is not within a proclaimed area for surface water management (DoW, 2009).

The Sabina and Abba Rivers are located within 1km of the Site to the southwest and northeast, respectively. The Sabina River has been heavily modified, with flow from the upper reaches of the Sabina River (i.e. Upper Sabina River) being diverted to the Sabina River Diversion Drain, approximately 1.5km west of the Site. The Sabina River Diversion drain joins the Vasse Diversion drain to the northwest of the Site, which was constructed in 1927 to divert ~65% of flow from the Sabina River and 90% of flow from the Vasse River away from the Lower Vasse River and the Vasse Wonnerup wetlands.

The Lower Sabina River (i.e. below the diversion) and Abba River flow generally to the northwest of the Site and discharge into the Vasse-Wonnerup wetlands, ~4.6km to the north-northwest of the Site (Figure 1). The Lower Sabina River has a total catchment area of $49km^2$, while the Abba River has a total catchment area of $261km^2$.

The major drainage features and catchment areas relevant to the Site are shown on Figure 6. These show that the Site is likely to be located wholly within the Sabina River catchment area, however, available regional mapping indicates that the north-eastern corner may straddle the catchment divide with the Abba River, although no evidence of surface water flows draining towards the Abba River were observed during the HydroSolutions (2017) site visit. Furthermore, the Princefield Road drain diverts runoff towards the Woddidup Creek and eventually to the Lower Sabina River. Previous high rainfall had led to surface water run-off observed within the shallow field drains on the western and northern Site boundaries, with flow observed to be occurring to the north and west respectively towards the tributary of the Lower Sabina River.

On-Site Drainage

Numerous farm/field drains exist on Site, with three main drains identified in June 2017 to assist with background surface water sampling. These include one drain extending along the western boundary of the Site ('Wonnerup Road South Drain') and a further two located in the western-central parts of the Site (Woddidup Creek/Drain), which are adapted from ephemeral creeks (Figure 6). These flow generally towards the north and northwest, and join the Lower Sabina River approximately 2km downstream at Wonnerup South Road. A discontinuous road-side drain is located along the northern boundary of the Site following Princefield Road, which flows to the west to join the Woddidup Creek/Drain draining to the north towards the Lower Sabina River.

Inspection of the Site by HydroSolutions (2017) confirmed that these drains have maximum depths of <1 m across the Site. Given that some static groundwater levels on Site have been reported to be very shallow (i.e. eight wells in the area contained water levels at <2mBGL), it is possible that these drains are connected to groundwater periodically. However, it should be noted that groundwater levels in the vicinity of the drains are generally >2mBGL except in the far southeast corner of the Site, and that any groundwater baseflow discharge to surface water flow in the drains would therefore be expected to be limited (or periodically absent).

2.6 WETLANDS

Approximately 808ha (~90%) of the Site is mapped as a wetland in the Geomorphic Wetlands of the Swan Coastal Plain dataset (DEC, 2008), all of which has been assessed as being in the 'Multiple Use' management category, which is described as wetlands with few ecological attributes and functions remaining (Figure 7). The majority of the wetland area within the Site (~624ha or 77%) is mapped as Palusplain (seasonally waterlogged flat), with small areas of Sumpland (seasonally inundated basin, ~30ha or 3%) and floodplain (seasonally inundated flats, ~155ha or 17%). No wetlands of environmental significance are present within the Site bounds.

The Yalyalup deposit is located ~4.6km southeast of the Vasse-Wonnerup Wetland system which is recognised as a wetland of international importance under the RAMSAR Convention. Given the likely northwest groundwater flow direction, the Site is generally up hydraulic-gradient from the wetland area. Consequently, any impacts to the superficial groundwater that may occur as a result of operations at the Site, have potential to reach the wetland.

2.7 ACID SULFATE SOIL RISK MAPPING

The Site occurs in an area depicted on DWER's online ASS risk map as Class II 'moderate to low risk of ASS occurring within 3m of natural soil surface' (www2.landgate.wa.gov.au) (Figure 8).

3. ACID SULFATE SOIL INVESTIGATION

3.1 SOIL SAMPLING METHODOLOGY

Doral undertook a targeted soil investigation in conjunction with resource definition drilling at the Site in mid-December 2014 to assist in determining the presence and distribution of ASS at the Site and also to characterise the various geological/geomorphological units. Drilling was undertaken using an air core drill rig, with soil samples collected and logged by Doral at 1m intervals from 31 locations (Figure 9). The drilling locations were spaced approximately 320m along the strike of the two deeper strandlines and drill holes were located at 80-120m spacing's across the widths of the anticipated deeper ore zones. The depth of drilling at each location was targeted to approximately 2m deeper than the anticipated maximum depth of disturbance, with a maximum drilling depth of 13mBGL.

Following logging of the soil profile, soil samples were collected for initial screening via field testing (pH_F and pH_{FOX}). Samples were placed in clearly labelled snaplock bags with air excluded and placed in a 12V vehicle freezer whilst on site, allowing the samples to be stored below 0°C. Engraved sample tag labels were also included with all soil samples in the event sample names rubbed off the ziplock bags in transit. The samples were initially analysed for pH_F at Doral's laboratory, prior to being stored in Doral's chest freezer (due to Christmas closure of the laboratory). All samples were then transported to the Australian Government National Measurement Institute laboratory for analysis of pH_{FOX} before being placed on cold storage at the laboratory pending decisions about further analytical analysis.

3.2 SOIL SAMPLE ANALYSIS

Soil samples were recovered at 1m intervals and field tests were performed on all 302 primary samples (pH_F in the field, and pH_{FOX} in the laboratory). The procedure used for field testing is discussed in detail in Hey et al. (2000) and DER (2015a). Following field testing, 75 of the 302 primary samples (approximately 25%) were selected for laboratory analysis using the Chromium Reducible Sulfur (CRS) suite method. Detailed analysis by CRS suite is used to determine whether soils are likely to generate net acidity, and if so, to quantify this acidity for comparison with action criteria used to determine management requirements. The CRS method is considered very reliable, and is less subject to interference from sulfides in organic matter or sulfate minerals. This method was selected primarily due to the site lithology which was observed to be clayey in nature.

3.3 SOIL ASSESSMENT CRITERIA

The ASS characteristics at the site were compared with guidance criteria provided in DER (2015a).

3.3.1 FIELD TEST CRITERIA

The results of field tests are considered to give an indication of which samples may represent ASS material. The DER recommend that soils which have low pH values (pH_F of $\leq$4, or pH_{FOX} of $\leq$3), or which exhibit a significant change in pH (ΔpH, as pHf – pHfox) may indicate a soil with ASS characteristics (DER, 2015a).

As such field test results were compared with the following criteria to identify potential ASS horizons:

- A pH_F of 4 or less;
- A pH_{FOX} of 3 or less;
- A change in pH value (ΔpH) of at least 3 units.

3.3.2 NET ACIDITY CRITERIA

Net acidity (NA) results were calculated using the equations presented in *Acid Sulfate Soils Laboratory Methods Guidelines* (Ahern *et al.,* 2004). The NA is calculated as the sum of actual acidity and potential acidity, as well as retained acidity (for low pH samples) and is used to characterise the current state and acid producing potential of the soils. Acid neutralising capacity is not included in the net acidity calculations, consistent with DER (2015a) guidance.

Actual acidity is available for release into the environment in the short term and is represented by Titratable Actual Acidity (TAA) values, using the CRS method, while potential acidity is represented by S_{CR} values. The pH_{KCl} of a sample is used to determine the net acidity equation, which varies for samples with alkaline pH (net acidity = potential acidity), near neutral pH (net acidity = actual + potential acidity), and acid pH (net acidity = actual + potential + retained acidity).

The NA results are compared to the DER (2015a) action criterion of 0.03%S (for projects where more than 1,000 tonnes of soil will be disturbed). If results exceed this criterion, it requires the preparation of an ASS Management Plan (ASSMP).

3.4 SOIL RESULTS

The data obtained from soil logs, field testing and CRS analysis is presented in Appendix 1. Chain of custody documentation and laboratory certificates are provided as Appendix 2.

3.4.1 FIELD TEST RESULTS

Field test results are summarised as follows:

- Field pH (pH_F) values range between 5.14 and 7.47;
- Field pH peroxide (pH_{FOX}) values range between 1.50 and 6.90;
- The change in pH (ΔpH) ranges between -0.23 and 5.05, with an average of 3.02.

Comparison to the DER (2015a) field test criteria for all 302 primary field tests indicates the following:

- 0 primary samples with a $pH_F \leq 4$ were identified;
- 120 primary samples (~40% of all samples) with a $pH_{FOX} \leq 3$ were identified;
- 142 primary samples (~47%) with ΔpH of three or greater were identified.

A significant fraction of samples would be considered to represent ASS material on the basis of the field test indicator values.

3.4.2 LABORATORY RESULTS

A total of 75 primary samples (~25% of total samples) were analysed via the CRS suite method from samples collected from 11 investigation locations. Samples were selected based on the field test results. The results of the laboratory CRS analyses are summarised as follows:

- One sample contained actual acidity (as s-TAA) in excess of the 0.03%S action criterion;
- 49 samples contained potential acidity (as S_{CR}) equal to or greater than the 0.03%S action criterion;
- Using the standard net acidity equation, NA values range from <0.01%S to 2.535%S.

Comparison of the CRS results to the assessment criteria indicates the following:

- 49 of the 75 samples analysed contained NA in excess of the 0.03%S action criteria.

Based on the calculated NA values, using the appropriate NA equation on the basis of the pH_{KCl} results, there are a total of 49 samples (65%) which exceed the 0.03%S NA action criterion, with values ranging from 0.03%S to 2.535%S. The maximum actual acidity (as s-TAA) is 0.035%S, and the maximum potential acidity (as S_{CR}) is 2.5%S. The maximum NA calculated from the CRS results is 2.535%S, with an average NA of 0.21%S for samples exceeding the DER (2015a) NA action criterion.

3.5 INTERPRETATION

Field results indicate that Site soils are generally slightly acidic to neutral as a large proportion of pH_F results are within the pH6.0 to pH7.0 range. This indicates that there is very little actual acidity present in the soil profile, which is confirmed by the laboratory results, which show very little acidity is present as s-TAA. However, field results also show a high proportion of samples with $pH_{FOX} \leq 3$ and a ΔpH above 3pH units, indicating that there is additional potential acidity yet to be released into the soil profile. This is also confirmed by the laboratory CRS results which show 49 of the 75 samples analysed, contain NA as S_{CR} above the action criterion (0.03%S).

Elevated NA above the action criterion was generally identified at depth (i.e. greater than ~5mBGL) from 10 of the 11 locations and at three of these locations elevated NA was also identified in surface and near surface soils. It should be noted that 41 of the 75 samples analysed by CRS were located >1m below the maximum depth of mine pits, of which 33 exceed the action criterion. The remaining 34 samples analysed for NA were located from soils within the ore zone of the proposed mine pits, of which 16 exceeded the NA action criterion.

4. GROUNDWATER ASSESSMENT

4.1 GROUNDWATER MONITORING WELL LOCATIONS

Due to the preliminary nature of the Project, Doral are yet to install site-specific groundwater monitoring wells to commence the collection of background groundwater data (quality and levels) in either the Superficial and Leederville aquifers. Installation of these monitoring wells is planned to occur in late 2017, with proposed locations shown on Figure 9. A network of landowner and/or DWER bores however have been used to collect initial samples to assist in assessing the baseline quality of groundwater and its vulnerability to acidification.

4.2 ASSESSMENT CRITERIA

Groundwater quality at the Site is compared with guidance criteria provided in (DER, 2015b) to assess whether ASS processes may have taken place at or in the vicinity of the Site. Criteria used for this assessment include the following:

- A sulfate: alkalinity ratio greater than 0.2;
- A pH less than 5;
- Soluble aluminium concentration of greater than 1 mg/L.

In addition, samples are considered in light of indicative guidelines presented in DER (2015b) regarding the buffering capacity of groundwater, based on a review of its alkalinity and pH.

The analytical results were also compared with criteria for Australian Drinking Water Guidelines (ADWG), Non-Potable Use Groundwater (NPUG), and the Fresh Water Guidelines (FWG) in due to the presence of the Sabina River. These criteria are summarised in DWER's document *Assessment and Management of Contaminated Sites* (DER, 2014).

4.3 ANALYTICAL RESULTS

A summary of groundwater analytical results in comparison to the relevant assessment criteria are presented below in Table 1 for the Superficial aquifer and Table 2 for the Leederville aquifer.

TABLE 1: SUMMARY OF SUPERFICIAL GROUNWATER QUALITY

LOCATION	DATE	SWL mBTOC	pH (FIELD)	Total Alkalinity mgCaCO3/L	Total Acidity mgCaCO3/L	SO_4 (mg/L)	Cl (mg/L)	SO_4: Cl RATIO	SO_4: ALK RATIO	AL (diss) (mg/L)	Fe (diss) (mg/L)
ASSESSMENT CRITERIA (mg/L)											
ASS			<5	NV	40	NV	NV	0.5	0.2	1	NV
ADWG			**6.5-8.5**	**NV**	**NV**	**500**	**NV**	**NV**	**NV**	**0.003**	**0.3**
NPUG			*NV*	*NV*	*NV*	*NV*	*NV*	*NV*	*NV*	*0.2*	*0.3*
FWG			6.5-8.5	NV	NV	NV	NV	NV	NV	0.055	0.3
ANALTYTICAL RESULTS (mg/L)											
20005166	June 2017	2.57	**6.2**	64	35	160	380	0.42	2.50	**0.016**	0.11
	July 2017	2.00	**6.34**	64	70	140	330	0.42	2.19	***0.34***	0.12
TS012M	June 2017	3.44	**5.86**	87	110	80	230	0.35	0.92	**0.005**	***0.64***
	July 2017	2.88	**6.05**	92	97	74	280	0.26	0.80	**0.01**	***1.2***

TABLE 2: SUMMARY OF LEEDERVILLE GROUNWATER QUALITY

LOCATION	DATE	SWL mBTOC	pH (FIELD)	Total Alkalinity mgCaCO3/L	Total Acidity mgCaCO3/L	SO_4 (mg/L)	Cl (mg/L)	SO_4: Cl RATIO	SO_4: ALK RATIO	AL (diss) (mg/L)	Fe (diss) (mg/L)
ASSESSMENT CRITERIA (mg/L)											
ASS			<5	NV	40	NV	NV	0.5	0.2	1	NV
ADWG			**6.5-8.5**	**NV**	**NV**	**500**	**NV**	**NV**	**NV**	**0.003**	**0.3**
NPUG			*NV*	*NV*	*NV*	*NV*	*NV*	*NV*	*NV*	*0.2*	*0.3*
FWG			6.5-8.5	NV	NV	NV	NV	NV	NV	0.055	0.3
ANALTYTICAL RESULTS (mg/L)											
20083645	June	0.76	**6.03**	52	120	37	340	0.11	0.71	**0.068**	***34***
	July	0.74	**6.31**	53	120	38	340	0.11	0.72	**0.087**	***39***
20005254	June	1.14	**5.85**	91	150	40	330	0.12	0.44	**0.064**	***29***
	July	0.67	**5.98**	85	150	34	340	0.10	0.4	**0.061**	***26***
20005356	June	2.75	**5.74**	51	170	66	460	0.14	1.29	**0.032**	***15***
	July	2.23	**5.80**	33	49	58	460	0.13	1.76	**0.032**	***15***
Lot 758 - Bore	July		**6.3**	32	45	22	270	0.08	0.69	**0.051**	***24***

LOCATION	DATE	SWL mBTOC	pH (FIELD)	Total Alkalinity mgCaCO3/L	Total Acidity mgCaCO3/L	SO_4 (mg/L)	Cl (mg/L)	SO_4: Cl RATIO	SO_4: ALK RATIO	AL (diss) (mg/L)	Fe (diss) (mg/L)
Lot 421 – Bore1	June		6.04	74	130	38	330	0.12	0.51	**0.050**	*22*
Lot 667 – WM1	June	0	5.74	64	190	40	310	0.13	0.63	0.084	*32*
	July	0	5.92	65	190	35	310	0.11	0.54	0.075	*33*
Lot 668 – Bore2	June	10.5	6.17	74	83	36	270	0.13	0.49	**0.049**	*23*
	July	9.68	6.47	59	70	31	280	0.11	0.53	0.056	*23*
Lot 200 - Bore	June		5.94	61	150	7	160	0.04	0.12	0.065	*36*
	July		6.12	78	150	14	160	0.09	0.18	0.08	*39*
Lot 552 - Bore	June		5.35	21	91	12	170	0.07	0.57	**0.015**	0.068
	July		5.42	39	130	13	170	0.08	0.33	0.066	*33*

4.3.1 Superficial Aquifer groundwater results

A comparison of the results to the ASS indicator criteria indicates the following for the Superficial aquifer quality:

- pH values range from 5.86 to 6.34, with an average of 6.11 and do not exceed the ASS indicator value of pH5.0;
- Three of the four samples exceed the DWER recommended maximum total acidity concentration of 40mg$CaCO_3$/L, with concentrations of 70-110 mg$CaCO_3$/L;
- Total alkalinity concentrations range from 64-92mg$CaCO_3$/L, indicating that groundwater is generally adequate to maintain acceptable pH levels;
- The sulfate to alkalinity ratio for all groundwater samples exceeds 0.2;
- Dissolved aluminium concentrations are below 1mg/L for all four samples.

A comparison of the groundwater results to the ADWG criteria indicates the following:

- The pH of all samples is below the recommended range of 6.5-8.5;
- Dissolved aluminium concentrations of all samples exceeded the criterion of 0.003mg/L;
- Dissolved iron concentrations of two of the four samples exceed the 0.3mg/L criteria.

A comparison of the groundwater results to the NPUG criteria indicates the following:

- One sample exceeds the dissolved aluminium criteria;
- Two samples exceed the dissolved iron criteria;

A comparison of the groundwater results to the FWG criteria indicates the following:

- The pH of all samples is below the recommended range of 6.5-8.5;
- One sample exceeds the dissolved aluminium criteria of 0.003mg/L;
- Two samples exceed the dissolved iron criteria of 0.3mg/L.

4.3.2 Leederville Aquifer groundwater results

A comparison of the results to the ASS indicator criteria indicates the following for the Leederville aquifer quality:

- pH values range from 5.35 to 6.47, with an average of 5.95 and do not exceed the ASS indicator value of pH5.0;
- All samples exceed the DWER recommended maximum total acidity concentration of 40mg$CaCO_3$/L, with concentrations ranging from 45-190 mg$CaCO_3$/L;
- Total alkalinity concentrations range from 21-91mg$CaCO_3$/L, indicating that groundwater is generally inadequate to maintain acceptable pH levels in areas vulnerable to acidification;
- The sulfate to alkalinity ratio for 13 of the 15 groundwater samples exceeds 0.2;
- Dissolved aluminum concentrations are below 1mg/L for all samples.

A comparison of the groundwater results to the ADWG criteria indicates the following:

- The pH of all samples is below the recommended range of 6.5-8.5;

- Dissolved aluminum concentrations of all samples exceed the 0.003mg/L criteria;
- Dissolved iron concentrations of all samples except two, exceed the 0.3mg/L criteria.

A comparison of the groundwater results to the NPUG criteria indicates the following:

- Dissolved iron concentrations of all samples except two, exceed the 0.3mg/L criteria

A comparison of the groundwater results to the FWG criteria indicates the following:

- The pH of all samples is below the recommended range of 6.5-8.5;
- Nine of the 15 samples exceed the dissolved aluminum criteria of 0.0055mg/L;
- Fourteen of the 15 samples exceed the dissolved iron criteria of 0.03mg/L.

4.4 INTERPRETATION

Groundwater results from initial groundwater monitoring undertaken by Doral, indicate that Superficial groundwater quality beneath the Site is slightly acidic due to pH levels generally <6.0 (although above the ASS indicator value of pH5.0), elevated total acidity concentrations of up to 110mg$CaCO_3$/L and moderate total alkalinity concentrations. The alkalinity/sulfate ratio indicates that groundwater is being affected by, or has already been affected by, the oxidation of sulfides. Moderate alkalinity concentrations coupled with a pH of <6.0 indicates groundwater is generally inadequate to maintain a stable pH in areas vulnerable to acidification. It is also noted that the alkalinity concentrations are approximately equal to the total acidity concentrations, indicating that some buffering capacity is present within the system to offset some of the acidity.

Groundwater quality in the Leederville Aquifer is also considered to be acidic as evidenced by the high total acidity concentrations (up to 190mg$CaCO_3$/L) and pH generally <6.0. Alkalinity concentrations are in the low to moderate range indicating that groundwater is inadequate to maintain a stable, acceptable pH level. The alkalinity/sulfate ratio also indicates that groundwater is being affected by, or has already been affected by, the oxidation of sulfides.

5. MINING AND DEWATERING PROCCESS

The mining activities will be scheduled to be undertaken on a campaign basis, with a portion of the ore body being mined and processed in a discrete time period. During each campaign, ore from the targeted area of the deposit will be mined progressively via a series of open-cut pits using dry mining techniques. Once the topsoil and subsoil are stripped and stockpiled, overburden (if present) will be removed via excavator and truck. Removed overburden will be stockpiled or where possible used in progressive rehabilitation of previously mined areas (i.e. backfilled into mine pits). Exact depths of ore and overburden will vary for each pit, but will not exceed ~12mbgl. Ore will be mined in a series of lifts, to a maximum depth of ~12mbgl. Additional infill drilling may indicate localised areas where the Yoganup strand ore might exceeds this indicated depth. Pits will be mined on a slight incline from the deepest point and then mined moving up gradient in order to retain pit water within a sump at the deepest point on the pit floor. This form of dewatering is known as 'passive' as no dewatering apparatus (e.g. spears) are used to actively abstract water and groundwater drawdown below the base of the pit (i.e. below 12m) is highly unlikely to occur. Only suction pumps (no submersible pumps) are used for dewatering and the suction pumps are set up at a level to maintain a 0.5m saturated pit floor. Mine pit dewater is pumped from the sump to the process water pond (PWP) for reuse.

Near surface dunal sand ore will be mined from the face using a Front End Loader in a single lift, and fed into the in-pit hopper, and screened and slurried using a mobile in-pit screening unit. The ore sourced from the deeper Yoganup strands will be mined using excavtors and trucks to a central ROM pad (then feed into a fixed location feed unit). Alkaline (lime sand) material may also be added into the in-pit hopper during the excavation of ore to increase/maintain the pH (pH6.0) and buffering capacity within the wet concentration process and outgoing sand tails. The screened slurry is then pumped to the feed preparation plant where it will move through a trommel and scrubber for removal of material greater than 3mm. Oversize materials (i.e. > 3mm) will be returned to the pit void or used to sheet internal mine site roads.

From the feed preparation plant, the ore will be transported via pumps and pipelines to the wet concentration plant where the process requires all particles >2.4mm to be removed from the ore. Approximately 500,000 to 700,000t of HMC is expected to be produced over the life of mining. The HMC is stockpiled onsite and the moisture content is then reduced by allowing the stockpile to drain, prior to transportation to the Picton Dry Separation Plant.

Two waste streams are produced from the wet concentration plant; sand tails and clay slurry. Sand tails (including the lime sand added to the in-pit hopper) are hydraulically returned as a slurry to the mine pits as rapidly as possible to maximise rebound of groundwater levels. The clay slurry is directed to the thickening circuit, where flocculent agglomerates clay fines, producing clay slurry.

Clay tails are either pumped into solar evaporation ponds (SEPs) to allow settlement and drying or co-disposed with sand tails. Dried clay tails from the SEPs will be removed from the ponds (during the dry months) and placed in-pit with sand tails. Where possible co-disposal of clay fines and sand tails will be undertaken during mining whereby the clay tails is disposed with the sand tails into the pit voids at the same time. This provides a more heterogeneous distribution of soil particle sizing and improves the hydraulic conductivity and permeability of the returned soil profile. The majority of the water will be decanted from the SEPs and pumped or gravity fed back to the PWP for use as process water.

6. SOIL MANAGEMENT STRATEGY

The Yalyalup deposit is mapped as Bassendean Sands in an area mapped as having a moderate to low risk of ASS (Class II) occurring within 3m of the natural soil surface. Results derived during Doral's ASS investigation show that site soils proposed for excavation and dewatering contain NA in excess of the DWER's action criterion of 0.03%S. Therefore, soils will require management once excavation activities begin.

The general sequence of mining and processing is as follows:

1. Removal and stockpiling of topsoil and subsoil;
2. Either overburden or mineral sands ore will be excavated:
    a. For strand deposit ore, which is overlain by several metres of overburden, initial excavation will be to remove overburden:
        i. Overburden, where present, will be re-buried into a pre-existing mine void, within 70 hours of excavation or will be stored and managed appropriately prior to re-burial or re-use onsite;
        ii. Excavation and processing of ore commences.
    b. Where ore is present at surface, such as for dunal deposit materials, excavation and ore processing will commence immediately.
3. For all ore that is excavated, processing commences when the material is fed into the in-pit hopper, with the addition of lime sand (as necessary to maintain process materials at pH6.0), and transported as a wet slurry to the wet concentration plant;
4. Processing of the slurried materials results in the ore materials being separated into three process streams; HMC, sand tails and clay fines:
    a. The HMC is initially stockpiled onsite prior to transport off-site for further treatment at Doral's Picton Dry Plant;
    b. The clay fines and sand tails waste streams are managed either by co-disposed into mine voids or managed as waste material (in SEPs) prior to being disposed on-site into mine voids that have been created.

In addition to the general sequence of mining and processing, if necessary, unprocessed materials may be utilised for construction of roads or infrastructure, with the material being referred to from herein as ''construction material''.

The soil management strategies presented here are intended to minimise the risk of ASS impacts.

6.1 TOPOSIL AND SUBSOIL MANAGEMENT

Topsoil and subsoil will be stripped to a depth of approximately 100mm and stockpiled, prior to use in progressive rehabilitation. In accordance with DER (2015b), topsoil will not require neutralisation if the pH of surface soils (0-0.3m) is less than pH4.0. Should the pH of this material be less than pH4.0, neutralisation will be undertaken using suitable alkaline material to ensure a revised validation criterion of pH5.0 is achieved.

6.2 OVERBURDEN MANAGEMENT

The strandline deposit ore at Yalyalup is overlain by approximately 2-5m of overburden which requires excavation and management prior to excavation and processing of ore.

On the basis that overburden will not be processed, any overburden that has been identified as ASS (i.e. NA > 0.03%S) will be reburied as soon as possible below the natural groundwater level into a mine void that is being actively backfilled with sand tails and/or clay fines resulting from ore processing. The sand tails and/or clay fines are hydraulically returned over the overburden, maintaining the overburden material to anoxic conditions and providing additional buffering capacity, as a result of the addition of lime sand during the excavation and processing of ore. The addition of this alkaline material during backfill of overburden is a form of *in situ* treatment as it allows a homogenous application of additional alkalinity to be applied to the overburden material.

Overburden identified as ASS that cannot be immediately backfilled will be excavated and temporarily stored in-pit on a guard layer of alkaline material for less than 70 hours prior to being re-buried below the natural groundwater level into a mine void that is being actively backfilled with sand tails and/or clay fines (i.e. equivalent to DWER's short-term stockpiling timeframe).

Overburden identified as ASS that is unable to be re-buried with within 70 hours will be stockpiled on a treatment pad prior to neutralisation treatment at an appropriate rate based on the NA of the material, and will be re-buried within 21 days (i.e. DWER's medium-term stockpiling timeframe). The treatment pad will be constructed of compacted crushed limestone of not less than 300mm thickness, be graded to ensure good drainage, and all sides will be bunded with limestone or similar alkaline material to a minimum height of approximately 150mm above the surface of the pad to prevent lateral run-off. A leachate collection system will also be present to manage run-off from rainfall events.

It should be noted that overburden excavated from below the natural groundwater level will be maintained in an anoxic state prior to excavation as a result of the passive dewatering method. As a result, this overburden will be excavated in a saturated state, reducing potential for oxidation of sulfidic acidity that may be present.

6.3 ORE MANGEMENT

Excavated ore that has been identified as ASS (i.e. NA >0.03%S) will be processed through the wet concentration plant as soon as possible. As this material is maintained in the form of a wet slurry (i.e. saturated), the risk of sulfide oxidation is greatly reduced and as such will not require any active soil management if in this state. The process slurry is maintained at pH6.0 to assist with the separation process. As such, alkaline (lime sand) material will be added into the in-pit hopper during the excavation of ore to maintain pH6.0 and increase buffering capacity within the wet concentration process. Unused (unreacted) lime sand becomes a portion of the outgoing sand tails, resulting in the addition of buffering capacity to this waste stream. The rate at which lime sand is added to the in-pit hopper will be determined through pit dewater, wet plant thickener and/or tails return water field pH monitoring.

Any ore material that is not processed immediately upon excavation will be placed on a guard layer of alkaline material and stockpiled for a period of no more than 70 hours (i.e. short-term stockpiling timeframes). Ore that cannot be processed within 70 hours will be stockpiled on a treatment pad (constructed as per Section 6.2) and will be processed or neutralised within 21 days (i.e. medium-term stockpiling timeframe).

6.4 PROCESSED MATERIALS MANAGEMENT

Processing of ore results in three streams of material, HMC, clay fines and sand tails. The three processed streams are then dealt with in the following manner:

- HMC is stockpiled and stored on-site until transport to Doral's Picton dry processing plant for further processing;
- Sand tails are hydraulically returned into pit voids (including as co-disposal);
- Clay fines are either hydraulically co-disposed with sand tails into pit voids or directed to SEPs to be consolidated for future disposal into mine voids.

Management of each of the process streams is detailed in the following sections.

6.4.1 HMC

The HMC resulting from processing will be stockpiled and stored on a bunded alkaline pad, as described in Section 6.2, until it is transported offsite. Leachate emanating from the stockpiled HMC will be captured and returned to the ore processing circuit, which is maintained at pH6.0.

6.4.2 SAND TAILS

Sand tails resulting from ore processing will be hydraulically returned to pit voids as a single waste stream and/or co-disposed with clay fines into pit voids. This material will have been maintained in a saturated state and with conditions maintained at pH6.0 throughout the process. Furthermore, the unused (unreacted) lime sand that was added to the process at commencement of the ore processing sequence (i.e. at the in-pit hopper) will form part of this process stream, resulting in the addition of buffering capacity to the locations where this material is hydraulically returned.

Sand tails will be regularly tested to ensure that the inherent acid neutralising capacity of this waste stream exceeds the acidity present. If necessary, additional lime sands will be incorporated during hydraulic disposal.

6.4.3 CLAY FINES

Clay fines will be managed by either:

- Immediate co-disposal with sand tails by hydraulic return in existing mine voids; or
- Directed to a SEP for storage and future use as void backfill.

Clay fines that are immediately co-disposed with sand tails will be maintained in a saturated state prior to disposal and will include additional buffering capacity provided by the unused (unreacted) lime sands within the sand tails material. This material will be regularly tested to ensure that the acid neutralising capacity exceeds the acidity present in this waste stream.

Clay fines material that are directed to the SEPs will also be regularly tested to ensure the acid neutralising capacity exceeds acidity of the waste stream. If insufficient buffering capacity is identified, additional neutralising material (lime sand) will be added prior to being discharged into a SEP. In addition to regular testing during discharge, this material will be re-tested following consolidation and drying within the SEP, prior to final disposal. The purpose of the pre-disposal testing is to ensure the pH and acid neutralising capacity of material is adequate to mitigate post-disposal risk to the receiving environment. Leachate from the SEP's will be directed back towards the ore processing circuit, which is maintained at pH6.0.

6.5 CONSTRUCTION MATERIAL MANAGEMENT

Overburden and non-processed material identified as ASS (i.e. NA >0.03%S), that will be used for site construction purposes (i.e. roads, pads, bunds etc) will either be:

- Neutralised for re-use within 70 hours of excavation; or
- Stockpiled on a treatment pad (as described in Section 6.2) for up to 21 days prior to neutralisation and re-use.

Neutralisation and validation sampling of this material will be undertaken using the rates and criteria provided in Section 6.6.

6.6 CONSTRUCTION MATERIAL NEUTRALISATION RATE AND VALIDATION

Table 3 presents the uncorrected neutralisation rate calculated using the following equation:

Lime required (kg $CaCO_3/m^3$) = Soil density (t/m^3) x NA (%S x 30.59) x 1.02 x safety factor (1.5) x 100/ENV

It should be noted that this liming rate is provided as a guide only, as it is based on samples analysed for CRS at depth (i.e. greater than ~5mBGL) and not of the actual overburden material. Doral intends to characterise the NA of overburden material during infill drilling in late 2017 to provide a more accurate liming rate.

TABLE 3: LIMING RATE CALCAULATION

A: Soil Density (tonne/m^3)	1.65
B: NA (%S)	0.66
C: Conversion Factor (%S to kg lime/tonne soil, including 1.5 x safety factor)	46.80
A*B*C: Uncorrected Liming Rate (kg $CaCO_3/m^3$ soil)	**51.0**

The liming rate presented in Table 3 has been calculated using an assumed bulk density of 1.65 t/m^3 and the average plus one standard deviation NA values for soils exceeding the action criterion at the Site (0.66%S); it is uncorrected for effective neutralising value (ENV). That is, uncorrected liming rates assume that the treatment will be undertaken using pure calcium carbonate which can all be directly utilised. As aglime (also known as lime sands), the most common agent, is not 100 % calcium carbonate and has particle size variations leading to a reduction in its chemical availability, the values presented in Table 3 will need to be corrected for ENV. A lime certificate providing information about the neutralising value and particle size distribution of the neutralising agent will be required. This is to be provided by the supplier. As an indication, the effective neutralising value of commonly available aglime/limesand may be in the order of 70%, which would yield a corrected liming rate of approximately 87kg$CaCO_3/m^3$ soil.

Treated material will be subject to validation sampling at a rate consistent with (DEC, 1996) guidance in *Landfill Waste Classification and Waste Definitions 1996 (As amended)*. Samples are to be undertaken to represent 'batches' of treatment.

All samples are to be assessed for pH_F and pH_{FOX}. The accuracy of the field testing program should be initially 'calibrated' by sending approximately 25% of samples for additional laboratory analysis by SPOCAS suite or CRS suite with inclusion of TPA analysis from SPOCAS suite.

Samples meeting the following criteria (DER, 2015b) will be deemed to be effectively neutralised:

1. Visually, the neutralising material must be well-blended with the soil.
2. Samples require a pH_F of between 6.0 and 8.5.
3. Samples require a pH_{FOX} of at least 5, to indicate that there is neutralising capacity greater than the existing plus potential acidity of the soil.
4. Laboratory results need to indicate that excess acid neutralising capacity is present, as evidence that acidity released in the future can be neutralised.

6.7 SAND TAILS NEUTRALISATION AND VERIFICATION

Sand tails will include unused (unreacted) lime sands resulting from the addition of lime sands to the excavated ore material at the in-pit hopper. The sand tails will also be co-disposed with clay fines. The incorporation of this material into the sand tails will result in the addition of acid neutralising capacity to the receiving environment of the sand tails.

Testing of the sand tails waste stream will be undertaken to ensure the material has been effectively neutralised, as per the following criteria:

1. Co-disposed materials must be well mixed prior to hydraulic reburial.
2. Samples require a pH_F of between 6.0 and 8.5.
3. Samples require a pH_{FOX} of at least 5, to indicate that there is neutralising capacity greater than the existing plus potential acidity of the soil.
4. Laboratory results need to indicate that excess acid neutralising capacity is present, as evidence that acidity released in the future can be neutralised.

6.8 CLAY FINES NEUTRALISATION AND VERIFICATION

Clay fines will be either co-disposed with sand tails into the mine voids or directed to a SEP for consolidation prior to final disposal into a mine void.

Clay fines sent to a SEP will be managed by addition of sufficient alkaline material to ensure that the acid neutralising capacity exceeds the acidity present within this material. Clay fines that are co-disposed will be treated by mixing with sand tails and/or by addition of appropriate alkaline material (lime sand) to ensure the material has been neutralised. Testing of the clay fines waste stream will be undertaken prior to either co-disposal in mine voids or storage in SEPS to ensure the following criteria are met:

1. Visually, the neutralising material must be well-blended with the soil.
2. Samples require a pH_F of between 6.0 and 8.5.
3. Samples require a pH_{FOX} of at least 5, to indicate that there is neutralising capacity greater than the existing plus potential acidity of the soil.
4. Laboratory results need to indicate that excess acid neutralising capacity is present, as evidence that acidity released in the future can be neutralised.

Clay fines that are contained within the SEPs will also be tested prior to disposal into mine voids and if necessary be treated by addition of alkaline material (lime sand), to ensure that sufficient acid neutralising capacity is present in to overcome future oxidation of sulfidic material. The aforementioned criteria must be met prior to removal or disposal of consolidated material from the SEPs.

6.9 DOCUMENTATION OF SOIL MANAGEMENT

Documentation of soil management will be maintained as follows:

- Source and volume of ASS material requiring neutralization;
- Source and volume of neutralising material used;
- Verification sampling undertaken;
- Final location of treated material.

7. DEWATERING MANAGEMENT STRATEGY

7.1 DEWATERING PROCESS AND EXTENT

Dewatering to the required depth of excavation will occur passively as groundwater enters the mining excavation. The water will be pumped out using a suction pump set at a level to maintain a 0.5m saturated pit floor and sent through to a sump prior to reaching the unlined process water pond where it mixes with other water from other mine processes. The use of passive dewatering reduces the extent of groundwater drawdown as far as practical.

The extent of groundwater drawdown is also reduced by recharge resulting from the hydraulic backfill of the pit voids with sand tails and clay fines. The pit backfilling acts to recharge groundwater levels rapidly, compared to unassisted rebound by aquifer hydraulic head pressures only. The expedited recharge, thereby reduces the extent of dewatering influence and returns the soil profile to anoxic conditions. Unreacted lime sand that was added to the ore slurry at the in-pit hopper (to ensure the process stream pH is maintained at pH6.0) also ends up in the sand tails waste stream, assisting to buffer the pH of the groundwater system as rebound occurs.

7.2 DEWATERING MONITORING

One sample point will be established to monitor the dewatering effluent quality at a location prior to the water reaching the process water pond (pit dewatering sump) and a second sample point will be established at the process water pond.

The following monitoring program will be conducted for the pit dewatering sump (pre-treatment) and process water dam (post-treatment):

- Field testing for pH, electrical conductivity (EC), total titratable acidity (TTA) and Total Alkalinity will occur three times a week (Monday, Wednesday and Friday);
- Monthly laboratory analysis for pH, EC, TDS, total acidity, total alkalinity, dissolved aluminium, dissolved iron and dissolved manganese.
    - If total aluminium is above 1mg/L then additional laboratory analysis will be required for the following total metals; arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc.

7.3 DEWATERING TRIGGER VALUES AND TREATMENT

DER (2015b) guidelines require that dewatering effluent with a pH of less than pH6.0 or total acidity of greater than 40mg$CaCO_3$/L or total alkalinity less than 30mg$CaCO_3$/L, be treated via addition of a neutralising agent prior to reinfiltration (i.e. hydraulic return of sand tails and/or clay fines into mine void).

As groundwater (from preliminary monitoring) has been shown to be slightly acidic, the following trigger values will apply to the monitoring of dewatering effluent from the pit dewatering sump (pre-treatment) and also within the process water pond:

- Field pH <5.5 or
- TTA >40 mg$CaCO_3$/L; or
- Total Alkalinity <30 mg$CaCO_3$/L.

Should any of these criteria be triggered, dewatering effluent will be treated via the addition of a suitable neutralising agent. In the event that the water within the process water pond exceeds the trigger values, active management of process water prior to reinfiltration (via clay fines and sand tails) or discharge from the water circuit will be required.

7.4 CONTINGENCY PLAN

In the event that monitoring of the dewatering effluent reaches a trigger value listed in Section 7.3, the initial response (apart from neutralisation) will be to increase the monitoring listed in Section 7.2 to daily field testing and weekly laboratory testing of the affected areas.

If trigger values listed in Section 7.3 are reached at the process water pond, the initial contingency measure will be to treat the process water through the addition of a suitable alkaline material to the thickener until the water is above the trigger values. Whilst the process water pond is outside of the trigger values, discharge of process water off site will cease.

Any off-site emergency discharge of water from the process water dam will be managed and monitored through DWER licensing under Part V of the EP Act before any process water is discharged.

Monitoring of the pit dewatering sump will provide prior indication that treatment is likely to be required at the process water dam. If the trigger values listed in Section 7.3 in the pit dewatering sump (pre-treatment) are exceeded, the contingency action will be to add a neutralising agent to the thickener.

8. GROUNDWATER MANAGEMENT STRATEGY

The disturbance of ASS material can lead to the release of acid and mobilisation of metals, causing contamination of groundwater which may cause offsite impacts to groundwater and groundwater dependent ecosystems. Indirect disturbance via dewatering is a primary concern, as areas of the site contain ASS material below the usual groundwater table interface which may be exposed to oxidation via dewatering. Indirect acidification via dewatering may lead to acidic or metal-rich groundwater plumes which may affect onsite or offsite receptors. In order to identify potential groundwater impacts, monitoring of groundwater quality will take place, and the results will be compared against baseline values. If required, contingency measures will be developed and implemented.

8.1 GROUNDWATER MANAGEMENT

As the ore body is mined using dry mining techniques, the ore located below the natural groundwater table, will need to be dewatered. Although the dewatering process will be passive, reducing the radius of influence of dewatering compared to active dewatering (i.e. such as spears), a significant area will eventually be impacted by the passive dewatering, including areas adjacent to the Sabina River, and wetland areas within the site. It is therefore considered appropriate to monitor groundwater to assess possible impacts of the reduction in groundwater levels during mining.

8.2 GROUNDWATER MONITORING WELLS

At present no groundwater monitoring wells have been installed at the Site. Doral plan to install site-specific groundwater monitoring wells up-gradient and down-gradient of mining areas towards the end of 2017 within the Superficial Aquifer (Figure 9). These wells will be used to develop trigger criteria and monitor changes in groundwater levels and quality.

8.3 GROUNDWATER MONITORING PROGRAM

The following monitoring program will be conducted during dewatering operations for the proposed groundwater monitoring wells:

- Monthly monitoring of groundwater levels;
- Monthly field testing for pH, EC, TTA and temperature;
- Monthly laboratory analysis for pH, EC, TDS, total acidity, total alkalinity, chloride, sulfate, dissolved aluminium, dissolved iron and dissolved manganese (If Al >1 mg/L then the sample will also be analysed for As, Cd, Cr, Cu, Pb, Hb, Ni, Se, Zn).

The results will be compared to site-specific assessment criteria (yet to be developed), which will be based on baseline monitoring results.

At the completion of dewatering operations, groundwater monitoring will continue as above for six months (or until any adverse trends have stabilised) then on a quarterly basis for an additional 12 months.

8.4 GROUNDWATER ASSESSMENT CRITERIA

It is proposed that site-specific groundwater assessment criteria will be developed for each of the proposed monitoring wells using background data that is to be collected in the 12-month period preceding the commencement of mining. The assessment criteria will be set using the mean laboratory data plus/minus two standard deviations for relevant ASS parameters.

8.5 TRIGGER CRITERIA

The trigger values are inherently conservative and the initial response to an exceedance by any parameter will be to establish the context of the exceedance and determine whether the result requires re-sampling/analysis, immediate further action, or no response at all. A key measure for the context of an exceedance is to consider whether multiple triggers are exceeded.

Initial response to exceedance of any trigger value will be:

- Review exceedance in relation to any site wide changes or trends in key ASS risk parameter (pH, TTA and TAlk);
- Review sample collection, handling and analysis methods and procedures to ensure appropriate methods were used;
- Review groundwater level data, dewatering effluent quality data and current mining operations to consider possible causal factors;
- If necessary, re-sample affected locations as soon as practical (i.e. within 2-weeks) to confirm whether or not the groundwater quality parameter(s) exceed the trigger value;
- Increase on-going monitoring frequency of the affected monitoring well(s).

Secondary responses will be developed based upon situation specific outcomes from the initial responses, but will include the following immediate further action responses:

- If it is confirmed that the pH and TTA exceed trigger criteria in successive sampling events, the sampling frequency for field parameters will be increased to fortnightly; and/or
- When it is confirmed that any other groundwater quality parameters have deteriorated to levels outside of the background based trigger levels; then
- Inform DWER that contingency monitoring is being undertaken; and
- Prepare a contingency action plan suited to the level of risk that confirmed adverse groundwater quality poses to potential receiving environments, such as down gradient groundwater users or environmental receptors.

8.6 REPORTING

The monthly groundwater monitoring results will be compared to trigger levels within 7 days of receipt of analytical results. The presence or absence of results that exceed trigger values will be recorded on a monthly groundwater log. If contingency measures are required, the initial response and or any secondary responses will be recorded in the groundwater log within 24 hours.

The groundwater log, field results and laboratory documentation of each year will be reported in the Annual Environmental Report (AER).

9. REFERENCES

Baddock, L., Vine, J., & Leathersich, M. (2005). *South West Yarragadee Hydrogeological Investigations and Evaluation, Southern Perth Basin. Infrastructure Planning Branch.* Water Corporation.

Davidson. (1995). *Hydrogeology and Groundwater Resources of the Perth Region. Geol. Soc. WA Bulletin 142.*

DEC. (1996). *Landfill Waste Classification and Waste Definitions 1996 (As amended December 2009).* Department of Environment and Conservation (DEC).

DEC. (2008). *Geomorphic Wetlands of the Swan Coastal Plain GIS Mapping dataset. Department of Environment and Conservation. Perth, Western Australia.*

DER. (2014). *Assessment and Management of Contaminated Sites.* Department of Environment regulation (DER). Government of Western Australia.

DER. (2015a). *Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes.* Government of Western Australia, Department of Environment Regulation (DER).

DER. (2015b). *Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes.* Guideline, Government of Western Australia, Department of Environment Regulation (DER).

DoW. (2009). *Whicher Area Surface Water Allocation Plan. Water resource and planning series Report 19. Department of Water, Western Australia.*

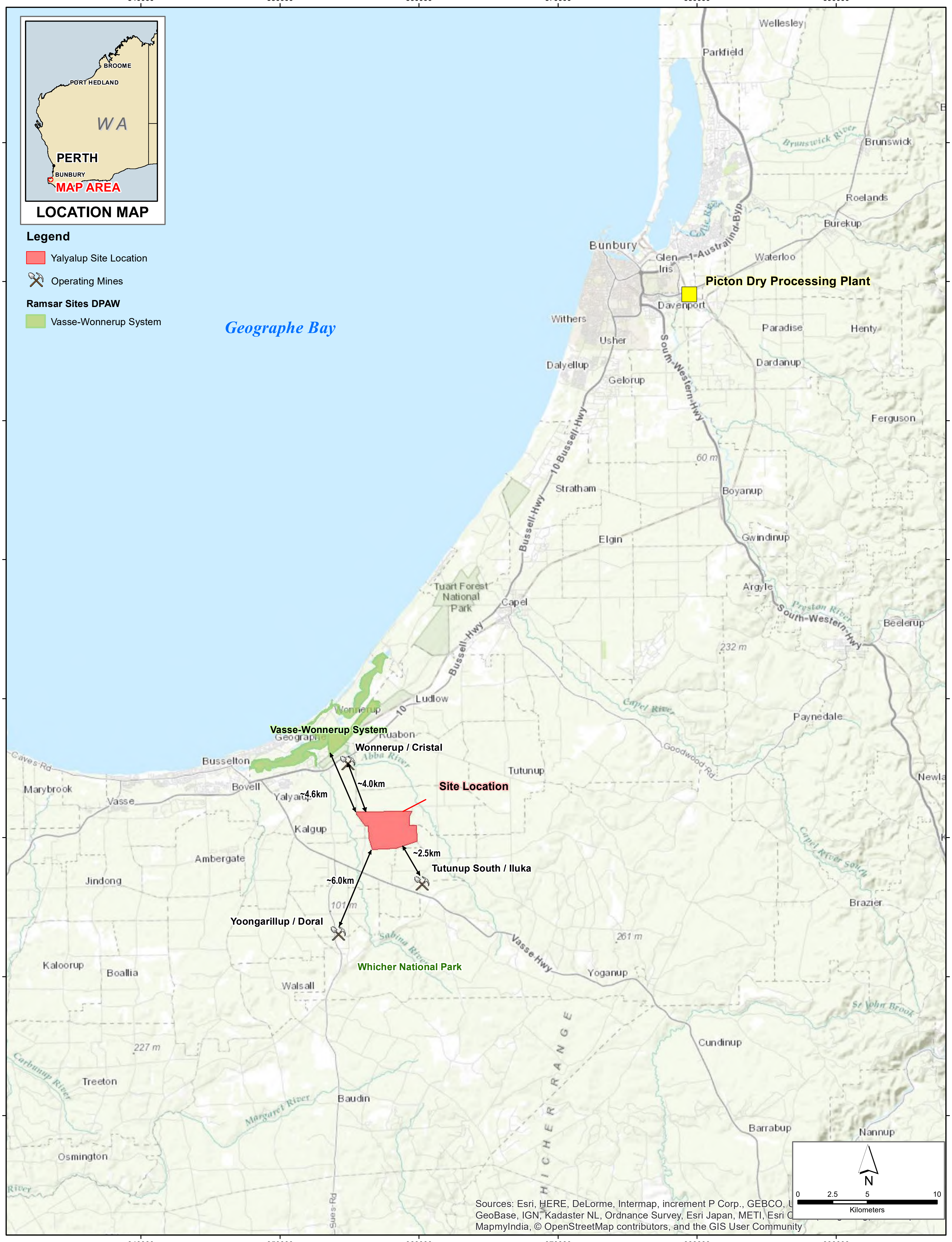
DoW. (2009). *Whicher Area Surface Water Allocation Plan. Water resource and planning series Report 19. Department of Water, Western Australia.*

Hirschberg. (1989). *Busselton shallow-drilling groundwater investigation: Western Australia Geological Survey, Professional Papers, Report 25, p. 17-37.*

HydroSolutions. (2017). *Initial Hydrogeological Assessment: Proposed Yalyalup Mineral Sands Mine. .* Unpublished report prepared for Doral Mineral Sands Pty Ltd.

Schafer, D., Johnson, S., & Kern, A. (2008). *Hydrogeology of the leederville aquifer in the western Busselton-Capel Groundwater Area. Hydrogeological record series Report HG31.* Department of Water.

FIGURES

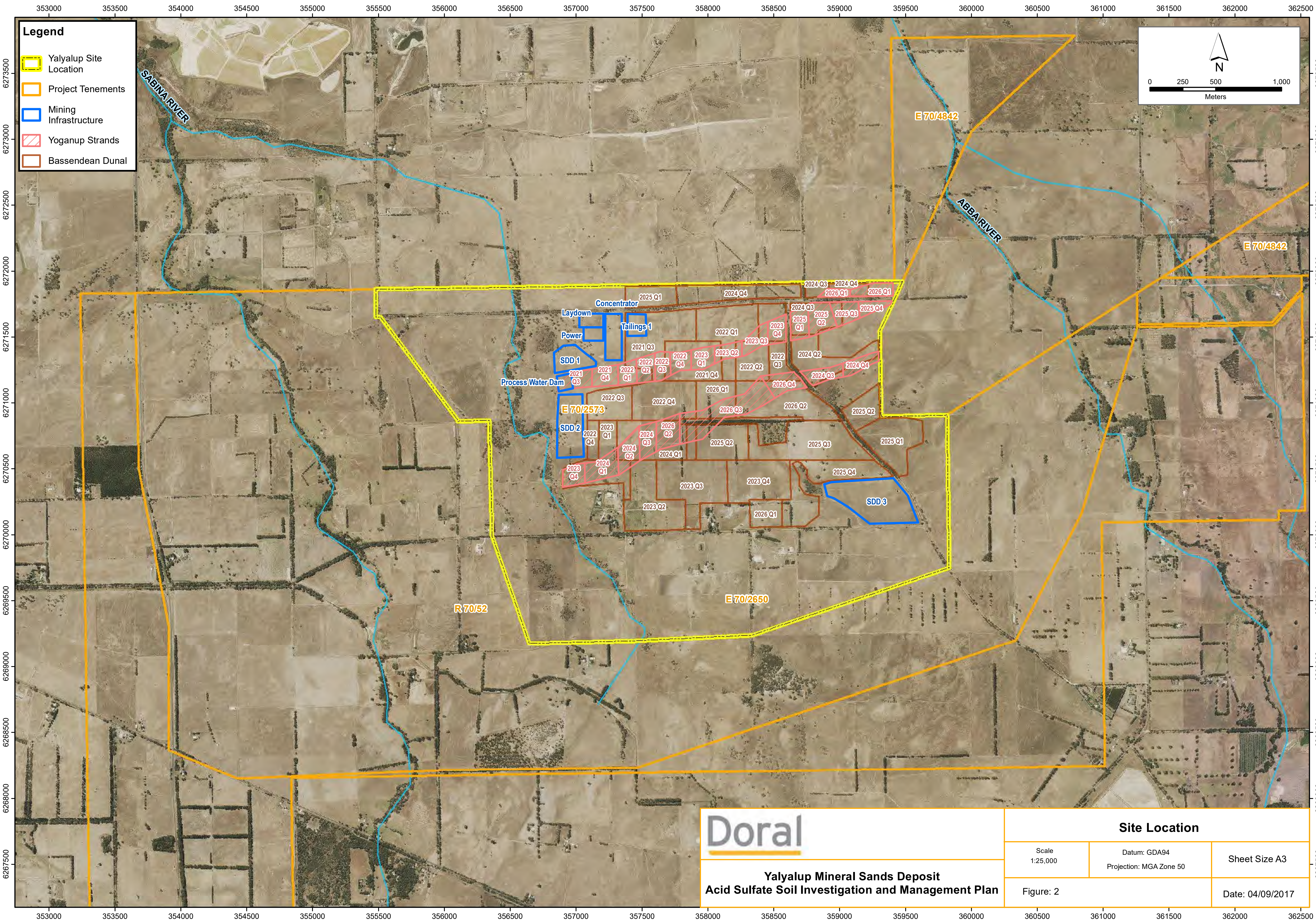


Doral

ASS Management Plan

Scale 1:250,000	Datum: GDA94 Projection: MGA Zone 50	Sheet Size A3
	Figure: 1	Date: 04/09/2017

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan



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Site Location

Scale 1:25,000

Datum: GDA94

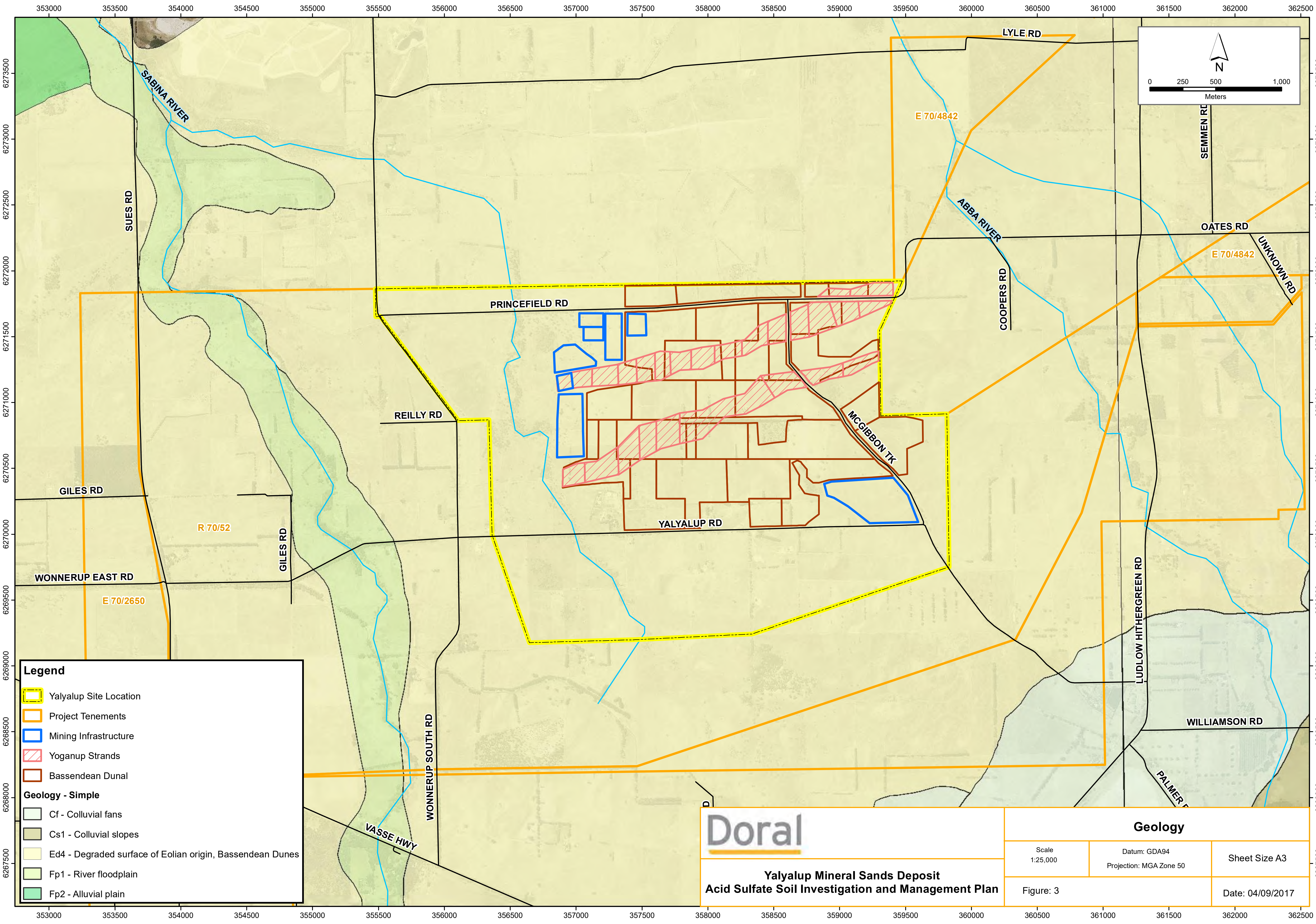
Projection: MGA Zone 50

Sheet Size A3

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Figure: 2

Date: 04/09/2017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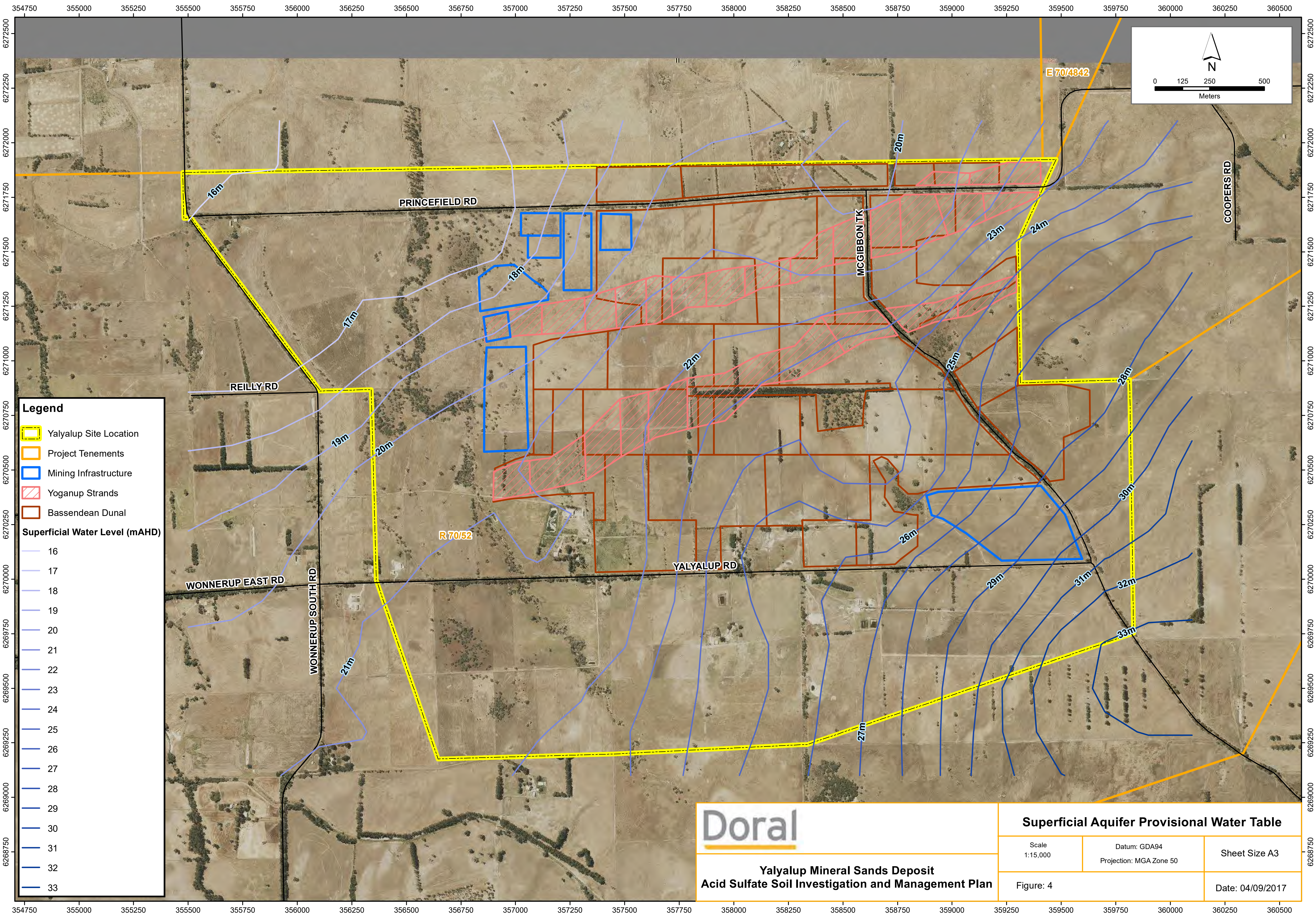
N
0 250 500 1,000
Meters
LYLE RD
SABINA RIVER
E 70/4842
SEMMEN RD
SUES RD
ABBA RIVER
OATES RD
UNKNOWN RD
COOPERS RD
PRINCEFIELD RD
REILLY RD
MCGIBBON TK
GILES RD
R 70/52
YALYALUP RD
WONNERUP EAST RD
E 70/2650
LUDLOW HITHERGREEN RD
WILLIAMSON RD
WONNERUP SOUTH RD
PALMER R
VASSE HWY
Legend
Yalyalup Site Location
Project Tenements
Mining Infrastructure
Yoganup Strands
Bassendean Dunal
Geology - Simple
Cf - Colluvial fans
Cs1 - Colluvial slopes
Ed4 - Degraded surface of Eolian origin, Bassendean Dunes
Fp1 - River floodplain
Fp2 - Alluvial plain
Geology
Scale 1:25,000
Datum: GDA94
Projection: MGA Zone 50
Sheet Size A3
Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan
Figure: 3
Date: 04/09/2017



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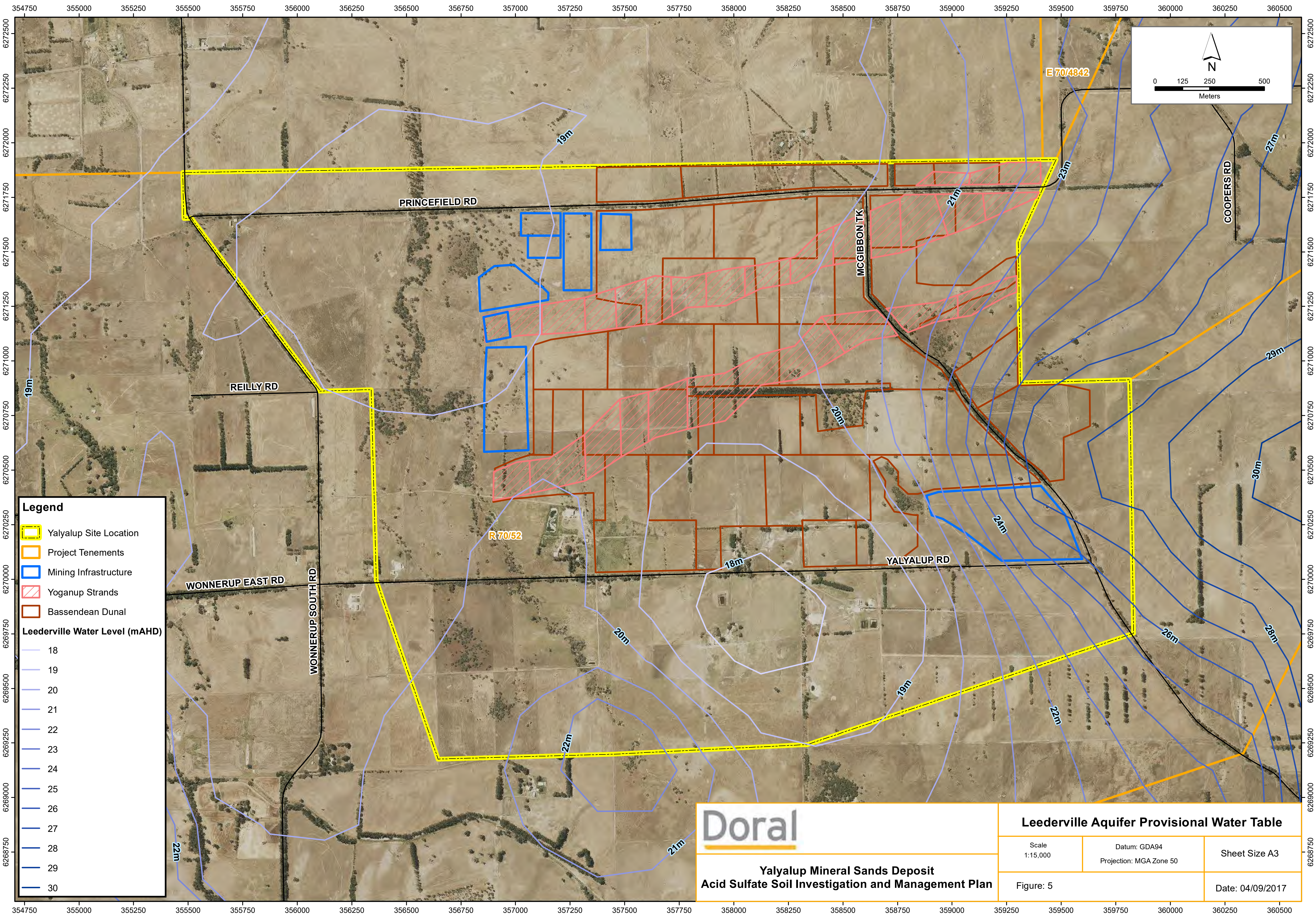
Superficial Aquifer Provisional Water Table

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Scale 1:15,000	Datum: GDA94 Projection: MGA Zone 50	Sheet Size A3
Figure: 4		Date: 04/09/2017



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Leederville Aquifer Provisional Water Table

Scale 1:15,000

Datum: GDA94

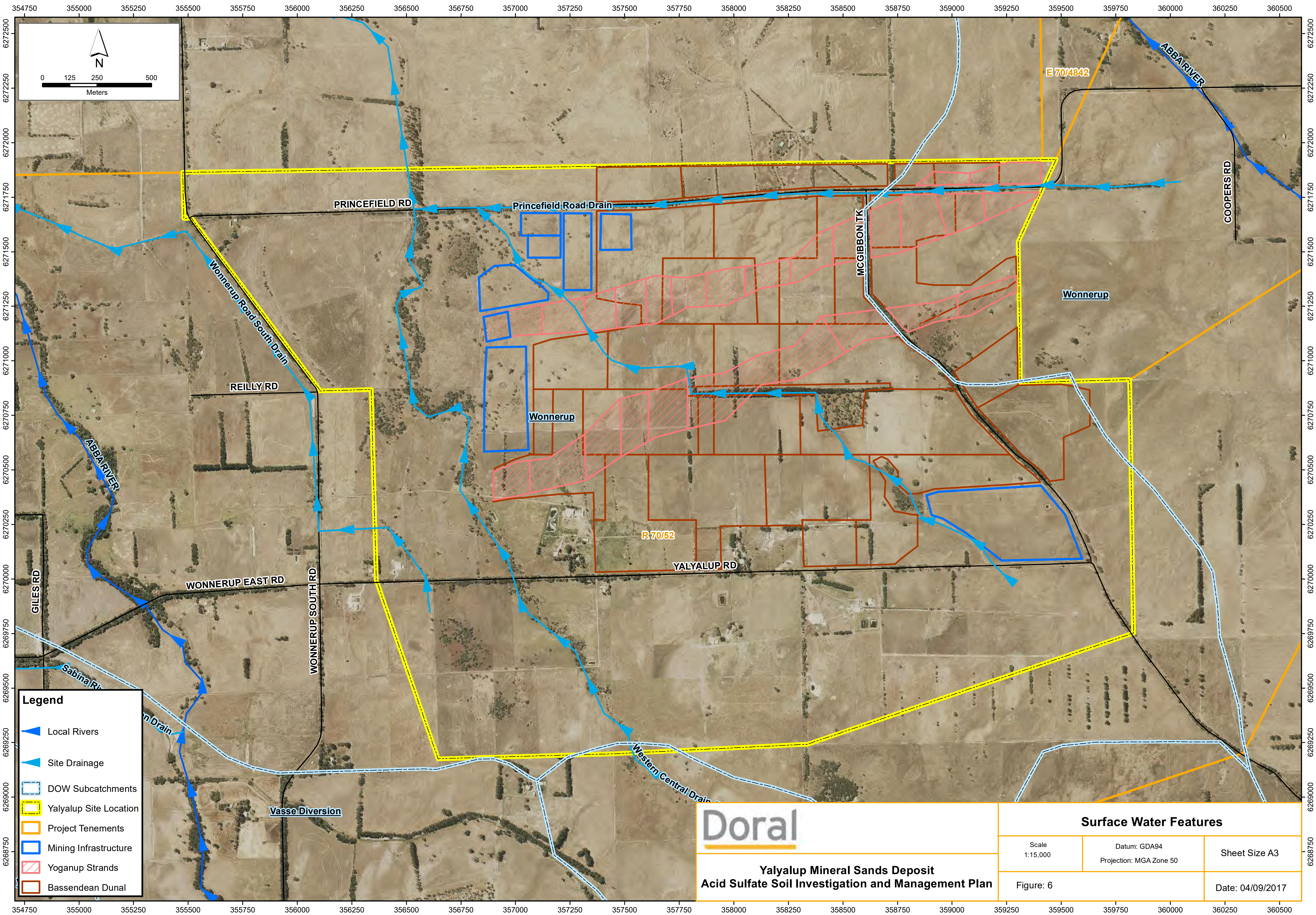
Projection: MGA Zone 50

Sheet Size A3

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Figure: 5

Date: 04/09/2017



Doral

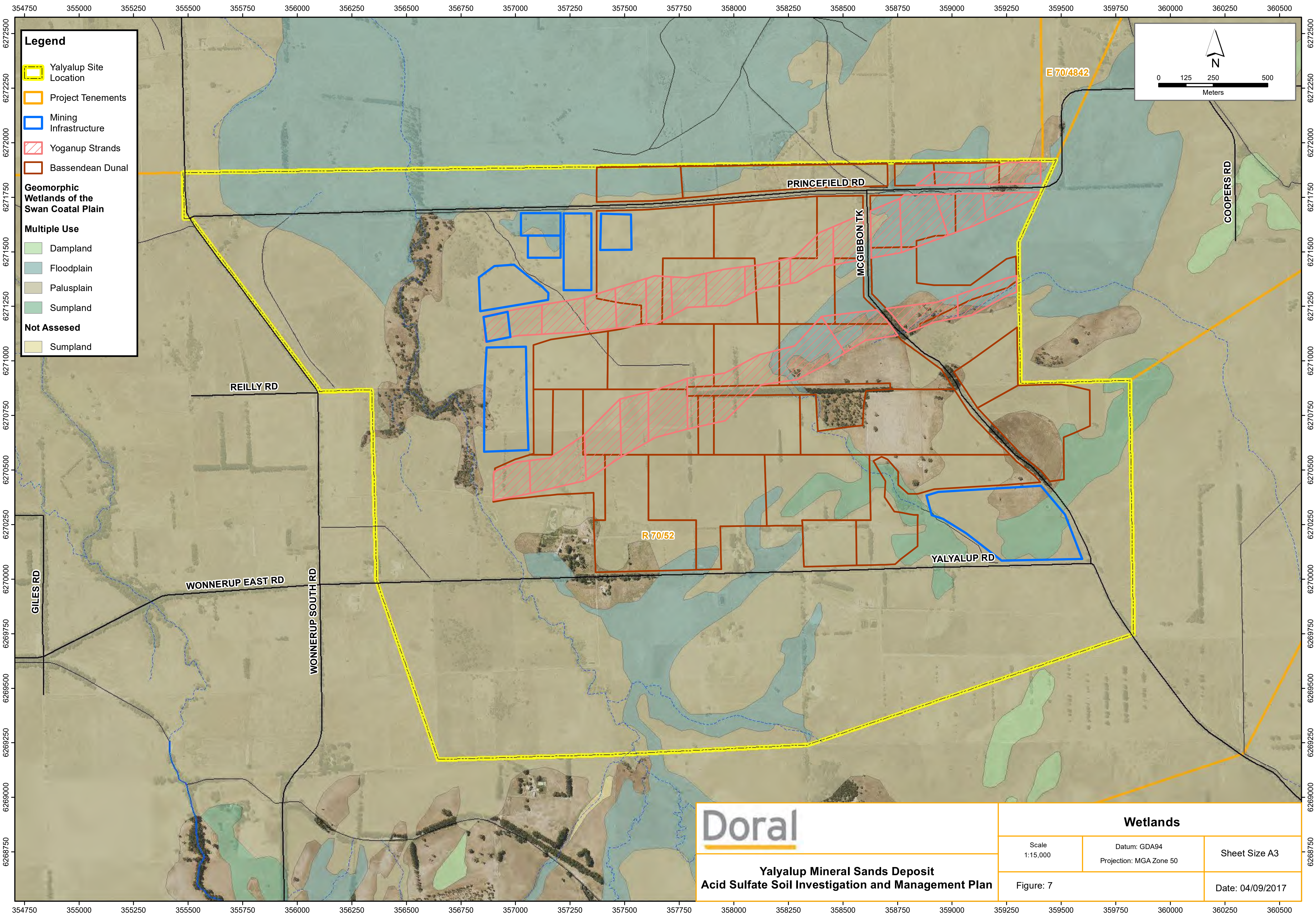
Surface Water Features

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Scale 1:15,000 | Datum: GDA94 | Projection: MGA Zone 50 | Sheet Size A3

Figure: 6

Date: 04/09/2017



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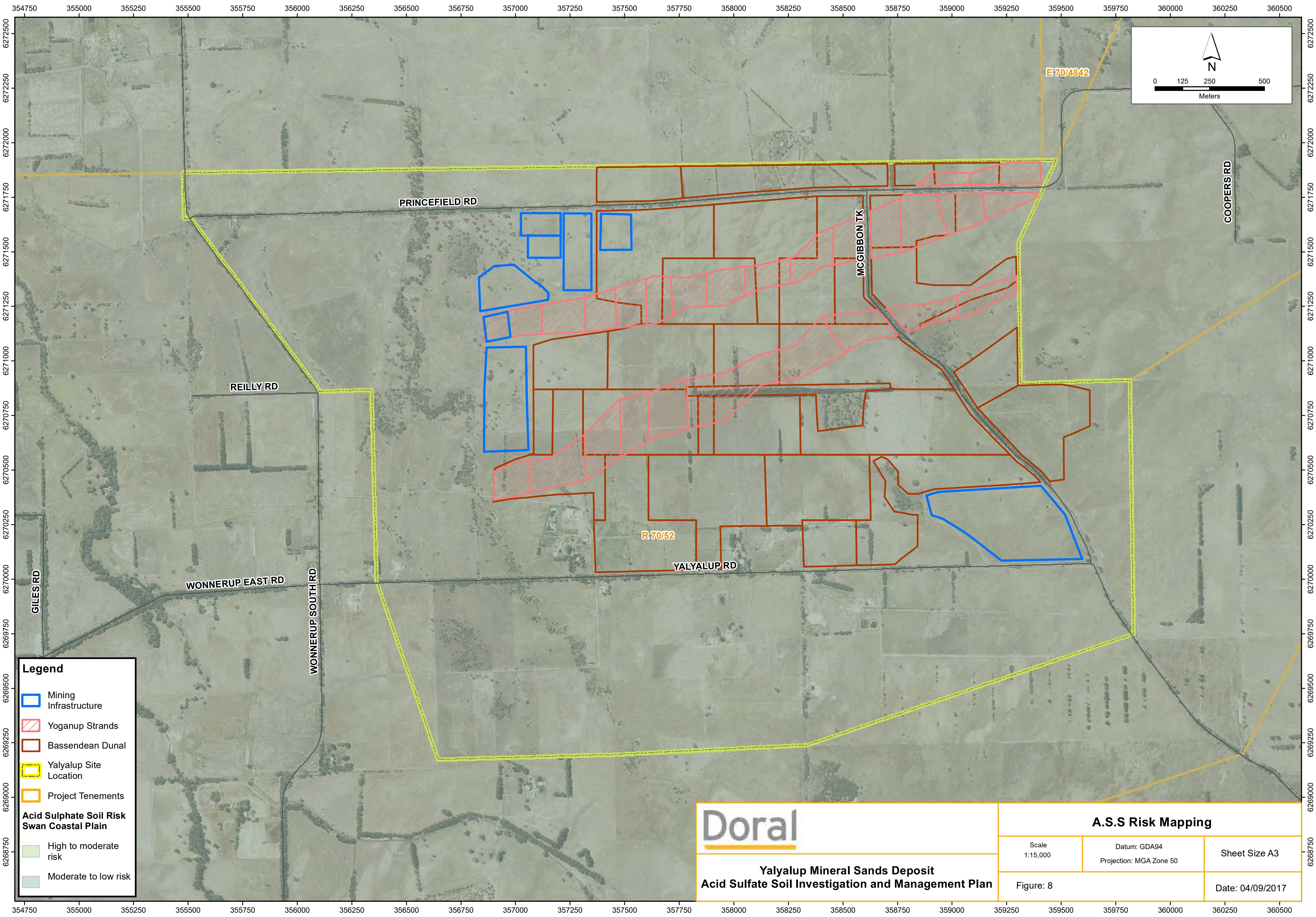
Wetlands

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Scale 1:15,000	Datum: GDA94 Projection: MGA Zone 50	Sheet Size A3
Figure: 7		Date: 04/09/2017



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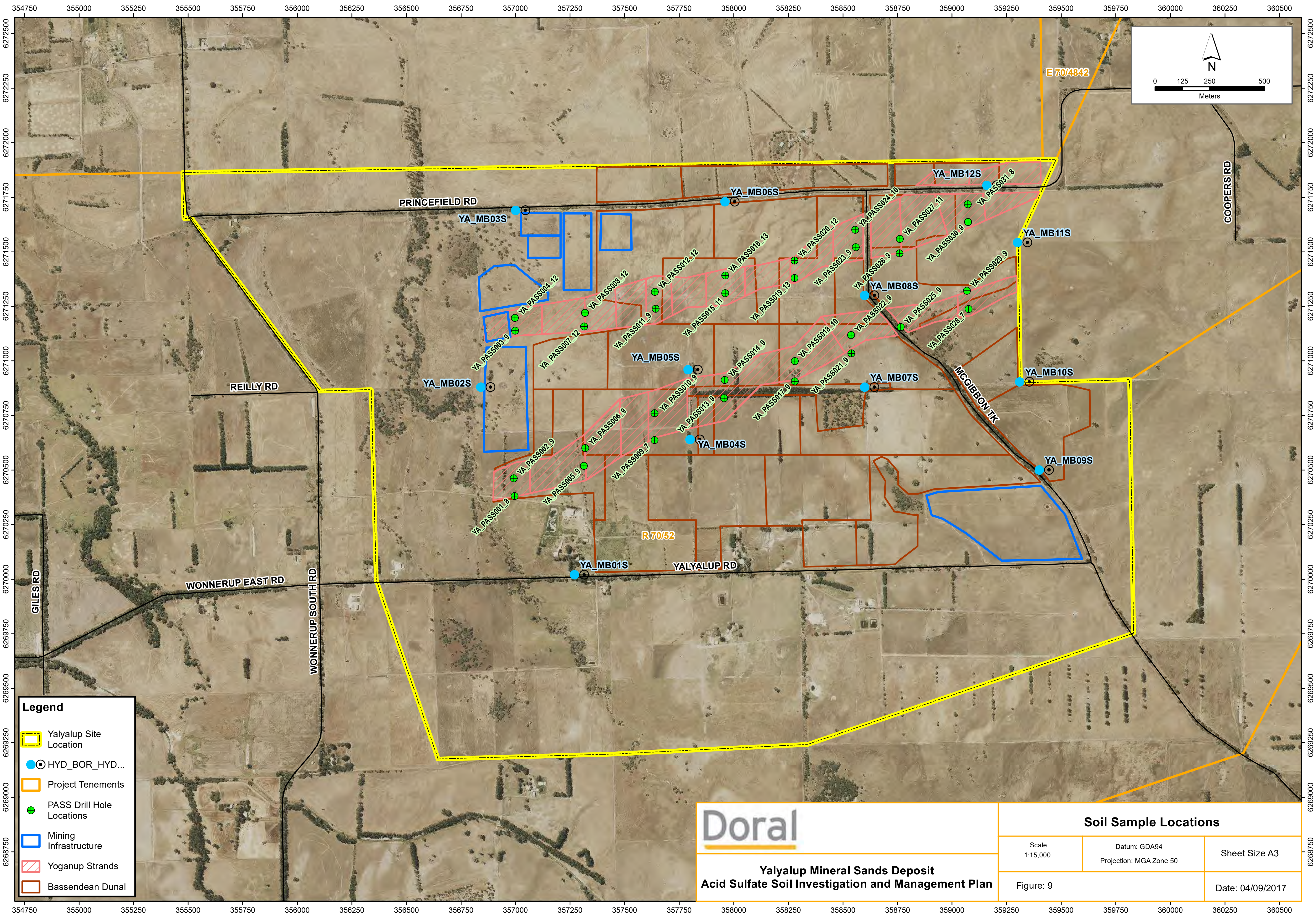
Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

A.S.S Risk Mapping

Scale 1:15,000	Datum: GDA94 Projection: MGA Zone 50	Sheet Size A3
Figure: 8		Date: 04/09/2017



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Soil Sample Locations

Yalyalup Mineral Sands Deposit
Acid Sulfate Soil Investigation and Management Plan

Scale 1:15,000 | Datum: GDA94 | Projection: MGA Zone 50 | Sheet Size A3

Figure: 9

Date: 04/09/2017

APPENDIX 1 – SOIL RESULTS

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_ from	depth _ to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
YA_PASS001_8	0	1	PASS001-BRANDS FIRST HOLE	GR	SY	D063753	6.64	3.90	2.74	X							
	1	2		GR	SC	D063754	6.56	4.00	2.56	XX							
	2	3		GB	CL	D063755	6.73	5.20	1.53	X							
	3	4	ALT HM LOCKED IN COFFEE ROCK	BR	CS	D063756	6.42	5.20	1.22	X							
	4	5		BR	CS	D063757	6.63	4.40	2.23	XXX							
	5	6		BR	CS	D063758	6.76	2.30	4.46	XX	5.40	5	0.008	0.07	0.078	S_{CR} + s-TAA	in pit
	6	7	WATER TABLE	GB	SC	D063759	6.75	3.70	3.05	X	5.70	5	0.008	0.01	0.010	S_{CR}	<1m below pit
	7	8	DK GREY CL---PASS POTENTIAL	GR	CL	D063760	6.58	1.70	4.88	XXX	5.20	5	0.008	0.08	0.088	S_{CR} + s-TAA	>1m below pit
YA_PASS002_9	0	1	CALIBRATE PH METER	GR	SA	D063761	5.30	3.40	1.90	X	5.10	5	0.008	0.01	0.018	S_{CR} + s-TAA	in pit
	1	2	THIS AREA IS IRRIGATED WITH DAIRY WASTE WATER	GR	SA	D063762	5.56	3.80	1.76	X	5.00	5	0.008	0.01	0.018	S_{CR} + s-TAA	in pit
	2	3		GB	CL	D063763	6.14	2.80	3.34	XX	5.40	4	0.006	0.01	0.016	S_{CR} + s-TAA	in pit
	3	4		GB	CL	D063764	6.30	3.70	2.60	X	5.40	4	0.006	0.01	0.016	S_{CR} + s-TAA	in pit
	4	5		GR	CS	D063765	7.10	3.80	3.30	X	5.70	4	0.006	0.01	0.010	S_{CR}	in pit
	5	6		GR	SA	D063766	5.63	3.10	2.53	X	6.80	1	0.002	0.01	0.010	S_{CR}	in pit
	6	7	TR MICAS	GR	SA	D063767	6.23	3.20	3.03	X	6.10	3	0.005	0.01	0.010	S_{CR}	<1m below pit
	7	8	TR MICAS	GR	SA	D063768	6.38	2.30	4.08	XX	6.50	1	0.002	0.01	0.010	S_{CR}	>1m below pit
	8	9	TR MICAS	GR	SA	D063769	6.25	2.60	3.65	XX	5.50	3	0.005	0.01	0.010	S_{CR}	>1m below pit
YA_PASS003_9	0	1	PASS 3	OB	CS	D063502	6.39	4.60	1.79	X							
	1	2		OB	CS	D063503	6.53	5.00	1.53	X							
	2	3		GB	SC	D063504	6.44	5.30	1.14	X							
	3	4		GR	SC	D063505	7.00	6.00	1.00	X							
	4	5	ORGANIC RICH	GG	CL	D063506	7.22	6.50	0.72	XXXX							
	5	6	ORGANIC RICH	GB	CL	D063507	7.10	5.40	1.70	XXXX							
	6	7	ORGANIC RICH_ SA-SR_ MICAS_ PYRITE	GR	SC	D063508	6.59	1.60	4.99	XXXX	4.80	9	0.014	0.96	0.974	S_{CR} + s-TAA	in pit
	7	8	ORGANIC RICH_ SA-SR_ MICAS	GR	SC	D063509	6.59	1.70	4.89	XXXX	5.50	7	0.011	0.34	0.340	S_{CR}	in pit
	8	9	ORGANIC RICH_ SA-SR_ MICAS	GR	SC	D063510	6.66	2.00	4.66	XXXX	5.30	7	0.011	0.17	0.181	S_{CR} + s-TAA	<1m below pit
YA_PASS004_12	0	1	PASS4	OB	CS	D063511	6.61	4.30	2.31	X							
	1	2		OB	SA	D063512	6.68	4.20	2.48	X							
	2	3		OB	SA	D063513	6.59	4.30	2.29	XX							
	3	4		OB	CS	D063514	6.29	4.00	2.29	X							
	4	5	ORGANIC RICH CLAY	GR	CL	D063515	7.47	6.50	0.97	XXXX							
	5	6	MICAS	GR	SA	D063516	6.98	3.00	3.98	XX	6.10	4	0.006	0.01	0.010	S_{CR}	in pit
	6	7	MICAS_ ORGANIC SILT AND MINOR PEAT	GR	SA	D063517	6.47	2.60	3.87	XX	6.20	2	0.003	0.03	0.030	S_{CR}	in pit
	7	8	WATER TABLE_ MICAS_ ORGANIC SILT AND MINOR PEAT	GR	SA	D063518	6.62	1.90	4.72	XXXX	5.50	5	0.008	0.25	0.250	S_{CR}	in pit
	8	9	MICAS_ ORGANIC SILT AND MINOR PEAT	GR	SA	D063519	6.56	2.00	4.56	XXXX	6.20	3	0.005	0.1	0.100	S_{CR}	<1m below pit
	9	10	MICAS_ ORGANIC SILT AND MINOR PEAT	GR	SA	D063520	6.50	2.00	4.50	XXX	5.60	5	0.008	0.05	0.050	S_{CR}	>1m below pit
	10	11	MICAS_ PYRIYE	GR	SA	D063521	6.38	2.50	3.88	XXX	6.00	4	0.006	0.06	0.060	S_{CR}	>1m below pit
	11	12	MICAS_ PYRIYE FROM 6M SA	GR	SA	D063522	6.40	2.40	4.00	XXX	5.60	4	0.006	0.03	0.030	S_{CR}	>1m below pit
YA_PASS005_9	0	1	PASS 5_ FINE ALT HM	GR	SA	D063770	6.02	3.90	2.12	X							
	1	2	IRRIGATED WITH DAIRY WASTE WATER	GR	SA	D063771	5.66	3.30	2.36	X							
	2	3		GW	CS	D063772	6.48	4.00	2.48	XX							
	3	4		GB	SC	D063773	6.56	4.80	1.76	X							
	4	5		GW	CS	D063774	6.73	3.90	2.83	X							
	5	6		GB	CS	D063775	6.90	4.30	2.60	X							
	6	7		GB	CS	D063776	7.10	3.60	3.50	X							
	7	8	WATER TABLE_ MICAS	GR	CS	D063777	7.09	3.00	4.09	X							
	8	9	MICAS_ MINOR ORGANIC SILT	GW	SA	D063778	6.97	2.30	4.67	XX							

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_ from	depth _ to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
	0	1	PASS 6_ FINE ALT HM	GR	SA	D063779	6.30	3.50	2.80	X							
	1	2		GR	SA	D063780	6.50	3.90	2.60	X							
	2	3		GR	SA	D063781	6.52	4.30	2.22	X							
	3	4		OB	IR	D063782	6.98	5.40	1.58	X							
	4	5		GW	CS	D063783	7.23	3.30	3.93	XX							
YA_PASS006_9	5	6	TR MICAS	GR	SA	D063784	7.37	5.20	2.17	X							
	6	7	TR MICAS_ RE CALIBRATE PH METER	GW	SA	D063785	6.34	4.80	1.54	X							
	7	8	WATER TABLE_ POSSIBLE SHELL FRAGMENTS_ MICAS	GW	SA	D063786	6.67	4.20	2.47	X							
	8	9	ORGANIC RICH CLAY AND MICAS	GW	CS	D063787	6.65	2.40	4.25	XXXX							
	0	1	FINE HM	OB	CS	D063523	6.25	3.70	2.55	XX							
	1	2	FINE HM	OB	CS	D063524	6.57	4.30	2.27	XX							
	2	3	FINE HM	OB	CS	D063525	6.34	4.10	2.24	XX							
	3	4		BR	SC	D063526	6.54	4.60	1.94	XX							
	4	5	ORGANIC RICH CLAY	GR	CL	D063527	6.76	6.20	0.56	XXXX							
	5	6	ORGANIC RICH CLAY	GG	CL	D063528	7.05	6.90	0.15	XXXX							
	6	7	ORGANIC SILT AND MINOR PEAT	GR	CS	D063529	7.04	2.70	4.34	XXX							
YA_PASS007_12	7	8	ORGANIC SILT AND MINOR PEAT_ MINOR PYRITE	GR	CS	D063530	6.99	1.60	5.39	XXXX							
	8	9	WATER TABLE_ ORGANIC SILT AND MINOR PEAT_ PYRITE	GR	CS	D063531	6.94	1.50	5.44	XXXX							
	9	10	ORGANIC SILT AND MINOR PEAT_ MICAS	GR	CS	D063532	7.12	1.50	5.62	XXXX							
	10	11	ORGANIC SILT AND MINOR PEAT_ PYRITE CEMENTED SS_ MICAS	GR	CS	D063533	7.34	2.40	4.94	XXX							
	11	12	ORGANIC SILT_ MICAS	GR	CS	D063534	7.21	2.60	4.61	XXXX							
	0	1	PASS8_ FINE ALT HM	OB	SA	D063535	5.42	2.00	3.42	XXX							
	1	2		OB	SA	D063536	5.14	1.90	3.24	XXX							
	2	3		OB	SA	D063537	5.57	2.30	3.27	XXX							
	3	4		OB	SC	D063538	6.25	2.60	3.65	XX							
	4	5		GR	CL	D063539	7.46	7.00	0.46	XXXX							
	5	6	MICAS	GR	SC	D063540	7.42	2.70	4.72	XXX							
YA_PASS008_12	6	7	MICAS	GW	SA	D063541	7.18	2.00	5.18	XXX							
	7	8	WATER TABLE_ MICAS_ TR PYRITE + PEAT	GW	SA	D063542	7.14	1.50	5.64	XXX							
	8	9	MICAS	GR	SA	D063543	7.26	1.70	5.56	XXX							
	9	10	ORGANIC SILT_ MICAS	GR	SA	D063544	7.08	1.90	5.18	XXXX							
	10	11	ORGANIC SILT_ MICAS	GR	SA	D063545	6.23	2.60	3.63	XXXX							
	11	12	PYRITE_ TR GARNET_ ORGANIC SILT_ MICAS	GG	SA	D063546	7.12	2.20	4.92	XXXX							
	0	1	PASS 9_ FINE ALT HM	GB	CS	D063788	5.88	3.80	2.08	X							
	1	2	FINE ALT HM	GB	CS	D063789	5.82	4.40	1.42	X							
YA_PASS009_7	2	3	FINE ALT HM_ BEWARE GROUND IR AS HM	OB	IR	D063790	6.21	4.70	1.51	X							
	3	4		GB	CL	D063791	6.40	5.30	1.10	X							
	4	5		GB	SA	D063792	6.41	5.10	1.31	X							
	5	6	TR MICAS	GB	SA	D063793	6.50	4.00	2.50	X							
	6	7	MICAS_ ORGANIC RICH CLAY	GR	SA	D063794	6.38	4.20	2.18	X							
	0	1	PASS 10_ FINE ALT HM	GB	CS	D063592	6.09	1.80	4.29	XXXX							
	1	2	FINE ALT HM	GB	CS	D063593	6.41	2.20	4.21	XXXX							
	2	3		GB	SC	D063594	6.51	2.20	4.31	XXX							
	3	4		GB	CS	D063595	6.42	2.10	4.32	XX							
YA_PASS010_9	4	5		GR	SC	D063596	6.75	3.30	3.45	XX							
	5	6	MICAS AND ORGANIC SILT	GR	SA	D063597	6.75	3.60	3.15	XX							
	6	7	MICAS AND ORGANIC SILT	GR	SA	D063598	6.60	1.70	4.90	XX							
	7	8	MICAS AND ORGANIC SILT	GR	SA	D063599	6.66	1.60	5.06	XXXX							
	8	9	MICAS AND ORGANIC SILT	GR	SA	D063600	6.76	2.30	4.46	XXXX							

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_ from	depth _ to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
YA_PASS011_9	0	1	PASS 11_ FINE ALT HM	GB	SA	D063547	6.80	2.80	4.00	XX							
	1	2	MINOR PYRITE??	CR	CS	D063548	6.56	3.10	3.46	XX							
	2	3		BR	IR	D063549	6.76	3.90	2.86	XX							
	3	4		GB	CS	D063550	6.72	2.60	4.12	XX							
	4	5		GB	CS	D063551	7.11	4.20	2.91	X							
	5	6	WATER TABLE	GW	CS	D063552	7.21	5.30	1.91	X							
	6	7		GB	CS	D063553	6.54	2.80	3.74	XXXX							
	7	8	MICAS_ OGRANIC RICH SILT_ PYRITE	GG	CS	D063554	6.66	2.00	4.66	XXXX							
	8	9	MICAS_ OGRANIC RICH SILT_ PYRITE	GG	CS	D063555	6.50	2.20	4.30	XXXX							
YA_PASS012_12	0	1	PASS 12_ CALIBRATE PH	OB	SA	D063556	7.04	2.40	4.64	XX							
	1	2		OB	IR	D063557	6.57	2.40	4.17	XX							
	2	3		BR	IR	D063558	6.56	3.20	3.36	XX							
	3	4		OB	SA	D063559	6.49	2.50	3.99	XX							
	4	5		BR	CS	D063560	6.53	2.70	3.83	XXXX							
	5	6	WATER TABLE	GB	SC	D063561	7.07	7.30	- 0.23	XXXX							
	6	7		GB	SA	D063562	6.69	4.60	2.09	X							
	7	8	ORGANIC SILT	GR	SA	D063563	6.79	1.90	4.89	XXXX							
	8	9	ORGANIC SILT_ MICAS	GG	SYS	D063564	6.93	2.40	4.53	XXXX							
	9	10	ORGANIC SILT_ MICAS	GG	SYS	D063565	6.63	2.70	3.93	XXXX							
	10	11	ORGANIC SILT_ MICAS	GG	SYS	D063566	6.75	2.20	4.55	XXXX							
	11	12	ORGANIC SILT_ MICAS	GG	SYS	D063567	6.55	2.30	4.25	XXXX							
YA_PASS013_9	0	1	PASS 13_ FINE ALT HM	GR	SA	D063795	5.49	3.40	2.09	X							
	1	2	FINE ALT HM	GR	CS	D063796	6.40	4.20	2.20	X							
	2	3		OB	IR	D063797	6.33	4.80	1.53	XX							
	3	4		OB	CS	D063798	6.38	5.00	1.38	XX							
	4	5		GR	CS	D063799	6.33	4.50	1.83	X							
	5	6		GR	CS	D063800	6.32	4.60	1.72	X							
	6	7	WATER TABLE_ TR MICAS	GR	SA	D063801	6.37	4.80	1.57	X							
	7	8	TR MICAS	GR	SA	D063802	6.34	4.70	1.64	X							
	8	9	TR MICAS	GR	SA	D063803	6.39	4.70	1.69	XX							
YA_PASS014_9	0	1	PASS 14_ FINE ALT HM	GB	SA	D063601	6.39	2.90	3.49	XX	5.60	3	0.005	0.04	0.040	S_{CR}	>1m below pit
	1	2	FINE ALT HM	CR	CS	D063602	6.47	2.70	3.77	XX	5.40	3	0.005	0.02	0.025	S_{CR} + s-TAA	>1m below pit
	2	3	FINE ALT HM	CR	CS	D063603	6.64	2.20	4.44	XX	6.10	3	0.005	0.04	0.040	S_{CR}	>1m below pit
	3	4		OB	IR	D063604	6.49	2.90	3.59	XX	6.40	1	0.002	0.09	0.090	S_{CR}	>1m below pit
	4	5		GB	CS	D063605	6.67	3.00	3.67	XX	5.90	3	0.005	0.15	0.150	S_{CR}	>1m below pit
	5	6		GR	CS	D063606	6.86	4.20	2.66	X							
	6	7		GR	CS	D063607	6.77	4.00	2.77	X							
	7	8		GR	CS	D063608	6.76	3.80	2.96	X							
	8	9		GR	CS	D063609	6.70	4.20	2.50	X							
YA_PASS015_11	0	1	PASS 15	GB	SA	D063568	6.47	3.30	3.17	X	5.70	4	0.006	0.01	0.010	S_{CR}	in pit
	1	2	FINE ALT HM	GB	CS	D063569	6.42	2.90	3.52	XX	5.50	5	0.008	0.06	0.060	S_{CR}	in pit
	2	3		GB	CS	D063570	6.52	2.70	3.82	XX	5.80	3	0.005	0.08	0.080	S_{CR}	in pit
	3	4		GB	CL	D063571	6.74	2.40	4.34	XXX	5.90	5	0.008	0.03	0.030	S_{CR}	in pit
	4	5		GW	SC	D063572	6.68	3.80	2.88	X	6.10	3	0.005	0.01	0.010	S_{CR}	in pit
	5	6	WATER TABLE	GW	CS	D063573	6.75	4.70	2.05	X	6.00	4	0.006	0.01	0.010	S_{CR}	in pit
	6	7	ORGANIC SILT	WH	SA	D063574	6.75	3.60	3.15	X	6.30	2	0.003	0.01	0.010	S_{CR}	in pit
	7	8	ORGANIC SILT	GR	SA	D063575	6.79	3.20	3.59	XX	6.70	1	0.002	0.02	0.020	S_{CR}	in pit
	8	9	MICAS_ ORGANIC SILT	GR	SA	D063576	6.60	2.10	4.50	XX	5.50	3	0.005	0.22	0.220	S_{CR}	in pit
	9	10	MICAS_ ORGANIC SILT	GW	SA	D063577	6.67	2.30	4.37	XXXX	5.30	4	0.006	0.31	0.316	S_{CR} + s-TAA	<1m below pit
	10	11	MICAS_ ORGANIC SILT	GW	SA	D063578	6.62	1.90	4.72	XXXX	5.80	3	0.005	0.22	0.220	S_{CR}	>1m below pit

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_from	depth_to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
YA_PASS016_13	0	1	PASS 16_ FINE ALT HM	BR	SA	D063579	6.11	1.90	4.21	XXX	5.70	5	0.008	0.04	0.040	S_{CR}	in pit
	1	2		GR	CS	D063580	6.38	2.10	4.28	XXXX	5.20	4	0.006	0.16	0.166	S_{CR} + s-TAA	in pit
	2	3		GB	CS	D063581	6.47	2.20	4.27	XXX	6.00	3	0.005	0.08	0.080	S_{CR}	<1m below pit
	3	4		GB	CS	D063582	6.56	2.40	4.16	XX	5.90	5	0.008	0.02	0.020	S_{CR}	>1m below pit
	4	5		BR	CS	D063583	6.51	3.50	3.01	XX	5.90	3	0.005	0.02	0.020	S_{CR}	>1m below pit
	5	6	ORGANIC RICH CLAY	GR	CL	D063584	6.76	6.50	0.26	XX							
	6	7	ORGANIC RICH CLAY	GR	CL	D063585	6.92	4.50	2.42	XX							
	7	8	WATER TABLE_ ORGANIC RICH CLAY	GR	CL	D063586	6.99	5.00	1.99	XXX							
	8	9	ORGANIC RICH CLAY	GR	CL	D063587	6.78	3.60	3.18	XX	5.30	4	0.006	0.05	0.056	S_{CR} + s-TAA	>1m below pit
	9	10	ORGANIC RICH	GR	SYS	D063588	6.84	2.30	4.54	XXXX	4.70	5	0.008	0.7	0.708	S_{CR} + s-TAA	>1m below pit
	10	11	MICACEOUS_ ORGANIC RICH	GR	SYS	D063589	6.66	2.00	4.66	XXXX	4.10	22	0.035	2.5	2.535	S_{CR} + s-TAA	>1m below pit
	11	12	MICACEOUS_ ORGANIC RICH	GR	SYS	D063590	6.63	1.60	5.03	XXXX	4.90	7	0.011	2.2	2.211	S_{CR} + s-TAA	>1m below pit
	12	13	MICACEOUS_ ORGANIC RICH	GR	SYS	D063591	6.40	1.70	4.70	XXXX	5.10	4	0.006	1.1	1.106	S_{CR} + s-TAA	>1m below pit
YA_PASS017_9	0	1	PASS 17_ FINE ALT HM	CR	CS	D063620	6.59	3.40	3.19	XX							
	1	2	FINE ALT HM	CR	CS	D063621	6.51	3.40	3.11	XX							
	2	3		CR	CS	D063622	6.46	3.00	3.46	XX							
	3	4		GB	SC	D063623	6.45	4.60	1.85	X							
	4	5		GR	CL	D063624	6.23	2.80	3.43	X							
	5	6		BR	CL	D063625	6.18	4.20	1.98	X							
	6	7	WATER TABLE_ TR MICAS	GB	CS	D063626	6.40	3.90	2.50	X							
	7	8	TR MICAS	CR	CS	D063627	6.47	4.00	2.47	X							
	8	9	TR MICAS	CR	CS	D063628	6.52	4.20	2.32	X							
YA_PASS018_10	0	1	PASS 18_ FINE ALT HM	GR	CS	D063610	6.55	3.70	2.85	X							
	1	2	FINE ALT HM	GR	CS	D063611	6.82	4.00	2.82	X							
	2	3	FINE ALT HM	GR	CS	D063612	6.53	4.70	1.83	X							
	3	4		OB	IR	D063613	6.70	4.60	2.10	X							
	4	5		GR	CS	D063614	6.62	4.50	2.12	X							
	5	6	WATER TABLE	GB	SA	D063615	6.64	4.60	2.04	X							
	6	7		GB	SA	D063616	6.56	4.60	1.96	X							
	7	8		GB	SA	D063617	6.57	4.00	2.57	X							
	8	9		GB	SA	D063618	6.65	4.20	2.45	X							
	9	10		GB	SA	D063619	6.62	3.00	3.62	X							
YA_PASS019_13	0	1	PASS 19_ FINE ALT HM	GR	CS	D063647	6.23	4.20	2.03	X							
	1	2		CR	CS	D063648	6.39	3.60	2.79	XX							
	2	3		GR	SC	D063649	6.36	4.50	1.86	X							
	3	4		OB	CS	D063650	6.55	2.80	3.75	XXX							
	4	5		OB	IR	D063651	6.49	5.20	1.29	X							
	5	6	WATER TABLE	OB	SC	D063652	6.59	5.40	1.19	X							
	6	7		GR	CS	D063653	5.83	4.40	1.43	XX							
	7	8	POSSIBLE FINE SHELL FRAGMENTS	GR	SA	D063654	6.72	4.20	2.52	X							
	8	9		GW	SA	D063655	6.64	4.50	2.14	X							
	9	10	TR MICAS	GR	SA	D063656	6.30	5.40	0.90	X							
	10	11	TR MICAS	GW	SA	D063657	6.63	5.40	1.23	X							
	11	12	TR MICAS	GW	SA	D063658	6.48	4.50	1.98	X							
	12	13	TR MICAS	GW	SA	D063659	6.30	4.40	1.90	X							
YA_PASS020_12	0	1	PASS 20_ FINE ALT HM	GB	SA	D063660	5.61	3.20	2.41	XX							
	1	2	FINE ALT HM	GB	SA	D063661	6.01	3.50	2.51	XX							
	2	3	FINE ALT HM	GB	SA	D063662	6.35	3.90	2.45	XX							
	3	4		GB	SA	D063663	6.35	3.30	3.05	XX							
	4	5		BR	IR	D063664	6.42	3.90	2.52	X							
	5	6		GR	CL	D063665	6.43	4.80	1.63	XX							
	6	7		GR	SC	D063666	6.63	3.90	2.73	X							
	7	8	TR MICAS	GR	SA	D063667	6.54	2.90	3.64	XX							
	8	9	TR MICAS	GR	SA	D063668	6.50	3.10	3.40	XX							
	9	10	TR MICAS	GR	SA	D063669	6.55	1.50	5.05	XXXX							
	10	11	MICACEOUS ORGANIC CLAY	GR	SC	D063670	6.80	1.90	4.90	XXX							
	11	12	MICAS _ ORGANIC SILT	GR	CS	D063671	6.67	1.90	4.77	XXXX							

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_ from	depth _ to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
YA_PASS021_9	0	1	PASS 21_ FINE ALT HM	CR	CS	D063629	6.32	3.80	2.52	X							
	1	2	FINE ALT HM	CR	CS	D063630	6.31	4.50	1.81	X							
	2	3		GR	SC	D063631	6.33	4.40	1.93	X							
	3	4		GB	CL	D063632	6.54	3.80	2.74	X							
	4	5		GR	CS	D063633	6.42	4.00	2.42	X							
	5	6		OR	SA	D063634	6.39	4.60	1.79	X							
	6	7		GR	CL	D063635	6.65	4.10	2.55	XX							
	7	8	ORGANIC RICH CLAY_ MICAS	GR	CL	D063636	6.57	4.60	1.97	XX							
	8	9	ORGANIC RICH_ MICAS	GR	CS	D063637	6.44	1.80	4.64	XXX							
YA_PASS022_9	0	1	PASS 22_ FINE ALT HM	GR	CS	D063638	6.15	3.80	2.35	X							
	1	2	FINE ALT HM	GR	CS	D063639	5.91	3.50	2.41	XX							
	2	3		GR	SC	D063640	6.27	3.50	2.77	XX							
	3	4		GB	CL	D063641	6.19	3.20	2.99	XX							
	4	5		BR	CL	D063642	6.05	3.60	2.45	XX							
	5	6		GR	CS	D063643	6.25	4.30	1.95	X							
	6	7		OR	CS	D063644	6.24	4.40	1.84	X							
	7	8	MICACEOUS. ORGANIC RICH CLAY	GR	CL	D063645	6.56	4.30	2.26	X							
	8	9	MICACEOUS. ORGANIC RICH CLAY	GR	CL	D063646	6.10	2.60	3.50	XXX							
YA_PASS023_9	0	1	PASS 23_ FINE ALT HM	GB	CS	D063672	6.26	2.30	3.96	XXXX							
	1	2		GR	CS	D063673	6.31	2.70	3.61	XX							
	2	3		GB	SC	D063674	6.53	3.20	3.33	XX							
	3	4		GB	SC	D063675	6.40	3.90	2.50	XX							
	4	5		OB	IR	D063676	6.33	4.20	2.13	X							
	5	6	WATER TABLE	OB	SA	D063677	6.36	4.90	1.46	X							
	6	7	ORGANIC RICH CLAY	BK	CL	D063678	6.44	3.00	3.44	XX							
	7	8	TR MICAS	GB	SA	D063679	6.40	2.30	4.10	XXXX							
	8	9	MICAS	GR	SA	D063680	6.64	2.20	4.44	XXXX							
YA_PASS024_10	0	1	PASS24_ FINE ALT HM	GR	SA	D063681	6.24	3.90	2.34	XX							
	1	2	FINE ALT HM	GR	SA	D063682	6.35	4.40	1.95	X							
	2	3		GB	SC	D063683	6.24	2.60	3.64	XX							
	3	4		GB	CL	D063684	6.34	3.70	2.64	XX							
	4	5		GB	SC	D063685	6.78	3.90	2.88	XX							
	5	6		BR	SC	D063686	6.90	5.90	1.00	XX							
	6	7		GR	CS	D063687	6.86	5.00	1.86	XX							
	7	8	ORGANICS	GR	CS	D063688	6.70	4.90	1.80	XX							
	8	9	MICACEOUS ORGANIC RICH CLAY	GR	CL	D063689	6.47	2.10	4.37	XXXX							
	9	10	MICACEOUS ORGANIC RICH CLAY	GR	CL	D063690	6.83	1.80	5.03	XXXX							
YA_PASS025_9	0	1	PASS 25_ FINE ALT HM	GR	SA	D063711	6.66	4.40	2.26	XX							
	1	2	FINE ALT HM	GR	SA	D063712	6.65	4.80	1.85	XX							
	2	3		GR	CS	D063713	6.54	4.10	2.44	XX							
	3	4		GR	CS	D063714	6.39	3.60	2.79	XX							
	4	5		GB	SC	D063715	6.58	4.20	2.38	XX							
	5	6		RG	SC	D063716	6.02	4.30	1.72	XX							
	6	7		GR	SC	D063717	6.18	4.30	1.88	X							
	7	8		GR	CS	D063718	6.27	4.50	1.77	X							
	8	9		GR	CS	D063719	6.39	4.30	2.09	X							
YA_PASS026_9	0	1	PASS 26_ FINE ALT HM	GR	CS	D063702	6.66	1.90	4.76	XXX							
	1	2	FINE ALT HM	GB	SA	D063703	6.75	2.00	4.75	XXX							
	2	3		OB	IR	D063704	6.87	2.10	4.77	XXX							
	3	4		OB	SA	D063705	6.77	2.90	3.87	XX							
	4	5		OB	SA	D063706	6.87	4.00	2.87	XX							
	5	6		GB	CS	D063707	6.88	2.30	4.58	XX							
	6	7		GB	CS	D063708	6.88	3.00	3.88	XX							
	7	8		GB	SC	D063709	6.84	3.50	3.34	XX							
	8	9	POSSIBLE FINE SHELL FRAGMENTS	GR	CS	D063710	6.81	5.20	1.61	X							

SAMPLE LOCATION	SAMPLE INTERVAL		PHYSICAL SOIL DESCRIPTION			LAB ID	FIELD TEST RESULTS				CHROMIUM SUITE						LOCATION RELATIVE TO PIT
	depth_ from	depth _ to	FIELD TEXTURE	COLOUR	LITHOLOGY	samp_id	phF	phFOX	pHf - pH fox	Reaction	pHKCl	sTAA	s-TAA (converted)	S_{CR}	NET ACIDITY	NA EQUATION	
						Units						molesH/t	%S	%S	%S		
						LOR	0.01	0.01	0.01	-	0.1	1	0.005	0.01	0.01		
						Criteria	≤4	≤3	≥3		<4	18	0.03	0.03	0.03		
YA_PASS027_11	0	1	PASS 27_ FINE ALT HM	GR	SA	D063691	5.78	3.40	2.38	XX							
	1	2	FINE ALT HM	GR	CS	D063692	6.55	4.80	1.75	X							
	2	3	FINE ALT HM	GR	CS	D063693	6.43	2.50	3.93	XX							
	3	4		GR	SC	D063694	6.44	4.00	2.44	XX							
	4	5		GR	SC	D063695	6.62	4.40	2.22	X							
	5	6		GR	CS	D063696	6.63	5.20	1.43	X							
	6	7		GR	CS	D063697	6.58	3.40	3.18	XX							
	7	8		GR	SC	D063698	6.72	4.10	2.62	XX							
	8	9	TR MICAS	GR	SA	D063699	6.64	3.90	2.74	X							
	9	10	TR MICAS	GR	SA	D063700	6.76	2.30	4.46	XX							
	10	11	MICAS	GR	CS	D063701	6.85	2.00	4.85	XXXX							
YA_PASS028_7	0	1	PASS 28_ FINE ALT HM	OB	IR	D063720	6.06	5.60	0.46	XXXX							
	1	2	FINE ALT HM_ BEWARE GROUND IR AS HM	OB	IR	D063721	6.30	6.10	0.20	XXXX							
	2	3	FINE ALT HM_ BEWARE GROUND IR AS HM	OB	IR	D063722	6.09	6.20	- 0.11	XXXX							
	3	4	FINE ALT HM_ BEWARE GROUND IR AS HM	OB	IR	D063723	6.13	5.90	0.23	XXX							
	4	5		GB	SC	D063724	6.55	4.00	2.55	XX	5.90	3	0.005	0.02	0.020	S_{CR}	in pit
	5	6	PEATY CLAY_ MICAS	BK	CL	D063725	6.37	3.30	3.07	XXX	4.40	10	0.016	0.01	0.026	S_{CR} + s-TAA	in pit
	6	7	MINOR ORGANICS + MICAS	GR	CL	D063726	6.67	2.90	3.77	XXXX	4.60	7	0.011	0.09	0.101	S_{CR} + s-TAA	<1m below pit
YA_PASS029_9	0	1	PASS 29_ FINE ALT HM	GR	SA	D063727	6.12	3.50	2.62	X	5.30	4	0.006	0.01	0.016	S_{CR} + s-TAA	in pit
	1	2	FINE ALT HM	GR	SA	D063728	6.38	3.50	2.88	X	6.70	1	0.002	0.01	0.010	S_{CR}	in pit
	2	3		OB	IR	D063729	6.38	3.50	2.88	XX	5.80	6	0.010	0.02	0.020	S_{CR}	in pit
	3	4		GB	CS	D063730	6.23	2.00	4.23	XXX	5.90	4	0.006	0.05	0.050	S_{CR}	in pit
	4	5		GR	CS	D063731	6.47	3.60	2.87	XX	6.10	3	0.005	0.02	0.020	S_{CR}	in pit
	5	6		OB	CS	D063732	6.34	1.80	4.54	XXX	5.30	6	0.010	0.09	0.100	S_{CR} + s-TAA	in pit
	6	7	TR GARNET	GR	SA	D063733	6.33	1.30	5.03	XXXX	4.60	12	0.019	0.86	0.879	S_{CR} + s-TAA	in pit
	7	8		GB	CL	D063734	6.35	2.20	4.15	XXXX	4.70	7	0.011	0.19	0.201	S_{CR} + s-TAA	in pit
	8	9	MICAS	GB	CS	D063735	6.64	2.60	4.04	XXX	5.90	4	0.006	0.03	0.030	S_{CR}	in pit
YA_PASS030_9	0	1	PASS 30_ FINE ALT HM	GB	SA	D063736	6.29	4.00	2.29	XXXX	6.60	1	0.002	0.03	0.030	S_{CR}	>1m below pit
	1	2		OB	IR	D063737	6.40	4.00	2.40	XXX	6.00	3	0.005	0.03	0.030	S_{CR}	>1m below pit
	2	3		BR	SA	D063738	6.56	6.00	0.56	XXX							
	3	4		BR	SA	D063739	6.49	3.60	2.89	XXX	5.80	4	0.006	0.04	0.040	S_{CR}	>1m below pit
	4	5		OB	SA	D063740	6.55	2.50	4.05	XXX	5.70	3	0.005	0.03	0.030	S_{CR}	>1m below pit
	5	6		GB	SA	D063741	6.47	2.00	4.47	XXXX	4.80	5	0.008	0.22	0.228	S_{CR} + s-TAA	>1m below pit
	6	7	TR MICS _ ORGANIC SILT_ PYRITE	GB	SD	D063742	6.49	2.00	4.49	XXXX	4.50	11	0.018	1.2	1.218	S_{CR} + s-TAA	>1m below pit
	7	8	ORGANIC SILT_ POSSIBLE SHELL FRAGMENTS	GR	SD	D063743	6.11	1.50	4.61	XXXX	5.00	5	0.008	0.26	0.268	S_{CR} + s-TAA	>1m below pit
	8	9	ORGANIC SILT_ POSSIBLE SHELL FRAGMENTS	GR	SD	D063744	6.12	1.60	4.52	XXXX	5.00	5	0.008	0.29	0.298	S_{CR} + s-TAA	>1m below pit
YA_PASS031_8	0	1	PASS31	GB	SA	D063745	6.19	2.70	3.49	XXXX	7.00	1	0.002	0.08	0.080	S_{CR}	>1m below pit
	1	2		GB	SA	D063746	6.22	2.10	4.12	XXXX	5.10	4	0.006	0.43	0.436	S_{CR} + s-TAA	>1m below pit
	2	3		GB	CS	D063747	6.21	1.70	4.51	XXXX	5.00	6	0.010	0.44	0.450	S_{CR} + s-TAA	>1m below pit
	3	4		GB	SA	D063748	6.23	1.90	4.33	XXXX	4.80	6	0.010	0.45	0.460	S_{CR} + s-TAA	>1m below pit
	4	5		GB	SA	D063749	6.43	2.60	3.83	XX	5.50	5	0.008	0.05	0.058	S_{CR} + s-TAA	>1m below pit
	5	6		GB	CS	D063750	6.38	1.90	4.48	XXXX	4.90	7	0.011	0.04	0.051	S_{CR} + s-TAA	>1m below pit
	6	7		GB	CS	D063751	6.46	6.20	0.26	XXXX							
	7	8	THIS HOLE WAS BUBBLING AIR TO THE SURFACE AFTER DRILLING	GR	SA	D063752	6.42	2.70	3.72	XX	5.10	5	0.008	0.02	0.028	S_{CR} + s-TAA	>1m below pit

APPENDIX 2 – CHAIN OF CUSTODY AND LABORATORY CERTIFICATES

Doral

Doral Mineral Sands
Lot 7 Harris Road
PICTON WA 6229
Telephone: 0407503574
Fax: 08 9725 4757
Contact: Rob Oliver
rob.oliver@doral.com.au

Facsimile Communication

Date: 26 / 1 / 2015
To: **National Measurement Institute** (LIMS Ref: QT-02002 C)
(NMI Quote Number: DORAO4B-CQ1501W 02)
26 Dick Perry Ave, Kensington, WA 6151
From: Robert Oliver

Sample Dispatch & Analysis Instructions

Fax Number: 08 9368 8444
Attention: Paula McLay
Phone Number: 08 93688425
Number of Pages: 5
Purchase Order:

Dispatch Date: 26 / 1 / 2015
Turn Around: 10 - 15 days (standard)
Number of Samples: 302
Number of Eskies:

Item	NMI LRN	Sample	Sample Matrix	pH FOX (Field Peroxide pH)	Comments
1	W15/001794	D063502	Soil		
2	W15/001795	D063503	Soil		
3	W15/001796	D063504	Soil		
4	W15/001797	D063505	Soil		
5	W15/001798	D063506	Soil		
6	W15/001799	D063507	Soil		
7	W15/001800	D063508	Soil		
8	W15/001801	D063509	Soil		
9	W15/001802	D063510	Soil		
10	W15/001803	D063511	Soil		
11	W15/001804	D063512	Soil		
12	W15/001805	D063513	Soil		
13	W15/001806	D063514	Soil		
14	W15/001807	D063515	Soil		
15	W15/001808	D063516	Soil		
16	W15/001809	D063517	Soil		
17	W15/001810	D063518	Soil		
18	W15/001811	D063519	Soil		
19	W15/001812	D063520	Soil		
20	W15/001813	D063521	Soil		
21	W15/001814	D063522	Soil		
22	W15/001815	D063523	Soil		
23	W15/001816	D063524	Soil		
24	W15/001817	D063525	Soil		
25	W15/001818	D063526	Soil		
26	W15/001819	D063527	Soil		
27	W15/001820	D063528	Soil		
28	W15/001821	D063529	Soil		
29	W15/001822	D063530	Soil		
30	W15/001823	D063531	Soil		
31	W15/001824	D063532	Soil		
32	W15/001825	D063533	Soil		
33	W15/001826	D063534	Soil		
34	W15/001827	D063535	Soil		
35	W15/001828	D063536	Soil		
36	W15/001829	D063537	Soil		
37	W15/001830	D063538	Soil		
38	W15/001831	D063539	Soil		
39	W15/001832	D063540	Soil		

RECEIVED
NMI WA
By: Kevin Robins
Date: 30-01-15
Time: 09:30
Frozen (Cold) Ambient

39 x Soil bags. Cold.

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40	W15/001833	D063541	Soil		
41	W15/001834	D063542	Soil		
42	W15/001835	D063543	Soil		
43	W15/001836	D063544	Soil		
44	W15/001837	D063545	Soil		
45	W15/001838	D063546	Soil		
46	W15/001839	D063547	Soil		
47	W15/001840	D063548	Soil		
48	W15/001841	D063549	Soil		
49	W15/001842	D063550	Soil		
50	W15/001843	D063551	Soil		

11 x Soil bags. Cold.

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51	W15/001844	D063552	Soil		
52	W15/001845	D063553	Soil		

[redacted]

102	W15/001895	D063603	Soil		
103	W15/001896	D063604	Soil		
104	W15/001897	D063605	Soil		
105	W15/001898	D063606	Soil		
106	W15/001899	D063607	Soil		
107	W15/001900	D063608	Soil		
108	W15/001901	D063609	Soil		
109	W15/001902	D063610	Soil		
110	W15/001903	D063611	Soil		
111	W15/001904	D063612	Soil		
112	W15/001905	D063613	Soil		
113	W15/001906	D063614	Soil		
114	W15/001907	D063615	Soil		
115	W15/001908	D063616	Soil		
116	W15/001909	D063617	Soil		
117	W15/001910	D063618	Soil		
118	W15/001911	D063619	Soil		
119	W15/001912	D063620	Soil		
120	W15/001913	D063621	Soil		
121	W15/001914	D063622	Soil		
122	W15/001915	D063623	Soil		
123	W15/001916	D063624	Soil		
124	W15/001917	D063625	Soil		
125	W15/001918	D063626	Soil		

24 x Soil bags. Cold.

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126	W15/001919	D063627	Soil		
127	W15/001920	D063628	Soil		
128	W15/001921	D063629	Soil		
129	W15/001922	D063630	Soil		
130	W15/001923	D063631	Soil		
131	W15/001924	D063632	Soil		
132	W15/001925	D063633	Soil		
133	W15/001926	D063634	Soil		
134	W15/001927	D063635	Soil		
135	W15/001928	D063636	Soil		
136	W15/001929	D063637	Soil		
137	W15/001930	D063638	Soil		
138	W15/001931	D063639	Soil		
139	W15/001932	D063640	Soil		
140	W15/001933	D063641	Soil		
141	W15/001934	D063642	Soil		
142	W15/001935	D063643	Soil		
143	W15/001936	D063644	Soil		
144	W15/001937	D063645	Soil		
145	W15/001938	D063646	Soil		
146	W15/001939	D063647	Soil		
147	W15/001940	D063648	Soil		
148	W15/001941	D063649	Soil		
149	W15/001942	D063650	Soil		
150	W15/001943	D063651	Soil		
151	W15/001944	D063652	Soil		
152	W15/001945	D063653	Soil		
153	W15/001946	D063654	Soil		
154	W15/001947	D063655	Soil		
155	W15/001948	D063656	Soil		
156	W15/001949	D063657	Soil		
157	W15/001950	D063658	Soil		
158	W15/001951	D063659	Soil		
159	W15/001952	D063660	Soil		
160	W15/001953	D063661	Soil		
161	W15/001954	D063662	Soil		
162	W15/001955	D063663	Soil		
163	W15/001956	D063664	Soil		
164	W15/001957	D063665	Soil		
165	W15/001958	D063666	Soil		
166	W15/001959	D063667	Soil		
167	W15/001960	D063668	Soil		
168	W15/001961	D063669	Soil		
169	W15/001962	D063670	Soil		
170	W15/001963	D063671	Soil		
171	W15/001964	D063672	Soil		
172	W15/001965	D063673	Soil		
173	W15/001966	D063674	Soil		
174	W15/001967	D063675	Soil		
175	W15/001968	D063676	Soil		
176	W15/001969	D063677	Soil		

51 x Soil bags Cold. KSR 30-01-15

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177	W15/001970	D063678	Soil		
178	W15/001971	D063679	Soil		
179	W15/001972	D063680	Soil		
180	W15/001973	D063681	Soil		
181	W15/001974	D063682	Soil		
182	W15/001975	D063683	Soil		
183	W15/001976	D063684	Soil		
184	W15/001977	D063685	Soil		
185	W15/001978	D063686	Soil		
186	W15/001979	D063687	Soil		
187	W15/001980	D063688	Soil		
188	W15/001981	D063689	Soil		
189	W15/001982	D063690	Soil		
190	W15/001983	D063691	Soil		
191	W15/001984	D063692	Soil		
192	W15/001985	D063693	Soil		
193	W15/001986	D063694	Soil		
194	W15/001987	D063695	Soil		
195	W15/001988	D063696	Soil		
196	W15/001989	D063697	Soil		
197	W15/001990	D063698	Soil		
198	W15/001991	D063699	Soil		
199	W15/001992	D063700	Soil		
200	W15/001993	D063701	Soil		

24 x Soil bags. Cold.

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201	W15/001994	D063702	Soil		
202	W15/001995	D063703	Soil		
203	W15/001996	D063704	Soil		
204	W15/001997	D063705	Soil		
205	W15/001998	D063706	Soil		
206	W15/001999	D063707	Soil		
207	W15/002000	D063708	Soil		
208	W15/002001	D063709	Soil		
209	W15/002002	D063710	Soil		
210	W15/002003	D063711	Soil		
211	W15/002004	D063712	Soil		
212	W15/002005	D063713	Soil		
213	W15/002006	D063714	Soil		
214	W15/002007	D063715	Soil		
215	W15/002008	D063716	Soil		
216	W15/002009	D063717	Soil		
217	W15/002010	D063718	Soil		
218	W15/002011	D063719	Soil		
219	W15/002012	D063720	Soil		YA_PASS_28
220	W15/002013	D063721	Soil		YA_PASS_28
221	W15/002014	D063722	Soil		YA_PASS_28
222	W15/002015	D063723	Soil		YA_PASS_28
223	W15/002016	D063724	Soil		YA_PASS_28
224	W15/002017	D063725	Soil		YA_PASS_28
225	W15/002018	D063726	Soil		YA_PASS_28
226	W15/002019	D063727	Soil		YA_PASS_29
227	W15/002020	D063728	Soil		YA_PASS_29
228	W15/002021	D063729	Soil		YA_PASS_29
229	W15/002022	D063730	Soil		YA_PASS_29
230	W15/002023	D063731	Soil		YA_PASS_29
231	W15/002024	D063732	Soil		YA_PASS_29
232	W15/002025	D063733	Soil		YA_PASS_29
233	W15/002026	D063734	Soil		YA_PASS_29
234	W15/002027	D063735	Soil		YA_PASS_29
235	W15/002028	D063736	Soil		YA_PASS_29
236	W15/002029	D063737	Soil		
237	W15/002030	D063738	Soil		
238	W15/002031	D063739	Soil		
239	W15/002032	D063740	Soil		
240	W15/002033	D063741	Soil		
241	W15/002034	D063742	Soil		
242	W15/002035	D063743	Soil		
243	W15/002036	D063744	Soil		
244	W15/002037	D063745	Soil		
245	W15/002038	D063746	Soil		
246	W15/002039	D063747	Soil		
247	W15/002040	D063748	Soil		
248	W15/002041	D063749	Soil		
249	W15/002042	D063750	Soil		
250	W15/002043	D063751	Soil		
251	W15/002044	D063752	Soil		YA_PASS_1

51 x Soil bags. Cold. KSR 30-01-15 Page 7 of 9

252	W15/002045	D063753	Soil		YA_PASS_1
253	W15/002046	D063754	Soil		YA_PASS_1
254	W15/002047	D063755	Soil		YA_PASS_1
255	W15/002048	D063756	Soil		YA_PASS_1
256	W15/002049	D063757	Soil		YA_PASS_1
257	W15/002050	D063758	Soil		YA_PASS_1
258	W15/002051	D063759	Soil		YA_PASS_1
259	W15/002052	D063760	Soil		YA_PASS_1
260	W15/002053	D063761	Soil		YA_PASS_69
261	W15/002054	D063762	Soil		YA_PASS_69
262	W15/002055	D063763	Soil		YA_PASS_69
263	W15/002056	D063764	Soil		YA_PASS_69
264	W15/002057	D063765	Soil		YA_PASS_69
265	W15/002058	D063766	Soil		YA_PASS_69
266	W15/002059	D063767	Soil		YA_PASS_69
267	W15/002060	D063768	Soil		YA_PASS_69
268	W15/002061	D063769	Soil		YA_PASS_69
269	W15/002062	D063770	Soil		YA_PASS_5
270	W15/002063	D063771	Soil		YA_PASS_5
271	W15/002064	D063772	Soil		YA_PASS_5
272	W15/002065	D063773	Soil		YA_PASS_5
273	W15/002066	D063774	Soil		YA_PASS_5
274	W15/002067	D063775	Soil		YA_PASS_5
275	W15/002068	D063776	Soil		YA_PASS_5

24 x Soil bags. Cold.

KSR
30-01-15

276	W15/002069	D063777	Soil		YA_PASS_5
277	W15/002070	D063778	Soil		YA_PASS_5
278	W15/002071	D063779	Soil		YA_PASS_6
279	W15/002072	D063780	Soil		YA_PASS_6
280	W15/002073	D063781	Soil		YA_PASS_6
281	W15/002074	D063782	Soil		YA_PASS_6
282	W15/002075	D063783	Soil		YA_PASS_6
283	W15/002076	D063784	Soil		YA_PASS_6
284	W15/002077	D063785	Soil		YA_PASS_6
285	W15/002078	D063786	Soil		YA_PASS_6
286	W15/002079	D063787	Soil		YA_PASS_6
287	W15/002080	D063788	Soil		YA_PASS_9
288	W15/002081	D063789	Soil		YA_PASS_9
289	W15/002082	D063790	Soil		YA_PASS_9
290	W15/002083	D063791	Soil		YA_PASS_9
291	W15/002084	D063792	Soil		YA_PASS_9
292	W15/002085	D063793	Soil		YA_PASS_9
293	W15/002086	D063794	Soil		YA_PASS_9
294	W15/002087	D063795	Soil		YA_PASS_13
295	W15/002088	D063796	Soil		YA_PASS_13
296	W15/002089	D063797	Soil		YA_PASS_13
297	W15/002090	D063798	Soil		YA_PASS_13
298	W15/002091	D063799	Soil		YA_PASS_13
299	W15/002092	D063800	Soil		YA_PASS_13
300	W15/002093	D063801	Soil		YA_PASS_13
301	W15/002094	D063802	Soil		YA_PASS_13
302	W15/002095	D063803	Soil		YA_PASS_13

27 x Soil bags Cold.

KJR 30-01-15.

Australian Government
National Measurement Institute

NATIONAL MEASUREMENT INSTITUTE QUOTATION

105 Delhi Rd, North Ryde NSW 2113 1/153 Bertie St, Port Melbourne VIC 3207 26 Dick Perry Ave, Kensington WA 6151

General Enquiries - phone: 1300 722 845 email: customerservice@measurement.gov.au www.measurement.gov.au ABN: 74 599 608 295

Quotation Number:	**DORA04B-CQ1501W 02002 C Special**
Date of Issue:	**January 22, 2015**
Valid Until:	**April 22, 2015**
LIMS Reference (NMI use only):	**QT-02002 C**

Contact Name:	**Rob Oliver - Geologist**
Company:	**Doral Mineral Sands**
ABN:	
Street Address:	**LOT 7 HARRIS ROAD PICTON**
Postal Address:	
Telephone/Mobile:	**0407503574**
email address:	**Rob.Oliver@doral.com.au**
Customer Reference:	**Request for quote via email**
Job / Project Reference:	**Acid sulfate soils**

Dear: **Rob**

Thank you for the opportunity to quote for the analysis of soil samples.

MATRIX	NO OF SAMPLES	TEST	LIMIT OF REPORTING	Price Per Sample (excl GST) AU$	Reference Method
SOIL	300				
		pH Fox		$ 9.00	
Sub-total per sample (excludes handling fee and GST)				$ 9.00	
Sub-total per 300 samples (excludes handling fee and GST)				$ 2,700.00	
*Sub-total per 300 samples with a 10 % discount *(excludes handling fee and GST)*				$ 2,430.00	
SOIL	Selected Samples				

[redacted]

Doral

Doral Mineral Sands
Lot 7 Harris Road
PICTON WA 6229
Telephone: 0407503574
Fax: 08 9725 4757
Contact: Rob Oliver
rob.oliver@doral.com.au

Facsimile Communication

Date: 28 / 1 / 2015
To: **National Measurement Institute** (LIMS Ref: QT-02002 C)
(NMI Quote Number: DORAO4B-CQ1501W 02)
26 Dick Perry Ave, Kensington, WA 6151
From: Robert Oliver

Sample Dispatch & Analysis Instructions

Fax Number: 08 9368 8444
Attention: Paula McLay
Phone Number: 08 93688425
Number of Pages: 5
Purchase Order:

Dispatch Date: 26 / 1 / 2015
Turn Around: 10 - 15 days (standard)

Number of Samples: 302
Number of Eskies:

Item	NMI LRN	Sample	Sample Matrix	pH FOX (Field Peroxide pH)	Comments
1		D063502	Soil		YA_PASS_3
2		D063503	Soil		YA_PASS_3
3		D063504	Soil		YA_PASS_3
4		D063505	Soil		YA_PASS_3
5		D063506	Soil		YA_PASS_3
6		D063507	Soil		YA_PASS_3
7		D063508	Soil		YA_PASS_3
8		D063509	Soil		YA_PASS_3
9		D063510	Soil		YA_PASS_3
10		D063511	Soil		YA_PASS_4
11		D063512	Soil		YA_PASS_4
12		D063513	Soil		YA_PASS_4
13		D063514	Soil		YA_PASS_4
14		D063515	Soil		YA_PASS_4
15		D063516	Soil		YA_PASS_4
16		D063517	Soil		YA_PASS_4
17		D063518	Soil		YA_PASS_4
18		D063519	Soil		YA_PASS_4
19		D063520	Soil		YA_PASS_4
20		D063521	Soil		YA_PASS_4
21		D063522	Soil		YA_PASS_4
22		D063523	Soil		YA_PASS_7
23		D063524	Soil		YA_PASS_7
24		D063525	Soil		YA_PASS_7
25		D063526	Soil		YA_PASS_7
26		D063527	Soil		YA_PASS_7
27		D063528	Soil		YA_PASS_7
28		D063529	Soil		YA_PASS_7
29		D063530	Soil		YA_PASS_7
30		D063531	Soil		YA_PASS_7
31		D063532	Soil		YA_PASS_7
32		D063533	Soil		YA_PASS_7
33		D063534	Soil		YA_PASS_7
34		D063535	Soil		YA_PASS_8
35		D063536	Soil		YA_PASS_8
36		D063537	Soil		YA_PASS_8
37		D063538	Soil		YA_PASS_8
38		D063539	Soil		YA_PASS_8
39		D063540	Soil		YA_PASS_8
40		D063541	Soil		YA_PASS_8
41		D063542	Soil		YA_PASS_8
42		D063543	Soil		YA_PASS_8
43		D063544	Soil		YA_PASS_8
44		D063545	Soil		YA_PASS_8
45		D063546	Soil		YA_PASS_8
46		D063547	Soil		YA_PASS_11
47		D063548	Soil		YA_PASS_11
48		D063549	Soil		YA_PASS_11
49		D063550	Soil		YA_PASS_11
50		D063551	Soil		YA_PASS_11

51		D063552	Soil		YA_PASS_11
52		D063553	Soil		YA_PASS_11
53		D063554	Soil		YA_PASS_11
54		D063555	Soil		YA_PASS_11
55		D063556	Soil		YA_PASS_11
56		D063557	Soil		YA_PASS_12
57		D063558	Soil		YA_PASS_12
58		D063559	Soil		YA_PASS_12
59		D063560	Soil		YA_PASS_12
60		D063561	Soil		YA_PASS_12
61		D063562	Soil		YA_PASS_12
62		D063563	Soil		YA_PASS_12
63		D063564	Soil		YA_PASS_12
64		D063565	Soil		YA_PASS_12
65		D063566	Soil		YA_PASS_12
66		D063567	Soil		YA_PASS_12
67		D063568	Soil		YA_PASS_15
68		D063569	Soil		YA_PASS_15
69		D063570	Soil		YA_PASS_15
70		D063571	Soil		YA_PASS_15
71		D063572	Soil		YA_PASS_15
72		D063573	Soil		YA_PASS_15
73		D063574	Soil		YA_PASS_15
74		D063575	Soil		YA_PASS_15
75		D063576	Soil		YA_PASS_15
76		D063577	Soil		YA_PASS_15
77		D063578	Soil		YA_PASS_15
78		D063579	Soil		YA_PASS_16
79		D063580	Soil		YA_PASS_16
80		D063581	Soil		YA_PASS_16
81		D063582	Soil		YA_PASS_16
82		D063583	Soil		YA_PASS_16
83		D063584	Soil		YA_PASS_16
84		D063585	Soil		YA_PASS_16
85		D063586	Soil		YA_PASS_16
86		D063587	Soil		YA_PASS_16
87		D063588	Soil		YA_PASS_16
88		D063589	Soil		YA_PASS_16
89		D063590	Soil		YA_PASS_16
90		D063591	Soil		YA_PASS_16
91		D063592	Soil		YA_PASS_10
92		D063593	Soil		YA_PASS_10
93		D063594	Soil		YA_PASS_10
94		D063595	Soil		YA_PASS_10
95		D063596	Soil		YA_PASS_10
96		D063597	Soil		YA_PASS_10
97		D063598	Soil		YA_PASS_10
98		D063599	Soil		YA_PASS_10
99		D063600	Soil		YA_PASS_10
100		D063601	Soil		YA_PASS_14
101		D063602	Soil		YA_PASS_14
102		D063603	Soil		YA_PASS_14
103		D063604	Soil		YA_PASS_14
104		D063605	Soil		YA_PASS_14
105		D063606	Soil		YA_PASS_14
106		D063607	Soil		YA_PASS_14
107		D063608	Soil		YA_PASS_14
108		D063609	Soil		YA_PASS_14
109		D063610	Soil		YA_PASS_18
110		D063611	Soil		YA_PASS_18
111		D063612	Soil		YA_PASS_18
112		D063613	Soil		YA_PASS_18
113		D063614	Soil		YA_PASS_18
114		D063615	Soil		YA_PASS_18
115		D063616	Soil		YA_PASS_18
116		D063617	Soil		YA_PASS_18
117		D063618	Soil		YA_PASS_18
118		D063619	Soil		YA_PASS_18
119		D063620	Soil		YA_PASS_17
120		D063621	Soil		YA_PASS_17
121		D063622	Soil		YA_PASS_17
122		D063623	Soil		YA_PASS_17
123		D063624	Soil		YA_PASS_17
124		D063625	Soil		YA_PASS_17
125		D063626	Soil		YA_PASS_17

126		D063627	Soil		YA_PASS_17
127		D063628	Soil		YA_PASS_17
128		D063629	Soil		YA_PASS_21
129		D063630	Soil		YA_PASS_21
130		D063631	Soil		YA_PASS_21
131		D063632	Soil		YA_PASS_21
132		D063633	Soil		YA_PASS_21
133		D063634	Soil		YA_PASS_21
134		D063635	Soil		YA_PASS_21
135		D063636	Soil		YA_PASS_21
136		D063637	Soil		YA_PASS_21
137		D063638	Soil		YA_PASS_22
138		D063639	Soil		YA_PASS_22
139		D063640	Soil		YA_PASS_22
140		D063641	Soil		YA_PASS_22
141		D063642	Soil		YA_PASS_22
142		D063643	Soil		YA_PASS_22
143		D063644	Soil		YA_PASS_22
144		D063645	Soil		YA_PASS_22
145		D063646	Soil		YA_PASS_22
146		D063647	Soil		YA_PASS_19
147		D063648	Soil		YA_PASS_19
148		D063649	Soil		YA_PASS_19
149		D063650	Soil		YA_PASS_19
150		D063651	Soil		YA_PASS_19
151		D063652	Soil		YA_PASS_19
152		D063653	Soil		YA_PASS_19
153		D063654	Soil		YA_PASS_19
154		D063655	Soil		YA_PASS_19
155		D063656	Soil		YA_PASS_19
156		D063657	Soil		YA_PASS_19
157		D063658	Soil		YA_PASS_19
158		D063659	Soil		YA_PASS_19
159		D063660	Soil		YA_PASS_20
160		D063661	Soil		YA_PASS_20
161		D063662	Soil		YA_PASS_20
162		D063663	Soil		YA_PASS_20
163		D063664	Soil		YA_PASS_20
164		D063665	Soil		YA_PASS_20
165		D063666	Soil		YA_PASS_20
166		D063667	Soil		YA_PASS_20
167		D063668	Soil		YA_PASS_20
168		D063669	Soil		YA_PASS_20
169		D063670	Soil		YA_PASS_20
170		D063671	Soil		YA_PASS_20
171		D063672	Soil		YA_PASS_23
172		D063673	Soil		YA_PASS_23
173		D063674	Soil		YA_PASS_23
174		D063675	Soil		YA_PASS_23
175		D063676	Soil		YA_PASS_23
176		D063677	Soil		YA_PASS_23
177		D063678	Soil		YA_PASS_23
178		D063679	Soil		YA_PASS_23
179		D063680	Soil		YA_PASS_23
180		D063681	Soil		YA_PASS_24
181		D063682	Soil		YA_PASS_24
182		D063683	Soil		YA_PASS_24
183		D063684	Soil		YA_PASS_24
184		D063685	Soil		YA_PASS_24
185		D063686	Soil		YA_PASS_24
186		D063687	Soil		YA_PASS_24
187		D063688	Soil		YA_PASS_24
188		D063689	Soil		YA_PASS_24
189		D063690	Soil		YA_PASS_24
190		D063691	Soil		YA_PASS_27
191		D063692	Soil		YA_PASS_27
192		D063693	Soil		YA_PASS_27
193		D063694	Soil		YA_PASS_27
194		D063695	Soil		YA_PASS_27
195		D063696	Soil		YA_PASS_27
196		D063697	Soil		YA_PASS_27
197		D063698	Soil		YA_PASS_27
198		D063699	Soil		YA_PASS_27
199		D063700	Soil		YA_PASS_27
200		D063701	Soil		YA_PASS_27

201		D063702	Soil		YA_PASS_26
202		D063703	Soil		YA_PASS_26
203		D063704	Soil		YA_PASS_26
204		D063705	Soil		YA_PASS_26
205		D063706	Soil		YA_PASS_26
206		D063707	Soil		YA_PASS_26
207		D063708	Soil		YA_PASS_26
208		D063709	Soil		YA_PASS_26
209		D063710	Soil		YA_PASS_26
210		D063711	Soil		YA_PASS_25
211		D063712	Soil		YA_PASS_25
212		D063713	Soil		YA_PASS_25
213		D063714	Soil		YA_PASS_25
214		D063715	Soil		YA_PASS_25
215		D063716	Soil		YA_PASS_25
216		D063717	Soil		YA_PASS_25
217		D063718	Soil		YA_PASS_25
218		D063719	Soil		YA_PASS_25
219		D063720	Soil		YA_PASS_28
220		D063721	Soil		YA_PASS_28
221		D063722	Soil		YA_PASS_28
222		D063723	Soil		YA_PASS_28
223		D063724	Soil		YA_PASS_28
224		D063725	Soil		YA_PASS_28
225		D063726	Soil		YA_PASS_28
226		D063727	Soil		YA_PASS_29
227		D063728	Soil		YA_PASS_29
228		D063729	Soil		YA_PASS_29
229		D063730	Soil		YA_PASS_29
230		D063731	Soil		YA_PASS_29
231		D063732	Soil		YA_PASS_29
232		D063733	Soil		YA_PASS_29
233		D063734	Soil		YA_PASS_29
234		D063735	Soil		YA_PASS_29
235		D063736	Soil		YA_PASS_30
236		D063737	Soil		YA_PASS_30
237		D063738	Soil		YA_PASS_30
238		D063739	Soil		YA_PASS_30
239		D063740	Soil		YA_PASS_30
240		D063741	Soil		YA_PASS_30
241		D063742	Soil		YA_PASS_30
242		D063743	Soil		YA_PASS_30
243		D063744	Soil		YA_PASS_30
244		D063745	Soil		YA_PASS_31
245		D063746	Soil		YA_PASS_31
246		D063747	Soil		YA_PASS_31
247		D063748	Soil		YA_PASS_31
248		D063749	Soil		YA_PASS_31
249		D063750	Soil		YA_PASS_31
250		D063751	Soil		YA_PASS_31
251		D063752	Soil		YA_PASS_31
252		D063753	Soil		YA_PASS_1
253		D063754	Soil		YA_PASS_1
254		D063755	Soil		YA_PASS_1
255		D063756	Soil		YA_PASS_1
256		D063757	Soil		YA_PASS_1
257		D063758	Soil		YA_PASS_1
258		D063759	Soil		YA_PASS_1
259		D063760	Soil		YA_PASS_1
260		D063761	Soil		YA_PASS_69
261		D063762	Soil		YA_PASS_69
262		D063763	Soil		YA_PASS_69
263		D063764	Soil		YA_PASS_69
264		D063765	Soil		YA_PASS_69
265		D063766	Soil		YA_PASS_69
266		D063767	Soil		YA_PASS_69
267		D063768	Soil		YA_PASS_69
268		D063769	Soil		YA_PASS_69
269		D063770	Soil		YA_PASS_5
270		D063771	Soil		YA_PASS_5
271		D063772	Soil		YA_PASS_5
272		D063773	Soil		YA_PASS_5
273		D063774	Soil		YA_PASS_5
274		D063775	Soil		YA_PASS_5
275		D063776	Soil		YA_PASS_5

276		D063777	Soil		YA_PASS_5
277		D063778	Soil		YA_PASS_5
278		D063779	Soil		YA_PASS_6
279		D063780	Soil		YA_PASS_6
280		D063781	Soil		YA_PASS_6
281		D063782	Soil		YA_PASS_6
282		D063783	Soil		YA_PASS_6
283		D063784	Soil		YA_PASS_6
284		D063785	Soil		YA_PASS_6
285		D063786	Soil		YA_PASS_6
286		D063787	Soil		YA_PASS_6
287		D063788	Soil		YA_PASS_9
288		D063789	Soil		YA_PASS_9
289		D063790	Soil		YA_PASS_9
290		D063791	Soil		YA_PASS_9
291		D063792	Soil		
292		D063793	Soil		
293		D063794	Soil		
294		D063795	Soil		
295		D063796	Soil		
296		D063797	Soil		
297		D063798	Soil		
298		D063799	S		
299		D063800	S		
300		D063801	S		
301		D063802	S		
302		D063803	S		

Australian Government

National Measurement Institute

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001794	D063502	SOIL
W15/001795	D063503	SOIL
W15/001796	D063504	SOIL
W15/001797	D063505	SOIL

Lab Reg No.		W15/001794	W15/001795	W15/001796	W15/001797	
Sample Reference	Units	D063502	D063503	D063504	D063505	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.6	5.0	5.3	6.0	WL281-23BF

W15/001794
to W15/002095

pH (FOX) soil reaction rating

X Slight reaction
XX Moderate reaction
XXX High reaction
XXXX Very vigorous reaction (gas evolution and heat generation commonly > 80C)

Note that NMI WA is not NATA accredited for the pH (FOX) and soil reaction rating tests.

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

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Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001798	D063506	SOIL
W15/001799	D063507	SOIL
W15/001800	D063508	SOIL
W15/001801	D063509	SOIL

Lab Reg No.		W15/001798	W15/001799	W15/001800	W15/001801	
Sample Reference	Units	D063506	D063507	D063508	D063509	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXXX	XXXX	WL281-23BF
pH fox		6.5	5.4	1.6	1.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

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Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001802	D063510	SOIL
W15/001803	D063511	SOIL
W15/001804	D063512	SOIL
W15/001806	D063514	SOIL

Lab Reg No.		W15/001802	W15/001803	W15/001804	W15/001806	
Sample Reference	Units	D063510	D063511	D063512	D063514	Method
Inorganics						
Soil Reaction Rating		XXXX	X	X	XX	WL281-23BF
pH fox		2.0	4.3	4.2	4.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001805	D063513	SOIL
W15/001807	D063515	SOIL
W15/001808	D063516	SOIL
W15/001809	D063517	SOIL

Lab Reg No.		W15/001805	W15/001807	W15/001808	W15/001809	
Sample Reference	Units	D063513	D063515	D063516	D063517	Method
Inorganics						
Soil Reaction Rating		X	XXXX	XX	XX	WL281-23BF
pH fox		4.0	6.5	3.0	2.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

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Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001810	D063518	SOIL
W15/001811	D063519	SOIL
W15/001812	D063520	SOIL
W15/001813	D063521	SOIL

Lab Reg No.		W15/001810	W15/001811	W15/001812	W15/001813	
Sample Reference	Units	D063518	D063519	D063520	D063521	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXX	XXX	WL281-23BF
pH fox		1.9	2.0	2.0	2.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001814	D063522	SOIL
W15/001815	D063523	SOIL
W15/001816	D063524	SOIL
W15/001817	D063525	SOIL

Lab Reg No.		W15/001814	W15/001815	W15/001816	W15/001817	
Sample Reference	Units	D063522	D063523	D063524	D063525	Method
Inorganics						
Soil Reaction Rating		XXX	XX	XX	XX	WL281-23BF
pH fox		2.4	3.7	4.3	4.1	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

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		Quote No.	: QT-02002
		Order No.	: 3100949724
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		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001818	D063526	SOIL
W15/001819	D063527	SOIL
W15/001820	D063528	SOIL
W15/001821	D063529	SOIL

Lab Reg No.		W15/001818	W15/001819	W15/001820	W15/001821	
Sample Reference	Units	D063526	D063527	D063528	D063529	Method
Inorganics						
Soil Reaction Rating		XX	XXXX	XXXX	XXX	WL281-23BF
pH fox		4.6	6.2	6.9	2.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001822	D063530	SOIL
W15/001823	D063531	SOIL
W15/001824	D063532	SOIL
W15/001825	D063533	SOIL

Lab Reg No.		W15/001822	W15/001823	W15/001824	W15/001825	
Sample Reference	Units	D063530	D063531	D063532	D063533	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXXX	XXX	WL281-23BF
pH fox		1.6	1.5	1.5	2.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001826	D063534	SOIL
W15/001827	D063535	SOIL
W15/001828	D063536	SOIL
W15/001829	D063537	SOIL

Lab Reg No.		W15/001826	W15/001827	W15/001828	W15/001829	
Sample Reference	Units	D063534	D063535	D063536	D063537	Method
Inorganics						
Soil Reaction Rating		XXXX	XXX	XXX	XXX	WL281-23BF
pH fox		2.6	2.0	1.9	2.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

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		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001830	D063538	SOIL
W15/001831	D063539	SOIL
W15/001832	D063540	SOIL
W15/001833	D063541	SOIL

Lab Reg No.		W15/001830	W15/001831	W15/001832	W15/001833	
Sample Reference	Units	D063538	D063539	D063540	D063541	Method
Inorganics						
Soil Reaction Rating		XX	XXXX	XXX	XXX	WL281-23BF
pH fox		2.6	7.0	2.7	2.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001834	D063542	SOIL
W15/001835	D063543	SOIL
W15/001836	D063544	SOIL
W15/001838	D063546	SOIL

Lab Reg No.		W15/001834	W15/001835	W15/001836	W15/001838	
Sample Reference	Units	D063542	D063543	D063544	D063546	Method
Inorganics						
Soil Reaction Rating		XXX	XXX	XXXX	XXXX	WL281-23BF
pH fox		1.5	1.7	1.9	2.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001837	D063545	SOIL
W15/001839	D063547	SOIL
W15/001840	D063548	SOIL
W15/001841	D063549	SOIL

Lab Reg No.		W15/001837	W15/001839	W15/001840	W15/001841	
Sample Reference	Units	D063545	D063547	D063548	D063549	Method
Inorganics						
Soil Reaction Rating		XXXX	XX	XX	XX	WL281-23BF
pH fox		2.2	2.8	3.1	3.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001842	D063550	SOIL
W15/001843	D063551	SOIL
W15/001844	D063552	SOIL
W15/001845	D063553	SOIL

Lab Reg No.		W15/001842	W15/001843	W15/001844	W15/001845	
Sample Reference	Units	D063550	D063551	D063552	D063553	Method
Inorganics						
Soil Reaction Rating		XX	X	X	XXXX	WL281-23BF
pH fox		2.6	4.2	5.3	2.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001846	D063554	SOIL
W15/001847	D063555	SOIL
W15/001848	D063556	SOIL
W15/001849	D063557	SOIL

Lab Reg No.		W15/001846	W15/001847	W15/001848	W15/001849	
Sample Reference	Units	D063554	D063555	D063556	D063557	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XX	XX	WL281-23BF
pH fox		2.0	2.2	2.4	2.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001850	D063558	SOIL
W15/001851	D063559	SOIL
W15/001852	D063560	SOIL
W15/001853	D063561	SOIL

Lab Reg No.		W15/001850	W15/001851	W15/001852	W15/001853	
Sample Reference	Units	D063558	D063559	D063560	D063561	Method
Inorganics						
Soil Reaction Rating		XX	XX	XXXX	XXXX	WL281-23BF
pH fox		3.2	2.5	2.7	7.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001854	D063562	SOIL
W15/001855	D063563	SOIL
W15/001856	D063564	SOIL
W15/001857	D063565	SOIL

Lab Reg No.		W15/001854	W15/001855	W15/001856	W15/001857	
Sample Reference	Units	D063562	D063563	D063564	D063565	Method
Inorganics						
Soil Reaction Rating		X	XXXX	XXXX	XXXX	WL281-23BF
pH fox		4.6	1.9	2.4	2.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001858	D063566	SOIL
W15/001859	D063567	SOIL
W15/001860	D063568	SOIL
W15/001861	D063569	SOIL

Lab Reg No.		W15/001858	W15/001859	W15/001860	W15/001861	
Sample Reference	Units	D063566	D063567	D063568	D063569	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	X	XX	WL281-23BF
pH fox		2.2	2.3	3.3	2.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001862	D063570	SOIL
W15/001863	D063571	SOIL
W15/001864	D063572	SOIL
W15/001865	D063573	SOIL

Lab Reg No.		W15/001862	W15/001863	W15/001864	W15/001865	
Sample Reference	Units	D063570	D063571	D063572	D063573	Method
Inorganics						
Soil Reaction Rating		XX	XXX	X	X	WL281-23BF
pH fox		2.7	2.4	3.8	4.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001866	D063574	SOIL
W15/001867	D063575	SOIL
W15/001868	D063576	SOIL
W15/001869	D063577	SOIL

Lab Reg No.		W15/001866	W15/001867	W15/001868	W15/001869	
Sample Reference	Units	D063574	D063575	D063576	D063577	Method
Inorganics						
Soil Reaction Rating		X	XX	XX	XXXX	WL281-23BF
pH fox		3.6	3.2	2.1	2.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001870	D063578	SOIL
W15/001871	D063579	SOIL
W15/001872	D063580	SOIL
W15/001873	D063581	SOIL

Lab Reg No.		W15/001870	W15/001871	W15/001872	W15/001873	
Sample Reference	Units	D063578	D063579	D063580	D063581	Method
Inorganics						
Soil Reaction Rating		XXXX	XXX	XXXX	XXX	WL281-23BF
pH fox		1.9	1.9	2.1	2.2	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001874	D063582	SOIL
W15/001875	D063583	SOIL
W15/001876	D063584	SOIL
W15/001877	D063585	SOIL

Lab Reg No.		W15/001874	W15/001875	W15/001876	W15/001877	
Sample Reference	Units	D063582	D063583	D063584	D063585	Method
Inorganics						
Soil Reaction Rating		XX	XX	XX	XX	WL281-23BF
pH fox		2.4	3.5	6.5	4.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	:	DORAL MINERAL SANDS PTY LTD	Job No.	:	DORA04_W/150130
		LOT 7 HARRIS ROAD	Quote No.	:	QT-02002
		PICTON WA 6229	Order No.	:	3100949724
			Date Sampled	:	
			Date Received	:	30-JAN-2015
Attention	:	ROB OLIVER	Sampled By	:	CLIENT
Project Name	:				
Your Client Services Manager	:	DAVID LYNCH	Phone	:	(08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001878	D063586	SOIL
W15/001879	D063587	SOIL
W15/001880	D063588	SOIL
W15/001881	D063589	SOIL

Lab Reg No.		W15/001878	W15/001879	W15/001880	W15/001881	
Sample Reference	Units	D063586	D063587	D063588	D063589	Method
Inorganics						
Soil Reaction Rating		XXX	XX	XXXX	XXXX	WL281-23BF
pH fox		5.0	3.6	2.3	2.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD	Job No.	: DORA04_W/150130
	LOT 7 HARRIS ROAD	Quote No.	: QT-02002
	PICTON WA 6229	Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001882	D063590	SOIL
W15/001883	D063591	SOIL
W15/001884	D063592	SOIL
W15/001885	D063593	SOIL

Lab Reg No.		W15/001882	W15/001883	W15/001884	W15/001885	
Sample Reference	Units	D063590	D063591	D063592	D063593	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXXX	XXXX	WL281-23BF
pH fox		1.6	1.7	1.8	2.2	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001886	D063594	SOIL
W15/001887	D063595	SOIL
W15/001888	D063596	SOIL
W15/001889	D063597	SOIL

Lab Reg No.		W15/001886	W15/001887	W15/001888	W15/001889	
Sample Reference	Units	D063594	D063595	D063596	D063597	Method
Inorganics						
Soil Reaction Rating		XXX	XX	XX	XX	WL281-23BF
pH fox		2.2	2.1	3.3	3.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001890	D063598	SOIL
W15/001891	D063599	SOIL
W15/001892	D063600	SOIL
W15/001893	D063601	SOIL

Lab Reg No.		W15/001890	W15/001891	W15/001892	W15/001893	
Sample Reference	Units	D063598	D063599	D063600	D063601	Method
Inorganics						
Soil Reaction Rating		XX	XXXX	XXXX	XX	WL281-23BF
pH fox		1.7	1.6	2.3	2.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001894	D063602	SOIL
W15/001895	D063603	SOIL
W15/001896	D063604	SOIL
W15/001897	D063605	SOIL

Lab Reg No.		W15/001894	W15/001895	W15/001896	W15/001897	
Sample Reference	Units	D063602	D063603	D063604	D063605	Method
Inorganics						
Soil Reaction Rating		XX	XX	XX	XX	WL281-23BF
pH fox		2.7	2.2	2.9	3.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
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		Date Sampled	:
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001898	D063606	SOIL
W15/001899	D063607	SOIL
W15/001900	D063608	SOIL
W15/001901	D063609	SOIL

Lab Reg No.		W15/001898	W15/001899	W15/001900	W15/001901	
Sample Reference	Units	D063606	D063607	D063608	D063609	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.2	4.0	3.8	4.2	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001902	D063610	SOIL
W15/001903	D063611	SOIL
W15/001904	D063612	SOIL
W15/001905	D063613	SOIL

Lab Reg No.		W15/001902	W15/001903	W15/001904	W15/001905	
Sample Reference	Units	D063610	D063611	D063612	D063613	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		3.7	4.0	4.7	4.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001906	D063614	SOIL
W15/001907	D063615	SOIL
W15/001908	D063616	SOIL
W15/001909	D063617	SOIL

Lab Reg No.		W15/001906	W15/001907	W15/001908	W15/001909	
Sample Reference	Units	D063614	D063615	D063616	D063617	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.5	4.6	4.6	4.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001910	D063618	SOIL
W15/001911	D063619	SOIL
W15/001912	D063620	SOIL
W15/001913	D063621	SOIL

Lab Reg No.		W15/001910	W15/001911	W15/001912	W15/001913	
Sample Reference	Units	D063618	D063619	D063620	D063621	Method
Inorganics						
Soil Reaction Rating		X	X	XX	XX	WL281-23BF
pH fox		4.2	3.0	3.4	3.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001914	D063622	SOIL
W15/001915	D063623	SOIL
W15/001916	D063624	SOIL
W15/001917	D063625	SOIL

Lab Reg No.		W15/001914	W15/001915	W15/001916	W15/001917	
Sample Reference	Units	D063622	D063623	D063624	D063625	Method
Inorganics						
Soil Reaction Rating		XX	X	X	X	WL281-23BF
pH fox		3.0	4.6	2.8	4.2	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD	Job No.	:	DORA04_W/150130
	LOT 7 HARRIS ROAD	Quote No.	:	QT-02002
	PICTON WA 6229	Order No.	:	3100949724
		Date Sampled	:	
		Date Received	:	30-JAN-2015
Attention	: ROB OLIVER	Sampled By	:	CLIENT
Project Name :				
Your Client Services Manager	: DAVID LYNCH	Phone	:	(08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001918	D063626	SOIL
W15/001919	D063627	SOIL
W15/001920	D063628	SOIL
W15/001921	D063629	SOIL

Lab Reg No.		W15/001918	W15/001919	W15/001920	W15/001921	
Sample Reference	Units	D063626	D063627	D063628	D063629	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		3.9	4.0	4.2	3.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001922	D063630	SOIL
W15/001923	D063631	SOIL
W15/001924	D063632	SOIL
W15/001925	D063633	SOIL

Lab Reg No.		W15/001922	W15/001923	W15/001924	W15/001925	
Sample Reference	Units	D063630	D063631	D063632	D063633	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.5	4.4	3.8	4.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001926	D063634	SOIL
W15/001927	D063635	SOIL
W15/001928	D063636	SOIL
W15/001929	D063637	SOIL

Lab Reg No.		W15/001926	W15/001927	W15/001928	W15/001929	
Sample Reference	Units	D063634	D063635	D063636	D063637	Method
Inorganics						
Soil Reaction Rating		X	XX	XX	XXX	WL281-23BF
pH fox		4.6	4.1	4.6	1.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001930	D063638	SOIL
W15/001931	D063639	SOIL
W15/001932	D063640	SOIL
W15/001933	D063641	SOIL

Lab Reg No.	Units	W15/001930	W15/001931	W15/001932	W15/001933	Method
Sample Reference		D063638	D063639	D063640	D063641	
Inorganics						
Soil Reaction Rating		X	XX	XX	XX	WL281-23BF
pH fox		3.8	3.5	3.5	3.2	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001934	D063642	SOIL
W15/001935	D063643	SOIL
W15/001936	D063644	SOIL
W15/001937	D063645	SOIL

Lab Reg No.		W15/001934	W15/001935	W15/001936	W15/001937	
Sample Reference	Units	D063642	D063643	D063644	D063645	Method
Inorganics						
Soil Reaction Rating		XX	X	X	X	WL281-23BF
pH fox		3.6	4.3	4.4	4.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001938	D063646	SOIL
W15/001939	D063647	SOIL
W15/001940	D063648	SOIL
W15/001942	D063650	SOIL

Lab Reg No.		W15/001938	W15/001939	W15/001940	W15/001942	
Sample Reference	Units	D063646	D063647	D063648	D063650	Method
Inorganics						
Soil Reaction Rating		XXX	X	XX	X	WL281-23BF
pH fox		2.6	4.2	3.6	4.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001941	D063649	SOIL
W15/001943	D063651	SOIL
W15/001944	D063652	SOIL
W15/001945	D063653	SOIL

Lab Reg No.		W15/001941	W15/001943	W15/001944	W15/001945	
Sample Reference	Units	D063649	D063651	D063652	D063653	Method
Inorganics						
Soil Reaction Rating		XXX	X	X	XX	WL281-23BF
pH fox		2.8	5.2	5.4	4.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001946	D063654	SOIL
W15/001947	D063655	SOIL
W15/001948	D063656	SOIL
W15/001949	D063657	SOIL

Lab Reg No.		W15/001946	W15/001947	W15/001948	W15/001949	
Sample Reference	Units	D063654	D063655	D063656	D063657	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.2	4.5	5.4	5.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001950	D063658	SOIL
W15/001951	D063659	SOIL
W15/001952	D063660	SOIL
W15/001953	D063661	SOIL

Lab Reg No.		W15/001950	W15/001951	W15/001952	W15/001953	
Sample Reference	Units	D063658	D063659	D063660	D063661	Method
Inorganics						
Soil Reaction Rating		X	X	XX	XX	WL281-23BF
pH fox		4.5	4.4	3.2	3.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001954	D063662	SOIL
W15/001955	D063663	SOIL
W15/001956	D063664	SOIL
W15/001957	D063665	SOIL

Lab Reg No.		W15/001954	W15/001955	W15/001956	W15/001957	
Sample Reference	Units	D063662	D063663	D063664	D063665	Method
Inorganics						
Soil Reaction Rating		XX	XX	X	XX	WL281-23BF
pH fox		3.9	3.3	3.9	4.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001958	D063666	SOIL
W15/001959	D063667	SOIL
W15/001960	D063668	SOIL
W15/001962	D063670	SOIL

Lab Reg No.		W15/001958	W15/001959	W15/001960	W15/001962	
Sample Reference	Units	D063666	D063667	D063668	D063670	Method
Inorganics						
Soil Reaction Rating		X	XX	XX	XXXX	WL281-23BF
pH fox		3.9	2.9	3.1	1.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001961	D063669	SOIL
W15/001963	D063671	SOIL
W15/001964	D063672	SOIL
W15/001965	D063673	SOIL

Lab Reg No.		W15/001961	W15/001963	W15/001964	W15/001965	
Sample Reference	Units	D063669	D063671	D063672	D063673	Method
Inorganics						
Soil Reaction Rating		XXX	XXXX	XXXX	XX	WL281-23BF
pH fox		1.9	1.9	2.3	2.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001966	D063674	SOIL
W15/001967	D063675	SOIL
W15/001968	D063676	SOIL
W15/001969	D063677	SOIL

Lab Reg No.		W15/001966	W15/001967	W15/001968	W15/001969	
Sample Reference	Units	D063674	D063675	D063676	D063677	Method
Inorganics						
Soil Reaction Rating		XX	XX	X	X	WL281-23BF
pH fox		3.2	3.9	4.2	4.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001970	D063678	SOIL
W15/001971	D063679	SOIL
W15/001972	D063680	SOIL
W15/001973	D063681	SOIL

Lab Reg No.		W15/001970	W15/001971	W15/001972	W15/001973	
Sample Reference	Units	D063678	D063679	D063680	D063681	Method
Inorganics						
Soil Reaction Rating		XX	XXXX	XXXX	XX	WL281-23BF
pH fox		3.0	2.3	2.2	3.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001974	D063682	SOIL
W15/001975	D063683	SOIL
W15/001976	D063684	SOIL
W15/001977	D063685	SOIL

Lab Reg No.		W15/001974	W15/001975	W15/001976	W15/001977	
Sample Reference	Units	D063682	D063683	D063684	D063685	Method
Inorganics						
Soil Reaction Rating		X	XX	XX	XX	WL281-23BF
pH fox		4.4	2.6	3.7	3.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD	Job No.	: DORA04_W/150130
	LOT 7 HARRIS ROAD	Quote No.	: QT-02002
	PICTON WA 6229	Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001979	D063687	SOIL
W15/001978	D063686	SOIL
W15/001980	D063688	SOIL
W15/001981	D063689	SOIL

Lab Reg No.		W15/001979	W15/001978	W15/001980	W15/001981	
Sample Reference	Units	D063687	D063686	D063688	D063689	Method
Inorganics						
Soil Reaction Rating		XX	XX	XX	XXXX	WL281-23BF
pH fox		5.9	5.0	4.9	2.1	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	:	DORAL MINERAL SANDS PTY LTD	Job No.	:	DORA04_W/150130
		LOT 7 HARRIS ROAD	Quote No.	:	QT-02002
		PICTON WA 6229	Order No.	:	3100949724
			Date Sampled	:	
			Date Received	:	30-JAN-2015
Attention	:	ROB OLIVER	Sampled By	:	CLIENT
Project Name	:				
Your Client Services Manager	:	DAVID LYNCH	Phone	:	(08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001982	D063690	SOIL
W15/001983	D063691	SOIL
W15/001984	D063692	SOIL
W15/001985	D063693	SOIL

Lab Reg No.	Units	W15/001982	W15/001983	W15/001984	W15/001985	Method
Sample Reference		D063690	D063691	D063692	D063693	
Inorganics						
Soil Reaction Rating		XXXX	XX	X	XX	WL281-23BF
pH fox		1.8	3.4	4.8	2.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001986	D063694	SOIL
W15/001987	D063695	SOIL
W15/001988	D063696	SOIL
W15/001989	D063697	SOIL

Lab Reg No.		W15/001986	W15/001987	W15/001988	W15/001989	
Sample Reference	Units	D063694	D063695	D063696	D063697	Method
Inorganics						
Soil Reaction Rating		XX	X	X	XX	WL281-23BF
pH fox		4.0	4.4	5.2	3.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001990	D063698	SOIL
W15/001991	D063699	SOIL
W15/001992	D063700	SOIL
W15/001993	D063701	SOIL

Lab Reg No.		W15/001990	W15/001991	W15/001992	W15/001993	
Sample Reference	Units	D063698	D063699	D063700	D063701	Method
Inorganics						
Soil Reaction Rating		XX	X	XX	XXXX	WL281-23BF
pH fox		4.1	3.9	2.3	2.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001994	D063702	SOIL
W15/001995	D063703	SOIL
W15/001996	D063704	SOIL
W15/001997	D063705	SOIL

Lab Reg No.		W15/001994	W15/001995	W15/001996	W15/001997	
Sample Reference	Units	D063702	D063703	D063704	D063705	Method
Inorganics						
Soil Reaction Rating		XXX	XXX	XXX	XX	WL281-23BF
pH fox		1.9	2.0	2.1	2.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/001998	D063706	SOIL
W15/001999	D063707	SOIL
W15/002000	D063708	SOIL
W15/002001	D063709	SOIL

Lab Reg No.		W15/001998	W15/001999	W15/002000	W15/002001	
Sample Reference	Units	D063706	D063707	D063708	D063709	Method
Inorganics						
Soil Reaction Rating		XX	XX	XX	XX	WL281-23BF
pH fox		4.0	2.3	3.0	3.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002002	D063710	SOIL
W15/002003	D063711	SOIL
W15/002004	D063712	SOIL
W15/002005	D063713	SOIL

Lab Reg No.		W15/002002	W15/002003	W15/002004	W15/002005	
Sample Reference	Units	D063710	D063711	D063712	D063713	Method
Inorganics						
Soil Reaction Rating		X	XX	XX	XX	WL281-23BF
pH fox		5.2	4.4	4.8	4.1	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002006	D063714	SOIL
W15/002007	D063715	SOIL
W15/002008	D063716	SOIL
W15/002009	D063717	SOIL

Lab Reg No.	Units	W15/002006	W15/002007	W15/002008	W15/002009	Method
Sample Reference		D063714	D063715	D063716	D063717	
Inorganics						
Soil Reaction Rating		XX	XX	XX	X	WL281-23BF
pH fox		3.6	4.2	4.3	4.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002010	D063718	SOIL
W15/002011	D063719	SOIL
W15/002012	D063720	SOIL
W15/002013	D063721	SOIL

Lab Reg No.		W15/002010	W15/002011	W15/002012	W15/002013	
Sample Reference	Units	D063718	D063719	D063720	D063721	Method
Inorganics						
Soil Reaction Rating		X	X	XXXX	XXXX	WL281-23BF
pH fox		4.5	4.3	5.6	6.1	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002014	D063722	SOIL
W15/002015	D063723	SOIL
W15/002016	D063724	SOIL
W15/002017	D063725	SOIL

Lab Reg No.		W15/002014	W15/002015	W15/002016	W15/002017	
Sample Reference	Units	D063722	D063723	D063724	D063725	Method
Inorganics						
Soil Reaction Rating		XXXX	XXX	XX	XXX	WL281-23BF
pH fox		6.2	5.9	4.0	3.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002018	D063726	SOIL
W15/002019	D063727	SOIL
W15/002020	D063728	SOIL
W15/002021	D063729	SOIL

Lab Reg No.		W15/002018	W15/002019	W15/002020	W15/002021	
Sample Reference	Units	D063726	D063727	D063728	D063729	Method
Inorganics						
Soil Reaction Rating		XXXX	X	X	XX	WL281-23BF
pH fox		2.9	3.5	3.5	3.5	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002022	D063730	SOIL
W15/002023	D063731	SOIL
W15/002024	D063732	SOIL
W15/002025	D063733	SOIL

Lab Reg No.		W15/002022	W15/002023	W15/002024	W15/002025	
Sample Reference	Units	D063730	D063731	D063732	D063733	Method
Inorganics						
Soil Reaction Rating		XXX	XX	XXX	XXXX	WL281-23BF
pH fox		2.0	3.6	1.8	1.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150130 : QT-02002 : 3100949724 : : 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002026	D063734	SOIL
W15/002027	D063735	SOIL
W15/002028	D063736	SOIL
W15/002029	D063737	SOIL

Lab Reg No.		W15/002026	W15/002027	W15/002028	W15/002029	
Sample Reference	Units	D063734	D063735	D063736	D063737	Method
Inorganics						
Soil Reaction Rating		XXXX	XXX	XXXX	XXX	WL281-23BF
pH fox		2.2	2.6	4.0	4.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002030	D063738	SOIL
W15/002031	D063739	SOIL
W15/002032	D063740	SOIL
W15/002033	D063741	SOIL

Lab Reg No.		W15/002030	W15/002031	W15/002032	W15/002033	
Sample Reference	Units	D063738	D063739	D063740	D063741	Method
Inorganics						
Soil Reaction Rating		XXX	XXX	XXX	XXXX	WL281-23BF
pH fox		6.0	3.6	2.5	2.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002034	D063742	SOIL
W15/002035	D063743	SOIL
W15/002036	D063744	SOIL
W15/002037	D063745	SOIL

Lab Reg No.	Units	W15/002034	W15/002035	W15/002036	W15/002037	Method
Sample Reference		D063742	D063743	D063744	D063745	
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXXX	XXXX	WL281-23BF
pH fox		2.0	1.5	1.6	2.7	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002039	D063747	SOIL
W15/002038	D063746	SOIL
W15/002040	D063748	SOIL
W15/002041	D063749	SOIL

Lab Reg No.		W15/002039	W15/002038	W15/002040	W15/002041	
Sample Reference	Units	D063747	D063746	D063748	D063749	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XXXX	XX	WL281-23BF
pH fox		2.1	1.7	1.9	2.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002042	D063750	SOIL
W15/002043	D063751	SOIL
W15/002044	D063752	SOIL
W15/002045	D063753	SOIL

Lab Reg No.		W15/002042	W15/002043	W15/002044	W15/002045	
Sample Reference	Units	D063750	D063751	D063752	D063753	Method
Inorganics						
Soil Reaction Rating		XXXX	XXXX	XX	X	WL281-23BF
pH fox		1.9	6.2	2.7	3.9	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002046	D063754	SOIL
W15/002047	D063755	SOIL
W15/002048	D063756	SOIL
W15/002049	D063757	SOIL

Lab Reg No.		W15/002046	W15/002047	W15/002048	W15/002049	
Sample Reference	Units	D063754	D063755	D063756	D063757	Method
Inorganics						
Soil Reaction Rating		XX	X	X	XXX	WL281-23BF
pH fox		4.0	5.2	5.2	4.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002050	D063758	SOIL
W15/002051	D063759	SOIL
W15/002052	D063760	SOIL
W15/002053	D063761	SOIL

Lab Reg No.		W15/002050	W15/002051	W15/002052	W15/002053	
Sample Reference	Units	D063758	D063759	D063760	D063761	Method
Inorganics						
Soil Reaction Rating		XX	X	XXX	X	WL281-23BF
pH fox		2.3	3.7	1.7	3.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002054	D063762	SOIL
W15/002055	D063763	SOIL
W15/002056	D063764	SOIL
W15/002057	D063765	SOIL

Lab Reg No.		W15/002054	W15/002055	W15/002056	W15/002057	
Sample Reference	Units	D063762	D063763	D063764	D063765	Method
Inorganics						
Soil Reaction Rating		X	XX	X	X	WL281-23BF
pH fox		3.8	2.8	3.7	3.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002058	D063766	SOIL
W15/002059	D063767	SOIL
W15/002060	D063768	SOIL
W15/002061	D063769	SOIL

Lab Reg No.		W15/002058	W15/002059	W15/002060	W15/002061	
Sample Reference	Units	D063766	D063767	D063768	D063769	Method
Inorganics						
Soil Reaction Rating		X	X	XX	XX	WL281-23BF
pH fox		3.1	3.2	2.3	2.6	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

Client	:	DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	:	DORA04_W/150130
			Quote No.	:	QT-02002
			Order No.	:	3100949724
			Date Sampled	:	
			Date Received	:	30-JAN-2015
Attention	:	ROB OLIVER	Sampled By	:	CLIENT
Project Name	:				
Your Client Services Manager	:	DAVID LYNCH	Phone	:	(08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002062	D063770	SOIL
W15/002063	D063771	SOIL
W15/002064	D063772	SOIL
W15/002065	D063773	SOIL

Lab Reg No.		W15/002062	W15/002063	W15/002064	W15/002065	
Sample Reference	Units	D063770	D063771	D063772	D063773	Method
Inorganics						
Soil Reaction Rating		X	X	XX	X	WL281-23BF
pH fox		3.9	3.3	4.0	4.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Order No.	: 3100949724
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Lab Reg No.	Sample Ref	Sample Description
W15/002066	D063774	SOIL
W15/002067	D063775	SOIL
W15/002068	D063776	SOIL
W15/002069	D063777	SOIL

Lab Reg No.		W15/002066	W15/002067	W15/002068	W15/002069	
Sample Reference	Units	D063774	D063775	D063776	D063777	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		3.9	4.3	3.6	3.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
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Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002070	D063778	SOIL
W15/002071	D063779	SOIL
W15/002072	D063780	SOIL
W15/002073	D063781	SOIL

Lab Reg No.		W15/002070	W15/002071	W15/002072	W15/002073	
Sample Reference	Units	D063778	D063779	D063780	D063781	Method
Inorganics						
Soil Reaction Rating		XX	X	X	X	WL281-23BF
pH fox		2.3	3.5	3.9	4.3	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
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Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002074	D063782	SOIL
W15/002075	D063783	SOIL
W15/002076	D063784	SOIL
W15/002077	D063785	SOIL

Lab Reg No.		W15/002074	W15/002075	W15/002076	W15/002077	
Sample Reference	Units	D063782	D063783	D063784	D063785	Method
Inorganics						
Soil Reaction Rating		X	XX	X	X	WL281-23BF
pH fox		5.4	3.3	5.2	4.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

REPORT OF ANALYSIS

Report No. RN1055694

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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002078	D063786	SOIL
W15/002079	D063787	SOIL
W15/002080	D063788	SOIL
W15/002081	D063789	SOIL

Lab Reg No.		W15/002078	W15/002079	W15/002080	W15/002081	
Sample Reference	Units	D063786	D063787	D063788	D063789	Method
Inorganics						
Soil Reaction Rating		X	XXXX	X	X	WL281-23BF
pH fox		4.2	2.4	3.8	4.4	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002082	D063790	SOIL
W15/002083	D063791	SOIL
W15/002084	D063792	SOIL
W15/002085	D063793	SOIL

Lab Reg No.		W15/002082	W15/002083	W15/002084	W15/002085	
Sample Reference	Units	D063790	D063791	D063792	D063793	Method
Inorganics						
Soil Reaction Rating		X	X	X	X	WL281-23BF
pH fox		4.7	5.3	5.1	4.0	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002086	D063794	SOIL
W15/002087	D063795	SOIL
W15/002088	D063796	SOIL
W15/002089	D063797	SOIL

Lab Reg No.		W15/002086	W15/002087	W15/002088	W15/002089	
Sample Reference	Units	D063794	D063795	D063796	D063797	Method
Inorganics						
Soil Reaction Rating		X	X	X	XX	WL281-23BF
pH fox		4.2	3.4	4.2	4.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

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		Quote No.	: QT-02002
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Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002090	D063798	SOIL
W15/002091	D063799	SOIL
W15/002092	D063800	SOIL
W15/002093	D063801	SOIL

Lab Reg No.		W15/002090	W15/002091	W15/002092	W15/002093	
Sample Reference	Units	D063798	D063799	D063800	D063801	Method
Inorganics						
Soil Reaction Rating		XX	X	X	X	WL281-23BF
pH fox		5.0	4.5	4.6	4.8	WL281-23BF

David Lynch, Section Manager
Inorganics - WA

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REPORT OF ANALYSIS

Report No. RN1055694

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150130
		Quote No.	: QT-02002
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 30-JAN-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/002094	D063802	SOIL
W15/002095	D063803	SOIL

Lab Reg No.		W15/002094	W15/002095			
Sample Reference	Units	D063802	D063803			Method
Inorganics						
Soil Reaction Rating		X	XX			WL281-23BF
pH fox		4.7	4.7			WL281-23BF

David Lynch, Section Manager
Inorganics - WA

18-FEB-2015

Unless notified to the contrary, the above samples will be disposed of one month from the reporting date.

All results are reported on 'as received' basis.

Results relate only to the sample(s) tested.
This Report shall not be reproduced except in full.

Australian Government
National Measurement Institute

REPORT OF ANALYSIS

Report No. RN1063921

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No.	: DORA04_W/150327_1
		Quote No.	: QT-01976
		Order No.	: 3100949724
		Date Sampled	:
		Date Received	: 27-MAR-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/005799	D063508	YA_PASS_3 SOIL
W15/005800	D063509	YA_PASS_3 SOIL
W15/005801	D063510	YA_PASS_3 SOIL
W15/005802	D063516	YA_PASS_4 SOIL

Lab Reg No.		W15/005799	W15/005800	W15/005801	W15/005802	
Sample Reference	Units	D063508	D063509	D063510	D063516	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		4.8	5.5	5.3	6.1	WL281-23A
Scr	%	0.96	0.34	0.17	0.01	WL281-22B
TAA	molH per t	9	7	7	4	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

W15/005799
to W15/005873

Acid sulfate soil analyses were determined on the samples after they were dried and ground in a ring mill (i.e. reported on a dry weight basis).

David Lynch, Section Manager
Inorganics - WA
Accreditation No. 2474

22-APR-2015

REPORT OF ANALYSIS

Report No. RN1063921

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Lab Reg No.	Sample Ref	Sample Description
W15/005803	D063517	YA_PASS_4 SOIL
W15/005804	D063518	YA_PASS_4 SOIL
W15/005805	D063519	YA_PASS_4 SOIL
W15/005806	D063520	YA_PASS_4 SOIL

Lab Reg No.		W15/005803	W15/005804	W15/005805	W15/005806	
Sample Reference	Units	D063517	D063518	D063519	D063520	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		6.2	5.5	6.2	5.6	WL281-23A
Scr	%	0.03	0.25	0.10	0.05	WL281-22B
TAA	molH per t	2	5	3	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

David Lynch, Section Manager
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22-APR-2015

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Lab Reg No.	Sample Ref	Sample Description
W15/005807	D063521	YA_PASS_4 SOIL
W15/005808	D063522	YA_PASS_4 SOIL
W15/005809	D063568	YA_PASS_15 SOIL
W15/005810	D063569	YA_PASS_15 SOIL

Lab Reg No.		W15/005807	W15/005808	W15/005809	W15/005810	
Sample Reference	Units	D063521	D063522	D063568	D063569	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		6.0	5.6	5.7	5.5	WL281-23A
Scr	%	0.06	0.03	<0.01	0.06	WL281-22B
TAA	molH per t	4	4	4	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

David Lynch, Section Manager
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Lab Reg No.	Sample Ref	Sample Description
W15/005811	D063570	YA_PASS_15 SOIL
W15/005812	D063571	YA_PASS_15 SOIL
W15/005813	D063572	YA_PASS_15 SOIL
W15/005814	D063573	YA_PASS_15 SOIL

Lab Reg No.		W15/005811	W15/005812	W15/005813	W15/005814	
Sample Reference	Units	D063570	D063571	D063572	D063573	Method
Inorganics						
ANC bt as $CaCO_3$	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.8	5.9	6.1	6.0	WL281-23A
Scr	%	0.08	0.03	<0.01	<0.01	WL281-22B
TAA	molH per t	3	5	3	4	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005815	D063574	YA_PASS_15 SOIL
W15/005816	D063575	YA_PASS_15 SOIL
W15/005817	D063576	YA_PASS_15 SOIL
W15/005818	D063577	YA_PASS_15 SOIL

Lab Reg No.		W15/005815	W15/005816	W15/005817	W15/005818	
Sample Reference	Units	D063574	D063575	D063576	D063577	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		6.3	6.7	5.5	5.3	WL281-23A
Scr	%	0.01	0.02	0.22	0.31	WL281-22B
TAA	molH per t	2	< 1	3	4	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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	PICTON WA 6229	Order No.	: 3100949724
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Lab Reg No.	Sample Ref	Sample Description
W15/005819	D063578	YA_PASS_15 SOIL
W15/005820	D063579	YA_PASS_16 SOIL
W15/005821	D063580	YA_PASS_16 SOIL
W15/005822	D063581	YA_PASS_16 SOIL

Lab Reg No.		W15/005819	W15/005820	W15/005821	W15/005822	
Sample Reference	Units	D063578	D063579	D063580	D063581	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.8	5.7	5.2	6.0	WL281-23A
Scr	%	0.22	0.04	0.16	0.08	WL281-22B
TAA	molH per t	3	5	4	3	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005823	D063582	YA_PASS_16 SOIL
W15/005824	D063583	YA_PASS_16 SOIL
W15/005825	D063587	YA_PASS_16 SOIL
W15/005826	D063588	YA_PASS_16 SOIL

Lab Reg No.		W15/005823	W15/005824	W15/005825	W15/005826	
Sample Reference	Units	D063582	D063583	D063587	D063588	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.9	5.9	5.3	4.7	WL281-23A
Scr	%	0.02	0.02	0.05	0.70	WL281-22B
TAA	molH per t	5	3	4	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005827	D063589	YA_PASS_16 SOIL
W15/005828	D063590	YA_PASS_16 SOIL
W15/005829	D063591	YA_PASS_16 SOIL
W15/005830	D063601	YA_PASS_14 SOIL

Lab Reg No.		W15/005827	W15/005828	W15/005829	W15/005830	
Sample Reference	Units	D063589	D063590	D063591	D063601	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		4.1	4.9	5.1	5.6	WL281-23A
Scr	%	2.5	2.2	1.1	0.04	WL281-22B
TAA	molH per t	22	7	4	3	WL281-23F
Trace Elements						
S hcl	%	0.13	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	0.14	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	< 0.01	Not Tested	Not Tested	Not Tested	WL281-20J

David Lynch, Section Manager
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22-APR-2015

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Lab Reg No.	Sample Ref	Sample Description
W15/005831	D063602	YA_PASS_14 SOIL
W15/005832	D063603	YA_PASS_14 SOIL
W15/005833	D063604	YA_PASS_14 SOIL
W15/005834	D063605	YA_PASS_14 SOIL

Lab Reg No.		W15/005831	W15/005832	W15/005833	W15/005834	
Sample Reference	Units	D063602	D063603	D063604	D063605	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.4	6.1	6.4	5.9	WL281-23A
Scr	%	0.02	0.04	0.09	0.15	WL281-22B
TAA	molH per t	3	3	< 1	3	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

David Lynch, Section Manager
Inorganics - WA
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Lab Reg No.	Sample Ref	Sample Description
W15/005835	D063724	YA_PASS_28 SOIL
W15/005836	D063725	YA_PASS_28 SOIL
W15/005837	D063726	YA_PASS_28 SOIL
W15/005838	D063727	YA_PASS_29 SOIL

Lab Reg No.		W15/005835	W15/005836	W15/005837	W15/005838	
Sample Reference	Units	D063724	D063725	D063726	D063727	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.9	4.4	4.6	5.3	WL281-23A
Scr	%	0.02	< 0.01	0.09	< 0.01	WL281-22B
TAA	molH per t	3	10	7	4	WL281-23F
Trace Elements						
S hcl	%	Not Tested	< 0.01	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	< 0.01	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	< 0.01	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005839	D063728	YA_PASS_29 SOIL
W15/005840	D063729	YA_PASS_29 SOIL
W15/005841	D063730	YA_PASS_29 SOIL
W15/005842	D063731	YA_PASS_29 SOIL

Lab Reg No.		W15/005839	W15/005840	W15/005841	W15/005842	
Sample Reference	Units	D063728	D063729	D063730	D063731	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		6.7	5.8	5.9	6.1	WL281-23A
Scr	%	< 0.01	0.02	0.05	0.02	WL281-22B
TAA	molH per t	< 1	6	4	3	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005843	D063732	YA_PASS_29 SOIL
W15/005844	D063733	YA_PASS_29 SOIL
W15/005845	D063734	YA_PASS_29 SOIL
W15/005846	D063735	YA_PASS_29 SOIL

Lab Reg No.		W15/005843	W15/005844	W15/005845	W15/005846	
Sample Reference	Units	D063732	D063733	D063734	D063735	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.3	4.6	4.7	5.9	WL281-23A
Scr	%	0.09	0.86	0.19	0.03	WL281-22B
TAA	molH per t	6	12	7	4	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005847	D063736	YA_PASS_30 SOIL
W15/005848	D063737	YA_PASS_30 SOIL
W15/005849	D063739	YA_PASS_30 SOIL
W15/005850	D063740	YA_PASS_30 SOIL

Lab Reg No.		W15/005847	W15/005848	W15/005849	W15/005850	
Sample Reference	Units	D063736	D063737	D063739	D063740	Method
Inorganics						
ANC bt as CaCO3	%	0.43	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		6.6	6.0	5.8	5.7	WL281-23A
Scr	%	0.03	0.03	0.04	0.03	WL281-22B
TAA	molH per t	< 1	3	4	3	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005851	D063741	YA_PASS_30 SOIL
W15/005852	D063742	YA_PASS_30 SOIL
W15/005853	D063743	YA_PASS_30 SOIL
W15/005854	D063744	YA_PASS_30 SOIL

Lab Reg No.		W15/005851	W15/005852	W15/005853	W15/005854	
Sample Reference	Units	D063741	D063742	D063743	D063744	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		4.8	4.5	5.0	5.0	WL281-23A
Scr	%	0.22	1.2	0.26	0.29	WL281-22B
TAA	molH per t	5	11	5	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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REPORT OF ANALYSIS

Report No. RN1063921

Client	: DORAL MINERAL SANDS PTY LTD LOT 7 HARRIS ROAD PICTON WA 6229	Job No. Quote No. Order No. Date Sampled Date Received	: DORA04_W/150327_1 : QT-01976 : 3100949724 : : 27-MAR-2015
Attention	: ROB OLIVER	Sampled By	: CLIENT
Project Name :			
Your Client Services Manager	: DAVID LYNCH	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W15/005855	D063745	YA_PASS_31 SOIL
W15/005856	D063746	YA_PASS_31 SOIL
W15/005857	D063747	YA_PASS_31 SOIL
W15/005858	D063748	YA_PASS_31 SOIL

Lab Reg No.		W15/005855	W15/005856	W15/005857	W15/005858	
Sample Reference	Units	D063745	D063746	D063747	D063748	Method
Inorganics						
ANC bt as CaCO3	%	0.29	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		7.0	5.1	5.0	4.8	WL281-23A
Scr	%	0.08	0.43	0.44	0.45	WL281-22B
TAA	molH per t	< 1	4	6	6	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

David Lynch, Section Manager
Inorganics - WA
Accreditation No. 2474

22-APR-2015

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Lab Reg No.	Sample Ref	Sample Description
W15/005859	D063749	YA_PASS_31 SOIL
W15/005860	D063750	YA_PASS_31 SOIL
W15/005861	D063752	YA_PASS_31 SOIL
W15/005862	D063758	YA_PASS_1 SOIL

Lab Reg No.		W15/005859	W15/005860	W15/005861	W15/005862	
Sample Reference	Units	D063749	D063750	D063752	D063758	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.5	4.9	5.1	5.4	WL281-23A
Scr	%	0.05	0.04	0.02	0.07	WL281-22B
TAA	molH per t	5	7	5	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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	LOT 7 HARRIS ROAD	Quote No.	: QT-01976
	PICTON WA 6229	Order No.	: 3100949724
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Lab Reg No.	Sample Ref	Sample Description
W15/005863	D063759	YA_PASS_1 SOIL
W15/005864	D063760	YA_PASS_1 SOIL
W15/005865	D063761	YA_PASS_2 SOIL
W15/005866	D063762	YA_PASS_2 SOIL

Lab Reg No.		W15/005863	W15/005864	W15/005865	W15/005866	
Sample Reference	Units	D063759	D063760	D063761	D063762	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.7	5.2	5.1	5.0	WL281-23A
Scr	%	0.01	0.08	<0.01	0.01	WL281-22B
TAA	molH per t	5	5	5	5	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005867	D063763	YA_PASS_2 SOIL
W15/005868	D063764	YA_PASS_2 SOIL
W15/005869	D063765	YA_PASS_2 SOIL
W15/005870	D063766	YA_PASS_2 SOIL

Lab Reg No.		W15/005867	W15/005868	W15/005869	W15/005870	
Sample Reference	Units	D063763	D063764	D063765	D063766	Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-19A2
pH kcl		5.4	5.4	5.7	6.8	WL281-23A
Scr	%	0.01	< 0.01	< 0.01	0.01	WL281-22B
TAA	molH per t	4	4	4	< 1	WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested	Not Tested	WL281-20J

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Lab Reg No.	Sample Ref	Sample Description
W15/005871	D063767	YA_PASS_2 SOIL
W15/005872	D063768	YA_PASS_2 SOIL
W15/005873	D063769	YA_PASS_2 SOIL

Lab Reg No.		W15/005871	W15/005872	W15/005873		
Sample Reference	Units	D063767	D063768	D063769		Method
Inorganics						
ANC bt as CaCO3	%	Not Tested	Not Tested	Not Tested		WL281-19A2
pH kcl		6.1	6.5	5.5		WL281-23A
Scr	%	< 0.01	< 0.01	< 0.01		WL281-22B
TAA	molH per t	3	< 1	3		WL281-23F
Trace Elements						
S hcl	%	Not Tested	Not Tested	Not Tested		WL281-20B
S kcl	%	Not Tested	Not Tested	Not Tested		WL281-23C
S nas (Calc)	%	Not Tested	Not Tested	Not Tested		WL281-20J

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22-APR-2015

Unless notified to the contrary, the above samples will be disposed of one month from the reporting date.

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

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