CRISTAL PIGMENTS AUSTRALIA PTY LTD

HYDROGEOLOGICAL INVESTIGATION

FOR

PROPOSED RESIDUE DISPOSAL AREA PANIZZA ROAD DARDANUP

CONSULTING ENGINEERS
WML CONSULTANTS

Document History and Status

Revision	Reviewed By	Date Issued	Purpose of Issue
A	Paul Foley	29/08/14	Draft for client comment

Distribution Record

Revision	Date Issued	Quantity	Issued To
A	29/08/14	1	Cristal Pigments Australia

Prepared by:	Peter DiDonna
WML Project No.:	5193
Document Name:	J:\JOBS\5193 Proposed New Millennium Cell at Dardanup\5193_3 Hydrogeological Assessment\Engineering\Reporting\5193-G-R-001-A.docx

EXECUTIVE SUMMARY

Cristal Pigments Australia Ltd (Cristal) proposes to construct a residue disposal facility (RDA), on their site at Panizza Road, some 4 km to the southeast of the town of Dardanup. It is proposed to accept approximately 5 million m^3 of waste over the next thirty years, from their titanium dioxide processing plants at Australind and Kemerton.

As part of the works application approval process to construct the facility, a hydrogeological assessment of the site has been carried out, following the Victorian EPA Best Practice Environmental Management Guidelines for Siting, Design, Operation and Rehabilitation of Landfills, known as the BPEM guidelines. For the purposes of waste classification, the DER has classified the waste as a Solid Waste under Schedule 1 of the Environmental Protection regulations 1987.

WML Consultants Pty Ltd (WML) was engaged by Cristal to undertake the hydrogeological assessment of the site, which comprised:

- A desk study to determine the site geology and hydrogeology;
- A review of previous drilling undertaken by both Cristal and Cristal Mining Australia Ltd (Cristal Mining);
- Additional ground investigation using both machine-excavated test pits and borehole drilling;
- Installation of a network of groundwater monitoring bores across the site to allow monitoring of both the superficial and Leederville aquifers;
- Insitu permeability testing;
- Laboratory testing to determine selected geotechnical and chemical properties of the soils and groundwater onsite;
- An assessment of the hydrogeological risk to the regional groundwater, and
- Engineering control measures to be incorporated into the design of the facility to reduce the risk of contaminant migration.

In the lower, western part of the site, where the initial residue cells are proposed to be constructed, the geology mainly comprises clayey sands of the Yoganup Formation to around 20 to 30 m depth, underlain by the Leederville formation. In the higher, eastern part of the site, above 80 mAHD, the Leederville formation outcrops, in particular, the uppermost Quindalup member. This consists of mostly marine and estuarine sandy clays, locally carbonaceous clays with minor lignite and extends to around 50 m depth. Holocene-aged windblown sand is present across the western (lower) half the site but its thickness is generally limited to around 1m.

Extensive mineral drilling has been out across the site, by Cristal Mining, to determine the heavy mineral sand reserve in the upper 20 m of the soil profile. Based on the findings of the 100 boreholes, the Yoganup Formation onsite has a high clay content, around 30%, with more permeable sand layers. Groundwater recharge through this clayey sand is therefore low, with movement strongly horizontal, through sand layers.

Groundwater drilling by Cristal, carried out as part of a baseline groundwater quality assessment, encountered groundwater in a sandy layer at 41m depth, the base of the Quindalup member. The general direction of groundwater flow is to the northwest, with an estimated through-flow beneath the site of the order of 350 m^3/day.

Seasonally perched groundwater was also encountered in the Yoganup formation, fed by a paleo channel that runs through the middle of the site and trends to the northwest. This results in seasonally artesian groundwater in the north western corner of the site, just

below the superficial laterite layer. In contrast, no groundwater is present within the Yoganup formation in the southern part of the site.

Insitu permeability testing of the Yoganup formation has revealed a permeability of the order of 10^{-8} m/s, in agreement with the 30% fines content of the soils, with locally higher permeability, 10^{-6} m/s, in more sandy zones. The underlying Quindalup member is expected to have similar permeabilities. As both soil units are strongly stratified with clayey seams, this insitu permeability reflects horizontal flow. For vertical flow, the permeability is expected to be one order of magnitude lower.

Groundwater quality in the seasonally perched superficial aquifer is generally good, apart from slightly elevated nitrate and phosphates, reflecting the previous agricultural use of the site. Groundwater quality in the water bearing sand layer of the Leederville formation at 41m depth is generally good, apart from marginal conductivity, 700 µS/cm, approaching the threshold of potability for drinking water.

Testing of the cation exchange capacity (CEC) has been carried out on soils from both the Yoganup formation and the underlying Leederville formation, as a guide to heavy metal capture. Insitu materials averaged a CEC of between 1.75-2.45 mEq/100g, which is typical for kaolin based clay/silt derived from the granites of the Darling Range.

In terms of hydrogeological risk, the site has been assessed with respect to the specific soil and groundwater targets provided in the BPEM guidelines. These are:

- the permeability of the underlying soils have a permissible maximum of $1x10^{-9}$ m/s, measured over a depth of 2 m,
- the cation exchange capacity of the soils to capture contaminants, be a minimum of 10 mEq/100g for a 2 m thick clay layer,
- the depth to groundwater is at least 2m below the floor of the cell.

Based on the hydrogeological investigation work carried out at the Panizza Road site, the near surface soils onsite do not meet the above criteria if **an unlined** residue disposal cell was constructed from site won soils. Additional engineering controls are therefore required for the proposed RDA construction, in order to reduce the hydrogeological risk. The proposed engineering controls are summarised as follows:

i) The use of a composite liner (GCL/HDPE) for both the residue storage area and the leachate pond, to significantly reduce seepage.

ii) Extensive stormwater drainage works to divert surface water runoff from the higher ground to the east, to control water levels in the superficial aquifer.

iii) Incorporating a compacted clay key trench into the design of the perimeter bunds on the uphill side of the cells, to further prevent recharge of the superficial aquifer

iv) Installation of a network of groundwater collection pipes beneath the base of the composite liner within the RDA, with the potential to divert seepage to the leachate pond, in the unlikely event of leakage being detected.

v) Leachate to be collected from both the surface of the impoundment and via base drainage, for return to Cristal's plant at Australind, for seawater disposal. In the longer term, however, enhanced evaporation and optimised surface area for drying may negate the need for return of leachate and seawater disposal.

Following the above engineering controls, the impact of the RDA has been reassessed, with a target of achieving less than 1% change in background groundwater quality for the Leederville formation. The assessment was based on the movement of chlorides, with the following aquifer characteristics:

- Conductivity 700 µS/cm
- Hydraulic gradient 0.005 (0.5%)
- Hydraulic conductivity 4.5 m/day
- Estimated groundwater through-flow 350 m^3/day, beneath the RDA area.
- "Average" level of QA for liner installation with defects limited to one hole per hectare of 50 mm^2 in area
- Average head of 0.3 m across the entire floor of the cell.

Based on the above, the estimated leakage rate through the base of the composite liner is 10 L/ha/day of a 2000 µS/cm solution containing chlorides, which results in less than 0.6% increase in the chloride level in the underlying Leederville i.e. imperceptible. This is considered acceptable from a hydrogeological perspective.

A search of the Department of Water groundwater bore database revealed that the nearest groundwater abstraction bores to the site are located 500 m away to the north and hydraulically up-gradient. These bores are not considered to be at risk from the proposed development.

TABLE OF CONTENTS

1. INTRODUCTION

Cristal Pigments Australia Ltd (Cristal) proposes to construct a residue disposal facility, some 4 km to the southeast of the town of Dardanup.

As part of the works application approval process, a hydrogeological assessment of the site was required by the Department of Environment Regulation (DER). The hydrogeological assessment forms part of the requirements of the Victorian EPA Best Practice Environmental Management Guidelines for Siting, Design, Operation and Rehabilitation of Landfills, known as the BPEM guidelines. All landfill sites in Western Australia must now comply with the BPEM guidelines.

WML Consultants Pty Ltd (WML) was engaged by Cristal to undertake a hydrogeological assessment of the site, which comprised:

- A desk study to determine the site history, geology and hydrogeology;
- A ground investigation using machine-excavated test pits and borehole drilling;
- Installation of 10 groundwater monitoring bores around the site boundary to allow monitoring of groundwater,
- Insitu and laboratory permeability testing and;
- Laboratory testing to determine selected geotechnical and chemical properties of the soils and groundwater onsite.

This report presents the findings of the investigation, an assessment of the hydrogeological risk to the regional groundwater and recommendations for residue storage liner design and operation to reduce the risk of contaminant migration.

2. SITE SETTING

2.1 Site Location

The site, covering an area of approximately 67 ha., is located 4 km southeast of the township of Dardanup. The proposed residue cells will initially be constructed adjacent to the lower, western boundary of the site before moving up the hill, to the east, with time.

The site location is shown in Drawing No. 5193-G-001 with a conceptual site layout of the cells is shown in Drawing No. 5193-G-100.

2.2 Surrounding Land Use

The site is bordered on the eastern site boundary by the northern extent of the Boyanup State Forest. To the north of the site is grazing land, to the south, the landfill site operated by the Shire of Dardanup and to the west, the Shire-owned laterite gravel pit. The nearest residential properties are located some 2 km to the west of the site and 1.2 km to the northeast.

An aerial photograph of the site is presented is Figure 1 below:

Figure 1. Site Location (Image courtesy Google Earth)

2.3 Topography

The site is located on the western slope of the Whicher Scarp, with the ground surface falling from 100 mAHD along the eastern site boundary to 58 mAHD in the north-western corner of the site. The Whicher Range forms a low, curving scarp between the southern end of the Darling Scarp and the Leeuwin-Naturaliste Ridge.

The foot of the scarp is an old shoreline and abuts the low-lying Pinjarra Plain. A number of ephemeral or semi-permanent streams form the headwaters of the Preston and Ferguson rivers, which generally flow to the northwest, discharging into Leschenault Inlet, at Bunbury.

The western half of the site comprises a gently sloping landscape with the general ground surface falling to the northwest at approximately 3%.

The higher, eastern half, of the site comprises two moderately sloping north west trending spurs, bisected by drainage gulleys, with the ground surface falling at around 6 to 7% to the northwest and slightly steeper into the gulleys. The outfall areas of these gulleys experience seasonal water logging

Several farm water supply dams are present onsite, constructed for stock watering. The ground surface has also been altered locally following extraction of laterite gravel.

2.4 Geology

Based on the 1:50,000 scale Geological Survey of Western Australia map sheet “Bunbury-Burekup”, the surface geology mainly comprises Pleistocene-aged clayey sands of the Yoganup Formation, deposited against the Whicher Scarp. The Yoganup Formation reaches a maximum elevation of around 80 mAHD, coinciding with the change in topography. The higher (eastern) parts of the site are Mesozoic sediments of the Leederville Formation, which form the Whicher Scarp.

The Leederville formation comprises interbedded sand and clays, tending with depth to shale and cemented sand. The formation has recently been subdivided into 6 distinct members, with a combined thickness of approximately 250 m and sits on the Yarragadee formation.

At outcrop on higher ground, a weathering profile has developed and comprises a residual ferruginous duricrust overlying pallid clay and sand of variable thickness. The slopes typically comprise gravelly colluvial deposits, while valleys consist of a thin, sandy

alluvial cover. In many places, a ferruginous hardpan has also developed in drainage depressions.

The Yoganup Formation comprises a succession of sandy clay and clayey sands with minor amounts of moderately sorted sand to approximately 30 m depth. The sand contains a zone of heavy mineral concentration in the upper 10 to 15 m, caused by wave action on the ancient shoreline. The Formation is interspersed with iron-cemented ferricrete or laterised beds, which occur over broad areas. The occurrence of iron-cementation is typically associated with historical water tables and preferred groundwater flow paths.

From mineral drilling carried out by Cristal Mining, the Yoganup Formation is known to have a high clay content and as such affects preferential groundwater flow and groundwater recharge. Permeabilities are typically of the order of 10^{-8} m/s but vary widely, depending on clay content. In general, the clay content is around 30%, which dominates the permeability. Water movement and groundwater recharge through this clayey sand is therefore low and movement strongly controlled by more permeable sand layers.

Holocene-aged windblown sand is present across the western (lower) half the site but its thickness is generally limited to around 1 m.

Approximately 1 km to the west of the site are brown and grey mottled clays and sandy clays of the Guilford Formation.

2.5 Hydrogeology

The hydrogeology of the general area has been studied previously by WML and others, as part of a regional waste disposal area. There are two regional aquifer systems in the general area; a superficial aquifer and the Leederville aquifer. Due to the presence of clayey beds, there is limited interconnection between the two aquifers and for most part, the Leederville aquifer is confined.

a) Superficial

The Superficial formations in this area consist of Yoganup Formation sands and sandy lenses within the Guildford formation further to the west. Bore yields are low, particularly from the Guildford formation, and water quality is marginal to brackish (500–2000 mg/L TDS) [1].

A seasonally perched groundwater system occurs within the Holocene-aged surficial sands and generally flowing in a westerly direction, following the natural fall of the ground. This perched groundwater ponds on the underlying clayey sand of the Yoganup Formation. In summer, the perched groundwater often disappears completely.

b) Leederville

The Leederville aquifer is a major, multi-layered sedimentary sequence which continues a further 2 km to the east, to the Darling Fault and westwards for 10 km, to near the coast. The aquifer is made up of six distinct members; Quindalup, Upper Mowen, Lower Mowen, Upper Vasse, Lower Vasse and Yelverton members. It is extremely heterogeneous in nature with poor lateral continuity of individual beds.

The Quindalup member consists of mostly marine and estuarine sandy clays locally carbonaceous clays with minor lignite. Its thickness varies, nominally 30 to 50 m thick but due to subsequent erosion since deposition, it thins beneath the Swan Coastal Plain. The Quindalup member is generally considered an aquitard.

At the base of the member is a thin, unconsolidated sand aquifer, less than 10 m thick.

[1] *Bunbury and South West Coastal groundwater areas subarea reference sheets*, Department of Water, May 2009

The Upper Mowen and Lower Mowen members comprise organic clays interbedded with sand and forms a leaky aquitard. The typical thickness is from 20 to 40 m.

The Upper Vasse member is considered to be the most prospective aquifer within the Leederville formation, comprising numerous sand beds of up to 5 m in thickness with thin discontinuous clay beds between. The member is typically up to 25 m thick and has been reported by the water well drilling contractors to occur at around 100 m depth in the area.

The Lower Vasse and Yelverton members form the deepest aquifer systems, with a combined thickness of around 100 m. They consist of interbedded clays and sands, usually cemented sands at the top of the Lower Vasse member. The sand beds form an important aquifer.

The aquifer thickness ranges between 100 and 300 m, with Quaternary soil cover typically ranging from 15 to 30 m.

In the vicinity of the site, the shallowest water-bearing sand layer of the Leederville formation occurs as a permanent, confined aquifer at around 40 m depth. This sand layer is separated from the surface by a succession of clay and clayey sand layers which occurs at depths of 30 to 40 m then variable clayey sands of the intervening Yoganup Formation from near ground surface to 30 m depth.

The Department of Water's Bunbury and South West Coastal groundwater areas subarea, Dardanup, indicates that the Leederville formation forms a significant regional aquifer for groundwater abstraction in the area[2]. There are no management zones in the Dardanup subarea. Allocation in this subarea is restricted in the north due to thinning of the formation and to ensure sufficient through flow to Kemerton North subarea to enable adequate management of the seawater interface. Generally groundwater salinity is >500 mg/L TDS.

c) Aquifer Recharge

The Leederville aquifer in the area is likely to be recharged by a combination of rainfall infiltration and infiltration via the Ferguson River, to the northeast.

Away from groundwater abstraction bores, water level fluctuation in the Quindalup and Upper Vasse Members typically fluctuate by 1 to 2 m/year. The Lower Vasse and Yelverton members show less variation, typically 0.2 m/year indicating poor connection with the overlying aquifers.

d) Groundwater quality

Superficial

Groundwater quality in the superficial aquifer is generally fresh, 500 mg/L TDS, locally higher in surface water bodies at the end of summer, due to concentration via evaporation.

Leederville

Groundwater in the Leederville is generally fresh. Chloride distribution, derived from marine aerosols in rainfall, is lower at the base of the Leederville, potentially due to lower sea levels during the time of recharge.

Radiocarbon dating (Carbon 14) has not been carried out for the boreholes onsite but based on studies of the Leederville aquifer in the Capel-Busselton groundwater area, the age of groundwater in the Quindalup, Mowen and Upper vase members is between 100 and 9000 years. In the Lower Vasse and Yelverton members, an indicative groundwater

[2] *Bunbury and South West Coastal groundwater areas subarea reference sheets*, Department of Water, May 2009

age of 11,000 to 30,000 years has been reported. Groundwater age increases along the direction of flow[3].

2.6 Hydrology

The site lies within the Preston River Basin, which flows into the Leschenault Inlet at Bunbury. The nearest water course is the Ferguson River, located hydraulically cross gradient some 2.0 km northeast of the site. The Ferguson River flows in a north-westerly direction before joining the Preston River, at Picton, some 11 km to the north west of the site. Due to its elevated position on the Whicher Scarp, the site is not subject to flooding.

Crooked Brook, a tributary of the Preston River, located hydraulically cross gradient some 3.1 m south of the site. Crooked Brook flows in a westerly direction before joining the Preston River some 6km west of the site.

Farm water supply dams are located onsite but these will be removed progressively as the site is developed. A small earth dam is located 300 m to the west of the site, associated with the adjacent gravel pit, owned by the Shire of Dardanup. This dam is used as a sediment trap for stormwater runoff and is not used for potable water.

Surface water drainage currently flows towards the northern site boundary. An overgrown ditch is present alongside Panizza Road, to carry surface water flow to the west. This ditch terminates within the roadside verge some 300 m west of the site.

2.7 Mineral Sand Lease

The site of the proposed RDA is located atop a mineral sand lease, owned by Cristal Mining. As part of proving the mineral sand resource at the site, extensive exploratory drilling has been carried out to 20 m depth, with the borehole logs, relevant laboratory testing and soil samples provided to WML, via Cristal.

The findings are discussed in more detail in Section 3, below.

2.8 Regional Surface Water Quality

Based on published reports from the Department of Water, the water quality for the lower Ferguson River is generally poor, with high to very high total nitrogen and total phosphorous. Water quality for the Preston River, located 3 km to the north east, is also poor, with high levels of nitrates, phosphates and iron (in excess of the Australian Drinking Water Guidelines).

Currently there is a limited understanding of the presence of contaminants (besides nitrogen and phosphorus) in the rivers. Studies in the Swan and Canning rivers and stormwater drains have established the presence of non-nutrient pollutants (e.g. organic chemicals, pesticides including DDT and dieldrin, hydrocarbons and heavy metals) from human activities relating to urban, agricultural and industrial land uses. A similar list of contaminants is therefore expected in surface water in the lower reaches of the rivers, due to the presence of similar land uses (present and historic). Acidification is also occurring and thereby increasing metal contamination of drainage from irrigated pastures as a result of fertiliser application.

2.9 Regional Groundwater Monitoring

Details of existing groundwater bores in the area were obtained from the Department of Water.

The details of 4 groundwater bores located hydraulically down-gradient of the site were obtained together with two boreholes, cross gradient to the north, to provide details of

[3] D.Schafer, S.Johnson and A.Kern, *Hydrogeology of the Leederville aquifer in the western Busselton-Capel Groundwater Area*, Department of Water, August 2008

the Yoganup Formation and underlying Leederville Formation. The relevant bore locations and details are outlined in Drawing No. 5139-G-300 and Table 1, respectively.

Table 1. Summary of DoW groundwater bores in proximity to the site

DoW site reference	Date Drilled	Location	Depth of Well (m)	Geology	Water Level (m)
61110261	Pre 1964	2.1 km west	6.2	Guildford Formation	0.5 - 23/8/76
61110266	Pre 1964	500 m west	18.5	Yoganup (?)	3.6 - 23/8/76
61110302	1966	1.4 km west	7.6	Yoganup (?)	2.7 - 29/6/66
61110353	1993	700 m northeast	59.7, slotted 41.7 to 59.7	Base Quindalup	1.6 - 11/11/93
61110356	1997	500 m northeast	60.0, slotted 48.0 to 60.0	Base Quindalup	12.5 - 11/97
61111493	2013	1 km west	Unknown	Unknown	2.5 to 3.1m - 12/2013 to 4/2014
61111494	2014	1 km west	Unknown	Unknown	2.25 to 3.1m - 12/2013 to 4/2014

3. PREVIOUS GROUND INVESTIGATIONS

3.1 Mineral Drilling

As part of proving the mineral sand resource at the site, 100 rotary percussive boreholes have been carried out across the site, to depth of up to 20 m depth, by Cristal Mining. The borehole locations are shown in Drawing No. 5193-G-306.

The exploratory drilling was carried out in 2 phases, using rotary percussive drilling techniques and compressed air, and comprised:

- in 2010, 30 boreholes to 10 to 20 m depth, and
- in 2014, 70 boreholes to 15 to 20 m depth.

Notwithstanding the heavy mineral assay requirement, all of the boreholes drilled in 2010 were tested at 1 m depth intervals for fines content, (percentage passing the 45 micron sieve).

The borehole logs, relevant laboratory testing and approximately 200 selected soil samples for inspection were provided to WML, by Cristal Mining. Based on the Cristal Mining borehole logs and WML's inspection of the samples, the general findings of the investigation were as follows:

GL to 1m/2m: Grey/grey brown SAND (windblown sand) with typically 12% passing the 75 micron sieve.

1m/2m to 3m/5m: Brown ROCK (laterite)

3m/5m to 15/20m: Variably brown, red brown and grey SAND, some clay. Fines content varies from 13% to 66% with an average of 28%. (Yoganup Formation). Below about 6 to 8 m depth, the fines content tended to be fairly consistent, between 25 to 30%, with occasional more clayey zones.

3.2 Superficial Sand Resource

In 2012, Main Roads Western Australia carried out 100 machine excavated test pits with a backhoe, across the western half of the site, to investigate a potential borrow pit for sand (See Drawing No. 5193-G-305). The test pits extended to depth of between 0.6 and 3.9 m and proved an average depth of sand across the western half of the site to be 1.0 m. The sand locally deepened towards the north-western and south-western corners.

An extensive series of soil classification tests carried out to demonstrate the engineering properties of the surficial sands with the results of the particle size distribution tests presented in Figure 2 below:

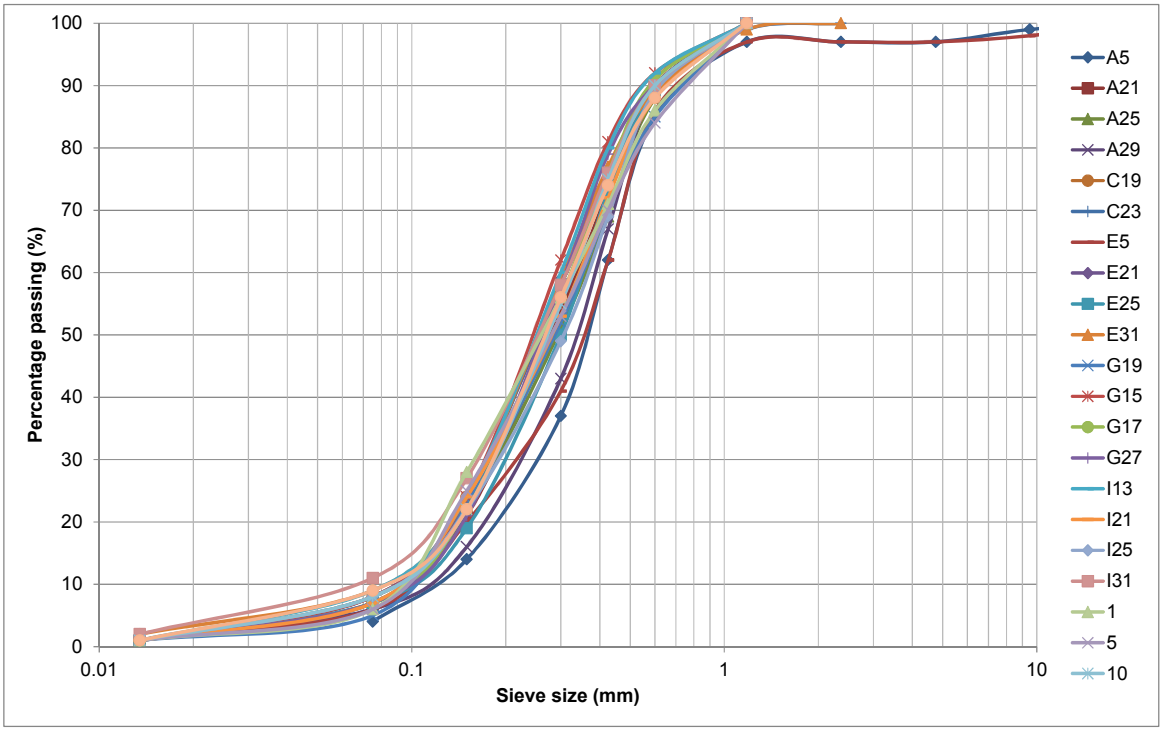


Figure 2. Summary of MRWA Surficial Sand PSD Analysis

3.3 Groundwater Monitoring Bores

Three 60 to 70 m deep groundwater monitoring bores were established by Cristal onsite, in October 2013, to establish baseline readings for the groundwater regime beneath the site. One set of boreholes (DD03) was located near the eastern site boundary, hydraulically up-gradient of the site with a further 2 sets (DD01 and DD02) along the western site boundary, down-gradient of the proposed RDAs. At each borehole location, 3 separate monitoring wells were installed, with screened intervals set at 1 to 3 m depth, 24 to 30 m depth and the lower 6 m of the deepest wells, 60 to 70 m depth.

The borehole locations are shown on Drawing No. 5193-G-301.

An initial attempt to install the groundwater bores in September 2013 was thwarted by soft ground conditions and artesian flow at shallow depth in the monitoring well DD01, located in the northwest part of the site.

Beneath the surficial sands and laterite along the western site boundary, both boreholes encountered variably clayey sand with occasional clay layers to 41 m depth. A ferruginised sand layer (coffee rock) was encountered at 29/30 m depth (30 mAHD) in both boreholes, considered to represent the lower part of the Yoganup Formation.

This was underlain by clayey sand with occasional black staining, considered typical of the Quindalup member of the Leederville formation. A water-bearing sand layer was encountered between 41m and 58m depth (19 to 2 mAHD) in boreholes DD01 and DD02

and from 59 m to 70 m in borehole DD03 (35 to <24 mAHD), potentially the base of the Quindalup member. Following completion of drilling, programmable data loggers were fitted in each of the deepest wells, to monitoring groundwater level fluctuations and conductivity with time. The results are presented in the appendices and summarised as follows:

Figure 3. Summary of water level data from downhole data loggers

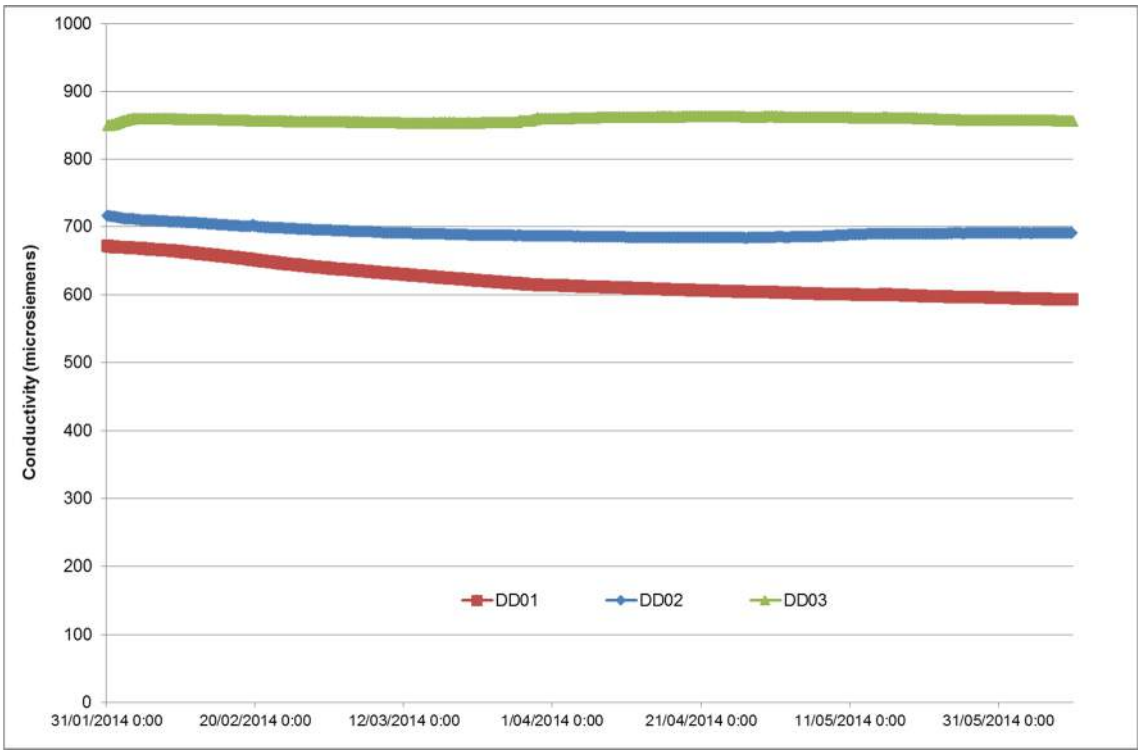


Figure 4. Summary of EC data from downhole data loggers

Groundwater level monitoring of the Quindalup member at the western site boundary has indicated a fairly consistent groundwater level of 33 mAHD, with seasonal fluctuation of around 0.25 m. This is consistent with observed behaviour in monitoring wells elsewhere at the base of the Whicher Scarp.

At the eastern site boundary, groundwater level fluctuations were slightly greater, some 0.75 m with groundwater 4m higher than the western site boundary. The general direction of groundwater flow is to the west with a hydraulic gradient of 0.005.

Monitoring of conductivity indicates slightly more saline groundwater beneath the higher, eastern part of the site. The conductivity at around 700 µS/cm is approaching the upper limit of 750 µS/cm, suggested by the Australian Drinking Water Guidelines.

4. GROUND INVESTIGATION

Following a review of the existing borehole data, a supplementary ground investigation was carried out by WML, to provide additional information on the superficial aquifer at the site. The ground investigation was carried out in 2 stages, comprising the installation of groundwater monitoring bores around the RDA perimeter then machine-excavated test pits across the site on an approximate 100 m grid.

The investigation locations are shown on Drawing No. 5193-G-304.

4.1 Machine-Excavated Test Pits

A total of 56 machine–excavated test pits were carried out between 14th and 21st July 2014, using a 20 tonne tracked excavator. The test pits generally extended to 5.0 m depth, using a 900 mm wide bucket. In areas of massive ferricrete and laterite, a single tine ripper was used initially, to break out the rock.

Small disturbed soil samples were collected for laboratory analysis, the pits photographed and then backfilled with the arisings.

The findings of the test pits are summarised in section 5 of this report.

4.2 Borehole Drilling

A rotary drill rig was used to install 4 sets of groundwater monitoring wells, to depths of between 5 and 15 m between 23rd June and 7th July 2014. At each monitoring well location, 3 separate wells were drilled, approximately 2m apart. The well screens were then set at selected depths, nominally 5 m, 10 m and 15 m, depending on lithology, to allow insitu measurements of permeability and monitoring of perched and artesian groundwater.

An additional four groundwater monitoring bores were then installed as part of the geotechnical assessment of the site and following the discovery of a shallow, sand infilled paleo channel running east west through the site

All boreholes were drilled in 76mm diameter using a tungsten carbide bit and polymer flush. Where the laterite caprock resulted in refusal of the tungsten carbide bit at shallow depth, the caprock was diamond cored with a T6S-76 mm barrel before resuming with the tungsten carbide bit.

Standard Penetration Tests (SPTs) were carried out at regular depth intervals within the boreholes and the split spoon sampler examined for soil structure and anisotropy. Disturbed soil samples were also collected at regular depth intervals during boring, from the cutting returns.

On reaching the target depth, 50 mm diameter PVC well casing was installed in boreholes, slotted over the bottom 2m of the well. A bentonite pellet seal was installed for the initial 1 m of backfill then the well casing from the top of the bentonite pellet seal

to ground level sealed using a cement-bentonite mix. A lockable steel cover was then installed with a concrete base to protect the well.

Insitu permeability testing was carried out in the groundwater monitoring bores. The wells were initially purged following drilling to remove drill fluids then allowed to stand to check on groundwater levels. The wells were then filled with water and readings taken of the fall in water level with time using a dip-meter.

5. INVESTIGATION FINDINGS

5.1 Subsurface Conditions

Subsurface conditions have been divided by elevation, essentially the 80 mAHD contour. Below this level is the Yoganup formation and above this, the Quindalup member, forming the upper part of the Leederville formation.

5.1.1 Yoganup Formation

Below the 80 mAHD contour, the site is characterized by shallow topsoil nominally 0.1 m thick, overlying pale grey fine to medium grained SAND to depths of between 0.4 and 4.9 m, formed by a combination of colluvial and aeolian process. In the south western corner of the site, the pale grey sand transitioned to a yellow brown fine to medium sand.

The base of the sand layer is marked by variably cemented LATERITE, locally to cobble and boulder-sized fragments. The laterite is typically 0.9 m thick but varies from 0.4 to 2.0 m. This is underlain by orange-brown mottled light grey brown clayey fine to medium grained very dense and variably iron-cemented SAND, forming the upper part of the Yoganup formation, but structurally modified by laterisation. A typical profile is shown in Photograph 1 below.

Photograph 1: Test Pit 24, located at 72 mAHD, showing the succession of colluvial/Aeolian sand over laterite then laterised clayey sand of the Yoganup formation.

At around 6 to 8 m depth, locally 10 m depth in borehole DD04, the iron cementing was no longer evident and the Yoganup formation graded to dense pale grey to cream clayey, silty fine to medium sand, locally fine to coarse, thinly interbedded with orange brown and light grey sandy silt/clay seams.

Photograph 2: Borehole DD05, SPT split spoon sampler at 15.1 m depth, showing thin orange brown sandy clay laminations within cream, clayey silty fine to medium sand.

Photograph 3: Borehole DD10, SPT split spoon sampler at 9.0 m depth, showing 15 cm thick band of cream clay within clayey silty fine to medium sand matrix

5.1.1 Quindalup member

Beneath the higher, eastern part of the site, subsurface conditions comprised hard and laterised sandy clays, with bands of ferricrete. The upper 2 m of the soil profile had once comprised pisolitic gravel but this was removed by previous site owners, under a gravel extraction license.

Photograph 4: Test Pit 40, located at 87 mAHD, showing hard, laterised red brown mottled orange brown and light grey, sandy CLAY/clayey SAND.

Photograph 5: Test Pit 54, located within the drainage gulley near the eastern site boundary, at 88 mAHD, showing hard sandy clay overlying ferricrete at base of test pit.

Ferricrete was commonly encountered in test pits located within the drainage gulley, indicative of historic groundwater levels.

5.2 Groundwater

5.2.1 Superficial

The groundwater regime, at the site, at shallow depth, is complex. The incised valley that runs east west through the higher, eastern part of the site appears to have formed a paleo drainage channel immediately downstream, cutting into the Yoganup formation. From the mineral drilling carried out by Cristal Mining, the heavy minerals are absent in the area immediately downstream of the outfall and infilled with laterised sand and laterite that continues on to the north west, to the western site boundary. A graphical depiction of the sand channel, taken from the mineral drilling programme is presented in Figure 5 below.

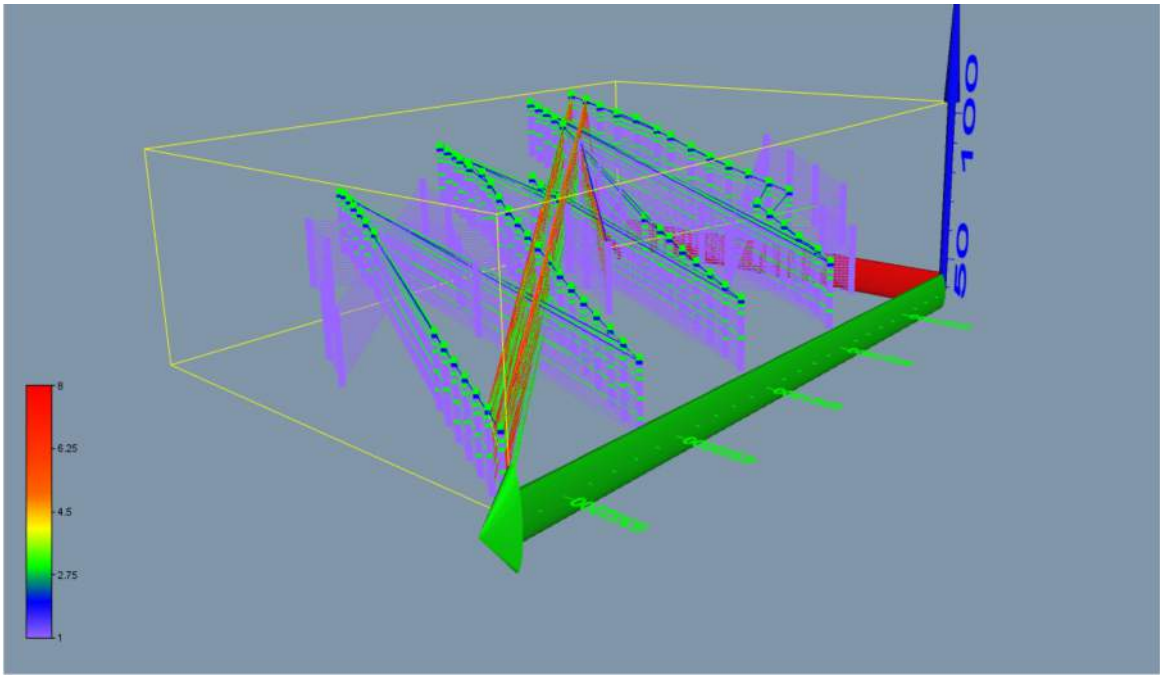


Figure 5: Paleo channel in upper part of Yoganup formation, based on mineral drilling programme (Image courtesy Cristal).

Surface water runoff from the higher part of the site enters the superficial sand layer at around the 80 m contour then disperses through the underlying Yoganup formation via preferential pathways in the more sandy horizons. The general trend in groundwater flow is to the north-west.

During heavy rainfall periods over the winter months, groundwater is temporarily trapped at the laterite layer and can rise to ground surface at borehole 10, some 200 m downstream of the gulley outfall. Artesian superficial groundwater was also encountered beneath the laterite layer along the western site boundary, during monitoring well installation in September 2013.

Despite the presence of the paleo channel, monitoring wells installed in the southern part of the site, both in the superficial sands and underlying Yoganup formation, did not encounter any groundwater in the upper 15 m of the soil profile.

5.3 Insitu Permeability Testing

Falling head permeability tests were undertaken on the monitoring wells once installation was completed. Each well was filled to the top with water and the level measured at set time intervals. The results of the insitu falling head tests are presented below:

Table 2: Results of insitu falling head permeability tests in Yoganup formation

Well ID	Elevation (mAHD)	Depth (m)	Slotted Interval (m)	Insitu Permeability (m/s)
DD04	58	4.92	2.88 to 4.88	$6.4x10^{-8}$
		8.67	6.60 to 8.60	$2.5x10^{-8}$
		14.28	12.24 to 14.24	$8.4x10^{-8}$
DD05	65.5	4.97	2.93 to 4.93	$6.2x10^{-8}$
		10.05	8.01 to 10.01	$5.5x10^{-8}$
		15.18	13.04 to 15.04	$3.5x10^{-8}$
DD06	76.7	5.50	3.46 to 5.46	$4.0x10^{-8}$
		9.99	7.95 to 9.95	$3.3x10^{-8}$
		14.93	12.89 to 14.89	$1.6x10^{-8}$
DD07	68.9	4.49	2.45 to 4.45	$1.2x10^{-8}$
		9.89	7.85 to 9.85	$1.2x10^{-7}$
		14.58	12.54 to 14.54	$2.4x10^{-8}$
DD08	75.4	11.90	9.86 to 11.86	$9.5x10^{-9}$
DD09	71.8	9.95	8.41 to 9.91	$1.0x10^{-6}$
DD14	91.5	5.07	3.03 to 5.03	$1.1x10^{-8}$

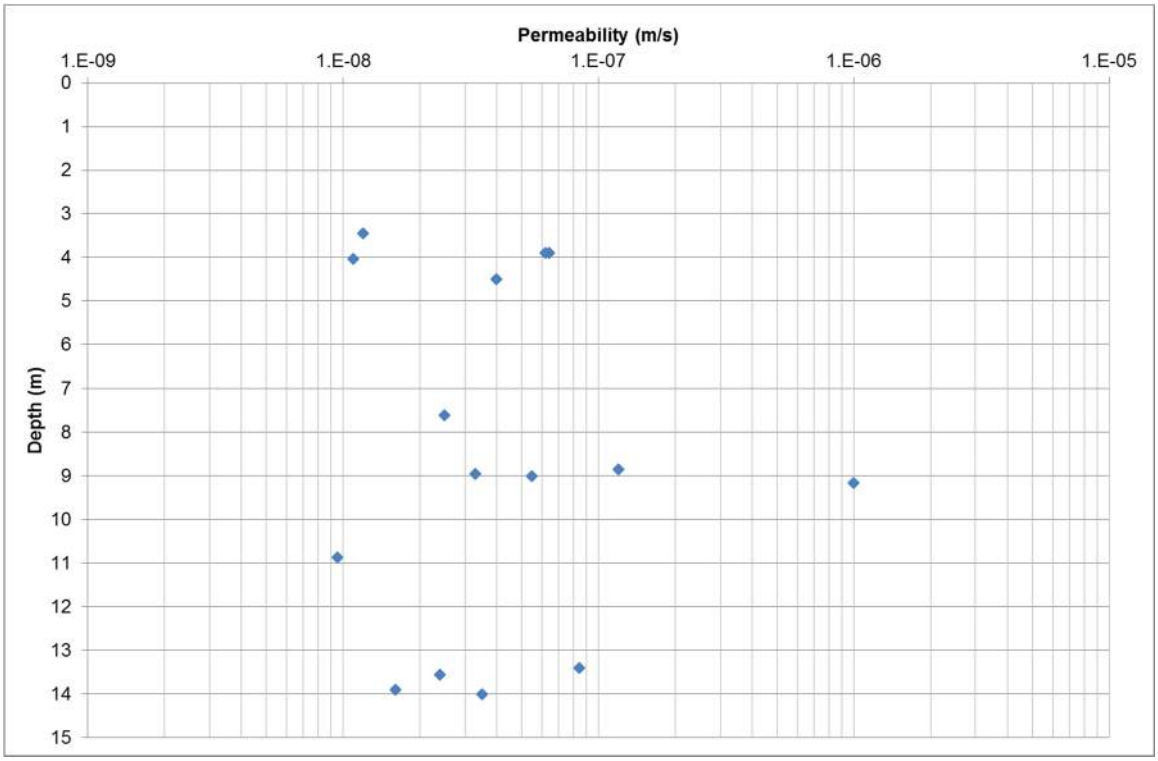


Figure 6: Plot of insitu permeability with depth for the Yoganup formation.

The results indicate atypical permeability within the range of $1x10^{-8}$ to $1x10^{-7}$ m/s with a locally higher result of $1x10^{-6}$ m/s at 9m depth in borehole DD09, installed within a sandy zone. Due to the strongly stratified nature of the Yoganup formation, the above permeability values are representative of the horizontal permeability. The vertical permeability is expected to be one order of magnitude lower i.e. $1x10^{-9}$ to $1x10^{-8}$ m/s.

6. LABORATORY TESTING

6.1 Cation Exchange Capacity Tests

Forty four cation exchange capacity tests were carried out on samples selected from the test pits by WML and the mineral drilling boreholes carried out by Cristal Mining, in order to assess the soil's capacity to protect groundwater from cation contamination. It is expressed as milliequivalent of hydrogen per 100 g of dry soil (mEq/100g). The holding capacity varies for the different clay types: kaolinites typically range from 3 to 15; illites, 10 to 40 and montmorillonites, 40 to 100 mEq/100g. The tests were carried out by South West Chemical Services, a Bunbury-based chemical testing laboratory and are summarised as follows:

Table 3: Summary of Cation Exchange Capacity Test Results

Location	Depth	Exch Al	Exch Ca	Exch Mg	Exch K	Exch Na	CEC
	m	mEq/100g	mEq/100g	mEq/100g	mEq/100g	mEq/100g	mEq/100g
DA 354	5	0.303	0.77	1.27	0.12	0.25	2.71
DA 354	9	0.229	0.42	1.01	0.21	0.27	2.14
DA 354	15	0.239	1.1	3.87	0.31	0.25	5.77
DA 354	20	0.074	0.23	0.27	0.06	0.03	0.66
DA 359	5	0.068	0.32	0.96	0.1	0.22	1.67
DA 359	10	0.062	0.33	0.83	0.08	0.08	1.38
DA 359	14	0.074	0.36	0.75	0.15	0.41	1.74
DA 359	19	0.033	0.46	1.28	0.23	0.42	2.42
DA 367	3	0.1	0.34	0.82	0.25	0.08	1.59
DA 367	8	0.412	0.21	0.35	0.12	0.04	1.13
DA 367	15	0.183	0.2	0.37	0.18	0.04	0.97
DA 367	19	0.533	0.3	0.48	0.12	0.1	1.53
DA 373	6	0.054	0.18	0.6	0.12	0.07	1.02
DA 373	10	0.054	0.22	0.56	0.19	0.08	1.1
DA 373	15	0.046	0.23	0.58	0.12	0.1	1.08
DA 373	20	0.061	0.3	0.71	0.25	0.08	1.4
DA 392	4	0.682	0.16	0.24	0.11	0.12	1.31
DA 392	10	0.354	0.19	0.27	0.18	0.14	1.13
DA 392	15	0.106	0.19	0.38	0.19	0.09	0.96
DA 392	20	0.391	0.3	0.48	0.15	0.11	1.43
DA 398	5	0.067	0.2	0.42	0.16	0.07	0.92
DA 398	10	0.913	0.11	0.22	0.13	0.03	1.4
DA 398	16	0.09	0.16	0.91	0.14	0.12	1.42
DA 398	20	0.029	0.15	0.64	0.17	0.09	1.08
DA 405	6	0.224	0.25	1.06	0.13	0.23	1.89
DA 405	11	0.107	0.17	0.47	0.19	0.1	1.04
DA 405	15	0.104	0.2	0.48	0.18	0.11	1.07
DA 405	20	1.099	0.82	5.06	0.25	0.59	7.82
DA 410	8	0.259	0.27	0.8	0.07	0.26	1.66
DA 410	11	0.15	0.15	0.61	0.13	0.5	1.54
DA 410	15	0.063	0.25	0.97	0.12	0.33	1.73
DA 410	20	0.069	0.18	0.48	0.14	0.13	1
TP 42	4.0 - 4.5	0.049	0.35	0.58	0.02	0.02	1.02

TP 46	1.0 - 1.5	0.055	0.4	0.73	0.04	0.07	1.3
TP 50	2.5 - 3.0	0.123	0.72	0.83	0.02	0.11	1.8
TP 50	4.0 - 5.0	1.045	0.1	0.18	<0.01	0.03	1.36
TP 52	3.5 - 4.0	0.081	0.96	0.66	0.09	0.07	1.86
TP 52	4.8 - 5.0	0.046	0.45	0.75	0.13	0.06	1.44
TP53	3.0 - 3.5	2.625	0.47	1.44	0.02	0.53	5.09
TP 56	1.3 - 2.7	2.302	0.2	1.66	0.02	0.22	4.4

A further 15 tests were carried out on samples recovered during installation of the deep monitoring wells to 60/70 m depth, by Cristal. The results are summarised as follows:

Table 4: Results of Cation Exchange Capacity

Borehole ID	Depth (m)	Cation Exchange Capacity mEq/100g
DD01	15	1.6
	33	3.8
	39	3.6
	42	4.5
	60	2.0
DD02	21	3.8
	24	3.5
	36	3.8
	42	3.9
	60	2.3
DD03	3	1.4
	24	3.1
	39	5.7
	48	1.9
	52	2.4

For the three deep boreholes, the average CEC was 3.2 mEq/100g

6.2 Chemical properties of groundwater

Chemical laboratory testing was carried out on samples of groundwater taken from the monitoring wells installed by both Cristal and WML. The key findings were as follows:

a) Heavy metals:

The levels of all heavy metals tested were all below the Australian Drinking Water Guideline (ADWG) values[4]. Key indicators for assessment of the impact of leachate are as follows:

Calcium: Calcium levels were fairly consistent in the superficial aquifer ranging from 4.2 to 6.4 mg/L. In the Leederville aquifer, calcium levels ranged from 7.2 to 35 mg/L.

[4] *Australian Drinking Water Guidelines 6*, National Health & Medical Research Council, December 2013

Sodium: In the superficial aquifer, sodium ranged from 6.5 to 42 mg/L.

In the Leederville aquifer, sodium levels ranged from 90 to 140 mg/L.

b) Non-metals and inorganic compounds:

The levels of all compounds tested were all below the Australian Drinking Water Guideline (ADWG) values. Key indicators for assessment of the impact of leachate are as follows:

Chloride: In the superficial aquifer, chloride levels ranged from 11 to 80 mg/L.

In the Leederville aquifer, chloride levels ranged from 150 to 270 mg/L.

c) Radiological count:

Guideline

No specific guideline values are set for beta- or gamma-emitting radionuclides. Specific beta- or gamma-emitting radionuclides should be identified and determined only if gross beta radioactivity (after subtracting the contribution of potassium-40) exceeds 0.5 Bq/L (27.6 Bq of beta activity per gram of stable potassium).

d) Hydrocarbons:

Trace levels of hydrocarbons in the range C_{15}-C_{28} (fuel oil and naturally occurring organic acids) and C_{29}-C_{36} (lubrication oil and tar derived from lignite) were detected in most of the groundwater monitoring bores following installation. In the Leederville aquifer, this may be due to lignite bands within the formation. However, the source of heavy hydrocarbons in the superficial aquifer is not evident at this stage. The bores will be resampled and tested in the lead up to construction.

7. RESIDUE PROPERTIES

7.1 Residue Production

The refinery process at Millennium's Kemerton and Australind plants produces a solid waste of clay-like consistency. As a result of heating to 800 $^{\circ}$C during processing and chemical additives, the clay-like waste comprises a mixture of heavy metals (principally oxides of iron, aluminium and manganese), together with minute levels of dioxins and furans. The waste is subsequently rewetted to form a slurry (15 to 20% solids w/w) to allow for transfer into disposal trucks for ease of transport and disposal via simple gravity feed. The slurry is finally lime–dosed to increase the pH to around 9, to reduce the mobility of metals in the leachate.

The slurry is currently disposed of to the nearby Transpacific Industries (TPI) site, also designed by WML, and will continue to be disposed of at this site until March 2018 when the agreement between TPI and Cristal expires. The site currently receives 160,000 wet tonnes of residue slurry per annum, at an average solids content of 18%. This residue disposal area is composite lined (GCL/HDPE).

Within the RDA, the slurry dries to an inert, near insoluble, low toxic, high plasticity clay-like residue, with a permeability of the order of 10^{-10} m/s. Leaching tests previously carried out by Cristal revealed that the residue in its dry state would meet the requirements of a Class 1 inert landfill, apart from slightly elevated heavy metals (principally molybdenum).

Radiological monitoring at the former disposal site at Dalyellup site has shown that levels of the residue are slightly elevated above background levels but that these do not

exceed the limit of radiation exposure for the general public. The Radiological Council has advised that a 2 m thick cap will be required on completion of filling of the cell in order to reduce radiation levels to background levels.

For the purposes of waste classification, the DEC has classified the waste as a Solid Waste under Schedule 1 of the Environmental Protection regulations 1987. For ease of materials handling the waste is a liquid initially.

7.2 Residue Composition

The residue is referred to as a neutralised chloride waste residue with a typical slurry composition as follows[5]:

Table 5: Summary of Slurry Composition

Chemical analysis	%
Water	79
Iron (II) and iron (III) hydroxides	6.60
Aluminium hydroxide	4.53
Manganese hydroxide	2.72
Magnesium hydroxide	2.62
Calcium chloride	1.41
Carbon	0.75
Titanium oxide	0.63
Other metal oxides	<1%
Uranium	25 to 50 ppm
Thorium	300 to 700 ppm

Monitoring of leachate, which is returned to the processing plant, via tanker backloading, has revealed the following properties:

Table 6: Summary of Leachate Composition

Chemical analysis	Concentration mg/L
Aluminium	1.2
Calcium	895
Manganese	2.3
Magnesium	41
Potassium	9.5
Sodium	340

Calcium, sodium and chlorine are the most common elements in the leachate. The influence of these on the underlying aquifer as discussed in Section 8.

[5] Courtesy of Cristal Chemicals

8. HYDROGEOLOGICAL RISK

8.1 General

In 2011, the Department of Environmental Regulation (DER) adopted the Victorian EPA Best Practice Environmental Management guidelines for Siting, Design, Operation and Rehabilitation of Landfills, known as the BPEM guidelines. In terms of hydrogeological risk, these guidelines required:

- a site specific assessment, if one has not been carried out previously,
- an assessment of the likely impact of leachate on the regional groundwater table, and
- measures to reduce the impact of the leachate to an acceptable level.

The BPEM guidelines also have specific soil and groundwater targets to be met, including minimum depth to groundwater, minimum permeability of the underlying soils and minimum cation exchange capacity (CEC) of the underlying soils to attenuate heavy metals. These are:

- the permeability of the underlying soils have a permissible maximum of $1x10^{-9}$ m/s, measured over a depth of 2 m,
- the cation exchange capacity of the soils to capture contaminants, be a minimum of 10 mEq/100g for a 2 m thick clay layer,
- the depth to groundwater is at least 2 m below the floor of the cell.

Based on the hydrogeological investigation work carried out at the Panizza Road site, the near surface soils onsite do not meet the above criteria for **an unlined** residue disposal cell, constructed from site won soils, due to unacceptably high permeability, low cation exchange capacity and seasonally high groundwater levels, within 2 m of ground surface. Additional engineering controls are therefore required for the proposed RDA construction.

The proposed engineering controls to reduce the hydrogeological risk are summarised as follows:

i) The use of a composite liner (GCL/HDPE) for both the residue storage area and the leachate pond, to minimise seepage and therefore the impact on the underlying aquifer.

ii) Extensive stormwater drainage works to divert surface water runoff from the higher ground to the west, to a dedicated stormwater retention pond. This will limit recharge to the superficial aquifer.

iii) Incorporating a compacted clay key trench into the design of the perimeter bunds on the uphill side of the cells, to further prevent surface water runoff from recharging the superficial aquifer

iv) As a further precaution, a network of groundwater collection pipes will also be installed beneath the base of the composite liner within the RDA, with the potential to divert seepage to the leachate pond, in the unlikely event of leakage being detected.

Following the above engineering controls, the site is considered suitable for residue storage.

8.2 Impact on Underlying Aquifer

8.2.1 Superficial Aquifer

The ground investigation has revealed that subsurface conditions comprise around 1m of windblown sand overlying typically 1 m of weakly laterised sand with some laterite cobbles and boulders.

Beneath the surficial sands and laterite and extending to at least 20 m depth beneath the western half of the site is very dense and weakly cemented grey mottled orange brown and red brown variably clayey, silty fine to medium sand of the Yoganup Formation. The Clay content of the Yoganup Formation is variable, but typically around 30%. It varies both spatially and with depth in an apparently random manner. Seasonally perched groundwater is present within the Yoganup Formation, fed by surface water runoff from the higher part of the site. The estimated through-flow in the Yoganup formation, across the site is estimated to be of the order of 1000 m^3/day but varies seasonally.

Groundwater recharge will be significantly reduced via the stormwater diversion drain, cut-off trench and subsequent HDPE lining of the storage area. Following these works, the seasonally perched groundwater should be eliminated and therefore any preferential pathway for offsite migration.

8.2.2 Regional Aquifer

Beneath the Yoganup Formation are thick beds of low permeability marine clays and clayey sands of the Quindalup member, the upper part of the Yoganup formation. These clayey beds and considered to be an aquitard and provide significant natural protection to the underlying groundwater resource.

At around 40 m depth is the first productive sand seam in terms of groundwater supply, a 17 m thick sand seam. Insitu testing and sampling has revealed the flowing aquifer characteristics:

- Conductivity 700 µS/cm, which is approaching the limit of acceptability for drinking water, 750 µS/cm.
- Hydraulic gradient 0.005
- Hydraulic conductivity 4.5 m/day
- Estimated groundwater through-flow 350 m^3/day, beneath the RDA.

The monitoring has revealed anomalies in groundwater quality, with chlorides present in higher concentrations uphill of the site. Regional studies of the Leederville by the Department of Water has suggested that this is due to the younger age of groundwater closer to the point of recharge and reflecting higher chloride levels as aerosols. The typical age of groundwater at depth in the Leederville is 15,000 years, recharged at a time when sea levels were some 20 m lower than present.

A preliminary assessment of the risk to the aquifer was based on movement of chlorides, as these are probably the only potential contaminant to reach the groundwater table in the long term, given the large thickness of unsaturated soil and the presence of clay bands to attenuate the heavy metals. The presence of lignite within the Quindalup will also capture trace levels of organic compounds in the leachate.

Based on achieving an “average” level of QA for liner installation with defects limited to one hole per hectare of 50 mm^2 in area, and an average head of 0.3 m across the entire floor of the cell, the estimated leakage rate through the base of the liner is of 10 L/ha/day of a 2000 µS/cm solution containing chlorides.

Assuming a hydraulic conductivity of 8m/day of the receiving aquifer and a hydraulic gradient of 0.005 (0.5%), the impact on the salinity of the receiving aquifer of 2000 µS/cm chlorides is less than a 0.6% increase in the chloride level i.e. imperceptible. This is considered acceptable.

Given the low permeability of the underlying strata (10^{-8} m/s but varies widely) and significant depth to the aquifer (40 m) it is likely that chlorides from the RDA will take at least 50 years, possibly much longer, to reach the groundwater table.

Due to the combined effects of retardation and attenuation from the large depth of clays and clayey sands, heavy metals and trace levels of organic compounds will probably never reach the groundwater table.

8.2.3 Impact on nearby groundwater abstraction bores

The nearest groundwater abstraction bores to the site are located 500 m away to the north and hydraulically up-gradient. These bores are not considered to be at risk.

9. SUMMARY AND RECOMMENDATIONS

Since the adoption of the Victorian EPA BPEM guidelines by the DEC (now DER) in 2011, all landfill sites in Western Australia must now comply with this document. One of the aims of the guidelines is to identify sites that require the fewest engineering and management controls in order to protect the groundwater. The hydrogeological investigation assesses the potential impact of landfill leachate on the local groundwater quality.

9.1 Protection of Groundwater

The BPEM guidelines recommend that a minimum of 2 m separation is maintained from the base of the landfill to the groundwater table, to allow some attenuation of contaminants. At this site, groundwater was encountered at 41 m depth in the boreholes and therefore, the site provides significantly greater separation.

From a hydrogeological perspective, the site is considered suitable for constructing of a composite lined facility, due to the low permeability of the underling soils and significant depth of unsaturated clayey soils overlying the aquifer.

Due to the combined effects of retardation and attenuation from the large depth of unsaturated clays, heavy metals and trace levels of organic compounds from residue disposal will probably never reach the groundwater table.

The surficial windblown sands, laterite gravel and Yoganup formation contain seasonally perched groundwater. Recharge will be prevented via a combination of stormwater diversion, a clay cut-off trench and lining the impoundment, thereby controlling levels in this superficial aquifer. Precautionary groundwater underdrains will be installed immediately beneath the liner with provision to divert seepage to the leachate pond.

9.2 Cation Exchange Capacity of Subgrade

Whilst the subgrade does not meet the minimum cation exchange capacity (CEC) of 10 mEq/100g over a depth of 2 m, it averages 4 mEq/100g over a depth of 40 m, thereby providing significantly higher cumulative protection to heavy metal migration. No additional design and management practices are considered necessary to protect the regional aquifer.

The superficial groundwater within the Yoganup formation is considered a seasonally perched aquifer and as such, not considered a suitable a source of potable drinking water. Small supplies may however be drawn for future stock watering, although supply is intermittent. The Yoganup formation provides the equivalent CEC with just over 5 m depth of soil.

Additional control measures are therefore not considered necessary at this site to provide protection to groundwater.

9.3 Subgrade Permeability

To meet the performance standards for groundwater protection, a clay subgrade generally needs to be at least 2m thick and have a permeability of less than $1x10^{-9}$ m/s.

At this site the permeability of the Yoganup Formation is greater than $1x10^{-9}$ m/s, varying from $5x10^{-8}$ m/s to $2x10^{-7}$ m/s, where tested. This formation is highly variable in composition with non-continuous sandy clay seams and clayey sand randomly distributed throughout the soil profile. The permeability depends upon preferential flow paths through more sandy lenses with horizontal permeability expected to be at least 1 order of magnitude higher than vertical permeability. In its current, undisturbed state, the subgrade does not meet the impermeability requirements of 10^{-9} m/s and will still not meet this requirement, even if reworked and re-compacted.

Permeability testing carried out previously by WML on nearby sites has indicated that remoulded samples to form a homogeneous mixture of clayey/silty sand with a fines content of 30%, have a permeability of around $4x10^{-8}$ m/s. For landfill liner design, a target permeability of around $5x10^{-10}$ m/s is required, to allow for standard deviation from field testing to still meet the criteria of $<1x10^{-9}$ m/s.

Even after reworking to break down the soil structure and preferential flow paths from root zones and sand lenses, the Yoganup formation will still not meet the impermeability requirements. The subgrade is therefore unlikely to meet the design permeability criteria without improvement or additional management measures but the potential for deeper migration is limited, due to the large depth of unsaturated, low permeability clayey/silty sand underlying the site.

Permeability values can vary from 5×10^{-9} m/s to $1x10^{-4}$ m/s in the underlying Quindalup formation. The wide range of permeabilities reflects the variation in soil type.

The proposed management measures comprise an engineered composite liner of geosynthetic clay liner and high density polyethylene.

DRAWINGS

5193-G-001 Locality Plan

5193-G-100 Concept RDA Design

5193-G-300 Department of Water Groundwater Bores

5193-G-301 On-site Groundwater Bores

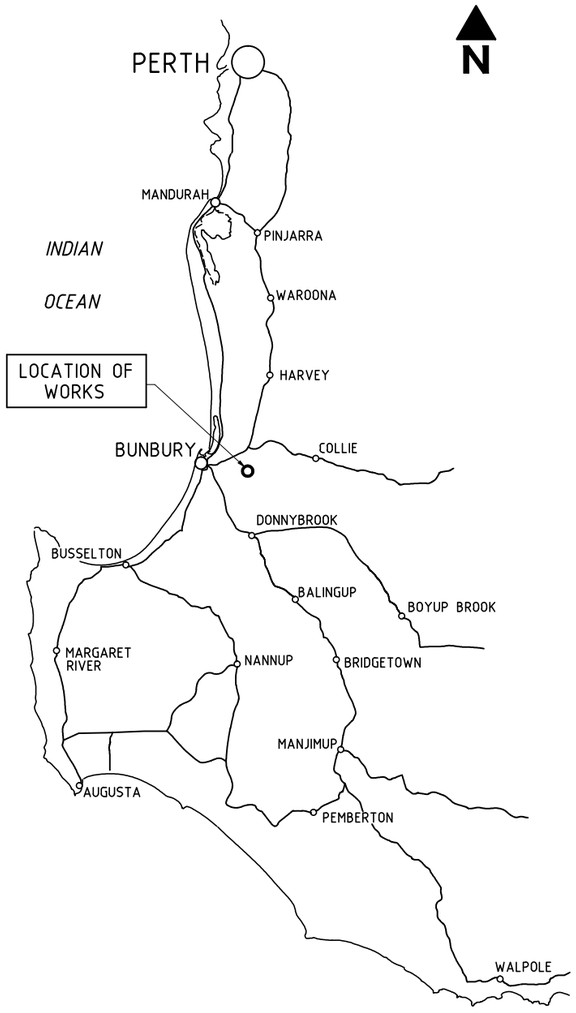
5193-G-302 Geology Map

5193-G-303 Stratigraphic Cross-Section

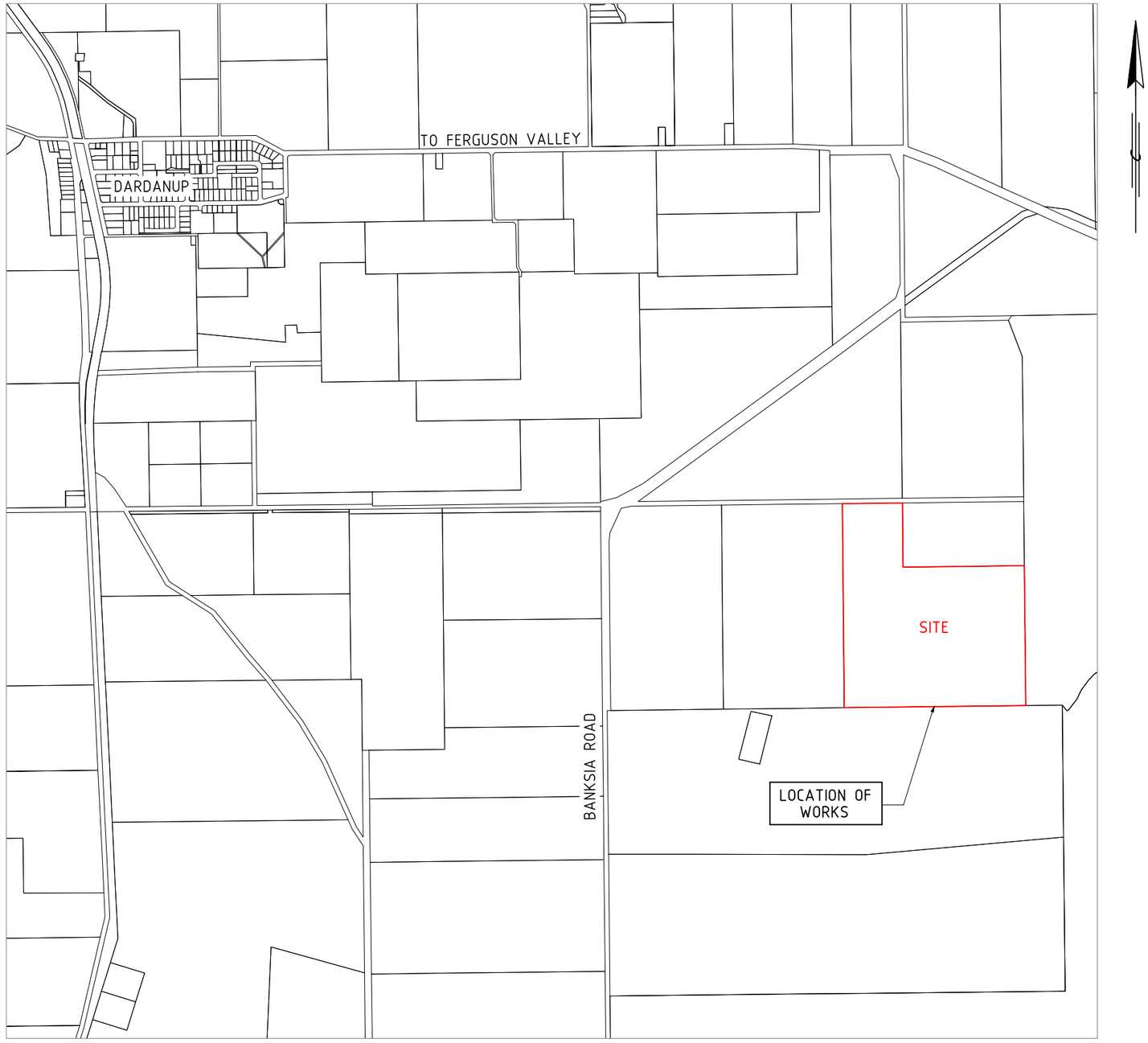
5193-G-304 WML Investigation Layout Plan

5193-G-305 MRWA Sand Investigation Layout Plan

5193-G-306 Cristal Mining Drilling Layout Plan



LOCALITY PLAN
N.T.S



LOCALITY PLAN
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DRAWING TITLE
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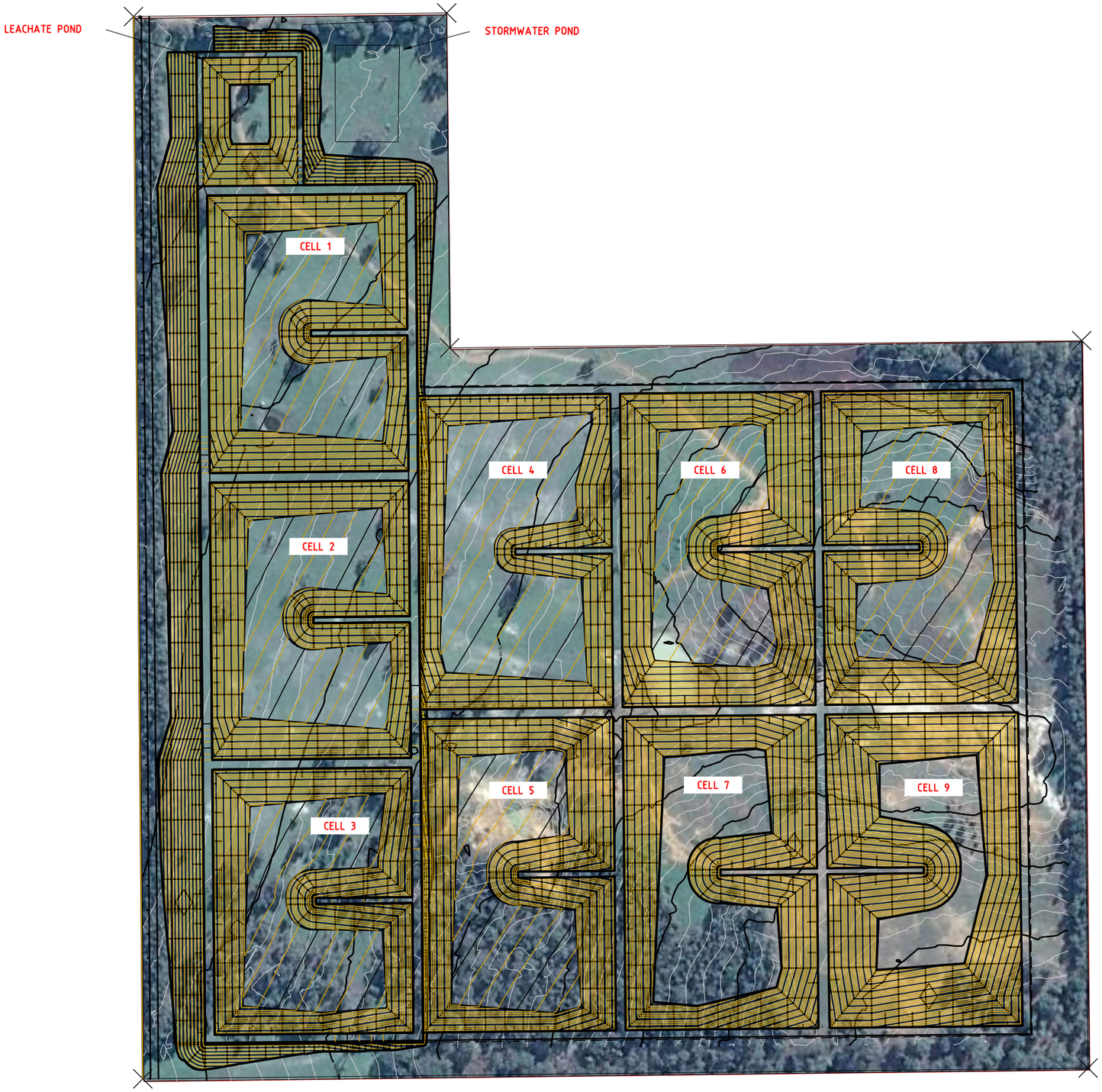

CELL LAYOUT PLAN
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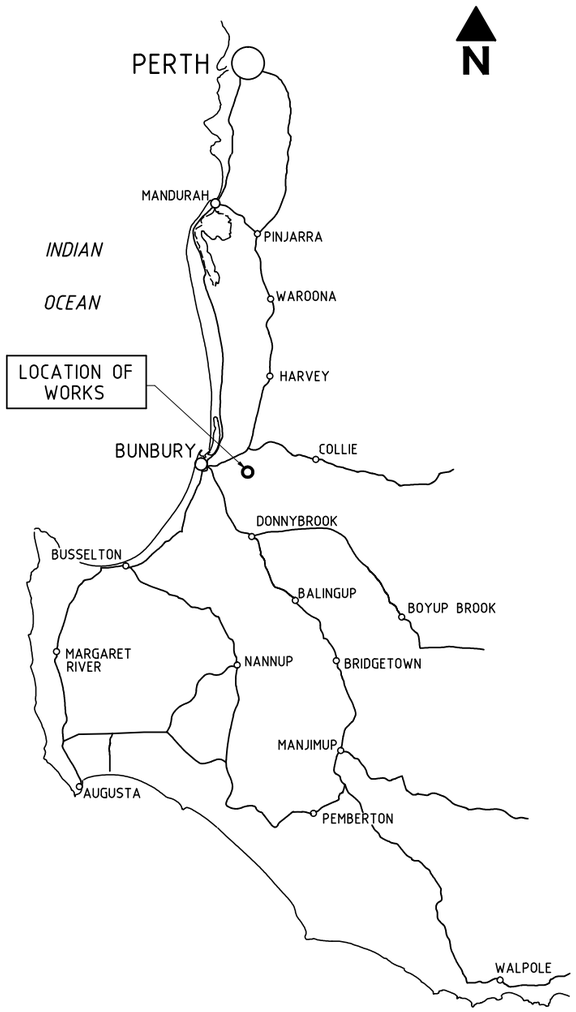
CLIENT
CRISTAL PIGMENT AUSTRALIA

PROJECT
RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

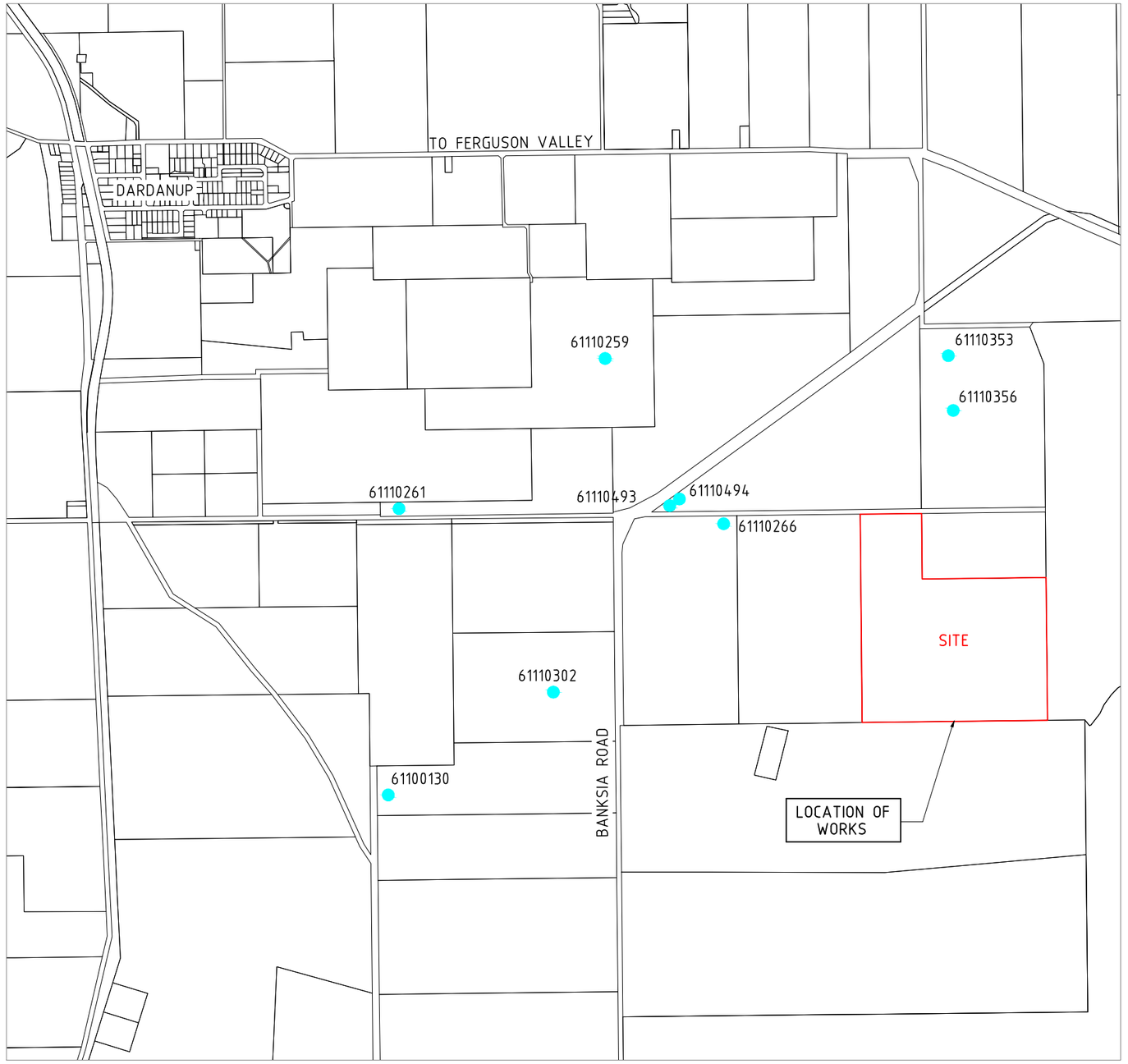
DRAWING TITLE
CONCEPTUAL DESIGN
CELL LAYOUT PLAN

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER: 5193-G-100
REVISION: A



LOCALITY PLAN
N.T.S



LOCALITY PLAN
N.T.S

LEGEND

61100130 — DEPARTMENT OF WATER GROUNDWATER MONITORING BORE ID

SCALE NOT TO SCALE

A1

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PROJECT MANAGERS
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APPROVED		

CLIENT: CRISTAL PIGMENT AUSTRALIA

PROJECT: RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE: DEPARTMENT OF WATER
LOCATION OF EXISTING BORES

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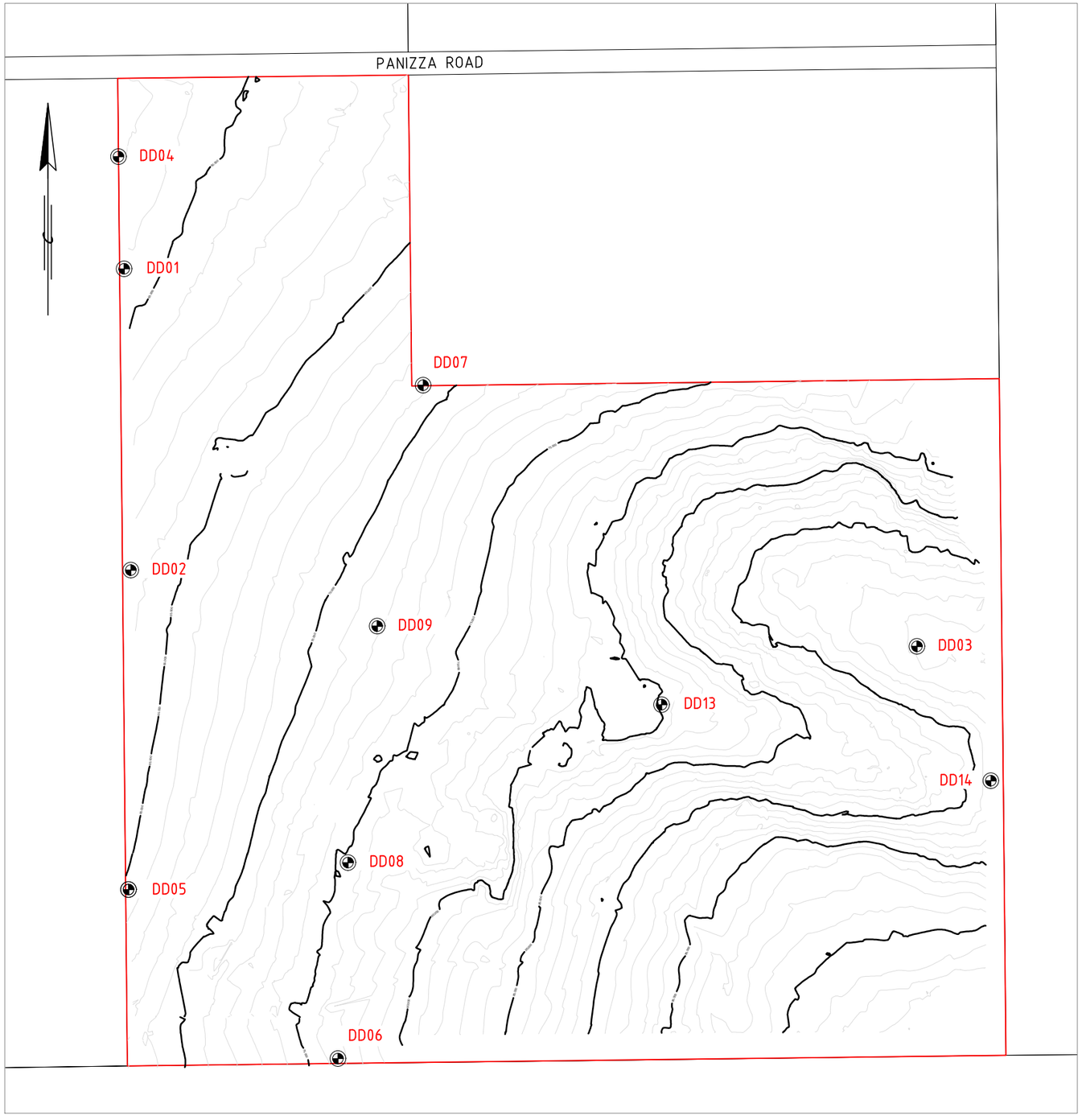
DRAWING NUMBER: 5193-G-300
REVISION: A



LOCALITY PLAN
N.T.S

SUPERFICIAL AQUIFER MONITORING BORE DATA

WELL ID	EASTING (m)	NORTHING (m)	DATE	DEPTH (mBGL)	RL* (mAHD)
DD01	387389	6302147	14/08/2014	1.490	57.710
DD02	387395	6301878	14/08/2014	2.240	61.260
DD03	388097	6301810	14/08/2014	1.720	92.280
DD04	387384	6302247	14/08/2014	10.200	47.800
DD05	387393	6301593	14/08/2014	15.050	50.450
DD06	387580	6301442	14/08/2014	14.900	61.600
DD07	387656	6302043	14/08/2014	14.050	54.950
DD08	387589	6301617	14/08/2014	11.000	64.500
DD09	387615	6301828	14/08/2014	1.040	70.900
DD13	387869	6301758	14/08/2014	-	-
DD14	387163	6301690	14/08/2014	4.370	87.130

RL* : Approximate elevation (TBC via on site survey at a later date)

LEEDERVILLE AQUIFER MONITORING BORE DATA

WELL ID	EASTING (m)	NORTHING (m)	DATE	DEPTH (mBGL)	RL* (mAHD)
DD01	387389	6302147	10/06/2014	26.328	32.872
DD02	387395	6301878	10/06/2014	30.531	32.969
DD03	388097	6301810	10/06/2014	57.720	36.280

RL* : Approximate elevation (TBC via on site survey at a later date)

LEGEND

DD01 GROUNDWATER MONITORING BORE ID

SCALE NOT TO SCALE

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CLIENT
CRISTAL PIGMENT AUSTRALIA

PROJECT
RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE
GROUNDWATER LEVELS IN SUPERFICIAL AQUIFER AND LEEDERVILLE FORMATION

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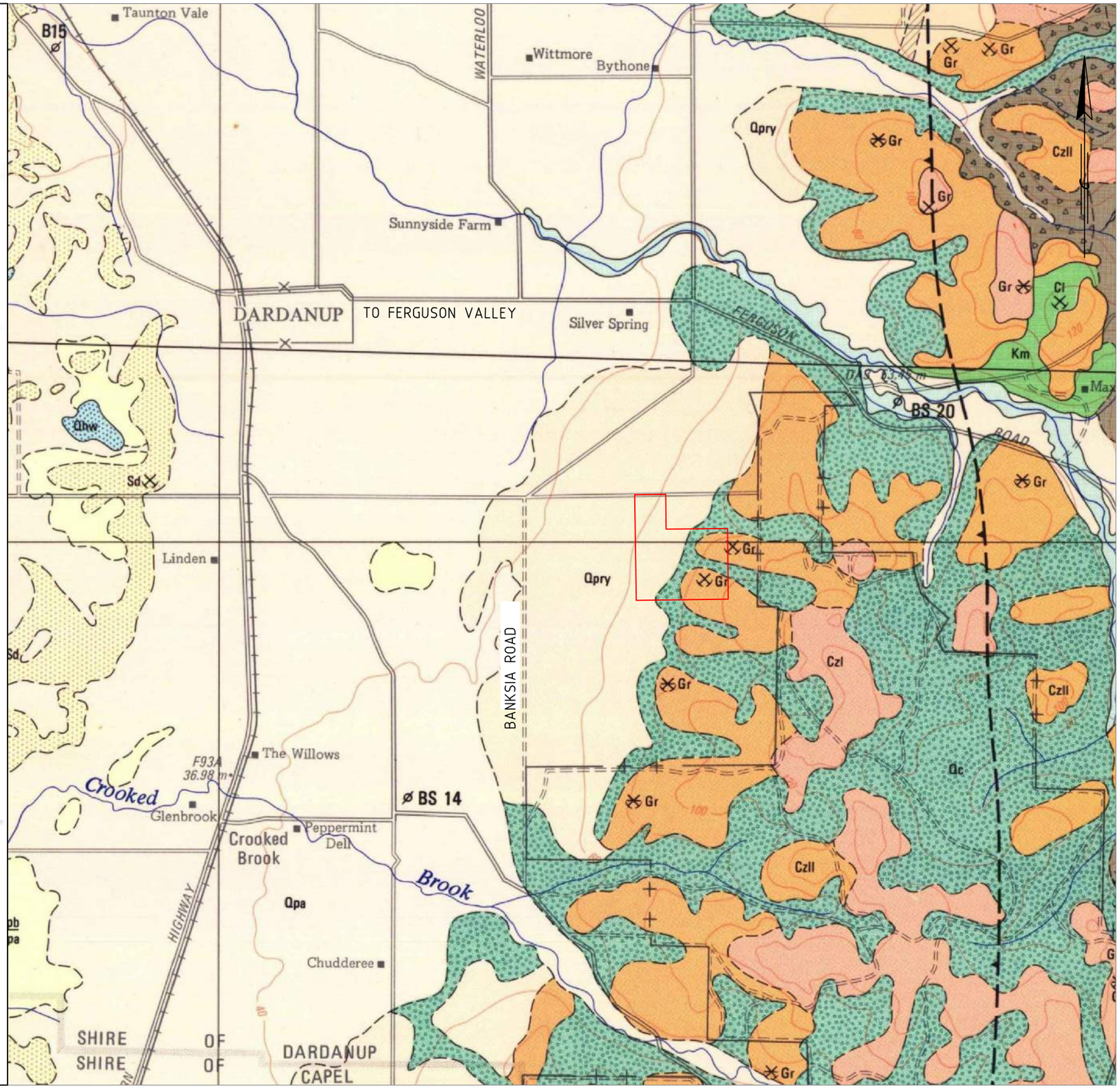
DRAWING NUMBER 5193-G-301 REVISION A

GEOLOGICAL UNIT LEGEND

		PROBABLE MAXIMUM THICKNESS (m)	
PHANEROZOIC	CAINOZOIC	QUATERNARY	HOLOCENE	Qhsm	20	SAFETY BAY SAND : Mobile dunes
				Qhs	40	Calcareous quartz sand dunes
				Qhw	? 5	Swamp deposits, mainly peaty sand
				Qhay	3	younger river terraces
				Qha		Alluvium
				Qhao	? 8	older river terraces
			PLEISTOCENE TO HOLOCENE	Qg	? 3	Lagoonal deposits, mud, silt, shell beds
				Qc	3	Colluvium, some eluvial soils
			PLEISTOCENE	Qts	30	Sand associated with Tamala Limestone, high dunes
				Qtl	40	TAMALA LIMESTONE : eolian and marine calcarenite
				Qpb	15	BASSENDEAN SAND : low rounded dunes
				Qpb / Qpa	5	Thin Bassendean Sand over Guildford Formation
				Qpa	20	GUILDFORD FORMATION : mainly alluvial sandy clay
				Qpry	15	YOGANUP FORMATION : younger element
				Qpr / Qpry	12	YOGANUP FORMATION : including ferruginised ilmenite layer
				Czll	6	Laterite, lower level
				Czl	6	Laterite, massive or pisolitic
	MESOZOIC	CRETACEOUS		Km	20 +	MAXICAR BEDS : siltstone and clay overlying arkose
				Kbb	70	BUNBURY BASALT : tholeiitic vesicular basalt



REGIONAL GEOLOGY PLAN
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APPROVED		

CLIENT: CRISTAL PIGMENT AUSTRALIA

PROJECT: RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE: EXTRACT FROM 1:50,000 GEOLOGICAL MAP BUNBURY-BUREKUP

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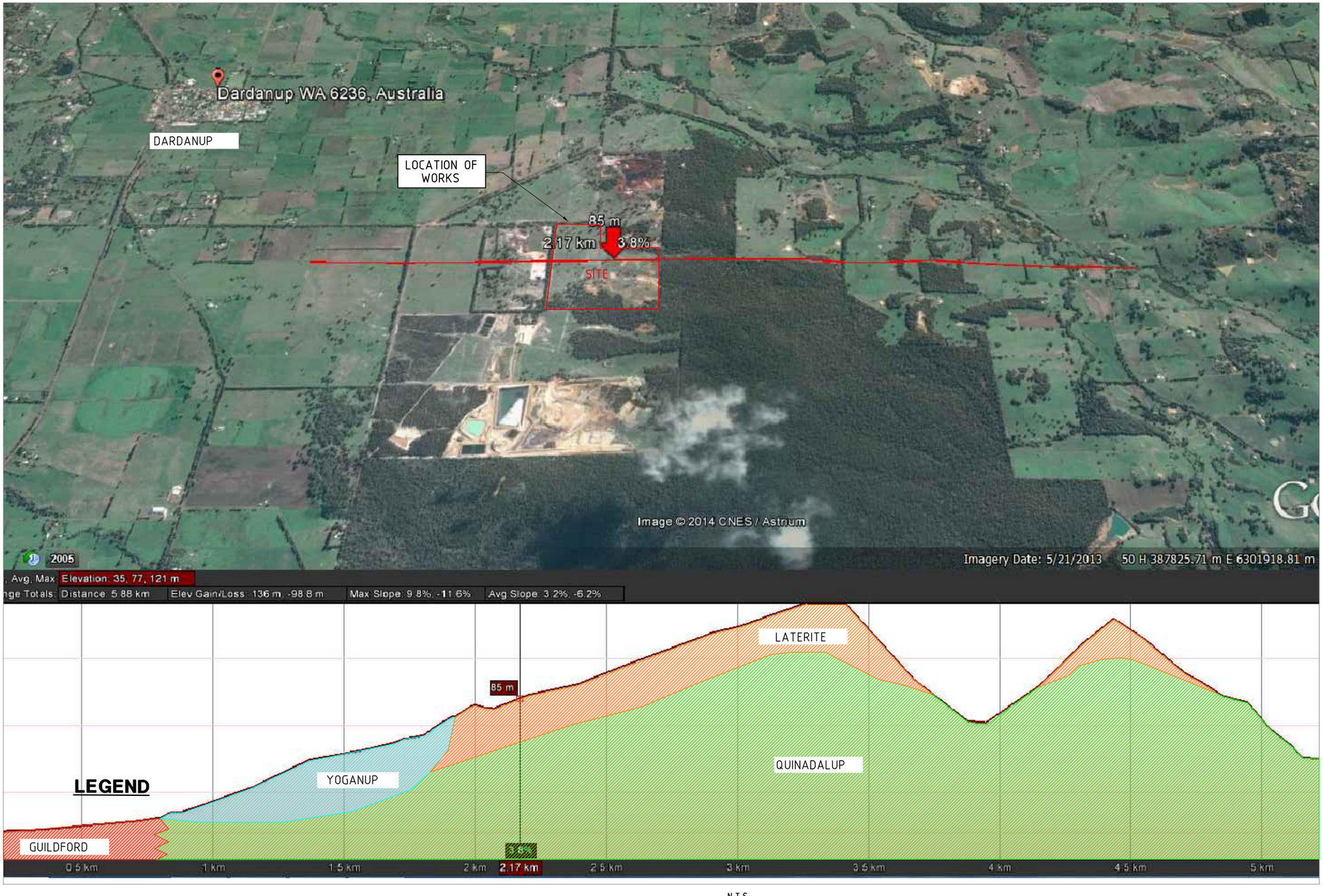

N.T.S

[SOURCE: GOOGLE EARTH]

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CLIENT: CRISTAL PIGMENT AUSTRALIA

PROJECT: RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE: STRATIGRAPHICAL CROSS SECTION

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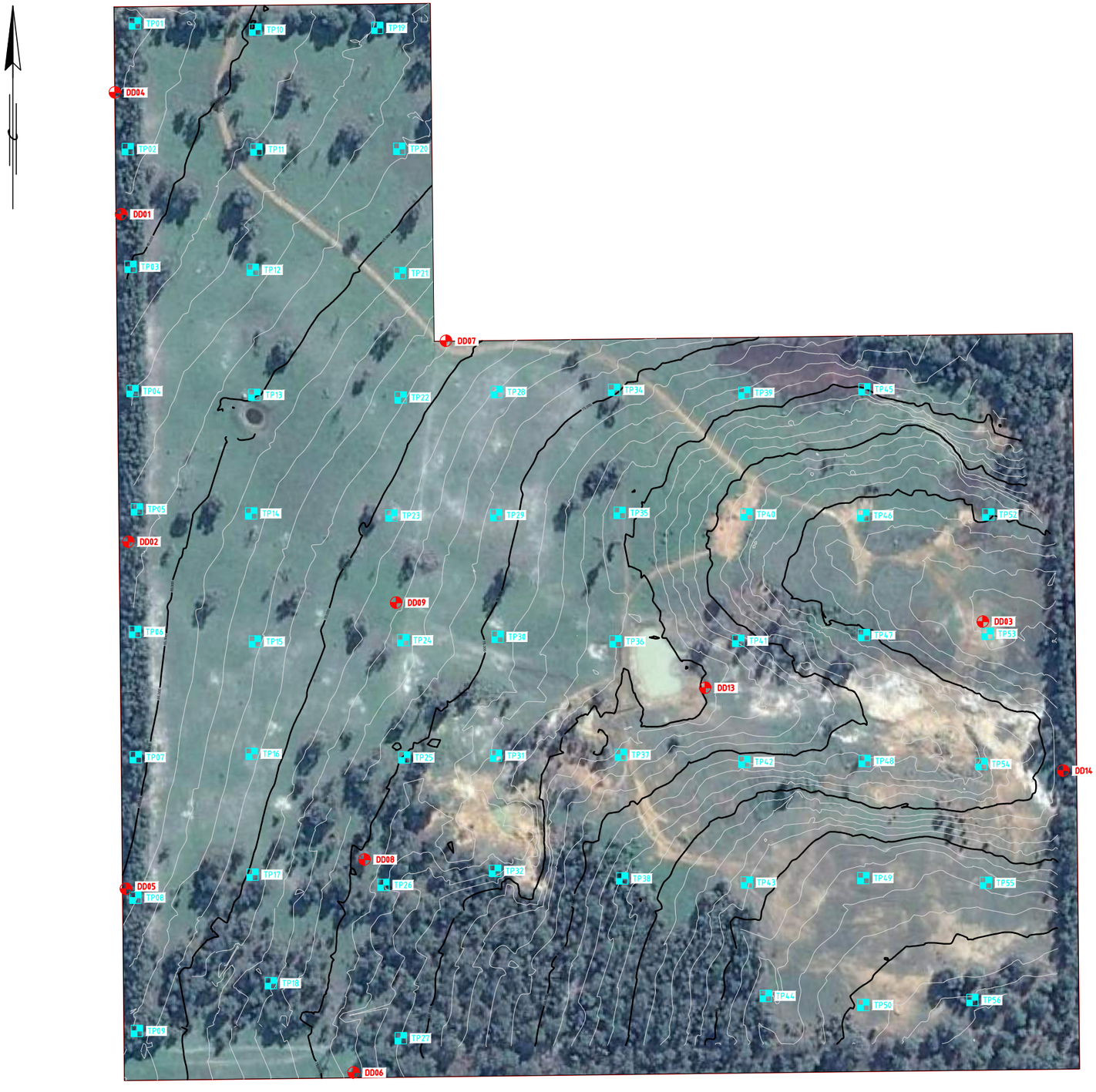

LOCALITY PLAN
N.T.S

LEGEND

DD01 GROUNDWATER MONITORING BORE 1

TP01 TEST PIT 1

GPS DATA (MGA 94)		
POINT ID	EASTING	NORTHING
TP 1	387400	6302304
TP 2	387395	6302201
TP 3	387397	6302104
TP 4	387398	6302002
TP 5	387402	6301905
TP 6	387400	6301804
TP 7	387401	6301701
TP 8	387401	6301586
TP 9	387402	6301476
TP 10	387499	6302299
TP 11	387500	6302200
TP 12	387497	6302101
TP 13	387499	6301999
TP 14	387496	6301901
TP 15	387499	6301796
TP 16	387496	6301704
TP 17	387497	6301605
TP 18	387512	6301515
TP 19	387599	6302300
TP 20	387618	6302201
TP 21	387618	6302099
TP 22	387619	6301997
TP 23	387611	6301900
TP 24	387621	6301797
TP 25	387622	6301701
TP 26	387605	6301596
TP 27	387619	6301470
TP 28	387698	6302001
TP 29	387697	6301900
TP 30	387698	6301800
TP 31	387697	6301702
TP 32	387696	6301608
TP 33	387794	6302003
TP 34	387799	6301902
TP 35	387795	6301796
TP 36	387800	6301703
TP 37	387801	6301601
TP 38	387901	6302000
TP 39	387903	6301901
TP 40	387896	6301797
TP 41	387901	6301697
TP 42	387903	6301598
TP 43	387919	6301505
TP 44	388000	6302003
TP 45	387999	6301900
TP 46	387999	6301801
TP 47	388000	6301698
TP 48	387999	6301602
TP 49	387999	6301498
TP 50	388102	6301900
TP 51	388101	6301802
TP 52	388096	6301695
TP 53	388099	6301598
TP 54	388088	6301502
DD01	387389	6302147
DD02	387395	6301878
DD03	388097	6301810
DD04	387384	6302247
DD05	387393	6301593
DD06	387580	6301442
DD07	387656	6302043
DD08	387589	6301617
DD09	387615	6301828
DD13	387869	6301758
DD14	388163	6301690

SCALE: NOT TO SCALE
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CLIENT: CRISTAL PIGMENT AUSTRALIA

PROJECT: RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE: WML INVESTIGATION LAYOUT PLAN

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DRAWING NUMBER: 5193-G-304 REVISION: A

LEGEND

1400 TEST PIT MARKER - SAND DEPTH 1400mm

SAND STRATA 1m CONTOURS

SITE BOUNDARY

MRWA TEST PIT LAYOUT PLAN

SCALE NOT TO SCALE

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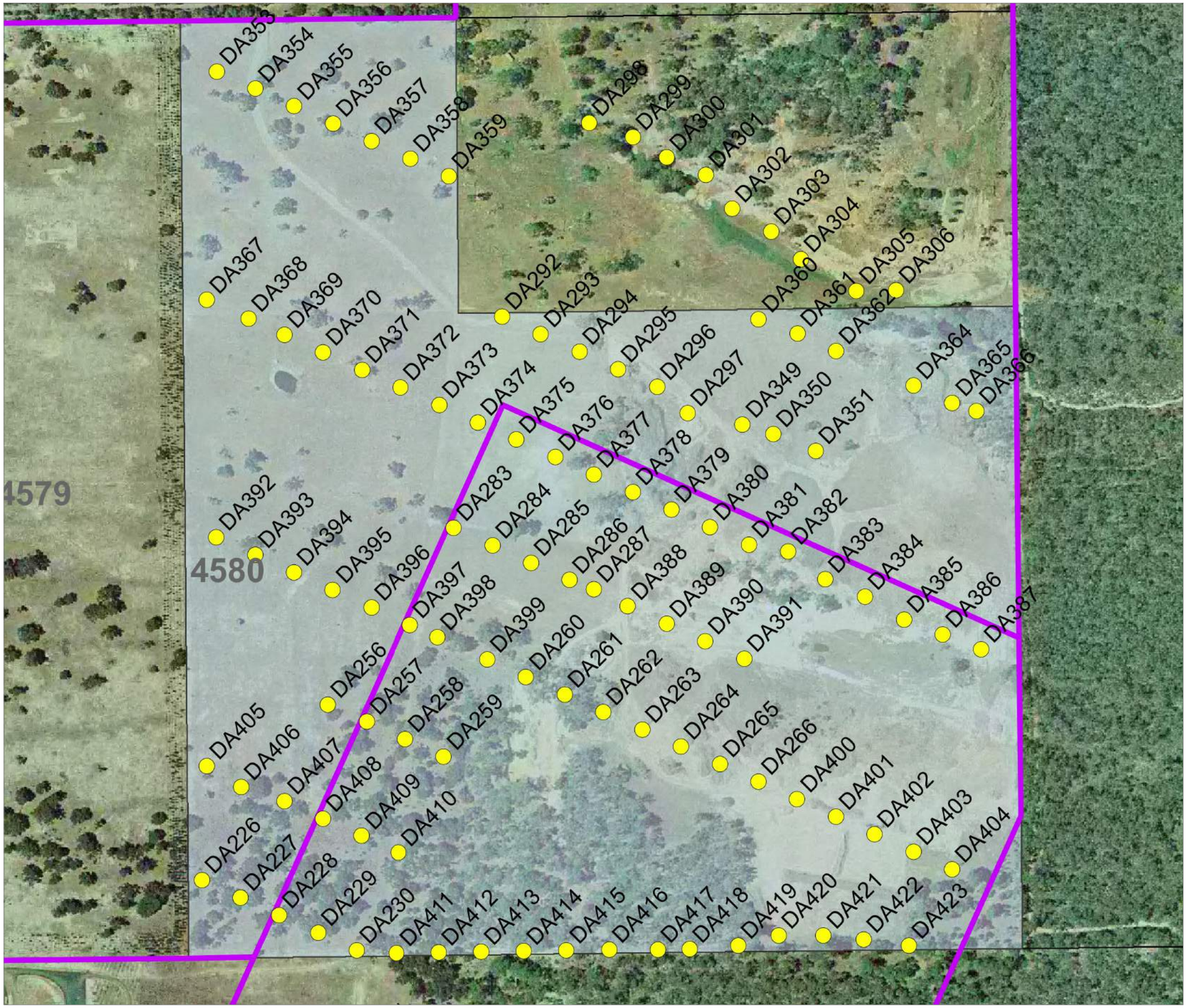
CLIENT
CRISTAL PIGMENT AUSTRALIA

PROJECT
RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE
MAIN ROADS WESTERN AUSTRALIA
SAND INVESTIGATION
TEST PIT LAYOUT

DRAWING NUMBER 5193-G-305 REVISION A



EXTRACT FROM BOREHOLE LAYOUT PLAN
N.T.S

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A1

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CLIENT
CRISTAL PIGMENT AUSTRALIA

PROJECT
RESIDUE DISPOSAL AREA
PANIZZA ROAD DARDANUP

DRAWING TITLE
CRISTAL MINING EXPLORATORY
BOREHOLE LAYOUT

THIS DRAWING SHALL BE TREATED AS PRELIMINARY AND IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AS APPROVED.

DRAWING NUMBER **5193-G-306** REVISION **A**

Appendix A

Results of Fieldwork

Test Pit & Borehole Logs

Insitu Permeability Test Results

Down Hole Data Logger Results

CONSULTING ENGINEERS WML CONSULTANTS	**TRIAL PIT: 1**	SHEET: 1 OF 1
CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387400.3 m E 6302303.6 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				
	1.5			SP	Moist, orange brown, fine to medium grained, **SAND** with some fine to coarse gravel.
	2.0			GP	Moist to wet, orange brown, fine to coarse, **sandy GRAVEL** with a trace of silt.
	2.5				
	3.0				Moist to wet, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.5				
	4.0			SC	Moist, mottled grey, orange and red brown, fine to medium grained, **clayey SAND** with a trace of fine to coarse gravel.
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 2

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387394.6 m E 6302200.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				
	1.5				
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.5			GP	Moist, orange brown, fine to coarse, **sandy GRAVEL**.
	3.0			SC	Moist, mottled pale grey, red and orange brown, fine to medium grained, **clayey SAND** with some fine to coarse gravel.
	3.5				
	4.0			SC	Moist, mottled pale grey, red and orange brown, fine to medium grained, weakly to moderately cemented, **clayey SAND** with some fine to coarse gravel.
	4.5				
	5.0				Hole Terminated at 4.90 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 3

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387396.6 m E 6302103.8 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5				
	2.0				
	2.5			SC	Moist, mottled pale grey and orange brown, **clayey SAND** with a trace of fine to coarse gravel.
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 4.70 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 4

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387398.4 m E 6302001.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND** with some root matter.
	0.5				
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5			SP	Wet, mottled pale grey and orange brown, fine to coarse grained, **gravelly SAND** with a trace of clay.
	2.0				
	2.5			SC	Moist, mottled pale grey and orange brown, fine to medium grained, **clayey SAND** with a trace of fine to coarse gravel.
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 4.80 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 5

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387402.0 m E 6301904.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5				
	2.0			SC	Moist to wet, mottled pale grey and orange brown, fine to coarse grained, **gravelly clayey SAND**.
	2.5				
	3.0			SP	Moist, mottled red and orange brown, fine to medium grained, **clayey SAND** with a trace of fine to coarse gravel.
	3.5				
	4.0			CL	Moist, mottled red and orange brown, hard, **sandy CLAY** with a trace of fine to coarse gravel.
	4.5				
	5.0				Hole Terminated at 4.60 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 6

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387400.4 m E 6301804.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				
	1.5			SP	Moist, pale grey to orange brown, fine to coarse grained, **gravelly SAND** with some silt and a trace of clay.
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.5				
	3.0			SP	Moist to wet, pale grey to orange brown, fine to medium grained, **gravelly SAND** with a trace to some clay and fine to coarse gravel.
	3.5				
	4.0			SC	Moist, mottled pale grey, orange and red brown, fine to medium grained, **clayey SAND** with a trace of fine to medium gravel.
	4.5				
	5.0				Hole Terminated at 4.70 m Collapse

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 7

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387401.1 m E 6301701.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND** with some root matter.
	2.0			SP	Moist, pale grey to orange brown, fine to medium grained, **gravelly SAND** with a trace of silt.
	3.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	4.0			SP	Moist to wet, pale grey to orange brown, fine to medium grained, **gravelly SAND** with a trace to some clay and fine to coarse gravel.
	5.0				Hole Terminated at 4.90 m Collapse

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 8

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387400.8 m E 6301585.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND**.
	2.0			SP	Moist, orange brown, fine to medium, **SAND** with some fine to coarse gravel.
	2.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	4.5			SC	Moist, mottled orange brown and cream, fine to medium grained, **clayey SAND** with some fine to coarse laterite gravel.
					Hole Terminated at 4.60 m Collapse
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 9

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387402.0 m E 6301476.2 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.8			SP	Moist, orange brown, fine to medium grained, **gravelly SAND** with some clay.
	4.8			SC	Moist, orange brown mottled red, fine to medium grained, **clayey SAND** with a trace of fine to coarse gravel.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 10

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387499.3 m E 6302298.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, grey brown, fine to medium grained, **SAND**.
	1.0				
				GP	Moist, grey brown, fine to coarse, **sandy GRAVEL**.
	1.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.0				
	2.5			GP	Moist, mottled grey and orange brown, fine to coarse, **sandy GRAVEL**.
	3.0			SC	Moist, mottled grey and orange brown, fine to medium grained, **clayey SAND**.
	3.5			SC	Moist, mottled pale grey, red and orange brown, fine to medium grained, **clayey SAND**.
	4.0				
	4.5				
	5.0				Hole Terminated at 4.80 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 11

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387500.2 m E 6302200.2 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				
	1.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.0				Hole Terminated at 1.70 m Refusal
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 12

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387497.2 m E 6302101.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	0.5				
	1.0				
	1.5				
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.5				
	3.0				Hole Terminated at 3.00 m Refusal
	3.5				
	4.0				
	4.5				
	5.0				

CONSULTING ENGINEERS
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TRIAL PIT: 13

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387498.5 m E 6301998.6 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				
	1.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.0			GP	Moist to wet, grey brown, fine to coarse, **sandy GRAVEL**.
	2.5				
	3.0				
	3.5			SC	Moist, mottled grey and orange brown, fine to medium grained, **clayey SAND**.
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 14

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387496.0 m E 6301901.2 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5				
	2.0				
	2.5				
	3.0			CL	Moist, mottled grey and orange brown, hard, **sandy CLAY**.
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 15

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387498.9 m E 6301796.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5			GP	Moist to wet, grey brown, fine to coarse, **sandy GRAVEL**.
	2.0				
	2.5			SC	Moist, mottled grey, red and orange brown, fine to medium grained, **sandy CLAY**.
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 16

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387496.3 m E 6301703.8 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, black to dark grey, fine to medium grained, **silty SAND** with roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND**.
	2.5			SP	Moist, orange brown, fine to medium grained, **gravelly SAND**.
	3.5			GP	Moist, orange brown, fine to medium, **sandy GRAVEL**.
	4.5				Hole Terminated at 4.50 m Collapse
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 17

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387496.9 m E 6301604.6 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with some large root matter.
	1.0				
	1.5				
	2.0			SP	Moist, orange brown, fine to medium grained, **SAND**.
	2.5				
	3.0			GP	Moist, orange brown, medium to coarse, **sandy GRAVEL** with a trace to some cobbles and boulders.
	3.5				
	4.0				Hole Terminated at 4.10 m Refusal
	4.5				
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 18

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: ACP
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 17/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387512.1 m E 6301515.4 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, orange brown, fine to medium grained, **SAND** with some silt at depth. [Large root matter to 1.0m depth]
	3.0				Moist, orange brown, **FERRICRETE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	4.0			SP	Moist, pale grey mottled orange brown, fine to medium grained, **gravelly SAND** with some clay.
	4.5			SC	Moist, pale grey mottled orange brown, fine to medium grained, **clayey SAND** with some gravel.
	5.0				Hole Terminated at 4.90 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 19

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387599.4 m E 6302300.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5			SC	Moist, mottled grey and orange brown, fine to coarse, **clayey SAND**.
	2.0				
	2.5				
	3.0				
	3.5			SC	Moist, white mottled red brown, fine to medium grained, **clayey SAND** with some fine to coarse, gravel and cobbles. [Intermitant iron cementing]
	4.0				
	4.5				
	5.0				Hole Terminated at 4.80 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 20

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387617.6 m E 6302200.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist to wet, grey, fine to medium grained, **SAND**.
	1.0			GPS	Wet, dark brown mottled orange brown, weakly iron cemented, fine to coarse, **sandy GRAVEL**.
	2.5			SC	Wet, mottled grey and orange brown, fine to medium grained, **clayey SAND**.
	4.0			SC	Wet, white mottled red brown, fine to medium grained, **clayey SAND**.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 21

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 18/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387618.0 m E 6302098.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				
	1.5				
	2.0			GPS	Moist to wet, orange brown, weakly iron cemented, fine to coarse, **sandy GRAVEL**.
	2.5				
	3.0			SC	Wet, mottled grey and orange brown, fine to medium grained, **clayey SAND**.
	3.5			SC	Wet, dark orange brown, fine to medium grained, **clayey SAND**.
	4.0				
	4.5				
	5.0				Hole Terminated at 4.80 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 22

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387618.7 m E 6301996.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.5				Wet, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.0			GP	Wet, grey, fine to coarse, **clayey sandy GRAVEL**.
				CL	Moist, mottled orange brown and grey, fine to medium grained, **sandy CLAY**.
	4.5			CL	Moist, white mottled red brown, fine to medium grained, **CLAY** with some sand.
				CL	Moist, orange brown, fine to medium grained, **sandy CLAY**.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 23

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387611.2 m E 6301899.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist to wet, pale grey, fine to medium grained, **SAND**.
	1.5			GP	Wet, grey brown, fine to coarse, **sandy GRAVEL** [Becoming cemented at ~2.0m and excavated as sandy GRAVEL with cobbles]
	3.0			CL	Moist, mottled grey and orange brown, hard, **sandy CLAY**.
	4.0			CL	Moist, mottled grey and red brown, hard, **sandy CLAY** with fine to medium gravel.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 24

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387620.6 m E 6301797.1 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND**.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5				
	2.0			CL	Moist, mottled grey and orange brown, hard, **sandy CLAY** with some fine to medium gravel.
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				Moist, dark brown, **"COFFEE ROCK"** in a hard **sandy CLAY** matrix. [Excavated as fine to coarse, **sandy clayey GRAVEL & COBBLES**]
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 25

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387621.7 m E 6301700.8 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, orange brown, fine to medium grained, **SAND** with a trace of silt.
	2.0			GP	Moist, orange brown, fine to medium, **sandy GRAVEL**.
	3.0			CL	Moist, mottled red and orange brown, **clayey SAND** with some fine to medium gravel.
	4.5				Moist, grey, fine to medium grained, **CEMENTED SAND**. [Excavated as angular cobbles and boulders]
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 26

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387604.6 m E 6301596.1 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, orange brown, fine to medium grained, **SAND** with a trace of silt and some root matter from adjacent trees.
	3.7				Hole Terminated at 3.70 m Collapse

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 27

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: Picton Civil Pty Ltd	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE: CAT 322B	LOGGED DATE: 21/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387618.9 m E 6301470.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, orange brown, fine to medium grained, **SAND**.
	2.0			GP	Moist, orange brown, fine to coarse, **sandy GRAVEL**.
	2.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.0			SC	Moist, mottled grey and orange brown, fine to medium, **clayey SAND** with some fine to medium gravel.
	5.0				Moist, dark red brown, **FERRICRETE**. [Excavated as fine to medium grained, gravelly clayey SAND with cobbles and boulders]
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 28

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387697.6 m E 6302001.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				
	1.5				
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.5			GP	Moist, mottled grey and orange brown, fine to coarse, **sandy GRAVEL** with some cobbles.
	3.0				
	3.5				
	4.0			SC	Moist, mottled pale grey and orange brown, fine to medium grained, **clayey SAND** with a trace to some fine to medium gravel.
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 29

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387697.1 m E 6301899.9 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				
	1.5				
	2.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	2.5			GP	Moist, mottled grey and orange brown, fine to coarse, **sandy GRAVEL** with some cobbles.
	3.0				
	3.5			SC	Moist, mottled pale grey and orange brown, fine to medium grained, **clayey SAND** with some fine to coarse gravel and occasional cobble.
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 30

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387698.2 m E 6301799.9 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
					Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	0.5				
	1.0				
	1.5			SP	Moist, grey brown, fine to medium grained, **SAND** with a trace of silt.
	2.0				
	2.5				
	3.0				Mottled red and orange brown, hard, **sandy CLAY**.
	3.5				
	4.0			CL	
	4.5				
					Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 31

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387697.0 m E 6301702.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	0.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.0				
	1.5			GP	Moist, brown, fine to medium, **sandy GRAVEL**.
	2.0			SP	Moist, cream mottled orange brown, fine to medium, **gravelly SAND** with a trace of clay.
	2.5			SC	Moist, cream mottled orange brown, fine to medium grained, **clayey SAND** with some gravel.
	3.0			SC	Moist, cream mottled orange brown, **clayey SAND**.
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 32

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387696.2 m E 6301607.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.5			SP	Moist, orange brown, fine to medium grained, **SAND** with a trace of silt.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5			SP	Moist, orange brown, fine to medium, **gravelly SAND** with a trace of clay.
	2.0				
	2.5				
	3.0				Moist, dark brown, **FERRICRETE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.5			SC	Moist, cream mottled orange brown, fine to medium grained, **clayey SAND**.
	4.0				
	4.5				Hole Terminated at 4.50 m Target depth
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 34

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387794.1 m E 6302002.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5				
	2.0			SC	Moist, mottled pale grey and orange brown, fine to medium grained, **clayey SAND**.
	2.5				
	3.0				
	3.5				
	4.0				
	4.5			CL	Moist, mottled pale grey and orange brown, fine to medium grained, **sandy CLAY**.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 35

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387798.6 m E 6301901.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, grey brown, fine to medium grained, **SAND** with a trace of silt.
	0.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.0			SC	Moist, dark red brown, fine to medium grained, **clayey SAND** with some fine gravel.
	1.5				
	2.0			SC	Moist, mottled cream, red and orange brown, fine to medium grained, **clayey SAND**.
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 36

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387795.2 m E 6301796.1 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, pale grey to orange brown, fine to medium grained, **SAND** with a trace of silt.
	2.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.0			SC	Moist, mottled cream, red and orange brown, fine to medium grained, **clayey SAND**.
	4.0				Hole Terminated at 4.00 m Collapse

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 37

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387799.5 m E 6301703.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SP	Moist, red brown mottled orange brown, fine to medium grained, **clayey SAND** with a trace of fine to medium gravel.
	3.0				Moist, dark brown, **FERRICRETE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	3.3				Hole Terminated at 3.30 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 38

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 14/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387800.6 m E 6301601.4 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				CL	Moist, red brown, hard, **sandy CLAY**.
	4.5				Hole Terminated at 4.50 m Machine Limit

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 39

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387901.0 m E 6302000.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.5			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	1.0				
	1.5			SP	Moist, red and orange brown, fine to coarse grained, **SAND** with some clay and fine to medium gravel.
	2.0				
	2.5				
	3.0				
	3.5			SC	Moist, white mottled orange brown, fine to coarse grained, **clayey SAND**.
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 40

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387902.8 m E 6301900.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0				Moist, mottled red brown and orange brown, fine grained, **silty SAND** with trace of clay.
	0.5				
	1.0				
	1.5				
	2.0				
	2.5			SM	
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 41

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387896.1 m E 6301796.7 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SC	Moist, orange brown to red brown, fine to medium grained, **clayey SAND**.
	1.0				
	1.5				
	2.0				
	2.5				
	3.0			CL	Moist, white mottled orange brown and red brown, hard, **sandy CLAY**.
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 4.80 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 42

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387901.1 m E 6301697.2 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5				Moist, orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.0				
	1.5				
	2.0				
	2.5			GP	Moist, orange brown, fine to coarse, **GRAVEL** in a clayey sand matrix with some cobbles.
	3.0				
	3.5				Moist, orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	4.0			SC	Moist, white mottled orange and red brown, fine to coarse grained, **clayey SAND**.
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 43

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387903.0 m E 6301598.1 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				GP	Moist, black to dark grey, fine to coarse, **silty sandy GRAVEL** with some cobbles and boulders.
	0.5				Moist, orange brown, weak to moderate strength, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.0			CL	Moist, white mottled red, **sandy CLAY**.
	1.5				
	2.0			CL	Moist, pale grey mottled orange brown, **sandy CLAY**.
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Moist, red, **FERRICRETE** in a white, **CLAY** matrix.
					Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 44

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387918.6 m E 6301505.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			SP	Moist, orange brown, fine to coarse grained, **gravelly SAND** with a trace of clay.
	1.0				
	1.5			SC	Moist to wet, orange brown, fine grained, **clayey SAND** with a trace of gravel.
	2.0				
	2.5				
	3.0				
	3.5			CL	Moist to wet, white mottled red, hard, **sandy CLAY**.
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 45

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387999.7 m E 6302003.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0				Moist, brown to black, decomposing **SAWDUST**. [Fiberous, peat like structure, highly compressible]
	2.0			SP	Moist, grey mottled orange brown, fine to medium grained, **SAND** with some clay.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 46

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387998.8 m E 6301899.6 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SC	Moist, orange brown to red brown, fine to medium grained, **clayey SAND**.
	2.0			SC	Moist, white mottled red brown, fine to medium grained, **clayey SAND**.
	4.5				Moist, red, **FERRICRETE** in a white, **CLAY** matrix.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 47

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387999.3 m E 6301801.4 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0				Moist, black, fine to medium grained, **silty SAND** with roots, organic matter and construction waste (concrete, plastic sheeting).
	1.8			SC	Moist, mottled red and orange brown, fine to coarse grained, **gravelly clayey SAND** with some cobbles.
	2.8			SC	Moist, white mottled red brown, fine to coarse grained, **gravelly clayey SAND**.
	4.0				Moist, red, **FERRICRETE** in a white, **CLAY** matrix.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 48

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388000.0 m E 6301697.9 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.5			SP	Moist, pale grey, fine to medium grained, **SAND** with a trace of silt.
	1.0				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
	1.5			GP	Moist, dark grey, fine to coarse, **sandy GRAVEL**.
	2.0			SC	Moist, mottled orange brown and white, fine to medium grained, **clayey SAND** with some fine to coarse gravel.
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 49

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 15/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387998.9 m E 6301601.8 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SC	Moist, mottled orange and red brown, fine to medium grained, **clayey SAND** with fine to coarse gravel.
	0.5				Moist, red to orange brown, **LATERITE**. [Excavated as sandy GRAVEL, COBBLES & BOULDERS]
				SC	Moist, mottled white, orange and red brown, fine to medium grained, **clayey SAND** with fine to coarse gravel.
	1.0				
	1.5				
	2.0				
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
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TRIAL PIT: 50

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 387998.8 m E 6301497.5 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	0.5			CL	Moist, mottled pale grey and orange brown, hard, **CLAY**.
	1.0				
	1.5				
	2.0				Moist, red, **FERRICRETE** in a mottled pale grey and orange brown, **CLAY** matrix.
	2.5				
	3.0				
	3.5				
	4.0			CL	Moist, white mottled red brown, **CLAY**.
	4.5				Hole Terminated at 4.50 m Machine Limit
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 52

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388101.6 m E 6301900.3 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.5				Moist, brown to black, decomposing **SAWDUST**. [Fiberous, peat like structure, highly compressible]
	1.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
	1.5			SC	Moist, mottled white and red brown, **clayey SAND**.
	2.0				
	2.5				
	3.0				
	3.5				
	4.0				
	4.5				
	5.0			CL	Moist, pale grey, hard, **CLAY**.
					Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 53

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388100.7 m E 6301802.4 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			CL	Moist, orange brown, hard, **CLAY**.
	2.5			CL	Moist, pale grey, hard, **CLAY**.
	3.8				Moist, red, **FERRICRETE** in a mottled pale grey and red brown, **sandy CLAY** matrix.
	4.0				Hole Terminated at 4.00 m Refusal

CONSULTING ENGINEERS
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TRIAL PIT: 54

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388095.7 m E 6301695.4 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.5			CL	Moist, mottled white and orange brown, **CLAY** with intermittent cemented strata.
	1.0				
	1.5				
	2.0			CL	Moist, mottled white and red brown, **CLAY** with intermittent cemented strata.
	2.5				
	3.0				Hole Terminated at 3.00 m Refusal
	3.5				
	4.0				
	4.5				
	5.0				

CONSULTING ENGINEERS
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TRIAL PIT: 55

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388099.4 m E 6301597.8 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SM	Moist, dark grey to black, fine to medium grained, **silty SAND** with some roots and organic matter.
				SC	Moist, mottled orange and red brown, fine to medium grained, **clayey SAND** with a trace of fine to coarse gravel.
	2.0			SC	Moist, mottled white, red and orange brown, fine to medium grained, **clayey SAND**
	3.8				Moist, red, **FERRICRETE** in a white mottled red brown, **clayey SAND** matrix.
	4.0			SC	Moist, white mottled red brown, fine to medium grained, **clayey SAND**.
	5.0				Hole Terminated at 5.00 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

TRIAL PIT: 56

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR:	LOGGED: MCC
PROJECT: Residue Disposal Area	MACHINE:	LOGGED DATE: 16/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL:
JOB NO.: 5193	POSITION: 388088.4 m E 6301501.6 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			GP	Moist, pale brown, fine to medium, **sandy GRAVEL**.
				GP	Moist, orange brown, fine to medium, **clayey sandy GRAVEL**.
	0.5			GP	Moist, mottled red and orange brown, fine to medium, **clayey sandy GRAVEL**. [Partially cemented]
				CL	Moist, mottled white and orange brown, hard, **CLAY** with some sand.
	1.0				
	1.5			CL	Moist, pale grey, hard, **CLAY**.
	2.0				
	2.5			CL	Moist, white mottled red brown, hard, **CLAY** with a trace to some fine to medium gravel.
	3.0				Hole Terminated at 3.10 m Refusal
	3.5				
	4.0				
	4.5				
	5.0				

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD04

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 24 - 25/06/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 58.00 m
JOB NO.: 5193	POSITION: 387384.0 m E 6302247.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	1.0			SP	Light grey-brown tending yellow-brown, medium dense, fine to medium grained, **SAND** with a trace of silt.
	2.0	2.23m SPT 9/25 (150mm)/- N>50 2.68m		SP-SM	Orange-brown mottled light grey, very dense, fine to medium grained, **iron cemented SAND** with some silt and a trace of clay. *Refusal of 95mm diameter titanium carbide bit at 2.8m*
	3.0				
	4.0	3.96m SPT 9/17/25 N=42 4.41m		SC	Orange-brown mottled light grey, dense, fine to coarse grained, **weakly iron cemented clayey SAND** with a trace of ironstone gravel.
	5.0			CS	Red-brown mottled light grey, very stiff to hard, **sandy CLAY**.
	6.0	5.97m SPT 28 (150mm)/-/- N>50 6.42m		SC	Red-brown mottled light grey, very dense, fine to coarse grained, **iron cemented clayey SAND**.
	7.0				

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD04

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 24 - 25/06/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 58.00 m
JOB NO.: 5193	POSITION: 387384.0 m E 6302247.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
		8.08m SPT 18/25 (110mm)/- N>50 8.53m		SC	Red-brown mottled light grey, very dense, fine to coarse grained, **iron cemented clayey SAND**. *(continued)* Tending weakly iron cemented.
	9.0				Cream mottled red-brown, very dense, fine to medium grained, weakly iron cemented **clayey SAND** with a trace of coarse sand.
	10.0	10.01m SPT 21/25 (95mm)/- N>50 10.46m			
	11.0			SC	
	12.0	12.25m SPT 11/18/25 N=43 12.70m			
	13.0				Cream, dense, fine to coarse grained, **SAND** with some clay. Occasionally thinly interbedded with cream, **silty CLAY** bands, 20-60mm thick.
	14.0			SP-SC	
	15.0	14.98m SPT 10/15/22 N=37 15.43m			
					Hole Terminated at 15.43 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD05

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 26 - 27/06/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 65.50 m
JOB NO.: 5193	POSITION: 387393.0 m E 6301593.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	(TOPSOIL) Grey, fine to medium grained, **silty SAND** with roots.
				SP	Light grey, medium dense, fine to medium grained, **SAND** with a trace of silt.
	1.0				
	2.0			SP	Orange-brown, dense, fine to medium grained, **SAND** with some fine gravel and a trace of clay.
	3.0			SM	Orange-brown, very dense, fine to medium grained, **iron cemented silty SAND** with a trace of clay.
	4.0	3.99m SPT 18/25 (100mm)/- N>50 4.44m		SM	Orange-brown mottled light grey, very dense, fine to medium grained, **weakly cemented silty SAND** with some fine gravel and a trace of clay.
	5.0				
	6.0	5.95m SPT 13/21/30 N=51 6.40m		SC	Red-brown mottled light grey, dense to very dense, fine to coarse grained, **clayey SAND**.
	7.0				
		8.02m			

CONSULTING ENGINEERS
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BOREHOLE: DD05

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 26 - 27/06/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 65.50 m
JOB NO.: 5193	POSITION: 387393.0 m E 6301593.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
		SPT 9/12/18 N=30 8.47m		SC	Cream mottled pink-brown, dense tending very dense, fine to medim grained, **clayey SAND** with a trace of coarse sand. Occasional thin cream, **silty CLAY** bands.
	9.0				
	10.0	10.05m SPT 11/16/21 N=37 10.50m			
	11.0				
	12.0				
		12.58m SPT 12/17/23 N=40 13.03m			
	13.0				
	14.0				
	15.0	15.00m SPT 12/22/29 N=51 15.45m			
					Hole Terminated at 15.45 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD06

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 30/06 - 01/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 76.70 m
JOB NO.: 5193	POSITION: 387580.0 m E 6301442.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	(TOPSOIL) Grey, fine to medium grained, **silty SAND** with roots.
				SP	Yellow-brown, medium dense, fine to medium grained, **SAND**.
	1.0				
	2.0	2.20m SPT 6/25 (130mm)/- N>50 2.65m		SP	Orange-brown to light brown, very dense, fine to medium grained, **iron cemented SAND**.
	3.0				
	4.0	4.05m SPT 5/8/11 N=19 4.50m		SP-SC	Red-brown mottled light grey, dense, fine to medium grained, **weakly cemented SAND** with some clay.
	5.0			CS	Cream mottled red-brown, hard, **weakly cemented sandy silty CLAY**.
	6.0	5.87m SPT 15/25 (90mm)/- N>50 6.32m			
	7.0			SP-SC	Cream mottled pink-brown, medium dense to dense, fine to medium grained, **silty SAND** with some clay and coarse sand. Occasional thin cream, **silty CLAY** bands 20-60mm thick.

CONSULTING ENGINEERS
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BOREHOLE: DD06

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 30/06 - 01/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 76.70 m
JOB NO.: 5193	POSITION: 387580.0 m E 6301442.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
		8.04m SPT 13/17/24 N=41 8.49m		SP-SC	Cream mottled pink-brown, medium dense to dense, fine to medium grained, **silty SAND** with some clay and coarse sand. Occasional thin cream, **silty CLAY** bands 20-60mm thick. *(continued)*
	9.0				
	10.0	10.08m SPT 6/11/15 N=26 10.53m			
	11.0				
	12.0	12.54m SPT 6/13/18 N=31 12.99m			
	13.0				
	14.0				
	15.0	15.05m SPT 8/18/19 N=37 15.50m			
					Hole Terminated at 15.50 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD07

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 02 - 04/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 68.90 m
JOB NO.: 5193	POSITION: 387656.0 m E 6302043.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SM	(TOPSOIL) Grey, fine to medium grained, **silty SAND** with roots.
	1.0			SP	Light brown, fine to medium grained, **SAND**.
	2.0	2.00m SPT No Penetration N>50			Orange-brown, weak, **LATERITE** locally non-intact. *SCR=55%, RQD=10%*
	3.0			SC	Cream mottled orange and red-brown, dense, fine to coarse grained, **clayey SAND** with a trace of gravel.
	4.0	4.05m SPT 9/13/22 N=35 4.50m			
	5.0				
	6.0	6.04m SPT 5/7/10 N=17 6.49m		SP-SC	Cream mottled pink-brown, medium dense, fine to coarse grained, **SAND** with some clay.
	7.0				
		8.01m			

CONSULTING ENGINEERS
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BOREHOLE: DD07

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE: 02 - 04/07/2014
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 68.90 m
JOB NO.: 5193	POSITION: 387656.0 m E 6302043.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
		SPT 6/10/13 N=23 8.46m			Cream locally mottled orange, medium dense, fine to coarse grained, **SAND** with some clay. Occasionally very thinly interbedded cream, **silty CLAY** layers (2mm).
	9.0				
		9.99m			
	10.0	SPT 5/10/11 N=21 10.44m			
	11.0				
				SP-SC	
	12.0				
		12.48m			
		SPT 8/11/14 N=25 12.93m			
	13.0				
	14.0				
		14.96m			
	15.0	SPT 6/10/14 N=24 15.41m			
					Hole Terminated at 15.41 m Target depth

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD08

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 75.40 m
JOB NO.: 5193	POSITION: 387589.0 m E 6301617.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	1.0			SP	Yellow-brown, loose to medium dense, fine to medium grained, **SAND** with a trace of silt.
	2.0	2.10m SPT 2/2/2 N=4 2.55m			
	3.0	3.12m SPT 2/3/3 N=6 3.57m			
	4.0	4.05m SPT 2/4/4 N=8 4.50m			As above, with some red-brown ironstone gravel.
	5.0	4.98m SPT 7/11/12 N=23 5.43m		SP	Grey-brown mottled orange, medium dense, fine to coarse grained, **SAND** with some gravel and a trace of clay. *Gravel content decreasing with depth.*
	6.0	6.01m SPT 12/17/23 N=40 6.46m			
	7.0	7.57m SPT 25 (120mm)/-/- N>50 7.69m		SC	Orange-red mottled light grey, hard, fine to medium grained, **sandy CLAY**. *SPT refusal on possible thin ferricrete layer or boulder at 7.69m*

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD08

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 75.40 m
JOB NO.: 5193	POSITION: 387589.0 m E 6301617.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
				SC	Orange-red mottled light grey, hard, fine to medium grained, **sandy CLAY**. *SPT refusal on possible thin ferricrete layer or boulder at 7.69m (continued)*
	9.0	8.98m SPT 18/25 (90mm)/- N>50 9.43m		SC	Light grey, very dense, fine to medium grained, **clayey SAND**. Interbedded with light grey, **silty CLAY** in thin horizontal layers. *A thin vertical seam of clayey SAND was interbedded within the silty CLAY layer, discontinues after 50-100mm.*
					As above, tending light brown mottled cream.
					Well cemented FERRICRETE.
	10.0			CS	Red-brown and light grey, hard/very dense, **sandy CLAY / CLAY with some sand**.
					Well cemented FERRICRETE.
		10.50m SPT 22/25 (150mm)/- N>50 10.95m		CS	Red-brown and light grey, hard/very dense, **sandy CLAY / CLAY with some sand**.
	11.0			SC	Pink-brown mottled light grey and orange, dense to very dense, fine to coarse grained, **clayey SAND**.
	12.0	12.00m SPT 11/18/25 (120mm) N>50 12.45m			
					Hole Terminated at 12.45 m Target depth
	13.0				
	14.0				
	15.0				

CONSULTING ENGINEERS
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BOREHOLE: DD09

SHEET: 1 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 71.80 m
JOB NO.: 5193	POSITION: 387615.0 m E 6301828.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	1.0	1.13m SPT 11/25 (150mm)/- N>50 1.58m		SP	Light brown, fine to medium grained, **SAND** with a trace of silt.
		1.88m		SPG	Dark brown mottled orange, very dense, fine to medium grained, **weakly cemented silty gravelly SAND**.
	2.0	SPT 4/4/8 N=12 2.33m		SP	Light grey, medium dense, fine to medium grained, **SAND** with a trace of clay.
	3.0				
	4.0	4.10m SPT 20/25 (125mm)/- N>50 4.55m		CL	Light grey, hard, **CLAY** with some sand. Mottled with orange-red, fine to medium grained, **cemented SAND**.
	5.0			SC	Light grey, dense, fine to coarse grained, **clayey SAND** with a trace of fine quartz gravel.
	6.0	5.96m SPT 15/18/22 N=40 6.41m			
	7.0			CS	Light grey, **sandy CLAY**. Mottled with light grey, fine to coarse grained, **SAND** with some clay.
		7.98m			

CONSULTING ENGINEERS
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BOREHOLE: DD09

SHEET: 2 OF 2

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 71.80 m
JOB NO.: 5193	POSITION: 387615.0 m E 6301828.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
		SPT 8/14/19 N=33 8.43m		CS	Light grey, **sandy CLAY**. Mottled with light grey, fine to coarse grained, **SAND** with some clay. *(continued)*
			F F		**FERRICRETE**.
					Red-brown, dense, fine to medium grained, **clayey SAND**.
	9.0				As above, light grey.
	10.0	10.03m SPT 9/12/16 N=28 10.48m		SC	
					Hole Terminated at 10.48 m Target depth
	11.0				
	12.0				
	13.0				
	14.0				
	15.0				

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD13

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 80.20 m
JOB NO.: 5193	POSITION: 387869.0 m E 6301758.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SPG	Grey, fine to medium grained, **gravelly SAND** with cobbles. *Fill.*
	1.0			SC	Orange-brown and light brown, fine to medium grained, **cemented clayey SAND** with cobbles.
	2.0			SC	Orange-brown and light brown, fine to medium grained, **clayey SAND**.
	3.0			SP	Red-brown and cream, fine to coarse grained, **weakly cemented SAND**.
	4.0			SP	Red-brown and cream, fine to coarse grained, **SAND**. *BH collapse to 4.0m*
	5.0				Hole Terminated at 5.00 m Target depth
	6.0				
	7.0				

CONSULTING ENGINEERS
WML CONSULTANTS

BOREHOLE: DD14

SHEET: 1 OF 1

CLIENT: Cristal Pigment Australia Ltd	CONTRACTOR: WML Consultants	LOGGED: PDD
PROJECT: Residue Disposal Area	MACHINE: Drill Rig	LOGGED DATE:
LOCATION: Panizza Road, Dardanup	CO-ORD SYSTEM: MGA94 Zone 50	SURFACE RL: 91.50 m
JOB NO.: 5193	POSITION: 388163.0 m E 6301690.0 m N	CHAINAGE:

WATER	DEPTH (m)	SAMPLES OR FIELD TEST	GRAPHIC LOG	CLASSIFICATION SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION
	0.0			SP	Light grey, fine to medium grained, **SAND** with some roots.
	1.0			SC	Yellow-brown and brown-cream, fine to medium grained, **cemented clayey SAND**.
	3.0			SC	Red-brown, fine to medium grained, **well cemented clayey SAND**.
	4.0				**FERRICRETE**. *Diamond core barrel used.*
	5.0				Hole Terminated at 5.00 m Target depth
	6.0				
	7.0				

Appendix B

Laboratory Test Results

Water Quality Test Results

Cation Exchange Capacity Results

Report Date: 10/06/2014 13:31
Report User Name: crfisher
Report Computer APWKS3707
Application: WinSitu.exe
Application Version: 5.6.22.4

Log File Properties
File Name DD1-Deep-2_2014-06-10_08-49-
Create Date 10/06/2014 8:49

Device Properties
Device Aqua TROLL 200
Site Dardanup
Device Name DD1
Serial Number 323262
Firmware Version 1.26
Hardware Version 2
Device Address 1

Used Memory 4
Used Battery 12

Log Configuration

Log Name	DD01-Deep-2
Created By	crfisher
Computer Name	APWKS3707
Application	WinSitu.exe
Application Version	5.6.22.4
Create Date	21/01/2014 8:40:52 AM W. Australia Standard Time
Log Setup Time Zone	Unknown
Notes Size(bytes)	4096
Overwrite when full	Enabled
Scheduled Start Time	21/01/2014 9:00:00 AM W. Australia Standard Time
Scheduled Stop Time	No Stop Time
Type	Linear
Interval	Days: 0 hrs: 06 mins: 00 secs: 00

Level Reference

Level Measurement Mode	Level Depth To Water
Specific Gravity	0.999
Level Reference Mode:	Set first logged value to offset
Level Reference Offset:	26.27 (m)

Other Log Settings

Depth of Probe:	10.3388 (m)
Head Pressure:	14.6905 (PSI)
Temperature:	27.0065 (C)

Log Notes:

Date and Time	Note
21/01/2014 8:40	Sensor SN: 323262 Factory calibration has expired.:
21/01/2014 8:40	Used Battery: 12% Used Memory: 7% User Name:
10/06/2014 8:49	Suspend Command
10/06/2014 8:49	Log Download - Used Battery: 15% Used Memory: 7% User

Date and Time	Elapsed Time Seconds	Sensor: PCTD(A) 197.3ft SN#: 323262 Level Depth To Water (m)	Sensor: PCTD(A) 197.3ft SN#: 323262 Actual Conductivity (µS)		Estimated Borehole RL 60
21/01/2014 9:00	0	26.27	742.49		33.73
21/01/2014 15:00	21600	26.254	686.315		33.746
21/01/2014 21:00	43200	26.225	683.521		33.775

22/01/2014 3:00	64800	26.238	682.721		33.762
22/01/2014 9:00	86400	26.209	682.281		33.791
22/01/2014 15:00	108000	26.246	681.759		33.754
22/01/2014 21:00	129600	26.207	681.507		33.793
23/01/2014 3:00	151200	26.217	680.983		33.783
23/01/2014 9:00	172800	26.216	680.773		33.784
23/01/2014 15:00	194400	26.213	680.624		33.787
23/01/2014 21:00	216000	26.197	680.351		33.803
24/01/2014 3:00	237600	26.215	680.168		33.785
24/01/2014 9:00	259200	26.216	680.002		33.784
24/01/2014 15:00	280800	26.245	679.966		33.755
24/01/2014 21:00	302400	26.238	679.914		33.762
25/01/2014 3:00	324000	26.257	679.711		33.743
25/01/2014 9:00	345600	26.28	679.625		33.72
25/01/2014 15:00	367200	26.285	679.252		33.715
25/01/2014 21:00	388800	26.279	678.782		33.721
26/01/2014 3:00	410400	26.276	678.533		33.724
26/01/2014 9:00	432000	26.269	678.259		33.731
26/01/2014 15:00	453600	26.281	677.955		33.719
26/01/2014 21:00	475200	26.267	677.455		33.733
27/01/2014 3:00	496800	26.294	677.334		33.706
27/01/2014 9:00	518400	26.286	676.978		33.714
27/01/2014 15:00	540000	26.299	676.839		33.701
27/01/2014 21:00	561600	26.266	676.389		33.734
28/01/2014 3:00	583200	26.258	676.261		33.742
28/01/2014 9:00	604800	26.286	676.032		33.714
28/01/2014 15:00	626400	26.288	676.039		33.712
28/01/2014 21:00	648000	26.268	675.621		33.732
29/01/2014 3:00	669600	26.277	675.161		33.723
29/01/2014 9:00	691200	26.273	674.935		33.727
29/01/2014 15:00	712800	26.304	674.418		33.696
29/01/2014 21:00	734400	26.276	674.082		33.724
30/01/2014 3:00	756000	26.306	673.509		33.694
30/01/2014 9:00	777600	26.319	673.273		33.681
30/01/2014 15:00	799200	26.322	672.919		33.678
30/01/2014 21:00	820800	26.306	672.424		33.694
31/01/2014 3:00	842400	26.317	672.026		33.683
31/01/2014 9:00	864000	26.304	671.394		33.696
31/01/2014 15:00	885600	26.308	671.192		33.692
31/01/2014 21:00	907200	26.287	670.922		33.713
1/02/2014 3:00	928800	26.301	670.731		33.699
1/02/2014 9:00	950400	26.294	670.606		33.706
1/02/2014 15:00	972000	26.305	670.354		33.695
1/02/2014 21:00	993600	26.262	670.065		33.738
2/02/2014 3:00	1015200	26.255	670.027		33.745
2/02/2014 9:00	1036800	26.244	669.944		33.756
2/02/2014 15:00	1058400	26.269	669.833		33.731
2/02/2014 21:00	1080000	26.236	669.64		33.764
3/02/2014 3:00	1101600	26.25	669.591		33.75
3/02/2014 9:00	1123200	26.248	669.569		33.752
3/02/2014 15:00	1144800	26.281	669.378		33.719
3/02/2014 21:00	1166400	26.264	669.063		33.736
4/02/2014 3:00	1188000	26.278	668.82		33.722
4/02/2014 9:00	1209600	26.284	668.727		33.716
4/02/2014 15:00	1231200	26.299	668.546		33.701
4/02/2014 21:00	1252800	26.279	668.162		33.721
5/02/2014 3:00	1274400	26.294	667.95		33.706
5/02/2014 9:00	1296000	26.268	667.825		33.732
5/02/2014 15:00	1317600	26.286	667.589		33.714
5/02/2014 21:00	1339200	26.275	667.408		33.725
6/02/2014 3:00	1360800	26.301	667.378		33.699
6/02/2014 9:00	1382400	26.3	667.219		33.7
6/02/2014 15:00	1404000	26.325	667.087		33.675
6/02/2014 21:00	1425600	26.299	666.795		33.701
7/02/2014 3:00	1447200	26.319	666.559		33.681
7/02/2014 9:00	1468800	26.311	666.338		33.689
7/02/2014 15:00	1490400	26.335	666.104		33.665
7/02/2014 21:00	1512000	26.307	665.914		33.693
8/02/2014 3:00	1533600	26.32	665.605		33.68
8/02/2014 9:00	1555200	26.329	665.581		33.671
8/02/2014 15:00	1576800	26.341	665.403		33.659
8/02/2014 21:00	1598400	26.311	664.948		33.689
9/02/2014 3:00	1620000	26.319	664.679		33.681

9/02/2014 9:00	1641600	26.323	664.456		33.677
9/02/2014 15:00	1663200	26.351	664.207		33.649
9/02/2014 21:00	1684800	26.348	663.934		33.652
10/02/2014 3:00	1706400	26.358	663.5		33.642
10/02/2014 9:00	1728000	26.372	663.298		33.628
10/02/2014 15:00	1749600	26.364	663.001		33.636
10/02/2014 21:00	1771200	26.347	662.616		33.653
11/02/2014 3:00	1792800	26.357	662.42		33.643
11/02/2014 9:00	1814400	26.349	662.206		33.651
11/02/2014 15:00	1836000	26.375	662.009		33.625
11/02/2014 21:00	1857600	26.354	661.697		33.646
12/02/2014 3:00	1879200	26.36	661.39		33.64
12/02/2014 9:00	1900800	26.343	660.891		33.657
12/02/2014 15:00	1922400	26.36	660.606		33.64
12/02/2014 21:00	1944000	26.346	660.319		33.654
13/02/2014 3:00	1965600	26.362	660.173		33.638
13/02/2014 9:00	1987200	26.367	659.947		33.633
13/02/2014 15:00	2008800	26.374	659.76		33.626
13/02/2014 21:00	2030400	26.35	659.374		33.65
14/02/2014 3:00	2052000	26.369	659.043		33.631
14/02/2014 9:00	2073600	26.364	658.713		33.636
14/02/2014 15:00	2095200	26.389	658.368		33.611
14/02/2014 21:00	2116800	26.374	657.988		33.626
15/02/2014 3:00	2138400	26.383	657.788		33.617
15/02/2014 9:00	2160000	26.396	657.528		33.604
15/02/2014 15:00	2181600	26.406	657.118		33.594
15/02/2014 21:00	2203200	26.38	656.865		33.62
16/02/2014 3:00	2224800	26.374	656.553		33.626
16/02/2014 9:00	2246400	26.358	656.218		33.642
16/02/2014 15:00	2268000	26.374	656.011		33.626
16/02/2014 21:00	2289600	26.337	655.682		33.663
17/02/2014 3:00	2311200	26.358	655.48		33.642
17/02/2014 9:00	2332800	26.361	655.211		33.639
17/02/2014 15:00	2354400	26.381	654.938		33.619
17/02/2014 21:00	2376000	26.346	654.554		33.654
18/02/2014 3:00	2397600	26.366	654.234		33.634
18/02/2014 9:00	2419200	26.358	653.907		33.642
18/02/2014 15:00	2440800	26.375	653.647		33.625
18/02/2014 21:00	2462400	26.365	653.26		33.635
19/02/2014 3:00	2484000	26.361	652.809		33.639
19/02/2014 9:00	2505600	26.357	652.335		33.643
19/02/2014 15:00	2527200	26.372	651.938		33.628
19/02/2014 21:00	2548800	26.357	651.526		33.643
20/02/2014 3:00	2570400	26.378	651.215		33.622
20/02/2014 9:00	2592000	26.355	650.909		33.645
20/02/2014 15:00	2613600	26.376	650.608		33.624
20/02/2014 21:00	2635200	26.344	650.195		33.656
21/02/2014 3:00	2656800	26.352	649.904		33.648
21/02/2014 9:00	2678400	26.348	649.598		33.652
21/02/2014 15:00	2700000	26.375	649.241		33.625
21/02/2014 21:00	2721600	26.362	648.828		33.638
22/02/2014 3:00	2743200	26.382	648.527		33.618
22/02/2014 9:00	2764800	26.382	648.264		33.618
22/02/2014 15:00	2786400	26.393	647.871		33.607
22/02/2014 21:00	2808000	26.372	647.535		33.628
23/02/2014 3:00	2829600	26.377	647.112		33.623
23/02/2014 9:00	2851200	26.379	646.725		33.621
23/02/2014 15:00	2872800	26.392	646.261		33.608
23/02/2014 21:00	2894400	26.369	645.985		33.631
24/02/2014 3:00	2916000	26.388	645.664		33.612
24/02/2014 9:00	2937600	26.397	645.445		33.603
24/02/2014 15:00	2959200	26.404	645.169		33.596
24/02/2014 21:00	2980800	26.372	644.813		33.628
25/02/2014 3:00	3002400	26.383	644.609		33.617
25/02/2014 9:00	3024000	26.39	644.439		33.61
25/02/2014 15:00	3045600	26.384	644.061		33.616
25/02/2014 21:00	3067200	26.358	643.69		33.642
26/02/2014 3:00	3088800	26.366	643.379		33.634
26/02/2014 9:00	3110400	26.357	643.142		33.643
26/02/2014 15:00	3132000	26.396	642.847		33.604
26/02/2014 21:00	3153600	26.381	642.396		33.619
27/02/2014 3:00	3175200	26.381	642.272		33.619
27/02/2014 9:00	3196800	26.382	641.96		33.618

27/02/2014 15:00	3218400	26.401	641.727		33.599
27/02/2014 21:00	3240000	26.376	641.335		33.624
28/02/2014 3:00	3261600	26.385	641.172		33.615
28/02/2014 9:00	3283200	26.365	640.836		33.635
28/02/2014 15:00	3304800	26.393	640.622		33.607
28/02/2014 21:00	3326400	26.384	640.366		33.616
1/03/2014 3:00	3348000	26.403	640.27		33.597
1/03/2014 9:00	3369600	26.402	640.038		33.598
1/03/2014 15:00	3391200	26.398	639.759		33.602
1/03/2014 21:00	3412800	26.382	639.447		33.618
2/03/2014 3:00	3434400	26.384	639.14		33.616
2/03/2014 9:00	3456000	26.368	638.863		33.632
2/03/2014 15:00	3477600	26.395	638.602		33.605
2/03/2014 21:00	3499200	26.365	638.358		33.635
3/03/2014 3:00	3520800	26.385	638.153		33.615
3/03/2014 9:00	3542400	26.372	637.889		33.628
3/03/2014 15:00	3564000	26.4	637.746		33.6
3/03/2014 21:00	3585600	26.35	637.518		33.65
4/03/2014 3:00	3607200	26.362	637.273		33.638
4/03/2014 9:00	3628800	26.349	637.162		33.651
4/03/2014 15:00	3650400	26.375	637.01		33.625
4/03/2014 21:00	3672000	26.344	636.83		33.656
5/03/2014 3:00	3693600	26.349	636.532		33.651
5/03/2014 9:00	3715200	26.329	636.289		33.671
5/03/2014 15:00	3736800	26.367	636.014		33.633
5/03/2014 21:00	3758400	26.364	635.687		33.636
6/03/2014 3:00	3780000	26.375	635.549		33.625
6/03/2014 9:00	3801600	26.386	635.357		33.614
6/03/2014 15:00	3823200	26.411	635.059		33.589
6/03/2014 21:00	3844800	26.397	634.795		33.603
7/03/2014 3:00	3866400	26.414	634.557		33.586
7/03/2014 9:00	3888000	26.399	634.283		33.601
7/03/2014 15:00	3909600	26.418	634.025		33.582
7/03/2014 21:00	3931200	26.406	633.734		33.594
8/03/2014 3:00	3952800	26.409	633.488		33.591
8/03/2014 9:00	3974400	26.401	633.398		33.599
8/03/2014 15:00	3996000	26.415	633.236		33.585
8/03/2014 21:00	4017600	26.378	633.055		33.622
9/03/2014 3:00	4039200	26.395	632.847		33.605
9/03/2014 9:00	4060800	26.377	632.555		33.623
9/03/2014 15:00	4082400	26.4	632.271		33.6
9/03/2014 21:00	4104000	26.375	632.061		33.625
10/03/2014 3:00	4125600	26.397	631.886		33.603
10/03/2014 9:00	4147200	26.4	631.72		33.6
10/03/2014 15:00	4168800	26.404	631.4		33.596
10/03/2014 21:00	4190400	26.385	631.178		33.615
11/03/2014 3:00	4212000	26.392	630.975		33.608
11/03/2014 9:00	4233600	26.404	630.929		33.596
11/03/2014 15:00	4255200	26.423	630.527		33.577
11/03/2014 21:00	4276800	26.402	630.327		33.598
12/03/2014 3:00	4298400	26.421	630.034		33.579
12/03/2014 9:00	4320000	26.414	629.826		33.586
12/03/2014 15:00	4341600	26.439	629.546		33.561
12/03/2014 21:00	4363200	26.437	629.182		33.563
13/03/2014 3:00	4384800	26.462	628.972		33.538
13/03/2014 9:00	4406400	26.452	628.879		33.548
13/03/2014 15:00	4428000	26.46	628.644		33.54
13/03/2014 21:00	4449600	26.437	628.336		33.563
14/03/2014 3:00	4471200	26.433	628.216		33.567
14/03/2014 9:00	4492800	26.418	628.072		33.582
14/03/2014 15:00	4514400	26.427	627.821		33.573
14/03/2014 21:00	4536000	26.413	627.623		33.587
15/03/2014 3:00	4557600	26.434	627.476		33.566
15/03/2014 9:00	4579200	26.439	627.333		33.561
15/03/2014 15:00	4600800	26.44	627.079		33.56
15/03/2014 21:00	4622400	26.423	626.735		33.577
16/03/2014 3:00	4644000	26.439	626.539		33.561
16/03/2014 9:00	4665600	26.425	626.173		33.575
16/03/2014 15:00	4687200	26.443	625.904		33.557
16/03/2014 21:00	4708800	26.437	625.721		33.563
17/03/2014 3:00	4730400	26.456	625.54		33.544
17/03/2014 9:00	4752000	26.452	625.283		33.548
17/03/2014 15:00	4773600	26.459	625.179		33.541

17/03/2014 21:00	4795200	26.428	624.748		33.572
18/03/2014 3:00	4816800	26.432	624.619		33.568
18/03/2014 9:00	4838400	26.438	624.469		33.562
18/03/2014 15:00	4860000	26.447	624.412		33.553
18/03/2014 21:00	4881600	26.432	624.099		33.568
19/03/2014 3:00	4903200	26.436	623.939		33.564
19/03/2014 9:00	4924800	26.433	623.625		33.567
19/03/2014 15:00	4946400	26.452	623.44		33.548
19/03/2014 21:00	4968000	26.424	623.101		33.576
20/03/2014 3:00	4989600	26.45	622.893		33.55
20/03/2014 9:00	5011200	26.446	622.866		33.554
20/03/2014 15:00	5032800	26.469	622.629		33.531
20/03/2014 21:00	5054400	26.435	622.365		33.565
21/03/2014 3:00	5076000	26.451	622.228		33.549
21/03/2014 9:00	5097600	26.44	621.935		33.56
21/03/2014 15:00	5119200	26.467	621.77		33.533
21/03/2014 21:00	5140800	26.438	621.392		33.562
22/03/2014 3:00	5162400	26.467	621.082		33.533
22/03/2014 9:00	5184000	26.455	621.023		33.545
22/03/2014 15:00	5205600	26.459	620.759		33.541
22/03/2014 21:00	5227200	26.434	620.581		33.566
23/03/2014 3:00	5248800	26.435	620.386		33.565
23/03/2014 9:00	5270400	26.419	620.295		33.581
23/03/2014 15:00	5292000	26.43	619.993		33.57
23/03/2014 21:00	5313600	26.422	619.805		33.578
24/03/2014 3:00	5335200	26.441	619.606		33.559
24/03/2014 9:00	5356800	26.433	619.366		33.567
24/03/2014 15:00	5378400	26.425	619.196		33.575
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25/03/2014 3:00	5421600	26.445	618.792		33.555
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25/03/2014 15:00	5464800	26.446	618.264		33.554
25/03/2014 21:00	5486400	26.423	618.07		33.577
26/03/2014 3:00	5508000	26.455	618.008		33.545
26/03/2014 9:00	5529600	26.439	617.658		33.561
26/03/2014 15:00	5551200	26.446	617.498		33.554
26/03/2014 21:00	5572800	26.432	617.339		33.568
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27/03/2014 9:00	5616000	26.441	616.487		33.559
27/03/2014 15:00	5637600	26.449	616.435		33.551
27/03/2014 21:00	5659200	26.426	616.164		33.574
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28/03/2014 9:00	5702400	26.422	615.906		33.578
28/03/2014 15:00	5724000	26.443	615.719		33.557
28/03/2014 21:00	5745600	26.442	615.438		33.558
29/03/2014 3:00	5767200	26.46	615.378		33.54
29/03/2014 9:00	5788800	26.457	615.264		33.543
29/03/2014 15:00	5810400	26.449	615.036		33.551
29/03/2014 21:00	5832000	26.433	614.916		33.567
30/03/2014 3:00	5853600	26.432	614.801		33.568
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31/03/2014 9:00	5961600	26.44	614.436		33.56
31/03/2014 15:00	5983200	26.425	614.246		33.575
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1/04/2014 3:00	6026400	26.414	614.095		33.586
1/04/2014 9:00	6048000	26.403	614.053		33.597
1/04/2014 15:00	6069600	26.398	613.947		33.602
1/04/2014 21:00	6091200	26.373	613.883		33.627
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3/04/2014 21:00	6264000	26.407	613.054		33.593
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4/04/2014 9:00	6307200	26.424	612.763		33.576
4/04/2014 15:00	6328800	26.438	612.659		33.562
4/04/2014 21:00	6350400	26.431	612.478		33.569

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5/04/2014 9:00	6393600	26.467	612.368		33.533
5/04/2014 15:00	6415200	26.487	612.235		33.513
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6/04/2014 9:00	6480000	26.448	612.013		33.552
6/04/2014 15:00	6501600	26.467	611.951		33.533
6/04/2014 21:00	6523200	26.44	611.752		33.56
7/04/2014 3:00	6544800	26.447	611.718		33.553
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7/04/2014 15:00	6588000	26.454	611.639		33.546
7/04/2014 21:00	6609600	26.445	611.581		33.555
8/04/2014 3:00	6631200	26.462	611.474		33.538
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8/04/2014 15:00	6674400	26.478	611.34		33.522
8/04/2014 21:00	6696000	26.459	611.135		33.541
9/04/2014 3:00	6717600	26.465	610.927		33.535
9/04/2014 9:00	6739200	26.451	610.948		33.549
9/04/2014 15:00	6760800	26.466	610.804		33.534
9/04/2014 21:00	6782400	26.464	610.724		33.536
10/04/2014 3:00	6804000	26.481	610.708		33.519
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11/04/2014 21:00	6955200	26.487	610.155		33.513
12/04/2014 3:00	6976800	26.509	610.132		33.491
12/04/2014 9:00	6998400	26.492	609.985		33.508
12/04/2014 15:00	7020000	26.493	609.952		33.507
12/04/2014 21:00	7041600	26.475	609.826		33.525
13/04/2014 3:00	7063200	26.475	609.785		33.525
13/04/2014 9:00	7084800	26.462	609.765		33.538
13/04/2014 15:00	7106400	26.467	609.585		33.533
13/04/2014 21:00	7128000	26.471	609.331		33.529
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14/04/2014 15:00	7192800	26.488	608.88		33.512
14/04/2014 21:00	7214400	26.479	608.667		33.521
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15/04/2014 9:00	7257600	26.487	608.601		33.513
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16/04/2014 3:00	7322400	26.468	608.268		33.532
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17/04/2014 15:00	7452000	26.472	607.732		33.528
17/04/2014 21:00	7473600	26.448	607.674		33.552
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18/04/2014 9:00	7516800	26.47	607.547		33.53
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18/04/2014 21:00	7560000	26.484	607.192		33.516
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19/04/2014 9:00	7603200	26.493	607.222		33.507
19/04/2014 15:00	7624800	26.522	607.103		33.478
19/04/2014 21:00	7646400	26.504	606.913		33.496
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21/04/2014 9:00	7776000	26.506	606.469		33.494
21/04/2014 15:00	7797600	26.505	606.537		33.495
21/04/2014 21:00	7819200	26.487	606.438		33.513
22/04/2014 3:00	7840800	26.507	606.476		33.493
22/04/2014 9:00	7862400	26.508	606.241		33.492
22/04/2014 15:00	7884000	26.532	606.251		33.468
22/04/2014 21:00	7905600	26.513	606.049		33.487
23/04/2014 3:00	7927200	26.508	605.897		33.492

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23/04/2014 21:00	7992000	26.511	605.681		33.489
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24/04/2014 9:00	8035200	26.539	605.447		33.461
24/04/2014 15:00	8056800	26.541	605.455		33.459
24/04/2014 21:00	8078400	26.532	605.156		33.468
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25/04/2014 9:00	8121600	26.509	605.063		33.491
25/04/2014 15:00	8143200	26.527	605.047		33.473
25/04/2014 21:00	8164800	26.507	604.952		33.493
26/04/2014 3:00	8186400	26.513	604.997		33.487
26/04/2014 9:00	8208000	26.547	604.91		33.453
26/04/2014 15:00	8229600	26.56	604.761		33.44
26/04/2014 21:00	8251200	26.565	604.59		33.435
27/04/2014 3:00	8272800	26.563	604.558		33.437
27/04/2014 9:00	8294400	26.548	604.415		33.452
27/04/2014 15:00	8316000	26.549	604.28		33.451
27/04/2014 21:00	8337600	26.519	604.216		33.481
28/04/2014 3:00	8359200	26.519	604.272		33.481
28/04/2014 9:00	8380800	26.514	604.238		33.486
28/04/2014 15:00	8402400	26.494	604.29		33.506
28/04/2014 21:00	8424000	26.497	604.242		33.503
29/04/2014 3:00	8445600	26.51	604.109		33.49
29/04/2014 9:00	8467200	26.513	604.239		33.487
29/04/2014 15:00	8488800	26.505	604.183		33.495
29/04/2014 21:00	8510400	26.503	604.107		33.497
30/04/2014 3:00	8532000	26.516	604.051		33.484
30/04/2014 9:00	8553600	26.495	603.871		33.505
30/04/2014 15:00	8575200	26.513	603.882		33.487
30/04/2014 21:00	8596800	26.501	603.747		33.499
1/05/2014 3:00	8618400	26.511	603.68		33.489
1/05/2014 9:00	8640000	26.501	603.539		33.499
1/05/2014 15:00	8661600	26.505	603.579		33.495
1/05/2014 21:00	8683200	26.472	603.472		33.528
2/05/2014 3:00	8704800	26.479	603.355		33.521
2/05/2014 9:00	8726400	26.462	603.246		33.538
2/05/2014 15:00	8748000	26.493	603.254		33.507
2/05/2014 21:00	8769600	26.494	603.171		33.506
3/05/2014 3:00	8791200	26.508	603.174		33.492
3/05/2014 9:00	8812800	26.5	602.916		33.5
3/05/2014 15:00	8834400	26.523	602.783		33.477
3/05/2014 21:00	8856000	26.505	602.671		33.495
4/05/2014 3:00	8877600	26.505	602.579		33.495
4/05/2014 9:00	8899200	26.489	602.425		33.511
4/05/2014 15:00	8920800	26.508	602.291		33.492
4/05/2014 21:00	8942400	26.495	602.087		33.505
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5/05/2014 9:00	8985600	26.516	602.173		33.484
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6/05/2014 15:00	9093600	26.525	601.759		33.475
6/05/2014 21:00	9115200	26.524	601.567		33.476
7/05/2014 3:00	9136800	26.546	601.523		33.454
7/05/2014 9:00	9158400	26.539	601.554		33.461
7/05/2014 15:00	9180000	26.561	601.266		33.439
7/05/2014 21:00	9201600	26.553	601.343		33.447
8/05/2014 3:00	9223200	26.572	601.2		33.428
8/05/2014 9:00	9244800	26.563	601.161		33.437
8/05/2014 15:00	9266400	26.536	601.003		33.464
8/05/2014 21:00	9288000	26.519	600.99		33.481
9/05/2014 3:00	9309600	26.523	601.074		33.477
9/05/2014 9:00	9331200	26.507	600.874		33.493
9/05/2014 15:00	9352800	26.499	600.993		33.501
9/05/2014 21:00	9374400	26.495	600.987		33.505
10/05/2014 3:00	9396000	26.498	600.913		33.502
10/05/2014 9:00	9417600	26.495	600.896		33.505
10/05/2014 15:00	9439200	26.493	600.884		33.507
10/05/2014 21:00	9460800	26.492	600.912		33.508
11/05/2014 3:00	9482400	26.497	600.727		33.503
11/05/2014 9:00	9504000	26.494	600.67		33.506

11/05/2014 15:00	9525600	26.505	600.909		33.495
11/05/2014 21:00	9547200	26.508	600.545		33.492
12/05/2014 3:00	9568800	26.515	600.453		33.485
12/05/2014 9:00	9590400	26.514	600.367		33.486
12/05/2014 15:00	9612000	26.502	600.464		33.498
12/05/2014 21:00	9633600	26.481	600.296		33.519
13/05/2014 3:00	9655200	26.502	600.225		33.498
13/05/2014 9:00	9676800	26.494	600.271		33.506
13/05/2014 15:00	9698400	26.492	600.327		33.508
13/05/2014 21:00	9720000	26.488	600.169		33.512
14/05/2014 3:00	9741600	26.501	600.172		33.499
14/05/2014 9:00	9763200	26.481	599.847		33.519
14/05/2014 15:00	9784800	26.498	599.75		33.502
14/05/2014 21:00	9806400	26.497	599.71		33.503
15/05/2014 3:00	9828000	26.511	599.769		33.489
15/05/2014 9:00	9849600	26.512	600.158		33.488
15/05/2014 15:00	9871200	26.529	600.774		33.471
15/05/2014 21:00	9892800	26.513	600.671		33.487
16/05/2014 3:00	9914400	26.515	600.466		33.485
16/05/2014 9:00	9936000	26.494	600.274		33.506
16/05/2014 15:00	9957600	26.504	600.172		33.496
16/05/2014 21:00	9979200	26.484	599.988		33.516
17/05/2014 3:00	10000800	26.512	599.988		33.488
17/05/2014 9:00	10022400	26.495	599.806		33.505
17/05/2014 15:00	10044000	26.494	599.821		33.506
17/05/2014 21:00	10065600	26.491	599.693		33.509
18/05/2014 3:00	10087200	26.517	599.568		33.483
18/05/2014 9:00	10108800	26.509	599.389		33.491
18/05/2014 15:00	10130400	26.521	599.283		33.479
18/05/2014 21:00	10152000	26.521	599.144		33.479
19/05/2014 3:00	10173600	26.531	599.142		33.469
19/05/2014 9:00	10195200	26.53	599.064		33.47
19/05/2014 15:00	10216800	26.532	599.042		33.468
19/05/2014 21:00	10238400	26.511	598.996		33.489
20/05/2014 3:00	10260000	26.524	598.865		33.476
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20/05/2014 21:00	10324800	26.449	598.227		33.551
21/05/2014 3:00	10346400	26.464	598.267		33.536
21/05/2014 9:00	10368000	26.447	598.059		33.553
21/05/2014 15:00	10389600	26.444	597.909		33.556
21/05/2014 21:00	10411200	26.436	597.93		33.564
22/05/2014 3:00	10432800	26.466	597.885		33.534
22/05/2014 9:00	10454400	26.461	597.907		33.539
22/05/2014 15:00	10476000	26.467	597.92		33.533
22/05/2014 21:00	10497600	26.454	597.793		33.546
23/05/2014 3:00	10519200	26.455	597.642		33.545
23/05/2014 9:00	10540800	26.449	597.367		33.551
23/05/2014 15:00	10562400	26.445	597.391		33.555
23/05/2014 21:00	10584000	26.437	597.321		33.563
24/05/2014 3:00	10605600	26.447	597.287		33.553
24/05/2014 9:00	10627200	26.44	597.216		33.56
24/05/2014 15:00	10648800	26.426	597.21		33.574
24/05/2014 21:00	10670400	26.415	597.097		33.585
25/05/2014 3:00	10692000	26.403	597.007		33.597
25/05/2014 9:00	10713600	26.406	596.905		33.594
25/05/2014 15:00	10735200	26.407	596.946		33.593
25/05/2014 21:00	10756800	26.391	596.9		33.609
26/05/2014 3:00	10778400	26.387	596.868		33.613
26/05/2014 9:00	10800000	26.378	596.665		33.622
26/05/2014 15:00	10821600	26.387	596.774		33.613
26/05/2014 21:00	10843200	26.385	596.652		33.615
27/05/2014 3:00	10864800	26.4	596.544		33.6
27/05/2014 9:00	10886400	26.394	596.516		33.606
27/05/2014 15:00	10908000	26.382	596.455		33.618
27/05/2014 21:00	10929600	26.359	596.34		33.641
28/05/2014 3:00	10951200	26.355	596.367		33.645
28/05/2014 9:00	10972800	26.337	596.36		33.663
28/05/2014 15:00	10994400	26.347	596.248		33.653
28/05/2014 21:00	11016000	26.358	596.302		33.642
29/05/2014 3:00	11037600	26.368	596.224		33.632
29/05/2014 9:00	11059200	26.365	596.288		33.635
29/05/2014 15:00	11080800	26.388	596.198		33.612

29/05/2014 21:00	11102400	26.375	596.037		33.625
30/05/2014 3:00	11124000	26.379	596.023		33.621
30/05/2014 9:00	11145600	26.369	595.971		33.631
30/05/2014 15:00	11167200	26.391	595.946		33.609
30/05/2014 21:00	11188800	26.392	595.732		33.608
31/05/2014 3:00	11210400	26.395	595.752		33.605
31/05/2014 9:00	11232000	26.389	595.741		33.611
31/05/2014 15:00	11253600	26.408	595.633		33.592
31/05/2014 21:00	11275200	26.403	595.479		33.597
1/06/2014 3:00	11296800	26.403	595.392		33.597
1/06/2014 9:00	11318400	26.381	595.201		33.619
1/06/2014 15:00	11340000	26.385	595.288		33.615
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2/06/2014 3:00	11383200	26.38	595.104		33.62
2/06/2014 9:00	11404800	26.371	595.051		33.629
2/06/2014 15:00	11426400	26.373	595.028		33.627
2/06/2014 21:00	11448000	26.357	594.849		33.643
3/06/2014 3:00	11469600	26.361	594.872		33.639
3/06/2014 9:00	11491200	26.347	594.816		33.653
3/06/2014 15:00	11512800	26.373	594.746		33.627
3/06/2014 21:00	11534400	26.346	594.658		33.654
4/06/2014 3:00	11556000	26.349	594.681		33.651
4/06/2014 9:00	11577600	26.311	594.597		33.689
4/06/2014 15:00	11599200	26.332	594.544		33.668
4/06/2014 21:00	11620800	26.31	594.482		33.69
5/06/2014 3:00	11642400	26.321	594.326		33.679
5/06/2014 9:00	11664000	26.289	594.265		33.711
5/06/2014 15:00	11685600	26.313	594.226		33.687
5/06/2014 21:00	11707200	26.306	594.1		33.694
6/06/2014 3:00	11728800	26.308	594.057		33.692
6/06/2014 9:00	11750400	26.304	594.082		33.696
6/06/2014 15:00	11772000	26.307	593.967		33.693
6/06/2014 21:00	11793600	26.301	593.927		33.699
7/06/2014 3:00	11815200	26.303	593.799		33.697
7/06/2014 9:00	11836800	26.298	593.7		33.702
7/06/2014 15:00	11858400	26.308	593.65		33.692
7/06/2014 21:00	11880000	26.309	593.562		33.691
8/06/2014 3:00	11901600	26.321	593.576		33.679
8/06/2014 9:00	11923200	26.32	593.405		33.68
8/06/2014 15:00	11944800	26.313	593.356		33.687
8/06/2014 21:00	11966400	26.315	593.279		33.685
9/06/2014 3:00	11988000	26.316	593.292		33.684
9/06/2014 9:00	12009600	26.314	593.215		33.686
9/06/2014 15:00	12031200	26.32	593.083		33.68
9/06/2014 21:00	12052800	26.314	593		33.686
10/06/2014 3:00	12074400	26.328	593.017		33.672

Report Date: 10/06/2014 13:31
Report User Name: crfisher
Report Computer Name: APWKS3707
Application: WinSitu.exe
Application Version: 5.6.22.4

Log File Properties

File Name	DD2-Deep-3_2014-06-10_08-37-15-329.wsl
Create Date	10/06/2014 8:37

Device Properties

Device	Aqua TROLL 200
Site	Default Site
Device Name	DD2
Serial Number	335744
Firmware Version	1.26
Hardware Version	2
Device Address	1
Device Comm Cfg	19200
Used Memory	4
Used Battery	6

Log Configuration

Log Name	DD2-Deep-3
Created By	crfisher
Computer Name	APWKS3707
Application	WinSitu.exe
Application Version	5.6.22.4
Create Date	21/01/2014 9:03:23 AM W. Australia Standard Time
Log Setup Time Zone	Unknown
Notes Size(bytes)	4096
Overwrite when full	Enabled
Scheduled Start Time	21/01/2014 10:00:00 AM W. Australia Standard Time
Scheduled Stop Time	No Stop Time
Type	Linear
Interval	Days: 0 hrs: 06 mins: 00 secs: 00

Level Reference Settings At Log Creation

Level Measurement Mode	Level Depth To Water
Specific Gravity	0.999
Level Reference Mode:	Set first logged value to offset
Level Reference Offset:	30.44 (m)

Other Log Settings

Depth of Probe:	10.2961 (m)
Head Pressure:	14.6298 (PSI)
Temperature:	27.8091 (C)

Log Notes:

Date and Time	Note
21/01/2014 9:03	Used Battery: 6% Used Memory: 7% User Name: crfisher
10/06/2014 8:38	Suspend Command Log Download - Used Battery: 9%
10/06/2014 8:38	Used Memory: 7% User Name: crfisher

Elapsed Time	**Sensor: PCTD(A) 197.3ft SN#: 335744**	**Sensor: PCTD(A) 197.3ft SN#: 335744**	**RL ground surface**

Date and Time	Seconds	Level Depth To Water (m)	Actual Conductivity (µS)		63.5
21/01/2014 10:00	0	30.44	730.852		33.06
21/01/2014 16:00	21600	30.462	733.405		33.038
21/01/2014 22:00	43200	30.432	732.139		33.068
22/01/2014 4:00	64800	30.438	729.448		33.062
22/01/2014 10:00	86400	30.433	727.96		33.067
22/01/2014 16:00	108000	30.459	726.66		33.041
22/01/2014 22:00	129600	30.426	726.101		33.074
23/01/2014 4:00	151200	30.45	724.48		33.05
23/01/2014 10:00	172800	30.43	724.006		33.07
23/01/2014 16:00	194400	30.433	723.725		33.067
23/01/2014 22:00	216000	30.412	724.131		33.088
24/01/2014 4:00	237600	30.421	723.836		33.079
24/01/2014 10:00	259200	30.426	722.275		33.074
24/01/2014 16:00	280800	30.457	721.754		33.043
24/01/2014 22:00	302400	30.447	721.224		33.053
25/01/2014 4:00	324000	30.483	720.792		33.017
25/01/2014 10:00	345600	30.479	720.025		33.021
25/01/2014 16:00	367200	30.478	719.813		33.022
25/01/2014 22:00	388800	30.465	719.788		33.035
26/01/2014 4:00	410400	30.468	719.701		33.032
26/01/2014 10:00	432000	30.462	722.064		33.038
26/01/2014 16:00	453600	30.482	721.41		33.018
26/01/2014 22:00	475200	30.468	721.118		33.032
27/01/2014 4:00	496800	30.498	721.464		33.002
27/01/2014 10:00	518400	30.493	721.304		33.007
27/01/2014 16:00	540000	30.484	720.639		33.016
27/01/2014 22:00	561600	30.463	720.283		33.037
28/01/2014 4:00	583200	30.483	720.274		33.017
28/01/2014 10:00	604800	30.484	719.809		33.016
28/01/2014 16:00	626400	30.484	719.677		33.016
28/01/2014 22:00	648000	30.472	719.311		33.028
29/01/2014 4:00	669600	30.471	718.868		33.029
29/01/2014 10:00	691200	30.483	718.209		33.017
29/01/2014 16:00	712800	30.496	718.18		33.004
29/01/2014 22:00	734400	30.483	717.756		33.017
30/01/2014 4:00	756000	30.511	717.471		32.989
30/01/2014 10:00	777600	30.512	717.28		32.988
30/01/2014 16:00	799200	30.519	716.706		32.981
30/01/2014 22:00	820800	30.505	716.405		32.995
31/01/2014 4:00	842400	30.508	716.233		32.992
31/01/2014 10:00	864000	30.504	715.82		32.996
31/01/2014 16:00	885600	30.508	715.526		32.992
31/01/2014 22:00	907200	30.48	715.148		33.02
1/02/2014 4:00	928800	30.513	714.595		32.987
1/02/2014 10:00	950400	30.499	713.805		33.001
1/02/2014 16:00	972000	30.505	713.628		32.995
1/02/2014 22:00	993600	30.461	713.229		33.039
2/02/2014 4:00	1015200	30.459	712.66		33.041
2/02/2014 10:00	1036800	30.453	712.11		33.047
2/02/2014 16:00	1058400	30.469	712.086		33.031
2/02/2014 22:00	1080000	30.434	711.744		33.066
3/02/2014 4:00	1101600	30.47	711.569		33.03
3/02/2014 10:00	1123200	30.474	711.348		33.026
3/02/2014 16:00	1144800	30.486	711.344		33.014
3/02/2014 22:00	1166400	30.463	711.102		33.037
4/02/2014 4:00	1188000	30.498	710.774		33.002
4/02/2014 10:00	1209600	30.487	710.46		33.013
4/02/2014 16:00	1231200	30.506	710.189		32.994
4/02/2014 22:00	1252800	30.483	710.044		33.017
5/02/2014 4:00	1274400	30.482	709.78		33.018
5/02/2014 10:00	1296000	30.477	709.703		33.023
5/02/2014 16:00	1317600	30.486	709.631		33.014
5/02/2014 22:00	1339200	30.47	709.521		33.03
6/02/2014 4:00	1360800	30.511	709.193		32.989
6/02/2014 10:00	1382400	30.502	709.553		32.998
6/02/2014 16:00	1404000	30.514	709.174		32.986
6/02/2014 22:00	1425600	30.495	708.978		33.005
7/02/2014 4:00	1447200	30.507	708.972		32.993
7/02/2014 10:00	1468800	30.505	708.774		32.995
7/02/2014 16:00	1490400	30.533	708.315		32.967
7/02/2014 22:00	1512000	30.505	708.291		32.995
8/02/2014 4:00	1533600	30.531	708.223		32.969
8/02/2014 10:00	1555200	30.527	707.929		32.973
8/02/2014 16:00	1576800	30.523	707.93		32.977
8/02/2014 22:00	1598400	30.511	707.632		32.989
9/02/2014 4:00	1620000	30.521	707.897		32.979
9/02/2014 10:00	1641600	30.52	707.646		32.98
9/02/2014 16:00	1663200	30.544	707.366		32.956

9/02/2014 22:00	1684800	30.538	707.166		32.962
10/02/2014 4:00	1706400	30.565	706.871		32.935
10/02/2014 10:00	1728000	30.556	706.934		32.944
10/02/2014 16:00	1749600	30.557	706.708		32.943
10/02/2014 22:00	1771200	30.53	706.772		32.97
11/02/2014 4:00	1792800	30.558	706.659		32.942
11/02/2014 10:00	1814400	30.551	706.515		32.949
11/02/2014 16:00	1836000	30.562	706.327		32.938
11/02/2014 22:00	1857600	30.536	706.154		32.964
12/02/2014 4:00	1879200	30.541	705.851		32.959
12/02/2014 10:00	1900800	30.538	705.585		32.962
12/02/2014 16:00	1922400	30.553	704.952		32.947
12/02/2014 22:00	1944000	30.531	705.253		32.969
13/02/2014 4:00	1965600	30.563	704.93		32.937
13/02/2014 10:00	1987200	30.553	704.802		32.947
13/02/2014 16:00	2008800	30.562	704.474		32.938
13/02/2014 22:00	2030400	30.548	704.24		32.952
14/02/2014 4:00	2052000	30.548	704.099		32.952
14/02/2014 10:00	2073600	30.549	703.775		32.951
14/02/2014 16:00	2095200	30.566	703.68		32.934
14/02/2014 22:00	2116800	30.556	703.432		32.944
15/02/2014 4:00	2138400	30.582	703.388		32.918
15/02/2014 10:00	2160000	30.574	703.499		32.926
15/02/2014 16:00	2181600	30.578	703.144		32.922
15/02/2014 22:00	2203200	30.555	703.029		32.945
16/02/2014 4:00	2224800	30.553	702.704		32.947
16/02/2014 10:00	2246400	30.54	702.506		32.96
16/02/2014 16:00	2268000	30.549	702.348		32.951
16/02/2014 22:00	2289600	30.526	702.276		32.974
17/02/2014 4:00	2311200	30.554	701.926		32.946
17/02/2014 10:00	2332800	30.548	701.66		32.952
17/02/2014 16:00	2354400	30.574	701.569		32.926
17/02/2014 22:00	2376000	30.537	701.333		32.963
18/02/2014 4:00	2397600	30.562	701.225		32.938
18/02/2014 10:00	2419200	30.548	701.337		32.952
18/02/2014 16:00	2440800	30.579	701.097		32.921
18/02/2014 22:00	2462400	30.549	700.901		32.951
19/02/2014 4:00	2484000	30.556	700.844		32.944
19/02/2014 10:00	2505600	30.542	700.847		32.958
19/02/2014 16:00	2527200	30.571	702.736		32.929
19/02/2014 22:00	2548800	30.551	700.968		32.949
20/02/2014 4:00	2570400	30.576	700.428		32.924
20/02/2014 10:00	2592000	30.548	699.943		32.952
20/02/2014 16:00	2613600	30.559	699.66		32.941
20/02/2014 22:00	2635200	30.533	699.445		32.967
21/02/2014 4:00	2656800	30.542	699.275		32.958
21/02/2014 10:00	2678400	30.538	699.13		32.962
21/02/2014 16:00	2700000	30.57	699.255		32.93
21/02/2014 22:00	2721600	30.543	699.204		32.957
22/02/2014 4:00	2743200	30.58	699.12		32.92
22/02/2014 10:00	2764800	30.558	698.991		32.942
22/02/2014 16:00	2786400	30.573	698.998		32.927
22/02/2014 22:00	2808000	30.556	698.625		32.944
23/02/2014 4:00	2829600	30.563	698.534		32.937
23/02/2014 10:00	2851200	30.554	698.511		32.946
23/02/2014 16:00	2872800	30.577	698.338		32.923
23/02/2014 22:00	2894400	30.554	697.908		32.946
24/02/2014 4:00	2916000	30.59	697.651		32.91
24/02/2014 10:00	2937600	30.574	697.503		32.926
24/02/2014 16:00	2959200	30.58	697.385		32.92
24/02/2014 22:00	2980800	30.552	697.199		32.948
25/02/2014 4:00	3002400	30.591	697.188		32.909
25/02/2014 10:00	3024000	30.571	697.11		32.929
25/02/2014 16:00	3045600	30.588	696.906		32.912
25/02/2014 22:00	3067200	30.551	696.829		32.949
26/02/2014 4:00	3088800	30.548	696.561		32.952
26/02/2014 10:00	3110400	30.554	696.509		32.946
26/02/2014 16:00	3132000	30.58	696.298		32.92
26/02/2014 22:00	3153600	30.562	696.273		32.938
27/02/2014 4:00	3175200	30.585	696.334		32.915
27/02/2014 10:00	3196800	30.576	695.976		32.924
27/02/2014 16:00	3218400	30.585	695.798		32.915
27/02/2014 22:00	3240000	30.566	695.67		32.934
28/02/2014 4:00	3261600	30.566	695.664		32.934
28/02/2014 10:00	3283200	30.571	695.583		32.929
28/02/2014 16:00	3304800	30.578	695.4		32.922
28/02/2014 22:00	3326400	30.569	695.246		32.931
1/03/2014 4:00	3348000	30.598	695.304		32.902
1/03/2014 10:00	3369600	30.592	695.21		32.908
1/03/2014 16:00	3391200	30.575	695.119		32.925
1/03/2014 22:00	3412800	30.57	695.064		32.93
2/03/2014 4:00	3434400	30.568	694.934		32.932
2/03/2014 10:00	3456000	30.562	694.84		32.938

2/03/2014 16:00	3477600	30.573	694.579		32.927
2/03/2014 22:00	3499200	30.565	694.445		32.935
3/03/2014 4:00	3520800	30.584	694.387		32.916
3/03/2014 10:00	3542400	30.567	694.365		32.933
3/03/2014 16:00	3564000	30.569	694.359		32.931
3/03/2014 22:00	3585600	30.534	694.18		32.966
4/03/2014 4:00	3607200	30.566	693.953		32.934
4/03/2014 10:00	3628800	30.547	693.764		32.953
4/03/2014 16:00	3650400	30.569	693.652		32.931
4/03/2014 22:00	3672000	30.534	693.656		32.966
5/03/2014 4:00	3693600	30.547	693.636		32.953
5/03/2014 10:00	3715200	30.537	693.619		32.963
5/03/2014 16:00	3736800	30.57	693.596		32.93
5/03/2014 22:00	3758400	30.551	693.458		32.949
6/03/2014 4:00	3780000	30.588	693.627		32.912
6/03/2014 10:00	3801600	30.574	693.558		32.926
6/03/2014 16:00	3823200	30.597	693.269		32.903
6/03/2014 22:00	3844800	30.576	693.108		32.924
7/03/2014 4:00	3866400	30.586	692.957		32.914
7/03/2014 10:00	3888000	30.588	692.719		32.912
7/03/2014 16:00	3909600	30.601	692.724		32.899
7/03/2014 22:00	3931200	30.593	692.656		32.907
8/03/2014 4:00	3952800	30.61	692.567		32.89
8/03/2014 10:00	3974400	30.582	692.556		32.918
8/03/2014 16:00	3996000	30.601	692.215		32.899
8/03/2014 22:00	4017600	30.571	691.732		32.929
9/03/2014 4:00	4039200	30.568	691.22		32.932
9/03/2014 10:00	4060800	30.562	691.198		32.938
9/03/2014 16:00	4082400	30.576	691.247		32.924
9/03/2014 22:00	4104000	30.568	691.182		32.932
10/03/2014 4:00	4125600	30.59	691.124		32.91
10/03/2014 10:00	4147200	30.582	690.976		32.918
10/03/2014 16:00	4168800	30.593	690.88		32.907
10/03/2014 22:00	4190400	30.564	690.971		32.936
11/03/2014 4:00	4212000	30.593	690.856		32.907
11/03/2014 10:00	4233600	30.584	690.778		32.916
11/03/2014 16:00	4255200	30.601	690.875		32.899
11/03/2014 22:00	4276800	30.581	690.793		32.919
12/03/2014 4:00	4298400	30.594	690.732		32.906
12/03/2014 10:00	4320000	30.6	690.617		32.9
12/03/2014 16:00	4341600	30.622	690.553		32.878
12/03/2014 22:00	4363200	30.62	690.595		32.88
13/03/2014 4:00	4384800	30.651	690.442		32.849
13/03/2014 10:00	4406400	30.64	690.381		32.86
13/03/2014 16:00	4428000	30.637	690.266		32.863
13/03/2014 22:00	4449600	30.606	690.142		32.894
14/03/2014 4:00	4471200	30.602	690.02		32.898
14/03/2014 10:00	4492800	30.597	690.037		32.903
14/03/2014 16:00	4514400	30.609	690.084		32.891
14/03/2014 22:00	4536000	30.588	689.984		32.912
15/03/2014 4:00	4557600	30.629	689.956		32.871
15/03/2014 10:00	4579200	30.611	689.875		32.889
15/03/2014 16:00	4600800	30.612	689.869		32.888
15/03/2014 22:00	4622400	30.612	689.765		32.888
16/03/2014 4:00	4644000	30.604	689.738		32.896
16/03/2014 10:00	4665600	30.605	689.669		32.895
16/03/2014 16:00	4687200	30.617	689.657		32.883
16/03/2014 22:00	4708800	30.611	689.713		32.889
17/03/2014 4:00	4730400	30.636	689.614		32.864
17/03/2014 10:00	4752000	30.628	689.534		32.872
17/03/2014 16:00	4773600	30.632	689.294		32.868
17/03/2014 22:00	4795200	30.618	689.124		32.882
18/03/2014 4:00	4816800	30.631	688.964		32.869
18/03/2014 10:00	4838400	30.619	688.913		32.881
18/03/2014 16:00	4860000	30.627	688.782		32.873
18/03/2014 22:00	4881600	30.607	688.685		32.893
19/03/2014 4:00	4903200	30.609	688.581		32.891
19/03/2014 10:00	4924800	30.609	688.566		32.891
19/03/2014 16:00	4946400	30.633	688.491		32.867
19/03/2014 22:00	4968000	30.603	688.463		32.897
20/03/2014 4:00	4989600	30.631	688.298		32.869
20/03/2014 10:00	5011200	30.623	688.278		32.877
20/03/2014 16:00	5032800	30.635	688.087		32.865
20/03/2014 22:00	5054400	30.612	688.017		32.888
21/03/2014 4:00	5076000	30.625	688.009		32.875
21/03/2014 10:00	5097600	30.622	687.849		32.878
21/03/2014 16:00	5119200	30.644	687.778		32.856
21/03/2014 22:00	5140800	30.623	687.765		32.877
22/03/2014 4:00	5162400	30.65	687.628		32.85
22/03/2014 10:00	5184000	30.625	687.616		32.875
22/03/2014 16:00	5205600	30.625	687.519		32.875
22/03/2014 22:00	5227200	30.605	687.519		32.895
23/03/2014 4:00	5248800	30.609	687.465		32.891

23/03/2014 10:00	5270400	30.601	687.424		32.899
23/03/2014 16:00	5292000	30.61	687.483		32.89
23/03/2014 22:00	5313600	30.603	687.541		32.897
24/03/2014 4:00	5335200	30.634	687.48		32.866
24/03/2014 10:00	5356800	30.614	687.386		32.886
24/03/2014 16:00	5378400	30.608	687.352		32.892
24/03/2014 22:00	5400000	30.602	687.235		32.898
25/03/2014 4:00	5421600	30.636	687.303		32.864
25/03/2014 10:00	5443200	30.619	687.411		32.881
25/03/2014 16:00	5464800	30.599	687.435		32.901
25/03/2014 22:00	5486400	30.609	687.532		32.891
26/03/2014 4:00	5508000	30.626	687.306		32.874
26/03/2014 10:00	5529600	30.612	687.212		32.888
26/03/2014 16:00	5551200	30.62	687.386		32.88
26/03/2014 22:00	5572800	30.605	687.009		32.895
27/03/2014 4:00	5594400	30.641	686.903		32.859
27/03/2014 10:00	5616000	30.631	687.421		32.869
27/03/2014 16:00	5637600	30.619	687.254		32.881
27/03/2014 22:00	5659200	30.606	686.922		32.894
28/03/2014 4:00	5680800	30.603	686.811		32.897
28/03/2014 10:00	5702400	30.609	686.771		32.891
28/03/2014 16:00	5724000	30.621	686.746		32.879
28/03/2014 22:00	5745600	30.622	686.658		32.878
29/03/2014 4:00	5767200	30.656	686.597		32.844
29/03/2014 10:00	5788800	30.646	686.545		32.854
29/03/2014 16:00	5810400	30.626	686.495		32.874
29/03/2014 22:00	5832000	30.613	686.463		32.887
30/03/2014 4:00	5853600	30.605	686.461		32.895
30/03/2014 10:00	5875200	30.598	686.481		32.902
30/03/2014 16:00	5896800	30.599	686.422		32.901
30/03/2014 22:00	5918400	30.597	686.332		32.903
31/03/2014 4:00	5940000	30.627	686.39		32.873
31/03/2014 10:00	5961600	30.616	686.32		32.884
31/03/2014 16:00	5983200	30.613	686.321		32.887
31/03/2014 22:00	6004800	30.6	686.328		32.9
1/04/2014 4:00	6026400	30.612	686.387		32.888
1/04/2014 10:00	6048000	30.587	686.236		32.913
1/04/2014 16:00	6069600	30.583	686.307		32.917
1/04/2014 22:00	6091200	30.566	686.208		32.934
2/04/2014 4:00	6112800	30.568	686.214		32.932
2/04/2014 10:00	6134400	30.561	686.193		32.939
2/04/2014 16:00	6156000	30.586	686.19		32.914
2/04/2014 22:00	6177600	30.58	686.205		32.92
3/04/2014 4:00	6199200	30.607	686.196		32.893
3/04/2014 10:00	6220800	30.594	686.162		32.906
3/04/2014 16:00	6242400	30.601	686.142		32.899
3/04/2014 22:00	6264000	30.592	686.06		32.908
4/04/2014 4:00	6285600	30.606	686.032		32.894
4/04/2014 10:00	6307200	30.603	686.083		32.897
4/04/2014 16:00	6328800	30.618	685.966		32.882
4/04/2014 22:00	6350400	30.614	685.943		32.886
5/04/2014 4:00	6372000	30.651	685.932		32.849
5/04/2014 10:00	6393600	30.634	685.913		32.866
5/04/2014 16:00	6415200	30.639	685.822		32.861
5/04/2014 22:00	6436800	30.618	685.691		32.882
6/04/2014 4:00	6458400	30.625	685.699		32.875
6/04/2014 10:00	6480000	30.621	685.552		32.879
6/04/2014 16:00	6501600	30.63	685.566		32.87
6/04/2014 22:00	6523200	30.61	685.577		32.89
7/04/2014 4:00	6544800	30.64	685.55		32.86
7/04/2014 10:00	6566400	30.632	685.62		32.868
7/04/2014 16:00	6588000	30.631	685.553		32.869
7/04/2014 22:00	6609600	30.619	685.482		32.881
8/04/2014 4:00	6631200	30.655	685.426		32.845
8/04/2014 10:00	6652800	30.635	685.439		32.865
8/04/2014 16:00	6674400	30.648	685.415		32.852
8/04/2014 22:00	6696000	30.639	685.485		32.861
9/04/2014 4:00	6717600	30.644	685.409		32.856
9/04/2014 10:00	6739200	30.633	685.397		32.867
9/04/2014 16:00	6760800	30.647	685.346		32.853
9/04/2014 22:00	6782400	30.637	685.198		32.863
10/04/2014 4:00	6804000	30.667	685.058		32.833
10/04/2014 10:00	6825600	30.645	685.044		32.855
10/04/2014 16:00	6847200	30.658	685.028		32.842
10/04/2014 22:00	6868800	30.642	684.955		32.858
11/04/2014 4:00	6890400	30.642	684.844		32.858
11/04/2014 10:00	6912000	30.644	684.977		32.856
11/04/2014 16:00	6933600	30.663	684.955		32.837
11/04/2014 22:00	6955200	30.659	684.774		32.841
12/04/2014 4:00	6976800	30.681	684.698		32.819
12/04/2014 10:00	6998400	30.665	684.575		32.835
12/04/2014 16:00	7020000	30.643	684.526		32.857
12/04/2014 22:00	7041600	30.643	684.543		32.857

13/04/2014 4:00	7063200	30.643	684.365		32.857
13/04/2014 10:00	7084800	30.637	684.344		32.863
13/04/2014 16:00	7106400	30.648	684.36		32.852
13/04/2014 22:00	7128000	30.645	684.413		32.855
14/04/2014 4:00	7149600	30.671	684.372		32.829
14/04/2014 10:00	7171200	30.66	684.411		32.84
14/04/2014 16:00	7192800	30.66	684.659		32.84
14/04/2014 22:00	7214400	30.653	684.356		32.847
15/04/2014 4:00	7236000	30.678	684.32		32.822
15/04/2014 10:00	7257600	30.666	684.406		32.834
15/04/2014 16:00	7279200	30.655	684.398		32.845
15/04/2014 22:00	7300800	30.646	684.415		32.854
16/04/2014 4:00	7322400	30.646	684.557		32.854
16/04/2014 10:00	7344000	30.653	684.683		32.847
16/04/2014 16:00	7365600	30.665	684.69		32.835
16/04/2014 22:00	7387200	30.654	684.721		32.846
17/04/2014 4:00	7408800	30.677	684.693		32.823
17/04/2014 10:00	7430400	30.652	684.741		32.848
17/04/2014 16:00	7452000	30.648	684.678		32.852
17/04/2014 22:00	7473600	30.635	684.639		32.865
18/04/2014 4:00	7495200	30.644	684.753		32.856
18/04/2014 10:00	7516800	30.647	684.743		32.853
18/04/2014 16:00	7538400	30.665	684.833		32.835
18/04/2014 22:00	7560000	30.655	684.829		32.845
19/04/2014 4:00	7581600	30.69	684.872		32.81
19/04/2014 10:00	7603200	30.676	684.749		32.824
19/04/2014 16:00	7624800	30.685	684.779		32.815
19/04/2014 22:00	7646400	30.674	684.684		32.826
20/04/2014 4:00	7668000	30.678	684.698		32.822
20/04/2014 10:00	7689600	30.67	684.63		32.83
20/04/2014 16:00	7711200	30.687	684.656		32.813
20/04/2014 22:00	7732800	30.661	684.67		32.839
21/04/2014 4:00	7754400	30.695	684.648		32.805
21/04/2014 10:00	7776000	30.675	684.712		32.825
21/04/2014 16:00	7797600	30.678	684.653		32.822
21/04/2014 22:00	7819200	30.663	684.756		32.837
22/04/2014 4:00	7840800	30.7	684.686		32.8
22/04/2014 10:00	7862400	30.684	684.649		32.816
22/04/2014 16:00	7884000	30.699	684.674		32.801
22/04/2014 22:00	7905600	30.679	684.786		32.821
23/04/2014 4:00	7927200	30.691	684.838		32.809
23/04/2014 10:00	7948800	30.673	684.842		32.827
23/04/2014 16:00	7970400	30.695	684.922		32.805
23/04/2014 22:00	7992000	30.685	684.856		32.815
24/04/2014 4:00	8013600	30.721	684.896		32.779
24/04/2014 10:00	8035200	30.715	684.836		32.785
24/04/2014 16:00	8056800	30.713	684.751		32.787
24/04/2014 22:00	8078400	30.696	684.771		32.804
25/04/2014 4:00	8100000	30.694	684.675		32.806
25/04/2014 10:00	8121600	30.684	684.685		32.816
25/04/2014 16:00	8143200	30.696	684.632		32.804
25/04/2014 22:00	8164800	30.68	684.686		32.82
26/04/2014 4:00	8186400	30.717	684.676		32.783
26/04/2014 10:00	8208000	30.718	684.659		32.782
26/04/2014 16:00	8229600	30.721	684.2		32.779
26/04/2014 22:00	8251200	30.736	683.755		32.764
27/04/2014 4:00	8272800	30.721	683.827		32.779
27/04/2014 10:00	8294400	30.71	684.048		32.79
27/04/2014 16:00	8316000	30.701	684.255		32.799
27/04/2014 22:00	8337600	30.686	684.46		32.814
28/04/2014 4:00	8359200	30.706	684.579		32.794
28/04/2014 10:00	8380800	30.676	684.596		32.824
28/04/2014 16:00	8402400	30.666	684.884		32.834
28/04/2014 22:00	8424000	30.666	684.657		32.834
29/04/2014 4:00	8445600	30.693	684.655		32.807
29/04/2014 10:00	8467200	30.68	684.694		32.82
29/04/2014 16:00	8488800	30.678	684.736		32.822
29/04/2014 22:00	8510400	30.678	684.738		32.822
30/04/2014 4:00	8532000	30.68	684.716		32.82
30/04/2014 10:00	8553600	30.667	684.788		32.833
30/04/2014 16:00	8575200	30.684	684.83		32.816
30/04/2014 22:00	8596800	30.674	684.825		32.826
1/05/2014 4:00	8618400	30.702	684.998		32.798
1/05/2014 10:00	8640000	30.677	684.994		32.823
1/05/2014 16:00	8661600	30.668	685.017		32.832
1/05/2014 22:00	8683200	30.653	685.013		32.847
2/05/2014 4:00	8704800	30.658	684.673		32.842
2/05/2014 10:00	8726400	30.645	684.693		32.855
2/05/2014 16:00	8748000	30.668	684.77		32.832
2/05/2014 22:00	8769600	30.664	684.879		32.836
3/05/2014 4:00	8791200	30.697	684.993		32.803
3/05/2014 10:00	8812800	30.684	685.077		32.816
3/05/2014 16:00	8834400	30.683	685.542		32.817

3/05/2014 22:00	8856000	30.681	685.312		32.819
4/05/2014 4:00	8877600	30.681	685.299		32.819
4/05/2014 10:00	8899200	30.668	685.68		32.832
4/05/2014 16:00	8920800	30.685	685.572		32.815
4/05/2014 22:00	8942400	30.672	685.562		32.828
5/05/2014 4:00	8964000	30.703	685.624		32.797
5/05/2014 10:00	8985600	30.685	685.628		32.815
5/05/2014 16:00	9007200	30.683	685.674		32.817
5/05/2014 22:00	9028800	30.67	685.799		32.83
6/05/2014 4:00	9050400	30.701	685.732		32.799
6/05/2014 10:00	9072000	30.682	685.874		32.818
6/05/2014 16:00	9093600	30.688	685.802		32.812
6/05/2014 22:00	9115200	30.689	685.924		32.811
7/05/2014 4:00	9136800	30.706	685.933		32.794
7/05/2014 10:00	9158400	30.706	686.087		32.794
7/05/2014 16:00	9180000	30.715	686.199		32.785
7/05/2014 22:00	9201600	30.712	686.379		32.788
8/05/2014 4:00	9223200	30.743	686.475		32.757
8/05/2014 10:00	9244800	30.711	686.693		32.789
8/05/2014 16:00	9266400	30.698	686.847		32.802
8/05/2014 22:00	9288000	30.685	687.006		32.815
9/05/2014 4:00	9309600	30.685	687.232		32.815
9/05/2014 10:00	9331200	30.669	687.39		32.831
9/05/2014 16:00	9352800	30.664	687.487		32.836
9/05/2014 22:00	9374400	30.664	687.639		32.836
10/05/2014 4:00	9396000	30.694	687.859		32.806
10/05/2014 10:00	9417600	30.676	688.227		32.824
10/05/2014 16:00	9439200	30.67	688.189		32.83
10/05/2014 22:00	9460800	30.663	688.457		32.837
11/05/2014 4:00	9482400	30.664	688.565		32.836
11/05/2014 10:00	9504000	30.664	688.63		32.836
11/05/2014 16:00	9525600	30.672	688.786		32.828
11/05/2014 22:00	9547200	30.682	688.791		32.818
12/05/2014 4:00	9568800	30.707	688.981		32.793
12/05/2014 10:00	9590400	30.689	688.995		32.811
12/05/2014 16:00	9612000	30.668	689.303		32.832
12/05/2014 22:00	9633600	30.661	689.227		32.839
13/05/2014 4:00	9655200	30.685	689.345		32.815
13/05/2014 10:00	9676800	30.676	689.385		32.824
13/05/2014 16:00	9698400	30.675	689.546		32.825
13/05/2014 22:00	9720000	30.675	689.512		32.825
14/05/2014 4:00	9741600	30.672	689.582		32.828
14/05/2014 10:00	9763200	30.662	689.671		32.838
14/05/2014 16:00	9784800	30.674	689.811		32.826
14/05/2014 22:00	9806400	30.669	689.818		32.831
15/05/2014 4:00	9828000	30.7	689.839		32.8
15/05/2014 10:00	9849600	30.676	689.9		32.824
15/05/2014 16:00	9871200	30.685	689.878		32.815
15/05/2014 22:00	9892800	30.684	689.956		32.816
16/05/2014 4:00	9914400	30.676	689.964		32.824
16/05/2014 10:00	9936000	30.663	690.008		32.837
16/05/2014 16:00	9957600	30.667	689.965		32.833
16/05/2014 22:00	9979200	30.661	690.096		32.839
17/05/2014 4:00	10000800	30.693	690.049		32.807
17/05/2014 10:00	10022400	30.669	690.077		32.831
17/05/2014 16:00	10044000	30.667	690.091		32.833
17/05/2014 22:00	10065600	30.666	690.089		32.834
18/05/2014 4:00	10087200	30.686	690.032		32.814
18/05/2014 10:00	10108800	30.674	690.128		32.826
18/05/2014 16:00	10130400	30.684	690.119		32.816
18/05/2014 22:00	10152000	30.679	690.083		32.821
19/05/2014 4:00	10173600	30.713	690.051		32.787
19/05/2014 10:00	10195200	30.693	690.15		32.807
19/05/2014 16:00	10216800	30.688	690.165		32.812
19/05/2014 22:00	10238400	30.675	690.2		32.825
20/05/2014 4:00	10260000	30.707	690.273		32.793
20/05/2014 10:00	10281600	30.636	690.171		32.864
20/05/2014 16:00	10303200	30.638	690.229		32.862
20/05/2014 22:00	10324800	30.637	690.242		32.863
21/05/2014 4:00	10346400	30.638	690.219		32.862
21/05/2014 10:00	10368000	30.626	690.265		32.874
21/05/2014 16:00	10389600	30.629	690.224		32.871
21/05/2014 22:00	10411200	30.62	690.289		32.88
22/05/2014 4:00	10432800	30.66	690.329		32.84
22/05/2014 10:00	10454400	30.646	690.364		32.854
22/05/2014 16:00	10476000	30.652	690.338		32.848
22/05/2014 22:00	10497600	30.64	690.351		32.86
23/05/2014 4:00	10519200	30.644	690.394		32.856
23/05/2014 10:00	10540800	30.629	690.464		32.871
23/05/2014 16:00	10562400	30.634	690.417		32.866
23/05/2014 22:00	10584000	30.625	690.458		32.875
24/05/2014 4:00	10605600	30.651	690.466		32.849
24/05/2014 10:00	10627200	30.629	690.486		32.871

24/05/2014 16:00	10648800	30.613	690.446		32.887
24/05/2014 22:00	10670400	30.601	690.554		32.899
25/05/2014 4:00	10692000	30.597	690.491		32.903
25/05/2014 10:00	10713600	30.603	690.483		32.897
25/05/2014 16:00	10735200	30.6	690.52		32.9
25/05/2014 22:00	10756800	30.589	690.532		32.911
26/05/2014 4:00	10778400	30.586	690.464		32.914
26/05/2014 10:00	10800000	30.578	690.388		32.922
26/05/2014 16:00	10821600	30.586	690.484		32.914
26/05/2014 22:00	10843200	30.594	690.567		32.906
27/05/2014 4:00	10864800	30.59	690.592		32.91
27/05/2014 10:00	10886400	30.587	690.511		32.913
27/05/2014 16:00	10908000	30.577	690.586		32.923
27/05/2014 22:00	10929600	30.567	690.554		32.933
28/05/2014 4:00	10951200	30.559	690.599		32.941
28/05/2014 10:00	10972800	30.55	690.651		32.95
28/05/2014 16:00	10994400	30.565	690.62		32.935
28/05/2014 22:00	11016000	30.562	690.537		32.938
29/05/2014 4:00	11037600	30.568	690.6		32.932
29/05/2014 10:00	11059200	30.569	690.59		32.931
29/05/2014 16:00	11080800	30.569	690.601		32.931
29/05/2014 22:00	11102400	30.572	690.588		32.928
30/05/2014 4:00	11124000	30.578	690.602		32.922
30/05/2014 10:00	11145600	30.566	690.675		32.934
30/05/2014 16:00	11167200	30.577	690.653		32.923
30/05/2014 22:00	11188800	30.612	690.629		32.888
31/05/2014 4:00	11210400	30.588	690.604		32.912
31/05/2014 10:00	11232000	30.585	690.637		32.915
31/05/2014 16:00	11253600	30.604	690.648		32.896
31/05/2014 22:00	11275200	30.602	690.58		32.898
1/06/2014 4:00	11296800	30.594	690.574		32.906
1/06/2014 10:00	11318400	30.582	690.554		32.918
1/06/2014 16:00	11340000	30.578	690.565		32.922
1/06/2014 22:00	11361600	30.571	690.659		32.929
2/06/2014 4:00	11383200	30.575	690.593		32.925
2/06/2014 10:00	11404800	30.561	690.614		32.939
2/06/2014 16:00	11426400	30.569	690.703		32.931
2/06/2014 22:00	11448000	30.557	690.463		32.943
3/06/2014 4:00	11469600	30.567	690.481		32.933
3/06/2014 10:00	11491200	30.56	690.592		32.94
3/06/2014 16:00	11512800	30.566	690.566		32.934
3/06/2014 22:00	11534400	30.547	690.49		32.953
4/06/2014 4:00	11556000	30.544	690.611		32.956
4/06/2014 10:00	11577600	30.535	690.45		32.965
4/06/2014 16:00	11599200	30.536	690.561		32.964
4/06/2014 22:00	11620800	30.522	690.571		32.978
5/06/2014 4:00	11642400	30.526	690.587		32.974
5/06/2014 10:00	11664000	30.51	690.654		32.99
5/06/2014 16:00	11685600	30.526	690.593		32.974
5/06/2014 22:00	11707200	30.516	690.585		32.984
6/06/2014 4:00	11728800	30.523	690.616		32.977
6/06/2014 10:00	11750400	30.506	690.654		32.994
6/06/2014 16:00	11772000	30.522	690.605		32.978
6/06/2014 22:00	11793600	30.512	690.601		32.988
7/06/2014 4:00	11815200	30.513	690.655		32.987
7/06/2014 10:00	11836800	30.507	690.554		32.993
7/06/2014 16:00	11858400	30.516	690.566		32.984
7/06/2014 22:00	11880000	30.512	690.567		32.988
8/06/2014 4:00	11901600	30.526	690.514		32.974
8/06/2014 10:00	11923200	30.519	690.562		32.981
8/06/2014 16:00	11944800	30.523	690.62		32.977
8/06/2014 22:00	11966400	30.515	690.637		32.985
9/06/2014 4:00	11988000	30.522	690.6		32.978
9/06/2014 10:00	12009600	30.523	690.677		32.977
9/06/2014 16:00	12031200	30.521	690.539		32.979
9/06/2014 22:00	12052800	30.523	690.614		32.977
10/06/2014 4:00	12074400	30.531	690.645		32.969

Report Date: 10/06/2014 13:31
Report User Name: crfisher
Report Computer Name: APWKS3707
Application: WinSitu.exe
Application Version: 5.6.22.4

Log File Properties

File Name DD3-Deep3_2014-06-10_08-17-35-570.wsl
Create Date 10/06/2014 8:17

Device Properties

Device Aqua TROLL 200
Site Dardanup
Device Name Cristal Logger 1r
Serial Number 323245
Firmware Version 1.26
Hardware Version 2
Device Address 1
Device Comm Cfg 19200 8 Even
Used Memory 12
Used Battery 14

Log Configuration

Log Name	DD3-Deep3
Created By	crfisher
Computer Name	APWKS3707
Application	WinSitu.exe
Application Version	5.6.22.4
Create Date	21/01/2014 9:50:41 AM W. Australia Standard Time
Log Setup Time Zone	Unknown
Notes Size(bytes)	4096
Overwrite when full	Enabled
Scheduled Start Time	21/01/2014 11:00:00 AM W. Australia Standard Time
Scheduled Stop Time	No Stop Time
Type	Linear
Interval	Days: 0 hrs: 06 mins: 00 secs: 00

Level Reference Settings At Log Creation

Level Measurement Mode	Level Depth To Water
Specific Gravity	0.999
Level Reference Mode:	Set first logged value to offset
Level Reference Offset:	56.99 (m)

Other Log Settings

Depth of Probe:	15.2706 (m)
Head Pressure:	21.6982 (PSI)
Temperature:	30.1289 (C)

Log Notes:

Date and Time	Note
21/01/2014 9:50	Sensor SN: 323245 Factory calibration has expired.: 17/09/2013 9:34:34 AM Used Battery: 14% Used Memory: 15% User Name: crfisher
10/06/2014 8:17	Suspend Command
10/06/2014 8:17	Log Download - Used Battery: 18% Used Memory: 15% User Name: crfisher

Date and Time	Elapsed Time Seconds	Sensor: PCTD(A) 197.3ft SN#: 323245 Level Depth To Water (m)	Sensor: PCTD(A) 197.3ft SN#: 323245 Actual Conductivity (µS)		RL ground surface 94
21/01/2014 11:00	0	56.99	915.078		41605.42667
21/01/2014 17:00	21600	57.019	858.189		41605.39767
21/01/2014 23:00	43200	57.018	852.385		41605.39867

22/01/2014 5:00	64800	57.009	849.303		41605.40767
22/01/2014 11:00	86400	57.021	846.985		41605.39567
22/01/2014 17:00	108000	57.025	846.261		41605.39167
22/01/2014 23:00	129600	57.023	845.393		41605.39367
23/01/2014 5:00	151200	57.022	844.887		41605.39467
23/01/2014 11:00	172800	57.031	843.765		41605.38567
23/01/2014 17:00	194400	57.03	842.567		41605.38667
23/01/2014 23:00	216000	57.032	842.003		41605.38467
24/01/2014 5:00	237600	57.035	841.736		41605.38167
24/01/2014 11:00	259200	57.04	841.595		41605.37667
24/01/2014 17:00	280800	57.053	841.491		41605.36367
24/01/2014 23:00	302400	57.046	841.378		41605.37067
25/01/2014 5:00	324000	57.047	841.258		41605.36967
25/01/2014 11:00	345600	57.055	841.275		41605.36167
25/01/2014 17:00	367200	57.056	840.937		41605.36067
25/01/2014 23:00	388800	57.055	840.443		41605.36167
26/01/2014 5:00	410400	57.053	839.719		41605.36367
26/01/2014 11:00	432000	57.06	839.25		41605.35667
26/01/2014 17:00	453600	57.062	838.925		41605.35467
26/01/2014 23:00	475200	57.063	840.709		41605.35367
27/01/2014 5:00	496800	57.063	842.572		41605.35367
27/01/2014 11:00	518400	57.07	843.391		41605.34667
27/01/2014 17:00	540000	57.062	843.989		41605.35467
27/01/2014 23:00	561600	57.066	844.561		41605.35067
28/01/2014 5:00	583200	57.068	845.123		41605.34867
28/01/2014 11:00	604800	57.082	845.626		41605.33467
28/01/2014 17:00	626400	57.081	846.013		41605.33567
28/01/2014 23:00	648000	57.081	846.348		41605.33567
29/01/2014 5:00	669600	57.086	846.733		41605.33067
29/01/2014 11:00	691200	57.101	847.045		41605.31567
29/01/2014 17:00	712800	57.101	847.508		41605.31567
29/01/2014 23:00	734400	57.101	847.809		41605.31567
30/01/2014 5:00	756000	57.097	848.151		41605.31967
30/01/2014 11:00	777600	57.106	848.394		41605.31067
30/01/2014 17:00	799200	57.109	848.716		41605.30767
30/01/2014 23:00	820800	57.11	849.201		41605.30667
31/01/2014 5:00	842400	57.104	849.688		41605.31267
31/01/2014 11:00	864000	57.127	850.268		41605.28967
31/01/2014 17:00	885600	57.122	850.824		41605.29467
31/01/2014 23:00	907200	57.123	851.262		41605.29367
1/02/2014 5:00	928800	57.118	851.973		41605.29867
1/02/2014 11:00	950400	57.13	853.256		41605.28667
1/02/2014 17:00	972000	57.138	854.305		41605.27867
1/02/2014 23:00	993600	57.126	855.064		41605.29067
2/02/2014 5:00	1015200	57.13	856.224		41605.28667
2/02/2014 11:00	1036800	57.141	857.027		41605.27567
2/02/2014 17:00	1058400	57.145	857.991		41605.27167
2/02/2014 23:00	1080000	57.147	858.621		41605.26967
3/02/2014 5:00	1101600	57.155	859.133		41605.26167
3/02/2014 11:00	1123200	57.162	859.347		41605.25467
3/02/2014 17:00	1144800	57.175	859.807		41605.24167
3/02/2014 23:00	1166400	57.165	859.747		41605.25167
4/02/2014 5:00	1188000	57.17	860.016		41605.24667
4/02/2014 11:00	1209600	57.176	859.88		41605.24067
4/02/2014 17:00	1231200	57.178	859.976		41605.23867
4/02/2014 23:00	1252800	57.179	859.807		41605.23767
5/02/2014 5:00	1274400	57.174	859.592		41605.24267
5/02/2014 11:00	1296000	57.193	860.027		41605.22367
5/02/2014 17:00	1317600	57.184	859.73		41605.23267
5/02/2014 23:00	1339200	57.185	859.898		41605.23167
6/02/2014 5:00	1360800	57.195	859.718		41605.22167
6/02/2014 11:00	1382400	57.203	859.869		41605.21367
6/02/2014 17:00	1404000	57.205	859.81		41605.21167
6/02/2014 23:00	1425600	57.206	860.012		41605.21067
7/02/2014 5:00	1447200	57.207	860.159		41605.20967
7/02/2014 11:00	1468800	57.217	859.944		41605.19967
7/02/2014 17:00	1490400	57.211	859.792		41605.20567
7/02/2014 23:00	1512000	57.21	859.717		41605.20667
8/02/2014 5:00	1533600	57.213	859.52		41605.20367
8/02/2014 11:00	1555200	57.224	859.404		41605.19267
8/02/2014 17:00	1576800	57.222	859.62		41605.19467
8/02/2014 23:00	1598400	57.229	859.436		41605.18767
9/02/2014 5:00	1620000	57.227	859.463		41605.18967
9/02/2014 11:00	1641600	57.235	859.348		41605.18167
9/02/2014 17:00	1663200	57.243	859.268		41605.17367
9/02/2014 23:00	1684800	57.238	859.342		41605.17867
10/02/2014 5:00	1706400	57.233	859.191		41605.18367
10/02/2014 11:00	1728000	57.244	859.585		41605.17267
10/02/2014 17:00	1749600	57.241	859.2		41605.17567
10/02/2014 23:00	1771200	57.24	859.023		41605.17667
11/02/2014 5:00	1792800	57.247	859.073		41605.16967
11/02/2014 11:00	1814400	57.262	858.771		41605.15467
11/02/2014 17:00	1836000	57.259	858.831		41605.15767

11/02/2014 23:00	1857600	57.25	858.686		41605.16667
12/02/2014 5:00	1879200	57.258	858.615		41605.15867
12/02/2014 11:00	1900800	57.262	858.577		41605.15467
12/02/2014 17:00	1922400	57.271	859.105		41605.14567
12/02/2014 23:00	1944000	57.268	859.122		41605.14867
13/02/2014 5:00	1965600	57.264	859.19		41605.15267
13/02/2014 11:00	1987200	57.284	859.079		41605.13267
13/02/2014 17:00	2008800	57.279	858.976		41605.13767
13/02/2014 23:00	2030400	57.279	858.917		41605.13767
14/02/2014 5:00	2052000	57.276	858.794		41605.14067
14/02/2014 11:00	2073600	57.292	858.654		41605.12467
14/02/2014 17:00	2095200	57.29	858.514		41605.12667
14/02/2014 23:00	2116800	57.298	858.503		41605.11867
15/02/2014 5:00	2138400	57.286	858.387		41605.13067
15/02/2014 11:00	2160000	57.301	858.284		41605.11567
15/02/2014 17:00	2181600	57.3	858.196		41605.11667
15/02/2014 23:00	2203200	57.301	858.13		41605.11567
16/02/2014 5:00	2224800	57.3	858.153		41605.11667
16/02/2014 11:00	2246400	57.309	857.937		41605.10767
16/02/2014 17:00	2268000	57.312	858.017		41605.10467
16/02/2014 23:00	2289600	57.32	857.827		41605.09667
17/02/2014 5:00	2311200	57.324	857.745		41605.09267
17/02/2014 11:00	2332800	57.327	857.599		41605.08967
17/02/2014 17:00	2354400	57.337	857.484		41605.07967
17/02/2014 23:00	2376000	57.328	857.404		41605.08867
18/02/2014 5:00	2397600	57.323	857.322		41605.09367
18/02/2014 11:00	2419200	57.345	857.363		41605.07167
18/02/2014 17:00	2440800	57.34	857.253		41605.07667
18/02/2014 23:00	2462400	57.334	857.206		41605.08267
19/02/2014 5:00	2484000	57.345	857.125		41605.07167
19/02/2014 11:00	2505600	57.354	857.078		41605.06267
19/02/2014 17:00	2527200	57.348	856.961		41605.06867
19/02/2014 23:00	2548800	57.346	856.964		41605.07067
20/02/2014 5:00	2570400	57.343	856.899		41605.07367
20/02/2014 11:00	2592000	57.352	856.938		41605.06467
20/02/2014 17:00	2613600	57.359	856.658		41605.05767
20/02/2014 23:00	2635200	57.348	856.683		41605.06867
21/02/2014 5:00	2656800	57.352	856.569		41605.06467
21/02/2014 11:00	2678400	57.36	856.565		41605.05667
21/02/2014 17:00	2700000	57.368	856.499		41605.04867
21/02/2014 23:00	2721600	57.363	856.41		41605.05367
22/02/2014 5:00	2743200	57.361	856.165		41605.05567
22/02/2014 11:00	2764800	57.37	856.249		41605.04667
22/02/2014 17:00	2786400	57.37	856.276		41605.04667
22/02/2014 23:00	2808000	57.371	856.2		41605.04567
23/02/2014 5:00	2829600	57.366	856.188		41605.05067
23/02/2014 11:00	2851200	57.378	856.164		41605.03867
23/02/2014 17:00	2872800	57.374	856.152		41605.04267
23/02/2014 23:00	2894400	57.373	856.139		41605.04367
24/02/2014 5:00	2916000	57.37	856.073		41605.04667
24/02/2014 11:00	2937600	57.38	855.942		41605.03667
24/02/2014 17:00	2959200	57.373	856.099		41605.04367
24/02/2014 23:00	2980800	57.379	856.026		41605.03767
25/02/2014 5:00	3002400	57.382	855.896		41605.03467
25/02/2014 11:00	3024000	57.385	855.92		41605.03167
25/02/2014 17:00	3045600	57.385	855.76		41605.03167
25/02/2014 23:00	3067200	57.379	855.821		41605.03767
26/02/2014 5:00	3088800	57.385	855.785		41605.03167
26/02/2014 11:00	3110400	57.391	855.745		41605.02567
26/02/2014 17:00	3132000	57.393	856.013		41605.02367
26/02/2014 23:00	3153600	57.394	855.667		41605.02267
27/02/2014 5:00	3175200	57.39	855.638		41605.02667
27/02/2014 11:00	3196800	57.399	855.495		41605.01767
27/02/2014 17:00	3218400	57.4	855.587		41605.01667
27/02/2014 23:00	3240000	57.4	855.553		41605.01667
28/02/2014 5:00	3261600	57.393	855.436		41605.02367
28/02/2014 11:00	3283200	57.406	855.556		41605.01067
28/02/2014 17:00	3304800	57.399	855.473		41605.01767
28/02/2014 23:00	3326400	57.401	855.438		41605.01567
1/03/2014 5:00	3348000	57.4	855.526		41605.01667
1/03/2014 11:00	3369600	57.401	855.441		41605.01567
1/03/2014 17:00	3391200	57.409	855.469		41605.00767
1/03/2014 23:00	3412800	57.408	855.444		41605.00867
2/03/2014 5:00	3434400	57.405	855.3		41605.01167
2/03/2014 11:00	3456000	57.413	855.323		41605.00367
2/03/2014 17:00	3477600	57.41	855.414		41605.00667
2/03/2014 23:00	3499200	57.409	855.147		41605.00767
3/03/2014 5:00	3520800	57.405	855.086		41605.01167
3/03/2014 11:00	3542400	57.416	855.259		41605.00067
3/03/2014 17:00	3564000	57.414	855.2		41605.00267
3/03/2014 23:00	3585600	57.4	855.177		41605.01667
4/03/2014 5:00	3607200	57.414	855.058		41605.00267
4/03/2014 11:00	3628800	57.423	855.229		41604.99367

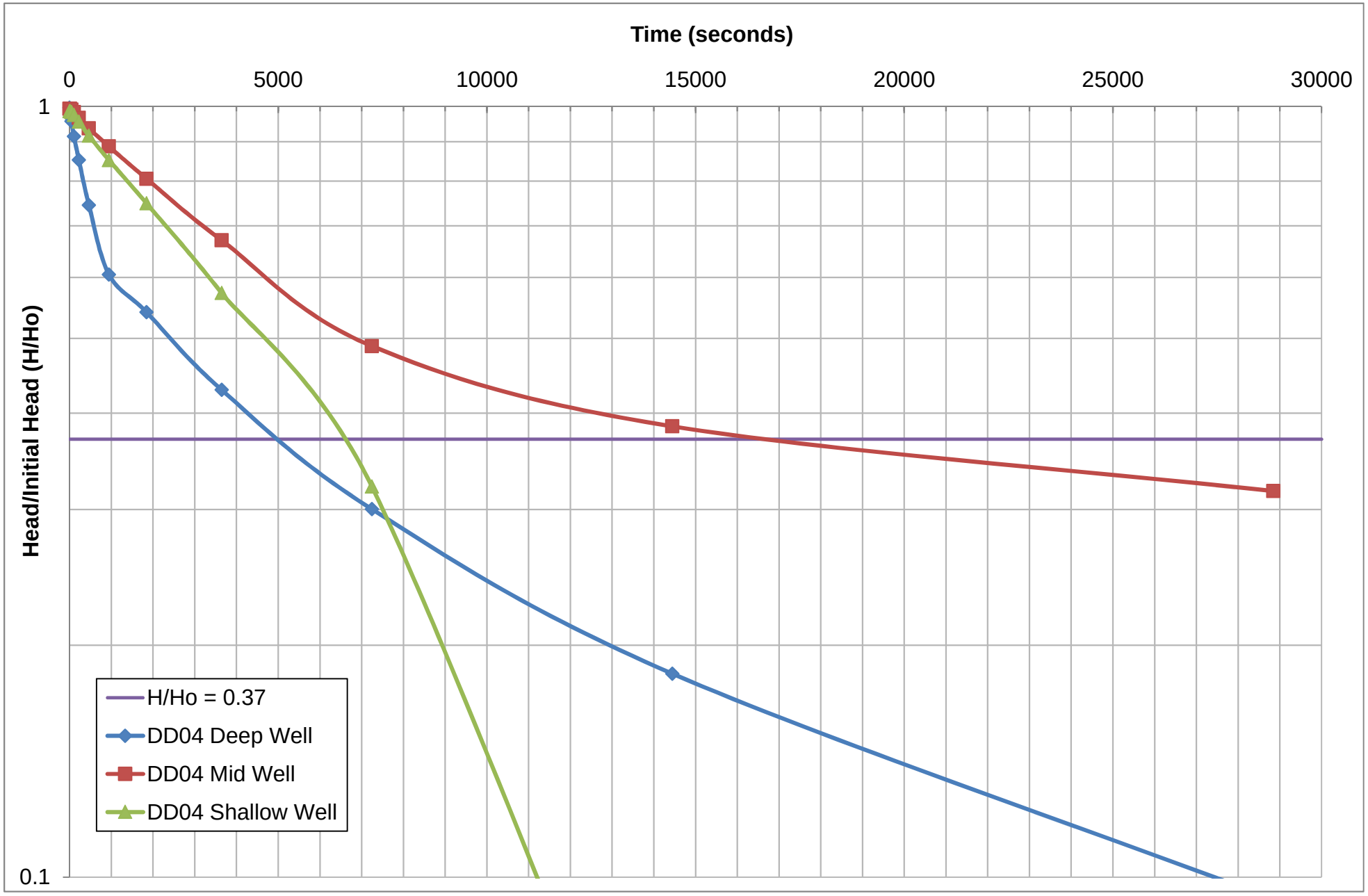
4/03/2014 17:00	3650400	57.424	854.963		41604.99267
4/03/2014 23:00	3672000	57.418	854.766		41604.99867
5/03/2014 5:00	3693600	57.424	855.027		41604.99267
5/03/2014 11:00	3715200	57.437	854.93		41604.97967
5/03/2014 17:00	3736800	57.437	855.038		41604.97967
5/03/2014 23:00	3758400	57.428	855.056		41604.98867
6/03/2014 5:00	3780000	57.428	854.874		41604.98867
6/03/2014 11:00	3801600	57.436	854.996		41604.98067
6/03/2014 17:00	3823200	57.437	854.724		41604.97967
6/03/2014 23:00	3844800	57.431	854.801		41604.98567
7/03/2014 5:00	3866400	57.435	854.867		41604.98167
7/03/2014 11:00	3888000	57.445	854.619		41604.97167
7/03/2014 17:00	3909600	57.436	854.62		41604.98067
7/03/2014 23:00	3931200	57.439	854.673		41604.97767
8/03/2014 5:00	3952800	57.433	854.517		41604.98367
8/03/2014 11:00	3974400	57.441	854.399		41604.97567
8/03/2014 17:00	3996000	57.435	854.342		41604.98167
8/03/2014 23:00	4017600	57.431	854.302		41604.98567
9/03/2014 5:00	4039200	57.438	854.191		41604.97867
9/03/2014 11:00	4060800	57.446	854.105		41604.97067
9/03/2014 17:00	4082400	57.45	854.311		41604.96667
9/03/2014 23:00	4104000	57.449	854.206		41604.96767
10/03/2014 5:00	4125600	57.446	854.224		41604.97067
10/03/2014 11:00	4147200	57.457	854.045		41604.95967
10/03/2014 17:00	4168800	57.452	853.885		41604.96467
10/03/2014 23:00	4190400	57.452	854.03		41604.96467
11/03/2014 5:00	4212000	57.453	853.956		41604.96367
11/03/2014 11:00	4233600	57.463	853.894		41604.95367
11/03/2014 17:00	4255200	57.462	853.721		41604.95467
11/03/2014 23:00	4276800	57.46	853.648		41604.95667
12/03/2014 5:00	4298400	57.463	853.748		41604.95367
12/03/2014 11:00	4320000	57.471	853.76		41604.94567
12/03/2014 17:00	4341600	57.47	853.796		41604.94667
12/03/2014 23:00	4363200	57.477	853.781		41604.93967
13/03/2014 5:00	4384800	57.468	853.71		41604.94867
13/03/2014 11:00	4406400	57.477	853.637		41604.93967
13/03/2014 17:00	4428000	57.466	853.699		41604.95067
13/03/2014 23:00	4449600	57.471	853.623		41604.94567
14/03/2014 5:00	4471200	57.465	853.601		41604.95167
14/03/2014 11:00	4492800	57.478	853.661		41604.93867
14/03/2014 17:00	4514400	57.477	853.655		41604.93967
14/03/2014 23:00	4536000	57.473	853.656		41604.94367
15/03/2014 5:00	4557600	57.482	853.629		41604.93467
15/03/2014 11:00	4579200	57.48	853.723		41604.93667
15/03/2014 17:00	4600800	57.481	853.76		41604.93567
15/03/2014 23:00	4622400	57.486	853.896		41604.93067
16/03/2014 5:00	4644000	57.49	853.792		41604.92667
16/03/2014 11:00	4665600	57.495	853.719		41604.92167
16/03/2014 17:00	4687200	57.486	853.785		41604.93067
16/03/2014 23:00	4708800	57.487	853.835		41604.92967
17/03/2014 5:00	4730400	57.483	853.768		41604.93367
17/03/2014 11:00	4752000	57.492	853.839		41604.92467
17/03/2014 17:00	4773600	57.49	853.793		41604.92667
17/03/2014 23:00	4795200	57.495	853.761		41604.92167
18/03/2014 5:00	4816800	57.492	853.877		41604.92467
18/03/2014 11:00	4838400	57.493	853.782		41604.92367
18/03/2014 17:00	4860000	57.492	853.862		41604.92467
18/03/2014 23:00	4881600	57.489	853.7		41604.92767
19/03/2014 5:00	4903200	57.494	853.777		41604.92267
19/03/2014 11:00	4924800	57.501	853.671		41604.91567
19/03/2014 17:00	4946400	57.508	853.73		41604.90867
19/03/2014 23:00	4968000	57.498	853.736		41604.91867
20/03/2014 5:00	4989600	57.496	853.76		41604.92067
20/03/2014 11:00	5011200	57.513	853.753		41604.90367
20/03/2014 17:00	5032800	57.5	853.85		41604.91667
20/03/2014 23:00	5054400	57.512	853.742		41604.90467
21/03/2014 5:00	5076000	57.507	853.802		41604.90967
21/03/2014 11:00	5097600	57.518	853.739		41604.89867
21/03/2014 17:00	5119200	57.507	853.577		41604.90967
21/03/2014 23:00	5140800	57.498	853.682		41604.91867
22/03/2014 5:00	5162400	57.507	853.684		41604.90967
22/03/2014 11:00	5184000	57.511	853.83		41604.90567
22/03/2014 17:00	5205600	57.504	853.894		41604.91267
22/03/2014 23:00	5227200	57.508	853.896		41604.90867
23/03/2014 5:00	5248800	57.507	854.017		41604.90967
23/03/2014 11:00	5270400	57.515	854.051		41604.90167
23/03/2014 17:00	5292000	57.51	854.03		41604.90667
23/03/2014 23:00	5313600	57.513	854.08		41604.90367
24/03/2014 5:00	5335200	57.512	854.175		41604.90467
24/03/2014 11:00	5356800	57.514	854.155		41604.90267
24/03/2014 17:00	5378400	57.511	854.247		41604.90567
24/03/2014 23:00	5400000	57.517	854.461		41604.89967
25/03/2014 5:00	5421600	57.518	854.185		41604.89867

25/03/2014 11:00	5443200	57.519	854.323		41604.89767
25/03/2014 17:00	5464800	57.51	854.407		41604.90667
25/03/2014 23:00	5486400	57.528	854.303		41604.88867
26/03/2014 5:00	5508000	57.518	854.422		41604.89867
26/03/2014 11:00	5529600	57.518	854.536		41604.89867
26/03/2014 17:00	5551200	57.521	854.676		41604.89567
26/03/2014 23:00	5572800	57.519	854.78		41604.89767
27/03/2014 5:00	5594400	57.525	854.84		41604.89167
27/03/2014 11:00	5616000	57.532	856.49		41604.88467
27/03/2014 17:00	5637600	57.536	856.394		41604.88067
27/03/2014 23:00	5659200	57.528	856.461		41604.88867
28/03/2014 5:00	5680800	57.528	856.663		41604.88867
28/03/2014 11:00	5702400	57.542	856.83		41604.87467
28/03/2014 17:00	5724000	57.541	857.05		41604.87567
28/03/2014 23:00	5745600	57.542	856.948		41604.87467
29/03/2014 5:00	5767200	57.547	857.487		41604.86967
29/03/2014 11:00	5788800	57.544	858.423		41604.87267
29/03/2014 17:00	5810400	57.533	858.859		41604.88367
29/03/2014 23:00	5832000	57.536	860.677		41604.88067
30/03/2014 5:00	5853600	57.537	860.082		41604.87967
30/03/2014 11:00	5875200	57.547	859.825		41604.86967
30/03/2014 17:00	5896800	57.541	859.863		41604.87567
30/03/2014 23:00	5918400	57.544	859.796		41604.87267
31/03/2014 5:00	5940000	57.553	859.885		41604.86367
31/03/2014 11:00	5961600	57.552	859.745		41604.86467
31/03/2014 17:00	5983200	57.557	859.588		41604.85967
31/03/2014 23:00	6004800	57.55	859.676		41604.86667
1/04/2014 5:00	6026400	57.549	859.496		41604.86767
1/04/2014 11:00	6048000	57.558	859.605		41604.85867
1/04/2014 17:00	6069600	57.548	859.669		41604.86867
1/04/2014 23:00	6091200	57.559	859.733		41604.85767
2/04/2014 5:00	6112800	57.565	859.826		41604.85167
2/04/2014 11:00	6134400	57.565	859.78		41604.85167
2/04/2014 17:00	6156000	57.571	859.775		41604.84567
2/04/2014 23:00	6177600	57.566	859.914		41604.85067
3/04/2014 5:00	6199200	57.574	860.265		41604.84267
3/04/2014 11:00	6220800	57.575	860.432		41604.84167
3/04/2014 17:00	6242400	57.568	860.465		41604.84867
3/04/2014 23:00	6264000	57.582	860.661		41604.83467
4/04/2014 5:00	6285600	57.576	860.791		41604.84067
4/04/2014 11:00	6307200	57.578	860.896		41604.83867
4/04/2014 17:00	6328800	57.575	860.994		41604.84167
4/04/2014 23:00	6350400	57.571	861.021		41604.84567
5/04/2014 5:00	6372000	57.575	861.043		41604.84167
5/04/2014 11:00	6393600	57.588	861.114		41604.82867
5/04/2014 17:00	6415200	57.573	861.022		41604.84367
5/04/2014 23:00	6436800	57.582	861.087		41604.83467
6/04/2014 5:00	6458400	57.57	861.228		41604.84667
6/04/2014 11:00	6480000	57.58	861.337		41604.83667
6/04/2014 17:00	6501600	57.586	861.487		41604.83067
6/04/2014 23:00	6523200	57.584	861.544		41604.83267
7/04/2014 5:00	6544800	57.585	861.626		41604.83167
7/04/2014 11:00	6566400	57.585	861.786		41604.83167
7/04/2014 17:00	6588000	57.586	861.591		41604.83067
7/04/2014 23:00	6609600	57.588	861.943		41604.82867
8/04/2014 5:00	6631200	57.59	861.775		41604.82667
8/04/2014 11:00	6652800	57.598	862.099		41604.81867
8/04/2014 17:00	6674400	57.6	862.092		41604.81667
8/04/2014 23:00	6696000	57.605	862.088		41604.81167
9/04/2014 5:00	6717600	57.599	862.104		41604.81767
9/04/2014 11:00	6739200	57.604	862.118		41604.81267
9/04/2014 17:00	6760800	57.595	862.028		41604.82167
9/04/2014 23:00	6782400	57.603	862.112		41604.81367
10/04/2014 5:00	6804000	57.59	862.116		41604.82667
10/04/2014 11:00	6825600	57.61	862.031		41604.80667
10/04/2014 17:00	6847200	57.605	862.215		41604.81167
10/04/2014 23:00	6868800	57.609	862.25		41604.80767
11/04/2014 5:00	6890400	57.605	862.216		41604.81167
11/04/2014 11:00	6912000	57.61	862.333		41604.80667
11/04/2014 17:00	6933600	57.608	862.06		41604.80867
11/04/2014 23:00	6955200	57.621	862.353		41604.79567
12/04/2014 5:00	6976800	57.61	862.322		41604.80667
12/04/2014 11:00	6998400	57.62	862.221		41604.79667
12/04/2014 17:00	7020000	57.619	862.25		41604.79767
12/04/2014 23:00	7041600	57.607	862.29		41604.80967
13/04/2014 5:00	7063200	57.613	862.301		41604.80367
13/04/2014 11:00	7084800	57.628	862.41		41604.78867
13/04/2014 17:00	7106400	57.617	862.455		41604.79967
13/04/2014 23:00	7128000	57.62	862.455		41604.79667
14/04/2014 5:00	7149600	57.623	862.469		41604.79367
14/04/2014 11:00	7171200	57.623	862.488		41604.79367
14/04/2014 17:00	7192800	57.624	862.433		41604.79267
14/04/2014 23:00	7214400	57.625	862.522		41604.79167

15/04/2014 5:00	7236000	57.624	862.643		41604.79267
15/04/2014 11:00	7257600	57.624	862.531		41604.79267
15/04/2014 17:00	7279200	57.633	862.608		41604.78367
15/04/2014 23:00	7300800	57.624	862.672		41604.79267
16/04/2014 5:00	7322400	57.633	862.631		41604.78367
16/04/2014 11:00	7344000	57.632	862.572		41604.78467
16/04/2014 17:00	7365600	57.629	862.714		41604.78767
16/04/2014 23:00	7387200	57.637	862.627		41604.77967
17/04/2014 5:00	7408800	57.634	862.579		41604.78267
17/04/2014 11:00	7430400	57.628	862.414		41604.78867
17/04/2014 17:00	7452000	57.632	862.566		41604.78467
17/04/2014 23:00	7473600	57.636	862.688		41604.78067
18/04/2014 5:00	7495200	57.634	862.584		41604.78267
18/04/2014 11:00	7516800	57.647	862.704		41604.76967
18/04/2014 17:00	7538400	57.631	862.679		41604.78567
18/04/2014 23:00	7560000	57.633	862.774		41604.78367
19/04/2014 5:00	7581600	57.634	862.657		41604.78267
19/04/2014 11:00	7603200	57.635	862.785		41604.78167
19/04/2014 17:00	7624800	57.637	862.943		41604.77967
19/04/2014 23:00	7646400	57.632	862.869		41604.78467
20/04/2014 5:00	7668000	57.637	863.094		41604.77967
20/04/2014 11:00	7689600	57.636	862.921		41604.78067
20/04/2014 17:00	7711200	57.627	862.772		41604.78967
20/04/2014 23:00	7732800	57.628	862.841		41604.78867
21/04/2014 5:00	7754400	57.628	862.765		41604.78867
21/04/2014 11:00	7776000	57.633	862.724		41604.78367
21/04/2014 17:00	7797600	57.631	862.906		41604.78567
21/04/2014 23:00	7819200	57.641	863.13		41604.77567
22/04/2014 5:00	7840800	57.632	862.957		41604.78467
22/04/2014 11:00	7862400	57.637	863.042		41604.77967
22/04/2014 17:00	7884000	57.643	862.917		41604.77367
22/04/2014 23:00	7905600	57.64	863.053		41604.77667
23/04/2014 5:00	7927200	57.637	863.153		41604.77967
23/04/2014 11:00	7948800	57.647	863.066		41604.76967
23/04/2014 17:00	7970400	57.639	862.997		41604.77767
23/04/2014 23:00	7992000	57.642	863.074		41604.77467
24/04/2014 5:00	8013600	57.646	863.145		41604.77067
24/04/2014 11:00	8035200	57.649	863.246		41604.76767
24/04/2014 17:00	8056800	57.639	863.09		41604.77767
24/04/2014 23:00	8078400	57.641	862.982		41604.77567
25/04/2014 5:00	8100000	57.64	862.806		41604.77667
25/04/2014 11:00	8121600	57.639	863.046		41604.77767
25/04/2014 17:00	8143200	57.645	863.01		41604.77167
25/04/2014 23:00	8164800	57.647	863.012		41604.76967
26/04/2014 5:00	8186400	57.647	862.832		41604.76967
26/04/2014 11:00	8208000	57.658	862.822		41604.75867
26/04/2014 17:00	8229600	57.654	862.705		41604.76267
26/04/2014 23:00	8251200	57.662	862.526		41604.75467
27/04/2014 5:00	8272800	57.652	862.528		41604.76467
27/04/2014 11:00	8294400	57.657	862.463		41604.75967
27/04/2014 17:00	8316000	57.651	862.232		41604.76567
27/04/2014 23:00	8337600	57.659	862.219		41604.75767
28/04/2014 5:00	8359200	57.654	862.278		41604.76267
28/04/2014 11:00	8380800	57.66	862.432		41604.75667
28/04/2014 17:00	8402400	57.658	862.279		41604.75867
28/04/2014 23:00	8424000	57.662	862.425		41604.75467
29/04/2014 5:00	8445600	57.667	862.456		41604.74967
29/04/2014 11:00	8467200	57.671	862.721		41604.74567
29/04/2014 17:00	8488800	57.67	862.844		41604.74667
29/04/2014 23:00	8510400	57.675	862.684		41604.74167
30/04/2014 5:00	8532000	57.673	862.659		41604.74367
30/04/2014 11:00	8553600	57.677	862.732		41604.73967
30/04/2014 17:00	8575200	57.675	862.612		41604.74167
30/04/2014 23:00	8596800	57.674	862.598		41604.74267
1/05/2014 5:00	8618400	57.673	862.766		41604.74367
1/05/2014 11:00	8640000	57.674	862.562		41604.74267
1/05/2014 17:00	8661600	57.669	862.594		41604.74767
1/05/2014 23:00	8683200	57.671	862.622		41604.74567
2/05/2014 5:00	8704800	57.68	862.571		41604.73667
2/05/2014 11:00	8726400	57.682	862.475		41604.73467
2/05/2014 17:00	8748000	57.674	862.237		41604.74267
2/05/2014 23:00	8769600	57.681	862.386		41604.73567
3/05/2014 5:00	8791200	57.67	862.289		41604.74667
3/05/2014 11:00	8812800	57.684	862.308		41604.73267
3/05/2014 17:00	8834400	57.678	862.392		41604.73867
3/05/2014 23:00	8856000	57.677	862.247		41604.73967
4/05/2014 5:00	8877600	57.671	862.218		41604.74567
4/05/2014 11:00	8899200	57.671	862.316		41604.74567
4/05/2014 17:00	8920800	57.67	862.227		41604.74667
4/05/2014 23:00	8942400	57.663	862.241		41604.75367
5/05/2014 5:00	8964000	57.665	862.253		41604.75167
5/05/2014 11:00	8985600	57.666	862.109		41604.75067
5/05/2014 17:00	9007200	57.662	862.111		41604.75467

5/05/2014 23:00	9028800	57.663	862.015		41604.75367
6/05/2014 5:00	9050400	57.664	861.973		41604.75267
6/05/2014 11:00	9072000	57.665	861.91		41604.75167
6/05/2014 17:00	9093600	57.672	861.839		41604.74467
6/05/2014 23:00	9115200	57.672	861.668		41604.74467
7/05/2014 5:00	9136800	57.667	861.733		41604.74967
7/05/2014 11:00	9158400	57.675	861.836		41604.74167
7/05/2014 17:00	9180000	57.667	861.635		41604.74967
7/05/2014 23:00	9201600	57.676	861.708		41604.74067
8/05/2014 5:00	9223200	57.666	861.698		41604.75067
8/05/2014 11:00	9244800	57.662	861.627		41604.75467
8/05/2014 17:00	9266400	57.67	861.618		41604.74667
8/05/2014 23:00	9288000	57.68	861.67		41604.73667
9/05/2014 5:00	9309600	57.676	861.62		41604.74067
9/05/2014 11:00	9331200	57.677	861.661		41604.73967
9/05/2014 17:00	9352800	57.677	861.611		41604.73967
9/05/2014 23:00	9374400	57.683	861.652		41604.73367
10/05/2014 5:00	9396000	57.688	861.643		41604.72867
10/05/2014 11:00	9417600	57.693	861.643		41604.72367
10/05/2014 17:00	9439200	57.687	861.633		41604.72967
10/05/2014 23:00	9460800	57.692	861.598		41604.72467
11/05/2014 5:00	9482400	57.693	861.502		41604.72367
11/05/2014 11:00	9504000	57.694	861.469		41604.72267
11/05/2014 17:00	9525600	57.697	861.468		41604.71967
11/05/2014 23:00	9547200	57.704	861.141		41604.71267
12/05/2014 5:00	9568800	57.703	861.391		41604.71367
12/05/2014 11:00	9590400	57.699	861.314		41604.71767
12/05/2014 17:00	9612000	57.696	861.223		41604.72067
12/05/2014 23:00	9633600	57.702	861.226		41604.71467
13/05/2014 5:00	9655200	57.703	861.211		41604.71367
13/05/2014 11:00	9676800	57.704	861.025		41604.71267
13/05/2014 17:00	9698400	57.704	860.98		41604.71267
13/05/2014 23:00	9720000	57.704	861.001		41604.71267
14/05/2014 5:00	9741600	57.703	860.902		41604.71367
14/05/2014 11:00	9763200	57.706	860.769		41604.71067
14/05/2014 17:00	9784800	57.705	860.76		41604.71167
14/05/2014 23:00	9806400	57.713	860.641		41604.70367
15/05/2014 5:00	9828000	57.707	860.652		41604.70967
15/05/2014 11:00	9849600	57.704	861.688		41604.71267
15/05/2014 17:00	9871200	57.702	861.765		41604.71467
15/05/2014 23:00	9892800	57.708	861.701		41604.70867
16/05/2014 5:00	9914400	57.702	861.244		41604.71467
16/05/2014 11:00	9936000	57.703	861.277		41604.71367
16/05/2014 17:00	9957600	57.694	861.428		41604.72267
16/05/2014 23:00	9979200	57.702	861.437		41604.71467
17/05/2014 5:00	10000800	57.706	861.035		41604.71067
17/05/2014 11:00	10022400	57.707	861.19		41604.70967
17/05/2014 17:00	10044000	57.699	861.054		41604.71767
17/05/2014 23:00	10065600	57.708	860.958		41604.70867
18/05/2014 5:00	10087200	57.707	860.919		41604.70967
18/05/2014 11:00	10108800	57.715	860.823		41604.70167
18/05/2014 17:00	10130400	57.706	860.698		41604.71067
18/05/2014 23:00	10152000	57.709	860.698		41604.70767
19/05/2014 5:00	10173600	57.708	860.589		41604.70867
19/05/2014 11:00	10195200	57.709	860.628		41604.70767
19/05/2014 17:00	10216800	57.712	860.54		41604.70467
19/05/2014 23:00	10238400	57.715	860.432		41604.70167
20/05/2014 5:00	10260000	57.713	860.211		41604.70367
20/05/2014 11:00	10281600	57.714	860.145		41604.70267
20/05/2014 17:00	10303200	57.717	860.118		41604.69967
20/05/2014 23:00	10324800	57.713	860.112		41604.70367
21/05/2014 5:00	10346400	57.711	860.051		41604.70567
21/05/2014 11:00	10368000	57.721	859.872		41604.69567
21/05/2014 17:00	10389600	57.712	859.787		41604.70467
21/05/2014 23:00	10411200	57.723	859.728		41604.69367
22/05/2014 5:00	10432800	57.714	859.527		41604.70267
22/05/2014 11:00	10454400	57.719	859.488		41604.69767
22/05/2014 17:00	10476000	57.72	859.372		41604.69667
22/05/2014 23:00	10497600	57.711	859.227		41604.70567
23/05/2014 5:00	10519200	57.716	859.148		41604.70067
23/05/2014 11:00	10540800	57.716	859.011		41604.70067
23/05/2014 17:00	10562400	57.712	858.892		41604.70467
23/05/2014 23:00	10584000	57.717	858.856		41604.69967
24/05/2014 5:00	10605600	57.718	858.787		41604.69867
24/05/2014 11:00	10627200	57.722	858.755		41604.69467
24/05/2014 17:00	10648800	57.712	858.579		41604.70467
24/05/2014 23:00	10670400	57.718	858.236		41604.69867
25/05/2014 5:00	10692000	57.73	858.391		41604.68667
25/05/2014 11:00	10713600	57.728	858.217		41604.68867
25/05/2014 17:00	10735200	57.722	858.286		41604.69467
25/05/2014 23:00	10756800	57.727	858.14		41604.68967
26/05/2014 5:00	10778400	57.733	858.148		41604.68367
26/05/2014 11:00	10800000	57.731	858.104		41604.68567

26/05/2014 17:00	10821600	57.735	858.084		41604.68167
26/05/2014 23:00	10843200	57.733	858.111		41604.68367
27/05/2014 5:00	10864800	57.743	857.964		41604.67367
27/05/2014 11:00	10886400	57.732	857.774		41604.68467
27/05/2014 17:00	10908000	57.737	857.716		41604.67967
27/05/2014 23:00	10929600	57.741	857.685		41604.67567
28/05/2014 5:00	10951200	57.736	857.75		41604.68067
28/05/2014 11:00	10972800	57.737	857.707		41604.67967
28/05/2014 17:00	10994400	57.737	857.607		41604.67967
28/05/2014 23:00	11016000	57.739	857.649		41604.67767
29/05/2014 5:00	11037600	57.736	857.235		41604.68067
29/05/2014 11:00	11059200	57.742	857.585		41604.67467
29/05/2014 17:00	11080800	57.738	857.392		41604.67867
29/05/2014 23:00	11102400	57.742	857.575		41604.67467
30/05/2014 5:00	11124000	57.744	857.461		41604.67267
30/05/2014 11:00	11145600	57.746	857.384		41604.67067
30/05/2014 17:00	11167200	57.738	857.322		41604.67867
30/05/2014 23:00	11188800	57.739	857.344		41604.67767
31/05/2014 5:00	11210400	57.744	857.418		41604.67267
31/05/2014 11:00	11232000	57.745	857.137		41604.67167
31/05/2014 17:00	11253600	57.743	857.562		41604.67367
31/05/2014 23:00	11275200	57.75	857.654		41604.66667
1/06/2014 5:00	11296800	57.737	857.734		41604.67967
1/06/2014 11:00	11318400	57.736	857.624		41604.68067
1/06/2014 17:00	11340000	57.733	857.635		41604.68367
1/06/2014 23:00	11361600	57.738	857.339		41604.67867
2/06/2014 5:00	11383200	57.734	857.478		41604.68267
2/06/2014 11:00	11404800	57.736	857.576		41604.68067
2/06/2014 17:00	11426400	57.731	857.674		41604.68567
2/06/2014 23:00	11448000	57.744	857.799		41604.67267
3/06/2014 5:00	11469600	57.733	857.826		41604.68367
3/06/2014 11:00	11491200	57.738	857.822		41604.67867
3/06/2014 17:00	11512800	57.73	857.925		41604.68667
3/06/2014 23:00	11534400	57.732	857.813		41604.68467
4/06/2014 5:00	11556000	57.731	857.944		41604.68567
4/06/2014 11:00	11577600	57.735	857.605		41604.68167
4/06/2014 17:00	11599200	57.73	857.779		41604.68667
4/06/2014 23:00	11620800	57.735	857.79		41604.68167
5/06/2014 5:00	11642400	57.732	857.598		41604.68467
5/06/2014 11:00	11664000	57.735	857.647		41604.68167
5/06/2014 17:00	11685600	57.731	857.477		41604.68567
5/06/2014 23:00	11707200	57.737	857.305		41604.67967
6/06/2014 5:00	11728800	57.74	857.489		41604.67667
6/06/2014 11:00	11750400	57.731	857.149		41604.68567
6/06/2014 17:00	11772000	57.733	857.283		41604.68367
6/06/2014 23:00	11793600	57.739	857.362		41604.67767
7/06/2014 5:00	11815200	57.726	857.25		41604.69067
7/06/2014 11:00	11836800	57.726	857.13		41604.69067
7/06/2014 17:00	11858400	57.727	857.162		41604.68967
7/06/2014 23:00	11880000	57.725	857.062		41604.69167
8/06/2014 5:00	11901600	57.726	856.948		41604.69067
8/06/2014 11:00	11923200	57.721	856.996		41604.69567
8/06/2014 17:00	11944800	57.72	857.007		41604.69667
8/06/2014 23:00	11966400	57.734	856.942		41604.68267
9/06/2014 5:00	11988000	57.721	856.899		41604.69567
9/06/2014 11:00	12009600	57.726	856.777		41604.69067
9/06/2014 17:00	12031200	57.718	856.481		41604.69867
9/06/2014 23:00	12052800	57.723	856.628		41604.69367
10/06/2014 5:00	12074400	57.72	856.494		41604.69667


Time (seconds)
0
5000
10000
15000
20000
25000
30000
1
0.1
Head/Initial Head (H/Ho)
H/Ho = 0.37
DD04 Deep Well
DD04 Mid Well
DD04 Shallow Well

DD04 Deep Well
Depth 14.28
Ho 10.89

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.04	10.85	1.00
15	15	0.33	10.56	0.97
30	45	0.47	10.42	0.96
60	105	0.93	9.96	0.91
120	225	1.61	9.28	0.85
240	465	2.78	8.11	0.74
480	945	4.3	6.59	0.61
900	1845	5	5.89	0.54
1800	3645	6.22	4.67	0.43
3600	7245	7.62	3.27	0.30
7200	14445	8.89	2	0.18
14400	28845	9.87	1.02	0.09

DD04 Mid Well
Depth 8.67
Ho 7.1

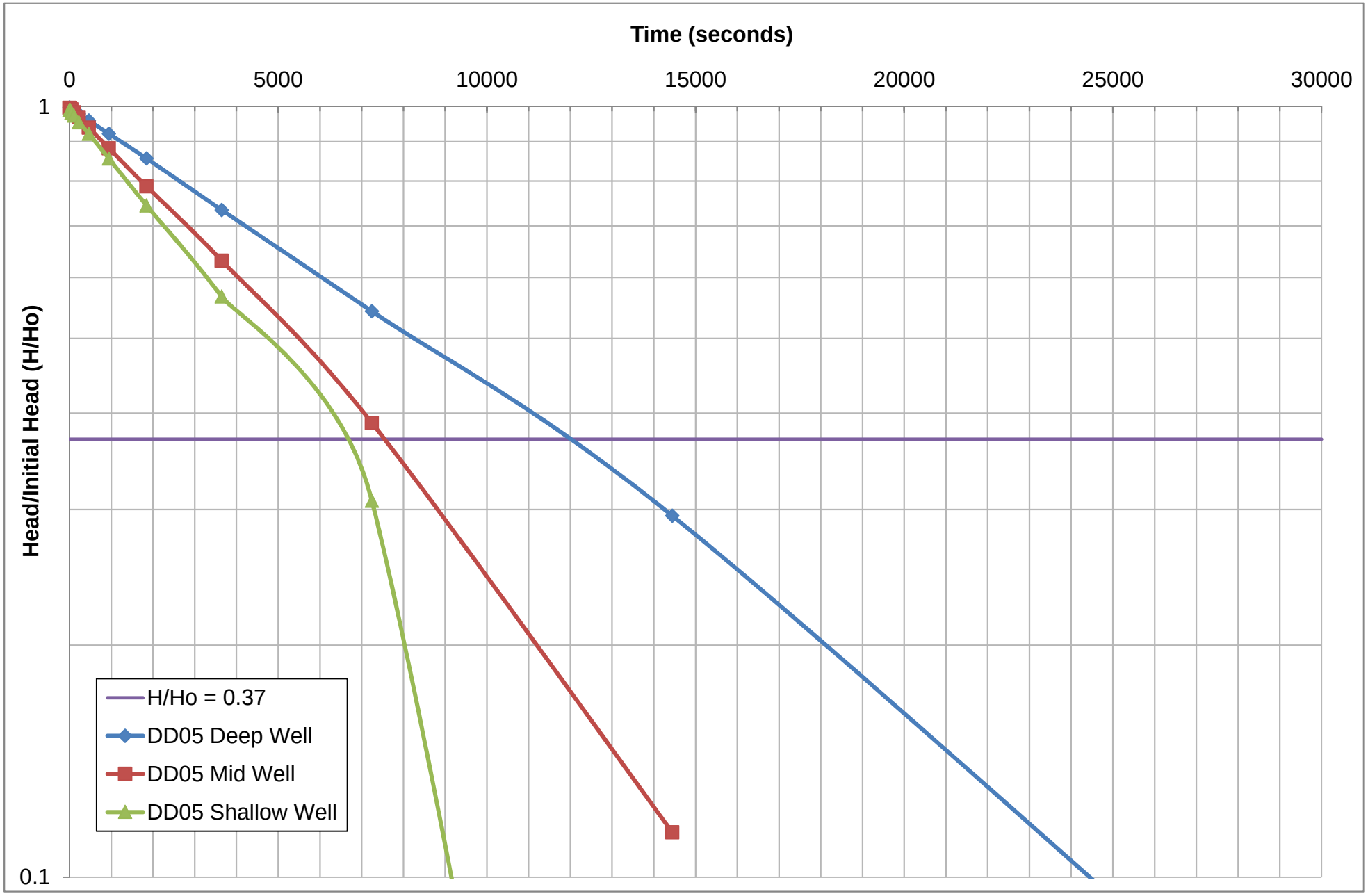
Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	7.05	0.99
15	15	0.05	7.05	0.99
30	45	0.07	7.03	0.99
60	105	0.12	6.98	0.98
120	225	0.24	6.86	0.97
240	465	0.45	6.65	0.94
480	945	0.8	6.3	0.89
900	1845	1.38	5.72	0.81
1800	3645	2.34	4.76	0.67
3600	7245	3.63	3.47	0.49
7200	14445	4.37	2.73	0.38
14400	28845	4.85	2.25	0.32

DD04 Shallow Well
Depth 4.92
Ho 3.58

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	3.53	0.99
15	15	0.05	3.53	0.99
30	45	0.06	3.52	0.98
60	105	0.09	3.49	0.97
120	225	0.16	3.42	0.96
240	465	0.3	3.28	0.92
480	945	0.53	3.05	0.85
900	1845	0.9	2.68	0.75
1800	3645	1.53	2.05	0.57
3600	7245	2.43	1.15	0.32
7200	14445	3.45	0.13	0.04
14400	28845	3.92	-0.34	

H/Ho = 0.37

0	0.37
30000	0.37


Time (seconds)
0
5000
10000
15000
20000
25000
30000
1
0.1
Head/Initial Head (H/Ho)
H/Ho = 0.37
DD05 Deep Well
DD05 Mid Well
DD05 Shallow Well

DD05 Deep Well
Depth 15.18
Ho 13.76

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.04	13.72	1.00
15	15	0.06	13.7	1.00
30	45	0.1	13.66	0.99
60	105	0.17	13.59	0.99
120	225	0.3	13.46	0.98
240	465	0.57	13.19	0.96
480	945	1.08	12.68	0.92
900	1845	1.98	11.78	0.86
1800	3645	3.66	10.1	0.73
3600	7245	6.3	7.46	0.54
7200	14445	9.71	4.05	0.29
14400	28845	12.91	0.85	0.06

DD05 Mid Well
Depth 10.05
Ho 8.75

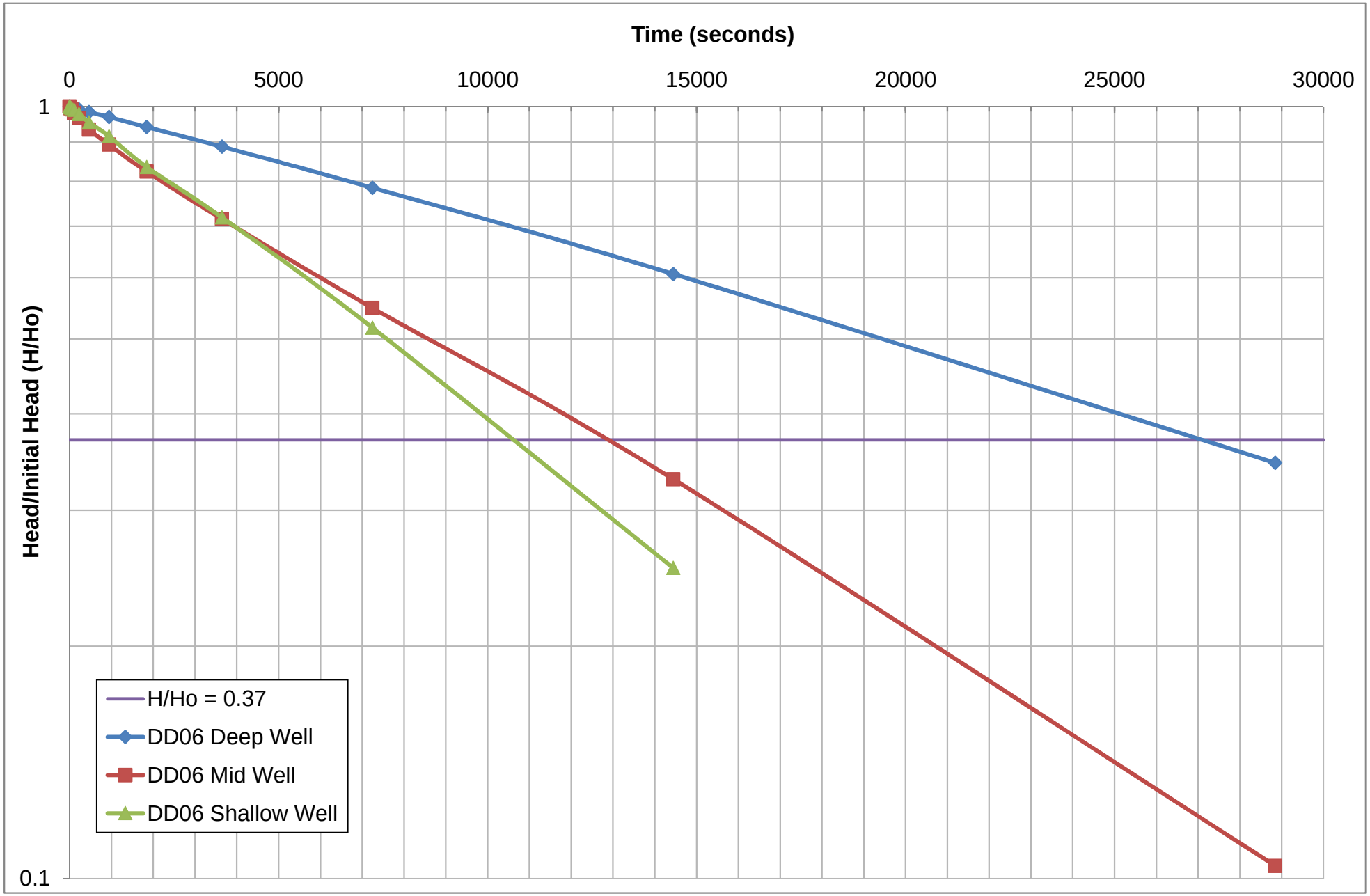
Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.04	8.71	1.00
15	15	0.05	8.7	0.99
30	45	0.08	8.67	0.99
60	105	0.15	8.6	0.98
120	225	0.28	8.47	0.97
240	465	0.54	8.21	0.94
480	945	1.03	7.72	0.88
900	1845	1.86	6.89	0.79
1800	3645	3.23	5.52	0.63
3600	7245	5.35	3.4	0.39
7200	14445	7.75	1	0.11
14400	28845	9.1	-0.35	

DD05 Shallow Well
Depth 4.97
Ho 3.67

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.04	3.63	0.99
15	15	0.04	3.63	0.99
30	45	0.07	3.6	0.98
60	105	0.1	3.57	0.97
120	225	0.17	3.5	0.95
240	465	0.29	3.38	0.92
480	945	0.53	3.14	0.86
900	1845	0.94	2.73	0.74
1800	3645	1.59	2.08	0.57
3600	7245	2.54	1.13	0.31
7200	14445	3.66	0.01	0.00
14400	28845	4.3	-0.63	

H/Ho = 0.37

0	0.37
30000	0.37


Time (seconds)
0
5000
10000
15000
20000
25000
30000
1
0.1
Head/Initial Head (H/Ho)
H/Ho = 0.37
DD06 Deep Well
DD06 Mid Well
DD06 Shallow Well

DD06	Deep Well
Depth	14.93
Ho	13.66

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0	13.66	1.00
15	15	0.01	13.65	1.00
30	45	0.02	13.64	1.00
60	105	0.05	13.61	1.00
120	225	0.11	13.55	0.99
240	465	0.22	13.44	0.98
480	945	0.42	13.24	0.97
900	1845	0.81	12.85	0.94
1800	3645	1.54	12.12	0.89
3600	7245	2.94	10.72	0.78
7200	14445	5.37	8.29	0.61
14400	28845	8.94	4.72	0.35

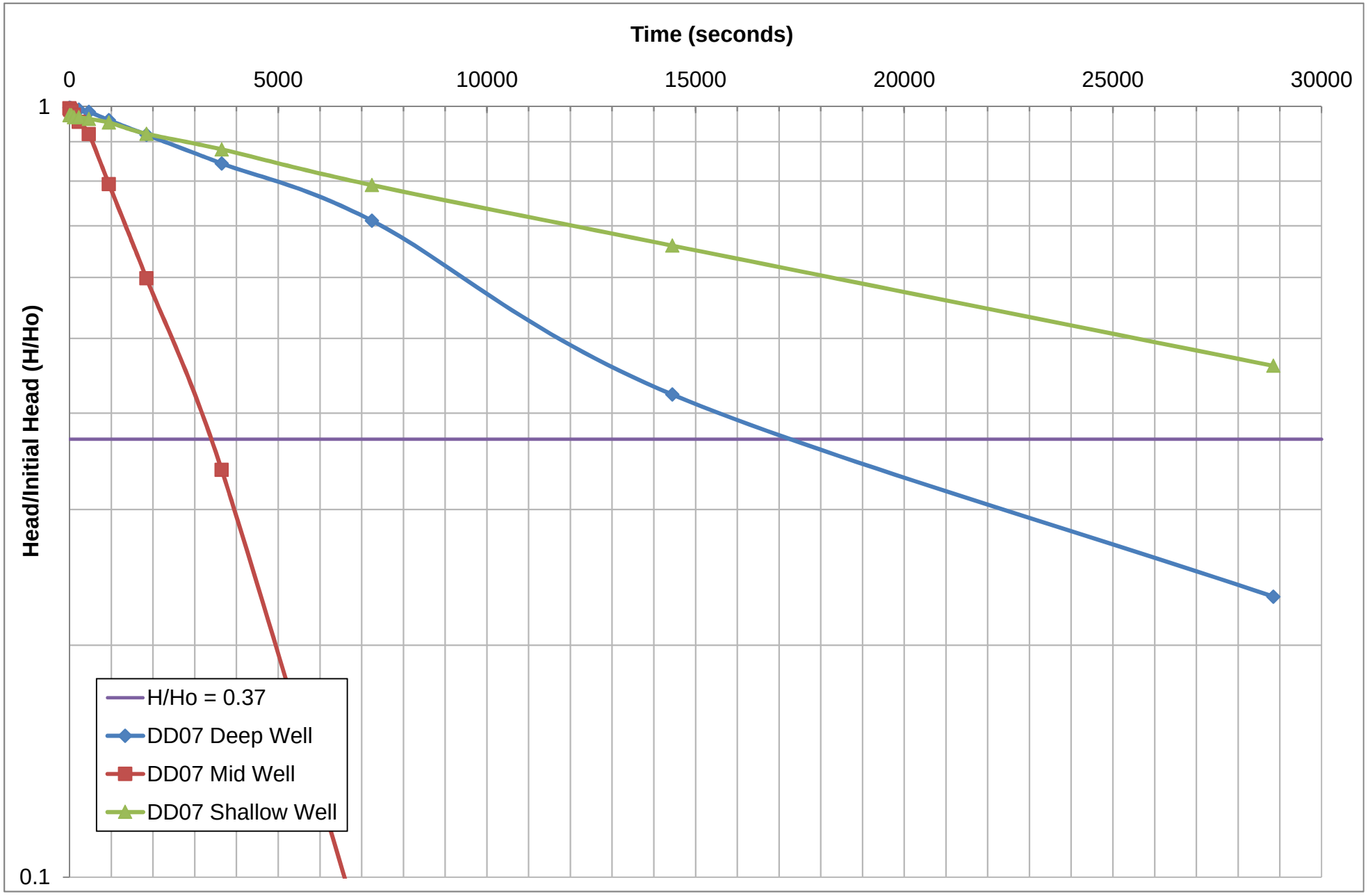
DD06	Mid Well
Depth	9.99
Ho	8.57

Interval	Time	Depth
secs	secs	m
0	0	0
15	15	0.04
30	45	0.07
60	105	0.16
120	225	0.29
240	465	0.57
480	945	0.92
900	1845	1.51
1800	3645	2.44
3600	7245	3.87
7200	14445	5.75
14400	28845	7.68

DD06	Shallow Well
Depth	5.5
Ho	4.12

H	H/Ho
m	-
8.57	1.00
8.53	1.00
8.5	0.99
8.41	0.98
8.28	0.97
8	0.93
7.65	0.89
7.06	0.82
6.13	0.72
4.7	0.55
2.82	0.33
0.89	0.10

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0	4.12	1.00
15	15	0.01	4.11	1.00
30	45	0.02	4.1	1.00
60	105	0.04	4.08	0.99
120	225	0.09	4.03	0.98
240	465	0.19	3.93	0.95
480	945	0.35	3.77	0.92
900	1845	0.68	3.44	0.83
1800	3645	1.16	2.96	0.72
3600	7245	1.99	2.13	0.52
7200	14445	3.08	1.04	0.25
14400	28845	4.13	-0.01	


Time (seconds)
0
5000
10000
15000
20000
25000
30000
1
0.1
Head/Initial Head (H/Ho)
H/Ho = 0.37
DD07 Deep Well
DD07 Mid Well
DD07 Shallow Well

DD07	Deep Well
Depth	14.58
Ho	13.15

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	13.1	1.00
15	15	0.06	13.09	1.00
30	45	0.07	13.08	0.99
60	105	0.08	13.07	0.99
120	225	0.13	13.02	0.99
240	465	0.21	12.94	0.98
480	945	0.53	12.62	0.96
900	1845	1.07	12.08	0.92
1800	3645	2.06	11.09	0.84
3600	7245	3.8	9.35	0.71
7200	14445	7.59	5.56	0.42
14400	28845	10.11	3.04	0.23

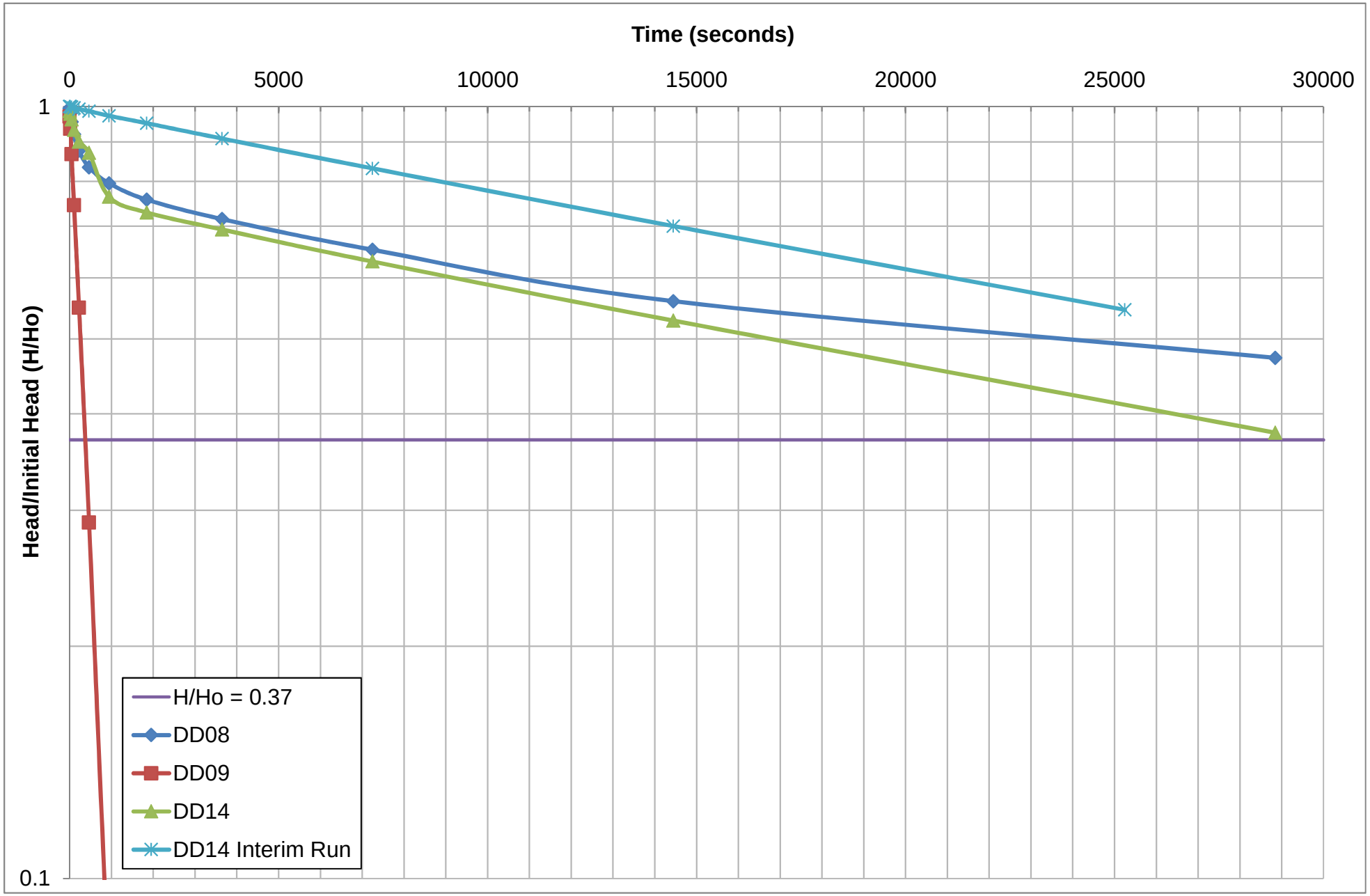
DD07	Mid Well
Depth	9.79
Ho	8.44

Interval	Time	Depth
secs	secs	m
0	0	0.05
15	15	0.08
30	45	0.12
60	105	0.21
120	225	0.38
240	465	0.67
480	945	1.75
900	1845	3.39
1800	3645	5.59
3600	7245	7.8
7200	14445	8.75
14400	28845	9.42

DD07 Shallow Well
Depth 4.49
Ho 1.91

H	H/Ho
m	-
8.39	0.99
8.36	0.99
8.32	0.99
8.23	0.98
8.06	0.95
7.77	0.92
6.69	0.79
5.05	0.60
2.85	0.34
0.64	0.08
-0.31	
-0.98	

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	1.86	0.97
15	15	0.05	1.86	0.97
30	45	0.05	1.86	0.97
60	105	0.06	1.85	0.97
120	225	0.06	1.85	0.97
240	465	0.07	1.84	0.96
480	945	0.09	1.82	0.95
900	1845	0.15	1.76	0.92
1800	3645	0.23	1.68	0.88
3600	7245	0.4	1.51	0.79
7200	14445	0.65	1.26	0.66
14400	28845	1.03	0.88	0.46


Time (seconds)
0
5000
10000
15000
20000
25000
30000
1
0.1
Head/Initial Head (H/Ho)
H/Ho = 0.37
DD08
DD09
DD14
DD14 Interim Run

DD08

Depth	11.9
Ho	10.56

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	10.51	1.00
15	15	0.21	10.35	0.98
30	45	0.47	10.09	0.96
60	105	0.84	9.72	0.92
120	225	1.3	9.26	0.88
240	465	1.75	8.81	0.83
480	945	2.16	8.4	0.80
900	1845	2.56	8	0.76
1800	3645	3.01	7.55	0.71
3600	7245	3.67	6.89	0.65
7200	14445	4.65	5.91	0.56
14400	28845	5.57	4.99	0.47

DD09

Depth	9.95
Ho	2.04

Interval	Time	Depth
secs	secs	m
0	0	0.06
15	15	0.13
30	45	0.27
60	105	0.52
120	225	0.92
240	465	1.45
480	945	1.89
1020	1965	2.03
1680	3645	2.04

DD14	
Depth	5.07
Ho	3.73

H	H/Ho
m	-
1.98	0.97
1.91	0.94
1.77	0.87
1.52	0.75
1.12	0.55
0.59	0.29
0.15	0.07
0.01	0.00
0	0.00

Interval	Time	Depth	H	H/Ho
secs	secs	m	m	-
0	0	0.05	3.68	0.99
15	15	0.08	3.65	0.98
30	45	0.14	3.59	0.96
60	105	0.25	3.48	0.93
120	225	0.37	3.36	0.90
240	465	0.48	3.25	0.87
480	945	0.88	2.85	0.76
900	1845	1.01	2.72	0.73
1800	3645	1.145	2.585	0.69
3600	7245	1.38	2.35	0.63
7200	14445	1.76	1.97	0.53
14400	28845	2.32	1.41	0.38

Quality Control Report

Job Number: 14-5157
Date: 7/08/2014

Environmental and Analytical Laboratory

This Quality Control Report is issued in accordance with Section 18 of the ARL Quality Management Manual. All QC parameters are contained within the relevant ARL Method as indicated by the method reference, either on this report or the Laboratory Report.

Acceptance of Holding Times, Duplicate RPD, Spike, LCS and CRM Recoveries are determined at the time of analysis by the Signatory indicated on the Laboratory Report.

DEFINITIONS

Duplicate Analysis
A sample, chosen randomly by the analyst at the time of sample preparation, analysed in duplicate.

RPD
Relative Percent Difference is the absolute difference between the sample and a duplicate analysis compared to the average of the two analytical results. Acceptance Limits can be exceeded by matrix interference or when the result is less than 5 times the LOR.

Matrix Spike
An additional portion of sample to which known amounts of the target analytes are added before sample preparation. Acceptance Limits can be exceeded by matrix interference or when the target analytes are present in the sample.

Certified Reference Material (CRM)
A commercially available certified solution/mixture of the target analyte of known concentration.

Laboratory Control Sample (LCS)
An in-house certified solution/mixture of the target analyte of known concentration.

Analytical Reference Laboratory (WA) PTY. Ltd
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsmile 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Quality Control Report

Job Number: 14-5157

Date: 7/08/2014

Environmental and Analytical Laboratory

Formaldehyde

Holding Time Criteria	Date	
Extracted	06/08/2014	
Analysed	06/08/2014	
Duplicate Analysis (14-5157-11)	**RPD (%)**	**Limits (%)**
Formaldehyde	0	25
Matrix Spike (14-5157-11)	**Recovery (%)**	**Limits (%)**
Formaldehyde	99	60 - 120

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www.arlwa.com.au ABN: 91 050 159 898

Analytical Reference Laboratory

LABORATORY REPORT

Job Number: 14-5157
Revision: 00
Date: 7 August 2014

ADDRESS: **National Measurement Institute**
PO Box 1246
Bentley DC WA 6983

ATTENTION: Kevin Robins

DATE RECEIVED: 31/07/2014

YOUR REFERENCE: W14/012382

PURCHASE ORDER: LSU140728

APPROVALS:

Paul Nottle
Organic Supervisor

REPORT COMMENTS:

Samples are analysed on an as received basis unless otherwise noted.

METHOD REFERENCES:

ARL No. 127	Formaldehyde in Water

NATA
WORLD RECOGNISED
ACCREDITATION
Accredited for compliance with ISO/IEC 17025
NATA Accreditation No. 2377

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

LABORATORY REPORT

National Measurement Institute

ARL Job No: 14-5157 *Revision: 00* *Date:* 7 August 2014

Misc. Organics in Water Sample No: Sample Description:	LOR	UNITS	14-5157-1 W14/012382_D D1S	14-5157-2 W14/012384_D D1D	14-5157-3 W14/012386_D D2I	14-5157-4 W14/012388_D D3S	14-5157-5 W14/012390_D D4I
Formaldehyde	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Misc. Organics in Water Sample No: Sample Description:	LOR	UNITS	14-5157-6 W14/012392_D D20	14-5157-7 W14/012383_D D1I	14-5157-8 W14/012385_D D2S	14-5157-9 W14/012387_D D2D	14-5157-10 W14/012389_D D3D
Formaldehyde	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Misc. Organics in Water Sample No: Sample Description:	LOR	UNITS	14-5157-11 W14/012391_D D4D
Formaldehyde	0.1	mg/L	<0.1

Result Definitions

LOR Limit of Reporting
[NT] Not Tested
[ND] Not Detected at indicated Limit of Reporting
[NR] Analysis Not Requested
(SS) Surrogate Standard Compound - Used for QC purposes. Acceptance Criteria is 60-120%.

Analytical Reference Laboratory (WA) Pty. Ltd.
46-48 Banksia Road, Welshpool, Western Australia 6106 Telephone: 08 6253 4444 Facsimile: 08 6253 4440
www.arlwa.com.au ABN: 91 050 159 898

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Cristal Pigment Australia LTD

Lot 4 Old Old Coast Road
AUSTRALIND WA 6230

Attention: Allan Lee

NMI Job No: CRIS05_W/140725
Sample Matrix: Water
Sample LRN Range: W14/012382 - 012392

Analyte	LOR	Blank	Units	LRN	Duplicate	Recovery	Acceptability
				W14/012390	D	%	Limits
Ammonia as NH3-N	1	<1	mg/L	<1	<1	104%	80 - 110
Bicarbonate as CaCO3	1	<1	mg/L	20	21	-	-
Chloride	10	<10	mg/L	80	80	99%	90 - 110
Nitrate as NO3-N	0.2	<0.2	mg/L	0.76	0.77	97%	90 - 110
Sulfate	5	<5	mg/L	10	10	101%	85 - 115
Total Dissolved Solids (Evap)	10	<10	mg/L	180	170	100%	90 - 110

Signed: **David Lynch**
Senior Environmental Chemist
NMI WA, Inorganic Section

Date: **7/08/2014**

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: **CRISTAL PIGMENT AUSTRALIA LTD**

NMI QA Report No: **CRIS05_W/140725T1**

Sample Matrix: Water(Total)

Analyte	Method	LOR	Blank	Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		mg/L	mg/L	mg/L	mg/L	%	%	%
Inorganics Section				**W14/012392**				**W14/012392**
Arsenic Total	NT2.47	0.001	< 0.001	0.001	0.001	9	95	97
Boron Total	NT2.47	0.005	< 0.005	0.010	0.009	11	100	90
Cadmium Total	NT2.47	0.0001	< 0.0001	< 0.0001	< 0.0001	ND	95	96
Calcium Total	NT2.47	0.005	< 0.005	4.3	4.3	0	86	98
Chromium Total	NT2.47	0.001	< 0.001	0.029	0.032	10	109	92
Cobalt Total	NT2.47	0.001	< 0.001	0.001	0.0011	10	102	98
Copper Total	NT2.47	0.001	< 0.001	0.013	0.014	7	104	95
Lead Total	NT2.47	0.001	< 0.001	0.019	0.022	15	97	101
Magnesium Total	NT2.47	0.005	< 0.005	0.51	0.52	2	81	100
Manganese Total	NT2.47	0.001	< 0.001	0.008	0.008	3	102	97
Mercury Total	NT2.47/2.44	0.0001	< 0.0001	< 0.0001	< 0.0001	ND	86	94
Molybdenum Total	NT2.47	0.001	< 0.001	<0.001	<0.001	ND	100	105
Nickel Total	NT2.47	0.001	< 0.001	0.008	0.008	3	103	97
Potassium Total	NT2.47	0.05	< 0.05	2.1	2.1	0	102	101
Selenium Total	NT2.47	0.001	< 0.001	< 0.001	< 0.001	ND	87	101
Sodium Total	NT2.47	0.05	< 0.05	7.7	7.8	1	101	100
Vanadium Total	NT2.47	0.001	< 0.001	0.024	0.029	19	89	100
Zinc Total	NT2.47	0.001	< 0.001	0.021	0.020	5	86	84

Filename = K:\RESIDUES\A_TPH_BX\ESDAT\

Legend:
Acceptable recovery is 75-120%.
Acceptable RPDs on duplicates is 44% at concentrations > 5 times LOR. Greater RPD may be expected at < 5 times LOR.
LOR = Limit Of Reporting ND = Not Determined
RPD = Relative Percent Difference NA = Not Applicable
LCS = Laboratory Control Sample.
#: Spike level is less than 50% of the sample's concentration, hence the recovery data is not reliable.

Comments:
Results greater than ten times LOR have been rounded to two significant figures.
This report shall not be reproduced except in full.

Signed:

Dr Michael Wu
Inorganics , NMI-North Ryde
Date: **5/08/2014**

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: CRISTAL PIGMENT AUSTRALIA LTD

NMI QA Report No: CRIS05_W/140725 QA
Sample Matrix: Water

Analyte	Method	LOR	Blank	Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix spk
		mg/L	mg/L	mg/L	mg/L	%	%	%
Inorganics Section				W14/012382				W14/012382
Chromium - Hexavalent	NW_D2	0.001	<0.001	<0.001	<0.001	ND	104	96

Legend
Acceptable recovery is 80-120%.
Acceptable RPDs on duplicates is 30% at > 5 times LOR. Greater RPD may be expected at < 5 LOR.
LOR = Limit Of Reporting
RPD = Relative Percent Difference
LCS = Laboratory Control Sample
ND = Not Determined
NA = Not Applicable

Comments
This report shall not be reproduced except in full.
Results greater than ten times LOR have been rounded to two significant figures.

Signed:

Dr Michael Wu
Inorganics Manager, NMI-Pymble
Date: **8/08/2014**

REPORT OF ANALYSIS

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05_W/140725
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	: 4500740712
		Date Sampled	: 24-JUL-2014
		Date Received	: 25-JUL-2014
Attention	ALLAN LEE	Sampled By	: CLIENT
Project Name :	Dardanup July 2014		
Your Client Services Manager	: David Lynch	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W14/012382	DD1S	Dardanup WATER 24/07/14
W14/012383	DD1I	Dardanup WATER 24/07/14
W14/012384	DD1D	Dardanup WATER 24/07/14
W14/012385	DD2S	Dardanup WATER 24/07/14

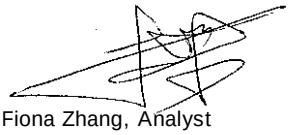
Lab Reg No.		W14/012382	W14/012383	W14/012384	W14/012385	
Sample Reference	Units	DD1S	DD1I	DD1D	DD2S	Method
Total Recoverable Trace Elements by ICP						
Arsenic Total	mg/L	< 0.001	0.001	0.001	0.001	NT2_47
Boron Total	mg/L	0.01	0.008	0.036	0.015	NT2_47
Cadmium Total	mg/L	< 0.0001	< 0.0001	0.0002	< 0.0001	NT2_47
Calcium Total	mg/L	4.2	1.7	7.2	6.4	NT2_47
Chromium Total	mg/L	0.007	0.13	0.021	0.01	NT2_47
Cobalt Total	mg/L	< 0.001	0.005	0.007	< 0.001	NT2_47
Copper Total	mg/L	0.007	0.067	0.046	0.010	NT2_47
Lead Total	mg/L	0.006	0.071	0.017	0.022	NT2_47
Magnesium Total	mg/L	0.47	4.4	8.6	2.9	NT2_47
Manganese Total	mg/L	0.004	0.029	0.094	0.021	NT2_47
Mercury Total	mg/L	< 0.0001	0.0003	< 0.0001	< 0.0001	NT247_244
Molybdenum Total	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	NT2_47
Nickel Total	mg/L	0.003	0.033	0.012	0.004	NT2_47
Potassium Total	mg/L	1.7	2	7.9	1.9	NT2_47
Selenium Total	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	NT2_47
Sodium Total	mg/L	6.5	25	90	6.8	NT2_47
Vanadium Total	mg/L	0.008	0.1	0.039	0.012	NT2_47
Zinc Total	mg/L	0.016	0.066	0.16	0.029	NT2_47

W14/012383
The Mercury result has been confirmed by repeat analysis.

REPORT OF ANALYSIS

Report No. RN1031948

Lab Reg No.		W14/012382	W14/012383	W14/012384	W14/012385	
Sample Reference	Units	DD1S	DD1I	DD1D	DD2S	Method



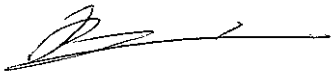
Fiona Zhang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

Lab Reg No.		W14/012382	W14/012383	W14/012384	W14/012385	
Sample Reference	Units	DD1S	DD1I	DD1D	DD2S	Method
Miscellaneous						
Chromium - Hexavalent	mg/L	< 0.001	0.002	< 0.001	< 0.001	NW_D2

W14/012382
to W14/012392.

Analysis of formaldehyde subcontracted. See attached report.



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

Lab Reg No.		W14/012382	W14/012383	W14/012384	W14/012385	
Sample Reference	Units	DD1S	DD1I	DD1D	DD2S	Method
Total Petroleum Hydrocarbons						
TPH C6 - C9	ug/L	< 25	< 25	< 25	< 25	WL244
TPH C10 - C14	ug/L	< 25	< 25	< 25	< 25	WL203
TPH C15 - C28	ug/L	< 100	< 100	180	< 100	WL203
TPH C29 - C36	ug/L	< 100	< 100	220	< 100	WL203
Total TPH	ug/L	< 250	< 250	400	< 250	WL203
Dates						
Date extracted		28-JUL-2014	28-JUL-2014	28-JUL-2014	28-JUL-2014	
Date analysed		29-JUL-2014	29-JUL-2014	29-JUL-2014	29-JUL-2014	
Sample condition on receipt		AMBIENT	AMBIENT	AMBIENT	AMBIENT	

W14/012382
, W14/012384-012392:

TPH C10-C36 concentrations are based on silica gel cleanup.

Koon-Bay Ho, Section Manager
Organics - WA
Accreditation No. 2474

8-AUG-2014

Lab Reg No.		W14/012382	W14/012383	W14/012384	W14/012385	
Sample Reference	Units	DD1S	DD1I	DD1D	DD2S	Method
Inorganics						
Ammonia as NH3-N	mg/L	< 1	< 1	< 1	< 1	WL132
Bicarbonate as CaCO3	mg/L	2	6	50	6	WL122
Chloride	mg/L	11	37	150	13	WL119
Nitrate as NO3-N	mg/L	0.4	3.2	0.2	4.4	WL119
Subcontracted Analysis		SeeAttached	SeeAttached	SeeAttached	SeeAttached	
Sulfate	mg/L	< 5	7	10	6	WL119
Total Dissolved Solids (Evap)	mg/L	130	150	390	90	WL123

W14/012382
to W14/012392.

Analysis of formaldehyde subcontracted. See attached.

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

8-AUG-2014

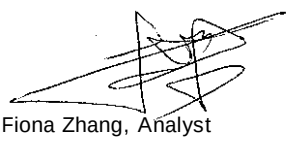
REPORT OF ANALYSIS

Report No. RN1031948

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05_W/140725
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	: 4500740712
		Date Sampled	: 24-JUL-2014
		Date Received	: 25-JUL-2014
Attention	ALLAN LEE	Sampled By	: CLIENT
Project Name	: Dardanup July 2014		
Your Client Services Manager	: David Lynch	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W14/012386	DD2I	Dardanup WATER 24/07/14
W14/012387	DD2D	Dardanup WATER 24/07/14
W14/012388	DD3S	Dardanup WATER 24/07/14
W14/012389	DD3D	Dardanup WATER 24/07/14

Lab Reg No.		W14/012386	W14/012387	W14/012388	W14/012389	
Sample Reference	Units	DD2I	DD2D	DD3S	DD3D	Method
Total Recoverable Trace Elements by ICP						
Arsenic Total	mg/L	0.003	< 0.001	0.002	0.001	NT2_47
Boron Total	mg/L	0.015	0.026	0.048	0.085	NT2_47
Cadmium Total	mg/L	0.0003	< 0.0001	0.0001	0.0001	NT2_47
Calcium Total	mg/L	5.3	3.2	4.2	12	NT2_47
Chromium Total	mg/L	0.091	0.004	0.021	0.013	NT2_47
Cobalt Total	mg/L	0.014	0.012	< 0.001	0.002	NT2_47
Copper Total	mg/L	0.061	0.005	0.022	0.024	NT2_47
Lead Total	mg/L	0.084	0.003	0.044	0.013	NT2_47
Magnesium Total	mg/L	11	11	5	20	NT2_47
Manganese Total	mg/L	0.11	0.06	0.018	0.038	NT2_47
Mercury Total	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	NT247_244
Molybdenum Total	mg/L	< 0.001	< 0.001	< 0.001	0.002	NT2_47
Nickel Total	mg/L	0.27	0.021	0.004	0.011	NT2_47
Potassium Total	mg/L	5.2	11	1.1	8.2	NT2_47
Selenium Total	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	NT2_47
Sodium Total	mg/L	66	110	42	140	NT2_47
Vanadium Total	mg/L	0.14	0.005	0.031	0.016	NT2_47
Zinc Total	mg/L	0.18	0.033	0.089	0.1	NT2_47

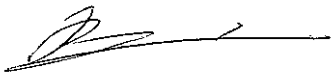


Fiona Zhang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

REPORT OF ANALYSIS

Lab Reg No.		W14/012386	W14/012387	W14/012388	W14/012389	
Sample Reference	Units	DD2I	DD2D	DD3S	DD3D	Method
Miscellaneous						
Chromium - Hexavalent	mg/L	0.004	< 0.001	< 0.001	< 0.001	NW_D2



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

Lab Reg No.		W14/012386	W14/012387	W14/012388	W14/012389	
Sample Reference	Units	DD2I	DD2D	DD3S	DD3D	Method
Total Petroleum Hydrocarbons						
TPH C6 - C9	ug/L	< 25	< 25	< 25	< 25	WL244
TPH C10 - C14	ug/L	< 25	< 25	< 25	< 25	WL203
TPH C15 - C28	ug/L	140	110	180	800	WL203
TPH C29 - C36	ug/L	180	150	250	1200	WL203
Total TPH	ug/L	320	260	430	2000	WL203
Dates						
Date extracted		28-JUL-2014	28-JUL-2014	28-JUL-2014	28-JUL-2014	
Date analysed		29-JUL-2014	29-JUL-2014	29-JUL-2014	29-JUL-2014	
Sample condition on receipt		AMBIENT	AMBIENT	AMBIENT	AMBIENT	

Koon-Bay Ho, Section Manager
Organics - WA
Accreditation No. 2474

8-AUG-2014

Lab Reg No.		W14/012386	W14/012387	W14/012388	W14/012389	
Sample Reference	Units	DD2I	DD2D	DD3S	DD3D	Method
Inorganics						
Ammonia as NH3-N	mg/L	< 1	< 1	< 1	< 1	WL132
Bicarbonate as CaCO3	mg/L	17	9	13	28	WL122
Chloride	mg/L	110	200	80	270	WL119
Nitrate as NO3-N	mg/L	0.78	< 0.2	1.1	2.8	WL119
Subcontracted Analysis		SeeAttached	SeeAttached	SeeAttached	SeeAttached	

REPORT OF ANALYSIS

Report No. RN1031948

Lab Reg No.		W14/012386	W14/012387	W14/012388	W14/012389	
Sample Reference	Units	DD2I	DD2D	DD3S	DD3D	Method
Inorganics						
Sulfate	mg/L	10	20	5	20	WL119
Total Dissolved Solids (Evap)	mg/L	770	400	150	500	WL123

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

8-AUG-2014

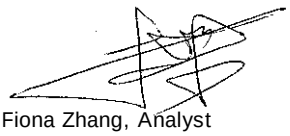
REPORT OF ANALYSIS

Report No. RN1031948

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05_W/140725
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	: 4500740712
		Date Sampled	: 24-JUL-2014
		Date Received	: 25-JUL-2014
Attention	ALLAN LEE	Sampled By	: CLIENT
Project Name	: Dardanup July 2014		
Your Client Services Manager	: David Lynch	Phone	: (08) 9368 8420

Lab Reg No.	Sample Ref	Sample Description
W14/012390	DD4I	Dardanup WATER 24/07/14
W14/012391	DD4D	Dardanup WATER 24/07/14
W14/012392	DD20	Dardanup WATER 24/07/14

Lab Reg No.		W14/012390	W14/012391	W14/012392		
Sample Reference	Units	DD4I	DD4D	DD20		Method
Total Recoverable Trace Elements by ICP						
Arsenic Total	mg/L	< 0.001	0.002	0.001		NT2_47
Boron Total	mg/L	0.021	0.025	0.010		NT2_47
Cadmium Total	mg/L	< 0.0001	0.0002	< 0.0001		NT2_47
Calcium Total	mg/L	4.9	35	4.3		NT2_47
Chromium Total	mg/L	0.002	0.022	0.03		NT2_47
Cobalt Total	mg/L	0.010	0.011	0.001		NT2_47
Copper Total	mg/L	0.010	0.031	0.013		NT2_47
Lead Total	mg/L	0.006	0.022	0.02		NT2_47
Magnesium Total	mg/L	5.8	6.5	0.51		NT2_47
Manganese Total	mg/L	0.016	0.15	0.008		NT2_47
Mercury Total	mg/L	< 0.0001	< 0.0001	< 0.0001		NT247_244
Molybdenum Total	mg/L	< 0.001	0.004	< 0.001		NT2_47
Nickel Total	mg/L	0.002	0.009	0.008		NT2_47
Potassium Total	mg/L	4.3	4.2	2.1		NT2_47
Selenium Total	mg/L	< 0.001	< 0.001	< 0.001		NT2_47
Sodium Total	mg/L	42	23	7.7		NT2_47
Vanadium Total	mg/L	0.002	0.019	0.027		NT2_47
Zinc Total	mg/L	0.04	0.16	0.02		NT2_47

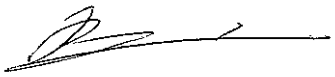


Fiona Zhang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

REPORT OF ANALYSIS

Lab Reg No.		W14/012390	W14/012391	W14/012392		
Sample Reference	Units	DD4I	DD4D	DD20		Method
Miscellaneous						
Chromium - Hexavalent	mg/L	< 0.001	< 0.001	< 0.001		NW_D2



Wei Huang, Analyst
Inorganics - NSW
Accreditation No. 198

8-AUG-2014

Lab Reg No.		W14/012390	W14/012391	W14/012392		
Sample Reference	Units	DD4I	DD4D	DD20		Method
Total Petroleum Hydrocarbons						
TPH C6 - C9	ug/L	< 25	< 25	< 25		WL244
TPH C10 - C14	ug/L	< 25	< 25	< 25		WL203
TPH C15 - C28	ug/L	150	280	< 100		WL203
TPH C29 - C36	ug/L	280	430	< 100		WL203
Total TPH	ug/L	430	700	< 250		WL203
Dates						
Date extracted		28-JUL-2014	28-JUL-2014	28-JUL-2014		
Date analysed		30-JUL-2014	30-JUL-2014	30-JUL-2014		
Sample condition on receipt		AMBIENT	AMBIENT	AMBIENT		

Koon-Bay Ho, Section Manager
Organics - WA
Accreditation No. 2474

8-AUG-2014

Lab Reg No.		W14/012390	W14/012391	W14/012392		
Sample Reference	Units	DD4I	DD4D	DD20		Method
Inorganics						
Ammonia as NH3-N	mg/L	< 1	10	1		WL132
Bicarbonate as CaCO3	mg/L	20	110	2		WL122
Chloride	mg/L	80	15	11		WL119
Nitrate as NO3-N	mg/L	0.76	< 0.2	0.48		WL119
Subcontracted Analysis		SeeAttached	SeeAttached	SeeAttached		

REPORT OF ANALYSIS

Report No. RN1031948

Lab Reg No.		W14/012390	W14/012391	W14/012392		
Sample Reference	Units	DD4I	DD4D	DD20		Method
Inorganics						
Sulfate	mg/L	10	16	5		WL119
Total Dissolved Solids (Evap)	mg/L	180	300	130		WL123

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

8-AUG-2014

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

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025.
This report shall not be reproduced except in full.
Results relate only to the sample(s) tested.

This Report supersedes reports: RN1031537 RN1031553 RN1031853 RN1031927

South West Chemical Services
Unit 5, 4 Mummery Cres.
Bunbury, WA, 6230
ABN 71 111 052 218
Phone/Fax 08 9721 7170
Mobile 0417 149 645
Email admin@swchemservices.com.au

Certificate of Analysis

Client Name:	WML Consultants Attn: P Di Donna/ M Cannon		
Address:	PO Box 2023, Bunbury, WA, 6231		
Phone No:	9722 3544	Fax:	9722 3599
Lab No:	7710	Order No:	
Date samples received:	14/08/14	Report date:	22/08/14

Sample details: 40 soil samples provided by client 14/08/14 ex Panizza Rd. Dardanup WA

Scope of Work: Analysis of soil for Cation Exchange Capacity

Test Methods: NH_4Cl_2/ $BaCl_2$ EXCATS (meq/100g) Soils are extracted with 0.1M NH_4Cl/0.1M $BaCl_2$ for 2 hours. Excat concentrations of the resulting extracts are determined by ICP.
REF: Rayment, G.E. and Higginson, F.R. (1992). Ion Exchange Properties. *Australian Laboratory Handbook of Soil and Water Chemical Methods.* Inkata Press, Melbourne, pp 164-169

Test Results: **see following page**

David Dodds
Dip.App.Chem. A.G.Inst. Tech.

Sample No.	Bore Hole	Top Depth	Exch Al	Exch Ca	Exch Mg	Exch K	Exch Na	CEC
		m	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g
134903	DA 354	5	0.303	0.77	1.27	0.12	0.25	2.71
134907	DA 354	9	0.229	0.42	1.01	0.21	0.27	2.14
134913	DA 354	15	0.239	1.10	3.87	0.31	0.25	5.77
134918	DA 354	20	0.074	0.23	0.27	0.06	0.03	0.66
135008	DA 359	5	0.068	0.32	0.96	0.10	0.22	1.67
135013	DA 359	10	0.062	0.33	0.83	0.08	0.08	1.38
135017	DA 359	14	0.074	0.36	0.75	0.15	0.41	1.74
135022	DA 359	19	0.033	0.46	1.28	0.23	0.42	2.42
135153	DA 367	3	0.100	0.34	0.82	0.25	0.08	1.59
135158	DA 367	8	0.412	0.21	0.35	0.12	0.04	1.13
135165	DA 367	15	0.183	0.20	0.37	0.18	0.04	0.97
135169	DA 367	19	0.533	0.30	0.48	0.12	0.10	1.53
135282	DA 373	6	0.054	0.18	0.60	0.12	0.07	1.02
135286	DA 373	10	0.054	0.22	0.56	0.19	0.08	1.10
135291	DA 373	15	0.046	0.23	0.58	0.12	0.10	1.08
135295	DA 373	20	0.061	0.30	0.71	0.25	0.08	1.40
135679	DA 392	4	0.682	0.16	0.24	0.11	0.12	1.31
135685	DA 392	10	0.354	0.19	0.27	0.18	0.14	1.13
135690	DA 392	15	0.106	0.19	0.38	0.19	0.09	0.96
135695	DA 392	20	0.391	0.30	0.48	0.15	0.11	1.43
135806	DA 398	5	0.067	0.20	0.42	0.16	0.07	0.92
135811	DA 398	10	0.913	0.11	0.22	0.13	0.03	1.40
135817	DA 398	16	0.090	0.16	0.91	0.14	0.12	1.42
135821	DA 398	20	0.029	0.15	0.64	0.17	0.09	1.08
135954	DA 405	6	0.224	0.25	1.06	0.13	0.23	1.89
135959	DA 405	11	0.107	0.17	0.47	0.19	0.10	1.04
135963	DA 405	15	0.104	0.20	0.48	0.18	0.11	1.07
135968	DA 405	20	1.099	0.82	5.06	0.25	0.59	7.82
136061	DA 410	8	0.259	0.27	0.80	0.07	0.26	1.66
136064	DA 410	11	0.150	0.15	0.61	0.13	0.50	1.54
136068	DA 410	15	0.063	0.25	0.97	0.12	0.33	1.73
136073	DA 410	20	0.069	0.18	0.48	0.14	0.13	1.00
	TP 42	4.0 - 4.5	0.049	0.35	0.58	0.02	0.02	1.02
	TP 46	1.0 - 1.5	0.055	0.40	0.73	0.04	0.07	1.30
	TP 50	2.5 - 3.0	0.123	0.72	0.83	0.02	0.11	1.80
	TP 50	4.0 - 5.0	1.045	0.10	0.18	<0.01	0.03	1.36
	TP 52	3.5 - 4.0	0.081	0.96	0.66	0.09	0.07	1.86
	TP 52	4.8 - 5.0	0.046	0.45	0.75	0.13	0.06	1.44
	TP53	3.0 - 3.5	2.625	0.47	1.44	0.02	0.53	5.09
	TP 56	1.3 - 2.7	2.302	0.20	1.66	0.02	0.22	4.40

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: CRISTAL PIGMENT AUSTRALIA LTD

NMI QA Report No: CRIS05_W/140121 QA
Sample Matrix: Soil

Analyte	Method	LOR	Blank	Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix spk
		mg/kg	mg/kg	mg/kg	mg/kg	%	%	%
Inorganics Section				W14/002655				W14/002655
Conductivity (uS/cm)	NW_B9	1	<1	53	NA	NA	107	NA

Legend
Acceptable recovery is 80-120%.
Acceptable RPDs on duplicates is 40% at >5 times LOR. Greater RPD may be expected at <5 LOR.
LOR = Limit Of Reporting
RPD = Relative Percent Difference
LCS = Laboratory Control Sample
ND = Not Determined
NA = Not Applicable

Comments
This report shall not be reproduced except in full.
Results greater than ten times LOR have been rounded to two significant figures.

Signed:

Dr Michael Wu
Inorganics Manager, NMI-Pymble
Date: **28/02/2014**

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: CRISTAL PIGMENT AUSTRALIA LTD

NMI QA Report No: CRIS05/140219 T1 **Sample Matrix:** Soil

Analyte	Method	LOR	Blank	Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		mEq/100g	mEq/100g	mEq/100g	mEq/100g	%	%	%
Inorganics Section				W14/002668				W14/002668
Aluminium	NT2.60	0.02	<0.02	0.28	0.29	4	**	97
Calcium	NT2.60	0.01	<0.01	0.13	0.11	17	102	96
Magnesium	NT2.60	0.01	<0.01	0.89	0.8	11	114	84
Potassium	NT2.60	0.02	<0.02	0.14	0.13	7	99	98
Sodium	NT2.60	0.02	<0.02	0.54	0.51	6	111	89

Filename = K:\Inorganics\Quality System\QA Reports\TE\QAR2014\Soil\

Legend:
Acceptable recovery is 75-120%.
Acceptable RPDs on duplicates is 44% at concentrations >5 times LOR. Greater RPD may be expected at <5 times LOR.
LOR = Limit Of Reporting ND = Not Determined
RPD = Relative Percent Difference NA = Not Applicable
LCS = Laboratory Control Sample.
#: Spike level is less than 50% of the sample's concentration, hence the recovery data canot be reported.
**: reference value not available
* sample was not spiked for this element
Comments:
Results greater than ten times LOR have been rounded to two significant figures.

Signed:

Dr Michael Wu
Inorganics Section, NMI-North Ryde
Date: **28/02/2014**

Australian Government
National Measurement Institute

ORGANIC QUALITY ASSURANCE REPORT

NMI Job No: CRIS05_W/140725

Sample Matrix: **Liquid**

			Sample Duplicates			LCS	Matrix	Extracted *
Analyte	**LOR**	**Blank**	**Sample**	**Duplicate**	**RPD**	**Recovery**	**Spike**	**within**
	ug/L	**ug/L**	**ug/L**	**ug/L**	**%**	**%**	**%**	**holding time**
Total Petroleum Hydrocarbons			**W14/012390**					
TPH C6-C9	25	<25	<25	<25	-	103	-	✓
TPH C10-C14	25	<25	<25	<25	-	96	-	✓
TPH C15-C28	100	<100	**150**	**130**	14	106	-	✓
TPH C29-C36	100	<100	**280**	**270**	4	103	-	✓

	TPH C6-C9	TPH C10 - C36
Spike criteria	70 - 130%	50 - 150%
Acceptable duplicate RPD	60%	60%
Method used	WL 244	WL 203
Holding time	14 days	7 days

RPD= Relative Percentage Difference.
' - ' = Not Applicable.
* Applies to all samples in the job.

Signed:

Koon-Bay Ho
Organic Chemistry
Date: **8/08/2014**

REPORT OF ANALYSIS

Report No. RN1011017

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05/140219
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	:
		Date Sampled	:
		Date Received	: 19-FEB-2014
Attention	: CRAIG FISHER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: RICHARD COGHLAN	Phone	: (02) 94490161

Lab Reg No.	Sample Ref	Sample Description
W14/002655	DD1-15	SOIL
W14/002656	DD1-33	SOIL
W14/002657	DD1-39	SOIL
W14/002658	DD1-42	SOIL

Lab Reg No.		W14/002655	W14/002656	W14/002657	W14/002658	
Sample Reference	Units	DD1-15	DD1-33	DD1-39	DD1-42	Method
BACl2 exchangeable cations						
Aluminium	mEq/100g	0.87	0.93	0.92	0.67	NT2_60
Calcium	mEq/100g	0.11	0.27	0.24	0.32	NT2_60
Cation Exchangeable Capacity	mEq/100g	1.6	3.8	3.6	4.5	NT2_60
Magnesium	mEq/100g	0.21	2	1.8	2.7	NT2_60
Potassium	mEq/100g	0.031	0.13	0.14	0.22	NT2_60
Sodium	mEq/100g	0.42	0.44	0.54	0.61	NT2_60

W14/002655
- W14/002669
Cation Exchangeable Capacity results are expressed on an air dried (40C) basis.

Ling Shuang Lu, Analyst
Inorganics - NSW
Accreditation No. 198

28-FEB-2014

REPORT OF ANALYSIS

Lab Reg No.		W14/002655	W14/002656	W14/002657	W14/002658	
Sample Reference	Units	DD1-15	DD1-33	DD1-39	DD1-42	Method
Miscellaneous						
Conductivity	uS/cm	53	100	55	70	NW_B9

Andrew Evans, Analyst
Inorganics - NSW
Accreditation No. 198

28-FEB-2014

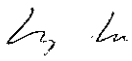
REPORT OF ANALYSIS

Report No. RN1011017

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05/140219
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	:
		Date Sampled	:
		Date Received	: 19-FEB-2014
Attention	: CRAIG FISHER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: RICHARD COGHLAN	Phone	: (02) 94490161

Lab Reg No.	Sample Ref	Sample Description
W14/002659	DD1-60	SOIL
W14/002660	DD2-21	SOIL
W14/002661	DD2-24	SOIL
W14/002662	DD2-36	SOIL

Lab Reg No. / Sample Reference	Units	W14/002659 DD1-60	W14/002660 DD2-21	W14/002661 DD2-24	W14/002662 DD2-36	Method
BACl2 exchangeable cations						
Aluminium	mEq/100g	0.17	2.2	1.9	1.2	NT2_60
Calcium	mEq/100g	0.14	0.18	0.17	0.22	NT2_60
Cation Exchangeable Capacity	mEq/100g	2	3.8	3.5	3.8	NT2_60
Magnesium	mEq/100g	1.2	0.8	0.83	1.7	NT2_60
Potassium	mEq/100g	0.11	0.051	0.048	0.15	NT2_60
Sodium	mEq/100g	0.42	0.54	0.56	0.62	NT2_60



Ling Shuang Lu, Analyst
Inorganics - NSW
Accreditation No. 198

28-FEB-2014

Lab Reg No. / Sample Reference	Units	W14/002659 DD1-60	W14/002660 DD2-21	W14/002661 DD2-24	W14/002662 DD2-36	Method
Miscellaneous						
Conductivity	uS/cm	55	53	74	150	NW_B9

Andrew Evans, Analyst
Inorganics - NSW
Accreditation No. 198

28-FEB-2014

REPORT OF ANALYSIS

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05/140219
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	:
		Date Sampled	:
		Date Received	: 19-FEB-2014
Attention	: CRAIG FISHER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: RICHARD COGHLAN	Phone	: (02) 94490161

Lab Reg No.	Sample Ref	Sample Description
W14/002663	DD2-42	SOIL
W14/002664	DD2-60	SOIL
W14/002665	DD3-3	SOIL
W14/002666	DD3-24	SOIL

Lab Reg No. / Sample Reference	Units	W14/002663 DD2-42	W14/002664 DD2-60	W14/002665 DD3-3	W14/002666 DD3-24	Method
BACl2 exchangeable cations						
Aluminium	mEq/100g	1.2	0.97	0.52	0.42	NT2_60
Calcium	mEq/100g	0.22	0.19	0.045	0.16	NT2_60
Cation Exchangeable Capacity	mEq/100g	3.9	2.3	1.4	3.1	NT2_60
Magnesium	mEq/100g	1.8	0.97	0.34	1.8	NT2_60
Potassium	mEq/100g	0.18	0.099	0.053	0.085	NT2_60
Sodium	mEq/100g	0.58	0.056	0.47	0.71	NT2_60

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Lab Reg No. / Sample Reference	Units	W14/002663 DD2-42	W14/002664 DD2-60	W14/002665 DD3-3	W14/002666 DD3-24	Method
Miscellaneous						
Conductivity	uS/cm	89	420	72	73	NW_B9

Andrew Evans, Analyst
Inorganics - NSW
Accreditation No. 198

28-FEB-2014

REPORT OF ANALYSIS

Report No. RN1011017

Client	: CRISTAL PIGMENT AUSTRALIA LTD	Job No.	: CRIS05/140219
	LOT 4 OLD COAST ROAD	Quote No.	: QT-01932
	AUSTRALIND WA 6233	Order No.	:
		Date Sampled	:
		Date Received	: 19-FEB-2014
Attention	: CRAIG FISHER	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: RICHARD COGHLAN	Phone	: (02) 94490161

Lab Reg No.	Sample Ref	Sample Description
W14/002667	DD3-39	SOIL
W14/002668	DD3-48	SOIL
W14/002669	DD3-52	SOIL

Lab Reg No.		W14/002667	W14/002668	W14/002669		
Sample Reference	Units	DD3-39	DD3-48	DD3-52		Method
BACl2 exchangeable cations						
Aluminium	mEq/100g	2.4	0.28	0.56		NT2_60
Calcium	mEq/100g	0.4	0.12	0.14		NT2_60
Cation Exchangeable Capacity	mEq/100g	5.7	1.9	2.4		NT2_60
Magnesium	mEq/100g	1.9	0.85	1		NT2_60
Potassium	mEq/100g	0.067	0.13	0.15		NT2_60
Sodium	mEq/100g	0.97	0.52	0.56		NT2_60

Ling Shuang Lu, Analyst
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28-FEB-2014

Lab Reg No.		W14/002667	W14/002668	W14/002669		
Sample Reference	Units	DD3-39	DD3-48	DD3-52		Method
Miscellaneous						
Conductivity	uS/cm	67	53	57		NW_B9

Andrew Evans, Analyst
Inorganics - NSW
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28-FEB-2014

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This Report supersedes reports: RN1010847 RN1010921