

Memorandum

To File

File reference 902196

From MD

Subject Review of Info & Comments Lot 101 on S 102 967
Summary.

Date 27/1/99

Notes

Site had power station (turbine building, boiler house and stores building) located on it. The boiler house has been demolished with materials disposed on site.

The site has had 12 test pits dug across it. This very roughly equates to a 30m grid. A groundwater monitoring bore was established at BH 8

The site has essentially been filled and fill varies from approx 0.5m to at least 4.0m across the site. The fill is typically made up of building rubble, ash, clays & sandy clays. It is possible that a lot of the fill was generated on site but some early ash fill may have been sourced from the gas works.

The largest amount of fill appears to be adjacent the powerhouse near the river where ash fill was probably dumped to reclaim land as well as the area adjoining Newform Park and the boiler house demolition area.

Most of the contamination appears to be associated with the ash and elevated ~~met~~ HMs & PAHs have been observed. Asbestos has also been found in the fill

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The area in the vicinity of the Powerhouse adjacent New Farm Park and fronting the Brisbane River significant ash has been used as fill, and associated with this ash H.M. & PAHs have been identified (TP4 PAH 355 @ 2.8mg & TP8 Pb 2340 @ 2mg) although it should be noted that surface at these sites were OK).

- One groundwater monitoring bore was installed in an area away from the turbine building. A deficiency in the investigation is a lack of groundwater monitoring on the river area of the site. However the impacts on the river which would be the receiving environment for the groundwater (in this area as there would be no other sources) would be expected to be minimal considering the size of the river at this location, the velocity of groundwater flow, the solubility of the contaminants involved and the capping which will be required across the site.

The SAMP is to be developed to - Generally the ash is contained under hard stand or under soil not exposed on the site being under hard stand or at several metres depth. However ash is exposed on the footings along the Powerhouse

Memorandum

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Notes

re Newfarm Park boundary.

The SMP should be developed to control activities during development of the site.
- Require capping of the site to minimise exposure to users of the site and water infiltration.

RTI DL RELEASE - EHP

Subject: New Farm Power Station site SMP

Date: Wed, 23 Dec 1998 15:45:03 +1000

From: "Woodfull, Chris" <cwoodfull@ppk.com.au>

To: "mack.dreyer@env.qld.gov.au" <mack.dreyer@env.qld.gov.au>

Mack

Please find attached revisions to Lot 101 for your review. Hopefully this addresses your concerns (including removing the conditional conditions) and simplifies the plan. Welcome edits/feedback. Once agreed, we will update Lot 2 (ie QTSC site) with any changes and forward through for sign off.

FYI my direct email address is cwoodfull@ppk.com.au, this came via our gneral office address - you might have an old card).

Cheers, Chris.

<<LOT_101.DOC>>

 Part 1.2	Name: LOT_101.DOC Type: Microsoft Word 6 and 95 (application/msword) Encoding: base64
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RTI DL RELEASE - EHP

Subject: New Farm Power Station**Date:** Mon, 18 Jan 1999 09:42:37 +1000**From:** Mack Dreyer <Mack.Dreyer@env.qld.gov.au>**Organization:** Department of Environment**To:** "Woodfull, Chris" <cwoodfull@ppk.com.au>

-- Chris

Thanks for your response on the SMP for the Power Station Site.

In reply:

- Appendix A = Appendix 1. I mixed up my terminology.

- As you will see from my response to section 3.1.6 in the version of the SMP I e-mailed you, I am trying to get away from having the administering authority approve items associated with the current development (conditional conditions). (Note - item 3.2.6 was put there as there may be development on the site in the future which will need a trigger for assessment and the development of appropriate management protocols). As a result I am uncomfortable with having a clause which requires administering authority approval for the current boardwalk and river frontage development. What we need to do is draft the condition controlling this area so that the contamination is contained (capped as per 3.1.1) and erosion managed. It may be that we need to get a firm proposal from BCC or we have a condition something like:

- The area of land on lot 101 on SP 102967 east of the powerstation and adjacent the river, including the land under the boardwalk is to be capped as per 3.1.1. In addition erosion of the cap is to be managed so as to maintain the integrity of the cap.

- My comments re adding administering authority approval for 3.1.3 and 3.2.3 are as per the above discussion. Can we get from BCC what they are planning to do for the current development? We can then assess this and then have a statement similar to what you have proposed for the post development phase. If the trees are in self contained planter boxes and these planter boxes themselves act as a cap then this would be ok and we could just have a condition relating to this.

- My reason for having condition 3.2.6 is as discussed in my second dot point.

- The 118ZZF conditions are in 3.2.5 (we should change the Department of Environment and Heritage to the Administering Authority) and I had thought that the WPHSP could be managed by 3.2.6 but to be consistent and make it clear we could also add it in.

- I wasn't sure how long the development was planned to take so I made it 6 monthly. This is typical of what we have done in the past for similar construction type projects, but I am open to suggestions.

Please let me know what you think of the above comments and explanations.

Regards

Mack Dreyer

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RTI DL RELEASE - EHP

Subject: RE: New Farm Power Station**Date:** Thu, 14 Jan 1999 11:00:20 +1000**From:** "Woodfull, Chris" <cwoodfull@ppk.com.au>**To:** "Mack.Dreyer@env.qld.gov.au" <Mack.Dreyer@env.qld.gov.au>

Mack thanks for the response/edits. Overall the revisions to the plan are fine. More specific comments/questions follow:

- the lot boundaries are annotated on the current SMP plan but a little difficult to pick up. We will highlight these and also prepare blow ups/enhancements of the individual land parcels for their respective plans.

- the coal bunkers are located just outside this land parcel (and will be edited);

- I assume Appendix A = Appendix 1?;

- w.r.t. Condition 3.1.4: a preliminary design is presented on the BCC Site Plan (Drawing No 345-05-164) and includes annotations such as "remove existing fill", "landscape on existing fill", "rock revetment", "boardwalk over existing concrete slab", etc. This drawing has been used as the basis for the SMP site plan. Without BCC finalising the design, my thoughts would be to reference the preliminary design drawing and revise/include a condition which has the final/detailed boardwalk area design requiring review/approval from the administering authority before construction can commence, (similar to 3.2.6).

eg. In order to minimise exposure to, and erosion of contaminated material along the river bank area, the final design for the elevated boardwalk (along the eastern bank of the river) and the sites river frontage (Appendix A) will require approval from the administering authority prior to construction commencing.

- w.r.t Conditions 3.1.3 & 3.2.3, once again we could add an administering approvals statement,

eg. Trees selected for garden bed areas, apart from species approved by the administering authority, shall be such that the root system Therefore the site owner can nominate trees for approval with supporting info if necessary (and the authority can also seek advice from the flora experts), without the plan limiting the range of plants.

Note that the preliminary design for Lot 101 is trees within self contained planter boxes.

- Condition 3.2.6: what's the rationale behind this condition, doesn't seem necessary to me, although I notice that for post construction, WHASP and Section 118ZZF conditions are absent.

- is the frequency of Condition 4.1.1 standard (I would have thought that six monthly a little too frequent for this size of project? (a Pacific Motorway-type project major earthworks, yes).

Let us know your thoughts ASAP, Cheers, Chris.

-----Original Message-----

From: Mack.Dreyer@env.qld.gov.au [mailto:Mack.Dreyer@env.qld.gov.au]

Sent: Thursday, 14 January 1999 8:42 AM

To: Woodfull, Chris

Subject: New Farm Power Station

Subject: New Farm Power Station**Date:** Thu, 14 Jan 1999 08:41:31 +1000**From:** Mack Dreyer <Mack.Dreyer@env.qld.gov.au>**Organization:** Department of Environment**To:** "Woodfull, Chris" <cwoodfull@ppk.com.au>

-- Chris

I apologise for not returning your call yesterday but I had locked myself away to try a complete a number of jobs which had been outstanding for some time. One of these was the New Farm Power Station.

I have attached a revised version of the SMP for your comment.

With regard to the SMP I am open to suggestions as to how you see sections 3.1.3 and 3.2.3 being drafted to permit large trees being allowed on the site and your estimation of the risks. Does BCC have an estimation of the number and location of large trees it would like to see on the site.

I do have some concerns with regard to section 3.1.4. I feel this should be tightened up a little as it is currently quite vague. Does the BCC have plans on how it is going to do construction in this area? This might allow more detail to be developed.

Note the SMP hasn't been through the peer reviewed as yet. We will do this when we have a plan that we are both happy with.

Please let me know what your thoughts on this draft are.

Regards

Mack Dreyer

+-----+
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 Part 1.2

Name: 902196lot101smpver3.DOC
Type: Microsoft Word 6 and 95 (application/msword)
Encoding: base64

Release

DRAFT SITE MANAGEMENT PLAN - LOT 101 ON SP 102967 (FORMER NEW FARM POWER STATION SITE).

1.0 Summary of Contamination

Lot 101 on SP 102967 was a part of a coal-powered power station facility, (formerly known as the New Farm Power Station site). Material used/generated during the operation of the power station has been used as fill across large areas of the site (including boiler ash and building rubble).

Levels of selected heavy metals (arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), zinc (Zn) and/or mercury (Hg)), Total Petroleum Hydrocarbons (TPHs) and/or Polycyclic Aromatic Hydrocarbons (PAHs) in excess of Department of Environment & Heritage (DEH) Environmental Investigation levels have been identified at various locations across the site. The elevated levels were typically associated with fill material consisting of boiler ash, waste and building rubble. Asbestos cement sheeting/debris was also noted in building rubble in the former boiler house and coal bunker areas (is this on this land parcel?) of the site.

The identified As, Cd, Cu, Zn and Hg concentrations were below DEH health-based investigation levels for parkland, recreational and/or commercial land-use. With the exception of 2 samples, Pb and PAH levels were also within the DEH health-based guidelines for parkland, recreational and/or commercial land use. The elevated TPH levels were predominantly longer chain hydrocarbons and therefore exposure to hydrocarbon vapours or the risk of an explosive gas build up is considered unlikely.

A site layout showing sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current DEH threshold levels) is presented in Appendix A.

SMP
Ver 3.
14/1/99

2.0 Objectives

The objective of the Site Management Plan (SMP) is to manage contamination on Lot 101 on SP 102967 during the site's development and post development in a manner which protects human health and the environment. The objective will be achieved by:

- Implementation of controls on site excavation, building refurbishment and redevelopment works;
- Establishment of barriers between users of the site and the contamination (ie site capping);
- Minimisation of surface water infiltration; and
- Implementation of monitoring programs.

3.0 Achievement and Management of Objectives

The owner is to ensure the following conditions are complied with in order to achieve and maintain the plan objectives:

3.1 Pre Construction and Construction

- 3.1.1 With the exception of landscaped garden areas, a capping layer consisting of a concrete slab, or bitumen/asphalt paving, or compacted clay to a minimum depth of 0.5 m or other equivalent impermeable cover is to be installed to maintain a barrier between contamination and site users as well as to minimise water infiltration.
- 3.1.2 Landscaped garden areas shall not exceed 10% of the site in area (appendix 1) and be constructed to ensure that exposure/infiltration to potentially contaminated material is minimised. To this end, gardens shall be constructed on beds of at least 300 mm of clean (imported) top soil (AS4419) on top of a minimum of 300 mm of compacted clay (or other suitable capping material). Measures shall be implemented to ensure that water does not infiltrate through the contaminated zone, (eg. agricultural drainage lines designed to discharge stormwater).
- 3.1.3 Plants selected for garden bed areas shall be such that the root system does not penetrate the clay cap. (Mack personally I believe this clause is now too restrictive and careful plant selection and landscaping design (to minimise infiltration rates) would allow larger trees to be successfully planted without prejudicing the safety of human health and the environment).
- 3.1.4 Exposure to, and erosion of, contaminated material beneath the elevated boardwalk (along the eastern bank of the river) and the sites river frontage is to be minimised. Options to control this erosion should include the removal, battering, capping and/or sealing of the contaminated material.
- 3.1.5 All slopes, batters and retaining walls are to be geotechnically stable and not subject to slumping, or erosion.
- 3.1.6 Site works relating to excavation, removal and/or disposal of soil must ensure that environmental harm is prevented. To achieve this an Environmental

Management Plan (EMP) shall be developed and implemented. The Environmental Management plan shall detail controls on site works (eg stormwater runoff controls, excavation methodology, dust and noise suppression etc). This plan shall be developed prior to the commencement of site works (upon finalisation of development plans) and be available to the administering authority on request. As a minimum the Environmental Management Plan must consider:

- the staging of site works to minimise the extent of disturbed areas and to reduce the potential for potentially contaminated runoff to impact surrounding areas;
- methodologies to control the emission of potentially contaminated dust;
- stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
- the identification and management of potentially Acid Sulphate Soils;
- minimising the exposure of humans and the environment to potentially contaminated sub-surface soils during excavation works;
- controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions);
- monitoring of pollution control equipment and new/existing environmental monitoring points and recording of results for review; and
- documentation of all contaminated soil transport operations including the descriptions of processes, personnel and/or organisations involved and approvals given.

3.1.7 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to PAHs, asbestos, TPH and heavy metal contaminated soils and/or waters. This WHASP shall be developed prior to the commencement of any civil construction works on site.

3.1.8 Contaminated soil must not be excavated or removed from the site without adequate sampling and without the prior approval of the Department of Environment and Heritage (DEH) under Section 118ZZF of the Environmental Protection Act 1994.

3.2 *Achievement of Management Objectives - Post Construction (development)*

3.2.1 The site capping layer (other than the landscaped garden areas, see appendix 1), which consists of a concrete slab, or bitumen/asphalt paving, or compacted clay to a minimum depth of 0.5 m or other equivalent impermeable cover is to be maintained in good condition at all times.

3.2.2 Landscaped garden areas, which are not to exceed 10% of the site in area, are to be maintained so that at least 300 mm of clean (imported) top soil (AS4419) overlies a minimum of 300 mm of compacted clay (or other suitable capping material). A water management strategy shall be developed and implemented for the watering of garden beds to ensure that infiltration into potentially contaminated soil is minimised. This watering strategy shall consider

watering rates, watering intensity and the design of appropriate drainage points within the gardens. Garden drainage systems are to be maintained in an operational condition.

- 3.2.3 Plants selected for garden bed areas shall be such that the root system does not penetrate the clay cap. (Mack personally I believe this clause is now too restrictive and careful plant selection and landscaping design (to minimise infiltration rates) would allow larger trees to be successfully planted without prejudicing the safety of human health and the environment).
- 3.2.4 Subsequent open space design changes to the site (ie. increasing the landscaped garden areas to more than 10% of the site area) will require a review of capping/sealing requirements and approval by the administering authority.
- 3.2.5 Contaminated soil must not be excavated or removed from the site without adequate sampling and without the prior approval of the Department of Environment and Heritage (DEH) under Section 118ZZF of the Environmental Protection Act 1994.
- 3.2.6 Excavations which extend below the capping layer must receive the prior approval of the administering authority.
- 3.2.7 Pollution control equipment, erosion control systems and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised must be maintained in an operational state.

4.0 Monitoring & Reporting

To ensure compliance with the SMP, the owner of the site is to ensure that the following monitoring and reporting requirements are performed.

4.1 Monitoring and Reporting - Pre Construction and Construction

- 4.1.1 During the pre-construction and construction phases of the development a report is to be submitted on a six monthly basis to the administering authority detailing the results of all monitoring and compliance with site management plan conditions.

4.2 Monitoring and Reporting - Post Construction

- 4.2.1 An inspection of the site is required at a minimum of every six months to ensure that the site management plan conditions have been satisfied.
- 4.2.2 Written records of details of inspections, monitoring and maintenance programs, site excavations, soil movements and soil disposals are to be documented and a available to the administering authority on request.

DRAFT SITE MANAGEMENT PLAN - LOT 101 ON SP 102967 (FORMER NEW FARM POWER STATION SITE).

1.0 Summary of Contamination (Lot 101 on SP 102967, formerly a portion of Lot 3 on RP 210504).

Lot 101 on SP 102967 was a part of a coal-powered power station facility, (formerly known as the New Farm Power Station site). Material used/generated during the operation of the power station has been used as fill across large areas of the site (including boiler ash and building rubble).

Levels of selected heavy metals (arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), zinc (Zn) and/or mercury (Hg)), Total Petroleum Hydrocarbons (TPHs) and/or Polycyclic Aromatic Hydrocarbons (PAHs) in excess of current Department of Environment & Heritage (DEH) Environmental Investigation levels were reported in soils and ash fill in the northern boundary (including former coal bunker and air raid shelter areas), and the southern and eastern boundaries of the site. Asbestos cement sheeting/debris was noted in building rubble in the former boiler house and coal bunker areas of the site.

Selected heavy metal impact (As, Cd, Pb, Zn and/or Hg), greater than current DEH Environmental Investigation guidelines was present at depths between 0.3 m and 2.9 m below ground level (mBGL). Elevated TPH levels were encountered in the top 1.0 m (former coal bunker) and PAH impact was reported at depths between 1.9 mBGL and 2.9 mBGL (southern and eastern site boundary areas). The elevated levels were typically associated with fill material consisting of boiler ash, waste and building rubble.

The reported As, Cd, Cu, Zn and Hg levels were within currently proposed DEH health-based investigation thresholds for parkland, recreational and/or commercial land-use. With the exception of 2 samples, Pb and PAH levels were also within the DEH health-based guidelines for parkland, recreational and/or commercial land use. The elevated TPH levels were predominantly longer chain hydrocarbons and therefore exposure to hydrocarbon vapours or the risk of an explosive gas build up is considered unlikely.

A site layout showing the sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current DEH threshold levels) is presented in Appendix A. The proposed development plan for the site presents minimal opportunities for soil/contaminated fill access. Based on the results of the investigation and given the proposed development plan for the site, the chemical contamination present at the site is considered unlikely to present a risk to human health and/or the environment with the implementation of appropriate management options.

2.0 Objectives

The objective of the Site Management Plan (SMP) is to manage contaminants identified on Lot 101 on SP 102967 in such a manner as to minimise potential human health and/or environmental effects. This shall be achieved through:

- Implementation of controls on site excavation, building refurbishment and redevelopment works;
- Provision for paving/sealing of the site to minimise potential contact of contaminants with humans and/or the environment;
- Options for the planting of vegetation in appropriately prepared garden beds;
- Minimisation of surface water infiltration;
- Prevention of contaminant migration from the site; and
- Implementation of monitoring programs.

3.0 Achievement and Management of Objectives

3.1 Pre Construction and Construction

In order to effectively manage the identified areas of concern, the following management options have been developed:

3.1.1 An Environmental Management Plan (EMP) shall be developed detailing controls on site works (eg stormwater runoff controls, excavation methodology, dust and noise suppression etc). This plan shall be developed and submitted to DEH for approval prior to the commencement of site works (upon finalisation of development plans) and may include provisions for:

- the staging of site works to minimise the extent of disturbed areas and to reduce the potential for potentially contaminated runoff to impact surrounding areas;
- methodologies to control the emission of potentially contaminated dust;
- stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
- the identification and management of potentially Acid Sulphate Soils;
- minimising the exposure of humans and the environment to potentially contaminated sub-surface soils during excavation works;
- controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions);
- monitoring of pollution control equipment and new/existing environmental monitoring points and recording of results for review; and
- the documentation of all contaminated soil transport operations including descriptions of processes, personnel and/or organisations involved and approvals given.

3.1.2 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to PAHs, asbestos, TPH and heavy metal contaminated soils and/or waters. This

WHASP shall be developed prior to the commencement of any civil construction works on-site.

- 3.1.3 The site (with the exception of landscaped garden areas) shall be capped/sealed in a manner that minimises/eliminates the infiltration of contaminants and potential human contact with contaminated materials. Capping/sealing options include concrete, bitumen/asphalt, a minimum 300 mm thick compacted clay bed).
- 3.1.4 Construction of the elevated boardwalk (along the eastern bank of the river) shall be conducted in such a manner that direct accidental exposure to contaminated material is minimised. Erosion of contaminated material beneath the boardwalk is to be minimised. Options to control this erosion should include the removal, battering, capping and/or sealing of the contaminated material beneath the boardwalk.
- 3.1.5 Landscaped garden areas shall be constructed in a manner to ensure that exposure/infiltration to potentially contaminated material is minimised. To this end, gardens shall be constructed on beds of at least 300 mm clean (imported) top soil (AS4419) on top of a minimum of 300 mm of compacted clay (or other suitable capping material).
- 3.1.7 Measures shall be implemented to ensure that water shall not infiltrate through the contaminated zone, (eg. agricultural drainage lines designed to discharge stormwater).

3.2 *Post Construction (Site Operation and Monitoring)*

The owner shall be responsible for the following:

- 3.2.1 Plants selected for garden bed areas shall be such that the root system does not penetrate the clay cap. (Mack personally I believe this clause is now too restrictive and careful plant selection and landscaping design (to minimise infiltration rates) would allow larger trees to be successfully planted without prejudicing the safety of human health and the environment).
- 3.2.2 A water management strategy shall be developed for the watering of garden beds to ensure that infiltration into potentially contaminated soil is minimised. This should include watering rates, intensity and the design of appropriate drainage points within the gardens.
- 3.2.3 Subsequent open space design changes to the site (ie. increasing the landscaped garden areas to more than 10% of the site area) will require a review of capping/sealing requirements at the site.
- 3.2.3 In the event that contaminated soils require removal from the site, approval under Section 118ZZF of the Environmental Protection Act shall be obtained prior to removal.
- 3.2.4 An inspection of pollution control equipment and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised.
- 3.2.5 A biennial inspection of the site including condition of pavements, grassed areas, vegetation and records of soil excavation and/or removal/disposal.
- 3.2.6 A biennial review of the Site Management Plan to ensure its ongoing suitability for the use of the site. Should development plans change from

the current proposed development, the SMP shall be modified accordingly (if required).

- 3.2.7 An annual report shall be submitted to the DEH detailing the results of monitoring activities, site inspections, site investigations and any environmental incidents during the period. The initial report shall be submitted to DEH prior to 30 December 1999.
- 3.2.8 Records of incidents and reports shall be kept for a period of five years or a term otherwise prescribed by DEH.
- 3.2.9 The commencement of the various monitoring periods is from the date of the approval of the plan.

RTI DL RELEASE - EHP

Memorandum

To File File reference 902 196.
From MD.
Subject Meeting C Woodfull Newstead Powerhouse SMPs Date 18/12/98
Notes

Meeting convened to discuss SMPs for Newstead Powerhouse site

Problems with submitted SMPs.

- need lot on plan on maps.
- figure 2 is misleading as contamination across the site has not been definitively quantified due to nature of fill across the site.

Went through SMP with Chris Woodfull (lot 101) and comments noted on plan. See attached draft SMP. - Emphasised that plan SMP had to be a condition of use. Copy of comments on SMP provided to Chris Woodfull. Agreed that SMP for lot 2 on RP 210504 would be very similar to lot 101.

Discussed SMP for Powerhouse Park lot 1 on RP 53157. - Agreed that in its current form the SMP is unacceptable as you cannot have a SMP which requires further investigation and due to minimal investigations performed on the lot. This would mean that the decision process from those further investigations would be a conditional condition.

Chris Woodfull agreed to rework SMPs for lot 101 & lot 2 - lot 1 will need further investigation.

DRAFT SITE MANAGEMENT PLAN - LOT 101 ON SP 102967 (FORMER NEW FARM POWER STATION SITE).

1.0 Summary of Contamination (Lot 101 on SP 102967, formerly a portion of Lot 3 on RP 210504).

Levels of selected heavy metals (arsenic (As), cadmium (Cd), copper (Cu), lead (Pb), zinc (Zn) and/or mercury (Hg)), Total Petroleum Hydrocarbons (TPHs) and/or Polycyclic Aromatic Hydrocarbons (PAHs) in excess of current Department of Environment & Heritage (DEH) Environmental Investigation levels were reported in soils in the northern boundary (including former coal bunker and air raid shelter areas), and the southern and eastern boundaries of the site. Asbestos cement sheeting/debris was noted in building rubble in the former boiler house and coal bunker areas of the site.

Selected heavy metal impact (As, Cd, Pb, Zn and/or Hg), greater than current DEH Environmental Investigation guidelines was present at depths between 0.3 m and 2.9 m below ground level (mBGL). Elevated TPH levels were encountered in the top 1.0 m (former coal bunker) and PAH impact was reported at depths between 1.9 mBGL and 2.9 mBGL (southern and eastern site boundary areas). The elevated levels were typically associated with fill material consisting of boiler ash, waste and building rubble.

The reported As, Cd, Cu, Zn and Hg levels were within currently proposed DEH health-based investigation thresholds for parkland, recreational and/or commercial land-use. With the exception of 2 samples, Pb and PAH levels were also within the DEH health-based guidelines for parkland, recreational and/or commercial land use. The elevated TPH levels were predominantly longer chain hydrocarbons and therefore exposure to hydrocarbon vapours or the risk of an explosive gas build up is considered unlikely.

A site layout indicating areas of expected contamination with respect to the proposed development is presented in Appendix A. The proposed development plan for the site presents minimal opportunities for soil/contaminated fill access. Based on the results of the investigation and given the proposed development plan for the site, the chemical contamination present at the site is considered unlikely to present a risk to human health and/or the environment with the implementation of appropriate management options.

2.0 Objectives

The objective of the Site Management Plan (SMP) is to manage contaminants identified on Lot 101 on SP 102967 in such a manner as to minimise potential human health and/or environmental effects. This shall be achieved through:

- Implementation of controls on site excavation, building refurbishment and redevelopment works;
- Provision for paving/sealing of the site to minimise potential contact of contaminants with humans and/or the environment;
- Options for the planting of vegetation in appropriately prepared garden beds;
- Minimisation of surface water infiltration;
- Prevention of contaminant migration from the site; and
- Implementation of monitoring programs.

3.0 Achievement and Management of Objectives

3.1 Pre Construction

In order to effectively manage the identified areas of concern, the following management options have been developed (assuming current development plans incorporating extensive paving for the site):

3.1.1 An Environmental Management Plan (EMP) shall be developed detailing controls on site works (eg stormwater runoff controls, excavation methodology, dust and noise suppression etc). This plan shall be developed and submitted to DEH for approval prior to the commencement of site works (upon finalisation of development plans) and may include provisions for:

- minimising the extent of disturbed areas;
- methodologies to control the emission of potentially impacted dust;
- provision for stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
- provisions for the identification and management of potentially Acid Sulphate Soils;
- controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions; and
- documentation of all contaminated soil transport operations including descriptions of processes, personnel and or organisations involved and approvals given.

3.1.2 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to PAHs, asbestos, TPH and heavy metal impacted soils and/or waters. This WHASP shall be developed prior to the commencement of any civil construction works on-site.

3.2 Construction and Post Construction (Operation)

3.2.1 Site works shall be staged such that disturbed areas are minimised and to reduce the potential for potentially contaminated runoff to impact surrounding areas.

3.2.2 Site works relating to excavation removal and/or disposal of soil must include provisions which ensure that environmental harm is prevented (eg preventing spread of contamination by controlling site runoff staging of site works, spillage from hauling trucks or improper disposal of contaminated stormwater or seepage).

3.2.3 Excavation shall be conducted in a manner that minimises the exposure of humans and the environment to potentially impacted sub-surface soils where practicable.

3.2.4 Capping and/or redevelopment of disturbed areas in the vicinity of the demolished boiler house, eastern bank of the Brisbane River (adjacent to the Power House) and the western boundary of the Power House building shall be conducted as soon as practicable following excavation and/or construction works. Development plans indicate that these areas of the site are to be sealed with paving, battered and/or covered by an elevated boardwalk.

Construction of the elevated boardwalk (along the eastern bank of the River) shall be such that direct accidental exposure to potentially impacted material is minimised. Erosion of contaminated material located under the elevated boardwalk is to be prevented. This may involve the removal, battering, capping and/or sealing of the contaminated material beneath the boardwalk to ensure accidental exposure to, or erosion of, potentially impacted soils is minimised/eliminated.

3.2.5 Proposed planter box gardens situated in the demolished boiler house area shall be constructed in a manner to ensure that exposure to potentially impacted material is minimised. To this end, gardens shall be constructed on beds of at least 300 mm clean top soil on top of a thin clay or other suitable cap (to limit the rate of surface water infiltration through the impacted zone). Plant species with root systems which may extend into potentially contaminated subsurface areas shall be selected based on their sensitivity/suitability to the identified chemical contaminants (ie. food crop or fruit plants shall not be used).

3.2.6 In the event that impacted soils require removal from the site, approval under Section 118ZZF of the Environmental Protection Act shall be obtained prior to removal.

*3.2.7 Provision for further environmental site investigation should site excavation works identify further areas of contamination not previously investigated or monitoring programs indicate an increase in contaminant levels.

3.2.8 Areas of identified contamination or fill material, which may contain contaminants at elevated levels (refer to Appendix A), should be covered with an impervious layer (eg. bitumen, concrete, clay capping, geo-synthetic liners, construction of buildings), to limit the rate of surface water infiltration.

do not agree that Appendix A is reliable

4.0 Monitoring Requirements

→ monitoring requirements pre & post construction

The owner shall be responsible for the following monitoring requirements:

- 4.1 An inspection of pollution control equipment and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised.
- 4.2 A biennial inspection of the site including condition of pavements, grassed areas, vegetation and records of soil excavation and/or removal/disposal.
- 4.3 A biennial review of the Site Management Plan to ensure its ongoing suitability for the use of the site. Should development plans change from the current proposed development, the SMP shall be modified accordingly (if required).
- 4.4 An annual report shall be submitted to the DEH detailing the results of monitoring activities, site inspections, site investigations and any environmental incidents during the period. The initial report shall be submitted to DEH prior to 30 December 1999.
- 4.5 Records of incidents and reports shall be kept for a period of five years or a term otherwise prescribed by DEH.
- 4.6 The commencement of the various monitoring periods is from the date of the approval of the plan.

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DRAFT SITE MANAGEMENT PLAN - LOT 1 ON RP 53157.

1.0 Summary of Contamination Powerhouse Park (Lot 1 on RP 53157)

Description of site use
Levels of selected heavy metals (manganese and copper), sulphate, Total Petroleum Hydrocarbons (TPHs) and/or Polycyclic Aromatic Hydrocarbons (PAHs) in excess of current Department of Environment & Heritage (DEH) Environmental Investigation guidelines were reported in fill (including ash, rubble) material in the western region and along the eastern boundary (ie. River bank area) of Powerhouse Park. Asbestos was detected in a fill sample from an unspecified depth in the northern centre portion of the site.

Manganese and copper levels greater than current DEH Environmental Investigation guidelines were present at depths between 1.0 m and 3.0 m below ground level (mBGL). Elevated sulphate and TPH levels were encountered in at one location the top 0.25 m (near the former coal handling wharf) and PAH impact was reported at depth of 2.0 to 2.5 mBGL (southern and eastern site boundary areas).

The elevated manganese, copper and PAH levels were within currently proposed DEH health-based investigation thresholds for parkland, recreational and/or commercial land-use.

A site layout indicating areas of expected contamination with respect to the current use (public open space/parkland) and proposed development (parkland with underground car parking facility) are presented in Appendix A. The current use for the site presents minimal opportunities for soil/contaminated fill access. Based on the results of the investigation and given the current use and proposed development plan for the site, the chemical contamination present at the site is considered unlikely to present a risk to human health and/or the environment, with the appropriate management strategies in place.

2.0 Objectives

The objective of the Site Management Plan (SMP) is to manage contaminants identified on Lot 1 on RP 53157 in such a manner as to minimise potential human health and/or environmental effects during pre-construction, construction and operational phases of the development. This shall be achieved through:

- Prevention of contaminant migration from the site;
- Implementation of controls on site excavation, building refurbishment and redevelopment works;
- Provision for paving/sealing of the site to minimise potential contact of contaminants with humans and/or the environment;
- Provision for additional investigation programmes;
- Options for the planting of vegetation in appropriately prepared garden beds; and
- Implementation of monitoring programs.

3.0 Achievement and Management of Objectives

3.1 Pre-Construction (based on Current Use)

In order to effectively manage the identified areas of concern in the period leading to the construction phase of development works, the following management options for the site have been developed (assuming current development plans for the site to be grassed with paving in the designated areas):

- Cannot have in SMP*
- 3.1.1 Additional site investigations are to be conducted to confirm the preliminary investigation results (NB. the current sample grid spacing is approximately 50 m). The site investigations should include a limited groundwater study. The additional site investigations are to be undertaken before the commencement of any site works which would result in substantial disturbance of the potentially contaminated fill material.
 - 3.1.2 An Environmental Management Plan (EMP) shall be developed detailing controls on site works (eg stormwater runoff controls, excavation methodology, dust and noise suppression

etc). This plan shall be developed and submitted to DEH for approval prior to the commencement of site works (upon finalisation of development plans) and may include provisions for:

- minimising the extent of disturbed areas;
- methodologies to control the emission of potentially impacted dust;
- provisions for the identification and management of potential Acid Sulphate Soils;
- provision for stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
- controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions); and
- documentation of all contaminated soil transport operations including descriptions of processes, personnel and or organisations involved and approvals given.

- 3.1.3 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to PAHs, asbestos, TPH, selected heavy metal and/or sulphate impacted soils and/or waters. This WHASP shall be developed prior to the commencement of any civil construction works on-site.

3.2 Construction and Operation

- 3.2.1 Site works shall be staged such that disturbed areas are minimised and to reduce the potential for potentially contaminated runoff to impact surrounding areas.
- 3.2.2 Site works relating to excavation removal and/or disposal of soil must include provisions which ensure that environmental harm is prevented (eg. preventing spread of contamination by controlling site runoff staging of site works, spillage from hauling trucks or improper disposal of contaminated stormwater or seepage).
- 3.2.3 Excavation shall be conducted in a manner that minimises the exposure of humans and the environment to potentially impacted sub-surface soils where practicable.
- 3.2.4 Capping and/or redevelopment of disturbed areas shall be conducted as soon as practicable following excavation and/or construction works. Current development plans indicate that the site shall be largely a grassed area with selected areas concreted or paved. Concrete and/or paving shall be installed as soon as practicable after cessation of initial site works.
- 3.2.5 Gardens situated on suspected contaminated areas shall be constructed in such a manner to minimise the potential for exposure to chemicals present in the soil (ie. volatilisation of contaminants, dermal contact). To this end, gardens shall be constructed on beds of at least 300 mm clean top soil overlying a minimum of 300 mm of compacted clean clay fill. Plant species with root systems which may extend into potentially contaminated subsurface areas shall be selected based on their sensitivity/suitability to the identified chemical contaminants (ie. food crop or fruit plants shall not be used).
- 3.2.6 In the event that impacted soils require removal from the site, approval under Section 118ZZF of the Environmental Protection Act shall be obtained prior to removal.
- 3.2.7 Provision for further environmental site investigation should site excavation works identify further areas of contamination not previously investigated or monitoring programs indicate an increase in contaminant levels.

4.0 Monitoring Requirements

The owner shall be responsible for the following monitoring requirements:

- 4.1 An inspection of pollution control equipment and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised.
- 4.2 A biennial inspection of the site including condition of pavements, grassed areas, vegetation and records of soil excavation and/or removal/disposal.
- 4.3 A biennial review of the SMP to ensure its ongoing suitability for the use of the site.
- 4.4 An annual report shall be submitted to the DEH detailing the results of additional site investigations, site inspections and any environmental incidents during the period. The initial report shall be submitted to DEH prior to 30 December 1999.

- 4.5 Records of incidents and reports shall be kept for a period of five years or a term otherwise prescribed by DEH.
- 4.6 The commencement of the various monitoring periods is from the date of the approval of the plan.

5.0 *Supplementary Requirements*

In the event that the site remains in its current state (ie public open space/parkland), the following conditions shall be followed to ensure the ongoing suitable use for the site:

5.1 *Plan Conditions*

- 5.1.1 Appropriate construction methods shall be developed prior to the commencement of any site works. This method shall ensure that exposure of humans to impacted material is kept to a minimum and that earthworks are staged to minimise stormwater runoff from potentially impacted spoil.
- 5.1.2 Provision for further site investigation (including groundwater investigation) for the Powerhouse Park site (as required by DEH). This investigation shall be conducted and reported within 3 months of DEH requesting further works for the purpose of adequately defining the potential human health and/or environmental risks posed by the site.
- 5.1.3 Contaminated soil must not be excavated or removed from the site without adequate sampling and without prior approval of DEH under Section 118ZZF of the Environmental Protection Act 1994.

5.2 *Monitoring and Maintenance Requirements*

- 5.2.1 A biennial inspection of the site is to be undertaken to ensure that the surface of Powerhouse Park is maintained to ensure contaminant exposure pathways to humans and the environment are minimised. This inspection schedule shall commence on 30 December 1998.
- 5.2.2 The DEH will undertake regular site inspections to monitor the site in relation to the above conditions.
- 5.2.3 An annual report shall be submitted to the DEH detailing the results of environmental investigations (and ongoing monitoring requirements, as required by the DEH), site inspections and any environmental incidents during the reporting period.
- 5.2.4 A biennial review of the SMP to ensure its ongoing suitability for the use of the site.
- 5.2.5 Records of incidents and reports shall be kept for a period of five years or a term otherwise prescribed by the DEH.

DRAFT SITE MANAGEMENT PLAN - LOT 2 ON REGISTERED PLAN (RP) 210504 (FORMER QTSC SITE).

1.0 Summary of Contamination Former Queensland Electricity Commission (QTSC) Site (Lot 2 on RP 210504)

Levels of selected heavy metals (arsenic, chromium, copper, lead and zinc) and/or Total Petroleum Hydrocarbons (TPH) in excess of Department of Environment and Heritage (DEH) guidelines were reported in soils in the northern corner, south western boundary, centre and south eastern boundary of Lot 2, RP 210504 (the QTSC site).

The impacted material was present at depths between 0.2 and 2.0 metres below ground level (mBGL), and was associated with fill material (consisting of ash and/or wood) and/or natural silty clay. This fill material was typically overlain by concrete between 0.2 and 0.5 m in thickness. Groundwater samples, collected during March 1998, did not report contaminant levels greater than current regulatory threshold criteria.

With the exception of one reported lead level, all elevated heavy metal concentrations were within currently proposed DEH health-based investigation thresholds for parkland, recreational and/or commercial land-use. The elevated TPH levels were predominantly longer chain hydrocarbons and therefore exposure to hydrocarbon vapours or the risk of an explosive gas build up is considered unlikely.

A site layout indicating areas of expected contamination with respect to the proposed development of this lot is presented in Appendix A. The proposed development plan for the site presents minimal opportunities for soil/contaminated fill access. Based on the results of the investigation and given the proposed development plan for the site, the chemical contamination present at the site is considered unlikely to present a human health and/or environmental risk with the implementation of appropriate management options.

2.0 Objectives

The objective of the Site Management Plan is to manage contaminants identified on Lot 2 on registered plan RP 210504 in such a manner as to minimise potential human health and/or environmental effects during construction and post construction phases of the development. This shall be achieved through:

- Prevention of contaminant migration from the site;
- Implementation of controls on site excavation, building refurbishment and redevelopment works;
- Provision for paving/sealing of the site to minimise potential contact of contaminants with humans and/or the environment;
- Options for the planting of vegetation in appropriately prepared garden beds; and
- Implementation of monitoring programs.

3.0 Achievement and Management of Objectives

3.1 Pre Construction

In order to effectively manage the identified areas of concern in the period leading to the construction phase of development works, the following management options for the site have been developed (assuming current development plans for the site as a temporary bitumen sealed carpark):

- 3.1.1 An Environmental Management Plan (EMP) shall be developed detailing controls on site works (eg stormwater runoff controls, excavation methodology, dust and noise suppression etc). This plan shall be developed and submitted to DEH for approval prior to the commencement of site works (upon finalisation of development plans) and may include provisions for:
- minimising the extent of disturbed areas;

- methodologies to control the emission of potentially impacted dust;
 - provision for stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
 - provisions for the identification and management of potentially Acid Sulphate Soils;
 - controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions; and
 - documentation of all contaminated soil transport operations including descriptions of processes, personnel and or organisations involved and approvals given.
- 3.1.2 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to polyaromatic hydrocarbons (PAHs), asbestos, TPH and heavy metal impacted soils and/or waters. Although not reported in soil samples from this site, PAHs and asbestos should be included in the WHASP as these materials have been identified within the power station complex and are likely to be present on the QTSC site. This WHASP shall be developed prior to the commencement of any civil construction works on-site.

3.2 *Construction and Post Construction (Operation)*

- 3.2.1 Groundwater monitoring wells installed on-site as part of previous site investigation works shall be maintained in their present condition to allow on-going monitoring of the groundwater aquifer.
- 3.2.2 Site works shall be staged such that disturbed areas are minimised and to reduce the potential for potentially contaminated runoff to impact surrounding areas.
- 3.2.3 Site works relating to excavation removal and/or disposal of soil must include provisions which ensure that environmental harm is prevented (eg preventing spread of contamination by controlling site runoff staging of site works, spillage from hauling trucks or improper disposal of contaminated stormwater or seepage).
- 3.2.4 Excavation shall be conducted in a manner that minimises the exposure of humans and the environment to potentially impacted sub-surface soils where practicable.
- 3.2.5 Capping and/or redevelopment of disturbed areas shall be conducted as soon as practicable following excavation and/or construction works. Development plans indicate that the site's initial reuse shall be mainly as a bitumen-sealed carpark, (the site may be redeveloped at a later stage). This bitumen seal shall be installed as soon as practicable after initial site levelling and sub-grade works.
- 3.2.6 Gardens situated on suspected contaminated areas shall be constructed in such a manner to minimise the potential for exposure to chemicals present in the soil (ie. dermal contact). To this end, gardens shall be constructed on beds of at least 300 mm clean top soil on top of a thin clay or other suitable cap (to limit the rate of surface water infiltration through the impacted zone). Plant species with root systems which may extend into potentially contaminated subsurface areas shall be selected based on their sensitivity/suitability to the identified chemical contaminants (ie. food crop or fruit plants shall not be used).
- 3.2.7 In the event that impacted soils require removal from the site, approval under Section 118ZZF of the Environmental Protection Act shall be obtained prior to removal.
- 3.2.8 Provision for further environmental site investigation should site excavation works identify further areas of contamination not previously investigated or monitoring programs indicate an increase in contaminant levels.
- * 3.2.9 Areas of identified contamination (refer Appendix A) should be covered with an impervious or low infiltration layer (eg. bitumen, concrete, clay capping, geo-synthetic liner, construction of building), to limit the rate of surface water infiltration.

4. *Monitoring Requirements*

The owner shall be responsible for the following monitoring requirements:

- 4.1 An inspection of pollution control equipment and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised.

- 4.2 A biennial inspection of the site including condition of pavements, grassed areas, vegetation and records of soil excavation and/or removal/disposal.
- 4.3 A round of groundwater sampling is to be undertaken from on-site groundwater monitoring wells (denoted as BH3, BH6 and BH8) prior to June 30 1999. Samples collected from this initial round of sampling shall be submitted for analysis of TPH, phenols, PAHs and selected heavy metals (ie. As, Cd, Cr, Cu, Hg, Ni, Pb and Zn). The groundwater monitoring event shall include gauging of the wells and recalculation of the local groundwater flow direction to confirm previous monitoring results. The results shall be provided in a written report to the DEH by 31 July 1999. Based on this round of sampling, subsequent monitoring requirements and the SMP conditions would be adjusted accordingly, eg if groundwater monitoring reveals:
- An annual groundwater monitoring frequency should levels remain consistent with previously reported results; or
 - More frequent testing should reported levels indicate an increase over previously reported results.
- 4.4 A biennial review of the Site Management Plan to ensure its ongoing suitability for the use of the site.
- 4.5 An annual report shall be submitted to the DEH detailing the results of groundwater monitoring, site inspections, site investigations and any environmental incidents during the period. The initial report shall be submitted to DEH prior to 30 December 1999.
- 4.6 Records of incidents and reports shall be kept for a period of five years or a term otherwise prescribed by DEH.
- 4.7 The commencement of the various monitoring periods is from the date of the approval of the plan.

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LEGEND

 INFERRED AREAS OF CONTAMINATION
BASED ON EXISTING INVESTIGATION DATA



FIGURE 2
SITE PLAN - INFERRED AREAS OF
CONTAMINATION

SCALE: A  1000 FT. AT A1

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LEGEND



INFERRED AREAS OF FILL
BASED ON EXISTING INVESTIGATION DATA



FIGURE 3

SITE PLAN - INFERRED AREAS OF FILL

SCALE A 1" = 5000' AT A1



Brisbane City

Contact name: Mr Fan Chen
Phone: 3403 4710
Fax direct: 3403 9158
Your reference:
Our reference: FC:pj-new farm

24 November 1998

PPK Environment & Infrastructure
GPO Box 2907
BRISBANE QLD 4001

Attention: Mr Chris Woodfull

Dear Sir,

New Farm Powerhouse SMPs Submission

The Brisbane City Council would like to invite your company to be acting on behalf of Council to prepare, and submit the Site Management Plans for New Farm Powerhouse Site (Lot 101/102 SP102967 and Lot 2 RP210504) to the State Department of Environment and Heritage for approval.

Should you have any queries about this matter, please contact me on the number above.

Yours sincerely

sch4p4(6) Personal information

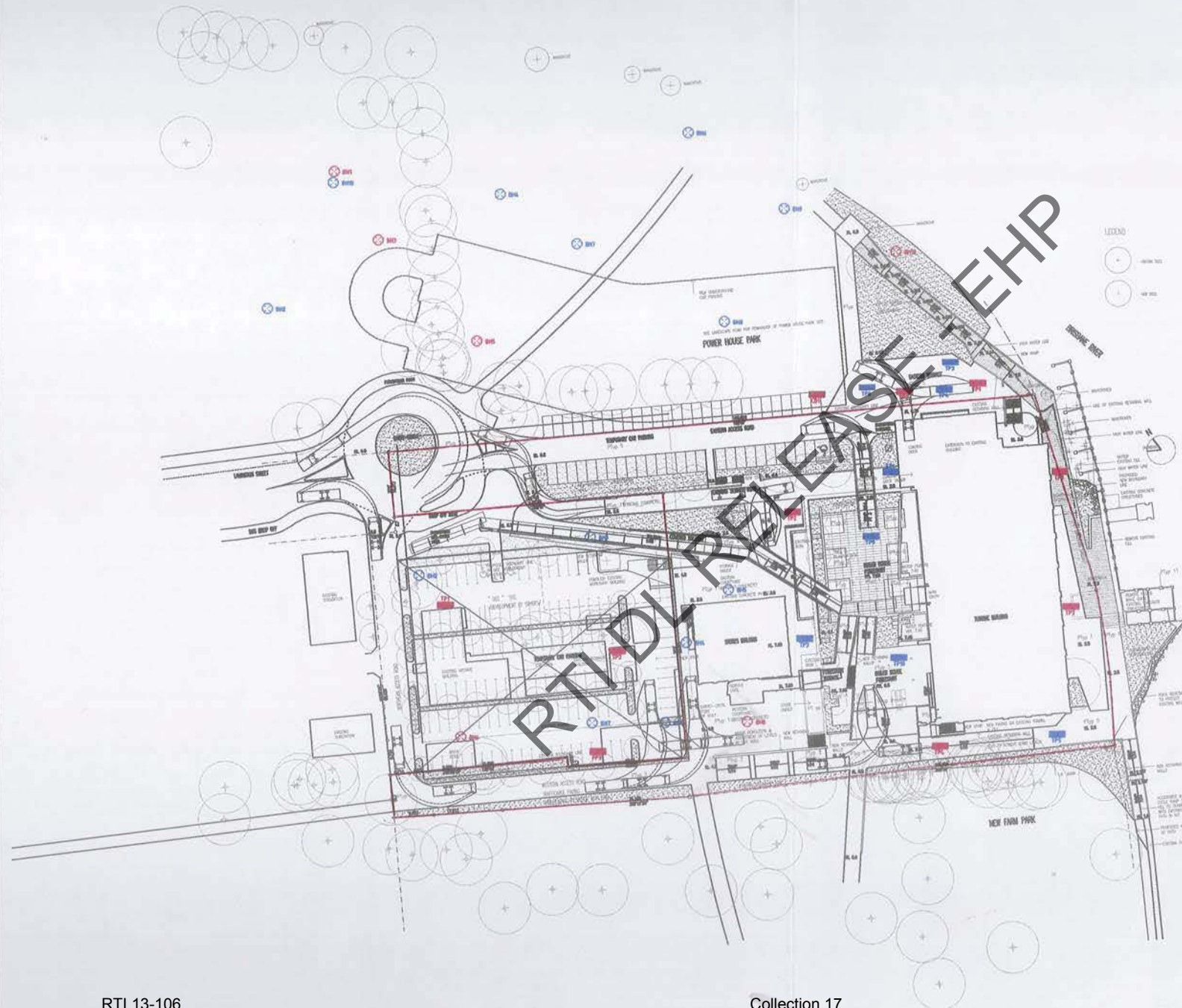
Fan Chen
Environmental Officer Land Contamination
TECHNICAL SUPPORT GROUP, DRS

Brisbane City Council

Technical Support Group
Development & Regulatory Services
Customer & Community Services Division
Level 11 69 Ann Street
Brisbane Qld 4000
GPO Box 1434
Brisbane Qld 4001

Facsimile 07 3403 6567

FC:PJ



LEGEND

- BHT SOIL RESULT GREATER THAN DEH GUIDELINES
- BHTB SOIL RESULT LESS THAN DEH GUIDELINES
- TPI SOIL RESULT GREATER THAN DEH GUIDELINES
- TPI SOIL RESULT LESS THAN DEH GUIDELINES



FIGURE 1

SITE PLAN - TEST PITS AND BORE HOLE LOCATIONS

SCALE A 1 10 20 5000 AT A1

lot boundaries?

Memorandum

To File File reference 902196.
From MD.
Subject Review Report - Additional Site Works Date 6/1/99.
Former New Farm Power Station. 6/1/98 Notes

Limited

- Works performed to assess quality of fill in vicinity of air raid shelter. It is not clear from the description or map provided where these samples were located but from the map provided with the SMP area is on lot 1 on RP 53157
- Reason for investigation is that significant excavation works will be required in this area due to elevator installation.
- 4 test pits dug in area to a max depth of 2.8m. Logs of all 4 pits predominately ash fill
- With the exception of test pit 2. HM OK slightly elevated Pb results as well. No asbestos identified in samples. ~~See~~
- Reports recommends that off-site disposal is required then soil requires 11872 F permit

- Contacted PPK. confirmed 4 test pits on lot RP 53157 - no material has been taken off-site but is stockpiled on site with sediment control for use elsewhere on the site.

PPK Environment & Infrastructure Pty Ltd

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Email ppkbris@ozemail.com.au

ACN 078 004 798
A NATA Certified Quality Company

Our Reference: 84K109B-LT002Act:syg

6 November 1998

Mr Wayne Francis
Brisbane City Council – City Design
Contract Management (Building)
Floor 3, TC Beirne Building
315 Brunswick Street Mall
FORTITUDE VALLEY QLD 4005

Dear Wayne,

Additional Site Assessment Works, Former New Farm Power Station

Introduction/Background

PPK Environment and Infrastructure Pty Ltd (PPK) were commissioned by Brisbane City Council (BCC) to conduct additional site assessment works at the former New Farm Power Station, located at Lamington Street New Farm. This letter report supplements existing site assessment data for the New Farm Power Station Site including:

- 'Environmental Site Assessment (ESA) of New Farm Power Station', PPK, September 1997 (PPK Ref No. 84J153B - PR002A1sr);
- 'Environmental Site Assessment - Lot 2 on RP 210504, New Farm Power Station, Lamington Road, New Farm, Queensland', PPK, April 1998 (PPK Ref No. 84K043A - PR001A1jf);
- 'Preliminary Site Assessment on QTSC Site - New Farm', Woodward-Clyde, March 1997 (WC Ref. No. A3200900\0001);
- 'Stage 1 Preliminary Site Investigation, The New Farm Power House', Brisbane City Council Scientific Services Branch, March 1993.

Limited sampling work of the Coal Bunker area was also recently conducted and a summary of this investigation was presented in a fax from PPK dated 30/7/98 (PPK Ref. 84J248A - fx001Asr).

The works were conducted to validate the quality of fill material in the vicinity of the air raid bunker at the site. PPK understand that as a part of the redevelopment of the site, an elevator is to be installed in the investigation area, requiring significant excavation works. The final scope of works included:

- Soil sampling from four test pits to a maximum depth of 2.8 metres (or bucket refusal);
- Laboratory analysis of the selected samples for Total Petroleum Hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), phenols, selected heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and asbestos and leachability tests of lead;
- Location and exposure of part of the air raid bunker; and
- Collation of results and production of a concise letter report, including recommendations for remedial/management options as required.

Site Works

Site works were conducted on 28 September 1998 and consisted the following:

- Initial site walkover;
- Excavation of four test pits (TP1 - TP4) and collection of soil samples from 0.2, 0.5, 1.0 and at 1.0 m intervals and/or changes in lithology, until final excavation depth; and
- exposure of a segment of the southern wall of the underground air raid bunker in the vicinity of the investigation area.

The test pits were located to assess the potential impacted fill material located in the vicinity of the abandoned air raid bunker, located on the northern side of the Powerhouse Building, near the bank of the Brisbane River. A site layout, detailing the test pit locations is presented in Figure 1, Appendix A.

All field activities were supervised by an environmental scientist/engineer responsible for the compilation of the test pit logs, collection of soil samples and re-instatement of the excavation. The site works were performed in accordance with PPK's ESA field procedures (December 1995). A summary of PPK's sampling procedures is presented in Appendix B. Samples were selected for laboratory analysis based on field observations.

The following was noted/conducted during the site visit:

- The area was filled with ash, presumably generated from the operation of the power station;
- The ash material was grey/black, loose and dry with no discernible odour.
- The material was loose and easy to dig (and allowed for the excavation of an additional test pit in the investigation area (TP4));
- A small amount of demolition rubble was also present in the fill material;
- 200 mm (approx.) I-beam girders of variable length were buried within the fill material;
- The total length of the air raid bunker could not be cost effectively exposed using the backhoe hired for excavation of the test pits; and
- No asbestos was identified on site;

A description of subsurface materials encountered at each test pit location has been detailed in test pit logs presented in Appendix C.

Contamination Criteria

To assess the significance of any contamination detected in soil or groundwater during an investigation, it is necessary to define the concentrations which are used for comparison.

Laboratory analysis results are compared with commonly applied regulatory requirements/criteria for sites which have been potentially impacted through prior and present land use. The contaminant acceptance criteria are usually threshold concentrations of specific contaminants which, if exceeded in a particular soil sample, may pose a health or environmental based risk and warrant further site specific investigation or risk analysis.

For all analytes tested in soil samples, DEH Environmental Investigation Levels have been adopted as the regulatory criteria in the first instance, with ANZECC, National Environmental Health Forum (NEHF)/South Australian Health Commission (SAHC) Health-Based Soil Investigation Levels criteria used in the absence of DEH guidelines.

Summary of Analytical Results

A total of 5 samples (including 1 field split duplicate sample) were initially submitted for laboratory testing for TPH and the selected heavy metals suite, 3 samples for laboratory testing for PAHs and phenols and 4 samples were submitted for identification of asbestos.

Primary and duplicate analyses were performed by AGAL in Brisbane and Sydney with the exception of asbestos identification which was performed by PPK. NATA certified methodologies were used for all analyses and internal laboratory QA/QC procedures are described within the laboratory reports.

Upon receipt of the analytical results, an additional 3 samples were submitted at the request of BCC (BCC facsimile, 7/10/98) for laboratory testing for the selected heavy metals suite, two samples for laboratory testing of lead leachability, and 1 sample for testing of TPH.

Laboratory testing reported the following results:

- Levels of TPH, PAHs, total phenols, cadmium, chromium, copper, mercury and nickel below current regulatory threshold criteria in all samples;
- A lead level of 420 mg/kg in a soil sample collected from test pit 2 at a depth of 2 m. This level is above current DEH environmental investigation levels (300 mg/kg) but below NEHF/SAHC health-based criteria (1200 mg/kg) for commercial/industrial and park land use (and also for residential with minimal opportunities for soil access, includes high-rise apartments and flats);
- Levels of zinc of 240 mg/kg and 630 mg/kg in soil samples TP1;1.7 and TP2;2.0 respectively. This is above current DEH environmental investigation levels (200 mg/kg) but below NEHF/SAHC health-based criteria (7000 mg/kg) for 'Standard' residential with garden/accessible soil, including day-care centres and schools;
- The lead leachability results reported in both samples submitted for analysis indicate that the material could be considered an inert waste; and
- No asbestos was identified in any sample submitted for laboratory testing.
- The duplicate soil sample (TP4;1.0D) analytical results reported consistent results with the primary sample (TP4;1.0) allowing for natural variations within the soil profile. Laboratory QA/QC procedures are detailed within the laboratory reports.

A summary of the analytical results are presented in Appendix D. A complete copy of the Laboratory Certificates and Reports of analysis is attached as Appendix E.

Summary and Recommendations

PPK was commissioned to undertake additional site investigation works at the former New Farm Power Station, New Farm, Qld and expose a portion of the disused air raid bunker wall. The site works were completed on 28 September 1998.

In summary the reported contaminant levels are within nominated health-based guidelines for the proposed land use (commercial/parkland) and should not require remediation. Given the possible use for this area and based on the results of the sampling and testing, the following conclusions and recommendations can be made:

- Levels of TPH, PAHs, total phenols, arsenic, cadmium, chromium, copper, mercury and nickel were reported within current regulatory threshold criteria;
- Levels of lead greater than DEH Environmental Investigation levels but below NEHF health-based guidelines were identified in sample one of eight samples submitted for laboratory testing. All other samples reported levels of lead below DEH Environmental Investigation levels;
- Levels of zinc greater than DEH Environmental Investigation levels but below NEHF health-based guidelines were identified in two of the eight samples submitted for laboratory testing. All other samples reported levels of zinc below DEH environmental investigation levels;
- Leachability of lead in both soil samples submitted for laboratory testing was consistent with an inert waste classification (as per BCC Waste Management guidelines);
- No asbestos was identified in samples submitted for laboratory testing; and
- The levels of the (potential) contaminants reported allow for the following management options:
 - ▶ The material may be left in place or can be safely used to fill other areas of the site in accordance with DEH Site Management Plan conditions; and/or
 - ▶ The material may be disposed of as an inert waste at an unlined landfill;

Note: Any removal of soil from the current lot must be performed under DEH approval under Section 118ZZF of the Environmental Protection Act 1994.

This report is based upon the Scope of Services, and is subject to the limitations and restrictions herein (refer to Appendix F). It has been produced for the exclusive use of Brisbane City Council. No other person or organisation is entitled to rely upon any part of it without prior written consent of PPK. BCC may release all or part(s) of this report to third parties, however, such third party in using and relying on this report agrees that it shall have no legal recourse against PPK or their parent or subsidiaries, and shall indemnify and defend from and against all claims arising out of or in conjunction with such use or reliance.

5/...

84K109B-LT002Act

PPK
Environment & Infrastructure

We trust that this letter report is satisfactory to your requirements and should you have any questions concerning the limited site groundwater assessment, please contact the undersigned on 3218 2225, or Chris Woodfull on 3218 2206.

Yours sincerely,

sch4p4(6) Personal information

Craig Thamm

Environmental Engineer

PPK Environment & Infrastructure Pty Ltd

Att.

RTI DL RELEASE - EHP

RTI DL RELEASE - EHP

Appendix A

Site Layout with Test Pit Locations

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Appendix B
PPK ESA Field Procedures

**Environmental Site Assessment
Field Procedures - Service
Station and Depot Facilities**

RTI DL RELEASE - EHP

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January, 1998
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A NATA Certified Quality Company

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Introduction

The following sections outline PPK's procedures for conducting soil gas surveys, soil boring and sampling programs, and groundwater monitor well installation and sampling for Environmental Site Assessments at depot and retail petroleum facilities. All field procedures are completed in accordance with Hot Work Permit, Workcover and Occupational Health and Safety requirements. Prior to conducting any of the following a site specific occupational health and safety plan is prepared and underground service companies are contacted for service line locations (where possible).

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1. Soil Gas Surveys

Soil Gas Surveys (SGSs) are performed to assess the presence and extent of volatile organic compounds (VOCs), including volatile petroleum hydrocarbon contaminants, in the soil at service station sites. An SGS is conducted to identify potential 'hot spots' of petroleum hydrocarbon impact. Hot spots are interpreted with respect to potential sources of petroleum hydrocarbon contamination identified on site, as VOCs may represent the vapour phase migrating from petroleum hydrocarbon contaminated soils or groundwater. As the vapour phase is mobile in the soil matrix, hot spots identified by a SGS may represent migration of a vapour plume away from a source. The results of the SGS are then used to site locations for soil borings, which allow sampling of subsurface soils for subsequent analysis for petroleum hydrocarbon analytes.

1.1 Soil Gas Survey Procedures

SGS involves collecting samples of soil gas from two depths (generally 1m and 2m below ground surface) where site conditions allow. These samples are analysed using a Microtip photoionisation detector (PID) calibrated using 105 parts per million (ppm) isobutylene in air. Isobutylene is used as a benzene surrogate¹. SGS results are therefore expressed as VOC isobutylene equivalent concentrations in ppm. A portable Gas Chromatograph (GC) may be used where identification of the volatile species is required. The procedure for conducting SGSs is:

1. Penetrate concrete/asphalt pavement using electric Kango hammer drill or pneumatic equivalent;
2. Drive a solid probe (or hollow probe with a slotted tip) into the ground to a depth of half or one metre below ground surface;
3. Insert Nylon tube attached to a PID into probe. Seal the probe from the influence of atmospheric air;
4. Monitor PID and record maximum reading (total VOC isobutylene equivalent concentration in ppm);
5. Remove Nylon tube and advance probe to two metres depth (or probe tip refusal) and repeat steps 3 and 4; and
6. Remove Teflon tube and probe from hole and backfill with concrete grout (where site is active) and proceed to next point.

¹

Benzene is a known carcinogen. Isobutylene is used to eliminate the need to store and handle benzene.

2. Soil Boring/Sampling Program

Soil boring programs allow physical identification of subsurface soil strata and collection of soil samples for field screening and analytical testing.

2.1 Soil Boring Procedure

All drilling equipment (rods, drive tubes, drill bits) are decontaminated prior to the commencement of sampling.

Soil borings are completed using diesel powered drilling rigs. Boreholes are advanced using either nominal 100mm diameter solid augers or 150mm diameter hollow stem augers depending on site conditions. Hollow augers are used where soils are unstable.

2.2 Soil Bore Sampling Procedure

Soil samples are collected continuously from the auger flights during advancement of the borehole. At one metre intervals below ground level, split spoon samplers are used to collect in-situ samples (where site conditions allow) for field screening and (where required) analytical testing. Two subsamples are collected at each interval. One subsample is collected in a VOC 'headspace' jar for subsequent field screening. The headspace jar is half-filled with soil and sealed with aluminium foil. The remaining sample is sealed in a glass jar supplied by the analytical laboratory and stored on ice for later analytical testing (if required). Samples submitted for analytical testing are stored and transported on ice in a cooler. Sample transport follows Chain-of-Custody documentation and procedures.

Split spoon samplers are decontaminated between samples. All drilling equipment is decontaminated between boreholes.

2.3 Excavation Sampling & Validation Procedure

In validating a one-tank excavation, one soil sample is collected from the excavation floor and from each wall and submitted for laboratory analysis. Where there are significant variations in lithology within an excavation wall, additional screening samples will be collected from different soil types and the sample returning the highest screening result submitted for laboratory analysis. For multiple-tank excavations, the number of samples obtained will be increased to give a sampling density similar to that used to validate a single-tank excavation. In general from excavation floors, one sample per tank or one sample per 30 kL of tank, whichever is greater, should be taken. For excavation pit walls, one sample should be taken for every 10 metre long by 4 metre deep wall section. Additional screening samples should always be taken where there is any doubt as to the integrity of excavation soils.

For other excavation works the following minimum number of samples will be collected:

Location	Number of Samples
Bowser/pump island	One per island area, screening one per bowser
Fuel transfer lines	One per line, screening one per 5 metre length of line
Tank vent points/lines	One per vent group, screening one per 5 metre length of line
Triple Interceptor Trap	One per trap, screening one per wall and one from pit floor
Stockpiled soils	One per 50m ³ , screening one per 25m ³
Imported backfill materials	One per 100m ³

Client works specifications will override the sample density guidelines stated above. All validation sample will be collected using decontaminated soil sampling equipment with duplicate samples obtained for field screening as detailed below.

2.4 Field Screening Procedure

Soil samples collected for 'headspace' VOC field screening are allowed to reach equilibrium with the headspace in the half-filled sample jar or bag for approximately 10 minutes after the sample is collected. The aluminium septum is then punctured with the tip of the PID and the maximum VOC reading recorded. The PID is calibrated as described above in section 1.1 and all VOC results expressed as VOC Isobutylene Equivalent Concentration in ppm.

Based on the results of field screening and the soil strata, up to three soil samples per boring are submitted for analytical testing.

The sample with the highest headspace reading and the deepest sample in the borehole are normally included in this selection.

3. Groundwater Monitor Well Installation and Sampling

When groundwater is encountered in a borehole all drilling activity ceases to allow monitoring of the water level. Once the water level in the well appears to have reached equilibrium the borehole is advanced to a depth approximately two metres below the stabilised water level.

After reviewing soil strata encountered in the borehole and the estimated depth groundwater was encountered, the monitor well is assembled at the borehole site. Well casing and screen is decontaminated. The appropriate length of well screen and casing is joined and lowered into the borehole. A sand pack is then placed around the screen to a depth approximately 200mm above the top of the screen. Bentonite pellets/granules are then placed above the sand pack (approximately 200mm) and the remainder of the borehole is grouted with a cement/bentonite slurry to ground surface. A locking well cap is used to seal the well and a metal flush mount cover or protective monument installed to protect the well from traffic and/or weather.

3.1 Monitor Well Development

Once the groundwater monitor well has been installed and well materials allowed to settle and cure, the well is developed. Groundwater is bailed or pumped from the well until all fine grained material is removed, or five well volumes have been removed. Water parameters of pH, EC, temperature are measured for each well volume. The groundwater is then left to stabilise for approximately seven days prior to sampling.

3.2 Groundwater Sampling

Prior to sampling, the standing water level in each well is measured and the elevation of monitor wells surveyed relative to a common height datum. Three to five well volumes are removed from the well prior to collection of the sample. The water parameters pH, temperature and EC are measured to verify groundwater in the well is representative of formation water. The well is then left to equilibrate and a bailed sample is obtained using a disposable, Teflon or stainless steel bailer. Samples are then poured into laboratory prepared containers with the appropriate preservatives for the analytes being tested. For each sample event a minimum of one blind duplicate and field equipment blank samples are collected and submitted for analysis.

4. Quality Assurance/Quality Control (QA/QC)

Results of analytical testing provide the basis for an Environmental Site Assessment Report. To establish the integrity and reliability of analytical results QA/QC procedures have been developed and implemented. QA/QC procedures are followed at all levels of sample analysis from collection in the field by PPK personnel to analysis in the laboratory by the nominated Laboratory.

4.1 Field QA/QC

For service station and related sites, PPK's Field QA/QC procedures follow the guidelines outlined in Australian Standard Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile Compounds (September, 1997), NSW EPA Guidelines for Assessing Service Station Sites (December, 1994) Queensland DoE Guidelines for the Assessment of Contaminated Land (January, 1992) and PPK Protocols for Planning and Implementation of Environmental Site Assessments (December, 1995). However, in conjunction with analytical laboratories, PPK have not been able to develop a methodology for quantifying loss of volatile compounds during sample collection, storage, and transport. Where site conditions allow, soil and water samples are collected to preserve in situ conditions and minimise loss of analytes (especially volatile compounds) from the sample. In addition to following the above documents, PPK use field QA/QC methods approved by NSW EPA (EPA ref. CH3438 and CH1237/3471).

4.2 Laboratory QA/QC

Analytical laboratories conduct QA/QC checks as part of their laboratory processing of the sample batches. Normal minimum QA/QC includes sample matrix spikes, spike duplicates and recoverability checks at a minimum of 10 % of samples. All laboratories contracted by PPK are required to use NATA endorsed analytical methodologies for all analysis. Analytical laboratories are also required to follow NSW EPA recommended extraction and quantification for analytes as specified in NSW EPA (1994).

4.3 Soil Sampling Quality Control

Soil samples are collected at approximately one metre intervals during advancement of a borehole. Auger cuttings are continually monitored for changes in soil strata. Where soil conditions allow, samples for analytical testing are collected using a split spoon sampler. This enables collection of relatively undisturbed soil samples. Where soil conditions prevent sampling using split spoon samplers, samples are collected directly from the auger flights. When this occurs, the driller is directed to clear the auger flights and the borehole of soil cuttings and then "screw" the augers approximately 200 mm into the undisturbed strata at the base of the borehole. The augers are then removed from the borehole and the sample collected.

From the soil sample collected using the split spoon sampler or augers, a subsample is selected and placed in a 250 ml glass jar. To minimise loss of a volatile analytes, samples are compacted in the jar to minimise headspace (ie. filled completely) and the jar sealed with a Teflon lined plastic cap. Contaminant migration in soil, naturally disperses via preferred pathways and when collecting samples for analysis, all care is taken to ensure it is representative of the soil stratum from which it was collected. However, any soil sample is at most a relatively small, discrete, representative of a medium which is vertically and areally heterogeneous.

When the 250 ml glass jar containing the sample is submitted to analytical laboratories for testing the jar is opened and the top 1 to 2 cm of the sample removed and discarded. Up to 10 g of the remaining sample is then collected for each test to be performed. These subsamples are collected using soil corers which extract an undisturbed sample. Discussions with various analytical laboratories indicated that all practical care is taken to ensure the subsamples removed for extraction² and analysis is representative of the media in the sample container.

In summary, all soil analytical results are assumed representative of the soil stratum from which the sample was extracted in a particular borehole. In reality, these results reflect analyte concentrations in a 10 g subsample of the collected sample. All care is taken by PPK and the analytical laboratories to ensure that the final 10 g sample reflects in situ conditions in the greater soil stratum. However, it must be noted that soil strata is rarely vertically or areally homogeneous in both physical and chemical properties. The analytical results and the inferences derived from these data, therefore are 'filtered' by the skill of the site supervisor and the project team to derive interpretations on the site conditions.

²

'Extraction' refers to laboratory methods used to remove the subject analyte from the sample matrix for quantification. Extraction methods vary for different analytes (eg. solvent extraction for some organic compounds and acid digestion for some metal analytes).

5. References

1. NSW EPA, December 1994, Guidelines for Assessing Service Station Sites.
2. PPK Pty Ltd, December 1995, Protocols for Planning and Implementation of Environmental Site Assessments.
3. Standards Australia, September 1997, Guide to the Sampling and Investigation of Potentially Contaminated Soil. Part 1: Non-volatile and Semi-volatile Compounds. AS4482.1-1997.
4. Queensland Department of Environment³, January 1992, Guidelines for the Assessment of Contaminated Land.

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³ Originally prepared by the Chem Unit Bureau of Emergency Services

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Appendix C
Test Pit Lithology Logs

BORE LOG DETAILS

PID READING	SAMPLE ID	LOG	LITHOLOGY	COMMENTS
				<p>Lithology</p> <ul style="list-style-type: none"> CL- Inorganic Clays CH- Inorganic Clays high plasticity GC- Clayey Gravels GP- Poorly Graded Gravels SW- Well Graded Sands ML- Inorganic Silts SM- Silty Sand SP- Gravelly Sands SC- Clayey sands GW- Well graded gravel OH- Organic Clays OL- Organic Silts GM- Silty gravel Rock Fill concrete Asphalt No Return <p>Well Construction</p> <ul style="list-style-type: none"> Concrete Cuttings Bentonite Gravel Gravel Pack Gatic Cover Sand Bentonite/Cement <p>Casing Construction</p> <ul style="list-style-type: none"> Class 18 acid washed PVC blank. Class 18 acid washed PVC screen.

GENERAL INFORMATION

Location: New Farm Powerhouse

Date Excavated: 28/9/98

Sampled By: CAT

Equipment Used: Backhoe

Cross Section TP1

Date 5/2/1998

Author eph

Project 046102a

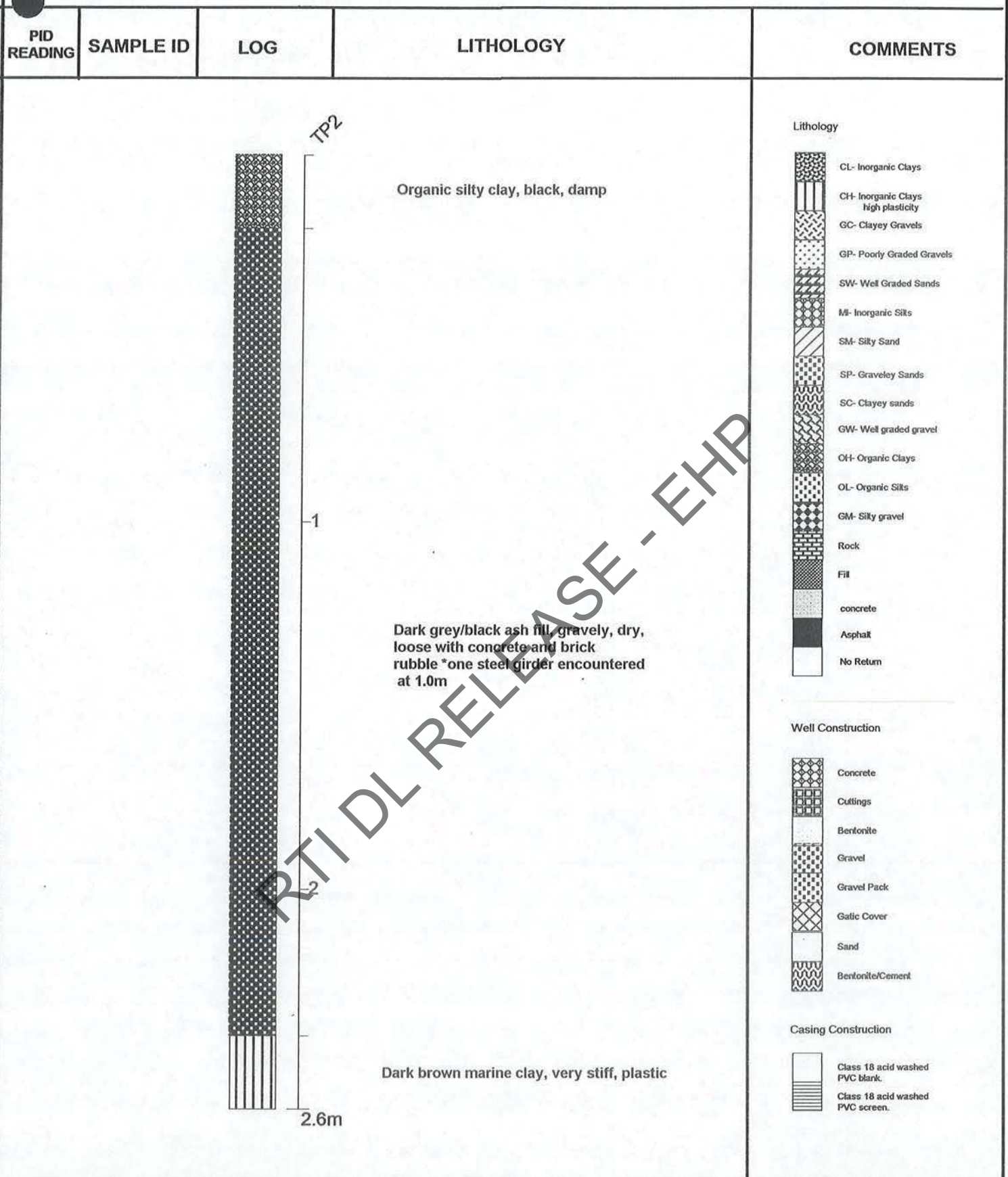
Drawing 1

Office Brisbane

PPK
Environment & Infrastructure

File 006.vor

TEST PIT DETAILS



GENERAL INFORMATION

Location: New Farm Powerhouse

Date Excavated: 28/9/98

Sampled By: CAT

Equipment Used: Backhoe

RTI 13-106

Collection 17

Cross Section TP2

Date 5/2/1998	
Author egh	
Project 84x102a	
Drawing 2	
Office Brisbane	File Data vnr

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TEST PIT DETAILS

PID READING	SAMPLE ID	LOG	LITHOLOGY	COMMENTS
		 <p>TP3</p> <p>Organic silty clay, black, damp</p> <p>1</p> <p>Dark grey/black ash fill, gravelly, dry, loose with occasional concrete and brick rubble</p> <p>2</p> <p>Dark brown marine clay, very stiff, plastic</p> <p>2.5m</p>	<p>Lithology</p> <ul style="list-style-type: none"> CL- Inorganic Clays CH- Inorganic Clays high plasticity GC- Clayey Gravels GP- Poorly Graded Gravels SW- Well Graded Sands ML- Inorganic Silts SM- Silty Sand SP- Gravelly Sands SC- Clayey sands GW- Well graded gravel OH- Organic Clays OL- Organic Silts GM- Silty gravel Rock Fill concrete Asphalt No Return <p>Well Construction</p> <ul style="list-style-type: none"> Concrete Cuttings Bentonite Gravel Gravel Pack Gatic Cover Sand Bentonite/Cement <p>Casing Construction</p> <ul style="list-style-type: none"> Class 18 acid washed PVC blank. Class 18 acid washed PVC screen. 	

GENERAL INFORMATION

Location: New Farm Powerhouse

Date Excavated: 28/9/98

Sampled By: CAT

Equipment Used: Backhoe

RTI 13-106

Collection 17

Cross Section TP3

Date 5/2/1998	
Author eph	
Project 844102a	
Drawing 3	
Office Brisbane	File Date ver

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TEST PIT DETAILS

PID READING	SAMPLE ID	LOG	LITHOLOGY	COMMENTS
		 <p>TP4</p> <p>1</p> <p>2</p> <p>2.8m</p>	<p>Organic silty clay, black, damp</p> <p>White/grey sandy clay fill, moist, friable</p> <p>Dark grey/black ash fill, gravelly, dry, loose with occasional lumps of wood</p> <p>Dark brown marine clay, very stiff, plastic</p>	<p>Lithology</p>  <ul style="list-style-type: none"> CL- Inorganic Clays CH- Inorganic Clays high plasticity GC- Clayey Gravels GP- Poorly Graded Gravels SW- Well Graded Sands ML- Inorganic Silts SM- Silty Sand SP- Gravelly Sands SC- Clayey sands GW- Well graded gravel OH- Organic Clays OL- Organic Silts GM- Silty gravel Rock Fill concrete Asphalt No Return <p>Well Construction</p>  <ul style="list-style-type: none"> Concrete Cuttings Bentonite Gravel Gravel Pack Gastic Cover Sand Bentonite/Cement <p>Casing Construction</p>  <ul style="list-style-type: none"> Class 18 acid washed PVC blank. Class 18 acid washed PVC screen.

GENERAL INFORMATION

Location: New Farm Powerhouse

Date Excavated: 28/9/98

Sampled By: CAT

Equipment Used: Backhoe

RTI 13-106

Collection 17

Cross Section TP4

Date 5/2/99	
Author eph	
Project 84x109a	
Drawing 4	
Office Drawings	File Drawings

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Appendix D
Summary of Analytical Results

Laboratory Soil Analysis - Heavy Metals Leachability

Sample Location	Sample ID	Date Sampled	Depth (mBGL)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Lead Leachate
Test Pit 1	TP1;0.2	28/09/98	0.2	3.5	nd	4.9	34	81	nd	10	77	NT
Test Pit 1	TP1;1.7	28/09/98	1.7	7.4	nd	7.3	34	110	nd	10	240	NT
Test Pit 2	TP2;2.0	28/09/98	2	9.3	nd	14	59	420	0.89	16	630	NT
Test Pit 3	TP3;0.5	28/09/98	0.5	8.7	nd	11	37	260	0.25	16	98	NT
Test Pit 3	TP3;2.5	28/09/98	2.5	4.6	nd	12	32	71	0.27	14	90	0.03
Test Pit 4	TP4;1.0	28/09/98	1	7.1	nd	8.6	51	120	nd	23	140	NT
Test Pit 4	TP4;1.0D	28/09/98	1	6.1	nd	7.9	47	110	nd	21	140	NT
Test Pit 4	TP4;2.0	28/09/98	2	5.3	nd	8.5	46	97	nd	12	130	0.08
Queensland DEH				20	3	50	60	300	1	60	200	NC

Notes:

- All results in mg/kg except where otherwise specified
- N/A Denotes not applicable
- NC Indicates no current regulatory criteria for the analyte tested
- NT Indicates analyte not tested
- nd Indicates analyte concentration below laboratory limit of reporting
- Results in red indicate levels in excess of current DEH threshold criteria
- DEH Guidelines Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998

Laboratory Soil Analysis - PAH's

Sample Location	Sample ID	Date Sampled	Depth (mBGL)	NAP	ACY	ACE	FLU	PHE	ANT	FLA	PYR	BAA	CHR	BBF/ BKF	BAP	DBA	BGP	IPY	Total
Test Pit 1	TP1;0.2	28/09/98	0.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Test Pit 2	TP2;2.0	28/09/98	2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Test Pit 3	TP3;2.5	28/09/98	2.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Test Pit 4	TP4;1.0	28/09/98	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Queensland DEH				NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	NC

Notes:

- All results in mg/kg except where otherwise specified
- N/A Denotes not applicable
- NC Indicates no current regulatory criteria for the analyte tested
- NT Indicates analyte not tested
- nd Indicates analyte concentration below laboratory limit of reporting

- Results in red indicate levels in excess of current DEH threshold criteria

- DEH Guidelines Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998

NAP: Naphthalene

PHE: Phenanthrene

BAA: Benzo (a) anthracene

BAR: Benzo (a) pyrene

ANT: Anthracene

ACY: Acenaphthylene

CHR: Chrysene

DBA: Dibenzo (a,h) anthracene

FLA: Fluoranthrene

ACE: Acenaphthene

BBF: Benzo (b) fluoranthene

BGP: Benzo (g,h,i) perylene

PYR: Pyrene

FLU: Fluorene

BKF: Benzo (k) fluoranthene

IPY: Indeno (1,2,3 - cd) pyrene

Laboratory Soil Analysis - TPH, Phenols

Sample Location	Sample ID	Date Sampled	Depth (mBGL)	C6-C9	C10-C14	C15-C28	C29-C36	Total TPH	Total Phenols
Test Pit 1	TP1;0.2	28/09/98	0.2	nd	nd	nd	nd	nd	nd
Test Pit 2	TP2;2.0	28/09/98	2	nd	nd	nd	nd	nd	nd
Test Pit 3	TP3;0.5	28/09/98	0.5	nd	nd	nd	nd	nd	NT
Test Pit 4	TP4;1.0	28/09/98	1	nd	nd	180	nd	180	nd
Test Pit 4	TP4;1.0D*	28/09/98	1	nd	nd	190	nd	190	NT
Queensland DEH				100	100	1000	1000	1000	5

Notes:

- All results in mg/kg except where otherwise specified
- N/A Denotes not applicable
- NC Indicates no current regulatory criteria for the analyte tested
- NT Indicates analyte not tested
- nd Indicates analyte concentration below laboratory limit of reporting
- * Duplicate denotes duplicate sample of TP4;1.0
- Results in red indicate levels in excess of current DEH threshold criteria
- DEH Guidelines Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998

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Appendix E
Original Laboratory Reports

REPORT OF ANALYSIS

Client : PPK Environment and Infrastructure
348 Edward Street
Brisbane Qld 4000

Attention : Craig Thamm

Job Number : 84K109B New Farm Powerhouse

Sample Description : Soil

Date of Receipt : 29 September 1998

Samples submitted to AGAL on the above date have been analysed as received.

Methods used :	TPH	AGAL(QLD)	Method QLM 2.04
	PAH	AGAL(QLD)	Method QLM 2.06
	Phenols	AGAL(QLD)	Method QLM 2.08
	Trace Elements	AGAL(NSW)	Method NT2_49

Quality Assurance :

The following QA procedures were included in the analyses :

- Analysis of reagent blanks.
- Analysis of recoveries.
- Analysis of samples in duplicate.

Results obtained for recoveries of selected analytes were as follows:

<u>Analyte</u>	<u>Soil</u>
TPH	98%
Benzo[a]pyrene	101%
Pentachlorophenol	90%

Results of Analysis:

Analytical results appear in tabular form on the following pages.

sch4p4(6) Personal information

9/11/98

Signed :

sch4p4(6) Personal information

Andrew Bradbury
Operations Manager

Date : 7 October 1998


National Association of Testing Authorities, Australia
NATA Endorsed Test Report
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Organics results

Client Reference No: Lab Registration No:	LOR mg/kg	TP1;0.2 N98/2583	TP2;2.0 N98/2584	TP3;0.5 N98/2585
Petroleum Hydrocarbons:				
C ₆ -C ₉	25	<LOR	<LOR	<LOR
C ₁₀ -C ₁₄	50	<LOR	<LOR	<LOR
C ₁₅ -C ₂₈	100	<LOR	<LOR	<LOR
C ₂₉ -C ₃₆	100	<LOR	<LOR	<LOR
Polyaromatic Hydrocarbons:				
Naphthalene	1.0	<LOR	<LOR	NT
Acenaphthylene	1.0	<LOR	<LOR	NT
Acenaphthene	1.0	<LOR	<LOR	NT
Fluorene	1.0	<LOR	<LOR	NT
Phenanthrene	1.0	<LOR	<LOR	NT
Anthracene	1.0	<LOR	<LOR	NT
Fluoranthene	1.0	<LOR	<LOR	NT
Pyrene	1.0	<LOR	<LOR	NT
Benzo[a]anthracene	1.0	<LOR	<LOR	NT
Chrysene	1.0	<LOR	<LOR	NT
Benzo[b] & [k]fluoranthene	2.0	<LOR	<LOR	NT
Benzo[a]pyrene	1.0	<LOR	<LOR	NT
Indeno[1,2,3-cd]pyrene	1.0	<LOR	<LOR	NT
Dibenz[ah]anthracene	1.0	<LOR	<LOR	NT
Benzo[ghi]perylene	1.0	<LOR	<LOR	NT
Phenols:				
Phenol	1.0	<LOR	<LOR	NT
2-Chlorophenol	1.0	<LOR	<LOR	NT
2-Methylphenol	1.0	<LOR	<LOR	NT
3+4-Methylphenols	1.0	<LOR	<LOR	NT
2-Nitrophenol	1.0	<LOR	<LOR	NT
2,4-Dimethylphenol	1.0	<LOR	<LOR	NT
2,4-Dichlorophenol	1.0	<LOR	<LOR	NT
2,6-Dichlorophenol	1.0	<LOR	<LOR	NT
4-Chloro-3-methylphenol	1.0	<LOR	<LOR	NT
2,4,6-Trichlorophenol	1.0	<LOR	<LOR	NT
2,3,6-Trichlorophenol	1.0	<LOR	<LOR	NT
2,3,4,6-Tetrachlorophenol	2.0	<LOR	<LOR	NT
2,3,5,6-Tetrachlorophenol	2.0	<LOR	<LOR	NT
Pentachlorophenol	2.0	<LOR	<LOR	NT

LOR = Limit of reporting

Above results are expressed in mg/kg on a dry weight basis.

NT = Not tested.

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AUSTRALIAN GOVERNMENT ANALYTICAL LABORATORIES

Brisbane Laboratory
NATA accredited

cnr. Wynnum & Creek Roads Cannon Hill QLD 4170

PO Box 3312 Tingalpa DC QLD 4173

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DIST

Department of
Industry, Science
& Technology

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Organics results (cont'd)

Client Reference No: Lab Registration No:	LOR mg/kg	TP4;1.0 N98/2586	TP4;1.0 (duplicate)	TP4;1.0D N98/2587
Petroleum Hydrocarbons:				
C ₆ -C ₉	25	<LOR	<LOR	<LOR
C ₁₀ -C ₁₄	50	<LOR	<LOR	<LOR
C ₁₅ -C ₂₈	100	180	180	190
C ₂₉ -C ₃₆	100	<LOR	<LOR	<LOR
Polyaromatic Hydrocarbons:				
Naphthalene	1.0	<LOR	<LOR	NT
Acenaphthylene	1.0	<LOR	<LOR	NT
Acenaphthene	1.0	<LOR	<LOR	NT
Fluorene	1.0	<LOR	<LOR	NT
Phenanthrene	1.0	<LOR	<LOR	NT
Anthracene	1.0	<LOR	<LOR	NT
Fluoranthene	1.0	<LOR	<LOR	NT
Pyrene	1.0	<LOR	<LOR	NT
Benzo[a]anthracene	1.0	<LOR	<LOR	NT
Chrysene	1.0	<LOR	<LOR	NT
Benzo[b] & [k]fluoranthene	2.0	<LOR	<LOR	NT
Benzo[a]pyrene	1.0	<LOR	<LOR	NT
Indeno[1,2,3-cd]pyrene	1.0	<LOR	<LOR	NT
Dibenz[ah]anthracene	1.0	<LOR	<LOR	NT
Benzo[ghi]perylene	1.0	<LOR	<LOR	NT
Phenols:				
Phenol	1.0	<LOR	<LOR	NT
2-Chlorophenol	1.0	<LOR	<LOR	NT
2-Methylphenol	1.0	<LOR	<LOR	NT
3+4-Methylphenols	1.0	<LOR	<LOR	NT
2-Nitrophenol	1.0	<LOR	<LOR	NT
2,4-Dimethylphenol	1.0	<LOR	<LOR	NT
2,4-Dichlorophenol	1.0	<LOR	<LOR	NT
2,6-Dichlorophenol	1.0	<LOR	<LOR	NT
4-Chloro-3-methylphenol	1.0	<LOR	<LOR	NT
2,4,6-Trichlorophenol	1.0	<LOR	<LOR	NT
2,3,6-Trichlorophenol	1.0	<LOR	<LOR	NT
2,3,4,6-Tetrachlorophenol	2.0	<LOR	<LOR	NT
2,3,5,6-Tetrachlorophenol	2.0	<LOR	<LOR	NT
Pentachlorophenol	2.0	<LOR	<LOR	NT

LOR = Limit of reporting

Above results are expressed in mg/kg on a dry weight basis.

NT = Not tested.

c:\docs\report98\RustPPK/pk982583.doc

The following analysis was performed by AGAL NSW.

1 Suakin Street

PYMBLE NSW 2073

NATA ACCREDITATION NUMBER: 198

Report Number: RN067302

Trace Elements results

Client Reference No: Lab Registration No:	Units	TP1;0.2 N98/2583	TP2;2.0 N98/2584	TP3;0.5 N98/2585
Trace Elements:				
Arsenic	mg/kg	3.5	9.3	8.7
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	4.9	14	11
Copper	mg/kg	34	59	37
Lead	mg/kg	81	420	260
Mercury	mg/kg	<0.2	0.89	0.25
Nickel	mg/kg	10	16	16
Zinc	mg/kg	77	630	98
Total Solids	%	82.6	86.1	92.5

Client Reference No: Lab Registration No:	Units	TP4;1.0 N98/2586	TP4;1.0D N98/2587
Trace Elements:			
Arsenic	mg/kg	7.1	6.1
Cadmium	mg/kg	<0.5	<0.5
Chromium	mg/kg	8.6	7.9
Copper	mg/kg	51	47
Lead	mg/kg	120	110
Mercury	mg/kg	<0.2	<0.2
Nickel	mg/kg	23	21
Zinc	mg/kg	140	140
Total Solids	%	86.1	88.4

All results are expressed on a dry weight basis.

Samples analysed as received.

This report shall not be reproduced except in full.

c:\docs\report198\RustPPK/pk982583.doc

REPORT OF ANALYSIS

Client : PPK Environment and Infrastructure
348 Edward Street
Brisbane Qld 4000

Attention : Craig Thamm

Job Number : 84K109B New Farm Powerhouse

Sample Description : Soil

Date of Receipt : 8 October 1998

Samples submitted to AGAL on the above date have been analysed as received.

Methods used : TPH AGAL(NSW) Method NGCMS_1121, 1112
Trace Elements AGAL(NSW) Method NT2_49, 2_47

Quality Assurance :

The following QA procedures were included in the analyses :

- Analysis of reagent blanks.
- Analysis of recoveries.
- Analysis of samples in duplicate.

Results of Analysis:

Analytical results appear in tabular form on the following pages.

sch4p4(6) Personal Information

4/11/98

sch4p4(6) Personal information

Signed :

Andrew Bradbury
Operations Manager

Date : 15 October 1998



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The following analysis was performed by AGAL NSW.

1 Suakin Street
PYMBLE NSW 2073

NATA ACCREDITATION NUMBER: 198

Report Number: RN068371, RN068331, RN068431, RN068477

Trace Elements results

Client Reference No: Lab Registration No:	Units	TP1;1.7 N98/2768	TP3;2.5 N98/2769	TP4;2.0 N98/2770
Trace Elements:				
Arsenic	mg/kg	7.4	4.6	5.3
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	7.3	12	8.5
Copper	mg/kg	34	32	46
Lead	mg/kg	110	71	97
Mercury	mg/kg	<0.2	0.27	<0.2
Nickel	mg/kg	10	14	12
Zinc	mg/kg	240	90	130
Total Solids	%	81.6	85.6	84.3

Above results are expressed on a dry weight basis.

Leachate results

Client Reference No: Lab Registration No:	Units	TP3;2.5 N98/2769	TP4;2.0 N98/2771
Trace Elements:			
Lead	mg/L	0.03	0.08

100g of sample was leached for 18 hours with 2000mL buffer at pH 4.93 and the leachate tested for the above metals.

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Organics results

Client Reference No:	Units	TP3;2.5
Lab Registration No:		N98/2769
Petroleum Hydrocarbons:		
C ₆ -C ₉	mg/kg	<25
C ₁₀ -C ₁₄	mg/kg	<50
C ₁₅ -C ₂₈	mg/kg	<100
C ₂₉ -C ₃₆	mg/kg	<100

Above results are expressed on a dry weight basis.
Samples analysed as received.
This report shall not be reproduced except in full.

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AUSTRALIAN GOVERNMENT ANALYTICAL LABORATORIES

Brisbane Laboratory cnr. Wynnum & Creek Roads Cannon Hill QLD 4170 PO Box 3312 Tingalpa DC QLD 4173
NATA accredited TELEPHONE (07) 3214 2161 FACSIMILE (07) 3214 2166

DIST
Department of
Industry, Science
Technology

Page 65

Release

Certificate of Analysis

CLIENT: Brisbane City Council
JOB NO: 84K109A
SAMPLED BY: As Received
DATE RECEIVED: 30/09/98
CONTACT: Mr W Francis
LOCATION: Newfarm Powerhouse
TEST METHOD: Qualitative identification of asbestos types in bulk samples at PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M001	TP1;1.0	Soil	N/A	NAD
M002	TP2;1.0	Soil	N/A	NAD
M003	TP3;0.5	Soil	N/A	NAD
M004	TP4;0.5	Soil	N/A	NAD

sch4p4(6) Personal information

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected

sch4p4(6) Personal information

Approved Identifier

sch4p4(6) Personal information

Approved Signatory

AUTHORISATION DATE

1/10/98

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 1 of 1



Record of Samples Collected

Client: BCC

Job Location: NEW PAM POWERHOUSE

Job No.: 84210913

Date Delivered to Laboratory: 30/2/98

Date:

Inspector:

Signature:

Sample No.	Location	Test Pit	1, 1.0m Blk
TP1; 1.0	New farm powerhouse	"	2, 1.0m Blk
TP2; 1.0	"	"	3, 0.5m Blk
TP3; 0.5	"	"	4, 0.5m Blk
TP4; 0.5	"	"	

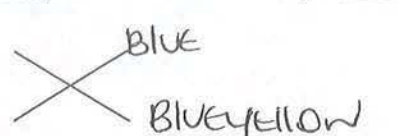
Fibre Identification Analysis

Client: <u>Brisbane City Council</u>				Job No: <u>84K109B</u>				
Lab Sample No: <u>M001</u>				Sample Disintegration Required Yes/No				
Client ID: <u>TP151.0</u>				If yes state method <u>sta</u>				
Sample Description: <u>Soil</u>				Mass/Dimension: <u>NA</u> cm x <u>NA</u> cm				
Stereo Microscope Examination								
		Morphology		Homogenous		Non-Homogenous		
A	<u>brown wavy fibres</u>			<u>✓</u>				
B								
C								
Polarised Light Microscopy								
Optical Orientation - (Cross polarised light)								
A	<u>1.550</u>		B	<u> </u>		C	<u> </u>	
		<u>BLUE</u>						
		<u>BLUE/YELLOW</u>						
Extinction Angle - (1st Order Red Out)				Pleochroism - (Plain Polarised Light)				
Parallel		Inclined		None		Strong		
Weak		None						
A	<u>✓</u>					A	<u>✓</u>	
B						B		
C						C		
Dispersion Staining Colours								
RI Oil <u>1.550</u>		RI Oil		RI Oil		RI Oil		
A		B		C				
<u>+</u> <u>Gold</u>		<u>+</u>		<u>+</u>				
<u>Gold</u>								
Trace Analysis				RI Oil				
Yes ☐ No ☒				RI Oil				
				RI Oil				
				RI Oil				
Slide				No Fibres				
1								
2								
3								
Fibres Present								
Chrys		Amos		Croc		UMF		
SMF		Organic Fibre		None				
A							<u>✓</u>	
B								
C								
Further Analysis								
SEM/EDAX Yes ☐ No ☒				XRD Yes ☐ No ☒				
Conclusion				Date: <u>1 / 10 / 98</u>				
<u>NO. Asbestos Detected</u>				Analyst: <u>sch4p4(6) Personal information</u>				
				Checked: <u>sch4p4(6) Personal information</u>				

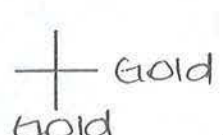
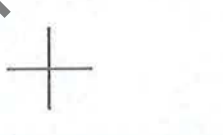
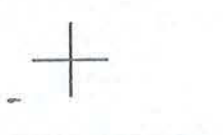
Fibre Identification Analysis

Client: <u>Brisbane City Council</u>		Job No: <u>84K109B</u>	
Lab Sample No: <u>M002</u>		Sample Disintegration Required Yes/No	
Client ID: <u>TP2 ; 1.0</u>		If yes state method	
Sample Description: <u>Soil</u>		Mass/Dimension: <u>2a cm x cm</u>	

Stereo Microscope Examination			
Morphology		Homogenous	Non-Homogenous
A	<u>brown wavy fibres</u>	✓	
B			
C			

Polarised Light Microscopy			
Optical Orientation - (Cross polarised light)			
A	<u>1.550</u>	B	
			

Extinction Angle - (1st Order Red Out)			Pleochroism - (Plain Polarised Light)		
Parallel	Inclined	None	Strong	Weak	None
A	✓		A	✓	
B			B		
C			C		

Dispersion Staining Colours		
RI Oil <u>1.550</u>	RI Oil	RI Oil
A	B	C
		

Trace Analysis		RI Oil	RI Oil	RI Oil
Yes ☐	No ☒	No Fibres	No Fibres	No Fibres
		Slide		
		1		
		2		
		3		

Fibres Present							
Chrys	Amos	Croc	UMF	SMF	Organic Fibre	None	
A					✓		
B							
C							

Further Analysis	
SEM/EDAX Yes ☐ No ☒	XRD Yes ☐ No ☒
Conclusion: <u>No Asbestos Detected</u>	
Date: <u>1 / 10 / 98</u> Analyst: <u>sch4p4(6) Personal information</u> Checked:	

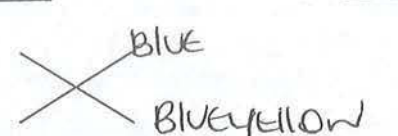
Fibre Identification Analysis

Client: <u>Brisbane City Council</u>		Job No: <u>84K109B</u>	
Lab Sample No: <u>MON3</u>		Sample Disintegration Required Yes/No	
Client ID: <u>TP3; 0.5</u>		If yes state method	
Sample Description: <u>Soil</u>		Mass/Dimension: <u>Na . cm x cm</u>	
Stereo Microscope Examination			
Morphology		Homogenous	Non-Homogenous
A	<u>brown wavy fibres</u>	☒	
B			
C			
Polarised Light Microscopy			
Optical Orientation - (Cross polarised light)			
A	<u>1.550</u>	B	
Extinction Angle - (1st Order Red Out)		Pleochroism - (Plain Polarised Light)	
Parallel Inclined None		Strong Weak None	
A	☒	A	☒
B		B	
C		C	
Dispersion Staining Colours			
RI Oil <u>1.550</u>	RI Oil	RI Oil	
A	B	C	
Trace Analysis			
Yes ☐ No ☒	RI Oil	RI Oil	RI Oil
	No Fibres	No Fibres	No Fibres
Slide			
1			
2			
3			
Fibres Present			
Chrys	Amos	Croc	UMF SMF Organic Fibre None
A			☒
B			
C			
Further Analysis			
SEM/EDAX	Yes ☐ No ☒	XRD	Yes ☐ No ☒
Conclusion		Date: <u>1 / 10 / 98</u>	
<u>No. Asbestos Detected</u>		Analyst: <u>sch4p4(6) Personal information</u>	
		Checked:	

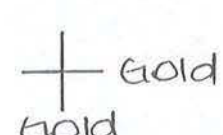
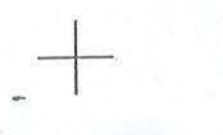
Fibre Identification Analysis

Client: <u>Brisbane City Council</u>		Job No: <u>84K109B</u>	
Lab Sample No: <u>M004</u>		Sample Disintegration Required Yes/No	
Client ID: <u>TP4J0.5</u>		If yes state method	
Sample Description: <u>Soil</u>		Mass/Dimension: <u>n/a</u> <u>cm x</u> <u>cm</u>	

Stereo Microscope Examination			
Morphology		Homogenous	Non-Homogenous
A	<u>brown wavy fibres</u>	✓	
B			
C			

Polarised Light Microscopy			
Optical Orientation - (Cross polarised light)			
A	<u>1.550</u>	B	
			

Extinction Angle - (1st Order Red Out)			Pleochroism - (Plain Polarised Light)		
Parallel	Inclined	None	Strong	Weak	None
A	✓		A	✓	
B			B		
C			C		

Dispersion Staining Colours		
RI Oil <u>1.550</u>	RI Oil	RI Oil
A	B	C
		

Trace Analysis		RI Oil		RI Oil		RI Oil	
Yes ☐	No ☒	Slide	No Fibres	No Fibres	No Fibres	No Fibres	No Fibres
		1					
		2					
		3					

Fibres Present							
Chrys	Amos	Croc	UMF	SMF	Organic Fibre	None	
A					✓		
B							
C							

Further Analysis	
SEM/EDAX Yes ☐ No ☒	XRD Yes ☐ No ☒

Conclusion		Date: <u>1. / 10 / 98</u>
NO. <u>Asbestos Detected</u>		Analyst: <u>sch4p4(6) Personal Information</u>
		Checked: <u></u>

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Appendix F
Statement of Limitations

LIMITATIONS OF ENVIRONMENTAL SITE ASSESSMENT REPORT
(Testing and/or monitoring undertaken)

Scope of Services

This environmental site assessment report ("the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and PPK ("scope of services"). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the report, PPK has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, PPK has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. PPK will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to PPK.

Environmental Conclusions

In accordance with the scope of services, PPK has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

LIMITATIONS OF ENVIRONMENTAL SITE ASSESSMENT REPORT
(Testing and/or monitoring undertaken)

Report for Benefit of Client

The report has been prepared for the benefit of the Client and no other party. PPK assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of PPK or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

PPK will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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Facsimile Cover Sheet

PPK
Environment & Infrastructure

Organisation: Brisbane City Council - City Business Division
Attention: Robin Eyears
Fax No: 3403 7808
From: Alan Barker
Date: 04/08/98 No of Pages (incl cover): 2
Our Reference: 84J248A\fx003aab
Re: **Analytical Results - New Farm Power Station Coal Bunker**

Dear Robin,

Further to the excavation of material from the coal bunker at the New Farm Power Station site, the results of the analysis of debris material collected from the fill in the bunker are now available. Please find following a summary of our findings and recommendations for the removal of the material.

- The coal bunker was filled with fill material consisting of predominantly bricks, steel and rubble from the abandoned coal handling infrastructure. Sampling was limited to the soil material and ash layer in the top 1 m of the fill as there was negligible soil present below this level (the deeper fill material consisting primarily of steel and brick) to allow samples to be obtained.
- Loose friable and fibrous debris was identified amongst the general rubble within the bunker. Similar material was identified in the stockpile as it was formed to the side of the bunker.

The samples of fibrous material were analysed for the presence of asbestos using polarised light microscopy in conjunction with dispersion staining techniques. The results are as follows :

Sample 01

Description : Fibrous debris in bunker

Result : Chrysotile (white) and Amosite (brown) asbestos detected

Sample 02

Description : Fibrous debris in stockpile

Result : Chrysotile and Amosite asbestos detected

ACN 078 004 798
A NATA Certified Company

PPK Environment &
Infrastructure Pty Ltd
12th Floor, IBM Centre
348 Edward Street
Brisbane Qld 4000
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GPO Box 2907
Brisbane Qld 4001
Australia

Tel: + 61 7 3218 2222

Fax: + 61 7 3831 4223

Email: ppkbris@ozemail.com.au

Environment & Infrastructure Services

- Planning, investigation, design, project management;
- Operational & maintenance;
- Outsourcing & partnering;
- Financing & equity participation

Industry Sectors:

- Mining & Resources
- Transport
- Urban Development & Building
- Water & Wastewater

Please phone this office if any part of this transmission failed or was misdirected

On the basis of the results obtained from the samples of debris, and based upon observations made during the excavation of fill material, it would appear loose asbestos debris is distributed throughout the bunker fill material. Our recommendations are as follows :

Removal of the rubble material and disposal to a suitably licensed landfill as asbestos contaminated waste. This should be performed under the following controlled conditions :

- Waste material / debris to be wet down prior to disturbance to suppress airborne dust;
- Trucks / bins used to transport material to be lined with 200 μ m plastic sheeting;
- Work to be performed by a suitably qualified and (class 5) licensed asbestos removalist;
- Asbestos fibre air monitoring to be performed during the removal works;
- Visual clearance inspection to be performed by an independent occupational hygienist to ensure the clean up has been performed adequately.

I trust this is satisfactory for your current needs and if you have any further queries, please do not hesitate to contact our office.

Yours sincerely,

sch4p4(6) Personal information

Alan Barker
Environmental Scientist

cc John Flavel, McMahon Services - fax : 3216 0670

RTI DL RELEASE - EHP

Facsimile Cover Sheet

PPK
Environment & Infrastructure

Organisation: McMahon Services

Attention: John Flavel

Fax No: 3216 0670

From: Steve Robertson

Date: 30/7/98

No of Pages (incl cover): 316

Our Reference: 84J248A\fx001asr

Re: **Analytical Results - New Farm Power Station
Coal Bunker**

John,

Further to the excavation of material from the coal bunker at the New Farm Power Station site, please find following a summary of our findings and recommendations for the removal of the material. The excavation was made on Thursday 16/7/98.

- The coal bunker was filled with fill material consisting of predominantly bricks, steel and rubble from the abandoned coal handling infrastructure. Sampling was limited to the soil material and ash layer in the top 1 m of the fill as there was negligible soil present below this level (the deeper fill material consisting primarily of steel and brick) to allow samples to be obtained.
- A thin layer of boiler ash was present in the coal bunker and a sample of this material was submitted for analysis of Total Petroleum Hydrocarbons (TPH); benzene, toluene, ethyl benzene, xylenes (BTEX); polycyclic aromatic hydrocarbons (PAHs) and the selected heavy metals (As, Cd, Cr, Cu, Ni, Pb, Zn and Hg).
- Water ingress into the pit was noted and a sample of the water was taken for analysis of TPH, BTEX, PAH and the selected heavy metals.

The results of the laboratory testing indicated the following:

- A TPH (C₆-C₃₆) level of 3004 mg/kg was reported in the soil sample submitted for laboratory testing which exceeds the current Department of Environment and Heritage (DEH) guideline of 1000 mg/kg;
- BTEX was not reported in the soil sample analysed;
- Levels of the selected heavy metals in soil were below current DEH guidelines;
- PAHs were reported less than the laboratory limit of reporting in the soil sample analysed;
- A TPH (C₆-C₃₆) level of 10 800 µg/L was reported in the water sample obtained from the coal bunker pit. This is in excess of the current regulatory criteria.
- BTEX and PAH levels were reported less than the laboratory reporting limits for the water sample analysed; and
- Selected heavy metal levels exceeded current regulatory thresholds,

ACN 078 004 798

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PPK Environment &
Infrastructure Pty Ltd
12th Floor, IBM Centre
348 Edward Street
Brisbane Qld 4000

Postal Address:

GPO Box 2907
Brisbane Qld 4001
Australia

Tel: + 61 7 3218 2222

Fax: + 61 7 3831 4223

Email: ppkbris@ozemail.com.au

Environment & Infrastructure Services

- Planning, investigation, design, project management;
- Operational & maintenance;
- Outsourcing & partnering;
- Financing & equity participation

Industry Sectors:

- Mining & Resources
- Transport
- Urban Development & Building
- Water & Wastewater

Please phone this office if any part of this transmission failed or was misdirected

however, they are within current trade waste disposal guidelines (with the exception of mercury).

On the basis of the results obtained from the soil and water samples and based upon observations made during the excavation of fill material, the following recommendations for the removal of the fill material and impacted water may be made. Consultation with the DEH should be undertaken prior to the implementation of any options to ensure that regulatory requirements are met:

- Removal of the rubble material and disposal to a suitably licensed landfill. On-site landfarming and reinstatement of the material is not practicable due to the presence of long chain petroleum hydrocarbons (C₁₅-C₂₈) and a limit of space at the powerstation site.
- Where possible, effort should be made to separate potentially recyclable material (eg steel and bricks) for possible re-use and/or recycling.
- Water may be disposed of to sewer subject to the provisions of a trade waste permit. This is possible as the levels of contaminants reported in the water are lower than the trade waste guidelines issued by the Brisbane City Council (with the exception of mercury).

A summary of the analytical results compared to assessment criteria is presented in Tables 1 and 2 and a copy of the laboratory reports are attached for your information. I trust this is satisfactory for your current needs and if you have any further queries, please do not hesitate to contact the undersigned on 3218 2281.

Yours sincerely

sch4p4(6) Personal information

Steve Robertson
Environmental Engineer

cc Robin Eyears 3403 7808

Table 1A - Summary of Soil Analytical Results (TPH and BTEX)

Sample ID	Date Sampled	TPH C ₆ -C ₉	TPH C ₁₀ -C ₁₄	TPH C ₁₅ -C ₂₈	TPH C ₂₉ -C ₃₆	Total TPH	Benzene	Toluene	Ethyl benzene	Xylenes
CB1	16/7/98	nd	332	2116	555	3004	nd	nd	nd	nd
Queensland DEH		100	100	1000	1000	1000	1	NC	NC	NC

Notes: All values given in mg/kg on a dry weight basis
Results in bold indicate levels exceeding DEH criteria

Table 1B - Summary of Soil Analytical Results (Selected Heavy Metals)

Sample ID	Date Sampled	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury
CB1	16/7/98	6	nd	nd	24	4	18	43	0.45
Queensland DEH		20	3	50	60	60	300	200	1
Health Based Investigation		500	100	600,000	5000	3000	1500	35,000	75

Notes: All values given in mg/kg on a dry weight basis
Results in bold indicate levels exceeding DEH criteria

Table 1C - Summary of Soil Analytical Results (Polycyclic Aromatic Hydrocarbons)

Sample ID	Date Sampled	Depth (mBGL)	NAP	ACY	ACE	FLU	PHE	ANT	FLA	PYR	BAA	CHR	BB F	BKF	BAP	DBA	BGP	IPY	Total
CB1	16/7/98		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Queensland DEH			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	NC	20
*Health Based Investigation Levels			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	50

Notes: All values given in mg/kg on a dry weight basis
Results in bold indicate levels exceeding regulatory criteria
NC indicates no current regulatory criteria for the analyte tested
* Health based investigation levels for a commercial development scenario (Langley and Imray)

NAP Naphthalene
ANT Anthracene
FLA Fluoranthrene
PYR Pyrene

PHE Phenanthrene
ACY Acenaphthylene
ACE Acenaphthene
FLU Fluorene

BAA Benzo (a) anthracene
CHR Chrysene
BBF Benzo (b) fluoroanthene
BKF Benzo (k) fluoroanthene

BAP Benzo (a) pyrene
DBA Dibenzo (a,h) anthracene
BGP Benzo (g,h,i) perylene
IPY Indeno (1,2,3 - cd) pyrene

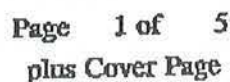
Table 2A - Summary of Water Analytical Results (TPH and BTEX)

Sample ID	Date Sampled	Total TPH	C6-C9	C10-C14	C15-C28	C29-C36	Benzene	Toluene	Ethyl Benzene	Xylenes
WS1	16/7/98	10 800	nd	nd	7010	3800	nd	nd	nd	nd
ANZECC Guidelines for the Protection of Aquatic Ecosystems		NC	NC	NC	NC	NC	300	300	NC	NC
Dutch Intervention Guidelines		NC	NC	600			30	1000	150	70

Table 2B - Summary of Water Analytical Results (Heavy Metals)

Sample ID	Date Sampled	Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Mercury
WS1	16/7/98	131	10	60	420	90	1990	3240	469
BCC Trade Waste		5000	2000	10 000	10 000	10 000	10 000	10 000	50
ANZECC Guidelines for the Protection of Aquatic Ecosystems		50	0.2-2	10	2-5	15-150	1-5	5-50	0.1
Dutch Intervention Guidelines		60	6	30	75	75	75	800	0.3

Notes: All values given in µg/L
Results in bold indicate levels exceeding regulatory criteria



Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified in Method Header
Leachates : mg/L (ppm) in leachate unless otherwise specified in Method Header



Job Number : 8E01275

Client : PPK Brisbane

Reference : 84J264A

Page 2 of 5
plus Cover Page

Analyte	Lab No	E49946
		CBI 0.5-
	Sample Id	0.6
	PQL	
E1110 PAH's in Soil		
Naphthalene	0.5	nd
Acenaphthylene	0.5	nd
Acenaphthene	0.5	nd
Fluorene	0.5	nd
Phenanthrene	0.5	nd
Anthracene	0.5	nd
Fluoranthene	0.5	nd
Pyrene	0.5	nd
Benzo(a)anthracene	0.5	nd
Chrysene	0.5	nd
Benzo(b) & (k)fluoranthene	1	nd
Benzo(a)pyrene	0.5	nd
Indeno(1,2,3-cd)pyrene	0.5	nd
Dibenz(a,h)anthracene	0.5	nd
Benzo(g,h,i)perylene	0.5	nd
Total PAH	-	nd
2-Fluorobiphenyl-SURROGATE	1	90%
Anthracene-d10-SURROGATE	1	87%
d14-Terphenyl-SURROGATE	1	91%

POL = Practical Quantitation Limit

LNR = Samples Listed not Received

 $\pi d = \langle \text{POL} \rangle$

— = Not Applicable

Soils : $\mu\text{g/kg}$ (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in
Method Header

Page 3 of 5
plus Cover Page

[illegible]

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

$$nd = \angle PQL$$

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in
Method Header



Job Number : 8E01275

Client : PPK Brisbane

Reference : 84J264A

Page 4 of 5
plus Cover Page

Analyte	Lab No	E49947				
	Sample Id	WS1				
	PQL					
E0220 TPH in Water (µg/L)						
Total C6-C36	-	10800				
C6-C9 Fraction	20	nd				
C10-C14 Fraction	20	nd				
C15-C28 Fraction	100	7010				
C29-C36 Fraction	100	3800				
E0010 BTEX (P&T) in Water (µg/L)						
Benzene	0.5	nd				
Toluene	1	nd				
Ethylbenzene	1	nd				
Total Xylenes	3	nd				
E4970 Total Recoverable Metals in Waters						
Arsenic	0.002	0.131				
Cadmium	0.0005	0.010				
Chromium	0.005	0.060				
Copper	0.005	0.420				
Nickel	0.005	0.090				
Lead	0.005	1.99				
Zinc	0.01	3.24				
E4950 Total Recoverable Mercury in Water						
Mercury	0.001	0.469				

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = <PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in
Method Header



Job Number : 8E01275

Client : PPK Brisbane

Reference : 84I264A

Page 5 of 5
plus Cover Page

Analyte	Lab No	E49947				
	Sample Id	WS1				
	PQL					
E0110 PAH's in Water (µg/L)						
Naphthalene	1	nd				
Acenaphthylene	1	nd				
Acenaphthene	1	nd				
Fluorene	1	nd				
Fluoranthene	1	nd				
Anthracene	1	nd				
Fluoranthene	1	nd				
Pyrene	1	nd				
Benzo(a)anthracene	1	nd				
Chrysene	1	nd				
Benzo(b) & (k)fluoranthene	2	nd				
Benzo(a)pyrene	1	nd				
Indeno(1,2,3-cd)pyrene	1	nd				
Dibenz(a,h)anthracene	1	nd				
Benzo(g,h,i)perylene	1	nd				
Total PAH		nd				
2-Fluorobiphenyl-SURROGATE	1	118%				
Anthracene-d10-SURROGATE	1	127%				
p-Terphenyl-D14-SURROGATE	1	130%				

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = <PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in Method Header

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Please fax back a signed copy when
samples are received at the laboratory.

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

ACN 001 491 667

Trading as Australian Analytical Laboratories Pty Ltd
5 Kelray Place

Correspondence to:

ASQUITH NSW 1630

P.O. Box 514

Telephone: (02) 9482 1922

HORNSBY NSW 1630

Facsimile: (02) 9482 1734

INVOICE NO. 00052332LX

PPK64

PPK Brisbane
348 Edward St
Brisbane

QLD

4000

Our Ref.
8E01275

Date
28/07/98

Attention : Mr Steve Robertson

Your Ref.
84J264A

Account Code : X002000X

Method	Description	Units	Unit Price	Total Amount
E1220	Total Petroleum Hydrocarbons	1	\$35.00	\$35.00
E1010	Benzene, Toluene, Ethylbenzene & Xylene	1	\$42.00	\$42.00
E1110	Polynuclear Aromatic Hydrocarbons	1	\$70.00	\$70.00
E5910	Metals by ICP-AES	1	\$40.00	\$40.00
E5950	Mercury in Soil	1	\$15.00	\$15.00
E0220	Total Petroleum Hydrocarbons	1	\$35.00	\$35.00
E0010	Benzene, Toluene, Ethylbenzene & Xylene	1	\$42.00	\$42.00
E0110	Polynuclear Aromatic Hydrocarbons	1	\$70.00	\$70.00
E4970	Total Metals by ICP-MS	1	\$50.00	\$50.00
E4950	Mercury	1	\$15.00	\$15.00
Terms strictly 30 days nett			TOTAL	\$414.00

Please send remittances to :-
Amdel Ltd
P.O. Box 338, Torrensville Plaza, S.A. 5031

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 8E01275
ATTENTION : Mr Steve Robertson
CLIENT : PPK Brisbane
SAMPLES : 2
REFERENCE : 84J264A
DATE RECEIVED : 17/07/98
DATE REPORTED : 24/07/98

<u>Method</u>	<u>Description</u>	<u>Extracted</u>	<u>Analysed</u>
E7500	Moisture (%w/w)	17/07/98	17/07/98
E1220	Total Petroleum Hydrocarbons	17/07/98	24/07/98
E1010	Benzene, Toluene, Ethylbenzene & Xylene	17/07/98	24/07/98
E1110	Polynuclear Aromatic Hydrocarbons	17/07/98	23/07/98
E5910	Metals by ICP-AES	17/07/98	21/07/98
E5950	Mercury in Soil	17/07/98	24/07/98
E0220	Total Petroleum Hydrocarbons	17/07/98	24/07/98
E0010	Benzene, Toluene, Ethylbenzene & Xylene	23/07/98	24/07/98
E0110	Polynuclear Aromatic Hydrocarbons	17/07/98	23/07/98
E4970	Total Metals by ICP-MS	21/07/98	24/07/98
E4950	Mercury	20/07/98	24/07/98

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA accreditation does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 8E01275

Client : PPK Brisbane

Reference : 84J264A

Page 2 of 5

plus Cover Page

Analyte	Lab No	E49946				
		CB1 0.5-				
	Sample Id	0.6				
	PQL					
E1110 PAH's in Soil						
Naphthalene	0.5	nd				
Acenaphthylene	0.5	nd				
Acenaphthene	0.5	nd				
Fluorene	0.5	nd				
Phenanthrene	0.5	nd				
Anthracene	0.5	nd				
Fluoranthene	0.5	nd				
Pyrene	0.5	nd				
Benz(a)anthracene	0.5	nd				
Chrysene	0.5	nd				
Benzo(b) & (k)fluoranthene	1	nd				
Benzo(a)pyrene	0.5	nd				
Indeno(1.2.3-cd)pyrene	0.5	nd				
Dibenz(a,h)anthracene	0.5	nd				
Benzo(g,h,i)perylene	0.5	nd				
Total PAH	-	nd				
2-Fluorobiphenyl-SURROGATE	1	90%				
Anthracene-d10-SURROGATE	1	87%				
d14-Terphenyl-SURROGATE	1	91%				

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = <PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in Method Header

Job Number : 8E01275

Client : PPK Brisbane

Reference : 84J264A

Page 4 of 5

plus Cover Page

Analyte	Lab No	E49947				
	Sample Id	WS1				
	PQL					
E0220 TPH in Water (µg/L)						
Total C6-C36	-	10800				
C6-C9 Fraction	20	nd				
C10-C14 Fraction	20	nd				
C15-C28 Fraction	100	7010				
C29-C36 Fraction	100	3800				
E0010 BTEX (P&T) in Water (µg/L)						
Benzene	0.5	nd				
Toluene	1	nd				
Ethylbenzene	1	nd				
Total Xylenes	3	nd				
E4970 Total Recoverable Metals in Water						
Arsenic	0.002	0.131				
Cadmium	0.0005	0.01				
Chromium	0.005	0.06				
Copper	0.005	0.42				
Nickel	0.005	0.09				
Lead	0.005	1.99				
Zinc	0.01	3.24				
E4950 Total Recoverable Mercury in Water						
Mercury	0.001	0.469				

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = <PQL

-- = Not Applicable

Soils

: mg/kg (ppm) dry weight unless otherwise specified

Waters

: mg/L (ppm) unless otherwise specified in Method Header

Leachates

: mg/L (ppm) in leachate unless otherwise specified in

Method Header

Job Number : 8E01275

Client : PPK Brisbane

Reference : 84J264A

Page 5 of 5

plus Cover Page

Analyte	Lab No	E49947				
	Sample Id	WS1				
	PQL					
E0110 PAH's in Water (µg/L)						
Naphthalene	1	nd				
Acenaphthylene	1	nd				
Acenaphthene	1	nd				
Fluorene	1	nd				
Phenanthrene	1	nd				
Anthracene	1	nd				
Fluoranthene	1	nd				
Pyrene	1	nd				
Benz(a)anthracene	1	nd				
Chrysene	1	nd				
Benzo(b) & (k)fluoranthene	2	nd				
Benzo(a)pyrene	1	nd				
Indeno(1.2.3-cd)pyrene	1	nd				
Dibenz(a,h)anthracene	1	nd				
Benzo(g,h,i)perylene	1	nd				
Total PAH		nd				
2-Fluorobiphenyl-SURROGATE	1	118%				
Anthracene-d10-SURROGATE	1	127%				
p-Terphenyl-D14-SURROGATE	1	130%				

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = <PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified in Method Header

Leachates : mg/L (ppm) in leachate unless otherwise specified in Method Header

QA/QC APPENDIX NO. 8E01275

<u>Method</u>	<u>Description</u>
E1220	Total Petroleum Hydrocarbons
E1010	Benzene, Toluene, Ethylbenzene & Xylene
E1110	Polynuclear Aromatic Hydrocarbons
E5910	Metals by ICP-AES
E5950	Mercury in Soil
E0220	Total Petroleum Hydrocarbons
E0010	Benzene, Toluene, Ethylbenzene & Xylene
E0110	Polynuclear Aromatic Hydrocarbons
E4970	Total Metals by ICP-MS
E4950	Mercury

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window			
Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within			
Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within			
Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming	
With Method Specification	✓
Chain of Custody Attached	✓

N/A = Not Applicable

Comments

1. Laboratory QA/QC including Method Blanks, Duplicates, Matrix Spike Duplicates, Laboratory Control Samples or CRM's are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes are available upon request (Refer to SPM-01).
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)).
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QAQC : Method Blank

ANALYTE	SAMPLE ID	Blank				
	PQL					
E1110 PAH's in Soil						
Naphthalene	0.5	nd				
Acenaphthylene	0.5	nd				
Acenaphthene	0.5	nd				
Fluorene	0.5	nd				
Phenanthrene	0.5	nd				
Anthracene	0.5	nd				
Fluoranthene	0.5	nd				
Pyrene	0.5	nd				
Benz(a)anthracene	0.5	nd				
Chrysene	0.5	nd				
Benzo(b) & (k)fluoranthene	1	nd				
Benzo(a)pyrene	0.5	nd				
Indeno(1.2.3-cd)pyrene	0.5	nd				
Dibenz(a,h)anthracene	0.5	nd				
Benzo(g,h,i)perylene	0.5	nd				
Total PAH	-	nd				
2-Fluorobiphenyl-SURROGATE	1	104%				
Anthracene-d10-SURROGATE	1	101%				
p-Terphenyl-D14-SURROGATE	1	105%				

PQL = Practical Quantitation Limit
nd = < PQL
-- = Not Applicable

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm) unless otherwise specified

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 5th Edition 1/6/98

QAQC : Spike Recoveries

Analyte	Spike	Level	Detected	Recovery Details			
	Level	Spike 1	Spike 2	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E0220 TPH in Water (µg/L)							
Total C6-C36	9500	9560	9640	101 %	101%	101 %	1 %
C6-C9 Fraction	4000	3560	3440	89 %	86%	88 %	3 %
C15-C28 Fraction	5500	6000	6200	109 %	113%	111 %	3 %
E0010 BTEX (P&T) in Water (µg/L)							
Benzene	10	10.0	11.0	100 %	110%	105 %	10 %
Toluene	10	10	11	100 %	110%	105 %	10 %
Ethylbenzene	10	10	11	100 %	110%	105 %	10 %
Total Xylenes	30	29	32	97 %	107%	102 %	10 %
E4970 Total Recoverable Metals in Waters							
Arsenic	0.100	0.095	0.087	95 %	86%	91 %	10 %
Cadmium	0.100	0.091	0.091	91 %	91%	91 %	0 %
Chromium	0.100	0.107	0.110	107 %	110%	109 %	3 %
Copper	0.100	0.085	0.085	85 %	85%	85 %	0 %
Nickel	0.100	0.101	0.097	101 %	97%	99 %	4 %
E4950 Total Recoverable Mercury in Water							
Mercury	0.100	0.091	0.089	91 %	89%	90 %	2 %

PQL = Practical Quantitation Limit
nd = < PQL
--- = Not Applicable

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm) unless otherwise specified

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 5th Edition 1/6/98

QAQC : Method Blank

ANALYTE	SAMPLE ID	Blank				
	PQL					
E0220 TPH in Water ($\mu\text{g/L}$)						
Total C6-C36	-	nd				
C6-C9 Fraction	20	nd				
C10-C14 Fraction	20	nd				
C15-C28 Fraction	100	nd				
C29-C36 Fraction	100	nd				
E0010 BTEX (P&T) in Water ($\mu\text{g/L}$)						
Benzene	0.5	nd				
Toluene	1	nd				
Ethylbenzene	1	nd				
Total Xylenes	3	nd				
E4970 Total Recoverable Metals in Waters						
Arsenic	0.002	nd				
Cadmium	0.0005	nd				
Chromium	0.005	nd				
Copper	0.005	nd				
Nickel	0.005	nd				
Lead	0.005	nd				
Zinc	0.01	nd				
E4950 Total Recoverable Mercury in Water						
Mercury	0.001	nd				

PQL = Practical Quantitation Limit
 nd = < PQL
 -- = Not Applicable

(S) Soils : mg/kg (ppm) dry weight
 (W) Waters : mg/l (ppm) unless otherwise specified

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 5th Edition 1/6/98

QAQC : Method Blank

ANALYTE	SAMPLE ID	Blank				
	PQL					
E0110 PAH's in Water ($\mu\text{g/L}$)						
Naphthalene	1	nd				
Acenaphthylene	1	nd				
Acenaphthene	1	nd				
Fluorene	1	nd				
Phenanthrene	1	nd				
Anthracene	1	nd				
Fluoranthene	1	nd				
Pyrene	1	nd				
Benz(a)anthracene	1	nd				
Chrysene	1	nd				
Benzo(b) & (k)fluoranthene	1	nd				
Benzo(a)pyrene	1	nd				
Indeno(1.2.3-cd)pyrene	1	nd				
Dibenz(a,h)anthracene	1	nd				
Benzo(g,h,i)perylene	1	nd				
Total PAH		nd				
2-Fluorobiphenyl-SURROGATE	1	94 %				
Anthracene-D10-SURROGATE	1	95 %				
p-Terphenyl-D14-SURROGATE	1	107 %				

PQL = Practical Quantitation Limit
 nd = < PQL
 -- = Not Applicable

(S) Soils : mg/kg (ppm) dry weight
 (W) Waters : mg/l (ppm) unless otherwise specified

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 5th Edition 1/6/98



INDUSTRIAL AND ENVIRONMENTAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 7584

Client: PPK Brisbane	Our Ref: 8E01275
Your Ref: 84J264A	Date: 24/07/98

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐
2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐
3. DISCARD IMMEDIATELY ☐
4. HOLD SAMPLES UNTIL _____ ☐

(Note: A charge of \$2.00 per sample per month or part thereof applies)

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to

Kattubaya Sahul
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

Certificate of Analysis

CLIENT: Brisbane City Council

JOB NO: 84J248A-137

SAMPLED BY: Alan Barker

DATE RECEIVED: 17/07/98

CONTACT: Ms Robin Eyears

LOCATION: New Farm Power Station - Coal Bunker

TEST METHOD: Qualitative identification of asbestos types in bulk samples at PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

<u>Lab Number</u>	<u>Client ID</u>	<u>Sample Description</u>	<u>Sample Dimensions</u> cm	<u>Identification Type</u>
M001	001	Debris	3 X 4	CH, A
M002	002	Debris	4 X 4	CH, A

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected

sch4p4(6) Personal information
Approved Identifier

sch4p4(6) Personal information
Approved Signatory

AUTHORISATION DATE

4/08/98

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

PPK

laboratory sample submission form for
asbestos fibre identification

Client:	BRISBANE CITY COUNCIL	Region:	—
Contact:	ROBIN CYEARS	Phone number:	
Address:		Fax number:	
		Order number:	

Name of site surveyed: NEW FARM POWER STATION —
COAL BUNKER

Please print

Sample sequence:

			0	0	1
--	--	--	---	---	---

 to

			0	0	2
--	--	--	---	---	---

Total samples sent:

2

 Date samples sent: / /
Date results required: / /

Additional comments: _____

Note: It is recommended that you photocopy this form and retain it for you records as part of good quality management and quality control.

PLEASE SEND ALL SAMPLES TO:

PPK
FLOOR 12
348 EDWARD STREET
BRISBANE QLD 4000

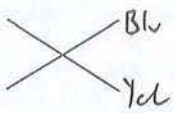
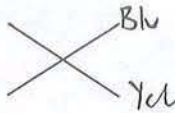
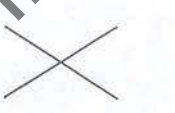
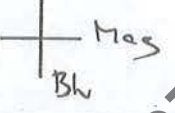
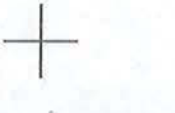
PH: (07) 3218 2253
FAX (07) 3831 4223

OFFICE USE ONLY

PPK JOB No.: 845248A - 137
DATE SAMPLES RECEIVED: 3-8-98
SAMPLES CHECKED BY: sch4p4(6) Personal information

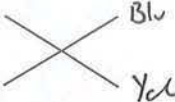
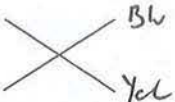
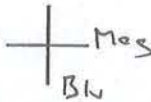
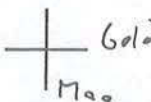
845248A-137

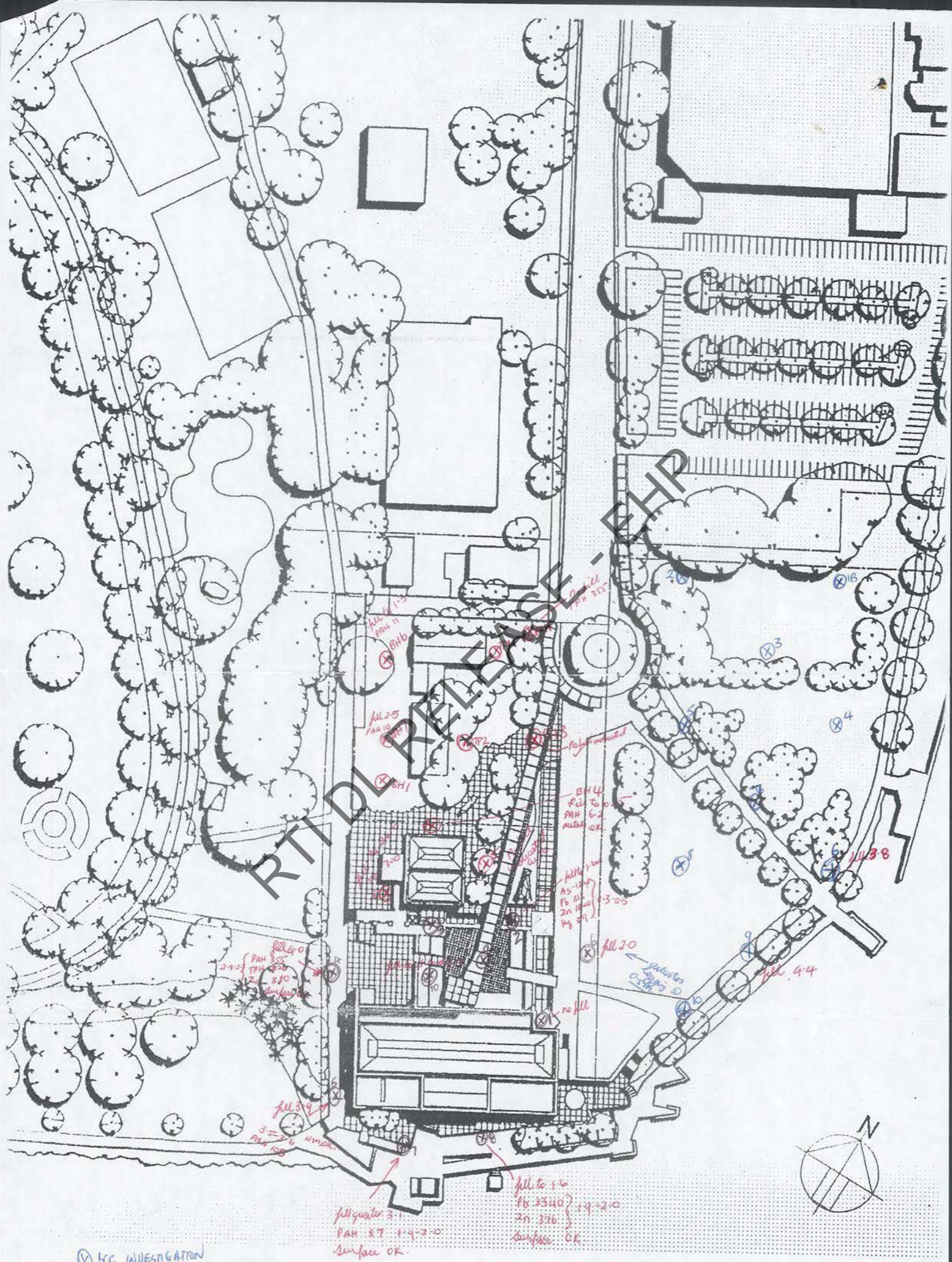
Fibre Identification Analysis

Client: <u>Brisbane City Council</u>				Job No: <u>845248A-137</u>			
Lab Sample No: <u>11002</u>				Sample Disintegration Required Yes/ ☒ No			
Client ID: <u>002</u>				If yes state method			
Sample Description: <u>Debris</u>				Mass/Dimension: <u>4 cm x 4 cm</u>			
Stereo Microscope Examination							
Morphology				Homogenous		Non-Homogenous	
A	<u>fine white silky</u>			☒			
B	<u>straight brown</u>			☒			
C							
Polarised Light Microscopy							
Optical Orientation - (Cross polarised light)							
A <u>1.55</u>		B <u>1.67</u>		C			
							
Extinction Angle - (1st Order Red Out)				Pleochroism - (Plane Polarised Light)			
Parallel		Inclined		None		Strong Weak None	
A	☒			A			☒
B	☒			B		☒	
C				C			
Dispersion Staining Colours							
RI Oil <u>1.55</u>		RI Oil <u>1.67</u>		RI Oil			
A		B		C			
							
Trace Analysis				RI Oil			
Yes ☐ No ☒				RI Oil			
				RI Oil			
				RI Oil			
Slide				No Fibres			
1							
2							
3							
Fibres Present							
Chrys		Amos		Croc		UMF	
SMF		Organic Fibre		None			
A	☒						
B		☒					
C							
Further Analysis							
SEM/EDAX Yes ☐ No ☒				XRD Yes ☐ No ☒			
Conclusion				Date: <u>4-8-98</u>			
<u>CH, A Asbestos Detected</u>				Analyst: <u>sch4p4(6) Personal information</u>			
				Checked: _____			

Client Can

Fibre Identification Analysis

Client: <i>Brisbane City Council</i>			Job No: <i>8452481 - 137</i>		
Lab Sample No: <i>ma01</i>			Sample Disintegration Required Yes ☒ No ☐		
Client ID: <i>001</i>			If yes state method		
Sample Description: <i>Debris</i>			Mass/Dimension: <i>3 cm x 4 cm</i>		
Stereo Microscope Examination					
Morphology		Homogenous		Non-Homogenous	
A	<i>fine white silky</i>	☒			
B	<i>straight brown</i>	☒			
C					
Polarised Light Microscopy					
Optical Orientation - (Cross polarised light)					
A	<i>1.55</i>	B	<i>1.67</i>	C	
					
Extinction Angle - (1st Order Red Out)			Pleochroism - (Plain Polarised Light)		
Parallel Inclined None			Strong Weak None		
A	☒		A		☒
B	☒		B	☒	
C			C		
Dispersion Staining Colours					
RI Oil <i>1.55</i>		RI Oil <i>1.67</i>		RI Oil	
A		B		C	
					
Trace Analysis					
Yes ☒ No ☒		RI Oil		RI Oil	
		No Fibres		No Fibres	
Slide					
1					
2					
3					
Fibres Present					
Chrys		Amos		Croc	
UMF		SMF		Organic Fibre	
None					
A	☒	☒			
B		☒			
C					
Further Analysis					
SEM/EDAX		Yes ☐ No ☒		XRD	
				Yes ☐ No ☒	
Conclusion			Date: <i>4-8-98</i>		
<i>CH, A Mag asbestos detected</i>			Analyst:		
			Checked: <i>sch4p4(6) Personal Information</i>		



① ECC INVESTIGATION

⊗ PPK Preliminary

RTI 13-106

⊗ PPK further investigation & what we.

Collection 17

Page 110

Release



KEY:

- TP1
 WOODWARD-CLYDE TEST PIT LOCATION
- BH3
 BOREHOLE
-  BH6 BOREHOLE WITH GROUNDWATER MONITORING WELL INSTALLED

④ approve locations of other TP's.

RTI 13-106

Collection 17

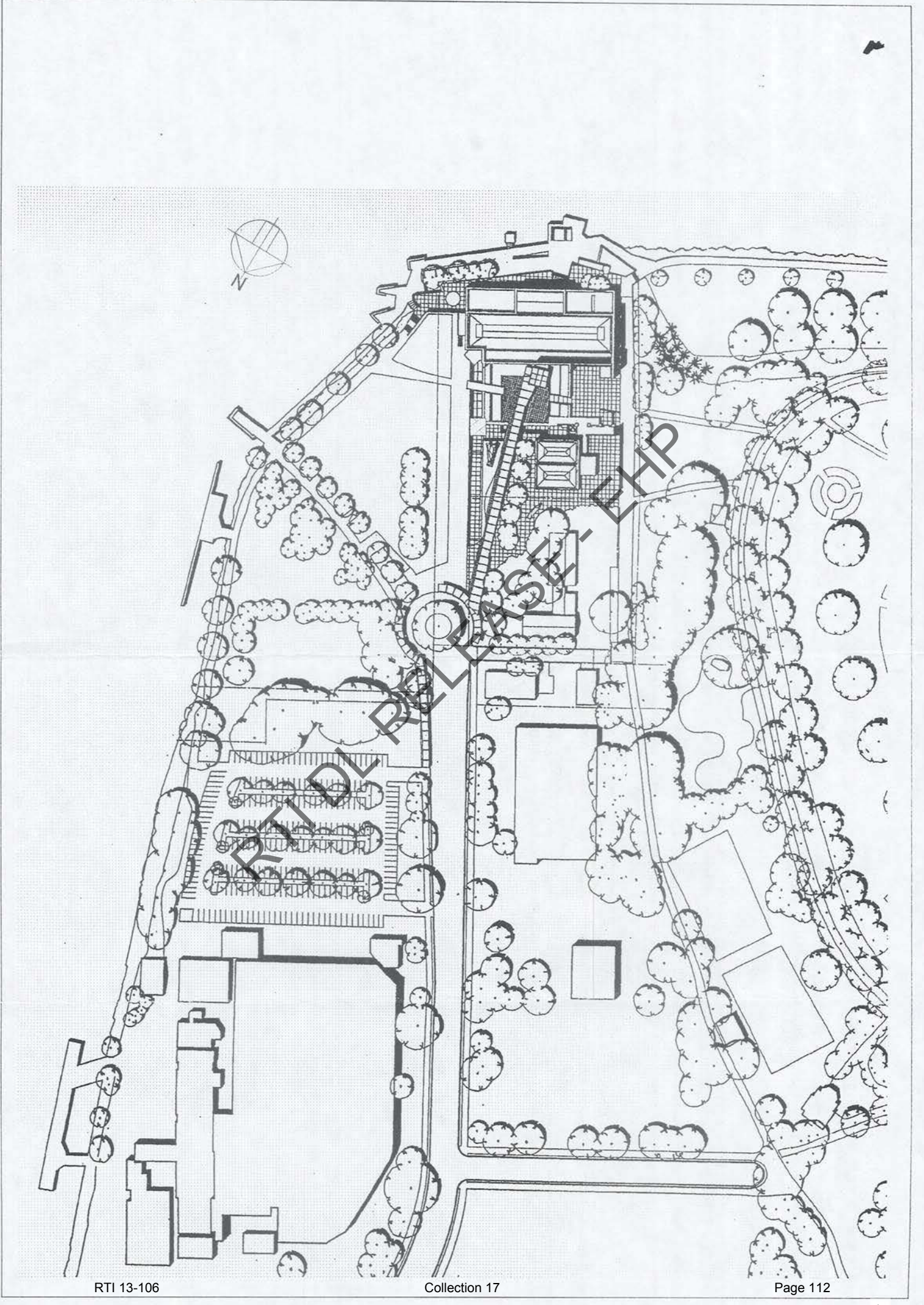
PPK
Environment & Infrastructure
12th Floor IBM Centre
348 Edward Street
Brisbane QLD 4000
G.P.O. Box 2907
Brisbane
QLD, 4000 Australia
Tel. 07 3218 2222
Fax 07 3831 4223
Email ppkbris@ozemail.com.au
ACN 078 004 798

**NEW FARM POWER STATION
LOT 2 ON RP210504**

BOREHOLE LOCATIONS Page 111

Job No
84K043A
Drawing No
FIG 1
Rev.

NOT TO SCALE



Mack Dreyer
(07) 3227 8619 {Direct fax - (07) 3227 8341}

902196

5 November 1998

Mr Chris Woodfull
PPK Environment & Infrastructure Pty Ltd
GPO Box 2907
BRISBANE 4000

Dear Mr Woodfull

Re: Newfarm Powerstation: Draft Site Management Plan, - Lot 2 and a Portion of Lot 3 on Registered Plan (RP) 210504, Lot 1 and a Portion of Lot 2 on RP 53157

I refer to the above referenced draft Site Management Plan (SMP) submitted to the Department of Environment and Heritage for review and apologise for not responding sooner. This draft SMP has now been reviewed and the following comments are provided in response:

1. As per our recent discussions it should be noted that SMPs are issued on a lot and plan basis. As a result, it is recommended that each land parcel have its own SMP rather than one SMP covering all conditions for all land parcels on the site.
2. As SMPs are directed at the owners/operators of the site it is my view that the inclusion of details of the concentrations of various contaminants in the *Summary of Contamination* section of the SMP is not necessary and only serves to complicate the SMP. A description of the nature and extent of contamination is all that is needed.
3. The following comments have assumed that the inferred areas of contamination on the map provided with the draft SMP are the areas to be capped. This needs to be clarified. Further consideration needs to be given to the area which needs to be capped with an impervious layer (section 3.1 of the draft SMP). It should be recognised that Lot 1 on RP 53157 has only been sampled on a 50 metre grid and while significant contamination was not identified, surface samples were not collected at all sample locations and significant quantities of ash and fill were found on the land parcel. As a result capping a small area around borehole 9 is not supported. What is needed is an assessment of the risk in this area and then a strategy developed to manage this risk. Similarly the areas to be capped on the remaining land parcels needs to be evaluated. From the results of the limited sampling, consideration should be given to capping the total area of lot 101 on SP 102967 particularly the southern portion of the land parcel.

4. Section 3.4 of the draft SMP should be more specific regarding the soil erosion measures to be implemented.
5. The groundwater monitoring requirement (section 3.8) should be evaluated as part of the site investigation. If required, the continued monitoring and evaluation of the results from this monitoring should form part of the SMP.
6. The final design and construction requirements may require the SMP to be divided into pre-construction and post construction components.
7. As per my recent e-mail I would recommend finalising the SMPs for Lot 1 on RP 53157, Lot 101 on SP 102967 and Lot 2 on RP 210504 before addressing the issue of the CSR site.

Please contact me if you require any further information

Yours sincerely

sch4p4(6) Personal information

Mack Dreyer
Chief Scientific Adviser
Hazardous Wastes & Contaminated Sites Section

Memorandum

File

File reference

902196

From

myb

Subject

Environmental Site Assessment New Farm River Station

Date

16/9/98

Notes

Spot not actually particular to 1 land parcel but at the time of the report was part of the Newfarm Park. It encompassed the turbine room switch room, demolished boiler house and its surroundings.

Groundwater

- shallow, 2 to 3 metres

Hazardous Materials Sampling Program.

Materials targeted

- asbestos
- Pb based paint
- PCB's

Asbestos identified

Bonded

- shoring spread across site
- mounting boards
- pipework.

Friable

- lagging debris
- wall board
- woven textile

- Some asbestos was found in a sample from the demolished boiler house.
- Minor amounts of fibre cement shoring was found around the buildings in the form of debris

Memorandum

File reference

From

Subject

Date

Notes

Significant levels of Pb based paints
around the site

PCBs were not found but capacitors not
analysed.

Soil and Water Sampling

excavations on approx 40 sq m
- samples collected at 0.5m intervals
or change in strata. 2 samples analysed for TP.

- Note drain samples - significantly
contaminated with HM

Elevated Results at: TP2 - Pb, As, Zn, Hg (0.3-0.5)

TP4 - PAH, Zn, TPH (2.8-2.9)

TP7 - PAH (1.9-2.0)

TP8 - Pb, Zn (1.9-2.0)

Report - Environmental Assessment Lot 2 on RP 2/10/04.
New Farm Power Station.

Geology

Fill ranged from 0.3 - 2.6m.

overlying silty clay with minor clay lenses.
to 6m. Sand content increases with depth.

Groundwater

Groundwater was encountered 3-4m BGS

Memorandum



File reference

From

Subject

Date

Notes

Site Investigations

- 8 BHs constructed on site but it would appear that 3 are not on the lot, but the adjacent Boiler house site.

- generally borer down to 60m. samples collected at 0.0.5 1m & then every m after that.

- 3 of the BHs were established as groundwater monitoring wells.

Results of investigations.

- No significant HAP identified
- slight TPH in some leaves.
- slight PAH in some samples

Groundwater

- slightly elevated Zn's. but need further analysis.

Memorandum

File File File reference 92196.
From MD
Subject Preliminary Site Assessment QTSC Site w/c. Date 14/9/98
Notes

Sampling

- 3 test pits to 3 metres
- Investigation would appear to be on Lot 2 on RP 210504 although not actually stated in report.
- Occupied by buildings
 - Office, workshop, joinery, carpenter's shop, Q&K archive & former transformer locations with majority of site placed.
- Workshops constructed 1940's with the exception of Q&K archive joinery shop and carpenter's shop - after 1946.
- Transformers removed after 1977
- No OSTS
- From BCC report this area not used for coal storage

Test Pits

TP1 fill to 0.9m generally ash type material. - surface 100mm OK.

TP2 fill to 0.1m Ash - Pb 410. + Zn 520

FP3 fill to 0.25m natural Pb - 1670 Cu 400.
Zn 1570.

↓
gravel layer - metal pieces, general rubbish, bracken, weeds - sitting on silty sand.

LEGEND

- 1 Boiler House
- 2 Turbine Room
- 4 Store and Office
- 5 Store
- 6 Office and Workshop
- 7 Transformers
- 8 Substation
- 9 Substation
- 10 QEC Archive
- 11 Joinery Shop
- 12 Carpenter's Shop
- 14 Crane
- 15 Ash Bunker
- 18 Coal Receiving Shed
- 24 Park Depot
- Testpit Location

GRAVEL PIT

FP3

TP1

TP2

SITE BOUNDARY -
LIMIT OF ASSESSMENT

**FIGURE 1 - Site Layout and
Sampling Locations**

Drawing No. A3200900/0001/G-002

Date: 10 March 1997

Source: BCC Preliminary Site Investigation Report
on New Farm Power Station 1993.

Page 119

Woodward-Clyde

Release

Memorandum

To File

File reference 902196.

From

MD

Subject

New Farm Powerhouse Site

Date

7/9/98

Notes

Report - Preliminary Site Investigation New Farm Powerhouse Site - Dec.

Site covers (latest CTs) lot 101 SP 102967
lot 2 RP210504.
lot 1 RP 53157.

Site is to be used for arts/cultural use

Site can be split into
Powerhouse
stores buildings
offices & workshops
boiler house - demolished
open space
transformers
wall stockpiling areas.

Site Features

- Offices & workshops.
constructed 1940's
renovated & currently in use

- Boiler house

demolished May 1984
bulb placed in the basement
section of the building -
covered with dirt.
doors in basement are buckling
and open to environment.
surface of structure 2-3 m above
ground.

Memorandum

File reference

From

Subject

Date

Notes

open space.

North of powerhouse

considerable amounts of fill imported
following closure of powerhouse &
approx 5 m above natural ground.

Transformers.

western boundary of powerhouse
site.

concrete foundations remain.

Coal Stockpiling areas.

stockpiling areas adjacent to
powerhouse covered with concrete
open space area covered with fill

Site History

1886 Racing club.

1880-1890's grazing

1893 - C&N bought adjacent property &
established a sugar refinery.

Creek meandered from northwest
corner to south east corner of
allotment.

Assumed that the creek was filled
as part of the during the construction
of the powerhouse.

Memorandum

File reference

From

Subject

Date

Notes

Powerhouse, boilerhouse and
stores built over the creek.

Turbine room & boiler house
first developed with operations
commencing in 1928

Turbine room & switch house expanded
in 1934. - boiler house extension
completed 1940

Coal transported by rail until 1950's.
when coal handling facility established.

Council repurchased the buildings
in 1973.

Plant removed 1977

Material from SEQEB cable
excavations used to fill the
site around the vacant land.

Boilerhouse demolished 1981
all debris with the exception of
masonry was removed from site.

rest of land transferred to
BCC 1990.

Memorandum

File reference

From

Subject

Date

Notes

Sampling Plan.

- Sampling -

Triangular grid. 50m grid over open space area. samples from discrete layers
2 bores were used to try and identify creek bed.

- judgemental sampling boiler house rubble, drains transformers & areas of exposed ash

Bores in open space. identified chat ground level of open space sloped from North-west to southern corner - Fill was mainly sand, gravel and clay mixes. Also layer of coal dust and ash. Fill on southern areas from cable excavations around Busbar. Ash found in all bores but 1B. Ash relatively close to surface @ 1, 2, 3, 4 & 5 - rest quite deep

Bores in boiler house as would be expected rubble - terminated on floor of boiler house.

Chemical Analysis

all layers identified in bore logs analysed for H.M. - All results OK. only slight encrustations. samples were collected over 0.5m with the

Memorandum

File reference

From

Subject

Date

Notes

exception of surface samples.
while all layers were analysed not
all layers from each core were
analysed. Ash in nearly all
cores was analysed for H.M.

Basically same samples analysed for PAH &
phenols.

phenols OK.

PAHs. - some slightly elevated PAHs
identified - BH 3 - 23.6 ng/Kg.
BH 5 - 20.0 ng/Kg.

but for proposed use is these results would
not appear to be a significant problem.

TPH is in carbon area.

Asbestos

no significant asbestos detected

Dioxins

Composite samples tested for
Dioxins - does not appear to be
significant.

CR - OK.

Conclusion

From area examined does not
appear to be contamination that would
preclude to use of the site for out & cultural
activities

Test Pit Log - TP1

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL -0.0 Concrete		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
Clay. Light brown, moist, soft sandy silty clay.		0.4	TP1; 0.5-0.6m TPH < QDL HM. ✓ PAH ✓ < QDL OC < QDL OP < QDL	NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Clay. Dark brown-grey moist soft silty clay.		1.0		
Clay. Dark brown-grey moist soft silty clay.		1.4	TP1; 1.4-1.6m TPH < QDL HM ✓ PAH ✓ OC ✓ OP ✓	
Clay. Dark brown-orange brown moist soft silty clay. Water intersected 2.5m.		1.9		
Test Pit Terminated		2.0	TP1; 2.2-2.5m PAH ✓ < QDL	
		2.5		
		3.0		
		4.0		
Logged By: [Signature]	Sampled By: [Signature]			TEST PIT TP1
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour	Notes			PPK Environment & Infrastructure JOB NO. 84J153B DRG.

Test Pit Log - TP2 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION
Fill. Orange brown soft dry gravelly sand. Some brick glass and cans. Old water hose.			TP2; 0.3-0.5m TPH EQDL HM AS-124, Cu 131 Pb 818, Zn 1940, Hg 3.9	LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July to 1 August 1997
Concrete		1.0	TP2; 0.8-1.0m	NOTES
Fill. Light brown stiff dry sandy fill with some ash.		1.2		EQUIPMENT USED
Clay. Dark grey soft moist sandy silty clay		1.6	TP2; 1.5-1.6m	Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
		2.4	TP2; 2.3-2.4m TPH EQDL HM ✓ Ⓢ	
Test Pit Terminated				
				TEST PIT TP2
Log scale (m)		Sample (m)		
Log scale (m) Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Sample (m) Notes		
				JOB NO. 84J153B DRG. NO. test_tp2

Test Pit Log - TP3

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p>		0.0		<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 31 July 1997</p>
<p>Fill. Grey firm dry gravelly sand fill with much ash and brick fragments up to 15 cm X 10 cm X 20 cm size.</p>		0.25	TP3; 0.3-0.5m	<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Fill. Orange brown sandy gravel fill with some ash and much brick.</p>		1.0	TP3; 1.0-1.2m	
<p>Fill. Dark grey gravelly sand fill with much ash</p>		1.2	TP3; 1.0-1.2m	
<p>Fill. Brown - grey sandy gravel fill with some brick and ash</p>		1.3	TP3; 1.3-1.35m	
<p>Fill. Light orange brown sandy gravel fill with much gravel</p>		1.4	TP3; 1.35-1.4m	
<p>Fill. Light grey sandy gravel fill with much ash and some slag</p>		1.4	TP3; 1.45-1.5m	
<p>Fill. Dark brown soft moist silty clay with some gravel and brick fragments</p>		1.9		
<p>Clay. Dark brown - grey soft moist silty clay with intrinsic roots and rootlets.</p>		2.7	TP3; 2.2-2.5m	
Test Pit Terminated				<p>TEST PIT TP3</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp3</p>
<p>Logged by: Personal information</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>	<p>Sampled by: Personal information</p> <p>Notes</p>			

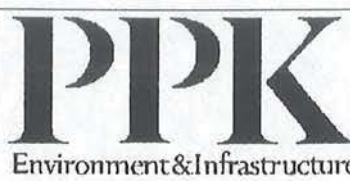
Test Pit Log - TP4

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION
Fill. Dark grey brown soft dry silt. Some brick ash and slag.		0.5	TP4; 0.3-0.4m TPH ✓ CQDL HM ✓ CN ✓	LOCATION: New Farm Powestation Lamington Road Newfarm QLD
Fill. Light grey soft dry silt with some ash.		1.7	TP4; 0.8-0.9	DATE EXCAVATED 31 July 1997
Fill. Light brown grey ash fill.		2.5		NOTES
Fill. Red brick cable armour		2.8	TP4; 2.8-2.9	EQUIPMENT USED
Fill. Dark red brown mottled, grey firm, dry clay. Transmission cable.		3.0	TPH C15-C28 720 HM - 2m 880 D - ✓ 355mg/Kg - PPH.	Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Clay. Red brown mottled grey firm moist clay.		4.1		
Test Pit Terminated				
TEST PIT TP4				
Log sheet (By) Personal information		Sample sheet (By) Personal information		
Field Classification		Notes		
0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour				JOB NO. 84J153B DRG. NO. test_tp4

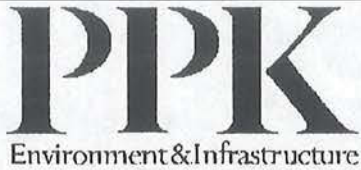
Test Pit Log - TP5

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION
Fill. Dark brown soft dry clay with some slag. Old asbestos pipe.		0.0	TP5; 0.5-0.6m	LOCATION: New Farm Powestation Lamington Road Newfarm QLD
Fill. Dark brown soft dry sandy clay with some ash and slag		0.7	TP5; 0.9-1.0m TPH ✓ CGL HM ✓	DATE EXCAVATED 31 July 1997
Fill. Dark brown soft dry sandy clay. Large pieces of rubble		1.9	TP5; 2.1-2.3m	NOTES
Fill. Dark brown soft dry sandy clay with much ash and some rubble. Old railway line at 3.1m		2.7	TP5; 2.9-3.0m	EQUIPMENT USED
Fill. Light grey gravelly clay with much ash and some gravel.		3.6	TP5; 3.5-3.6m TPH ✓ CGL HM ✓	Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Clay. Red brown mottled firm moist sandy clay.		3.9	TP5; 3.8-4.0m	
Test Pit Terminated		4.0		
				TEST PIT TP5
Log sample Personal information		Sample Personal information		
Field Classification		Notes		
0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour				JOB NO. 84J153B DRG. NO. test_tp5

Test Pit Log - TP6

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
				GENERAL INFORMATION
				LOCATION: New Farm Powestation Lamington Road Newfarm QLD
				DATE EXCAVATED 1 August 1997
				NOTES
				EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
GROUND LEVEL 0.0		0.0		
Fill. Light grey brown soft dry sandy clay with some gravel, broken brick, rags, old water pipe, broken asbestos sheet.		0.5	TP6; 0.3-0.4m	
Fill. Asbestos lagging debris with rare sandy clay.		0.8	TP6; 0.5-0.6m	
Fill. Dark grey black boiler ash		0.9	TP6; 0.8-0.9m	
Fill. Light grey boiler ash		1.0	TP6; 0.9-1.0m	
Fill. Light brown soft dry sandy gravel		1.2	TP6; 1.9-1.2m	
Fill. Light grey boiler ash with minor vitreous slag.		2.0	TP6; 1.3-1.4m	
Clay. Brown orange soft moist sandy gravelly clay with much gravel.		2.7	TP6; 2.0-2.1m	
		3.6		
		3.9	TP6; 4.0-4.1m	
Test Pit Terminated		4.1		
				TEST PIT TP6
Logged by: [Signature]		Sampled by: [Signature]		
Field Classification		Notes		
0 No obvious contamination				JOB NO. 84J153B DRG. NO. test_tp6
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP7

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION
0.0 Fill. Dark brown sandy loam topsoil		0.2	TP7; 0.2-0.3m	LOCATION: New Farm Powestation Lamington Road Newfarm QLD
0.3 Fill. Grey dry soft boiler ash			TP7; 0.8-0.9m	DATE EXCAVATED 1 August 1997
Fill. Light brown orange soft dry sandy gravel. Old water pipe				NOTES
		1.2		EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Dark brown soft moist silty sand with boulders up to 60x60x20cm size.			TP7; 1.9-2.0m	
		2.1		
Fill. Dark grey brown soft wet clayey gravel.				
		3.1	TP7; 3.0-3.1m	
Test Pit Terminated				
TEST PIT TP7				
Log sheet (16) Personal information		Sample sheet (16) Personal information		
Field Classification		Notes		
0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour				JOB NO. 84J153B DRG. NO. test_tp7

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION		LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Fill. Dark brown soft moist sandy gravelly clay with much brick boulders and rock.</p> <p>Clay. Dark grey wet soft sandy gravelly clay. Water 1.8 m.</p> <p>Test Pit Terminated</p>			<p>0.0</p> <p>1.6</p> <p>2.0</p> <p>3.1</p>	<p>TP8; 1.2-1.3m</p> <p>TPH < QDL ✓</p> <p>HM ✓</p> <p>TP8; 1.9-2.0m</p> <p>TPH ✓</p> <p>Pb 2340</p> <p>Zn 376</p>	<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 1 August 1997</p> <p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Log sheet (16) Personal information</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>		<p>Log sheet (16) Personal information</p> <p>Notes</p>		<p>TEST PIT TP8</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp8</p>	

Test Pit Log - TP9 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997
Fill. Dark brown sandy loam, some plasterboard		0.25	TP9; 0.3-0.4m TP9; 0.3-0.5m	
Fill. Light grey brown soft dry clayey sandy gravel with much rubble.		1.2	TP9; 1.4-1.5m	NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Light brown soft dry gravelly loam. Much building rubble		2.2	TP9; 2.1-2.3m	
Fill. Light brown grey soft dry silty sandy gravel. Much building rubble		2.6	TP9; 3.9-4.0m	
Fill. Orange brick building rubble		4.5	TP9; 4.1-4.3m	
Test Pit Terminated Concrete				
Logged By: [Signature] Sample No: [Signature]	Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour			TEST PIT TP9 PPK Environment & Infrastructure JOB NO. 84J153B DRG. NO. test_tp9

Test Pit Log - TP10

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS	
				GENERAL INFORMATION	
				LOCATION: New Farm Powestation Lamington Road Newfarm QLD	
				DATE EXCAVATED 31 July 1997	
				NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.	
GROUND LEVEL 0.0 Fill. Grey soft dry boiler ash with some rubble.		0.0	TP10; 0.2-0.3m	-TPH ✓ HAM ✓	
		0.3	TP10; 0.3-0.4m		
Fill. Light brown soft dry gravelly clay		1.2	TP10; 1.4-1.5m		
Fill. Brown grey building rubble with bitumen, concrete, brick glass.		1.8	TP10; 1.8-1.9m		TPH ✓ HAM ✓
Fill. Red orange brick and building rubble. Old sign, pipes plaster board.			TP10; 2.2-2.4m		
			TP10; 2.6-2.8m		
Test Pit Terminated Concrete		3.7			
				TEST PIT TP10	
Log made by (Name) Personal information		Sampled by (Name) Personal information			
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes			
				JOB NO. 84J153B DRG. NO. test_tp10	

Borehole Log - BH2

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GENERAL INFORMATION				
NATURAL GROUND LEVEL 0.0 Concrete				LOCATION: New Farm Power Station Lamington Road New Farm DATE DRILLED 4 March 1998
Clay - Medium Brown silty clay, dry, low to med plasticity		0.4	BH2;0.5 PID 0.0 ppm <i>C₂₉₋₃₆ 335</i> <i>HM ✓</i>	
Silt - Yellow brown sandy silt, Dry, low plasticity		1.5	BH2;1.0 PID 0.0 ppm	EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
Silt - Brown clayey silt, Moist, low to med plasticity		2.0	BH2;2.0 PID 0.0 ppm	
Clay - Brown clay with streaks of sand, Moist, medium plasticity		2.8	BH2;3.0 PID 0.0 ppm <i>HAN ✓</i> <i>TPH ✓</i> <i>PAH ✓</i>	
Groundwater at ~3.5 m Clay - Grey brown silty clay with nodules of sand, wet, medium to high plasticity		3.5	BH2;4.0 PID 0.0 ppm	
Clay - Dark grey silty clay with streaks of sand, wet, medium plasticity		4.5	BH2;5.0 PID 0.0 ppm	
Clay - Dark grey sandy silty clay, wet, low to med plasticity		5.0	BH2;6.0 PID 0.0 ppm	
Bore Log ceased at 6.0 m				
RTI DL RELEASE - EHP				
				BOREHOLE BH2
Logged By: <small>Section 4(6) Personal information</small>		Sampled By: <small>Section 4(6) Personal information</small>		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight order 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
<small>13-106</small>		<small>Collection 17</small>		<small>JOB NO. 84K043A DRG. NO. bore_bh2</small> <small>Page 135</small>

BORE HOLE DETAILS - BH3

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	WELL CONSTRUCTION	DETAILS																
<p>NATURAL GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p> <p>Clay - Dark grey silty clay, dry, low to med plasticity</p> <p>Sand - Brown clayey sand, fine grained sand, moist, low plasticity</p> <p>Clay - Grey brown silty clay, Moist, medium plasticity</p> <p>Clay - Dark Grey silty clay, wet, medium to high plasticity</p> <p>Groundwater at ~3.8 m</p> <p>Borehole terminated at 3.5 mBGL</p>	<p>DEPTH (mBGL)</p> <p>0.0</p> <p>0.3</p> <p>1.5</p> <p>2.0</p> <p>3.0</p> <p>3.8</p> <p>6.0</p> <p>TPA ✓ PAH ✓ HM ✓</p>		<p>GENERAL INFORMATION</p> <p>LOCATION: Lamington Road, New Farm.</p> <p>DATE DRILLED: 6 March 1998</p> <p>EQUIPMENT USED</p> <p>Drilling Company: Paddy Christensen & Son</p> <p>Drilling Rig with 120 mm solid stem auger.</p> <p>Well Construction Details</p> <p>50 mm Class 18 threaded, slotted, acid washed, PVC screen from 4.0 to 5.5 m BGL. Filter sand from 3.3 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 3.3 mBGL. Concrete pad and flush mount from ground surface to 0.1 mBGL. Lockable cap.</p> <p>PID READINGS</p> <table border="1"> <thead> <tr> <th>DEPTH(mBGL)</th> <th>PID (ppm)</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>0.0</td></tr> <tr><td>1.0</td><td>0.0</td></tr> <tr><td>2.0</td><td>0.0</td></tr> <tr><td>3.0</td><td>0.0</td></tr> <tr><td>4.0</td><td>0.0</td></tr> <tr><td>5.0</td><td>0.0</td></tr> <tr><td>6.0</td><td>0.0</td></tr> </tbody> </table>	DEPTH(mBGL)	PID (ppm)	0.5	0.0	1.0	0.0	2.0	0.0	3.0	0.0	4.0	0.0	5.0	0.0	6.0	0.0
DEPTH(mBGL)	PID (ppm)																		
0.5	0.0																		
1.0	0.0																		
2.0	0.0																		
3.0	0.0																		
4.0	0.0																		
5.0	0.0																		
6.0	0.0																		
<p>Logged By: [Personal information]</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>	<p>Sampled By: [Personal information]</p> <p>Notes</p>	<p>BOREHOLE BH3</p> <p>PPK</p> <p>Environment & Infrastructure</p> <p>JOB NO. 84K043A DRG. NO. BH3 Page 136</p>																	

Borehole Log - BH4

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GENERAL INFORMATION				
NATURAL GROUND LEVEL 0.0 Concrete Fill - Ash and bits of concrete Clay - Red brown silty clay, moist, low to med plasticity				LOCATION: New Farm Power Station Lamington Road New Farm
				DATE EXCAVATED 6 March 1998
				EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
Groundwater at ~3.0 m Clay - Brown silty clay with nodules of yellow medium grained sand, wet, medium to high plasticity Bore Log ceased at 6.0 m		0.0		<div style="position: relative; height: 100%;"> <div style="position: absolute; top: 0; right: 0; color: blue; font-family: cursive;"> HM ✓ TPH 62g C36 242. </div> <div style="position: absolute; top: 15%; right: 0; color: blue; font-family: cursive;"> HM ✓ TPH ✓ </div> </div>
		0.3	BH4;0.5 PID 0.0 ppm	
		0.5	BH4;1.0 PID 0.0 ppm	
			BH4;2.0 PID 0.0 ppm	
		3.0	BH4;3.0 PID 0.0 ppm	
			BH4;4.0 PID 0.0 ppm	
			BH4;5.0 PID 0.0 ppm	
		6.0	BH4;6.0 PID 0.0 ppm	
BOREHOLE BH4				
Logged By: (b) Personal information		Sampled By: (b) Personal information		<div style="font-size: 4em; font-weight: bold; margin: 0;">PPK</div> <div style="font-weight: bold; margin: 0;">Environment & Infrastructure</div>
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
		Collection 17		JOB NO. 84K043A DRG. NO. bore_bh4 Page 137

RTI DL RELEASE - EHP

Borehole Log - BH5

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GENERAL INFORMATION				
NATURAL GROUND LEVEL 0.0 Concrete				LOCATION: New Farm Power Station Lamington Road New Farm
Clay - Red brown silty clay, moist, low to med plasticity Clay - Dark grey sandy silty clay, fine grained sand, moist, medium plasticity				
Groundwater at ~2.8 m Clay - Dark Grey brown silty clay wet, medium to high plasticity				DATE EXCAVATED 6 March 1998
Clay - Dark brown silty clay with rare fine grained sand, wet, medium plasticity Bore Log ceased at 6.0 m				EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
BOREHOLE BH5				
Logged By (6) Personal information		Sampled By (6) Personal information		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight order 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		

RTI DL RELEASE - EHP

TTH ✓
G 80 ✓
HM ✓

TTH ✓
PAH ✓
HM ✓

BORE HOLE DETAILS - BH6

New Farm Power Station ESA

GRAPHIC DESCRIPTION LOG		WELL CONSTRUCTION	DETAILS																
<p>NATURAL GROUND LEVEL</p> <p>and occasional gravel</p> <p>own silty clay, plasticity</p> <p>own silty clay with grained sand, moist, medium plasticity</p> <p>er at ~3.0 m</p> <p>ay brown silty clay medium to high plasticity</p> <p>rk Grey silty sand, grained sand, wet, clay</p> <p>ased at 6.0 m</p>		<p>DEPTH (mBGL)</p> <p>0.0</p> <p>0.35</p> <p>1.3</p> <p>2.0</p> <p>3.0</p> <p>5.0</p> <p>6.0</p>	<p>GENERAL INFORMATION</p> <p>LOCATION: Lamington Road, New Farm.</p> <p>DATE DRILLED: 6 March 1998</p> <p>EQUIPMENT USED</p> <p>Drilling Company: Paddy Christensen & Son</p> <p>Drilling Rig with 120 mm solid stem auger.</p> <p>Well Construction Details</p> <p>50 mm Class 18 threaded, slotted, acid washed, PVC screen from 2.0 to 5.0 m BGL. Filter sand from 1.5 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 1.5 m BGL. Concrete pad and flush mount from ground surface to 0.1 m BGL. Lockable cap.</p> <p>PID READINGS</p> <table border="1"> <thead> <tr> <th>DEPTH(mBGL)</th> <th>PID (ppm)</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>0.0</td></tr> <tr><td>1.0</td><td>0.0</td></tr> <tr><td>2.0</td><td>0.0</td></tr> <tr><td>3.0</td><td>0.0</td></tr> <tr><td>4.0</td><td>0.0</td></tr> <tr><td>5.0</td><td>0.0</td></tr> <tr><td>6.0</td><td>0.0</td></tr> </tbody> </table>	DEPTH(mBGL)	PID (ppm)	0.5	0.0	1.0	0.0	2.0	0.0	3.0	0.0	4.0	0.0	5.0	0.0	6.0	0.0
DEPTH(mBGL)	PID (ppm)																		
0.5	0.0																		
1.0	0.0																		
2.0	0.0																		
3.0	0.0																		
4.0	0.0																		
5.0	0.0																		
6.0	0.0																		
<p>Personal information</p> <p>Sampled By</p> <p>Notes</p>		<p>BOREHOLE BH6</p> <p>PPK</p> <p>Environment & Infrastructure</p>																	

Borehole Log - BH7

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GENERAL INFORMATION				
NATURAL GROUND LEVEL 0.0 Concrete Fill - Orange gravelly sandy clay, dry, low plasticity Fill - Large pieces of gravel, small amount of fines, dry Angular gravel up to 5x4x2 cm				LOCATION: New Farm Power Station Lamington Road New Farm
				DATE EXCAVATED 9 March 1998
				EQUIPMENT USED Drilling Company: Paddy Christensen & Son Drilling Rig with 120 mm solid stem auger.
Clay - Grey brown silty clay wet, medium to high plasticity Groundwater at ~3.0 m Clay - Dark grey silty clay, wet, medium to high plasticity, some organic matter present		0.0 0.3 0.7 2.5 3.3	BH6;0.5 PID 0.0 ppm BH7;1.0 PID 0.0 ppm BH7;2.0 PID 0.0 ppm BH7;3.0 PID 0.0 ppm	<div style="position: relative; height: 100%;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%) rotate(-45deg); opacity: 0.3; font-size: 4em; pointer-events: none;">RTI DL RELEASE - EHP</div> </div>
Sand - Dark Grey silty sand, with fine grained sand, wet, low plasticity Bore Log ceased at 6.0 m		5.5 6.0	BH7;4.0 PID 0.0 ppm BH7;5.0 PID 0.0 ppm BH7;6.0 PID 0.0 ppm	
		BOREHOLE BH7		
Logged By (6) Personal information		Sampled By (6) Personal information		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
RTI 108/106		Collection 17		
		<div style="font-size: 3em; font-weight: bold; margin: 0;">PPK</div> <div style="font-weight: bold; margin: 0;">Environment & Infrastructure</div>		
		JOB NO. 84K043A DRG. NO. bore_bh7 Page 140		

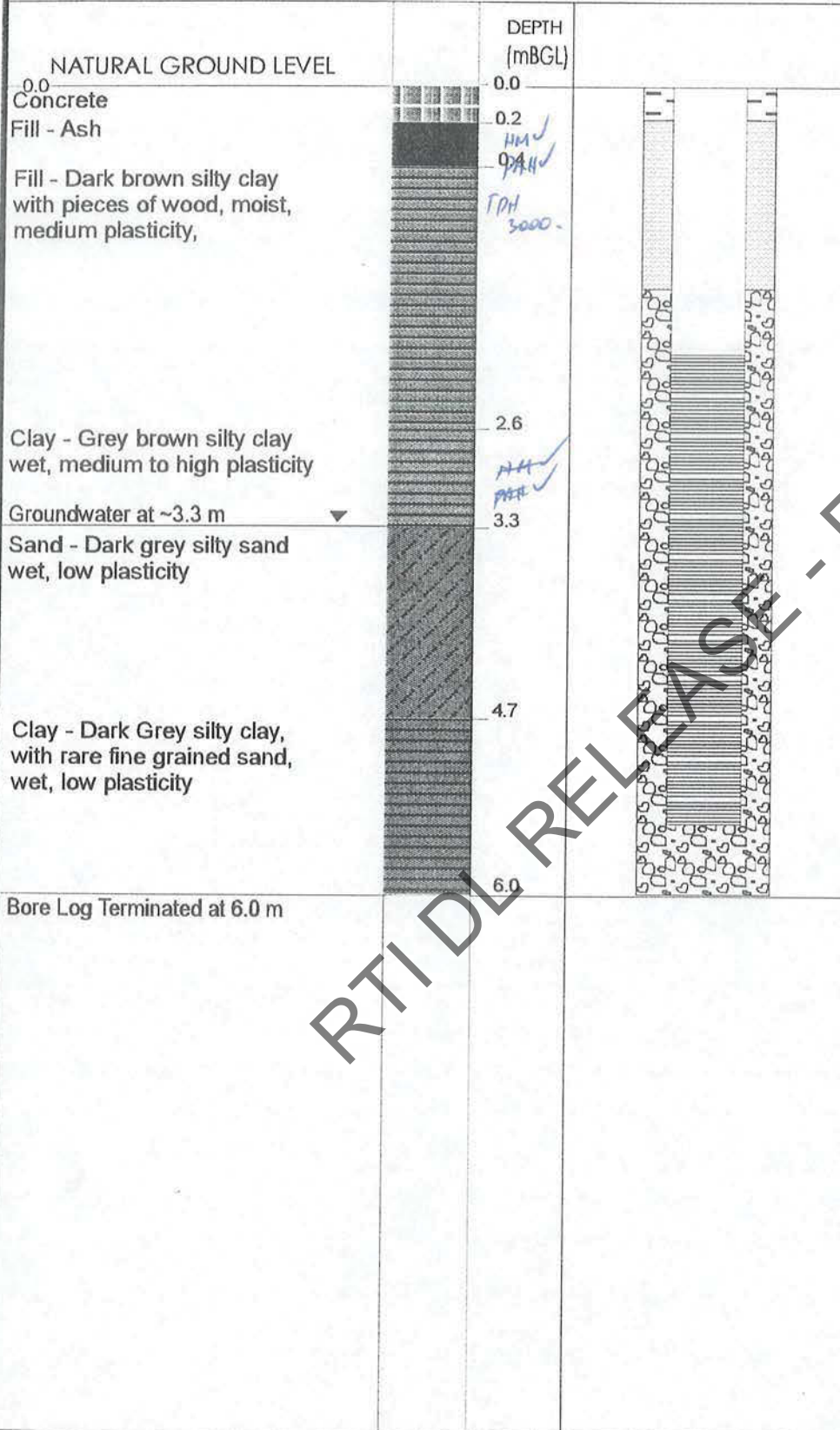
BORE HOLE DETAILS - BH8

New Farm Power Station ESA

STRATIGRAPHIC DESCRIPTION LOG

WELL CONSTRUCTION

DETAILS



GENERAL INFORMATION

LOCATION: Lamington Road, New Farm.

DATE DRILLED: 6 March 1998

EQUIPMENT USED

Drilling Company:
Paddy Christensen & Son
Drilling Rig with
120 mm solid stem auger.

Well Construction Details
50 mm Class 18 threaded, slotted, acid washed, PVC screen from 2.0 to 3.0 m BGL. Filter sand from 1.5 m BGL to 6.0 m BGL, bentonite seal from 0.1 m to 1.5 mBGL. Concrete pad and flush mount from ground surface to 0.1 mBGL. Lockable cap.

PID READINGS

DEPTH(mBGL)	PID (ppm)
0.5	0.0
1.0	0.0
2.0	0.0
3.0	0.0
4.0	0.0
5.0	0.0
6.0	0.0

BOREHOLE BH8

PPK
Environment & Infrastructure

JOB NO. 84K043A DR Page 01 BH8

Logged By: Personal information

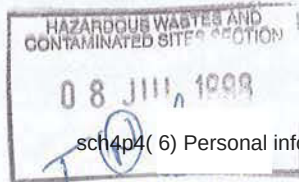
Sampled By: Personal information

Field Classification

- 0 No obvious contamination
- 1 Slight visual contamination and/or slight odour
- 2 Visual contamination and/or odour
- 3 Gross visual contamination and/or strong odour

Notes

Collection 17



**Draft Site Management Plan -
Lot 2 and a Portion of Lot 3 on
Registered Plan (RP) 210504,
Lot 1 and a Portion of Lot 2 on
RP53157**

Brisbane City Council

**PPK Environment &
Infrastructure Pty Ltd**

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July, 1998
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A NATA Certified Quality Company

DRAFT SITE MANAGEMENT PLAN - LOT 2 AND A PORTION OF LOT 3 ON REGISTERED PLAN (RP) 210504, LOT 1 AND A PORTION OF LOT 2 ON RP 53157.

1. Summary of Contamination

Site investigations conducted on the lots comprising the area of the proposed development, identified the following areas impacted by petroleum hydrocarbons (TPH), selected heavy metals, polycyclic aromatic hydrocarbons (PAHs) and asbestos.

1.1. New Farm Powerstation Site (Portion of Lot 3 on RP 210504)

- 1.1.1 Levels of selected heavy metals (arsenic, chromium, copper, lead and zinc) and/or PAH in excess of DoE guidelines were reported in soils in the northern corner, south western and south eastern boundaries of the site.
- 1.1.2 Maximum levels of lead (2340 mg/kg), zinc (1840 mg/kg) and mercury (3.9 mg/kg) were reported in soil samples in the south eastern (lead) and northern corner of the site (zinc and mercury).
- 1.1.3 Maximum PAH level of 355 mg/kg was reported in a soil sample obtained from the south western boundary of the site bordering New Farm Park.
- 1.1.4 Asbestos was identified in rubble material in the area of the demolished boilerhouse.

1.2. Queensland Electricity Commission (QTSC) Site (Lot 2 on RP 210504)

- 1.2.1 Levels of selected heavy metals (arsenic, chromium, copper, lead and zinc) and/or TPH in excess of DoE guidelines were reported in soils in the northern corner, south western boundary, centre and south eastern boundary of the site.
- 1.2.2 Maximum levels of arsenic (35 mg/kg), chromium (51 mg/kg), copper (440 mg/kg), lead (1670 mg/kg) and zinc (1570 mg/kg) were reported in soil samples from the south western boundary of the site.
- 1.2.3 Maximum TPH concentration of 1860 mg/kg was reported in the southern corner of the site.

1.3. Portion of Commonwealth Sugar Refineries (CSR) Site (Lot 2 on RP 53157)

- 1.3.1 Levels of copper, zinc and/or TPH in excess of DoE guidelines were reported in soils in the eastern corner, southern corner and south western portions of the site.

1.4. Powerhouse Park (Lot 1 on RP 53157)

- 1.4.1 Levels of selected heavy metals (magnesium and copper), TPH and/or PAHs in excess of DoE guidelines were reported in fill material in the northern corner, northern centre, eastern corner, south western corner and south western boundary of the site.
- 1.4.2 Maximum levels of selected heavy metals (manganese and copper) of 854 mg/kg and 98 mg/kg respectively were reported in fill material in the northern centre and southern corner of the site respectively.
- 1.4.3 Maximum levels of TPH and PAHs of 1540 mg/kg and 23.6 mg/kg respectively were reported in surface soils in the north western and northern centre portions of the site.
- 1.4.4 Asbestos was detected in a fill sample from an unspecified depth in the northern centre portion of the site.

A site layout indicating areas of contamination with respect to the proposed developments is presented in Appendix A.

2. Objectives

The objective of the Site Management Plan is to manage contaminants identified on Lot 2 and a portion of Lot 3 on registered plan (RP) 210504, Lot 1 and a portion of Lot 2 on RP 53157 in such a manner as to minimise potential human health and/or environmental effects. This shall be achieved through:

- 2.1 Prevention of contaminant migration from the site;
- 2.2 Implementation of controls on site excavation, building refurbishment and redevelopment works;
- 2.3 Provision for paving/sealing of the site to minimise potential contact of contaminants with humans and/or the environment;
- 2.4 Options for the planting of vegetation in appropriately prepared garden beds; and
- 2.5 Implementation of monitoring programs.

3.0 *Achievement and Management of Objectives*

In order to effectively manage the identified areas of concern, the following management options for the site have been developed:

- 3.1 Areas of identified contamination (refer Appendix A) should be covered with an impervious layer (eg. bitumen, concrete, clay capping, geo-synthetic liners, construction of buildings), to limit the rate of surface water infiltration.
- 3.2 A site specific Workplace Health and Safety Plan, satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997, shall be developed for the site and shall specifically address exposure to PAHs, TPH and heavy metal impacted soils and/or waters.
- 3.3 Gardens situated on contaminated areas shall be constructed in such a manner to minimise the potential for exposure to chemicals present in the soil (ie. volatilisation of contaminants, dermal contact). To this end, gardens shall be constructed on beds of at least 300 mm clean top soil and plants shall be selected such that root systems do not penetrate into potentially contaminated sub surface areas.
- 3.4 Measures to reduce the potential for soil erosion should be implemented.
- 3.5 In the event that impacted soils require removal from the site, approval under Section 118ZZF of the Environmental Protection Act shall be obtained prior to removal.
- 3.6 Areas of the site requiring extensive excavation, removal and/or disposal of soil from the identified impacted area shall include provisions for the protection of the environment. These may include:
 - 3.6.1 provision for stormwater controls around stockpiles and/or excavations to minimise the potential for off-site migration of contaminants;
 - 3.6.2 controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions);
 - 3.6.3 documentation of all contaminated soil transport operations including descriptions of processes, personnel and or organisations involved and approvals given.
- 3.7 Provision for further environmental site investigation should site excavation works identify further areas of contamination not previously investigated or monitoring programs indicate an increase in contaminant levels.
- 3.8 Consideration for the installation of groundwater monitoring wells on Powerhouse Park and the south eastern portion of the Powerstation site, to assess potential migration of identified contaminants into the underlying groundwater aquifer.

4.0 *Monitoring Requirements*

The owner shall be responsible for the following monitoring requirements:

- 4.1 An inspection of pollution control equipment and/or safety equipment installed during the period of the redevelopment and/or the operation of the site to ensure environmental impact is being minimised.
- 4.2 A biennial inspection of the site including condition of pavements, grassed areas, vegetation and records of soil excavation and/or removal/disposal.
- 4.3 Annual groundwater monitoring to commence upon the approval of this plan. The monitoring frequency may be modified to reflect changes in the condition of the groundwater aquifer (eg a reduction in monitoring should two consecutive rounds indicate impact has not occurred or an increase should monitoring indicate impact has occurred).
- 4.4 A biennial review of the Site Management Plan to ensure its ongoing suitability for the use of the site.
- 4.5 The commencement of the various monitoring periods is from the date of the approval of the plan.

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Approximate Scale



RTI 13-106

Collection 17

● Inferred Area of Contamination

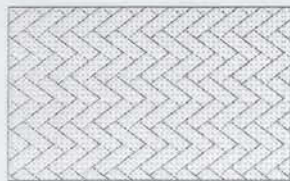
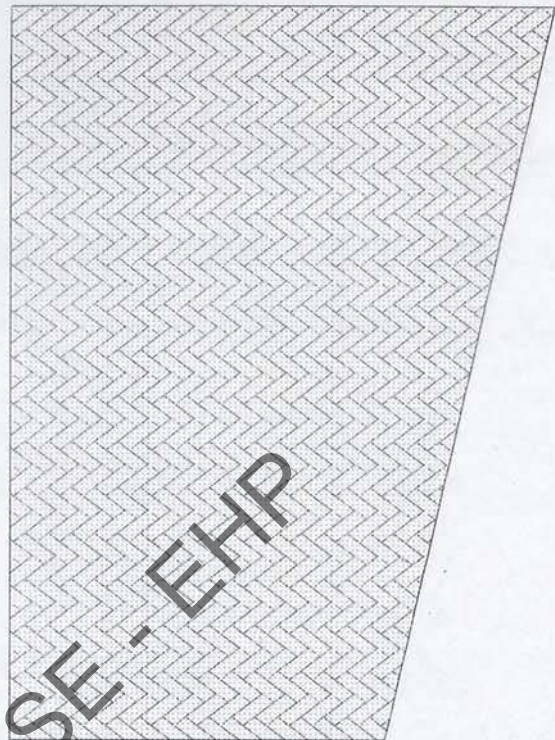
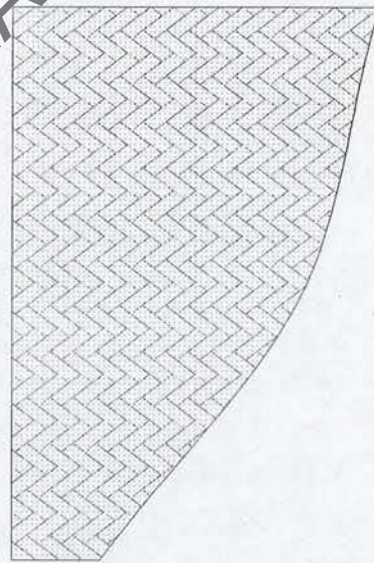
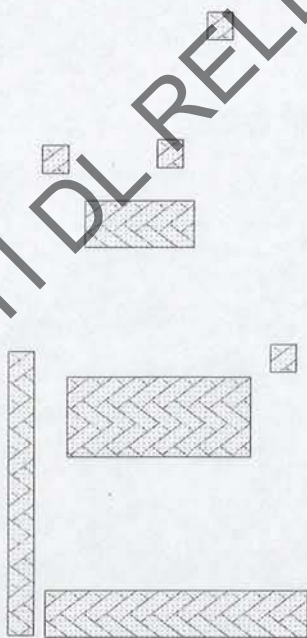
TITLE: Proposed BCC New Farm
Powerstation Development

Please note: Original drawing supplied by BCC

Page 145

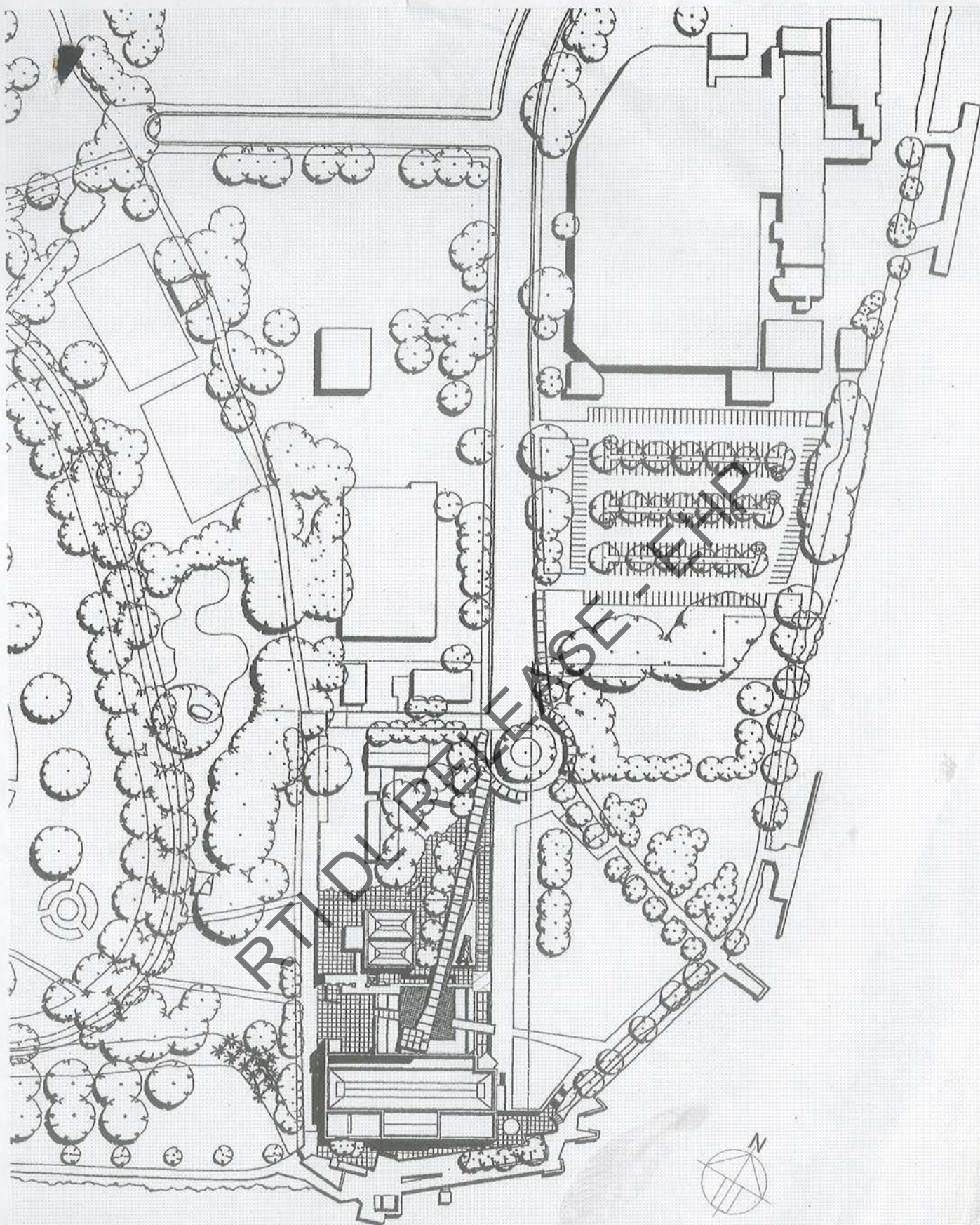
Release

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Key

 Identified areas of fill



Release

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To MAEK BREYER

Client DOE

Address Level 12, 160 ANN ST

BRISBANE QLD 4000

From CHRIS WOODFULL

Date 3/7/98

Project NEW FARM POWER STATION SMP

Job No. 84K109A

We enclose the following documents:

Quantity	Document No.	Rev. No.	Description
1	84K109A-AA0020CW		Draft SMP - Lot 2 and a portion of Lot 3 on RP 21054, Lot 1 and a portion of Lot 2 on RP 53157.
			Mack
			Draft SMP for Review (as well!) Have verbal approval to submit. NB. We have generated just one SMP for the moment but it will/should be easy to create "multiples" from this overall SMP for separate lots if necessary. Look forward to hearing back from you in the near future.
			Regards

sch4p4(6) Personal information

Please acknowledge receipt of documents by signing the green copy and returning to this office.

Reason

sch4p4(6) Personal information

Authorised by

Method of Delivery

HAND

**Environmental Site Assessment
of New Farm Power Station,
New Farm**

RTI DL RELEASE - EHP

Brisbane City Council

**PPK Environment &
Infrastructure Pty Ltd**

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September, 1997
84J153B/ PR002A1sr

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Executive Summary

PPK Environment & Infrastructure Pty Ltd (PPK) was commissioned by Brisbane City Council to investigate and report on potential site contamination arising from the operation of the New Farm Power Station, New Farm. The purpose of this report is to present and assess the significance of the results of the investigation and provide recommendations for appropriate remedial action, as required.

Site investigation works were undertaken in two phases, a hazardous materials audit and a contaminated site investigation. The objective of the hazardous materials audit, conducted on 28 and 29 July 1997, was to identify the extent of asbestos throughout the site, sample painted areas for the presence of lead based paint and obtain oil samples for PCB analysis.

The contaminated site investigation consisted of the excavation and sampling of ten test pits, carried out between 31 July and 1 August 1997. The locations of eight test pits were based on a 40 metre grid pattern around the perimeter of the site and two test pits were excavated in the area of the now demolished boilerhouse. Three additional soil samples were collected from drains located within the power station building. Three water samples were collected from sumps or depressions containing standing water.

Results of the hazardous substances audit indicated the following:

- Asbestos was present on site in a condition that presents a health risk to workers removing the material.
- Asbestos was present in a soil sample obtained from test pit 10, excavated in the area of fill in the demolished boilerhouse.
- Lead was found in 6 of 7 paint samples submitted for laboratory analysis in concentrations exceeding National Health and Medical Research Council (NH&MRC) guidelines.
- Polychlorinated biphenyls (PCBs) were not reported above detection limits in the samples submitted for laboratory analysis, however, it is likely that PCBs would be present in capacitors in fluorescent light fittings based on the light fittings' age.

Results of the contaminated soil and water investigation indicated the following:

- Site investigation works indicated that 8 of 23 soil samples submitted for laboratory analysis reported selected heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb and or Zn) and/or PAHs in levels greater than accepted DoE or Dutch Intervention guidelines.
- The areas exhibiting the greatest impact on site are the drain sediments inside the turbine room and coal handling area, the area of fill along the southern boundary of the site, the area of fill along the western boundary adjacent to New Farm Park and the area of fill in a backfilled depression adjacent to the boilerhouse (TP2).
- Toxicity characteristic leaching procedure (TCLP) analysis of samples Turbine room 1 East (Turb 1 East) and TP 2; 0.3-0.5 indicated lead and zinc levels in leachate exceeded the acceptance criteria for unlined landfills but were within the limits for lined landfills.
- Three water samples obtained from the turbine room, coal bunker and sump (inside the powerhouse building) contained TPH, Pb and/or Hg at levels in excess of ANZECC and/or Trade Waste Discharge Limits for Brisbane City Council.

Based on the results of this assessment the site contains power station related contaminants in soil and water in excess of the relevant health or environmental guidelines. Further to this, hazardous materials are present on site in concentrations and/or conditions that potentially pose a risk to future workers or users of the site. The site is being considered for redevelopment for public use, and consequently the above issues require addressing prior to redevelopment.

The following recommendations to facilitate redevelopment may be made:

- Prior to any demolition, removal works and/or remedial works, a comprehensive workplace health and safety plan be developed.
- Friable asbestos material be removed from site by a licensed asbestos removalist and disposed of at an approved landfill, in accordance with all statutory and legislative requirements.
- Airborne fibre monitoring during and after removal of asbestos material and final visual inspection (to be conducted by suitably qualified occupational hygienist).
- Further air sampling of the indoor air environment to determine airborne lead paint concentrations.
- Interim measures for mitigating the exposure to lead particulates such as encapsulating the material and final removal of lead based paint to be undertaken by a suitably qualified contractor in accordance with the draft Australian Standard DR97003.
- Suspected PCB capacitors be removed from light fittings and disposed of in accordance with all relevant statutory requirements.
- A health risk assessment be conducted for selected parameters and pathways to assist in the development of appropriate remedial strategies for impacted soil material. Remedial strategies may include capping and/or limited excavation and disposal.
- Further investigation to delineate the extent of contamination in areas which may require remedial works (eg TP2).
- Assessment of groundwater conditions and potential impacts to nearby aquatic eco-systems.
- Disposal of contaminated drain sediments and the fill adjacent to the boilerhouse (TP2) to a lined landfill be undertaken in accordance with all statutory requirements. A Section 14 Approval for the Transport and Disposal of Contaminated Material is required for this work.
- Contaminated surface waters to be collected by a suitably licensed liquid waste disposal contractor, treated and disposed of at a licensed treatment facility. Alternatively, on site treatment of the water to a level meeting Trade Waste Discharge Limits may be undertaken prior to discharge to sewer.

1. Introduction

PPK Environment & Infrastructure Pty Ltd (PPK) was commissioned by Brisbane City Council to investigate and report on potential soil impacts and hazardous materials present at the decommissioned New Farm Power Station.

The site is being considered for redevelopment for public use and the health risks associated with the site need to be assessed prior to redevelopment occurring. The scope of works for the hazardous materials audit and the soil investigation reported herein were detailed in the PPK proposal dated July 1997 (referenced 84JP153). A summary of the objectives is as follows:

- Identify the presence of asbestos materials and develop a building register outlining the location, amount and type of asbestos encountered.
- Identify the presence of polychlorinated biphenyls (PCBs) and develop appropriate disposal options if required.
- Characterise the extent of contamination on-site and assess contaminant mobility based on soil pH and TCLP results.
- Provide recommendations for the conduct of a health and/or ecological risk assessment.

To achieve these objectives, the assessment included the following activities:

- Review of previous consultants' investigation reports.
- Conduct a hazardous materials audit to identify the extent of lead based paint, asbestos and PCBs.
- Conduct a soil and surface water investigation.
- Preparation of a Site Investigation Report.

This report presents the results of the investigation and contains recommendations applicable for the re-development of the site. Site audit and investigation works were carried out during the period 28 July to 1 August 1997.

2. Background Information

2.1 Overview of Previous Consultants' Reports

New Farm Power Station and the adjacent Queensland Electricity Commission (QEC) site have been the subject of two previous site investigations:

- Stage 1 - Preliminary Site Investigation New Farm Powerhouse, Brisbane City Council Analytical Services
- Preliminary Site Assessment on QTSC Site - New Farm, Woodward-Clyde.

The Stage 1 Site Investigation by Brisbane City Council indicated the following:

- Sample locations were predominantly confined to the area of fill on the eastern side of the site with further sampling occurring in the boilerhouse rubble, and various surface locations.
- Soil samples (obtained from boreholes 3, 6, and 10 in the area of the fill) analysed contained selected heavy metal concentrations greater than Department of Environment (DoE) guidelines.
- Organic compound results greater than DoE levels were obtained in three samples (boreholes 1, 3 and 5) and asbestos was detected in borehole 3.
- This report concluded that "there was no evidence of any significant levels of contamination which would restrict the development of the site for the end uses proposed".

Woodward Clyde conducted a preliminary site assessment for the adjacent QTSC/QEC site and the results from this indicated that:

- Surface samples (obtained from TP1, TP2 and FP3) contained selected heavy metal concentrations greater than DoE threshold values.
- Samples at depth were not analysed. Fill including ash, gravel and general rubbish was encountered in two of the three test pits.

2.2 Property/Address

The site address is New Farm Powerhouse, Lamington Road, New Farm. A site location map for the site is presented in Appendix A.

2.3 Party Responsible for Assessment

Brisbane City Council
69 Ann Street
BRISBANE QLD 4000

2.4 Environmental Consultant

PPK Environment and Infrastructure Pty Ltd
IBM Centre
348 Edward Street
BRISBANE QLD 4000

2.5 Proposed Land Use

The New Farm Power Station site has been decommissioned and is being considered for re-development for public use.

2.6 Operator of Site

The registered owner of the site is Brisbane City Council.

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3. Site Description and Inspection

3.1 Topography

The site occupies a near rectangular parcel of land approximately 95 metres by 110 metres in dimension.

The site consists of three terraces (north western, middle and south eastern). The south eastern and the north western terraces are essentially flat whilst the middle terrace is elevated and slopes at approximately 3-5° to the north west and approximately 5-8° towards the south east.

A site layout is presented in Appendix B.

3.2 Surrounding Land Use

The New Farm Power Station is situated at the end of Lamington Road, in an area used extensively for light industrial activity and public open space.

Queensland Electricity Corporation (QEC) operates several workshops on the north western boundary of the site and a Commonwealth Sugar Refineries (CSR) gypsum bulk handling depot is located approximately 200 metres north of the site. To the south west and north east the site is bordered by New Farm Park and Power House Park, respectively. The Brisbane River represents the southern boundary of the site.

3.3 Local/Regional Geology

Geological survey maps indicate that soils in the area are Quaternary aged undifferentiated alluvial plains consisting of sand, silt clay and gravel. The alluvial sediments overlie a sequence of primarily Triassic aged volcanic rocks including ignimbrite, stratified and massive rhyolitic tuff, and conglomerate, sandstone and scree breccia horizons. The volcanic rock sequence is underlain by cleaved shale, siltstone and greywacke of the Neranleigh - Fernvale Beds formation (Brisbane Sheet 9543 1:100 000 Geological Map; Department of Mines 1986).

3.4 Groundwater

The close proximity of the Brisbane River suggests that groundwater will be encountered at approximately 2 - 3 metres depth below ground level. The shallow depth was later confirmed during site works.

3.5 Site Observations

At the time of the site works the site was secured by a chain link fence around the perimeter. Several holes in the fence were evident allowing access to the power station grounds and building. Approximately 70% of the site is paved or constructed upon with unpaved areas being present on top of the boilerhouse, the western and southern sides of the power house structure and the eastern area of fill. The condition of the concrete in the area of the railway line and in front of the boilerhouse was satisfactory. Unpaved areas were well grassed and the vegetation did not exhibit signs of die back. Broken asbestos cement sheeting was scattered at various points outside the building structure.

The demolished boilerhouse area has been filled, with building rubble, vegetation and topsoil, being visible through gaps in retaining plate steel sheets located adjacent to the railway line. The ground surface of the boilerhouse is uneven and piles of building debris and removed vegetation were located in this area.

The interior of the power station building was in a state of disrepair with building debris located at various points. The majority of machinery and infrastructure had been previously removed with the exception of the gantry crane, switches and transformer remaining. Previous asbestos removal work is evident on the northern side of the first, ground and lower ground floors. Damaged asbestos materials are scattered throughout the power house and very few undamaged asbestos materials remain.

Oils from the switch room located on the first floor had leaked from the switches through floor penetrations resulting in pooling on the lower floor. Several areas of standing water and drain sediments were also noted at this time. Paint in the interior of the building was encountered in various states of repair and many of the wall surfaces exhibited graffiti.

There is evidence to suggest that the site has been utilised as an illegal party venue and used syringes were noted at various locations around the site. Broken bottles and other rubbish were also noted during site investigation works.

4. Summary of Potential Contamination Issues

Based on the previous use of the site as a power station, an initial site visit, and Brisbane City Council anecdotal information, the following contaminants may be present:

- Asbestos - from wall and roof sheeting, pipe lagging, fireproofing and electrical insulation.
- PCBs - from fluorescent light capacitors and leaking switch room and transformer oils.
- Lead - from lead-based paint.
- Poly aromatic hydrocarbons (PAHs) - produced as a by product of the combustion process contained in areas of ash fill.
- Metals - from boiler ash waste.
- Organo chlorine pesticides (OCPs) - from weed control around the railway line.
- Petroleum hydrocarbons - from the spillage of waste oil and or diesel from machinery operation and the railway line.

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5. Hazardous Materials Sampling Program

5.1 Sampling Methodology and Locations

Sampling locations for asbestos, lead-based paint and PCBs are presented in Appendix C.

Samples of suspected asbestos materials were collected from representative locations throughout the power station and surrounding grounds. The samples were collected by removing a small portion of the suspect material using clean tools and equipment, placing the sample into a clean plastic clip lock bag and assigning a unique identification number. This number was recorded in the field sampling record together with details describing the location, product type, size, and condition of the material.

Photographs of the asbestos sample in-situ were taken at each sampling location and relevant sample details were recorded. These included:

- size
- condition
- product type
- application

Lead-based paint samples were collected by carefully scraping paint samples from selected locations within the power station building. These scrapings were then placed into clean plastic clip lock bags and submitted for laboratory analysis.

Suspected PCB material was collected in clean, acid washed, solvent rinsed, sample jars supplied by the analytical laboratory. Oil from switch gear and transformers within the power house structure were targeted for PCB analysis. Photographs are supplied in Appendix D.

5.2 Handling of Samples

PCB samples were placed into an esky chilled to approximately 4°C by frozen ice bricks. Each sample was assigned a unique sampling number and details placed on the field sampling record.

Upon completion of field activities, all samples were checked for labelling consistency and reconciled to the field sampling record. Chain of Custody and laboratory analysis requests were completed for each sample batch. The asbestos, lead based paint and PCB samples were submitted to a NATA accredited laboratory within 24 hours of collection.

5.3 Laboratories Used

Asbestos

PPK Asbestos Laboratory
348 Edward Street
Brisbane QLD 4000

Lead Based Paint and PCBs

Amdel Ltd
5 Kelray Place
Asquith NSW 2077

5.4 Assessment Criteria

To determine the significance of any contamination detected it is necessary to define applicable concentrations that are to be used for comparison.

Asbestos

Exposure limits for airborne concentration of asbestos have been formulated by Worksafe Australia and are as follows:

- | | |
|----------------------------------|---------------|
| ■ Chrysotile (White asbestos): | 1.0 fibres/ml |
| ■ Amosite (Brown/Grey asbestos): | 0.1 fibres/ml |
| ■ Crocidolite (Blue asbestos): | 0.1 fibres/ml |
| ■ Other Forms of asbestos: | 0.1 fibres/ml |

For the purpose of this assessment a worst case scenario has been presumed and consequently the limit of 0.1 fibres/ml has been adopted. Presently, there are no guidelines or concentrations for asbestos fibres in soil.

Lead Based Paint

There is on going regulatory discussion about the concentration limit for lead in paint with values ranging from 0.25 % and 1.0 %. For the purpose of this investigation the level of 0.25 % formulated by the National Health and Medical Research Council (NH&MRC) for new paint has been adopted.

PCBs

PCBs are persistent in the environment and have a DoE threshold level of 1 mg/kg in soil. Currently there are no health based guidelines utilised by the DoE for the assessment of PCBs. PCBs have been classified as a Class 1a carcinogen by the Western Australian Health Department and a limit of 50 ppm has been adopted for PCBs in capacitors.

5.5 Results

The hazardous materials audit yielded the following results. Full laboratory analytical results for asbestos, lead-based paint and PCBs are supplied in Appendix E.

Asbestos

Two forms of asbestos products were identified during site inspection work: bonded asbestos and friable asbestos. Bonded asbestos-containing materials identified include:

- fibre cement sheeting
- resinous mounting boards
- fibre cement pipework

The fibre cement sheeting identified is generally in poor condition, badly damaged and scattered over the entire site. This material contains a mixture of all three asbestos types and appears to have originated from internal wall linings, ceiling linings, external eaves linings, and gable ends.

Resinous mounting boards containing chrysotile asbestos are located mainly in the switch room on the south side of the power station and are generally in fair condition.

A small section of fibre cement pipework is located in the service tunnel at the far western end of the ground floor. This material is unsealed and generally in good condition.

The bonded materials pose a low risk to health as asbestos fibres are bound into the firm matrix material. Of greater concern to health is the friable asbestos located at various points throughout the site.

Friable asbestos-containing materials identified during the site inspection include:

- lagging debris
- millboard
- woven textile

Asbestos lagging is located in minor quantities at various points throughout the first, ground and lower ground floors and contains a mixture of chrysotile and crocidolite asbestos. It is understood this material originates from removed steam pipes and boilers.

Asbestos millboard material containing chrysotile asbestos is located in switch room fuse covers and is present as thermal lining inside the electrical cabinet door on the east wall of the ground floor. Additional asbestos millboard in the form of castings are present in the switch rooms and appear to originate from within the switch gear. The millboard material is in a generally poor condition and scattered over the floor surface.

The woven textile material located mainly in the switch rooms or south side of the ground floor contains chrysotile asbestos. The woven nature of this material is less likely to release significant airborne fibre concentrations. In some instances this material is partially sealed with paint providing an encapsulant over the asbestos, thus further inhibiting fibre release.

The asbestos lagging and millboard materials are friable and unstable in their present condition and may release significant levels of airborne fibre (>0.05 fibres/ml) if disturbed. Due to the friable nature of the woven asbestos textile material and its location on floor surfaces, it is considered a moderate risk to health.

The extent of the asbestos is not fully known on the lower ground floor as it is currently submerged in approximately 300 mm of water. Friable asbestos-containing material was detected at the northern edges of the lower ground floor area and it must be presumed that further asbestos contamination may exist below the water surface.

Sampling for airborne fibres within the power station revealed that airborne fibre concentrations were well below the occupational exposure standard of 0.1 fibres per millilitre and were not approaching the action level of 0.05 fibres per millilitre.

Two soil samples were collected from test pits excavated in the building rubble of the demolished boilerhouse and analysed for asbestos. One soil sample (TP10; 2.2-2.4m) contained chrysotile asbestos in cement sheeting.

A summary of identified asbestos situations is contained in Table 1 and a full asbestos register is presented in Appendix F.

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Table 1 - Identified Asbestos Situations

Lower Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Fill material at the side of lower floor area on southern side	Debris	Insulation material	Poor	Yes	Immediate	Unknown	CH	Refer 20	-	Significant quantities of asbestos debris are present in the soil on northern edge next to steps. This material may be scattered throughout the lower ground floor area, which is presently submerged in 300mm water.

CH - Chrysotile Asbestos
A - Amosite Asbestos
C - Crocidolite Asbestos
NAD - No Asbestos Detected

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Table 1 Continued... Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Third column from west end	Debris	Insulation material	Poor	Yes	Immediate	< 1m ²	CH	Refer 20	22/1	
Back of third column from west end	Debris	Insulation material	Poor	Yes	Immediate	< 1m ²	CH	20	23/1	Debris at base of column is visually consistent with debris on column. Some material evident around base of several other columns.
Throughout ground floor	Debris	Fibre cement sheeting	Poor	No	Medium	< 1m ²	CH,A,C	Refer 7	-	Scattered over floor surface
On top of concrete plinth on northern wall	Debris	Insulation material	Poor	Yes	Immediate	< 1m ²	CH	Refer 20	-	
Electrical Cabinet, eastern wall	Arc shields	Fibre cement sheeting	Fair	No	Medium	< 1m ²	CH	21	24/1	Four Arc shields
Electrical Cabinet, eastern wall	Electrical mounting board	Resinous board	Fair	No	Medium	< 1m ²	CH	22	24/1	
Electrical Cabinet, eastern wall	Insulation to cabinet door	Millboard	Poor	Yes	High	1m ²	CH	23	24/1	Internal thermal lining to cabinet door
1st small room, south-east corner	Debris	Fibre cement sheeting	Poor	No	Medium	2m ²	CH,A,C	Refer 7	-	Broken fibre cement sheeting and resinous membrane scattered over floor surface
1st small room, southern wall	Gasket	Gasket	Fair	No	Medium	1m ²	CH	24	1/2	These and other gaskets are scattered throughout ground floor area.
South wall	Fuse insulation	Textile	Poor	Yes	High	10m ²	CH	26	3/2	Widespread throughout area
Tunnel - west wall	Gutter Down pipe	Compressed sheet	Fair	No	Medium	2 linear meters	CH	27	4/2	Unsealed

CH - Chrysotile Asbestos
 A - Amosite Asbestos
 C - Crocidolite Asbestos
 NAD - No Asbestos Detected

Table 1 Continued... First Floor (Level 1)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Elevated Floor Slab on south side	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	13	12/1	
Throughout first floor	Debris	Fibre cement sheet	Poor	No	Medium	40m ²	CH,A,C,	Refer 7	16/1	Damaged fibre cement sheeting scattered over entire floor surface
Recess in north wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	Refer 13	17/1	
Hole at base of north wall near elevated platform	Debris	Insulation material	poor	Yes	Immediate	<1m ²	CH,C	Refer 13	18/1	
Switch Room, south west corner	Insulation to fuse socket	Textile	Fair	Yes	High	2m ²	CH	17	19/1	
Switch Room, south west corner	Insulation to fuse hood	Millboard	Fair	Yes	High	2m ²	CH	18	20/1	
Switch Room, south west corner	Debris	Millboard	Poor	Yes	Immediate	2m ²	CH	Refer 17 and 18	21/1	Asbestos millboard castings are scattered over entire floor. Similar situations are present in either switch rooms.
LT Board Room, south west corner on floor	Debris	Textile	Poor	Yes	High	1m ²	CH	Refer 17	-	Asbestos textile debris is scattered over floor surface
Electrical Cabinet, south wall of Turbine Room	Arc Shields	Fibre cement sheeting	Fair	No	Medium	1m ²	CH	Refer 21	-	Arc shields are unsealed

CH - Chrysotile Asbestos

A - Amosite Asbestos

C - Crocidolite Asbestos

NAD - No Asbestos Detected

Table 1 Continued... First Floor (Level 1) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Mezzanine Floor surface	Debris	Fibre cement sheeting	Poor	No	Medium	1m ²	CH	Refer 28	-	Broken fibre cement sheeting scattered on floor originates from leaves lining
South side of Mezzanine	Insulation to electrical mounting board	Millboard	Poor	Yes	High	< 1m ²	CH	15	15/1	Thermal lining inside electrical box

Second Floor (Level 2)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Floor Partition Walls	Wall lining	Fibre cement sheeting	Poor	No	Medium	30m ²	CH	12	10/1	Badly damaged fibre cement sheeting, debris scattered over floor surface

Second Floor (Level 2) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Throughout Mezzanine	Ceiling lining	Fibre cement sheeting	Poor	No	Medium	240 m ²	CH,A,C	7	-	Several sheets smashed and badly damaged
Switch Room	Lower wall lining	Fibre cement sheeting	Fair	No	Medium	40 m ²	CH	8	6/1	
Switch Room	Electrical mounting board	Resinous board	Fair	No	Medium	2 m ²	CH	11	9/1	Dark coloured mounting boards
Throughout Mezzanine	Debris	Fibre cement sheeting	poor	No	Medium	10 m ²	CH,A,C	Refer 7	-	Broken AC debris scattered over floor surface

CH - Chrysotile Asbestos
A - Amosite Asbestos
C - Crocidolite Asbestos
NAD - No Asbestos Detected

Table 1 Continued... External

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
2nd floor S/W deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	2	2	Broken fibre cement sheeting scattered over deck floor. Appears to originate from switch room
Roof	Gable end	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	4	4	Fibre cement sheeting is badly damaged at east and west ends of roof
Roof	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	Refer 4	4	Broken fibre cement sheeting scattered over east and west ends of roof
Roof - north side	Wall lining	Fibre cement sheeting	Poor	No	Medium	40m ²	CH	Refer 4	Refer 4	
2nd floor S/E deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	Refer 2		Broken fibre cement sheeting scattered over deck floor. Appears to originate from switch room

Surrounding Grounds

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Perimeter of Building	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH,A,C	Refer 10	5/2	Fibre cement sheeting debris scattered around building
East Wall	Eaves lining	Fibre cement sheeting	Poor	No	Medium	22m ²	CH	28	6/2	Eaves lining is badly damaged

CH - Chrysotile Asbestos
A - Amosite Asbestos
C - Crocidolite Asbestos
NAD - No Asbestos Detected

Lead Based Paint

Structures painted with lead-based paint have deteriorated considerably over the years. Much of the paint has peeled away from the substrate and has fallen on lower surfaces. Elevated lead concentrations in excess of the occupational exposure guidelines of 0.25 % were detected in six of the seven samples submitted for laboratory analysis. A maximum lead content of 46 % was detected sample P3, corresponding to a light blue/grey paint on structural steel RSJ beams.

A summary of elevated lead results is presented in Table 2.

Table 2 - Elevated Lead in Paint Concentrations

Sample No	Sample Description	Lead Content (% W/W)
P1	Blue coloured paint with white undercoat on internal walls, level 2 mezzanine	13
P2	Light blue paint on switchboard units, level 2 mezzanine	0.940
P3	Light blue/grey paint on structural steel RSJ beams, level 2	46
P4	Brown/yellow paint on lower walls, level 1	18
P6	Silver coloured paint on structural steel columns throughout power station	19
P7	White paint on upper walls throughout ground floor and level 1	11

PCBs

Analysis of suspected PCB containing materials revealed that PCBs were not present. A sample of the electrical capacitors in the fluorescent light fittings was not obtained for safety reasons, however, these capacitors are suspected to contain PCBs due to their age.

5.6 Risk Appraisal

Asbestos

At present, the asbestos materials located at the New Farm Power Station do not pose an immediate risk to health. This assessment is based on the results of airborne fibre monitoring conducted at various representative locations on site which reveal no elevated airborne fibre levels (>0.1 fibres/ml) on site.

Lead Based Paint

The extent and poor condition of lead-based paints throughout the New Farm Power Station presents a health hazard to persons entering the site as it may easily become airborne and possibly inhaled or swallowed.

PCBs

PCBs were not detected in the samples analysed, however, it is presumed that fluorescent light capacitors contain PCB material. Suspected PCB-containing capacitors are not likely to present a risk to personnel on site providing they remain undisturbed.

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6. Soil and Water Sampling Program

6.1 Soil Sampling Methodology and Locations

Soil sampling locations are supplied as Appendix G.

The soil sampling program was conducted during the period from 31 July to 1 August and consisted of:

- The excavation of test pits on a 40 metre grid pattern around the perimeter of the building and the excavation of two pits in the demolished boilerhouse. Samples from the test pits (TPs 1 - 10), were taken at 0.5 metres intervals or change of strata (whichever was the greater) up to a maximum depth of 4.3 m.
- Three sediment samples (Coal Drain, Turb 1 East and Turb 2 West) obtained from sealed drains located within the powerhouse building.

Excavation was undertaken using a backhoe and the bucket was pressure cleaned between test pits to minimise the risk of cross contamination.

A stainless steel trowel was used to collect soil samples from the bucket or excavation wall and the trowel was washed between samples to reduce the risk of cross contamination.

6.2 Water Sampling Methodology and Locations

Areas of free standing water were identified during a preliminary site walkover in the following locations:

- The sump located beneath the switch rooms.
- Coal bunkers in the turbine room.
- Turbine room depressions.

Water samples from the sump were collected using a disposable bailer with the sample being transferred to sample bottles. The coal bunker and turbine room depressions were sampled by immersing the clean sample jars into the water and drawing the sample.

All sample jars and bottles were supplied by the laboratory performing the analysis.

6.3 Ground Conditions Encountered

Soil conditions encountered on site varied greatly and test pit logs are presented in Appendix H. A summary of the soil conditions encountered is as follows:

- Natural Type 1:** Clay. Light brown, soft, moist sandy silty clay. This material was encountered in test pit TP1 from 0.4 m to 1.4 m below ground level (BGL).
- Natural Type 2:** Clay. Dark brown-grey to dark orange-brown soft to firm, moist silty clay. This material was encountered in 7 of the ten test pits (TPs 1, 2, 3, 4, 5, 6, 8). The depth encountered ranged from 1.6 m to 3.9 m BGL.
- Fill Type 1:** Ash. Light grey to black gravelly ash with some gravel sized vesicular slag. This material was encountered in TPs 3, 4, 5, 6, 7, 10 at varying depths.
- Fill Type 2:** Rubble. Orange brick building rubble including glass, concrete, pipes, signs, rags, plasterboard sheet, asbestos. This material was encountered in TPs 9, 10 at various depths.
- Fill Type 3:** Asbestos lagging. Off white asbestos lagging material encountered in TP6 at approximately 0.5 m depth BGL.
- Fill Type 4:** Sand. Dark brown silty sand to sandy gravelly clay with abundant boulders encountered in TPs 7 and 8 up to 2.1 m BGL.
- Fill Various:** Heterogeneous fills encountered in TPs 2 to 10 consisting of grey to brown gravels, sands, silts and clays including brick fragments, ash, slag, glass, clay pipes and other materials.

6.4 Handling of Soil and Water Samples

Soil samples once collected were placed into acid washed, solvent rinsed, Teflon sealed glass sample jars and stored in eskies chilled to approximately 4°C with frozen ice bricks.

Upon completion of all field works the soil samples were checked for labelling consistency with the field sampling record and a Chain of Custody Form completed. Upon verification of correct labelling the samples were repacked in another esky with freshly frozen ice bricks and submitted to the laboratory. In the event that samples were not able to be submitted within 24 hours they were stored overnight in the PPK sample refrigerator at less than 4°C.

Upon collection water samples were stored in an esky chilled to approximately 4°C by frozen ice bricks. Upon completion of site works the samples were checked for labelling consistency and a Chain of Custody Form completed. These samples were then submitted to the laboratory within 24 hours.

6.5 Sampling Depths and Analytes

Individual soil samples were collected at 0.5 metre intervals or change of strata whichever was the greater. All soil samples were submitted to the laboratory for the following analysis:

- Total Petroleum Hydrocarbons (TPH) in the C₆-C₃₆ chain length range
- Poly-aromatic Hydrocarbons (PAH)
- Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)
- pH

In addition, the following analyses were undertaken

- 1 sample from each test pit was submitted for analysis of sulphur
- 3 samples submitted for analysis of OCPs and organo-phosphorous pesticides (OPPs)
- 4 samples submitted for analysis of cyanide
- 2 samples submitted for toxicity characteristic leaching procedure (TCLP) analysis of selected heavy metals.

All water samples were submitted for the following analysis:

- TPH
- Heavy Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)

In addition, the sump sample was submitted for analysis of PCBs.

The above described analytes were chosen on the basis of previous site activities and possible contaminants commonly associated with power station sites.

6.6 Laboratories Used

Soil and Water

Amdel
5 Kelray Place
Asquith NSW 2077

6.7 Assessment Criteria

Assessment criteria are utilised to determine the significance of contamination detected during the sampling program and determine appropriate removal/disposal techniques. For this investigation and the determining of appropriate disposal strategies the following assessment criteria were consulted:

- Soil assessment criteria:

- ▶ DoE threshold levels.
- ▶ Dutch Intervention levels consulted in the absence of applicable DoE levels.
- ▶ Brisbane City Council Disposal criteria for lined and unlined landfills.
- Water Assessment criteria:
 - ▶ ANZECC Guidelines for raw water.
 - ▶ Brisbane City Council Trade Waste Discharge Limits.

6.8 Results

Laboratory analytical results and returned Chain of Custody forms are supplied as Appendix I and J respectively. A summary of the analytical results with statistical analysis is supplied as Appendix K.

6.9 Analytical Results - Soil

With respect to the site conditions and regulatory requirements, the results of the soil investigation are :

- Arsenic levels, above the DoE guideline of 20 mg/kg were detected in 2 of 23 samples analysed. These elevated results were detected in TP2 (fill material in a backfilled depression adjacent to the boilerhouse) and Turb 1 East (sediment in an open concrete drain in the turbine room).
- Levels of cadmium above DoE guidelines were encountered in 3 samples analysed. These samples were Coal Drain (sediment in sealed concrete drain in the coal handling area) Turb 1 East and Turb 2 West (sediment in an open concrete drain in the turbine room). A maximum concentration of 52 mg/kg was detected in sample Turb 1 East.
- Soil sample Turb 1 east reported elevated chromium, copper, nickel and mercury levels in excess of DoE guidelines of 57 mg/kg, 1140 mg/kg, 60mg/kg and 291 mg/kg respectively.
- Copper concentrations in excess of DoE guidelines were detected in a further 5 samples. These were:
 - ▶ Coal Drain;
 - ▶ Turb 2 West;
 - ▶ Two samples from TP 8 (fill material located on the south eastern boundary of the site adjacent to the Brisbane River); and
 - ▶ TP 2.

- Mercury concentrations in excess of DoE guidelines were detected in 3 further samples. These were:
 - TP 2;
 - Coal Drain; and
 - Turb 2 West.
- Lead and zinc concentrations exceeding the DoE guidelines were detected in samples obtained from TP 2, TP 8, Coal Drain, Turb 1 East and Turb 2 West. A sample from TP 4 (western side of site adjacent to New Farm Park), taken from approximately 2.8 m BGL, contained zinc in concentrations exceeding DoE guidelines.
- Levels of PAHs in excess of DoE guidelines were detected in two samples TP 4 and TP 7 (located on western end of southern boundary adjacent to Brisbane River) with a maximum total PAH concentration of 355 mg/kg being present in the sample from TP4.
- TCLP analysis of samples from TP2 and Turb 1 East indicated lead and zinc levels in leachate greater than acceptance criteria for unlined landfills, however, the leachability of contaminants within the material is within disposal criteria for a lined landfill.

All other parameters analysed were below the relevant DoE or Dutch Intervention guidelines.

Table 3 provides a summary of soil sample results above the regulatory thresholds.

Table 3 - Elevated Soil Contaminant Levels

Sample #	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Total PAH
TP2 0.3-0.5	124	1	14	131	42	818	1840	3.9	-
TP4 2.8-2.9	-	1	21	20	17	57	880	0.12	355
TP7 1.9-2.0	-	-	9	59	11	105	131	0.48	87
TP8 1.2-1.3	-	-	8	72	12	17	131	0.33	-
TP8 1.9-2.0	9	-	8	110	15	2340	376	0.12	8.7
Coal Drain	7	52	16	282	13	5140	3360	2.1	-
Turbine 1 East	30	11	57	1140	88	23 700	23 600	291	-
Turbine 2 West	17	8	48	528	52	24 600	28 300	27	-
DoE Guideline	20	3	50	60	60	300	200	1	20
Dutch Intervention	55	12	380	190	210	530	720	10	40

Notes: All values in mg/kg unless otherwise specified
Values in bold indicate levels exceeding DoE guideline
- Indicates level lower than laboratory analysis limits of detection

6.10 Analytical Results - Water

Water sampling and laboratory analysis of samples obtained from the three identified areas of standing water produced the following results:

- Levels of TPH exceeding the Brisbane City Council Trade Waste Discharge Limits were detected in water samples collected from the turbine room, coal bunker and sump. A maximum total TPH concentration of 3040 mg/L was detected in the sump sample.
- Lead levels exceeding the ANZECC Raw Water guidelines were detected in the Turbine room and Bunker samples.
- A mercury level above the ANZECC Raw Water guideline of 0.013 mg/L was encountered in the Bunker sample.

Table 4 provides a summary of the elevated water results exceeding current regulatory criteria.

Table 4 - Elevated Water Contaminant Levels

Sample #	TPH C ₉	C ₆ - C ₁₄	TPH C ₁₀ - C ₂₈	C ₁₅ - C ₃₆	TPH C ₂₉ - C ₃₆	Pb	Hg
Turbine Room	-	100	36 000	-	102	-	-
Sump	-	2200	3 000 000	34 000	-	-	-
Bunker	-	260	6400	1000	1200	13	
Brisbane City Council Trade Waste Discharge Limit	30 000					10 000	50
ANZECC Guideline	-					0.05	0.001

All values in µg/L unless otherwise specified

7. Health and Safety Issues During Removal and Disposal of Hazardous Materials

Asbestos

Toxicity:	Class 1a Carcinogen.
Exposure Pathway:	Inhalation.
Personal Protective Equipment:	Class P2 respirator, disposable overalls.

Mesothelioma may be contracted without high level chronic exposure to asbestos dust. This is the most likely asbestos related disease that may be contracted if asbestos exposure occurs at this site.

There are several methods available for the control of asbestos including:

- Deferment
- Encapsulation/sealing
- Enclosure/isolation
- Removal

Personnel involved in the removal or disposal of asbestos from this site should wear a class P2 respirator, and disposable overalls as a minimum. The respirator may be either a canister or disposable type and proper fitment must be ensured to maintain protection.

Overalls and disposable respirators should be placed into a clean plastic bag, clearly labelled with asbestos warning signs when leaving the contaminated area and then sealed and placed into a second clean plastic bag with the same markings and sealed again.

Lead Based Paint

Toxicity:	Known intellectual impairment in children, suspected teratogenic substance.
Exposure Pathway:	Inhalation, ingestion, dermal contact.
Personal Protective Equipment:	Class P2 respirator, disposable overalls, rubber gloves, safety glasses.

Relatively low levels of lead in the blood can adversely affect the intellectual development and behaviour of young children. Excessive exposure may result in a range of neurological effects in adults. Lead is also foeto-toxic and may cross from the mother to the baby through the placenta to affect the nervous system of the child and may also result in premature birth.

The removal of lead-based paint should be performed with all efforts being made to reduce the production of airborne dust or fumes. To this end, wet sanding or chemical paint stripping are the most effective forms of removal. Lead paint abatement should be carried out in accordance with the Draft Australian Standard 97003 which provides a guide for the management of lead paint in residential and commercial buildings.

Half face respirators meeting the requirements of Australian Standards AS1715 and AS1716 should be worn in addition to goggles or face shields to prevent eye irritation or injury. Coveralls, disposable overshoes, gloves and a hat are also recommended. Should skin contact be made with the lead-based paint (particularly hands), a Tri-sodium phosphate/water solution should be used to decontaminate the skin surface.

PCBs

Toxicity:	Class 1a Carcinogen.
Exposure Pathway:	Ingestion, dermal contact.
Personal Protective Equipment:	Disposable overalls, rubber gloves, safety glasses.

PCB exposure may immediately result in irritation to the eyes and long term health problems with skin, hair and the liver. PCBs are classed as a Class 1a carcinogen by the West Australian Department of Health.

Removal of the suspected PCB containing capacitors in the fluorescent light fittings should be undertaken with care to ensure that dermal contact or ingestion of the material does not occur. Personal protective equipment to be used in this instance includes, rubber nitrile gloves, disposable overalls, safety glasses and substantial footwear.

8. Conclusions and Recommendations

PPK conducted a hazardous materials audit and a contaminated site investigation of the New Farm Power Station, Lamington Road, New Farm. From these works and the subsequent laboratory analysis of samples the following conclusions may be drawn:

- Asbestos is present over much of the site, both internally and externally. It is present in two forms, friable and bonded asbestos material with the friable material presenting a high risk to health due to its structure and condition.
- Lead-based paint is present on site with the lead content in 6 of 7 samples submitted for laboratory analysis exceeding NH&MRC limits. Condition of the lead paint may be considered poor presenting a high risk to users of the site and construction workers involved in redevelopment.
- PCBs were not detected in the oil or water samples analysed. PCB capacitors are likely to be on site in fluorescent light fittings due to the age of such fixtures.
- Site investigation works indicated that 8 of 23 soil samples submitted for laboratory analysis reported selected heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb and or Zn) and/or PAHs in levels greater than accepted DoE or Dutch Intervention guidelines. The horizontal and vertical extent of contamination has not been fully delineated.
- Areas exhibiting the greatest impact on-site include:
 - ▶ Sediments that have accumulated within drains inside the turbine room and coal handling area;
 - ▶ The area of fill along the southern boundary of the site;
 - ▶ Fill located along the western boundary adjacent to New Farm Park; and
 - ▶ Fill located in a depression adjacent to the boilerhouse (TP2).
- Three water samples obtained from the turbine room, coal bunker and sump (inside the powerhouse building) contained TPH, Pb and/or Hg at levels in excess of ANZECC and/or Trade Waste Discharge Limits for Brisbane City Council.
- TCLP analysis of samples Turb 1 East and TP2; 0.3-0.5 indicated lead and zinc levels in leachate exceeded the acceptance criteria for unlined landfills but were within acceptance limits for lined landfills.

From these conclusions and with the understanding the site is to be utilised for public use, the following recommendations may be made:

- Prior to demolition or removal works, a comprehensive workplace health and safety plan be developed.
- Friable asbestos material be removed from site by a licensed asbestos removalist and disposed of at an approved landfill, in accordance with all statutory and legislative requirements.

- Airborne fibre monitoring during and after removal of asbestos material and final visual inspection to be conducted by suitably qualified occupational hygienist.
- Consideration for the removal of bonded asbestos materials should include time frame, removal options, qualified removal personnel and disposal options.
- Further air sampling of the indoor air environment to determine airborne lead paint concentrations.
- Interim measures for mitigating the exposure to lead particulates such as encapsulating the material with a spray mist form encapsulant should be considered.
- Final removal of lead based paint is required to be undertaken by a suitably qualified contractor. The draft Australian Standard DR97003 should be used as a guide for this work.
- Suspected PCB capacitors should be removed from light fittings and disposed of in accordance with all relevant statutory requirements.
- A health risk assessment be conducted for selected parameters and pathways to assist in the development of appropriate remedial strategies for impacted soil material. Remedial strategies may include capping and/or limited excavation and disposal.
- Further investigation to delineate the extent of contamination in areas which may require remedial works (eg TP2).
- Assessment of groundwater conditions and potential impacts to nearby aquatic eco-systems.
- The removal and off site disposal of accumulated drain sediments to a licensed lined landfill in accordance with all statutory requirements. A Section 14 Approval for the Transport and Disposal of Contaminated Material is required for this work.
- Subject to the development of the preferred remedial strategy, fill material adjacent to the boilerhouse (ie TP 2 samples), may require partial or total excavation and off site disposal to an approved facility.
- Contaminated surface waters to be collected by a suitably licensed liquid waste disposal contractor, treated and disposed of at a licensed treatment facility. Alternatively, on site treatment of the water to a level meeting Trade Waste Discharge Limits may be undertaken prior to discharge to sewer.

On the basis of these recommendations further investigations and/or remedial works would be required at the site prior to redeveloping the power station as a recreational facility.

9. Statement of Limitations

This assessment was restricted to the agreed-upon Scope of Services. No representations or warranties are made concerning the nature or quality of the soil and water, or any other substance on the Property, other than the visual observations and analytical data as stated in this report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no sampling technique can completely eliminate the possibility that samples are not totally representative of soil and/or groundwater conditions encountered. The sampling can only reduce this possibility to an acceptable level.

It should also be recognised that site conditions, including contaminant extent and concentrations can change with time. This is particularly relevant if this report is used after a protracted delay, such that further investigation of the site may be necessary.

In preparing this report, PPK has relied upon certain verbal information and documentation provided by the client and/or third parties. Except as discussed, PPK did not attempt to independently verify the accuracy or completeness of that information, but did not detect any inconsistency or omission of a nature that might call into question the validity of any of it. To the extent that the conclusions in this report are based in whole or in part on such information, they are contingent on its validity. PPK assume no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to PPK.

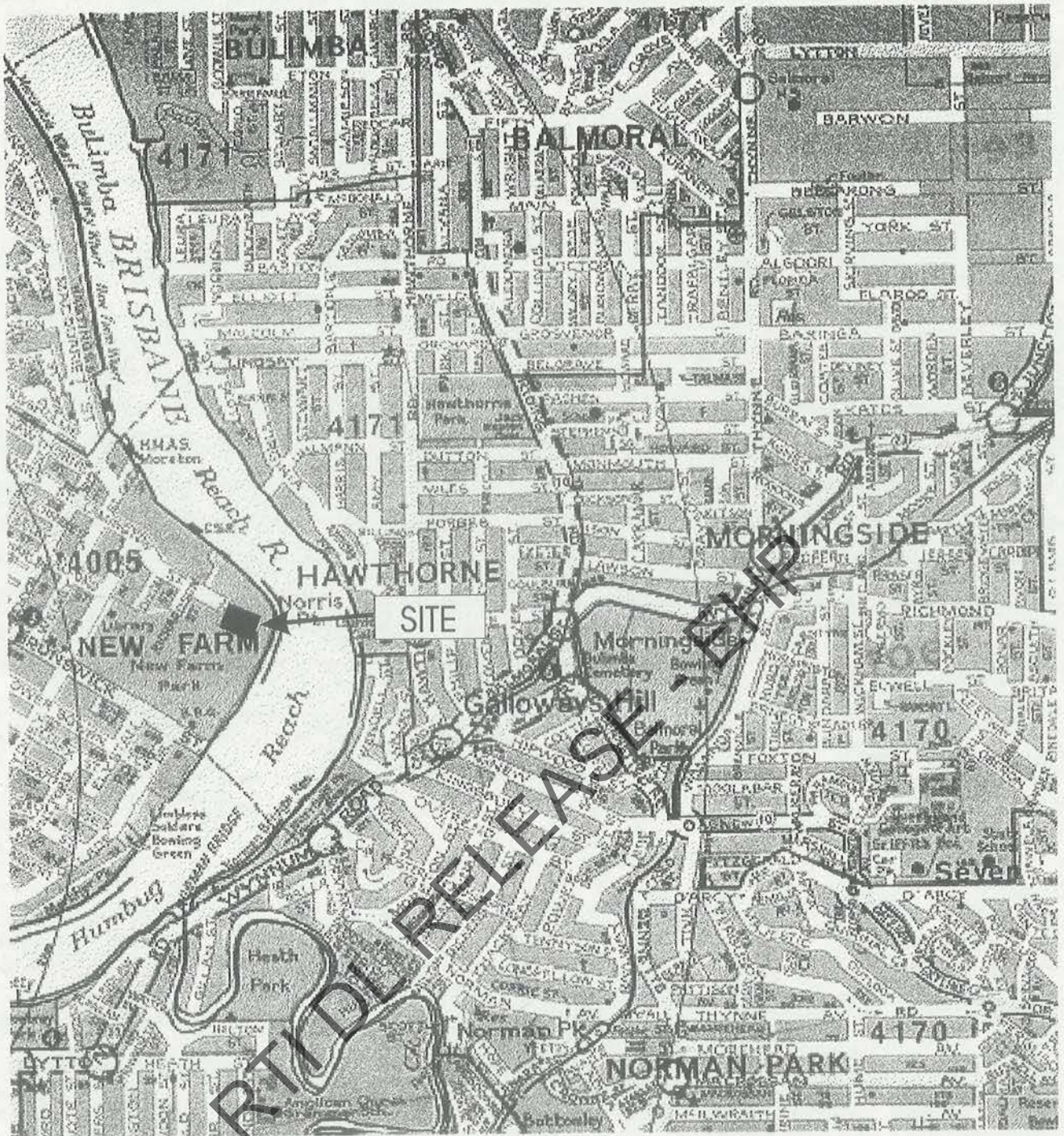
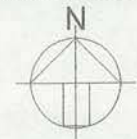
Within the limitations of the agreed-upon Scope of Services, this assessment has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, express or implied, is made.

This report is based upon the Scope of Services, and is subject to the Limitations and Restrictions, defined herein. It has been prepared for the exclusive use of Brisbane City Council. No other person or organisation is entitled to rely upon any part of it without the prior written consent of PPK. Brisbane City Council may release all or part(s) of this report to third parties; however, such third party in using or relying on this report agrees that it shall have no legal recourse against PPK or their parent or subsidiaries, and shall indemnify and defend them from and against all claims arising out of, or in conjunction with, such use or reliance.

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Appendix A

Site Location Map



PPK
Environment & Infrastructure

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TITLE:
NEW FARM POWER STATION
LAMINGTON ROAD

SITE LOCATION

SCALE:
Do not Scale

84J153B\ACAD\LAYO

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Appendix B

Site Layout

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Appendix C

Sample Locations (Asbestos,
Lead Paint and PCBs)

Appendix D

Photographs (Asbestos, Lead
Paint and PCBs)



Photo 1 : Asbestos insulation debris on top of concrete plinth, Ground Floor.



Photo 2 :

- a) Asbestos mounting board inside the electrical cabinet, Ground Floor
- b) Asbestos millboard lining to the door of the electrical cabinet, Ground Floor
- c) Asbestos cement arc shield inside the electrical cabinet, Ground Floor.

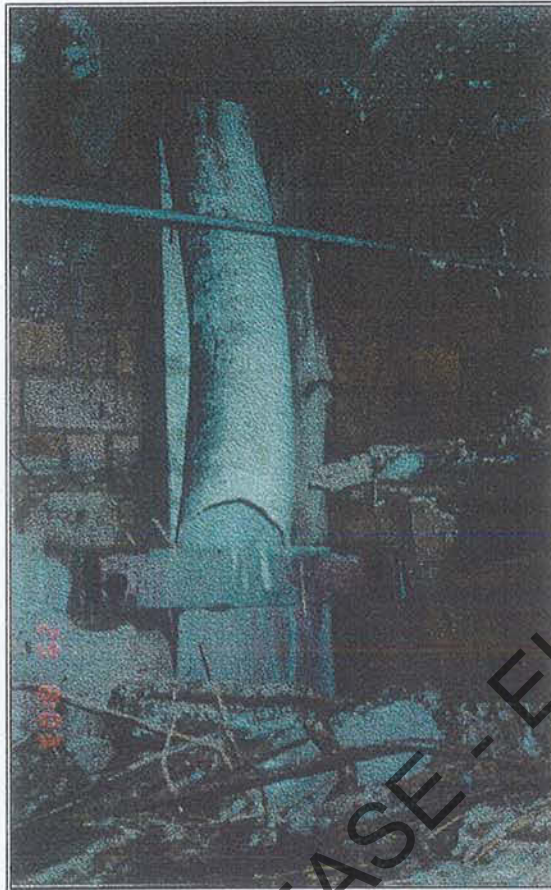


Photo 3 : Asbestos cement pipe in service tunnel, Ground Floor.



Photo 4 : Asbestos insulation debris on floor against northern wall, Level 1.



Photo 5 : Asbestos insulation in the electrical fuse socket in the Switch Room, Level 1.



Photo 6 : Asbestos insulation debris in Switch Room, Level 1.



Photo 7 : Damaged asbestos cement wall sheeting, Level 2.



Photo 8 : Asbestos cement debris scattered over floor of south / east and south / west decks, Second Floor.

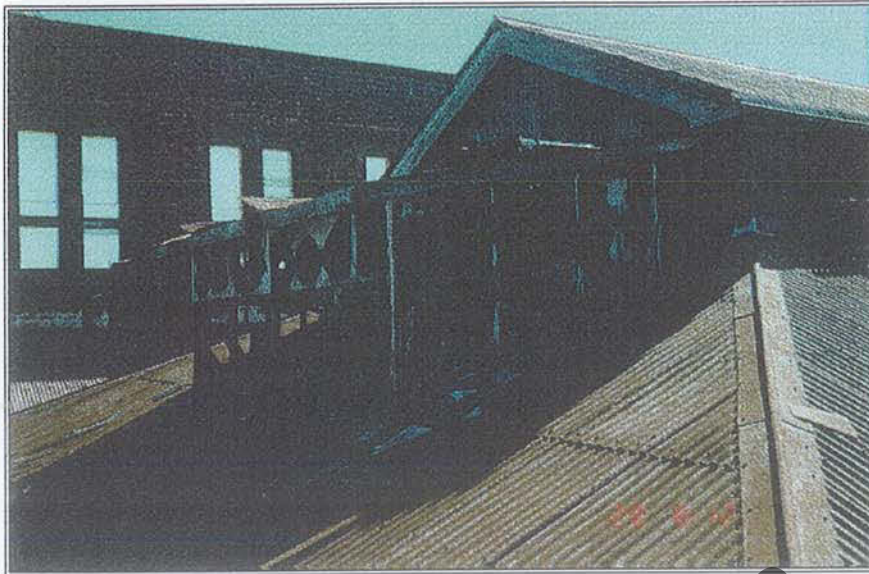


Photo 9 : Asbestos gable end, Roof.



Photo 10 : Asbestos cement vent shelter, Roof.

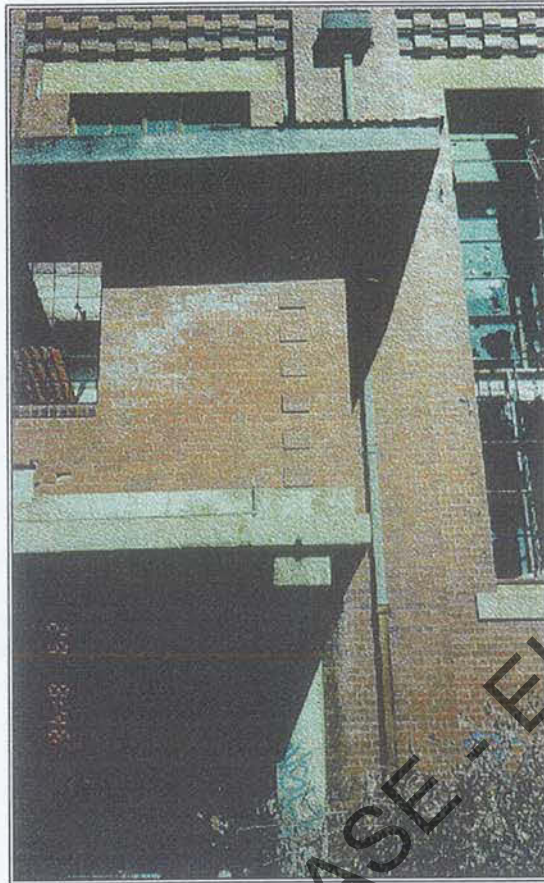


Photo 11 : Asbestos cement eaves lining on east side of power station, Level 1 Mezzanine.



Photo 12 : Silver lead based paint on horizontal structural steel beams, Level 2.



Photo 13: Test Pit 10 (Demolished Boilerhouse)



Photo 14: Test Pit 9 (Demolished Boilerhouse)

Appendix E

Analytical results (Asbestos,
Lead and PCBs)

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ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00110A
ATTENTION : Mr Phil Torley
CLIENT : PPK Brisbane
SAMPLES : 11
REFERENCE : 11241/84JI53A
DATE RECEIVED : 25/08/97
DATE REPORTED : 28/08/97

<u>Method</u>	<u>Description</u>
*E032	Polychlorinated Biphenyls

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 7B00110A
Client : PPK Brisbane
Reference : 11241/84JI53A

Page 1 of 1
plus Cover Page

[illegible]

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Less than PQL
-- = Not Applicable

Soils	: mg/kg (ppm) dry weight unless otherwise specified
Waters	: mg/L (ppm) unless otherwise specified
Leachates	: mg/L (ppm) in leachate
*	: POL raised due to matrix interference

QA/QC APPENDIX NO. 7B00110A

<u>Method</u>	<u>Description</u>
E032	Polychlorinated Biphenyls

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)			✓
Check Standard Within Acceptance Criteria($\pm 10\%$)			✓
Recalibration Within Acceptance Criteria($\pm 15\%$)			✓

Other QA/QC

	Yes	No	N/A
Holding time conforming With Method Specification	✓		
Chain of Custody Attached	✓		

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

⊖AQC : Matrix Spike / Check Solution

[illegible]

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

Client: PPK Brisbane	Our Ref: 7B00110A
Your Ref: 11241/84JI53A	Date: 28/08/97

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐
2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐
3. DISCARD IMMEDIATELY ☐

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to

Ross Dewar
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00110
ATTENTION : Mr Phil Torley
CLIENT : Rust PPK Brisbane
SAMPLES : 10
REFERENCE : 11241/84JI53A
DATE RECEIVED : 30/07/97
DATE REPORTED : 04/08/97

<u>Method</u>	<u>Description</u>
*E363	Metals in Paint
E033	Polychlorinated Biphenyls (High Levels)

RESULTS

All samples were analysed as received. This report relates specifically to the samples received. Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued. Schemes indicated above with * are not covered by NATA registration for this laboratory.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

[illegible]

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Less than PQL
-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified
Leachates : mg/L (ppm) in leachate

Job Number : 7B00110

Client : Rust PPK Brisbane

Reference : 11241/84JI53A

Page 2 of 3
plus Cover Page

[illegible]

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Release

[illegible]

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Less than PQL
-- = Not Applicable

Soils	: mg/kg (ppm) dry weight unless otherwise specified
Waters	: mg/L (ppm) unless otherwise specified
Leachates	: mg/L (ppm) in leachate

QA/QC APPENDIX NO. 7B00110

Method	Description
E363	Metals in Paint

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

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A NATA Certified Quality Company

CERTIFICATE OF ANALYSIS

CLIENT: Brisbane City Council.
SAMPLED BY: Phil Torley
CONTACT: Felicity Boevink
LOCATION: Newfarm Power Station.

JOB NO: 84J153A

DATE RECEIVED:

28/07/97

TEST METHOD: Filters examined at Rust PPK's Queensland Laboratory in accordance with N.O.H.S.C. (August 1988) Code of Practice for Membrane Filter Method Estimating Airborne Asbestos Dust, Rust PPK's Laboratory Method No. 2, and N.A.T.A Registration No.9607. N.A.T.A does not register sampling.

Work In Progress Monitoring Results

<u>Lab</u> <u>Number</u>	<u>Location</u>	<u>Result</u> <u>(Fibres/Field)</u>	<u>Concentration</u> <u>(Fibres/mL)</u>
M001	Lowerground. (SE)	6.5 / 100	< 0.01
M002	Lowerground. (SW)	3 / 100	< 0.01
M003	Level 1 (W)	1.5 / 100	< 0.01
M004	Level 1 (E)	2 / 100	< 0.01

NB If Asbestos type unidentified Worksafe Australia occupational Exposure Standard = 0.1 fibres/ml. This exposure standard should be compared against occupational results only.



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Authorisation Date
05/08/97

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ACN 078 004 798
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CERTIFICATE OF ANALYSIS

CLIENT: Brisbane City Council.
SAMPLED BY: Phil Torley
CONTACT: Felicity Boevink
LOCATION: Newfarm Power Station.

JOB NO: 84J153A-1

DATE RECEIVED: 29/07/97

TEST METHOD: Filters examined at Rust PPK's Queensland Laboratory in accordance with N.O.H.S.C. (August 1988) Code of Practice for Membrane Filter Method Estimating Airborne Asbestos Dust, Rust PPK's Laboratory Method No. 2 and N.A.T.A Registration No.9607. N.A.T.A does not register sampling.

Work In Progress Monitoring Results

<u>Lab</u> <u>Number</u>	<u>Location</u>	<u>Result</u> <u>(Fibres/Field)</u>	<u>Concentration</u> <u>(Fibres/mL)</u>
M005	Lowerground. (E)	2.5 / 100	< 0.01
M006	Ground Floor. (NW)	2 / 100	< 0.01
M007	Level 2, Switch Room.	1.5 / 100	< 0.01
M008	Level 1, Fuse Room.	3 / 100	< 0.01

NB If Asbestos type unidentified Worksafe Australia occupational Exposure Standard = 0.1 fibres/ml. This exposure standard should be compared against occupational results only.



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Authorisation Date

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Certificate of Analysis

CLIENT: Brisbane City Council.

JOB NO: 84J153A

SAMPLED BY: Phil Torley

DATE RECEIVED: 30/07/97

CONTACT: Felicity Boevink.

LOCATION: Newfarm Power Station.

TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

<u>Lab Number</u>	<u>Client ID</u>	<u>Sample Description</u>	<u>Sample Dimensions</u> cm	<u>Identification Type</u>
M001	1	Resinous material	3 X 3	NAD
M002	2	Fibre Cement Sheeting	3 X 3	CH, A
M003	3	Putty	3 X 2	NAD
M004	4	Fibre Cement Sheeting	5 X 4	CH
M005	5	Resinous material	3 X 3	NAD
M006	6	Insulation	2 X 1	NAD
M007	7	Fibre Cement Sheeting	4 X 3	CH, A, C
M008	8	Fibre Cement Sheeting	2 X 2	CH
M009	9	Resinous Board	3 X 2	NAD
M010	10	Rope	0.5 X 0.5	NAD
M011	11	Resinous material	1 X 0.5	CH

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected

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AUTHORISATION DATE

1/08/97

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Certificate of Analysis

CLIENT: Brisbane City Council.

JOB NO: 84J153A

SAMPLED BY: Phil Torley

DATE RECEIVED: 30/07/97

CONTACT: Felicity Boevink.

LOCATION: Newfarm Power Station.

TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No.9507. N.A.T.A. does not register sampling.

M012	12	Fibre Cement Sheeting	3 X 3	CH
M013	13	Insulation	2 X 2	CH, C
M014	14	Rope	1 X 1	NAD
M015	15	Insulation	2 X 2	CH
M016	16	Resinous Board	1.5 X 1	CH
M017	17	Insulation	1 X 1	CH
M018	18	Insulation	3 X 1	CH
M019	19	Resinous material	2 X 2	NAD
M020	20	Insulation	2 X 2	CH
M021	21	Fibre Cement Sheeting	2 X 1	CH
M022	22	Resinous Board	1 X 0.5	CH
M023	23	Insulation	4 X 1	CH
M024	24	Gasket	3 X 2	CH

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



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AUTHORISATION DATE

1/08/97

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

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Certificate of Analysis

CLIENT: Brisbane City Council.

JOB NO: 84J153A

SAMPLED BY: Phil Torley

DATE RECEIVED: 30/07/97

CONTACT: Felicity Boevink.

LOCATION: Newfarm Power Station.

TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

M025	25	Resinous material	2 X 1	NAD
M026	26	Insulation	1 X 1	CH
M027	27	Fibre Cement Sheeting	0.5 X 1	CH
M028	28	Fibre Cement Sheeting	3 X 2	CH

LEGEND

- NAD - No Asbestos Detected
- CH - Chrysotile Asbestos Detected
- A - Amosite Asbestos Detected
- C - Crocidolite Asbestos Detected
- UMF - Unknown Mineral Fibres Detected



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AUTHORISATION DATE

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NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

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Certificate of Analysis

CLIENT: Brisbane City Council. **JOB NO:** 84J153B
SAMPLED BY: Phil Torley **DATE RECEIVED:** 1/08/97
CONTACT: Felicity Boervink
LOCATION: Newfarm Power Station.
TEST METHOD: Qualitative identification of asbestos types in bulk samples at Rust PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Rust PPK's in-house method No.1 and N.A.T.A registration No 9607. N.A.T.A. does not register sampling.

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M001	A1 TP9	Sheeting	7 X 5	CH
M002	A2 TP9	Plasterboard	4 X 3	NAD
M003	A3 TP4	Gauze Mat	5 X 5	NAD
M004	A4 TP6	Insulation	8 X 8	A
M005	A5 TP6	Insulation	4 X 4	CH, A

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



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AUTHORISATION DATE

6/08/97

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 1 of 1

Certificate of Analysis

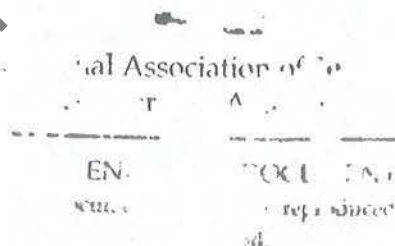
CLIENT: Brisbane City Council
SAMPLED BY: As received
CONTACT: Felicity Boevink
LOCATION: New Farm Power Station
TEST METHOD:

JOB NO: 84J153A-2
DATE RECEIVED: 24/09/97

Qualitative identification of asbestos types in bulk samples at PPK's Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using PPK's in-house method No.1 and N.A.T.A registration No.9607. N.A.T.A. does not register sampling.

Lab Number	Client ID	Sample Description	Sample Dimensions cm	Identification Type
M001	TP9 (1.4-1.5m)	Soil	N/A	NAD
M002	TP10 (2.2-2.4m)	Soil	N/A	CH, Handpicked approx. dia. 5mm x 3mm x 2mm

RTI DL RELEASE - ENP



LEGEND

- NAD - No Asbestos Detected
- CH - Chrysotile Asbestos Detected
- A - Amosite Asbestos Detected
- C - Crocidolite Asbestos Detected
- UMF - Unknown Mineral Fibres Detected

sch4p4(6) Personal information

Approved Identifier

sch4p4(6) Personal information

Approved Signatory

AUTHORISATION DATE

24/09/97

NB: If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

Page 1 of 1

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Appendix F

Asbestos Register

Asbestos Register

Lower Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Fill material at the side of lower floor area on southern side	Debris	Insulation material	Poor	Yes	Immediate	Unknown	CH	Refer 20	-	Significant quantities of asbestos debris are present in the soil on northern edge next to steps. This material may be scattered throughout the lower ground floor area, which is presently submerged in 300mm water.

Ground Floor

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Third column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	-	
Back of column from west end	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	20	-	Debris at base of column is visually consistent with debris on column. Some material evident around base of several other columns.
Throughout ground floor	Debris	Fibre cement sheeting	Poor	No	Medium	<1m ²	CH,A,C	Refer 7	-	Scattered over floor surface
On top of concrete plinth on northern wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH	Refer 20	1	
Electrical Cabinet, eastern wall	Arc shields	Fibre cement sheeting	Fair	No	Medium	<1m ²	CH	21	2	Four Arc shields
Electrical Cabinet, eastern wall	Electrical mounting board	Resinous board	Fair	No	Medium	<1m ²	CH	22	2	

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Electrical Cabinet, eastern wall	Insulation to cabinet door	Millboard	Poor	Yes	High	1m ²	CH	23	2	Internal thermal lining to cabinet door
1st small room, south-east corner	Debris	Fibre cement sheeting	Poor	No	Medium	2m ²	CH,A,C	Refer 7	-	Broken fibre cement sheeting and resinous membrane scattered over floor surface
1st small room, south-east wall	Gasket	Gasket	Fair	No	Medium	1m ²	CH	24	-	These and other gaskets are scattered throughout ground floor area.
2nd small room, south wall	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	1m ²	NAD	Refer 25	-	
South wall	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	Unknown	NAD	25	-	Cables may also extend below ground, widespread throughout power station
South wall	Fuse insulation	Textile	Poor	Yes	High	10m ²	CH	26	-	Widespread throughout area
Tunnel - west wall	Gutter Down pipe	Compressed sheet	Fair	No	Medium	2 linear meters	CH	27	3	Unsealed

First Floor (Level 1)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Elevated Floor Slab on south side	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	13	4	
Gantry Crane	Electrical mounting board	Resinous board	Fair	No	N/A	1m ²	NAD	Refer 9	-	
Gantry Crane	Brake pads	Compressed sheet	Fair	No	N/A	<1m ²	NAD	14	-	Large brake drum on Gantry Crane
Throughout first floor	Debris	Fibre cement sheet	Poor	No	Medium	40m ²	CH,A,C	Refer 7	-	Damaged fibre cement sheeting scattered over entire floor surface
Recess in north wall	Debris	Insulation material	Poor	Yes	Immediate	<1m ²	CH,C	Refer 13	-	

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Hole at base of north wall near elevated platform	Debris	Insulation material	poor	Yes	Immediate	<1m ²	CH,C	Refer 13	18/1	
Switch Room, south east corner	Electrical mounting board	Resinous board	Fair	No	Medium	2m ²	CH	16	-	
Switch Room, south east corner	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	5m ²	NAD	Refer 10	-	
Outside Transformer Room Passage	Debris	Resinous membrane	Poor	Yes	N/A	2m ²	NAD	Refer 5	-	Torn resinous membrane lying on floor surface
Switch Room, south west corner	Insulation to fuse socket	Textile	Fair	Yes	High	2m ²	CH	17	5	
Switch Room, south west corner	Insulation to fuse hood	Millboard	Fair	Yes	High	2m ²	CH	18	-	
Switch Room, south west corner	Debris	Millboard	Poor	Yes	Immediate	2m ²	CH	Refer 17 and 18	6	Asbestos millboard castings are scattered over entire floor. Similar situations are present in either switch rooms.
LT Board Room, south west corner on floor	Debris	Textile	Poor	Yes	High	1m ²	CH	Refer 17	-	
Empty room, south west corner	Floor covering	Resinous membrane	Poor	No	N/A	15 m ²	NAD	19	-	
Electrical Cabinet, south wall of Turbine Room	Arc Shields	Fibre cement sheeting	Fair	No	Medium	1m ²	CH	Refer 21	-	Arc shields are unsealed

First Floor (Level 1) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Mezzanine Floor surface	Debris	Fibre cement sheeting	Poor	No	Medium	1m ²	CH	Refer 28	-	Broken fibre cement sheeting scattered on floor originates from leaves lining

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
South side of Mezzanine	Insulation to electrical mounting board	Millboard	Poor	Yes	High	< 1m ²	CH	15	-	Thermal lining inside electrical box

Second Floor (Level 2)

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Floor Partition Walls	Wall lining	Fibre cement sheeting	Poor	No	Medium	30m ²	CH	12	7	Badly damaged fibre cement sheeting, debris scattered over floor surface
Switch Room	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	2m ²	NAD	Refer 10	-	

Second Floor (Level 2) Mezzanine

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Support column alongside Gantry	Debris	Dust	Poor	Yes	N/A	< 1m ²	NAD	6	-	Debris situated at base of support column
Throughout Mezzanine	Ceiling lining	Fibre cement sheeting	Poor	No	Medium	240 m ²	CH,A,C	7	-	Several sheets smashed and badly damaged
Switch Room	Lower wall lining	Fibre cement sheeting	Fair	No	Medium	40 m ²	CH	8	-	
Switch Room	Electrical mounting board	Resinous board	Fair	No	N/A	6 m ²	NAD	9	-	Light brown coloured mounting board
Switch Room	Insulation to electrical cable	Insulation material	Poor	Yes	N/A	Numerous cables	NAD	10	-	Cables located inside switchboards
Switch Room	Electrical mounting	Resinous	Fair	No	Medium	2 m ²	CH	11	-	Dark coloured mounting boards

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
	board	board								
Throughout Mezzanine	Debris	Fibre cement sheeting	poor	No	Medium	10 m ²	CH,A,C	Refer 7	-	Broken AC debris scattered over floor surface

External

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
2nd floor S/W deck	Floor covering	Resinous membrane	Poor	No	N/A	240 m ²	NAD	1	-	
2nd floor S/W deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	2	8	Broken fibre cement sheeting scattered over deck floor, appears to originate from switchroom
2nd floor S/W deck	Sealant	Fibrous Putty	Poor	No	N/A	2m ²	NAD	3	-	Putty in windows around entire building
2nd floor S/E deck	Floor covering	Resinous membrane	Poor	No	N/A	240 m ²	NAD	Refer 1		
2nd floor S/E deck	Debris	Fibre cement sheeting	Poor	No	Medium	3m ²	CH,A	Refer 2		Broken fibre cement sheeting scattered over deck floor. Appears to originate from switchroom
2nd floor S/Edeck	Sealant	Fibrous putty	Poor	No	N/A	2m ²	NAD	Refer 3		Putty in windows around entire building
Roof	Gable end	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	4	9	Fibre cement sheeting is badly damaged one at east and west ends of roof
Roof	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH	Refer 4	9	Broken fibre cement sheeting scattered over east and west ends of roof
Roof flashing	Membrane beneath flashing	Resinous membrane	Fair	No	N/A	15m ²	NAD	5	-	
Roof - north side	Wall lining	Fibre cement sheeting	Poor	No	Medium	40m ²	CH	Refer 4	10	

Surrounding Grounds

Location	Application	Product	Condition	Friable	Recommended Action	Quantity	Asbestos Type	Sample No	Photo	Comments
Perimeter of Building	Debris	Fibre cement sheeting	Poor	No	Medium	10m ²	CH,A,C	Refer 10	-	Fibre cement sheeting debris scattered around building
East Wall	Eaves lining	Fibre cement sheeting	Poor	No	Medium	22m ²	CH	28	11	Eaves lining is badly damaged

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Appendix G

Soil Sample Locations

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Appendix H

Test Pit Logs

Test Pit Log - TP1

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS			
<p>GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p> <p>Clay. Light brown, moist, soft sandy silty clay.</p> <p>Clay. Dark brown-grey moist soft silty clay.</p> <p>Clay. Dark brown-orange brown moist soft silty clay. Water intersected 2.5m.</p> <p>Test Pit Terminated</p>		<p>0.0</p> <p>0.4</p> <p>1.0</p> <p>1.4</p> <p>1.9</p> <p>2.0</p> <p>2.5</p> <p>3.0</p> <p>4.0</p>	<p>TP1; 0.5-0.6m</p> <p>TP1; 1.4-1.6m</p> <p>TP1; 2.0-2.5m</p>	<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 31 July 1997</p>			
				<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>			
TEST PIT TP1							
Logged By: SDR		Sampled By: SDR		<p>PPK</p> <p>Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG.</p>			
Field Classification		Notes					
0 No obvious contamination							
1 Slight visual contamination and/or slight odour							
2 Visual contamination and/or odour							
3 Gross visual contamination and/or strong odour							

RTI DL RELEASE - EHP

Test Pit Log - TP2 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Fill. Orange brown soft dry gravelly sand. Some brick glass and cans. Old water hose.</p>		0.0	TP2; 0.3-0.5m	<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 31 July to 1 August 1997</p>
<p>Concrete</p>		1.0	TP2; 0.8-1.0m	<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Fill. Light brown stiff dry sandy fill with some ash.</p>		1.2	TP2; 1.5-1.6m	
<p>Clay. Dark grey soft moist sandy silty clay</p>		1.6	TP2; 2.3-2.4m	
<p>Test Pit Terminated</p>		2.4		
<p>Logged By: SDR</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>				<p>Sampled By: SDR</p> <p>Notes</p>
<p>TEST PIT TP2</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp2</p>				

Test Pit Log - TP3

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Concrete</p>		0.0		<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 31 July 1997</p>
<p>Fill. Grey firm dry gravelly sand fill with much ash and brick fragments up to 15 cm X 10 cm X 20 cm size.</p>		0.25	TP3; 0.3-0.5m	<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Fill. Orange brown sandy gravel fill with some ash and much brick.</p>		1.0	TP3; 1.0-1.2m	
<p>Fill. Dark grey gravelly sand fill with much ash</p>		1.2		
<p>Fill. Brown - grey sandy gravel fill with some brick and ash</p>		1.3	TP3; 1.3-1.35m	
<p>Fill. Light orange brown sandy gravel fill with much gravel</p>		1.4	TP3; 1.35-1.4m	
<p>Fill. Light grey sandy gravel fill with much ash and some slag</p>			TP3; 1.45-1.5m	
<p>Fill. Dark brown soft moist silty clay with some gravel and brick fragments</p>		1.9		
<p>Clay. Dark brown - grey soft moist silty clay with intrinsic roots and rootlets.</p>			TP3; 2.2-2.5m	
<p>Test Pit Terminated</p>		2.7		<p>TEST PIT TP3</p>
<p>Logged By: SDR</p>	<p>Sampled By: SDR</p>			<p>PPK Environment & Infrastructure</p>
<p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>	<p>Notes</p>			
				<p>JOB NO. 84J153B DRG. NO. test_tp3</p>

Test Pit Log - TP4

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
				GENERAL INFORMATION
				LOCATION: New Farm Powestation Lamington Road Newfarm QLD
				DATE EXCAVATED 31 July 1997
				NOTES
				EQUIPMENT USED
				Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
GROUND LEVEL		0.0		
Fill. Dark grey brown soft dry silt. Some brick ash and slag.		0.5	TP4; 0.3-0.4m	
Fill. Light grey soft dry silt with some ash.		1.7	TP4; 0.8-0.9	
Fill. Light brown grey ash fill.		2.5		
Fill. Red brick cable armour		2.8	TP4; 2.8-2.9	
Fill. Dark red brown mottled, grey firm, dry clay. Transmission cable.		3.0		
Clay. Red brown mottled grey firm moist clay.		4.1		
Test Pit Terminated				
				TEST PIT TP4
Logged By: SDR		Sampled By: SDR		
Field Classification		Notes		
0 No obvious contamination				JOB NO. 84J153B DRG. NO. test_tp4
1 Slight visual contamination and/or slight odour				
2 Visual contamination and/or odour				
3 Gross visual contamination and/or strong odour				

Test Pit Log - TP5 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
GROUND LEVEL 0.0		0.0		GENERAL INFORMATION LOCATION: New Farm Powestation Lamington Road Newfarm QLD DATE EXCAVATED 31 July 1997 NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
Fill. Dark brown soft dry clay with some slag. Old asbestos pipe.			TP5; 0.5-0.6m	
		0.7		
Fill. Dark brown soft dry sandy clay with some ash and slag			TP5; 0.9-1.0m	
		1.9		
Fill. Dark brown soft dry sandy clay. Large pieces of rubble			TP5; 2.1-2.3m	
		2.7		TEST PIT TP5  JOB NO. 84J153B DRG. NO. test_tp5
Fill. Dark brown soft dry sandy clay with much ash and some rubble. Old railway line at 3.1m			TP5; 2.9-3.0m	
		3.6		
Fill. Light grey gravelly clay with much ash and some gravel			TP5; 3.5-3.6m	
Clay. Red brown mottled firm moist sandy clay.		3.9		
		4.0		
Test Pit Terminated			TP5; 3.8-4.0m	
Logged By: SDR		Sampled By: SDR		TEST PIT TP5  JOB NO. 84J153B DRG. NO. test_tp5
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		

Test Pit Log - TP6

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>GROUND LEVEL</p> <p>0.0</p> <p>Fill. Light grey brown soft dry sandy clay with some gravel, broken brick, rags, old water pipe, broken asbestos sheet.</p> <p>0.5</p> <p>Fill. Asbestos lagging debris with rare sandy clay.</p> <p>0.8</p> <p>Fill. Dark grey black boiler ash</p> <p>0.9</p> <p>Fill. Light grey boiler ash</p> <p>1.0</p> <p>Fill. Light brown soft dry sandy gravel</p> <p>1.2</p> <p>Fill. Light grey boiler ash with minor vitreous slag.</p> <p>2.0</p> <p>Clay. Brown orange soft moist sandy gravelly clay with much gravel.</p> <p>2.7</p> <p>3.6</p> <p>3.9</p> <p>4.1</p> <p>Test Pit Terminated</p>				<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 1 August 1997</p> <p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>TP6; 0.3-0.4m</p> <p>TP6; 0.5-0.6m</p> <p>TP6; 0.8-0.9m</p> <p>TP6; 0.9-1.0m</p> <p>TP6; 1.9-1.2m</p> <p>TP6; 1.3-1.4m</p> <p>TP6; 2.0-2.1m</p> <p>TP6; 4.0-4.1m</p>				<p>TEST PIT TP6</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp6</p>
<p>Logged By: SDR</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>		<p>Sampled By: SDR</p> <p>Notes</p>		

Test Pit Log - TP7 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS			
<p>GROUND LEVEL</p> <p>0.0</p> <p>Fill. Dark brown sandy loam topsoil</p> <p>Fill. Grey dry soft boiler ash</p> <p>Fill. Light brown orange soft dry sandy gravel. Old water pipe</p> <p>Fill. Dark brown soft moist silty sand with boulders up to 60x60x20cm size.</p> <p>Fill. Dark grey brown soft wet clayey gravel.</p> <p>Test Pit Terminated</p>		<p>0.0</p> <p>0.2</p> <p>0.3</p> <p>1.2</p> <p>2.1</p> <p>3.1</p>	<p>TP7; 0.2-0.3m</p> <p>TP7; 0.8-0.9m</p> <p>TP7; 1.9-2.0m</p> <p>TP7; 3.0-3.1m</p>	<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 1 August 1997</p>			
				<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>			
				TEST PIT TP7			
Logged By: SDR		Sampled By: SDR		<p>PPK</p> <p>Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp7</p>			
<p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>		<p>Notes</p>					

Test Pit Log - TP8 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<p>0.0 GROUND LEVEL</p> <p>Fill. Dark brown soft moist sandy gravelly clay with much brick boulders and rock.</p>		0.0		<p>GENERAL INFORMATION</p> <p>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</p> <p>DATE EXCAVATED 1 August 1997</p>
<p>Clay. Dark grey wet soft sandy gravelly clay. Water 1.8 m.</p> <p>Test Pit Terminated</p>		1.6 2.0	<p>TP8; 1.2-1.3m</p> <p>TP8; 1.9-2.0m</p>	<p>NOTES</p> <p>EQUIPMENT USED</p> <p>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</p>
<p>Logged By: SDR</p> <p>Field Classification</p> <p>0 No obvious contamination</p> <p>1 Slight visual contamination and/or slight odour</p> <p>2 Visual contamination and/or odour</p> <p>3 Gross visual contamination and/or strong odour</p>				<p>TEST PIT TP8</p> <p>PPK Environment & Infrastructure</p> <p>JOB NO. 84J153B DRG. NO. test_tp8</p>
<p>Sampled By: SDR</p> <p>Notes</p>				

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Test Pit Log - TP9 New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
<div>GROUND LEVEL</div> <div>0.0</div> <div>Fill. Dark brown sandy loam, some plasterboard</div> <div>0.25</div> <div>Fill. Light grey brown soft dry clayey sandy gravel with much rubble.</div> <div>1.2</div> <div>Fill. Light brown soft dry gravelly loam. Much building rubble</div> <div>2.2</div> <div>Fill. Light brown grey soft dry silty sandy gravel. Much building rubble</div> <div>2.6</div> <div>Fill. Orange brick building rubble</div> <div>4.5</div> <div>Test Pit Terminated Concrete</div>		<div>0.0</div> <div>0.25</div> <div>1.2</div> <div>2.2</div> <div>2.6</div> <div>4.5</div>	<div>TP9; 0.3-0.4m</div> <div>TP9; 0.3-0.5m</div> <div>TP9; 1.4-1.5m</div> <div>TP9; 2.1-2.3m</div> <div>TP9; 3.9-4.0m</div> <div>TP9; 4.1-4.3m</div>	<div>GENERAL INFORMATION</div> <div>LOCATION: New Farm Powestation Lamington Road Newfarm QLD</div> <div>DATE EXCAVATED 31 July 1997</div> <div>NOTES</div> <div>EQUIPMENT USED</div> <div>Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.</div>
<div>RTI DL RELEASE - EHP</div>				<div>TEST PIT TP9</div>
<div>Logged By: SDR</div>		<div>Sampled By: SDR</div>		<div>PPK</div> <div>Environment & Infrastructure</div>
<div>Field Classification</div> <div>0 No obvious contamination</div> <div>1 Slight visual contamination and/or slight odour</div> <div>2 Visual contamination and/or odour</div> <div>3 Gross visual contamination and/or strong odour</div>		<div>Notes</div>		
<div>JOB NO. 84J153B DRG. NO. test_tp9</div>				

Test Pit Log - TP10

New Farm Powerstation ESA

STRATIGRAPHIC DESCRIPTION	LOG	DEPTH (mBGL)	SAMPLE NO	DETAILS
				GENERAL INFORMATION
				LOCATION: New Farm Powestation Lamington Road Newfarm QLD
				DATE EXCAVATED 31 July 1997
				NOTES EQUIPMENT USED Backhoe with 600 mm trenching bucket. Maximum possible depth 5.5 m.
GROUND LEVEL 0.0 Fill. Grey soft dry boiler ash with some rubble.		0.0	TP10; 0.2-0.3m	
		0.3	TP10; 0.3-0.4m	
Fill. Light brown soft dry gravelly clay		1.2	TP10; 1.4-1.5m	
Fill. Brown grey building rubble with bitumen, concrete, brick glass.		1.8	TP10; 1.8-1.9m	
Fill. Red orange brick and building rubble. Old sign, pipes plaster board.			TP10; 2.2-2.4m	
			TP10; 2.6-2.8m	
Test Pit Terminated Concrete		3.7		
				TEST PIT TP10
Logged By: SDR		Sampled By: SDR		
Field Classification 0 No obvious contamination 1 Slight visual contamination and/or slight odour 2 Visual contamination and/or odour 3 Gross visual contamination and/or strong odour		Notes		
				JOB NO. 84J153B DRG. NO. test_tp10

RTI DL RELEASE - EHP

Appendix I

Original Laboratory Results

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

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HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
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CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00114
ATTENTION : Mr Steve Robertson
CLIENT : Rust PPK Brisbane
SAMPLES : 54
REFERENCE : 84JL53B
DATE RECEIVED : 04/08/97
DATE REPORTED : 08/08/97

<u>Method</u>	<u>Description</u>
B1042	Moisture (%w/w)
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
E511	pH in Soil
E340	Metals in Soils
M350S	Mercury
E504	*Total Cyanide in Soil
E031	Polychlorinated Biphenyls
E083	Total Petroleum Hydrocarbons
E370	Total Metals in Water
M350W	Mercury
W031	pH
E012	Organochlorine Pesticides and PCBs

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Schemes indicated above with * are not covered by NATA registration for this laboratory.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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plus Cover Page

Analyte	Lab No	E27840	E27843	E27845	E27847	E27849
		TP6	TP6	TP7	TP7	TP8
	Sample Id	0.9-1.0	2.0-2.1	0.2-0.3	1.9-2.0	1.2-1.3
	PQL					
E1042 Moisture Content %(w/w)	-	29	17	21	15	21
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	585	100
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	480	100
C29-C36 Fraction	100	nd	nd	nd	105	nd
pH in soil (1:5 in water)		9.1	7.7	8.1	8.8	8.8
Metals in Soil						
Arsenic	5	nd	nd	nd	nd	nd
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	nd	7	nd	9	8
Copper	5	13	nd	11	59	72
Nickel	5	nd	nd	nd	11	12
Lead	5	7	21	40	105	177
Zinc	5	18	12	24	131	164
Mercury	0.05	nd	nd	0.58	0.48	0.33
E504 Total Cyanide	0.1	0.2	--	0.2	--	--
Total Phenolics as phenol	0.1	--	--	nd	--	--

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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Analyte	Lab No	E27850	E27851	E27853	E27856	E27859
		TP8	TP2	TP2	TP5	TP5
	Sample Id	1.9-2.0	0.3-0.5	2.3-2.4	0.9-1.0	3.5-3.6
	PQL					
E1042 Moisture Content %(w/w)	-	19	49	24	18	15
E084 TPH in Soil						
TPH C6-C36 as C8	-	105	10	nd	nd	nd
C6-C9 Fraction	10	nd	10	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	105	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		8.6	9.6	8.2	8.7	8.6
Metals in Soil						
Arsenic	5	9	124	nd	nd	nd
Cadmium	1	nd	1	nd	nd	nd
Chromium	5	8	14	28	20	13
Copper	5	110	131	15	14	18
Nickel	5	15	42	23	17	14
Lead	5	2340	818	8	30	48
Zinc	5	376	1840	42	59	56
Mercury	0.05	0.12	3.9	nd	0.09	0.26
E504 Total Cyanide	0.1	--	--	--	--	--
Total Phenolics as phenol	0.1	--	--	nd	--	--

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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Analyte	Lab No	E27861	E27863	E27865	E27867	E27870
		TP4	TP4	TP3	TP3	TP1
	Sample Id	0.3-0.4	2.8-2.9	1.0-1.2	1.35-1.4	0.5-0.6
	PQL					
E1042 Moisture Content %(w/w)	-	14	10	21	9.9	23
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	720	nd	nd	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	720	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		7.5	7.9	9.0	8.6	8.3
Metals in Soil						
Arsenic	5	nd	nd	nd	nd	nd
Cadmium	1	nd	1	nd	nd	nd
Chromium	5	21	21	nd	nd	24
Copper	5	20	20	6	nd	15
Nickel	5	17	17	6	nd	19
Lead	5	40	57	12	26	8
Zinc	5	69	880	15	39	49
Mercury	0.05	0.14	0.12	nd	0.07	0.06
E504 Total Cyanide	0.1	0.2	--	0.2	--	--
Total Phenolics as phenol	0.1	--	0.8	nd	--	--

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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Analyte	Lab No	E27872	E27873	E27876	E27879	E27882
		TP1	TP9	TP9	TP10	TP10
	Sample Id	2.2-2.5	0.3-0.4	2.1-2.3	0.2-0.3	1.8-1.9
	PQL					
E1042 Moisture Content %(w/w)	-	29	19	12	14	9.6
E084 TPH in Soil						
TPH C6-C36 as C8	-	nd	nd	nd	nd	nd
C6-C9 Fraction	10	nd	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd	nd
C15-C28 Fraction	100	nd	nd	nd	nd	nd
C29-C36 Fraction	100	nd	nd	nd	nd	nd
pH in soil (1:5 in water)		7.2	8.1	7.8	8.0	8.2
Metals in Soil						
Arsenic	5	nd	10	nd	nd	nd
Cadmium	1	nd	nd	nd	nd	nd
Chromium	5	26	15	23	7	5
Copper	5	18	22	19	32	27
Nickel	5	33	13	23	10	7
Lead	5	9	29	16	106	127
Zinc	5	61	72	148	124	120
Mercury	0.05	nd	0.08	0.07	0.28	0.13
E504 Total Cyanide	0.1	--	--	--	--	--
Total Phenolics as phenol	0.1	nd	--	--	--	--

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27885	E27886	E27887	CB
		COAL	TURBI	TURB2	CONTROL
	Sample Id	DRAIN	EAST	WEST	BLANK
	PQL				
E1042 Moisture Content %(w/w)	-	7.0	47	42	
E084 TPH in Soil					
TPH C6-C36 as C8	-	nd	570	705	nd
C6-C9 Fraction	10	nd	nd	nd	nd
C10-C14 Fraction	20	nd	nd	nd	nd
C15-C28 Fraction	100	nd	570	705	nd
C29-C36 Fraction	100	nd	nd	nd	nd
pH in soil (1:5 in water)		8.5	8.0	8.0	6.5
Metals in Soil					
Arsenic	5	7	30	17	nd
Cadmium	5	52	11	8	nd
Chromium	5	16	57	48	nd
Copper	5	282	1140	528	nd
Nickel	5	13	88	52	nd
Lead	5	5140	23700	24600	nd
Zinc	5	3360	23600	28300	nd
Mercury	0.05	2.1	291	27	nd
E504 Total Cyanide	0.1	--	--	--	nd
Total Phenolics as phenol	0.1	--	--	--	nd

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

Analyte	Lab No	E27840	E27843	E27845	E27847	E27849
		TP6	TP6	TP7	TP7	TP8
	Sample Id	0.9-1.0	2.0-2.1	0.2-0.3	1.9-2.0	1.2-1.3
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	1.0	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	nd	nd	nd	1.1	nd
Anthracene	0.5	nd	nd	nd	1.2	nd
Fluoranthene	0.5	nd	nd	nd	8.6	1.0
Pyrene	0.5	nd	nd	nd	10	1.0
Benzo(a)anthracene	0.5	nd	nd	nd	6.5	0.6
Chrysene	0.5	nd	nd	nd	5.3	0.5
Benzo(b)&(k)fluoranthene	0.5	nd	nd	nd	20	1
Benzo(a)pyrene	0.5	nd	nd	nd	9.7	0.7
Indeno(1.2.3-cd)pyrene	0.5	nd	nd	nd	12	0.8
Dibenz(a,h)anthracene	0.5	nd	nd	nd	1.7	nd
Benzo(g,h,i)perylene	0.5	nd	nd	nd	9.9	0.6
Total PAHs	-	nd	nd	nd	87	6.6
Surrogate % Recovery	-	74	78	72	98	86

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27850	E27851	E27853	E27856	E27859
		TP8	TP2	TP2	TP5	TP5
	Sample Id	1.9-2.0	0.3-0.5	2.3-2.4	0.9-1.0	3.5-3.6
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	nd	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	0.6	nd	nd	nd	nd
Anthracene	0.5	nd	nd	nd	nd	nd
Fluoranthene	0.5	1.3	nd	nd	nd	2.5
Pyrene	0.5	1.4	nd	nd	nd	2.6
Benzo(a)anthracene	0.5	0.7	nd	nd	nd	1.4
Chrysene	0.5	0.7	nd	nd	nd	1.2
Benzo(b)&(k)fluoranthene	1	2	nd	nd	nd	3
Benzo(a)pyrene	0.5	0.8	nd	nd	nd	1.5
Indeno(1.2.3-cd)pyrene	0.5	0.8	nd	nd	nd	1.4
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.5	0.8	nd	nd	nd	1.2
Total PAHs	-	8.7	nd	nd	nd	15
Surrogate % Recovery	-	81	98	92	104	105

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
Client : Rust PPK Brisbane
Reference : 84JI53B

Analyte	Lab No	E27861	E27863	E27865	E27867	E27870
		TP4	TP4	TP3	TP3	TP1
	Sample Id	0.3-0.4	2.8-2.9	1.0-1.2	1.35-1.4	0.5-0.6
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	3.9	nd	nd	nd
Acenaphthylene	0.5	nd	0.8	nd	nd	nd
Acenaphthene	0.5	nd	6.6	nd	nd	nd
Fluorene	0.5	nd	9.0	nd	nd	nd
Phenanthrene	0.5	nd	65	nd	nd	nd
Anthracene	0.5	nd	13	nd	nd	nd
Fluoranthene	0.5	nd	61	nd	nd	nd
Pyrene	0.5	nd	49	nd	nd	nd
Benzo(a)anthracene	0.5	nd	26	nd	nd	nd
Chrysene	0.5	nd	20	nd	nd	nd
Benzo(b)&(k)fluoranthene		nd	39	nd	nd	nd
Benzo(a)pyrene	0.5	nd	22	nd	nd	nd
Indeno(1.2.3-cd)pyrene	0.5	nd	21	nd	nd	nd
Dibenz(a,h)anthracene	0.5	nd	2.6	nd	nd	nd
Benzo(g,h,i)perylene	0.5	nd	18	nd	nd	nd
Total PAHs	-	nd	355	nd	nd	nd
Surrogate % Recovery	-	108	76	91	95	98

PQL = Practical Quantitation Limit
LNR = Samples Listed not Received
nd = Less than PQL
-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
Waters : mg/L (ppm) unless otherwise specified
Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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Analyte	Lab No	E27872	E27873	E27876	E27879	E27882
		TP1	TP9	TP9	TP10	TP10
	Sample Id	2.2-2.5	0.3-0.4	2.1-2.3	0.2-0.3	1.8-1.9
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	nd
Acenaphthylene	0.5	nd	nd	nd	nd	nd
Acenaphthene	0.5	nd	nd	nd	nd	nd
Fluorene	0.5	nd	nd	nd	nd	nd
Phenanthrene	0.5	nd	nd	nd	nd	nd
Anthracene	0.5	nd	nd	nd	nd	nd
Fluoranthene	0.5	nd	nd	0.9	0.8	1.0
Pyrene	0.5	nd	nd	1.0	0.8	1.1
Benzo(a)anthracene	0.5	nd	nd	0.7	nd	0.7
Chrysene	0.5	nd	nd	0.7	0.5	0.7
Benzo(b)&(k)fluoranthene	1	nd	nd	3	1	2
Benzo(a)pyrene	0.5	nd	nd	1.3	0.7	1.0
Indeno(1.2.3-cd)pyrene	0.5	nd	nd	1.7	0.7	1.3
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	nd
Benzo(g,h,i)perylene	0.5	nd	nd	1.5	0.6	1.2
Total PAHs	-	nd	nd	10	5.5	8.9
Surrogate % Recovery	-	99	104	112	119	71

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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 plus Cover Page

Analyte	Lab No	E27885	E27886	E27887	CB	
		COAL	TURB1	TURB2	CONTROL	
	Sample Id	DRAIN	EAST	WEST	BLANK	
	PQL					
E092 PAH's in Soil						
Naphthalene	0.5	nd	nd	nd	nd	
Acenaphthylene	0.5	nd	nd	nd	nd	
Acenaphthene	0.5	nd	nd	nd	nd	
Fluorene	0.5	nd	nd	nd	nd	
Phenanthrene	0.5	nd	nd	nd	nd	
Anthracene	0.5	nd	nd	nd	nd	
Fluoranthene	0.5	nd	nd	nd	nd	
Pyrene	0.5	nd	nd	nd	nd	
Benzo(a)anthracene	0.5	nd	nd	nd	nd	
Chrysene	0.5	nd	nd	nd	nd	
Benzo(b)&(k)fluoranthene		nd	nd	nd	nd	
Benzo(a)pyrene	0.5	nd	nd	nd	nd	
Indeno(1.2.3-cd)pyrene	0.5	nd	nd	nd	nd	
Dibenz(a,h)anthracene	0.5	nd	nd	nd	nd	
Benzo(g,h,i)perylene	0.5	nd	nd	nd	nd	
Total PAHs	-	nd	nd	nd	nd	
Surrogate % Recovery	-	120	126	123	73	

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114
 Client : Rust PPK Brisbane
 Reference : 84JI53B

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Analyte	Lab No	E27843	E27870	E27873	CB
		TP6	TP1	TP9	CONTROL
	Sample Id	2.0-2.1	0.5-0.6	0.3-0.4	BLANK
	PQL				
E012 Organochlorine Pesticides in Soil					
HCB	0.1	nd	nd	nd	nd
a-BHC	0.1	nd	nd	nd	nd
Lindane	0.1	nd	nd	nd	nd
Heptachlor	0.1	nd	nd	nd	nd
Aldrin	0.1	nd	nd	nd	nd
b-BHC	0.1	nd	nd	nd	nd
d-BHC	0.1	nd	nd	nd	nd
Oxychlordane	0.1	nd	nd	nd	nd
Heptachlor epoxide	0.1	nd	nd	nd	nd
Alpha-Endosulfan	0.1	nd	nd	nd	nd
Gamma-Chlordane	0.1	nd	nd	nd	nd
Alpha-Chlordane	0.1	nd	nd	nd	nd
trans-Nonachlor	0.1	nd	nd	nd	nd
DDE	0.1	nd	nd	nd	nd
Dieldrin	0.1	nd	nd	nd	nd
Endrin	0.1	nd	nd	nd	nd
DDD	0.1	nd	nd	nd	nd
Beta-Endosulfan	0.1	nd	nd	nd	nd
DDT	0.1	nd	nd	nd	nd
Endosulfan sulphate	0.1	nd	nd	nd	nd
Methoxychlor	0.1	nd	nd	nd	nd
Total PCBs	1	nd	nd	nd	nd
PCB Identification	-	--	--	--	--
Surrogate % Recovery	-	83	84	79	100

PQL = Practical Quantitation Limit
 LNR = Samples Listed not Received
 nd = Less than PQL
 -- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified
 Waters : mg/L (ppm) unless otherwise specified
 Leachates : mg/L (ppm) in leachate

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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plus Cover Page

Analyte	Lab No	E27843	E27870	E27873	CB	
		TP6	TP1	TP9	CONTROL	
	Sample Id	2.0-2.1	0.5-0.6	0.3-0.4	BLANK	
	PQL					
E022 OP Pesticides in Soil						
Dichlorvos	0.5	nd	nd	nd	nd	
Mevinphos	0.5	nd	nd	nd	nd	
Ethoprop	0.5	nd	nd	nd	nd	
Phorate	0.5	nd	nd	nd	nd	
Demeton-s	0.5	nd	nd	nd	nd	
Diazinon	0.5	nd	nd	nd	nd	
Disulfoton	0.5	nd	nd	nd	nd	
Ronnel	0.5	nd	nd	nd	nd	
Chlorpyrifos methyl	0.5	nd	nd	nd	nd	
Chlorpyrifos	0.5	nd	nd	nd	nd	
Merphos	0.5	nd	nd	nd	nd	
Parathion methyl	0.5	nd	nd	nd	nd	
Fenthion	0.5	nd	nd	nd	nd	
Malathion	0.5	nd	nd	nd	nd	
Fenitrothion	0.5	nd	nd	nd	nd	
Prothiophos	0.5	nd	nd	nd	nd	
Stirophos	0.5	nd	nd	nd	nd	
Ethion	0.5	nd	nd	nd	nd	
Bolstar	0.5	nd	nd	nd	nd	
Fensulfothion	0.5	nd	nd	nd	nd	
Azinphos methyl	0.5	nd	nd	nd	nd	
Coumaphos	0.5	nd	nd	nd	nd	
Surrogate % Recovery	-	79	85	81	100	

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

Job Number : 7B00114

Client : Rust PPK Brisbane

Reference : 84JI53B

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Analyte	Lab No	E27834	E27835	E27836	CB
		TURB			CONTROL
	Sample Id	ROOM	SUMP	BUNKER	BLANK
	PQL				
E031 Polychlorinated Biphenyls in Water					
PCB1242	0.01	---	nd	---	nd
PCB1248	0.01	---	nd	---	nd
PCB1254	0.01	---	nd	---	nd
PCB1260	0.01	---	nd	---	nd
Total PCBs	--	---	nd	---	nd
E083 TPH in Water					
TPH C6-C36 as C8	-	36	3040	7.5	nd
C6-C9 Fraction	0.02	nd	nd	nd	nd
C10-C14 Fraction	0.04	0.10	2.2	0.26	nd
C15-C28 Fraction	0.2	36	3000	6.4	nd
C29-C36 Fraction	0.2	nd	34	1.0	nd
Total Metals in Waters					
Arsenic	0.002	nd	0.004	0.030	nd
Cadmium	0.001	nd	nd	0.003	nd
Chromium	0.005	nd	nd	0.018	nd
Copper	0.005	0.008	nd	0.835	nd
Nickel	0.005	nd	nd	0.034	nd
Lead	0.005	0.102	nd	1.2	nd
Zinc	0.01	0.94	0.03	1.3	nd
M350 Mercury in Water					
W031 pH	0.001	nd	nd	0.013	nd
		7.6	7.5	8.9	6.5

PQL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION
Trading as Australian Analytical Laboratories Pty Ltd
ACN 001 491 667

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS

Contents :

- 1) Cover Page
- 2) Analysis Report Pages
- 3) QA/QC Appendix

REPORT No : 7B00114B
ATTENTION : Mr Steve Robertson
CLIENT : PPK Brisbane
SAMPLES : 2
REFERENCE : 84JI53B
DATE RECEIVED : 19/08/97
DATE REPORTED : 26/08/97

<u>Method</u>	<u>Description</u>
E2002E	Toxicity Characteristic Leachate Proc.
T370WT	Metals in Leachate by ICP-MS
T350	Mercury in Leachate

RESULTS

All samples were analysed as received. This report relates specifically to the samples received. Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued. Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Job Number : 7B00114B

Client : PPK Brisbane

Reference : 84JI53B

Page 1 of 1

plus Cover Page

[illegible]

POL = Practical Quantitation Limit

LNR = Samples Listed not Received

nd = Less than PQL

-- = Not Applicable

Soils : mg/kg (ppm) dry weight unless otherwise specified

Waters : mg/L (ppm) unless otherwise specified

Leachates : mg/L (ppm) in leachate

QA/QC APPENDIX NO. 7B00114B

Method Description

T370WT Metals in Leachate by ICP-MS
T350 Mercury in Leachate

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window			
Within Acceptance Criteria($\pm 2\%$)			✓
Check Standard Within			
Acceptance Criteria($\pm 10\%$)			✓
Recalibration Within			
Acceptance Criteria($\pm 15\%$)			✓

Other QA/QC

Holding time conforming With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

Correspondence to:
PO BOX 514
HORNSBY NSW 2077

5 Kelray Place
ASQUITH NSW 2077
Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

Client: PPK Brisbane	Our Ref: 7B00114B
Your Ref: 84JI53B	Date: 26/08/97

SAMPLE DISPOSAL ADVICE

All samples remain the client's property after analysis. These will be either returned or disposed of (at the client's cost where applicable) following analysis.

Please indicate your requirements below.

1. RETURN SAMPLES TO CLIENT ☐

2. DISCARD AFTER * 6 Weeks - Soils ☐
* 4 Weeks - Waters ☐

3. DISCARD IMMEDIATELY ☐

* Storage times commence from date of issue of the final report.

RETURN TO FOLLOWING ADDRESS _____

TRANSPORT COMPANY _____

PLEASE NOTE *If this advice slip is not returned within 15 days, it will be assumed that the samples referenced above can be discarded after indicated storage times (*)*

Authorised Signature _____

Please return to

Ross Dewar
AMDEL Ltd
P.O. Box 514
HORNSBY N.S.W. 2077
or fax to (02) 9482 1734

ENVIRONMENTAL AND INDUSTRIAL SERVICES DIVISION

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HORNSBY NSW 2077

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Telephone: (02) 9482 1922
Facsimile: (02) 9482 1734

CERTIFICATE OF ANALYSIS**Contents :**

- 1) Cover Page
- 2) Amdel Mineral Chemistry Report 7B00114A

REPORT No : 7B00114A
ATTENTION : Mr Steve Robertson
CLIENT : PPK Brisbane
SAMPLES : 7
REFERENCE : 84JI53B
DATE RECEIVED : 22/08/97
DATE REPORTED : 14/08/97

N.B. Sulfur analysis conducted by Amdel Laboratories Mineral Chemistry NATA registration 1526.

RESULTS

All samples were analysed as received. This report relates specifically to the samples received.
Results relate to the source material only to the extent that the samples as supplied are truly representative of the sample source. This report replaces any preliminary results issued.
Note that for schemes indicated with * NATA registration does not cover the performance of this service.

PLEASE SEE ATTACHED PAGES FOR RESULTS

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

MINERAL CHEMISTRY

Amdel Laboratories Ltd
PO Box 338
Torrensville Plaza SA 5031
ACN 009 076 555

Telephone (08) 8416 5300
Facsimile (08) 8234 0321

Mr Steve Robertson
Rust PPK
348 Edward Street
BRISBANE NSW 4000

FINAL ANALYSIS REPORT

Your Order No: 843153B

Our Job Number : 7B00114A

Sample rec'd : 06/08/97

Results reported : 14/08/97

No. of samples : 7

Report comprises a cover sheet and pages 1 to 1

Approved Signature:

sch4p4(6) Personal information

for
Alan Ciplys
Manager - Mineral Chemistry

Report Codes:
N.A. - Not Available.
L.N.R. - Listed But Not Received.
I.S. - Insufficient Sample.

Distribution Codes:
CC - Carbon Copy
EM - Electronic Media
MM - Magnetic Media

inal

ANALYTICAL REPORT

	SAMPLE	S
TP6	0.9-1.0M	0.20
TP8	1.2-1.3M	<0.05
TP2	0.3-0.5M	0.40
TP5	0.9-1.0M	<0.05
TP4	0.3-0.4M	0.10
TP1	0.5-0.6M	<0.05
TP10	0.2-0.3M	0.05

RTI DL RELEASE - EHP

UNITS	%
DET. LIM	0.05
SCHEME	VOL2

QA/QC APPENDIX NO. 7B00114

<u>Method</u>	<u>Description</u>
E084	Total Petroleum Hydrocarbons
E092	Polynuclear Aromatic Hydrocarbons
E511	pH in Soil
E340	Metals in Soils
M350S	Mercury
E504	Total Cyanide in Soil
E031	Polychlorinated Biphenyls
E083	Total Petroleum Hydrocarbons
E370	Total Metals in Water
M350W	Mercury
W031	pH
E012	Organochlorine Pesticides and PCBs
E022	Organophosphorus Pesticides
E1032	Total Phenolics as phenol

Chromatography QA/QC

	Yes	No	N/A
Retention Time Window			
Within Acceptance Criteria($\pm 2\%$)	✓		
Check Standard Within			
Acceptance Criteria($\pm 10\%$)	✓		
Recalibration Within			
Acceptance Criteria($\pm 15\%$)	✓		

Other QA/QC

Holding time conforming	
With Method Specification	✓
Chain of Custody Attached	✓

N/A=Not Applicable

Comments

1. Laboratory QA/QC including Duplicates, Matrix Spike Duplicates, and check/reference samples are included in this QA/QC appendix. (Where applicable)
2. Inter-Laboratory proficiency trial results available on request. (Where applicable)
3. Surrogate description and recoveries are recorded in the Report. (Where applicable)
4. Acceptance criteria for specific analytes as are listed on each QA/QC page.
5. Practical Quantitation Limit (PQL is typically 2-10 x method detection limit (MDL)
6. PQL's are matrix dependent and are increased accordingly where sample extracts are diluted.
7. Results are uncorrected for matrix spike or surrogate recoveries.

sch4p4(6) Personal information

per G.W. ANDERSON
Manager Environmental Sydney

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E084 TPH in Soil							
TPH C6-C36 as C8	950	1060	1040	112%	109%	111%	2%
C6-C9 Fraction	400	445	435	111%	109%	110%	2%
C15-C28 Fraction	550	610	600	111%	109%	110%	2%
Metals in Soil							
Arsenic	50	49	48	98%	96%	97%	2%
Cadmium	50	49	48	98%	96%	97%	2%
Chromium	50	51	51	102%	102%	102%	0%
Copper	50	51	51	102%	102%	102%	0%
Nickel	50	50	49	100%	98%	99%	2%
Lead	50	50	49	100%	98%	99%	2%
Zinc	50	48	48	96%	96%	96%	0%
Mercury	0.50	0.49	0.49	98%	98%	98%	0%
E504 Total Cyanide	0.5	0.5		100%			
Total Phenolics as phenol		0.8		80%			
pH in soil (1:5 in water)	7.4	7.3	7.4	99%	100%	99%	1%

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

AQC : Duplicates

Analyte	PQL	Dupl 1	Dupl 2	Average	RPD (%)
E084 TPH in Soil					
TPH C6-C36 as C8	-	nd	nd		
C6-C9 Fraction	10	nd	nd		
C10-C14 Fraction	20	nd	nd		
C15-C28 Fraction	100	nd	nd		
C29-C36 Fraction	100	nd	nd		
Metals in Soil					
Arsenic	5	nd	nd		
Cadmium	1	nd	nd		
Chromium	5	nd	nd		
Copper	5	14	13	13.5	7%
Nickel	5	nd	nd		
Lead	5	nd	7	7	
Zinc	5	21	18	19.5	15%
Mercury	0.05	nd	nd		

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

[illegible]

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level	Detected	Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E012 Organochlorine Pesticides in Soil							
HCB	0.5	0.5	0.5	100%	100%	100%	0%
a-BHC	0.5	0.5	0.5	100%	100%	100%	0%
Lindane	0.5	0.5	0.5	100%	100%	100%	0%
Heptachlor	0.5	0.4	0.4	80%	80%	80%	0%
Aldrin	0.5	0.5	0.5	100%	100%	100%	0%
b-BHC	0.5	0.5	0.5	100%	100%	100%	0%
d-BHC	0.5	0.5	0.5	100%	100%	100%	0%
Oxychlordane	0.5	0.5	0.5	100%	100%	100%	0%
Heptachlor epoxide	0.5	0.5	0.5	100%	100%	100%	0%
Alpha-Endosulfan	0.5	0.5	0.5	100%	100%	100%	0%
Gamma-Chlordane	0.5	0.5	0.5	100%	100%	100%	0%
Alpha-Chlordane	0.5	0.5	0.5	100%	100%	100%	0%
trans-Nonachlor	0.5	0.5	0.5	100%	100%	100%	0%
DDE	1.0	1.0	1.0	100%	100%	100%	0%
Dieldrin	0.5	0.5	0.5	100%	100%	100%	0%
Endrin	0.5	0.5	0.5	100%	100%	100%	0%
DDD	1	0.9	1.0	90%	100%	95%	11%
Beta-Endosulfan	0.5	0.6	0.6	120%	120%	120%	0%
DDT	1.0	1.0	1.0	100%	100%	100%	0%
Endosulfan sulphate	0.5	0.6	0.5	120%	100%	110%	18%
Methoxychlor	0.5	0.5	0.5	100%	100%	100%	0%
Total PCBs	-	--	--				
PCB Identification	-	--	--				
Surrogate % Recovery	-	--	--				

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

QAQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level Detected		Recovery Details			
		Result1 (ppm)	Result2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E022 OP Pesticides in Soil							
Dichlorvos	5	5.1	4.9	102%	98%	100%	4%
Mevinphos	5	4.2	4.0	84%	80%	82%	5%
Ethoprop	5	5.0	4.8	100%	96%	98%	4%
Phorate	5	4.5	4.8	90%	96%	93%	6%
Demeton-s	5	5.3	5.1	106%	102%	104%	4%
Diazinon	5	4.2	4.5	84%	90%	87%	7%
Disulfoton	5	4.7	4.7	94%	94%	94%	0%
Ronnel	5	4.3	4.9	86%	98%	92%	13%
Chlorpyrifos methyl	5	4.4	4.6	88%	92%	90%	4%
Chlorpyrifos	5	4.7	4.7	94%	94%	94%	0%
Merphos	5	4.8	4.8	96%	96%	96%	0%
Parathion methyl	5	4.8	5.0	96%	100%	98%	4%
Fenthion	5	4.7	4.7	94%	94%	94%	0%
Malathion	5	4.5	5.0	90%	100%	95%	11%
Fenitrothion	5	4.8	4.8	96%	96%	96%	0%
Prothiophos	5	5.2	5.0	104%	100%	102%	4%
Stirophos	5	4.0	4.2	80%	84%	82%	5%
Ethion	5	4.4	4.8	88%	96%	92%	9%
Bolstar	5	4.7	4.6	94%	92%	93%	2%
Fensulfothion	5	4.4	4.8	88%	96%	92%	9%
Azinphos methyl	5	5.1	5.1	102%	102%	102%	0%
Coumaphos	5	4.9	5.8	98%	116%	107%	17%
Surrogate % Recovery		--	--				

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

AQC : Matrix Spike / Check Solution

Analyte	Level (ppm)	Level	Detected	Recovery Details			
		Result 1 (ppm)	Result 2 (ppm)	Rec 1 (%)	Rec 2 (%)	Average (%)	RPD (%)
E031 Polychlorinated Biphenyls in Water							
PCB1260	0.1	0.10	0.10	100%	100%	100%	0%
E083 TPH in Water							
TPH C6-C36 as C8	9.5	11	9.7	116%	102%	109%	13%
C6-C9 Fraction	4.0	4.5	3.7	113%	93%	103%	20%
C15-C28 Fraction	5.5	6.8	6.0	124%	109%	116%	13%
Total Metals in Waters							
Arsenic	0.100	0.105	0.104	105%	104%	105%	1%
Cadmium	0.100	0.103	0.100	103%	100%	102%	3%
Chromium	0.100	0.099	0.099	99%	99%	99%	0%
Copper	0.100	0.100	0.099	100%	99%	100%	1%
Nickel	0.100	0.101	0.100	101%	100%	101%	1%
Lead	0.100	0.089	0.086	89%	86%	87%	3%
Zinc	0.100	0.10	0.10	100%	100%	100%	0%
M350 Mercury in Water	0.12	0.110	0.110	92%	92%	92%	0%
W031 pH	7.4	7.4		100%			

PQL = Practical Quantitation Limit

(S) Soils : mg/kg (ppm) dry weight
(W) Waters : mg/l (ppm)

nd = Not Detected
-- = Not Applicable

All results are within the acceptance criteria:

Refer to Amdel-Sydney Quality Control Manual SPM-01 4th Edition 1/7/97

Release

Appendix J

Returned Chain of Custodies
(Soil & Water)

Form Number:
Phone Number:
Contact Name:
Delivery Address:
Quote Number:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location
29/7/97		PCB1 ✓	E27803	
29/7/97		PCB2 ✓	04	
29/7/97		PCB3 ✓	05	
29/7/97		PCB4 ✓	06	
"		P1 ✓	07	
"		P2 ✓	08	
"		P3 ✓	09	
"		P4 ✓	10	
"		P5 ✓	11	
"		P6 ✓	12	
"		P7 ✓	13	

Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBS	Metals
S							
L							
L							
L							
L							
S							
S							
S							
S							
S							
S							
S							

Form:
Removal Time Required:
Notes:
Comments:

Initials	Comments/Additional Information and/or Analysis Required
	 <p>For lead Based Paint.</p>

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order & Condition by (Name): sch4p4 (6) Personal information
Date & Time: 29/7/97
Company: RTI 13-106
Signature:

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order & Condition by (Name): VINITA SINGH
Date & Time: 9AM 30/7/97
Company: amtel
Signature: sch4p4 (6) Personal information

Relinquished by:
Date & Time:
Company:
Signature:

Received in Good Order & Condition by (Name):
Date & Time:
Company:
Signature:

Medium*: S = Soil, W = Water, V = Vapour
Legend** (circle the following to be tested)
Metals: Al As Be Cd Co Cr Cu Fe Hg
L Mg Mn Ni Pb Se Sn V Zn

Samples on Ice ☐ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

RTI DL RELEASE - EHP

Job Title: **NEWFARM REMEDIATION**

laboratory Name: **AMDEL**

Address: **3/1 FORT LAURENCE MILTON**

Fax Number: **07 3369 9111**

Phone Number: **3369 5555**

Contact Name: **BILL STAVROPOULOS**

Delivery Method:

Quote Number:

Rust PPK Job Number: **843 153 B**

Job Location: **NEWFARM**

Project Manager: **CRAIG WILDERMUTH**

Results Expected by: **6-8-97**

Fax Results to: **Steve Roberson**

Fax Number: **07 3331 4223**

Phone Number: **3331 0502**

Spreadsheet of Results Required: **Y / N**

Format:

Turnaround Time Required: **2-5 days**

Invoice to:

Comments: **GCMS Compounds to be supplied.**

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	GC/MS/PCB's	Metals**	PH	Initials	Comments/Additional Information and/or Analysis Required
1/8/97	8:10am	Turbine Room	✓ x 2	E27834	W			✓							
	7:30am	Sump	✓ x 2	35				✓							
	8:15am	Bunker	✓ x 2	36				✓							

sch4p4(6) Personal information



Relinquished by: sch4p4(6) Personal information

Date & Time: **1-8-97 1:30pm**

Company: **AMDEL**

Signature: sch4p4(6) Personal information

Received in Good Order

Condition by (Name): **GARTH MORRISON**

Date & Time: **04/07/97 10AM**

Company: **AMDEL LABS**

Signature: sch4p4(6) Personal information

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order

& Condition by (Name):

Date & Time:

Company:

Signature:

Medium*: S = Soil, (W) = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al (AS) Be (Cf) Co Cr (Cl) Fe (Hc) Li Mg Mn (Nf) (Pb) Se Sn V (Zr)

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

Job Title:

NEWFARM POWERSTATION

Laboratory Name:

AMDEL

Address:

MILTON

Fax Number:

Phone Number:

Contact Name:

BILL STAVROPOLOU

Delivery Method:

Quote Number:

Rust PPK Job Number:

8451530.

Job Location:

Project Manager:

CAIRN 4210000000

Results Expected by/on:

6-8-97

Fax Results to:

S. Rasmussen

Fax Number:

5931 4223

Phone Number:

8212 0022

Spreadsheet of Results Required: Y / N

Format:

Turnaround Time Required: 3-5 days.

Invoice to:

Comments: GCMS Chemists.

Date Sampled	Time	Sample I.D.	Container Size	Sample Location
1/3/97		TP1; 5.0-3.1m	✓ 27848	
		TP3; 1.2-1.3m	✓ 49	
		TP3; 1.9-2.0m	✓ 50	
11/7/97		TP2; 0.3-0.5m	✓ 51	
10/7/97		TP2; 1.5-1.6m	✓ 52	
		TP2; 2.3-2.4m	✓ 53	
11/7/97		TP2; 0.3-1.0m	✓ 54	
11/7/97		TP5; 0.5-0.6m	✓ 55	
		TP5; 0.9-1.0m	✓ 56	

Medium*
Preservative Type
Filtered (X)
TPH
BTEX
PAH's
OC/OP/PCBs
Metals**
PH

Initials

Comments/Additional Information and/or Analysis Required

sch4p4(6) Personal information

Hold

Hold



Relinquished by: sch4p4(6) Personal information

Date & Time: 11/8/97 2:00pm

Company: PPK

Signature: sch4p4(6) Personal information

Received in Good Order
Condition by (Name): GARTH MORRISON

Date & Time: 04/08/97 10am

Company: AMDEL LARS

Signature: sch4p4(6) Personal Information

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Medium* (S) = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Pb

Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

Job Title: **NEWFARM**

Laboratory Name: **AMDEL**

Address: **MILTON**

Rust PPK Job Number: **8431535**

Job Location:

Project Manager: **C. L. Liden**

Results Expected by/on: **6-8-97**

Fax Results to: **S. Robertson**

Fax Number: **8231 4223**

Phone Number: **8219 8822**

Spreadsheet of Results Required: **Y / N**

Format:

Turnaround Time Required: **3-5 days**

Invoice to:

Comments: **GC ms chromatograms**

Fax Number:

Phone Number:

Contact Name: **BILL STANHOPE**

Delivery Method:

Quote Number:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Initials	Comments/Additional Information and/or Analysis Required
31/7/97		TP5; 2.2-3.3m	✓ 57	85	S									
		TP5; 2.9-3.0m	✓ 58											
		TP5; 3.5-3.6m	✓ 59											
		TP5; 3.8-4.0m	✓ 60											
31/7/97		TP4; 0.3-0.4m	✓ 61											
		TP4; 0.8-0.9m	✓ 62											
		TP4; 1.5-2.9m	✓ 63											
		TP3; 0.3-0.5m	✓ 64											
		TP3; 1.0-1.2m	✓ 65											
		TP3; 1.3-1.35m	✓ 66											

sch4p4(6) Personal information



Relinquished by: sch4p4(6) Personal information

Relinquished by:

Relinquished by:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al ☒ Be ☒ Cd ☒ Co ☒ Cr ☒ Cu ☒ Fe ☒ Hg ☒

Li ☒ Mg ☒ Mn ☒ Ni ☒ Pb ☒ Se ☒ Sn ☒ V ☒ Zn

Samples on Ice: ☒ Yes ☐ No

Received in Good Order & Condition by (Name): **GARTH MORRISON**

Received in Good Order & Condition by (Name):

Received in Good Order & Condition by (Name):

Date & Time: **04/08/97 10AM**

Date & Time:

Date & Time:

Company: **AMDEL LABS**

Company:

Company:

Signature: sch4p4(6) Personal information

Signature:

Signature:

Collection 17

Please fax back a signed copy when samples are received at the laboratory

Job Title:

NEW ARM

Laboratory Name:

AMDEL

Address:

MILTON

Fax Number:

Phone Number:

Contact Name:

DILL STANHOPE

Delivery Method:

Quote Number:

Rust PPK Job Number:

84J153B.

Job Location:

Project Manager: C. W. L. Morrison

Results Expected by/on: 6-8-97

Fax Results to: S. Robertson

Fax Number: 3831 4882

Phone Number: 3318 2802

Spreadsheet of Results Required: Y / N

Format:

Turnaround Time Required: 3-5 days

Invoice to:

Comments: GCMS Chromatograms

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Initials	Comments/Additional Information and/or Analysis Required
21/7/97		TP3; 1.35m-1.4m	✓ 67		S			✓		✓		✓		} Hold } Hold } Hold } Hold
		TP3; 1.45-1.5m	✓ 68											
		TP3; 2.2-2.5m	✓ 69											
		TP1; 0.5-0.6m	✓ 70									✓		
		TP1; 1.4-1.6m	✓ 71									✓		
		TP1; 2.2-2.5m	✓ 72									✓		
		TP9; 0.3-0.4m	✓ 73									✓		
		TP9; 0.3-0.5m	✓ 74									✓		
		TP9; 1.4-1.5m	✓ 75									✓		
		TP9; 2.1-2.3m	✓ 76					✓		✓		✓		

sch4p4(6) Personal information



Relinquished by: sch4p4(6) Personal information

Date & Time: 2:00 1-8-97

Company: PPL

Signature: sch4p4(6) Personal information

Received in Good Order
Condition by (Name): GARTH MORRISON

Date & Time: 04/08/97 10am

Company: AMDEL / ABS

Signature: sch4p4(6) Personal information

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend*: (circle the following to be tested)

Metals: Al (AS) Be (C) Co (C) Cu (C) Fe (C) Hg (C)

Li Mg Mn (Ni) Pb Se Sn V (Zn)

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

RTI DL RELEASE - EHP

Job Title:

Laboratory Name: **NEUFAM**

Address: **AMDEL**

MILTON

Fax Number:

Phone Number:

Contact Name: **BKL STAUROPOLOUS**

Delivery Method:

Quote Number:

Rust PPK Job Number:

84J153B

Job Location:

Project Manager: **C. W. MORRISON**

Results Expected by/on: **6-8-97**

Fax Results to: **S. Polych**

Fax Number: **3331 4223**

Phone Number: **3318 2022**

Spreadsheet of Results Required: **Y / N**

Format:

Turnaround Time Required: **3-5 days**

Invoice to:

Comments: **6 Cms Chromatograms**

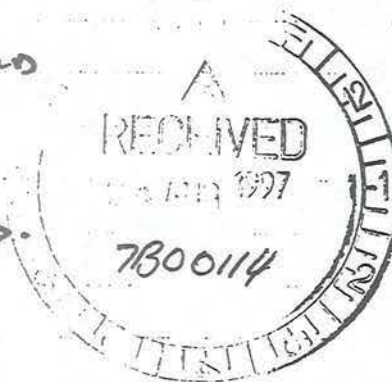
Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	Initials	Comments/Additional Information and/or Analysis Required
21-7-97		TPA; 3.9-4.0m	✓ 77											
		TPA; 4.1-4.3m	✓ 78											
		TP10; 0.2-0.3m	✓ 79											
		TP10; 0.3-0.4m	✓ 80											
		TP10; 1.4-1.6m	✓ 81											
		TP10; 1.8-1.9m	✓ 82											
		TP10; 2.2-2.4m	✓ 83											
		TP10; 2.6-2.8m	✓ 84											

sch4p4(6) Personal information

HOLD

HOLD

HOLD



Relinquished by: sch4p4(6) Personal information

Date & Time: **5-00 1-8-97**

Company: **PPA**

Signature: sch4p4(6) Personal information

Received in Good Order
Condition by (Name): **GARTH MORRISON**

Date & Time: **04108197 10am**

Company: **AMDEL LABS**

Signature: sch4p4(6) Personal information

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Relinquished by:

Date & Time:

Company:

Signature:

Received in Good Order
& Condition by (Name):

Date & Time:

Company:

Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend*: (circle the following to be tested)

Metals: Al ☒ As ☒ Be ☒ Cd ☒ Co ☒ Cr ☒ Cu ☒ Fe ☒ Hg ☒
Li Mg Mn ☒ Ni ☒ Pb ☒ Se Sn V ☒ Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

Job Title: NEW FARM	Rust PPK Job Number: 84J15313	Job Location:	Project Manager: C. G. G. G. G.
Laboratory Name: AMPEL			Results Expected by/on: 6-8-97
Address: MILTON			Fax Results to: S. Robertson
			Fax Number: 3431 4223
			Phone Number: 2214 2222
Fax Number:			Spreadsheet of Results Required: Y / N
Phone Number:			Format:
Contact Name: Bill STAVROPOULOS			Turnaround Time Required: 3-5 days
Delivery Method: 1			Invoice to:
Quote Number:			Comments: GCMS Chromatograms

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	Initials	Comments/Additional Information and/or Analysis Required
1/8/97		Coal drain	✓ 85											
		Turbine 1 (East)	✓ 86											
		Turbine 2 (West)	✓ 87											

sch4p4(6) Personal information



Relinquished by: sch4p4(6) Personal information	Relinquished by:	Relinquished by:	Medium* ☒ S Soil, W = Water, V = Vapour
Date & Time: 200 1-8-97	Date & Time:	Date & Time:	Legend** (circle the following to be tested)
Company: PPK	Company:	Company:	Metals: Al ☒ As ☒ Be ☒ Cd ☒ Co ☒ Cr ☒ Cu ☒ Fe ☒ Hg
Signature: sch4p4(6) Personal information	Signature:	Signature:	Li ☒ Mg ☒ Mn ☒ N ☒ Pb ☒ Se ☒ Sn ☒ V ☒ Zn
Received in Good Order	Received in Good Order	Received in Good Order	Samples on Ice: ☒ Yes ☐ No
Condition by (Name): G. MORRISON	Condition by (Name):	Condition by (Name):	
Date & Time: 4-08-97	Date & Time:	Date & Time:	
Company: AMPEL LABS	Company:	Company:	
Signature: sch4p4(6) Personal information	Signature:	Signature:	

Please fax back a signed copy when samples are received at the laboratory

Appendix K

Summary of Analytical Results and Statistical Analysis

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Sample	Depth (m)	C6-C9	C10-C14	C15-C28	C29-C36	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Cn	Phenols
TPH and Metals															
Limit of reporting		10	20	100	100	5	1	5	5	5	5	5	0.05	0.1	0.1
TP6	0.9-1.0	10	20	100	100	5	1	5	13	5	7	18	0.05	0.2	0.1
TP6	2.0-2.1	10	20	100	100	5	1	7	5		21	12	0.05		
TP7	0.2-0.3	10	20	100	100	5	1	5	11	5	40	24	0.58	0.2	0.1
TP7	1.9-2.0	10	20	480	105	5	1	9	59	11	105	131	0.48		
TP8	1.2-1.3	10	20	100	100	5	1	8	72	12	177	164	0.33		
TP8	1.9-2.0	10	20	105	100	9	1	8	110	15	2340	376	0.12		
TP2	0.3-0.5	10	20	100	100	124	1	14	131	42	818	1840	3.9		
TP2	2.3-2.4	10	20	100	100	5	1	28	15	23	8	42	0.05		0.1
TP5	0.9-1.0	10	20	100	100	5	1	20	14	17	30	59	0.09		
TP5	3.5-3.6	10	20	100	100	5	1	13	18	14	48	56	0.26		
TP4	0.3-0.4	10	20	100	100	5	1	21	20	17	40	69	0.14	0.2	
TP4	2.8-2.9	10	20	720	100	5	1	21	20	17	57	880	0.12		0.8
TP3	1.0-1.2	10	20	100	100	5	1	5	6	6	12	15	0.05	0.2	0.1
TP3	1.35-1.4	10	20	100	100	5	1	5	5	5	26	39	0.07		
TP1	0.5-0.6	10	20	100	100	5	1	24	15	19	8	49	0.06		
TP1	2.2-2.5	10	20	100	100	5	1	26	18	33	9	61	0.05		0.1
TP9	0.3-0.4	10	20	100	100	10	1	15	22	13	29	72	0.08		
TP9	2.1-2.3	10	20	100	100	5	1	23	19	23	16	148	0.07		
TP10	0.2-0.3	10	20	100	100	5	1	7	32	10	106	124	0.28		
TP10	1.8-1.9	10	20	100	100	5	1	5	27	7	127	120	0.13		
Coal Drain	Surface	10	20	100	100	7	52	16	282	13	5140	3360	2.1		
Turb 1 East	Surface	10	20	570	100	30	11	57	1140	88	23700	23600	291		
Turb 2 West	Surface	10	20	705	100	17	8	48	528	52	24600	28300	27		

Brisbane City Council - New Farm ESA Summary of Soil Analytical Results

Sample	Depth (m)	C6-C9	C10-C14	C15-C28	C29-C36	As	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Cn	Phenols
Total		23	23	23	23	23	23	23	23	23	23	23	23	4	6
Mean		10.00	20.00	190.43	100.22	12.26	3.96	16.96	112.26	19.65	2498.43	2589.52	14.22	0.20	0.22
Stdev		0.00	0.00	205.34	1.04	25.01	10.76	13.59	253.26	19.08	6927.96	7444.75	60.60	0.00	0.29
Max		10.00	20.00	720.00	105.00	124.00	52.00	57.00	1140.00	88.00	24600.00	28300.00	291.00	0.20	0.80
Min		10.00	20.00	100.00	100.00	5.00	1.00	5.00	5.00	5.00	7.00	12.00	0.05	0.20	0.10
95% UCL		10.00	20.00	276.07	100.65	22.69	8.45	22.63	217.88	27.51	5387.59	5694.20	39.49	0.20	0.45
Assumes maximum value for results stated to be <20, <50, <100, <100															
Sample															
OCPs and OPPs		OCPs	OPPs												
Limit of reporting		0.1	0.5												
TP6	2.0-2.1	0.1	0.5												
TP1	0.5-0.6	0.1	0.5												
TP9	0.3-0.4	0.1	0.5												
Total		3	3												
Mean		0.10	0.50												
Stdev		0.00	0.00												
Max		0.10	0.50												
Min		0.10	0.50												
95% UCL		0.10	0.50												
All values in mg/kg unless otherwise specified															

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Sample	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)(k)fluoranthene	Benzo(a)pyrene	Ideno(1,2,3-cd)pyrene	Dibenz(a,h)anthracene
PAHs															
Limit of reporting		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP6	0.9-1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP6	2.0-2.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP7	0.2-0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP7	1.9-2.0	0.5	1	0.5	0.5	1.1	1.2	8.6	10	6.5	5.3	20	9.7	12	1.7
TP8	1.2-1.3	0.5	0.5	0.5	0.5	0.5	0.5	1	1	0.6	0.5	1	0.7	0.8	0.5
TP8	1.9-2.0	0.5	0.5	0.5	0.5	0.6	0.5	1.3	1.4	0.7	0.7	2	0.8	0.8	0.5
TP2	0.3-0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP2	2.3-2.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP5	0.9-1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP5	3.5-3.6	0.5	0.5	0.5	0.5	0.5	0.5	2.5	2.6	1.4	1.2	3	1.5	1.4	0.5
TP4	0.3-0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP4	2.8-2.9	3.9	0.8	6.6	9	65	13	61	49	26	20	39	22	21	2.6
TP3	1.0-1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP3	1.35-1.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP1	0.5-0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP1	2.2-2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP9	0.3-0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
TP9	2.1-2.3	0.5	0.5	0.5	0.5	0.5	0.5	0.9	1	0.7	0.7	3	1.3	1.7	0.5
TP10	0.2-0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5	0.5	1	0.7	0.7	0.5
TP10	1.8-1.9	0.5	0.5	0.5	0.5	0.5	0.5	1	1.1	0.7	0.7	2	1	1.3	0.5
Coal Drain	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Turb 1 East	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Turb 2 West	Surface	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5
Total		23	23	23	23	23	23	23	23	23	23	23	23	23	23

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Mean	0.65	0.53	0.77	0.87	3.33	1.07	3.68	3.23	1.94	1.61	3.74	1.97	2.05	0.64
Stdev	0.71	0.12	1.27	1.77	13.44	2.60	12.61	10.17	5.39	4.13	8.64	4.77	4.77	0.49
Max	3.90	1.00	6.60	9.00	65.00	13.00	61.00	49.00	26.00	20.00	39.00	22.00	21.00	2.60
Min	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	0.50	0.50	0.50
95% UCL	9.43E-01	5.84E-01	1.30E+00	1.61E+00	8.94E+00	2.16E+00	8.94E+00	7.48E+00	4.19E+00	3.34E+00	7.34E+00	3.95E+00	4.04E+00	8.50E-01
All values in mg/kg unless otherwise specified														

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