

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 area 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.

Site layouts showing sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current DEH threshold levels) is presented in Figures 1 & 2.

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, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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. The integrity of the capping material is to be maintained to ensure water does not infiltrate through the contaminated zone and prevent/minimise erosion of clay capping layers (where installed).
- 3.1.2 Landscaped garden areas shall not exceed 10% of the site in area (Figures 1 & 2) 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 capping material.
- 3.1.4 The area of land, on Lot 101 on SP 102967, to the east of the former Power Station building and adjacent to the river (including land under the boardwalk) is to be capped as per 3.1.1.
- 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 EMP 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 EMP 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 (or equivalent), 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 Administering Authority under Section 118ZZF (or equivalent) of the Environmental Protection Act 1994.
- 3.1.9 The groundwater monitoring well installed on-site as part of previous site investigation works at location BH 8 (see Figure 2) shall be maintained in an operational condition to allow on-going monitoring of the groundwater aquifer. If damaged the monitoring bore is to be replaced.
- 3.2 *Achievement of Management Objectives - Post Construction (development)*
- 3.2.1 The site capping layer (other than the landscaped garden areas, see Figures 1 & 2), which consists of a concrete slab, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/or other equivalent impermeable cover is to be maintained in good condition at all times.
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- 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 Administering Authority under Section 118ZZF (or equivalent) 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.

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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 (and at the completion of the construction phase) to the administering authority detailing the results of all monitoring and compliance with SMP 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 SMP 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.
- 4.2.3 A round of groundwater sampling is to be undertaken from the on-site groundwater monitoring well BH 8 (see Figure 2) prior to 30 November 1999 (Note BH 3 and BH 6 on Lot 2 on RP 210504 should be sampled at the same time - see SMP for Lot 2 on RP 210504). 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 (including BH 3 and BH 6) and recalculation of the local groundwater flow direction to confirm previous monitoring results. The results shall be provided in a written report to the Administering Authority by 31 December 1999. Based on this round of sampling, subsequent groundwater monitoring and reporting

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

1.0 Summary of Contamination

Lot 2 on RP 210504 was formerly used for the purpose of power distribution. Waste material from the adjacent New Farm Power Station site has been used as fill material on this land parcel. As a consequence, fill consisting mostly of boiler ash, was deposited across much of the site.

Levels of selected heavy metals (arsenic, chromium, copper, lead and zinc) and/or Total Petroleum Hydrocarbons (TPH) in excess of Adminstrating Authority Environmental Investigation level 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 contaminated 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 Adminstrating Authority 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.

Site layouts showing sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current Adminstrating Authority thresholds) is presented in Figures 1 & 2.

2.0 Objectives

The objective of the Site Management Plan is to manage contaminants identified on Lot 2 on 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:

- Implementation of controls on site excavation, building refurbishment and redevelopment works;
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- Minimisation of surface water infiltration; and
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- controls for material cartage (eg covering loads, wetting material to reduce airborne dust emissions;
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- 3.2 *Achievement of Management Objectives - Post Construction (development)*
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4. *Monitoring & Reporting*

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- 4.1.1 During the pre-construction and construction phases of the development a report is to be submitted on a six monthly basis (and at the completion of the construction phase) to the administering authority detailing the results of all monitoring and compliance with SMP 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 SMP 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.
- 4.2.3 A round of groundwater sampling is to be undertaken from on-site groundwater monitoring wells (denoted as BH3 and BH6) prior to 30 November 1999 (Note BH 8 on Lot 101 on SP 102967 should be sampled at the same time - see SMP for Lot 101 on SP 102967). 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 Administering Authority by 31 December 1999. Based on this round of sampling, subsequent groundwater monitoring and reporting 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.

RTI DL RELEASE - EHP

Subject: New Farm Power Station Update/Notification**Date:** Thu, 21 Jan 1999 12:53:03 +1000**From:** "Woodfull, Chris" <cwoodfull@ppk.com.au>**To:** "Mack.Dreyer@env.qld.gov.au" <Mack.Dreyer@env.qld.gov.au>

Mack

further to our recent correspondence, Susie Beale notified me this morning that BCC are:

- happy to go with capping across the site (including the boardwalk area (ie. the reference back to condition 3.1.1;

- have decided to accept the root barrier (ie. clay capping, plastic/HDPE layer, planter boxes, etc) for this site and QTSC site, given the proposed development plans for the site. I understand that the detailed design is essentially completed and a finalised SMP is required to work with.

NB. that BCC do not consider this condition will NOT be acceptable for Powerhouse Park land parcel (regardless of conditions applied to neighbouring land parcels). This issue may require a meeting with interested parties (eg DEH, BCC Parks Management, etc) to thrash out an acceptable clause, once further investigations have been completed at the Park site.

- happy with the 6 monthly monitoring reporting requirement during pre-construction and construction works, (the project schedule is for the completion of construction works by the end of this year)

Therefore, if you have no objections, I will finalise changes to the draft SMP for your final review (and peer review), including site plans and send to you ASAP - hopefully by the end of tomorrow.

Cheers, Chris

RTI DL RELEASE EMP

Release

Subject: RE: New Farm Power Station**Date:** Mon, 18 Jan 1999 13:14:49 +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 update. See comments below:

re: 3.1.4, reference back to 3.1.1 would seem appropriate (and the preliminary design is broadly consistent with this). This will keep the plan uncomplicated. Nb. may need to include reference to a batter (or wall) for the embankment areas).

re: 3.1.3, agreed, the planter boxes are not an issue (as the boxes are self contained and would sit on a sealed pavement). However, it is 1) the possible future changes to landscape design and 2) the potential ramifications of the clause on adjacent land parcels affected with the same contamination issues (eg Powerhouse Park) which need to be considered also.

I will refer this issue to the BCC management team (and if they are comfortable with a no clay capping penetration clause - we can ease as is (with an additional reference to planter boxes).

Howev, in my mind, a consultation (and approvals) process between the owner and Admin Authority is a simple condition which will allow for a safe but flexible land management approach (and I would have thought been acceptable to the principles behind the introduction of site management plans).

On a general note, without these kinds of clauses, isn't the usefulness of the SMP process somewhat reduced, particularly in the management of long term contaminated land parcels, ie the plan becomes an inflexible/non evolving document (which might not be able to take into account improvements in management/remedial techniques and/or risk assesment data?

re: 3.2.5 and WHASP, no further comments needed.

re: 4.1.1, 6 monthly monitoring report during pre construction and construction-(I will confirm).

Hopefully, we can finalise this week.

Cheers, Chris.

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

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

Sent: Monday, 18 January 1999 9:43 AM

To: Woodfull, Chris

Subject: New Farm Power Station

-- 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

discussed with C.W. & IPA implications

sch4p4(6) Personal Information

Version 3

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- 4.2.1 An inspection of the site is required at a minimum of every six months to ensure that the SMP 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 available to the Administering Authority on request.
- 4.2.3 A round of groundwater sampling is to be undertaken from on-site groundwater monitoring wells (denoted as BH3 and BH6) prior to 30 November 1999 (Note BH 8 on Lot 101 on SP 102967 should be sampled at the same time - see SMP for Lot 101 on SP 102967). 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 (including BH 8 - see SMP Lot 101 on SP102967) and recalculation of the local groundwater flow direction to confirm previous monitoring results. The results shall be provided in a written report to the Administering Authority by 31 December 1999. Based on this round of sampling, subsequent groundwater monitoring and reporting requirements (and the SMP conditions) are to be reassessed by the Administering Authority.

Version 4.

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 area 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.

Site layouts showing sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current DEH threshold levels) is presented in Figures 1 & 2.

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, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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. The integrity of the capping material is to be maintained to ensure water does not infiltrate through the contaminated zone and prevent/minimise erosion of clay capping layers (where installed).
- 3.1.2 Landscaped garden areas shall not exceed 10% of the site in area (Figures 1 & 2) 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 capping material.
- 3.1.4 The area of land, on Lot 101 on SP 102967, to the east of the former Power Station building and adjacent to the river (including land under the boardwalk) is to be capped as per 3.1.1.
- 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 EMP 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 EMP 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;

Release

- 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 (or equivalent), 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 Administering Authority under Section 118ZZF (or equivalent) of the Environmental Protection Act 1994.
- 3.1.9 The groundwater monitoring well installed on-site as part of previous site investigation works at location BH 8 (see Figure 2) shall be maintained in an operational condition to allow on-going monitoring of the groundwater aquifer. If damaged the monitoring bore is to be replaced.
- 3.2 *Achievement of Management Objectives - Post Construction (development)*
- 3.2.1 The site capping layer (other than the landscaped garden areas, see Figures 1 & 2), which consists of a concrete slab, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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 capping material.
- 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 Administering Authority under Section 118ZZF (or equivalent) 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 A site specific Workplace Health and Safety Plan (WHASP), satisfying the relevant obligations imposed by the Workplace Health and Safety Act 1997 (or equivalent), 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 approved (refer to 3.2.6) excavation works on-site.
- 3.2.8 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.
- 3.2.9 The groundwater monitoring well installed on-site as part of previous site investigation works at location BH 8 (see Figure 2) shall be maintained in an operational condition to allow on-going monitoring of the groundwater aquifer. If damaged the monitoring bore is to be replaced.

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 (and at the completion of the construction phase) to the administering authority detailing the results of all monitoring and compliance with SMP 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 SMP 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.
- 4.2.3 A round of groundwater sampling is to be undertaken from the on-site groundwater monitoring well BH 8 (see Figure 2) prior to 30 November 1999 (Note BH 3 and BH 6 on Lot 2 on RP 210504 should be sampled at the same time - see SMP for Lot 2 on RP 210504). 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 (including BH 3 and BH 6- see SMP Lot 2 on RP 210504) and recalculation of the local groundwater flow direction to confirm previous monitoring results. The results shall be provided in a written report to the Administering Authority by 31 December 1999. Based on this round of sampling, subsequent groundwater

monitoring and reporting requirements (and the SMP conditions) are to be reassessed by the Administering Authority.

RTI DL RELEASE - EHP

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To MACK FREYER

From CHRIS WOODFULL

Client EPA - QLD

Client _____
Address Level 12, 160 Ann Street
Brisbane, Qld, 4002

Date 25/1/99

Project New Farm Power Station - 8mPs

Job No. 84K109A

We enclose the following documents:

Quantity	Document No.	Rev. No.	Description
1	902196 lot 10 SMP V. 1		lot 101 draft SMP (former Power St. site)
1	2-210504		Lot 2 draft SMP. (former Q1&E site)
			w/te hard copy of plans
			and disc which includes electronic versions of Plans as of 25/1/99.

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

Reason _____ sch4p4(6) Personal information

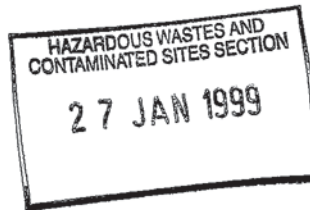
Authorised by _____

Method of Delivery Carner

RTI 13-106

Collection 18
 ✓ White-Client Copy Green-Receipt Copy Blue-File Copy Yellow-Book Copy

Page 21



Mack

draft SMPs, as discussed. Nb. The Appendix A cover page has not been included in these versions, (if requested these would be added and forwarded by email.

Cheers

sch4p4(6) Personal information

25/1/99

With Compliments

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 area 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.

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

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, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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. The integrity of the capping material is to be maintained to ensure water does not infiltrate through the contaminated zone and prevent/minimise erosion of clay capping layers (where installed).
- 3.1.2 Landscaped garden areas shall not exceed 10% of the site in area (Appendix A) 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 capping material.
- 3.1.4 The area of land, on Lot 101 on SP 102967, to the east of the former Power Station building and adjacent to the river (including land under the boardwalk) is to be capped as per 3.1.1.
- 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 EMP 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 EMP 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 Administering Authority 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 A), which consists of a concrete slab, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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 capping material.
- 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 Administering Authority 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 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 approved (refer to 3.2.6) excavation works on-site.
- 3.2.8 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

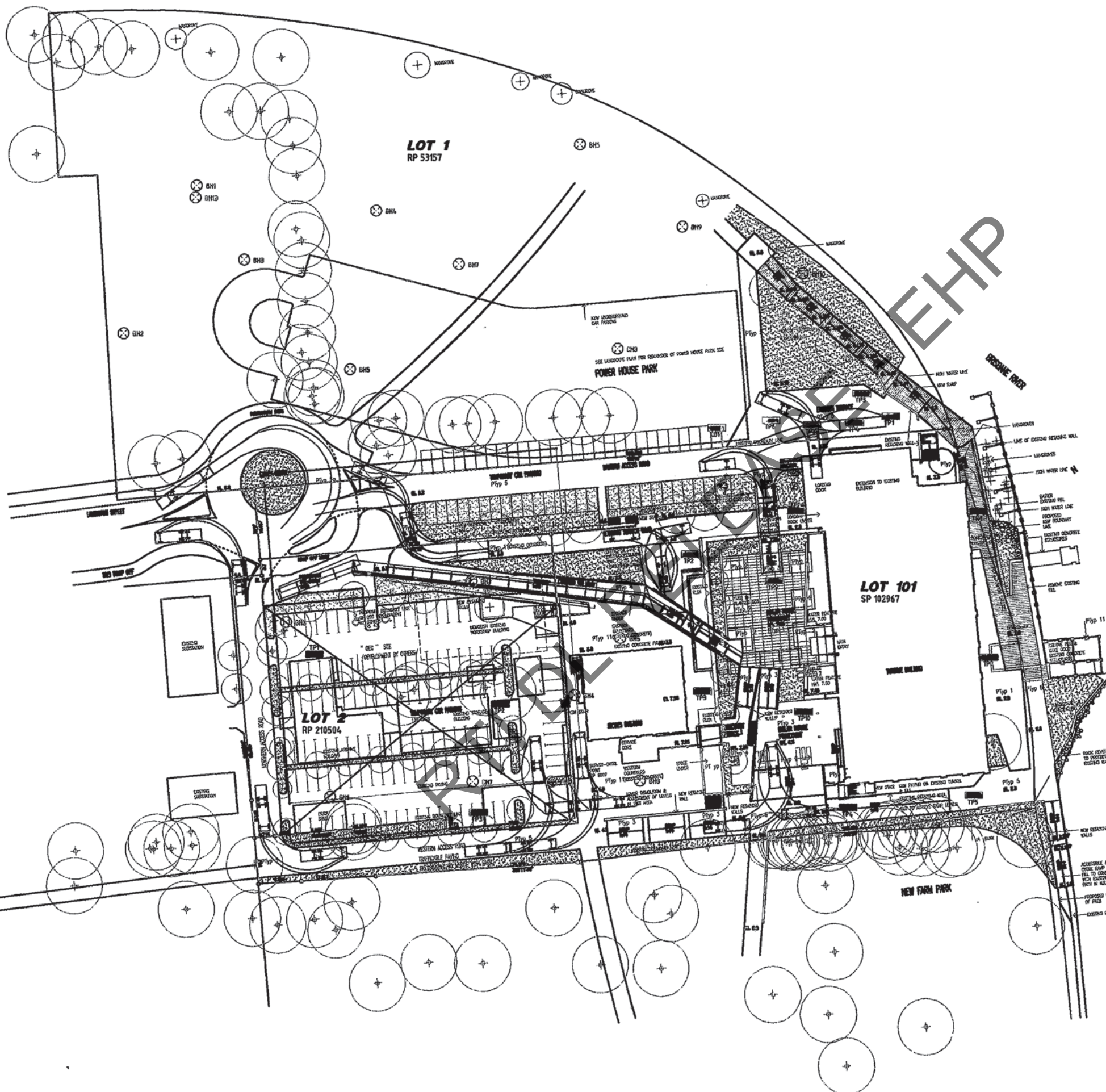
To ensure compliance with the SMP, the owner of the site is to ensure that the following monitoring and reporting requirements are performed.

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 (and at the completion of the construction phase) to the administering authority detailing the results of all monitoring and compliance with SMP 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 SMP 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 available to the Administering Authority on request.



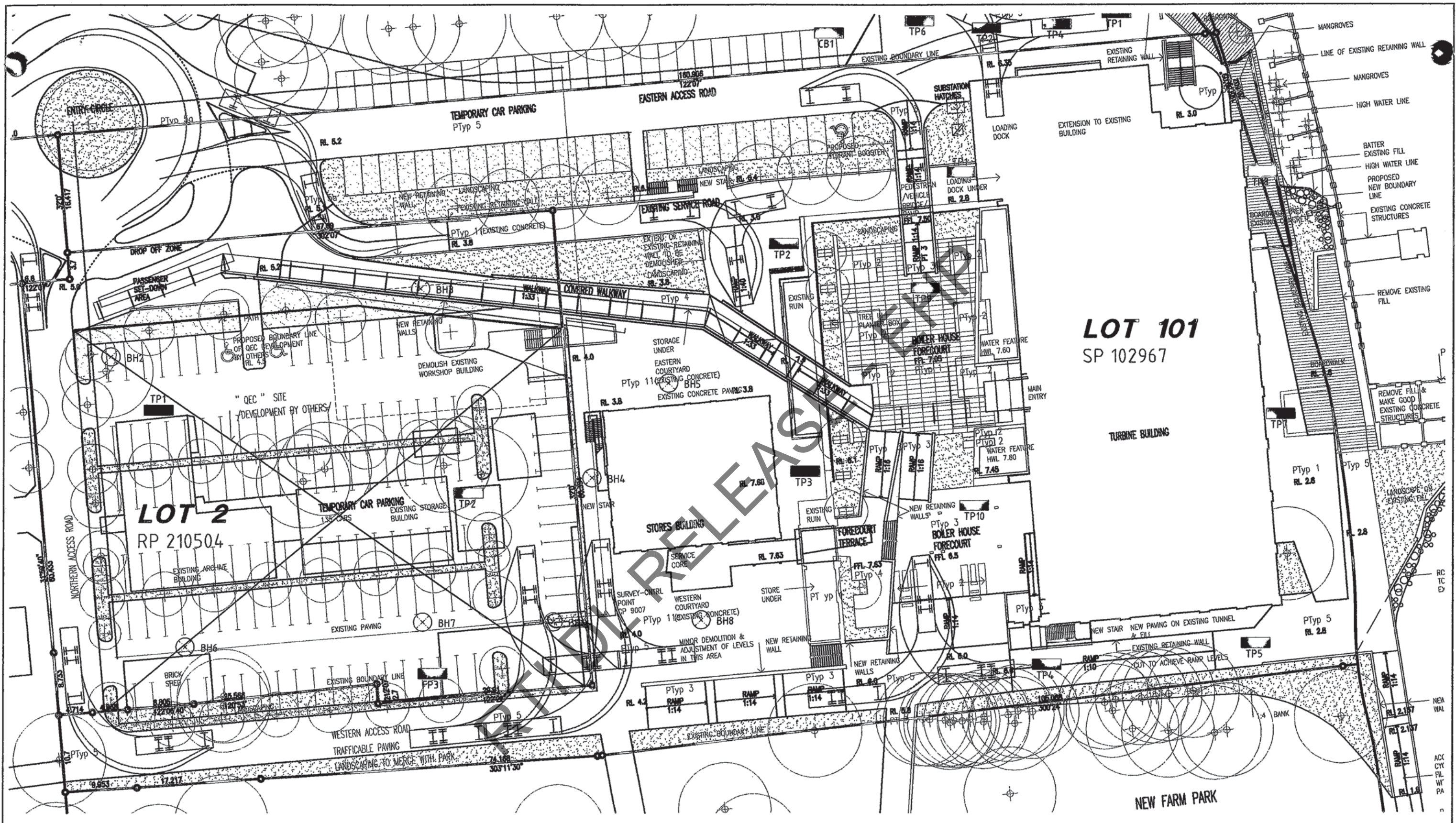
LEGEND

- BH1 BOREHOLE
SOIL RESULT GREATER THAN DEH GUIDELINES
- BH18 BOREHOLE
SOIL RESULT LESS THAN DEH GUIDELINES
- TP1 TESTPIT
SOIL RESULT GREATER THAN DEH GUIDELINES
- TP4 TESTPIT
SOIL RESULT LESS THAN DEH GUIDELINES
- RP BOUNDARY



FIGURE 1
SITE PLAN - RP BOUNDARIES

SCALE 0 10 20 1:600 AT A1



LOT 101
SP 102967

LOT 2
RP 210504

LEGEND

- ⊗ BH1 BOREHOLE
SOIL RESULT GREATER THAN DEH GUIDELINES
- ⊗ BH1B BOREHOLE
SOIL RESULT LESS THAN DEH GUIDELINES
- RP BOUNDARY
- TP1 TESTPIT
SOIL RESULT GREATER THAN DEH GUIDELINES
- TP4 TESTPIT
SOIL RESULT LESS THAN DEH GUIDELINES



FIGURE 2
SITE PLAN - LOT 101, SP 102967

SCALE 1:250 AT A1

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

1.0 Summary of Contamination

Lot 1 on RP 210504 was formerly used for the purpose of power distribution. Waste material from the adjacent New Farm Power Station site has been used as fill material on this land parcel. As a consequence, fill consisting mostly of boiler ash, was deposited across much of the site.

Levels of selected heavy metals (arsenic, chromium, copper, lead and zinc) and/or Total Petroleum Hydrocarbons (TPH) in excess of Adminstrating Authority Environmental Investigation level 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 contaminated 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 Adminstrating Authority 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.

Site layouts showing sample locations (and highlighting locations which contained heavy metal and/or organic compounds above current Adminstrating Authority thresholds) is presented in Appendix A.

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:

- 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, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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. The integrity of the capping material is to be maintained to ensure water does not infiltrate through the contaminated zone and prevent/minimise erosion of clay capping layers (where installed).
- 3.1.2 Landscaped garden areas shall not exceed 10% of the site in area (Appendix A) 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 capping material.
- 3.1.4 All slopes, batters and/or retaining walls are to be geotechnically stable and not subject to slumping, or erosion.
- 3.1.5 Groundwater monitoring wells installed on-site as part of previous site investigation works shall be maintained in their present condition to allow ongoing monitoring of the groundwater aquifer.
- 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 EMP 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 EMP 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 Administering Authority 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 A), which consists of a concrete slab, bitumen/asphalt paving, compacted clay to a minimum depth of 0.5 m and/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.
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- 3.2.5 Contaminated soil must not be excavated or removed from the site without adequate sampling and without the prior approval of the Administering Authority 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 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 approved (refer to 3.2.6) excavation works on-site.

- 3.2.8 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.
- 3.2.9 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.

4. *Monitoring & Reporting*

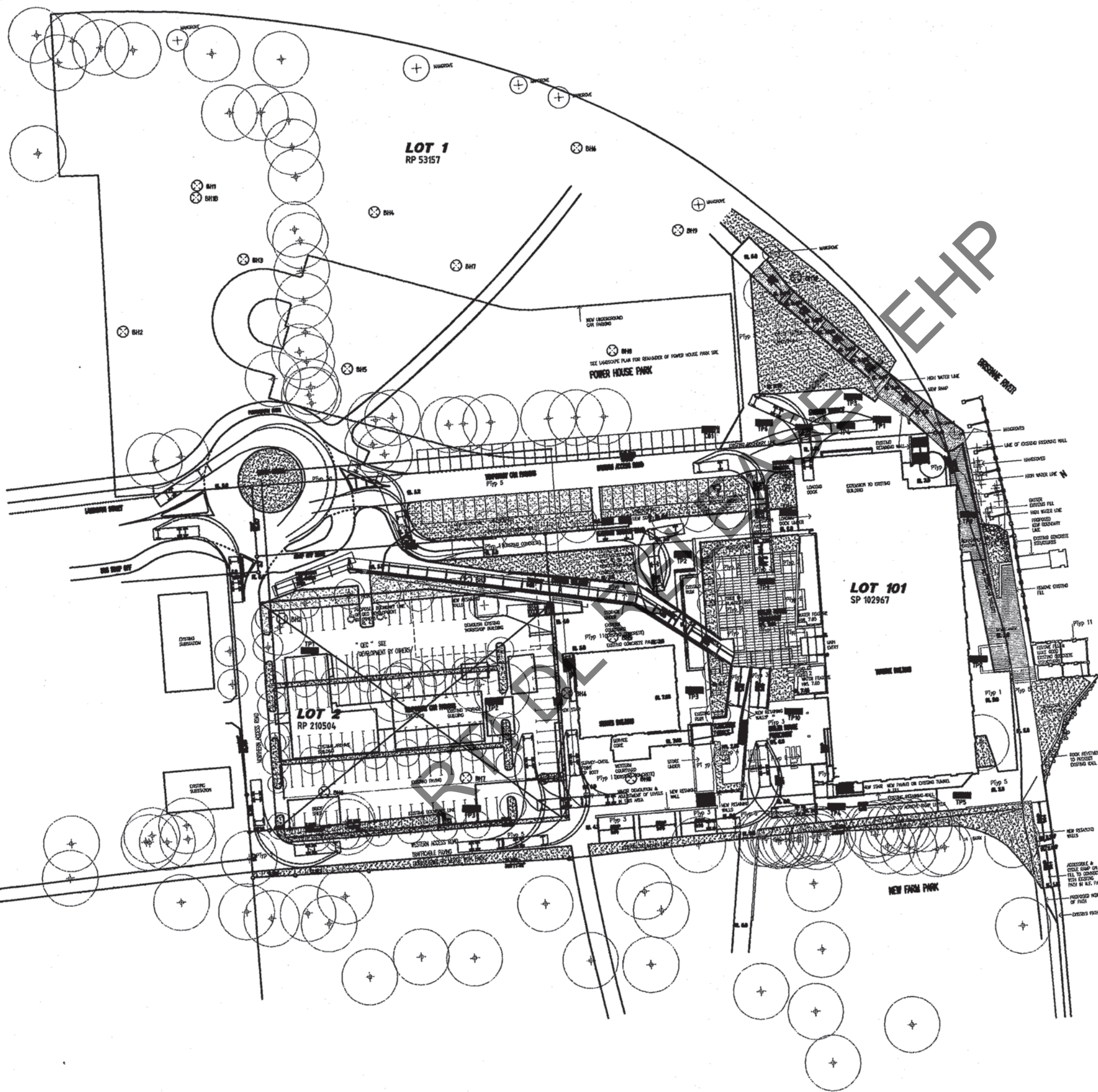
To ensure compliance with the SMP, the owner of the site is to ensure that the following monitoring and reporting requirements are performed.

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 (and at the completion of the construction phase) to the administering authority detailing the results of all monitoring and compliance with SMP 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 SMP 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 available to the Administering Authority on request.
- 4.2.3 A round of groundwater sampling is to be undertaken from on-site groundwater monitoring wells (denoted as BH3, BH6 and BH8) prior to 30 November 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 Administering Authority by 31 December 1999. Based on this round of sampling, subsequent groundwater monitoring and reporting 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.



LEGEND

- ⊗ BH1 BOREHOLE
SOIL RESULT GREATER THAN DEH GUIDELINES
- ⊗ BH1B BOREHOLE
SOIL RESULT LESS THAN DEH GUIDELINES
- TP1 TESTPIT
SOIL RESULT GREATER THAN DEH GUIDELINES
- TP4 TESTPIT
SOIL RESULT LESS THAN DEH GUIDELINES
- RP BOUNDARY



FIGURE 1
SITE PLAN - RP BOUNDARIES

SCALE 0 10 20 1:600 AT A1

