

Cont site



Dedicated to a better Brisbane

Phone direct: 3027 4724
Fax direct: 333 40071
Mobile: CTPI - Personal information
Email: greg.mcpherson@brisbane.qld.gov.au
Reference: CD/W4-080520

DEPARTMENT OF ENVIRONMENT
AND RESOURCE MANAGEMENT
- 2 OCT 2009
BNE 2009 / 9282

6 June 2008

Ecoaccess
Environmental Protection Agency
PO Box 15155
City East QLD 4002

Attention: Kim Barry

RECEIVED
01 OCT 2009
EPA

Re: Submission of an Application for Assessment of a Site Investigation

Please find attached an application for the assessment of a site investigation report for Howard Smith Wharf.

Also enclosed is the City Design Environmental Management (CDEM) Report Review of the Howard Smith Wharf Site (May 2008) which outlines the results of previous assessments relevant to the Howard Smith Wharf site and applies statistical techniques to the results obtained by City Design - Geotechnical and Environmental Engineering (1999) in order to assess the significance of residual contamination at the site.

As part of the process, CDEM reviewed EPA File No 901727 and from this was able to confirm that significant assessment and remediation of the site had occurred during 1996 including the development of a site management plan for the site. Neither the draft of final Stage II Contamination Assessment Report or the site management plan, which were referenced in the EPA file, were able to be located during a search by EPA officers therefore CDEM has developed new SMPs for each of the lots being considered.

On the basis of the review, CDEM is seeking a determination from the EPA that the site (Lot 3 on SP 128031 and Lot 4 on SP 128032) is suitable for any use, subject to implementation of the attached Site Management Plans.

Yours faithfully

CTPI - Personal information

Greg McPherson
Senior Environmental Engineer
City Design
Brisbane City Council

Brisbane City Council ABN 72 002 765 795

RECEIVED
1 OCT 2009
EPA SOUTHERN REGION

A



environmental licences and permits

Application Form

Part A

General details for all applications

OFFICIAL USE ONLY

DATE RECEIVED

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FILE REF

--

PROJECT REF

--

COMPLETE FORM

☐

ENTERED BY (SIGNATURE)

--

DATE

--	--	--

RECEIPTING DETAILS ONLY

DATE RECEIVED

--	--	--

RECEIPT NUMBER

--

AMOUNT RECEIVED

\$

PROCESSED BY (INITIALS AND NAME)

--

GUIDE

- The applicant is the person intending to carry out the activity and in whose name the relevant permits or licences are to be issued.

The registered address is legally required for the serving of notices. It is the address of a person and cannot be a post office box.

If more than one applicant as part of a partnership, complete the "Joint applicant details" form and attach to this PART A form.

Important information for applicants

This form asks for general applicant details and a description of the proposed project and any associated activities. The completed form must be submitted together with relevant activity specific [Part B] forms and any other associated forms included in your application kit.

Specific details must accompany this form to enable your application to be processed. The guide provided will help you complete your application correctly. If you have any difficulties completing the form, contact the Ecoaccess Customer Service Unit desk on 1300 368 326. Please number all attachments alphabetically (e.g. 'Attachment A').

(Commercial and confidential information must be marked clearly. If subsequent activities are added to the project, you will be required to resubmit this application with details of the additional activity).

Tick relevant boxes below if the applicant(s) are:

- ☐ an individual or sole trader
- ☐ individuals in a partnership
- ☐ individual(s) acting on behalf of an unincorporated organisation
- **Go to Section 1**
- ☒ an incorporated company
- ☐ an incorporated association
- ☐ a statutory authority
- ☐ a body politic
- **Go to Section 2**

1. Individual applicant(s) details⁽¹⁾

APPLICANT'S FULL NAME		TITLE	DATE OF BIRTH
REGISTERED ADDRESS		POST CODE	
TELEPHONE	FACSIMILE	E-MAIL	
POSTAL ADDRESS (WRITE "AS ABOVE" IF THE SAME AS REGISTERED ADDRESS)		POST CODE	



Application form – Part A
General details for all applications

Guardian details (if applicable)

A parent or legal guardian must complete the following details if an applicant is under 18 years of age.

GUARDIAN'S FULL NAME		DATE OF BIRTH
GUARDIAN'S REGISTERED ADDRESS		POST CODE
GUARDIAN'S SIGNATURE	DATE	

→ Go to Section 3

2. Applicant details

2. The applicant is the registered legal entity (not a business trading name) intending to carry out the activity and in whose name the relevant permits or licences are to be issued.

The registered address is legally required for the serving of notices. It is the registered business address of the company making the application and cannot be a post office box.

Enter the Australian Business Number (ABN); or the Australian Company Number (ACN) of the incorporated company; or the Association Number (AN) of the incorporated association; or the title and section of the legislation that gives the statutory corporation its legal status.

REGISTERED LEGAL ENTITY NAME Brisbane City Council		
TRADING NAME (IF APPLICABLE)		
REGISTERED ADDRESS GPO Box 1434, Brisbane, Qld		POST CODE 4001
TELEPHONE 3027 5453	FACSIMILE	E-MAIL/WEBSITE
POSTAL ADDRESS (WRITE "AS ABOVE" IF THE SAME AS REGISTERED ADDRESS) as above		POST CODE
ABN/ACN/AN OR TITLE AND SECTION OF LEGISLATION 72002765795		

Application form – Part A
General details for all applications

Principal contact or person in charge details

PRINCIPAL CONTACT/PERSON IN CHARGE FULL NAME Greg McPherson		TITLE Mr
POSITION IN CORPORATION Senior Environmental Engineer		
TELEPHONE 3027 4724	FASCIMILE	E-MAIL/WEBSITE
POSTAL ADDRESS (WRITE "AS ABOVE" IF THE SAME AS REGISTERED ADDRESS) as above		POST CODE

Authorised signatory

The authorised signatory is the person authorised to sign an application on behalf of a corporation and in doing so declares that the corporation will be bound by the conditions associated with the granting of the licence or permit.

AUTHORIZED SIGNATORY FULL NAME Greg McPherson	TITLE Mr
POSITION IN CORPORATION Senior Environmental Engineer	

3. Project details

Pre-lodgement

Have you previously attended a pre-lodgement meeting or submitted a pre-lodgement form for this project?

☒ NO ☐ YES

PROJECT NUMBER (IF APPLICABLE)

Project description

Briefly describe the proposed activities, works, development or management. Attach a separate sheet if there is insufficient space below.

DESCRIPTION Assessment of site investigation report - remove land from EMR

Application form – Part A
General details for all applications

Approvals required

Please list all Part B application forms you are attaching to this form.

<p>APPLICATION FORMS</p> <p>Application for assessment of a site investigation/validation report</p>
--

Project site

Where will the activities be conducted? Provide the street address, real property description(s) of the land(s) in which the project is located and local government area. If you require more space, attach a separate sheet.

This information should at least provide enough details to allow an EPA or QPWS officer to locate the site of the proposal.

<p>STREET ADDRESS</p> <p>1. 5 Boundary St Brisbane</p> <p>2. 175 Bowen Tce Fortitude Valley</p>	
<p>LOT</p> <p>1. Lot 3 2. Lot 4</p>	<p>PLAN</p> <p>1. SP190810 2. SP128032</p>
<p>LOCAL GOVERNMENT AREA</p> <p>Brisbane</p>	

If possible, provide a specific location within a protected area, a property name or an attached map with the project area clearly delineated. Also include the map name/details.

Give as much information as possible to accurately locate your activity, for example maps with contextual or boundary lines on plan or GPS boundary co-ordinates.

<p>SPECIFIC LOCATION/PROPERTY NAME</p> <p>Howard Smith Wharf</p>
<p>PROTECTED AREA</p>
<p>GEOGRAPHICAL CO-ORDINATES</p>

Geographical co-ordinates can include northing/easting, longitude/latitude.

Attachments

List all attached documents, including maps containing information supporting this application in the space below. If there are no attachments mark "N/A."

Label all attachments alphabetically (e.g. 'Attachment A')

<p>ATTACHMENTS (LABEL ALL ATTACHMENTS ALPHABETICALLY – E.G. "ATTACHMENT A")</p> <p>Attachment A – Application form Part B</p> <p>Attachment B – Checklist for B2000</p> <p>Attachment C – Statutory declaration</p> <p>Attachment D – Report – Report Review document and map</p> <p>Attachment E – Title insurance policy</p> <p>Attachment F – Map of site</p>
--

4. Applicant's certification

Note: If you have not told the truth in this application you may be liable for prosecution under the relevant Acts or Regulations.

- I do solemnly and sincerely declare that the information provided is true and correct to the best of my knowledge and I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *Oaths Act 1867*.
- I understand that information supplied on or with this application form may be disclosed publicly in accordance with the *Freedom of Information Act 1992* and the *Evidence Act 1977*.

APPLICANT(1) SIGNATURE	CTPI - Personal information
------------------------	-----------------------------

Joint applicant signatures (if applicable)

APPLICANT(2) SIGNATURE

APPLICANT(3) SIGNATURE

APPLICANT(4) SIGNATURE

APPLICANT(5) SIGNATURE

DATE

Complete the following checklist.

- ☒ Application form(s) signed and completed
- ☒ Permit fees paid or enclosed (if applicable)
- ☒ Supporting information attached (e.g. maps)

Please return your completed application kit to:

**Ecoaccess Customer Service Unit
Environmental Protection Agency**

PO Box 15155
City East
Queensland 4002

Enquiries: **1300 368 326**
Facsimile: (07) 3115 9600
Email: eco.access@epa.qld.gov.au

Attachment A

Released by EHP
RTI Act 2009



environmental licences and permits

Application form — Part B

Sections 375 & 390 — *Environmental Protection Act 1994*

Application for assessment of a site investigation / validation report

This form asks for activity specific details in relation to an application under Sections 375 and 390 of the *Environmental Protection Act 1994* for an assessment of a site investigation/validation report. Please read the information sheets and any guidelines included with your application kit to understand the environmental management and conservation issues, policies and procedures that relate to the activities proposed.

Note: Your application must be accompanied by a General Details – Part A form.

1. Lodgement details

Complete this section only if form not lodged by applicant

NAME	TELEPHONE
COMPANY/ORGANISATION	
POSTAL ADDRESS	
EMAIL	FACSIMILE

2. Site owner's details

An Agent's address is not acceptable.

NAME Brisbane City Council	TELEPHONE 3027 4727
POSTAL ADDRESS GPO Box 1434 Brisbane Qld 4001	FACSIMILE

3. Site details

If you require additional space, attach the information on a separate sheet marked "Site Details."

STREET ADDRESS 5 Boundary St Brisbane	
LOT(S) Lot 3	PLAN(S) SP 190810
LOCAL GOVERNMENT AUTHORITY Brisbane	

Application for assessment of a site investigation / validation report

NOTIFIABLE ACTIVITY/POSSIBLE CONTAMINATING ACTIVITY Hazardous Contaminant	
CURRENT LAND USE Bikepath/footpath linking Ivory Lane to the floating walkway along the Brisbane River (adjacent to Storey Bridge, Fortitude Valley) with several buildings	PROPOSED LAND USE Commercial precinct
STREET ADDRESS 175 Bowen Tce Fortitude Valley	
LOT(S) Lot 4	PLAN(S) SP 128032
LOCAL GOVERNMENT AUTHORITY Brisbane	
NOTIFIABLE ACTIVITY/POSSIBLE CONTAMINATING ACTIVITY HAZARDOUS CONTAMINANT	
CURRENT LAND USE BIKEPATH/FOOTPATH LINKING IVORY LANE TO THE FLOATING WALKWAY ALONG THE BRISBANE RIVER (ADJACENT TO STOREY BRIDGE, FORTITUDE VALLEY) WITH SEVERAL BUILDINGS	PROPOSED LAND USE COMMERCIAL PRECINCT

4. Details of report

4.1 Is a development application pending under the *Integrated Planning Act 1997*?

NO



YES

4.2 The attached report contains (as per Guidelines for the Assessment and Management of Contaminated Land in Queensland)



Stage 1 and Stage 2 investigation



Stage 3 and Stage 4 remediation and validation report

If previous submissions have been made quote:

Ref no. _____

4.3 Is a response required from the EPA at this time or is further information following?



Response required



Further information following

5. Payment

The applicable fee¹ of \$ 2000

¹ The fee is \$445.30 per lot where the land is used exclusively for residential purposes and is not the subject of a development application. For any other lot the fee is \$1000 per lot.

Application form – Part B

Application for assessment of a site investigation / validation report

- ☒ is enclosed with this application (cheque, money order etc.); or
- ☐ was paid by electronic funds transfer (EFT) on _____; and
details required in the information sheet *Electronically paying fees to the EPA* were included.
- The payment was for:
- ☐ this application only and the EFT identification code is: _____ / / ; or
- ☐ this and other applications. A payment notification (from the final page of the information sheet *Electronically paying fees to the EPA*²) was sent to the EPA and a copy is attached.

Note: An incomplete application (including applications that do not include the fee, or sufficient detail to show that the fee has been paid where fees are paid by EFT) may be invalid. Invalid applications will be returned without processing and will only be processed if resubmitted with all invalidating issues addressed.

6. Applicant checklist

- ☒ Application form(s) completed and signed.
- ☒ Permit fees paid or enclosed (if applicable).
- ☒ Enclosed statutory declarations by investigators, preparers and owners as per Section 383 of the *EP Act*.
- ☒ Enclosed signed consultant's report (as per Guidelines for the Assessment and Management of Contaminated Land in Queensland).
- ☒ Enclosed legible copy/copies of proof of ownership of site/s clearly showing the full name(s) of the registered proprietor(s) e.g. current certificates of Title or Title Searches.
- ☒ Enclosed legible copy/copies of all relevant registered plans (available from the Titles Section, Department Natural Resources and Mines) clearly showing location of the site/s and current registered plan details.
- ☒ Enclosed copy of a street map/area map clearly showing location of property.

Please return your completed application kit to:

**Ecoaccess Customer Service Unit
Environmental Protection Agency**

PO Box 15155
City East
Queensland 4002

Enquiries: **1300 368 326**
Facsimile: (07) 3115 9600
eco.access@epa.qld.gov.au

² Available at www.epa.qld.gov.au or through the Ecoaccess Customer Service Unit (phone 1300 368 326).

Application for assessment of a site investigation/validation report

OFFICE USE ONLY

Account code: 9090411/433019

Released by EHP
RTI Act 2009

Attachment B

Released by EHP
RTI Act 2009



BRISBANE CITY COUNCIL
CITY FUND ACCOUNT

Commonwealth Bank

Commonwealth Bank of Australia
240 QUEEN STREET, BRISBANE, QLD



PAY THE SUM OF

TWO THOUSAND DOLLARS AND ZERO CENTS

NOT NEGOTIABLE
A/C PAYEE ONLY

293639

Date

02/06/2008

TO THE ORDER OF

\$ *****2000.00

ENVIRONMENTAL PROTECTION AGENCY
PO BOX 15155
CITY EAST QLD 4002

For and on behalf of Brisbane City Council City Fund Account

CTPI - Personal information

⑈ 293639 ⑈ 064⑈000⑈ 1045⑈9600⑈

Released by EHP
RTI Act 2009

Attachment C

Released by EHP
RTI Act 2009

STATUTORY DECLARATION

(INVESTIGATION REPORT PREPARER)

Address of Site Investigated: 3 Boundary Street Brisbane, Queensland 4000 and 175 Bowen Terrace Fortitude Valley, Queensland 4006

Real Property Descriptions: Lot 3 on SP 190810 and Lot 4 on SP 128032

Title of Report: Report Review Howard Smith Wharf
May 2008

I, Gregory James McPherson of Brisbane City Council, Level 1, Green Square, South Tower, 505 St Paul's Terrace, Fortitude Valley, in the State of Queensland, do solemnly and sincerely declare that;

- I was the investigator and preparer of the report described above;
- I am a member of Environment Institute of Australia and New Zealand (EIANZ); and my qualifications and experience as previously submitted to the Environmental Protection Agency are relevant to this investigation;
- I have not knowingly included any false, misleading or incomplete information in the report;
- I have not knowingly failed to reveal any relevant information or document to the administering authority; and

I certify that:

- The report addresses the relevant matters for the investigation and is factually correct; and
- The opinions expressed in it are honestly and reasonably held.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *Oaths Act 1867*

CTPI - Personal information

Signature

Name GREGORY JAMES MCPHERSON

Taken and Declared before me at BRISBANE this 29TH day of MAY 2008.

Witness (Justice of the Peace/Commissioner for Declarations)

Signature Jeffrey James Dowling JP (Qual) 29926

Name (& JP Number if applicable)

Attachment D

Released by EHP
RTI Act 2009

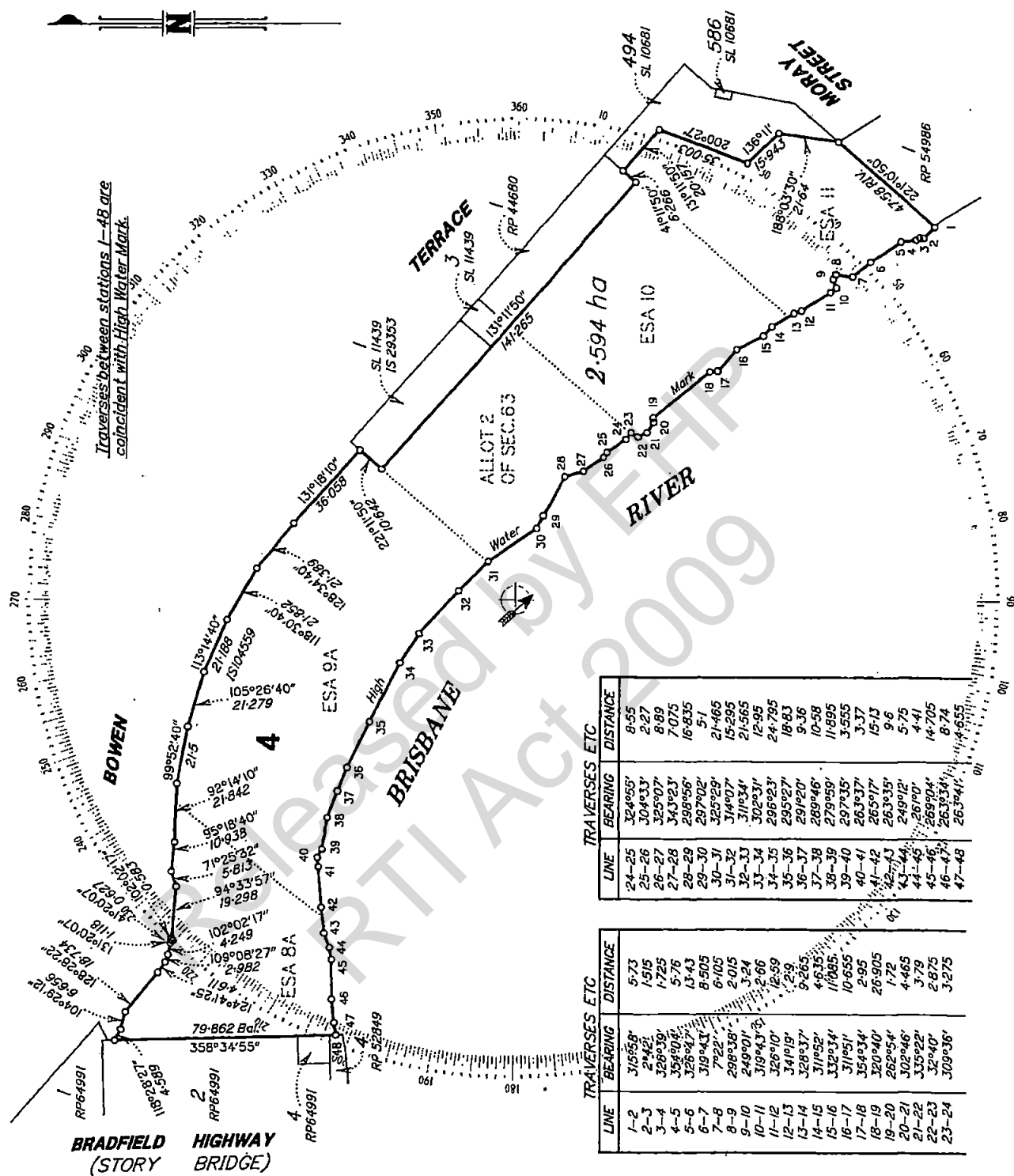
Attachment E

Released by EHP
RTI Act 2009

Land Use Act 1994 : Land Act 1994
Form 21 Version 2

SURVEY PLAN

Sheet 1 of 1



Kellar Fox & McGhie Pty. Ltd. ACN 010 162 197
hereby certify that the Company has made this plan
pursuant to Section 25 of the Surveyors Regulation
1992, and that the plan is accurate, and compiled from
RC906986 & CP890874 in the Department of Natural
Resources



Director and Licensed Surveyor

Personal info

Director

Date: 11.6.00

0m 75m 150m 225m
0 50mm 100mm 150mm State copyright reserved

Plan of Lot 4

Cancelling U.S.L. being Lot 2 on B3333, the balance of
Lots 21 & 22 on RP8614, Lot 2 on RP8616, the balance of
Lot 4 on RP41821, Lot 2 on RP44680 and Lot 4 on CP890874

PARISH: NORTH BRISBANE COUNTY: Stanley

Meridian: AMG Zone 56 Vide RC906986

F/N's: NO

Scale: 1:1500

Format: STANDARD



SP128032

Plan Status

704127834

BE 494

NO FEE
23/08/2000 15:58

IDealing No 1

WARNING : Folded or Mutilated Plans will not be accepted.
Plans may be rolled.
Information may not be placed in the outer margins.

Registered

s. Lodged by

PI - Personal inform

Senior Property Analyst
Portfolio and Housing Unit
Department of Public Works
GPO Box 2457, Brisbane Q 4001
Phone: 3404 3787

- Personal inform

Property Service
Unit 14, AXA
Ph: X78110

(Include address, phone number, reference, and Lodger Code)

525

1. Certificate of Registered Owners or Lessees.

I/We

Existing			Created		
Title Reference	Lot	Plan	Lots	Emis	Road
U. 5 L					

(Names in full)

* as Registered Owners of this land agree to this plan and dedicate the Public Use
Land as shown hereon in accordance with Section 50 of the Land Title Act 1994.

* as Lessees of this land agree to this plan.

Signature of * Registered Owners * Lessees

APPROVED

- Personal inform

Douglas James Fergusson
Delegate of the Minister for Natural Resources

* Rule out whichever is inapplicable

2. Local Government Approval.

hereby approves this plan in accordance with the :
%

Dated this ... day of

* Insert the name of the Local Government % Insert Integrated Planning Act 1997 or
Insert designation of signatory or delegation Local Government (Planning & Environment) Act 1990

3. Plans with Community Management Statement :

CMS Number

Name :

4. References :

Dept File : BRI/000369
Local Govt :
Surveyor : TA 2283-00ESAs 8A,
9A, 10 & 11
and Allot 2
of Sec. 63

4

Orig

Lots

7. Portion Allocation :

8. Map Reference :

9543-33313

9. Locality :

FORTITUDE VALLEY

10. Local Government :

BRISBANE C. C.

11. Passed & Endorsed :

By : Kellar Fox & McGhie Pty. Ltd.
ACN 010 162 197
Date : 14.6.00
Signed : I - Personal inform
Designation : Liaison Officer

12. Building Format Plans only.

I certify that :

- * As far as it is practical to determine, no part of the building shown on this plan encroaches onto adjoining lots or road;
- * Part of the building shown on this plan encroaches onto adjoining * lots and road

Licensed Surveyor/Director * Date
* delete words not required

13. Lodgement Fees :

Survey Deposit
Lodgement \$ 37.00
New Titles \$
Photocopy \$
Postage \$
TOTAL \$ 37.00

14. Insert
Plan
Number

SP128032

CURRENT TITLE SEARCH

NATURAL RESOURCES AND WATER, QUEENSLAND

Request No: 4127531

Search Date: 03/06/2008 13:23

Title Reference: 50323249

Date Created: 31/07/2000

Previous Title: 40025609

REGISTERED OWNER

Dealing No: 707890862 14/07/2004

BRISBANE CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 4 SURVEY PLAN 128032
 County of STANLEY Parish of NORTH BRISBANE
 Local Government: BRISBANE CITY

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
 Deed of Grant No. 40025609 (Lot 4 on SP 128032)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (NATURAL RESOURCES AND WATER) [2008]

Requested By: D APPLICATIONS GLOBAL X

Page 1/1

Based on the property location index provided with the certificate of title issued by the State of Queensland (Department of Natural Resources and Water) Current as at Sep. 2006

When every care is taken to ensure that the data is correct, the State of Queensland (Department of Natural Resources and Water) makes no representations or warranties as to the accuracy of the data. The State of Queensland (Department of Natural Resources and Water) is not responsible for any loss or damage, including without limitation, consequential damages, arising from the use of the data, whether or not the data is accurate or if the data is not up to date, in any way.

CURRENT TITLE SEARCH

NATURAL RESOURCES AND WATER, QUEENSLAND

Request No: 4127462

Search Date: 03/06/2008 13:19

Title Reference: 50700219

Date Created: 07/01/2008

Previous Title: 50323248

REGISTERED OWNER

Dealing No: 711289700 19/12/2007

BRISBANE CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 3 SURVEY PLAN 190810

County of STANLEY

Parish of NORTH BRISBANE

Local Government: BRISBANE CITY

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10985174 (ESA 8A)
Deed of Grant No. 11981103 (POR 400)
Deed of Grant No. 19549108 (ESA 7A)
2. EASEMENT IN GROSS No 705796394 16/07/2002 at 12:30
burdening the land
BRISBANE CITY COUNCIL
over
EASEMENT B ON SP150140

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (NATURAL RESOURCES AND WATER) [2008]

Requested By: D APPLICATIONS GLOBAL X

Page 1/1

Based on the Property Location Index provided with the permission of the State of Queensland Department of Natural Resources and Water (Current as Sept 2006).

While every care is taken to ensure the accuracy of this data The State of Queensland (Department of Natural Resources and Water) makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose. It disclaims all responsibility and all liability (including consequential damage) for all expenses, losses, damages (including indirect or consequential damage) and costs that you might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

Land Title Act 1994; Land Act 1994
Form 21 Version 2

SURVEY PLAN

Sheet
1 of 2

REFERENCE MARKS

STN	TO	ORIGIN	BEARING	DIST
1	O.Screw in Conc	4/15193482	177°58'45"	1.741
2	O.Nail	13/RP64991	358°42'40"	1.497
14	O.Screw in Kerb	24/15193482	344°50'	7.421
14	O.Screw in Kerb	24/15193482	66°42'	21.078
14	O.Screw in Conc	24/15193482	77°08'40"	37.779
14	O.Cor Building	24/15193482	96°37'	37.885

PERMANENT MARKS

PM	ORIGIN	BEARING	DIST	NO
1-OPM (New Conn.)	12/15193482	109°50'	72.6	16370
14-OPM	24/15193482	239°45'15"	94.548	131399

DATUM FOR LEVELS

PM13/399
RL=2.05m AHD (Der.)

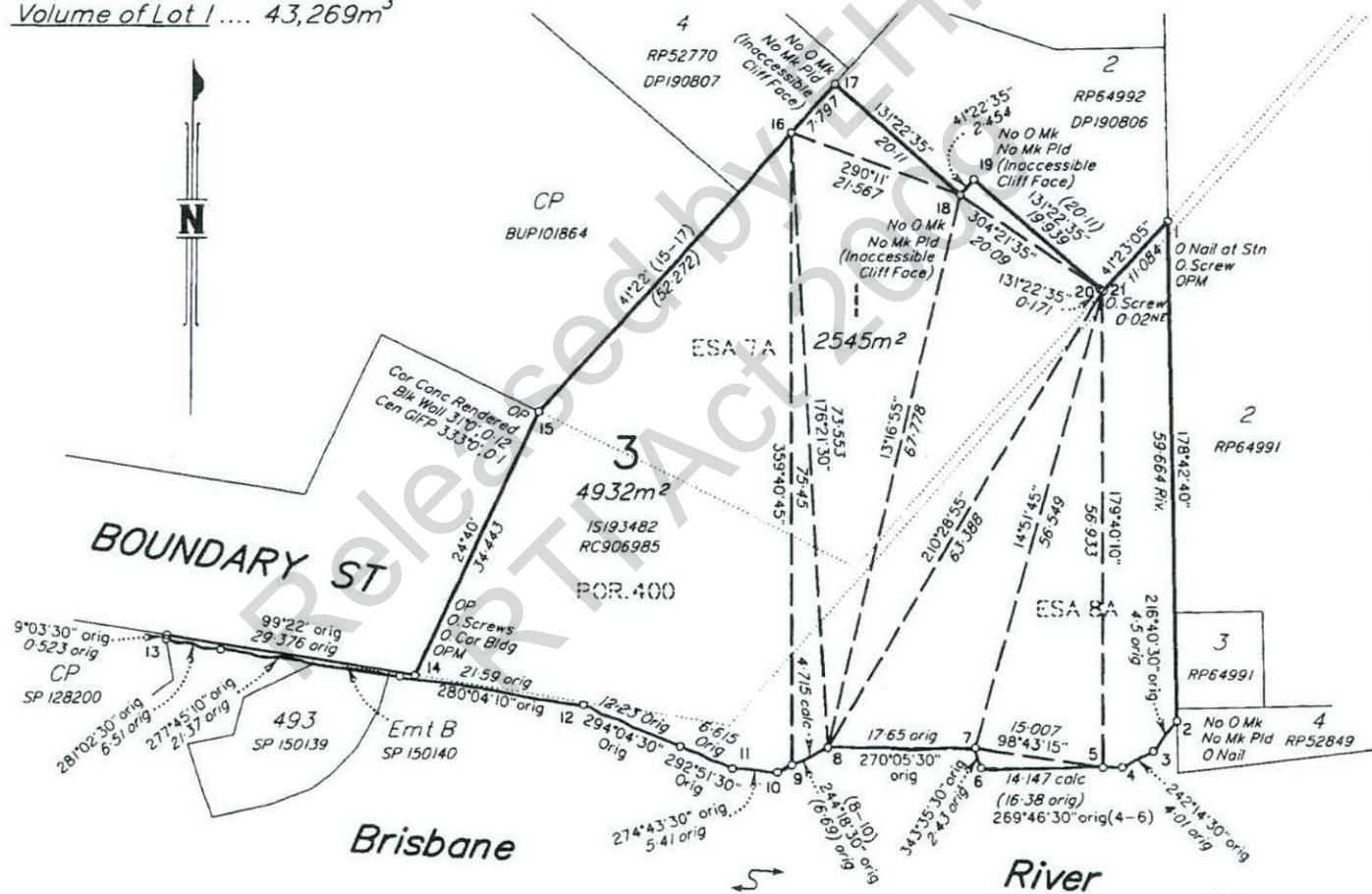
Lot 3 is a Standard Format Lot

Lot 1 is Bounded by vertical planes

No Marks placed for Lot 1 as all new corners are underground and inaccessible.

Original information compiled from 15193482 in the Department of Natural Resources and Water.

Original Traverse between Stns. 2-13 coincident with High Water Mark (H.W.M.)

Area of Footprint of Lot 1 2,545m²Volume of Lot 1 43,269m³Direction of Isometric View
SEE SHEET 2

JONES FLINT & PIKE PTY. LTD. (ACN 050 414 045) hereby certify that the land comprised in this plan was surveyed by the corporation, by Fabian Bruno SALVATI, Surveying Graduate, for whose work the corporation accepts responsibility, under the supervision of Mark Thomas FITZGERALD, Cadastral Surveyor, and that the plan is accurate, that the said survey was performed in accordance with the Survey and Mapping Infrastructure Act 2003 and Surveyors Act 2003 and associated Regulations and Standards and that the said survey was completed on 6/09/06



PI - Personal informa

PI - Personal informa

Date 27/10/06

Plan of Lots 1 & 3

Cancelling Lot 3 on SP128031

PARISH: NORTH BRISBANE COUNTY: Stanley

Meridian: MGA 94 Vide 15193482

F/N's: No

Scale: 1:600

Format: VOLUMETRIC

SP190810

Plan Status:

Attachment F

Released by EHP
RTI Act 2009



Howard Smith Wharf

Scale = 1:3,417

Metres 50 100 150

Date : Jun 3, 2008

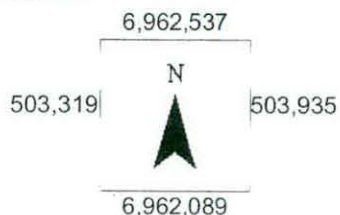
User : 068575

Disclaimer:

(c) Brisbane City Council [2006].
In consideration of Council, and the copyright owners listed below, permitting the use of this data, you acknowledge and agree that Council, and the copyright owners, give no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accept no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage), relating to any use of this data.
Data must not be used for direct marketing or be used in breach of the privacy laws.

Copyright of data is as follows:
Cadastre (c) 2006 Department of Natural Resources and Mines
Street Names and House Numbers (c) 2006 Brisbane City Council
2005 Aerial Imagery (c) 2005 QASCO
2005 DigitalGlobe QuickBird Satellite Imagery (c) 2005 DigitalGlobe
2002 Contours (c) 2002 AAMHatch
2005 Brisway (c) 2005 Melway Publishing

Location :



Copyright BCC, 2006





Report Review Howard Smith Wharf

May 2008

Prepared on behalf of:
City Planning - Brisbane City Council

Prepared by:
Environmental Management
Water and Environment Group
Brisbane City Council



City Design

Level 1 South Tower
Green Square
505 St Pauls Terrace
Fortitude Valley QLD 4006

Locked Bag 6996
Albion QLD 4010

Telephone 07 3403 3849
Facsimile 07 3403 0438

*Delivering Innovative Solutions to Create
Sustainable Communities*

Document Control:

G:\Proj08\080520_Howard_Smith_Wharf\Environmental\Howard_Smith_Wharf_Report_Review_Rev2.doc

Issue No.	Date of Issue	Amdt	Prepared By (Author/s)		Edited and Proofread By		Reviewed By		Approved for Issue (Project Director)	
			Name	Initial	Name	Initials	Name	Initials	Name	Initials
1	16-3-2008		Greg McPherson		Kate Atkins		Greg McPherson		Michael Lane	
2	26-5-2008		Greg McPherson	<i>GM</i>	Kate Atkins	<i>KA</i>	Greg McPherson	<i>GM</i>	Michael Lane	<i>ML</i>

Executive Summary

In order to assist in the preliminary application for a material change of use for the Howard Smith Wharf Site, City Design - Environmental Management (CDEM) was commissioned by City Planning to undertake a review of previous contamination assessment reports and to prepare a submission to the EPA (including Draft Site Management Plans (SMPs) if required).

The specific scope undertaken by CDEM and described in this report included:

- Review of available information pertaining to the site including EPA File No 901727 and previous contamination assessment (Howard Smith Wharf, Fortitude Valley Site Contamination Assessment Draft Report March 1999);
- Provision of recommendations including an application to the EPA to remove the site from the EMR if the results of the review warrant this action; and
- Development of appropriate Site Management Plans (SMPs) in the event that the lots are not removed from the EMR;

The history of the site as reported by City Design Geotechnical and Environmental Engineering (1999) indicates a range of activities having been historically conducted at the site including:

- General stevedoring;
- Naval ship maintenance, and storage and loading of supplies during wartime;
- As a base for the Water Police and Police Diving Squad;
- As a police impoundment area for stolen cars and as a holding area for property to be used in court cases;
- Government stores for equipment being held for auction;
- Vehicle maintenance and refuelling;
- Storage of low level radioactive waste; and
- Various other small scale maintenance and engineering purposes.

There was no indication from the site history of any specific notifiable activity ever having been conducted at the Howard Smith Wharf site with the exception of the historical presence of an underground fuel storage tank which was reportedly decommissioned and removed from site prior to 1996.

It is further understood from review of the 1999 City Design report and EPA file No 901727 that Queensland Health undertook radiation monitoring in the shed used for storage of low level radioactive waste and found no evidence of radiation levels exceeding National Health and Medical Research Council (NHMRC) guidelines.

During the assessment conducted by City Design -Geotechnical & Environmental Engineering in 1999, a total of 54 boreholes were drilled over the 3.6 hectare area of the Howard Smith Wharf site. A total of 50 soil samples were collected during the assessment with 34 selected samples subsequently dispatched to the laboratory for analysis.

A statistical interpretation of the laboratory results obtained by City Design – Geotechnical and Environmental & Environmental Engineering in 1999 was undertaken as part of the review conducted by CDEM.

On the basis of the review of the available information CDEM concludes the following:

- No specific notifiable activities are known to have occurred at the site with the exception of the historical presence of a single underground fuel storage tank which was reportedly decommissioned and removed from site prior to 1996;
- Significant remediation of the site including the off-site disposal of approximately 2200m³ of Total Petroleum Hydrocarbons (TPH) and heavy metal contaminated soil appears to have been conducted by Golder Associates in late 1996;
- A Site Management Plan was also developed by Golder in 1996. It would appear from correspondence between the DoE and Golder in late 1996 that the SMP was accepted by the DoE;
- The EPA was unable to locate either a copy of the SMP or the Stage II Contamination Assessment report pertaining to the site during a search in late 2007;
- Discreet samples collected by City Design in 1999 returned concentrations for various heavy metal contaminants exceeding environmental investigation levels;
- The 95% upper confidence level (UCL) for the mean concentration for all heavy metals analysed with the exception of zinc were below the EIL;
- The 95% upper confidence level (UCL) for the mean zinc concentration while exceeding the EIL was well below the health based investigation level for standard residential land use;
- While isolated samples returned TPH, Total Polycyclic Aromatic Hydrocarbons (PAH) and benzo(a)pyrene concentrations exceeding guideline values, the sample analysis for these samples was highly targeted and the resulting exceedances obtained are not considered representative of the soil/fill at the site in general;
- Given the shallow depth to bedrock at the site there is little potential for significant volumes of contaminated soil to exist at the site and little potential for contaminants to migrate to depth;
- None of the contamination concentration exceedances reported were sufficiently elevated to raise serious concerns with respect to human health or the environment given the overall exposure potential at the site and given any future land use; and
- The site is therefore considered suitable for any land use subject to implementation of the provisions of the draft SMPs provided in **Attachment D**.

On the basis of this review it is recommended that this report be forwarded to the Director of the Queensland Environmental Protection Agency along with a recommendation that the site (Lot 3 on SP 190810 and Lot 4 on SP 128032) is suitable for any use, subject to implementation of the attached Site Management Plans.

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Appendix A – Site Contamination Assessment Draft Report- Geotechnical and Environmental Engineering, March 1999.

Appendix B – Summary of Soil Analysis Results and Statistical Analysis

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Appendix D Draft Site Management Plans

1.0 Introduction

City Policy and Strategy Division is undertaking a planning study and compiling a preliminary application for a material change in use for the Howard Smith Wharves site at Boundary Street, Brisbane.

The site considered in the planning study/preliminary application includes eight lots (Lots 1 and 2 on RP.64992, Lot 3 on SP 190810 (formerly Lot 3 on SP.128031), Lot 2 on RP.64991, Lots 3 and 4 on RP.64991, Lot 4 on RP.52849 and Lot 4 on SP.128032). Lot 3 on SP.190810 and Lot 4 on SP.128032 are listed on the Environmental Protection Agency's (EPA) Environmental Management Register (EMR) for a notifiable activity (hazardous contaminant site).

In order to assist in the preliminary applications City Design - Environmental Management (CDEM) was commissioned by City Planning to undertake a review of previous contamination assessment reports and to prepare a submission to the EPA (including a Site Management Plan (SMP) if required) for the Howard Smith Wharf site.

The specific scope undertaken by CDEM and described in this report included:

- Review of available information pertaining to the site including the previous contamination assessment (Howard Smith Wharf, Fortitude Valley Site Contamination Assessment Draft Report March 1999);
- Provision of recommendations including an application to the EPA to remove the site from the EMR if the results of the review warrant this action; and
- Development of appropriate Site Management Plans (SMPs) in the event that the lots are not removed from the EMR;

In addition to the above scope a site inspection for the Howard Smith Wharf site was undertaken in order to assess the current state of the site.

2.0 Review of available information

The following reports and information were reviewed as part of the scope of works undertaken by CDEM:

- Howard Smith Wharf, Fortitude Valley Site Contamination Assessment Draft Report, City Design – Geotechnical and Environmental Engineering, March 1999;
- City Design Geotechnical and Environmental Engineering File Number 98-155;
- Brisbane City Council WeBbasx database; and
- EPA File No 901 727.

A copy of the *Howard Smith Wharf, Fortitude Valley Site Contamination Assessment Draft Report*, City Design – Geotechnical and Environmental Engineering, March 1999 is provided in **Appendix A**.

A summary of the information from the above sources and relevant to this review is provided below.

The real property description of the site at the time of the contamination assessment conducted in 1999 consisted of the following lots:

Lot 400 on SL1404; *Haz Contaminant*
 Lot 2 on RP 40998; *Not listed*
 Lot 2 on RP64992; *NL*
 Lots 1,2,3 and 4 on RP64991; *NL*
 Lot 6 on RP8569; *NL*
 Lots 3 and 4 on RP52849; *NL*
 Lot 4 on RP60570; *NL*
 Lot 2 on B3333; *Haz Cont.*
 Lot 2 on RP44680; *Haz Cont.*
 Lots 21 and 22 on RP8614; and *Haz Cont.*
 Lot 4 on RP41821. *Haz Cont.*

Of these sites, Lot 400 on SL1404, Lot 2 on RP44680, Lots 21 and 22 on RP8614 and Lot 4 on RP41821 were listed on the EPA's Environmental Management Register (EMR) at the time of the 1999 assessment.

The size of site covered by the 1999 assessment was reported to be approximately 3.6 hectares.

Review of Councils WebBASX/IBimap system confirms that the majority of the site covered by the 1999 contamination assessment was subsequently re-configured to form Lot 3 on SP 128031 and Lot 4 on SP 128032. Lot 3 on SP128031 was again re-configured in January 2008 to form Lot 3 on SP 190810.

Specifically:

- Lot 400 on SL1404 (1,181m²) became part of Lot 3 on SP128031(4,931m²) which was in turn re-configured to form Lot 3 on SP 190810 (4,932m²);

- Lot 2 on RP44680 (5,094 m²), Lot 21 on RP8614 (1,893 m²), Lot 22 on RP8614 (1,539 m²); and Lot 4 on RP41821 (1071 m²) became part of Lot 4 on SP 128032 (25,940 m²).

The geology of the site consists of a thin veneer of soil or fill (generally less than 1 metre depth) overlying bedrock.

The history of the site as reported by City Design Geotechnical and Environmental Engineering (1999) indicates a range of activities having been historically conducted at the site including:

- General stevedoring;
- Naval ship maintenance, and storage and loading of supplies during wartime;
- As a base for the Water Police and Police Diving Squad;
- As a police impoundment area for stolen cars and as a holding area for property to be used in court cases;
- Government stores for equipment being held for auction;
- Vehicle maintenance and refuelling;
- Storage of low level radioactive waste; and
- Various other small scale maintenance and engineering purposes.

There is no indication from the site history with respect to any specific notifiable activity ever having been conducted at the Howard Smith Wharf site with the exception of the historical presence of an underground fuel storage tank (UST) which was reportedly decommissioned and removed from site prior to 1996.

It is understood from review of the 1999 City Design report that Queensland Health undertook radiation monitoring in the shed used for storage of low level radioactive waste in 1994 and found no evidence of radiation levels exceeding National Health and Medical Research Council (NHMRC) guidelines.

During the assessment conducted by City Design -Geotechnical & Environmental Engineering in 1999, a total of 54 boreholes were drilled over the 3.6 hectare area of the Howard Smith Wharf site. A total of 50 soil samples were collected during the assessment with 34 selected samples subsequently dispatched to the laboratory for analysis.

2.1 Review of EPA File No 901727

EPA file (Reference No 901 727) was reviewed by CDEM on 19 November 2007.

The information obtained during this review is summarised below:

A letter dated 5 February 1996 from the Environmental Health - Radiation Health branch confirmed that there were no radiation levels exceeding NHMRC guidelines detected at the site.

A letter dated 16 May 1996 from the Department of Public Works and Housing to the Hazardous Waste and Contaminated Sites Section of the Department of Environment (DoE) indicated the following enclosures:

1. An Application for Site Contamination Report;
2. A cheque for \$440.00 being the statutory fee;
3. A site history and Stage II testing proposal by Golder Associates;
4. Extract from the Government Land Register;
5. Real Property descriptions; and
6. Street Map.

A letter dated 18 June 1996 from Gary O'Connor (DoE) to Mr J Furner from the Dept of Public Works and Housing provided recommended/required:

1. *Validation of walls of the former UST excavation;*
2. *Clarification of the use of the large steel mains beneath the sheds; and*
3. *Validation of the soils immediately downslope of the aboveground tank near the water police office.*

The correspondence further indicated that:

"Subject to the above comments the Stage II sampling proposal is acceptable".

A document transmittal dated 12 September 1996 indicated transmittal of a Draft Stage II Contamination Assessment Report and Site Management Plan (Reference 96638197 (c)) from Golder Associates to DoE.

Correspondence dated 19 September 1996 from Gary O'Connor (DoE) to PI - Personal information from Golder Associates provided "Comments re Draft Site Contamination Assessment and Site Management Plan" including a request for further clarification regarding the zinc clean up criteria proposed for the site by Golder Associates.

Correspondence dated 30 September from Golder to DoE "queried" the risk assessment required by DoE.

A letter dated 8 October 1996 from Gary O'Connor (DoE) to PI - Personal information (Golder Associates Pty Ltd) provided further clarification regarding the DoE risk assessment requirements.

A document Transmittal dated 20 November 1996 indicated transmittal of Stage II Contamination Assessment Report and Site Management Plan from Golder Associates to DoE.

Correspondence dated 2 December 1996 from Gary O'Connor (DoE) to Golder Associates acknowledged that DoE comments regarding the draft report had been satisfactorily addressed in the final report.

Correspondence from Mr Russel Miller from the Brisbane City Council Hazardous Waste section to PI - Personal information from Golder Associates confirmed acceptance of 2210m³ of heavy metal and Total Petroleum Hydrocarbon (TPH) contaminated soil.

Correspondence dated 5 December 1996 from Gary O'Connor (DoE) to PI - Personal information (Golder Associates) confirmed DoE approval for off-site disposal of 2,200m³ of contaminated soil.

Note: Only the Laboratory Results Table from the Stage II Contamination Assessment report was found in the EPA file reviewed. Neither the draft or the final Stage II contamination reports or the Site Management Plan referenced in the file were able to be located and a subsequent search by the EPA failed to find copies of these documents. A copy of the Stage I Contamination Assessment report compiled by Golder Associates was contained in the file. A summary of the findings of this report is provided in Section 2.2.1 below.

2.1.1 Review of Stage 1 Contamination Assessment Report

The EPA file contained the following report;

Site Contamination Assessment

Stage 1

Howard Smith Wharf

Fortitude Valley Brisbane

Golder Associates April 1996.

Conclusions contained in this report included the following:

"Four areas of the Howard Smith Wharf Site were identified as potentially contaminated in the site history studies:

- *The location of the former underground fuel tank.*
- *Imported fill near the site entrance.*
- *Fill on the New Farm end of the site.*
- *Wooden structural materials in the former wharf facilities."*

The former underground fuel tank had been found to be decommissioned and removed however 40m³ of hydrocarbon contaminated sand fill remains in the tank pit. Sampling has indicated that contamination in this area is likely to be confined to the tank pit however additional in situ clay material (100mm) will need to be removed in any remedial operations to ensure that only clean materials remain.....

Various contaminated materials were identified at the site. These are summarised as follows:

- *Recently introduced fill (from Transit Centre) near site entrance A lead and zinc :hot spot" of around 300m³ which also contains significant concentrations of dieldrin";*
- *A zinc "hot spot" at the New Farm end which may represent up to 1500m³ of material;*
- *Moderately contaminated ash layer of unknown extent which contains significant lead and zinc concentrations and may represent up to 400m³; and*
- *Possibly 150m³ of broken rock material moderately elevated in zinc."*

Identified options included:

- Leaving material in situ resulting in a "restricted" classification; and
- Remediation to a "former" classification.

Further characterisation was recommended.

The history contained in the Stage 1 report was generally consistent with the history reported by City Design in 1999.

It was noted that the No 5 shed at the site had been occupied by Australian Gypsum Product Pty Ltd, a plaster manufacturer, up to 1944 and Australian Plaster Industries from 1945 until 1972 when the shed was demolished and removed.

The most significant TPH contamination levels reported for the Stage 1 Assessment was 138mg/kg for the C₆-C₁₀ TPH fraction.

Lead concentrations ranging between 532mg/kg and 2430mg/kg were recorded in fill at the site entrance while zinc concentrations of between 430mg/kg and 1370mg/kg were reported for the fill from the Transit Centre.

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3.0 Site Inspection - CDEM

A contaminated land professional from CDEM conducted a site inspection on 11 October 2007.

Photographs taken at the time of the inspection are reproduced in **Appendix C**.

The observations made during this inspection are summarised below:

- The majority of the site is paved with either bitumen or concrete;
- Lot 3 is separated from Lot 4 by the deck width of the story bridge;
- A walkway/cycleway bisects the sites;
- Several buildings are present on the southern side of the walkway/cycle way;
- The building labelled as Building No 4 in the 1999 assessment had been demolished;
- The diesel AST previously identified at the site remained in situ;
- Areas to the north of the walkway were fenced and secured from the remainder of the site;
- There were no obvious signs of any significant contamination at the site observed during the site inspection; and
- There were no notifiable activities observed to be occurring at the site at the time of the inspection.

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4.0 Interpretation of Laboratory Results (City Design – Geotechnical and Environmental Engineering, 1999)

4.1 Assessment Guidelines

To assess the significance of the results obtained during environmental investigations, laboratory results for soil testing are commonly compared to criteria developed or applied by regulatory authorities. These criteria are developed through research and represent concentrations of contaminants within the environment that may lead to adverse health or environmental effects.

In the case of soil investigations, The National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) Urban Ecological Investigation Levels (EILs) have been used in the first instance as the regulatory criteria with the NEPM health based soil investigation levels (HIL) guidelines used where contaminant levels exceed EIL. These criteria specify different exposure settings (ranging from residential to industrial land use) enabling the application of more site-specific criteria to a particular site depending on its land use.

The criteria specified within this assessment have been developed with consideration to Queensland EPA guidelines and the NEPM for Assessment of Site Contamination. These guidelines are subject to change with the further development of the NEPMs and through the updating of scientific knowledge with respect to potential health and environmental risks.

4.2 Statistical Assessment and Discussion

A statistical interpretation of the laboratory results obtained by City Design – Geotechnical and Environmental & Environmental Engineering in 1999 was undertaken as part of the review conducted by CDEM.

A summary of the Soil Analysis Results including mean and standard deviation calculations is provided in **Appendix B**.

The review of the laboratory results indicates the following:

- Various “low level” discreet exceedances of environmental investigation levels (EIL’s) for heavy metals were reported for various samples;
- The 95% upper confidence level (UCL) for the mean concentration for all heavy metals analysed, with the exception of zinc, were below the EIL;
- The 95% UCL for the mean for zinc (364 mg/kg), while exceeding the EIL, is well below the health based threshold for standard residential land use of 7000mg/kg;

- The 95% UCL for TPH (C₁₀-C₁₄ fraction) exceeds the EPA's standard investigation threshold for this TPH fraction of 100 mg/kg. The mean value of the TPH (C₁₀-C₁₄ fraction) concentration is however below the adopted threshold level;
- The 95% UCL for benzo(a)pyrene exceeds the EPA's health based investigation threshold for standard residential land use however the mean value reported for benzo(a)pyrene was below the EPA's health based investigation threshold for standard residential land use;
- Limited targeted analysis was conducted for TPH (10 samples analysed only) and polycyclic aromatic hydrocarbons including benzo(a)pyrene (six samples analysed only). (Only fill samples where ash was noted were analysed for PAH constituents); and
- None of the contamination concentration exceedances reported were sufficiently elevated to raise serious concerns with respect to human health or the environment given the overall exposure potential at the site and given any future land use.

Samples BH1-0.2 and BH22-0.2 which returned concentrations for benzo(a)pyrene of 1.2 mg/kg and 1.9 mg/kg were among 5 fill samples noted to contain ash material. None of the other 50 samples collected were noted to contain any traces of ash. Given the specific targeting of the PAH analysis and the generally low concentrations of PAH and benzo(a) pyrene reported despite this targeting, it is unlikely that the PAH concentrations reported are indicative of any significant risk to human health or the environment given any subsequent land use of the site.

Soil samples selected for TPH analysis were generally targeted on the basis of visual assessment and/or proximity to areas where petroleum products were suspected to have been historically stored. Samples BH51-0.2 and BH52-0.2 which returned concentrations for TPH exceeding EPA guideline values were collected at shallow depth in an area described in the 1999 report as possibly previously housing fuel storage tanks and associated pipework. Samples collected from a further four sampling locations in this vicinity returned concentrations for TPH below EPA guideline values. Sample BH44-0.2 which was collected from adjacent to the diesel AST returned TPH concentrations below EPA guideline values.

Given the time that has elapsed since the City Design 1999 assessment and now, and given that hydrocarbon storage at the site had ceased in about 1999 it is likely that any residual hydrocarbons within shallow soil/fill at the site will have reduced/attenuated on those levels recorded in 1999.

5.0 Conclusions

On the basis of the review of the available information CDEM concludes the following:

- No specific notifiable activities are known to have occurred at the site with the exception of the historical presence of a single underground fuel storage tank which was reportedly decommissioned and removed from site prior to 1996;
- Significant remediation of the site including the off-site disposal of approximately 2200m³ of TPH and heavy metal contaminated soil appears to have been conducted by Golder Associates in late 1996;
- A Site Management Plan (SMP) was also developed by Golder in 1996. It would appear from correspondence between the DoE and Golder in late 1996 that the SMP was accepted by the DoE;
- The EPA was unable to locate either a copy of the SMP or the Stage II Contamination Assessment report pertaining to the site during a search in late 2007;
- Discreet samples collected by City Design in 1999 returned concentrations for various heavy metal contaminants exceeding environmental investigation levels;
- The 95% upper confidence level (UCL) for the mean concentration for all heavy metals analysed with the exception of zinc were below the EIL;
- The 95% upper confidence level (UCL) for the mean zinc concentration while exceeding the EIL was well below the health based investigation level for standard residential land use;
- While isolated samples returned TPH, total PAH and benzo(a)pyrene concentrations exceeding guideline values, the sample analysis for these samples was highly targeted and the resulting exceedances obtained are not considered representative of the soil/fill at the site in general;
- Given the shallow depth to bedrock at the site there is little potential for significant volumes of contaminated soil to exist at the site and little potential for contaminants to migrate to depth;
- None of the contamination concentration exceedances reported were sufficiently elevated to raise serious concerns with respect to human health or the environment given the overall exposure potential at the site and given any future land use; and
- The site is therefore considered suitable for any land use subject to implementation of the provisions of the draft SMPs provided in **Attachment D**.

6.0 Recommendations

On the basis of this review it is recommended that this report be forwarded to the Director of the Queensland Environmental Protection Agency along with a recommendation that the site (Lot 3 on SP 190810 and Lot 4 on SP 128032) is suitable for any use, subject to implementation of the attached Site Management Plans.

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**Appendix A – Site Contamination Assessment Draft
Report- Geotechnical and Environmental
Engineering, March 1999.**

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HOWARD SMITH WHARF, FORTITUDE VALLEY

SITE CONTAMINATION ASSESSMENT

DRAFT REPORT

Distribution:

2 Copies: City Planning
1 Copy: Geotechnical and Environmental Engineering

Reference: 98155(B)

Date Issued: 9 March 1999

EXECUTIVE SUMMARY

City Planning commissioned City Design to complete a site contamination assessment of Howard Smith Wharf at Boundary St, Fortitude Valley.

The purpose of the investigation is to assess the contamination status of the site to provide City Planning with information required as part of the proposed transfer of ownership of the site from State Government to Brisbane City Council. The site contamination assessment is also being prepared for submission, if requested by City Planning, to the Department of Environment and Heritage (DEH), for issuance of a Suitability Statement for the intended future use and/or to identify the remediation/management requirements of the site.

The results of soil sampling and laboratory analysis indicate some low level heavy metals contamination at the site, with two sampling locations exceeding Queensland DEH health-based guidelines for lead. Some low level petroleum hydrocarbon contamination was also found in one area, with two sampling locations exceeding Qld CHEM Unit guidelines for Total Petroleum Hydrocarbons.

The site is considered suitable for high to medium density residential, commercial / industrial or open space / recreational subject to either remediation of contaminated areas or by managing future use of the site under a Site Management Plan.

It is recommended that a Site Management Plan be developed and submitted to DEH for approval prior to commencement of site development works.

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1.0 INTRODUCTION

In December 1998, City Design was commissioned by City Planning to carry out a site contamination assessment of Howard Smith Wharf, under the Story Bridge in Brisbane City.

The assessment was carried out in accordance with the *DEH Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998*. The purpose of the assessment is to assess the contamination status of the site to provide City Planning with information required as part of the proposed transfer of ownership of the site from State Government to Brisbane City Council. The site contamination assessment is also being prepared for submission, if requested by City Planning, to the Department of Environment and Heritage (DEH), for issuance of a Suitability Statement for the intended future use and/or to identify the remediation/management requirements of the site.

1.1 Objective and Scope of Work

The objective of the site contamination assessment is to provide City Planning with the necessary information on the contamination status of the site to enable the transfer of property ownership in accordance with statutory and due diligence requirements.

The scope of the work carried out for the site contamination assessment, comprises four stages:

- Stage 1 - Preliminary Site Investigation (Completed)
Includes site description and site history
- Stage 2 - Detailed Site Investigation (Completed)
Includes sampling and testing for contaminants
Defining contaminant boundaries
- Stage 3 - Health and environmental assessment and determination of remediation plan (Future if required)
- Stage 4 - Implementation of agreed remediation plan and validation sampling (Future if required)

March 1999

98155(B)

2.0 SITE DESCRIPTION

2.1 Property Description

The site is located at Boundary Street, Fortitude Valley under the Story Bridge and comprises the following lots in the Parish of North Brisbane:

Lot 400 on SL1404;
Lot 2 on RP40998;
Lot 2 on RP64992;
Lots 1,2,3 and 4 on RP64991;
Lot 6 on RP8569;
Lots 3 and 4 on RP52849;
Lot 4 on RP60570;
Lot 2 on B3333;
Lot 2 on RP44680;
Lots 21 and 22 on RP8614; and
Lot 4 on RP41821.

The site covers a total area of approximately 3.6 Ha. The actual wharf area is currently zoned "Commercial" with the remainder of the site being zoned "Special Development" under the Brisbane Town Plan.

2.2 Site Layout and Surrounding Land Use

The site currently contains 9 permanent buildings and approximately 10 mobile storage sheds or demountable buildings. Four of the permanent buildings are large wharf storage sheds, with parts of each shed being located on wharf areas which extend out over the Brisbane River. These buildings are constructed of timber, steel, corrugated iron and tin, with raised timber floors. In addition, there are 4 bomb shelters dating back to the Second World War located at the base of the cliffs throughout the site. There are 2 fenced off areas within the site as well as 2 lockable gates (excluding the entrance gate) which enable other sections within the site to be fenced off.

The surrounding land use and owners are:

North : Residential houses and a small park above the cliffs
South : Brisbane River
East : Residential houses above the cliffs
West : Block of residential units, car park, Boundary Street

2.3 Site Operations

The site has been vacant for several months, however it is currently used by the Police as a carpark. Various items of equipment and materials are currently temporarily stored on-site by the State Government.

2.4 Topography and Geology

The site is bounded on the northern side by cliffs, which are understood to have been formed as the result of quarrying operations carried out in the 1930's. The site is flat, and surface runoff drains directly into Brisbane River via a number of drains running under the wharf buildings.

A shallow channel runs between the edge of the concrete hardstand and the base of the cliff, from the western boundary of the site to the bomb shelter located opposite Building No. 3 (refer Figure 1). Surface water has ponded in this channel.

According to regional geology maps (City of Brisbane Geological Map, Sheet 3), the site is located on the boundary of two rock formations. These are the Palaeozoic age Neranleigh-Fernvale Beds (comprising greywacke, siltstone, shale, chert, jasper and basic volcanics) and the Mesozoic age Brisbane Tuff (comprising rhyolitic tuff, conglomerate, breccia and minor sandstone and shale). The interface between these two formations is evident in the cliff face, and was also observed during drilling investigations and sampling undertaken as part of the assessment.

The majority of the site is founded on a rock base overlain by a fill layer, the depth of which was found to vary up to approximately 1m. A large proportion of the fill observed during sampling was consistent with the geological composition of the cliff face described above, indicating that the fill possibly originated as a result of previous quarrying activities on site.

Rapid water infiltration was observed in boreholes during sampling conducted following a period of heavy rainfall, especially in areas located near to the cliff face. This was evidence of runoff flowing from the cliff face through the fill layer towards Brisbane River.

2.5 EPA Contaminated Land Register

EPA have advised that the following lots are currently registered on the Contaminated Land Register, in accordance with Schedule 8.3 of the Environmental Protection Act, 1997, the reason for which being described as "Hazardous Contaminant":-

- Lot 400 on SL1404;
- Lot 2 on RP44680;
- Lots 21 and 22 on RP8614; and
- Lot 4 on RP41821.

March 1999

98155(B)

3.0 SITE HISTORY AND SITE INSPECTION

3.1 Site History

A site history was established by reviewing information supplied by various personnel who have had previous involvement with or knowledge regarding the site, and aerial photographs of the site dating back to 1964. References to buildings or features of the site in the following site history description can be found on Figure 1.

Review of aerial photographs indicated that:-

1964 - The site and surrounding area was generally as it appears today, however, there appears to be a number of small buildings located in the area at the eastern end of the site now used as the open storage area.

1974 - As above, however, this photo was taken during the Brisbane River Floods and the site appears to be completely inundated by flood waters.

An historical title search for the property was conducted by Brisbane City Legal Practice, Paralegal unit. The history of ownership of the site is quite complex due to the large number of individual lots which comprise the site. However, information received to date indicates that various lots within the site were generally privately owned until around the turn of the century, or in some cases until around the late 1920's. Qld National Bank Limited also owned some portions of the site at the beginning of the century. Brisbane Wharves Limited owned a number of lots for varying periods within 1901 and 1936. The Bureau of Industry also owned some lots from 1936 to 1950. Lots 1-4 of RP64991 were leased to Howard Smith Ltd from 1935 to 1956. The Department of Public Works currently owns the site, owning some lots from as early as 1946.

From the findings of the historical title search and anecdotal evidence from State Government personnel, it appears that the wharves on-site have been in use for the majority of this century. The wharves were used in wartime by the Navy for ship maintenance and storage and loading of supplies. Personal communication with ex-Navy personnel suggests that neither storage nor loading of munitions occurred at the site.

The following lots are identified as Prescribed Purpose Sites on BCC's Bimap system:-

- Lot 2 on B3333;
- Lot 2 on RP44680;
- Lots 21 and 22 on RP8614; and
- Lot 4 on RP41821.

Personal communication with the Contaminated Land Unit within BCC identified previous preliminary site investigation works which have been undertaken. Details of these investigations are unclear, however, it is believed that elevated metals of lead, copper and zinc were identified on some or all of the above lots. The registering of four of the above lots on the EPA Contaminated Land Register (refer Section 2.5) may be linked to the results of these site investigations, however, this is unconfirmed. The following description of site history is discussed on an area-by-area basis.

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Personal communication with police personnel from Valley Police indicated that the Water Police and Police Diving Squad used part of the site as a base for their activities for some 20 years before relocating to the mouth of the Brisbane River approximately 3 months ago. Building No. 1 was used for administrative purposes, while Building No. 2 was used for storage purposes. It is possible that drums of oil and / or fuel may have also been stored on-site. General maintenance of police boats occurred while moored in the Brisbane River, and a bunded above-ground diesel tank located adjacent to Building No. 1 was used for police boat refuelling. This tank is still in place.

The fenced off area located opposite the Water Police building was used by Police as an impoundment area for seized and stolen cars, and for property to be used as evidence in court cases.

Building No. 3 was previously used as a general government store for government plant and equipment being held for auction. The State Works Department (now known as Q Build) also used the building for storage of plant, equipment and material such as stone masonry pieces.

Building No. 4 was previously used by multiple government departments as a general storage area. The building is currently approximately 90% vacant, however, is still used as a storage area for obsolete and old medical equipment awaiting transport to other countries. A government garage was also located in the eastern end of Building No. 4. Here servicing and maintenance of government vehicles occurred. Personal communication with State Government personnel indicates that refuelling of vehicles occurred at the garage, however, information regarding the fuel storage tanks is limited. There is a bunded area outside the garage area which possibly held a fuel storage tank and a concrete pad located opposite the garage area may also indicate the previous location of a fuel storage tank or bowisers.

A disused small amenities block containing toilets and showers is located opposite the government garage. This building was not connected to sewer, however, effluent was temporarily stored in holding tanks located outside the block. The effluent was pumped out and tankered off-site on a weekly basis. The amenities block was apparently used mainly by the Police Diving Squad.

An area outside the eastern end of Building No. 4 was used by Q Build for diamond sawing of silica sandstone blocks. A silica sand trap still located on-site was used to collect the effluent generated by the use of water for cooling purposes. This effluent comprised silica dust mixed with water and was temporarily stored in holding tanks located next to the trap. The holding tanks were pumped out and tankered off-site as needed.

A fenced off storage shed located opposite Building No. 4 adjacent to the base of the cliffs, was previously used as a storage area for low level radioactive hospital waste. It is believed that the types of waste stored included such items as hospital gowns and medical equipment used in radioactive procedures such as X-Rays. Storage of this type of waste ceased approximately 10 years ago and is now located near Maleny, north of Brisbane. Personal communication with Bruce Wallace from Queensland Health, indicates that radiation monitoring inside the storage shed was carried out in 1994 by Queensland Health, however, there was no evidence that radiation levels exceeded NHMRC Guidelines.

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Building No. 5 was previously used by the Police Diving Squad for storage and general operations such as tank and boat maintenance. It is not known whether any hazardous substances were stored here.

Located east of Building No. 5 and bounded by the cliff and Brisbane River is an open area which is partially unconcreted. This area has been previously used as a general bulk storage area for various government activities and projects. When the quantity of material stored had accumulated sufficiently, government auctions were apparently held to clear the area.

3.2 Site Inspection

From site visits, the following site characteristics have been observed or inferred, based on a visual "walkover" assessment along with discussions with various personnel providing information.

The site has been fully vacated except for some areas where residual storage of some material / rubbish still occurs. It is expected that this material will be gradually removed from site. The site is presently used as a minor carpark by the Police.

Approximately two-thirds of the site is covered by a concrete hardstand which is expected to have prevented the downward migration of contaminants into underlying soils. No significant cracking or failure of the concrete hardstand was observed during the site inspection.

A bunded aboveground diesel storage tank is located next to Building No.1. From site history investigations this was apparently used by Water Police for boat refuelling. Staining of the concrete under the tank was evident. A large drum of waste oil and 2 small drums of oil/fuel were observed outside the bunded area. These drums were slightly leaking.

A number of empty drums were also observed inside the car impoundment area located opposite the Water Police buildings. What appears to be a drum of oil was also present and slightly leaking. A leaking drum of oil was also observed next to the eastern pylon of the Story Bridge. Three leaking drums of oil were also observed adjacent to the cliff opposite Building No.3. The extent of oil contamination on the concrete hardstand in this area is quite significant, and was observed to be draining into the small channel running in between the edge of the hardstand and the cliff base. The oil has ponded in this channel and does not appear to be draining from the channel.

A disused incinerator which appears to have been gas-fired is located next to the diesel tank described above.

Differing portions of each wharf building extend over Brisbane River. Each building is supported on timber pylons, with a raised timber floor, with some areas in Buildings 2 (Water Police) and 4 (government garage) also covered by plywood. These plywood areas appear to be stained by oil, which indicates the servicing and maintenance of engines. Building No.2 also contains a sign on the wall "SUPER ONLY" possibly indicating that drums of fuel were stored here. Signage also indicates that welding took place within this building.

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Each wharf building contains some abandoned furniture or fittings, and rubbish. Building No. 4 is still used as a storage area for medical equipment awaiting shipment overseas.

A concrete pad is located at the base of the cliff opposite the area used as a government garage. There appears to have been a trench approximately 0.4m wide dug through the concrete hardstand which may indicate the presence of previous fuel storage tanks and associated pipework. A bunded area was also observed next to the garage area which may have contained an aboveground fuel storage tank.

A dismantled building which appears to be an old storage shed was observed adjacent to the cliff opposite building No. 4. The building was apparently abandoned due to termite damage, which were subsequently treated before dismantling the building.

The store shed located opposite Building No. 4 and adjacent to what appears to what appears to be an old bomb shelter is fenced off and padlocked. This is apparently the store shed used for storage of low level radioactive hospital waste.

The open air storage area located at the south-east of the site is quite overgrown, however, there is a small amount of stone masonry and equipment currently stored there. A number of empty and / or corroded drums were scattered throughout the site, especially in the open air storage area.

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4.0 SAMPLING PLAN

Based on the above information a sampling program was developed to access the nature and extent of soil contamination within the site. The sampling program comprised drilling of boreholes and collection of soil samples at 54 locations. The sampling locations were identified on a grid measuring approximately 20m x 20m. A site plan showing the sampling locations is shown on **Figure 2**. Due to various site conditions during sample collection (eg. water inflow, shallow base rock), samples were able to be taken from 41 of the 54 sampling locations. 33 sampling locations were on the concrete hardstand.

The number of sampling locations was determined from AS4482.1-1997 *Guide to the sampling and investigation of potentially contaminated soil*, and site-specific information obtained from site history investigations.

Sampling was undertaken on 27 January 1999, 29 January 1999, and 2 February 1999. Drilling of boreholes and concrete drilling was conducted under supervision by Schneider Drilling Pty Ltd.

Table 1 below describes the lithology, samples taken, and analytes for each sampling location. Selected soil samples were analysed for one or more of the following:

- heavy metals including arsenic, cadmium, chromium, copper, lead, and zinc;
- pH;
- Total Petroleum Hydrocarbons (TPH);
- Benzene, Toluene, Ethyl-benzene, Xylene (BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH); and
- Organochlorine and Organophosphorus Pesticides (OC/OP).

Table 1 Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH1	0.0 - 0.2	0.2	1	(Fill) ash, underlying thin layer of asphalt	1,2,4,5
	0.2-0.9	0.5	2	Weathered Tuff, possible fill sourced on-site, yellow brown	1,2
	0.9			Base rock	
BH2	0.0-0.4	0.3		Weathered Tuff, possible fill sourced on-site, yellowy brown	
	0.4			Base rock	
BH3	0.0-0.2	0.2	3	Weathered Tuff, possible fill sourced on-site, yellowy brown	1,2
	0.2			Base rock	
BH4	0-0.15	0.1	4	(Fill) ash	1,2,4
	0.15			Base rock	

Table 1 (Cont) Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH5	0-0.1	0.1		Weathered Tuff, possible fill sourced on-site, yellowy brown Base rock	
BH6	0.0-0.2 0.2-0.6 0.6	0.2	5	(Fill) gravelly sand, brown (Fill) broken glass Base rock	1,2,5
BH7	0.0-0.9 0.9	0.35 0.5	6	(Fill) sandy clay, some gravel, trace ash and glass, mottled browns Base rock	1,2,3,4
BH8	0.0-0.2 0.2-0.8 0.8	0.2	7	(Fill) gravelly sand, some glass, yellowy light brown Weathered Tuff, possible fill sourced on-site, light brown Base rock	1,2
BH9	0.0-0.2 0.2	0.2		Weathered Tuff, possible fill sourced on-site, light brown Base rock	
BH10	0.0-0.9 0.9	0.5	8	Weathered Tuff, possible fill sourced on-site, light brown Base rock	1,2,3,5
BH11	0.0-0.1 0.1-0.5	0.2		(Fill) Gravel, up to 30mm diameter Weathered tuff, light brown	
BH12	0.0-0.2 0.2-0.9 0.9	0.2 0.5	9	(Fill) sandy gravel, up to 30mm diameter, grey (Fill) gravelly sand, some clay, light brown Base rock	1,2 Increase in moisture content observed with depth, saturated above base rock
BH13					Inaccessible
BH14	0.0-0.2 0.2	0.2		Concrete (Fill) gravel, well-graded, some sand Base rock	Rapid inflow observed
BH15	0.0-0.2 1.2	0.2	10	Concrete (Fill) sandy clay Base rock	1,2 Further samples unavailable due to saturation
BH16	0.0-0.2 0.8	0.2		Concrete (Fill) clayey sand, some gravel Base rock	Water observed, further samples unavailable due to saturation

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Table 1 (Cont) Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH17	0.0-0.2 0.4	0.2	11	Concrete (Fill) gravel, well-graded Base rock	1,2 Inflow observed at 0.2m
BH18					No sample – water at surface
BH19	0.0-0.1 0.1			(Fill) gravel Base rock	No sample (rock fill)
BH20	0.0-0.02 0.02-1.1 1.1	0.2	12	Topsoil, grass Weathered Tuff Base rock	1,2,5 Inflow observed at 0.25m
BH21	0.0-0.6 0.6-0.95 0.95	0.2	13	(Fill) clayey sand, some gravel Extremely weathered phyllite - clay, some gravel, grey Base rock	1,2,3 Inflow observed at 0.3m
BH22	0.0-0.2 0.2-0.5	0.2 0.5	14 15	(Fill) silty sand, ash, slight amount of tar-like material, black (Fill) silty sand, light brown	1,2,3,4 Slightly odourous (diesel) 1,2,3
BH23	0.0-0.2 0.2-0.3 0.3	0.2	16	Concrete (Fill) gravelly clay, grey Weathered phyllite Base rock	1,2,3
BH24	0.0-0.2 0.2-0.4 0.4	0.2		Concrete (Fill) gravelly (well-graded) clay, light brown Weathered phyllite Base rock	
BH25	0.0-0.2 0.2-0.5 0.5-1.3 1.3	0.2 0.5	17	Concrete (Fill) sandy clay, some gravel, brown (Fill) sandy clay, some gravel, brown, mottled orange, grey Weathered phyllite Base rock	1,2
BH26	0.0-0.25 0.25-0.5	0.2		Concrete (Fill) gravelly clay, green grey, mottled orange Weathered phyllite	Saturated at 0.5m

Table 1 (Cont) Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH27	0.0-0.2	0.2	18	Concrete (Fill) gravelly clay, light brown. Mottled orange, grey, dark brown	1,2
	0.2-1.0	0.5		Weathered phyllite, light brown/orange, stiffness increasing with depth	
BH28	0.0-0.1	0.5 1.0	19	Concrete (Fill) gravel	Water observed directly under concrete 1,2
	0.1-1.0			Weathered phyllite – clay, mottled grey, orange, green, stiffness increasing with depth	
BH29	0.0-0.05 0.05			Concrete (Fill) gravel Base rock, some weathering	No sample
BH30	0.0-0.1 0.1			Topsoil, grass Base rock, some weathering	No sample
BH31	0.0			Concrete Base rock under concrete	No sample
BH32	0.0			Concrete Base rock under concrete	No sample
BH33	0.0-0.05 0.05-0.4 0.4	0.2	20	Concrete (Fill) gravel, some clay Weathered phyllite Base rock	1,2
BH34	0.0-0.5 0.5			Concrete Weathered phyllite Base rock	
BH35	0.0-0.2 0.2	0.2		Concrete (Fill) gravel, some clay Base rock	
BH36	0.0-0.1	0.1	22	Concrete (Fill) sand, medium to coarse grain, possible bedding sand	1,2,3
	0.1			Base rock	
BH37	0.0-0.1 0.1	0.1	23	Concrete Weathered phyllite Base rock	1,2
BH38	0.0-0.2	0.2		Concrete (Fill) sand, medium to coarse grain, possible bedding sand	Water inflow observed at 0.2m
	0.2			Base rock	

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Table 1 (Cont) Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH38A	0.0-0.05 0.05			Concrete (Fill) gravel Base rock	No sample
BH39	0.0-0.1 0.1	0.1	24	Concrete (Fill) sandy gravel Weathered phyllite, stiffness increasing with depth	1,2,3
BH39A	0.0-0.1 0.2			Concrete Weathered phyllite Base rock	No sample
BH40	0.0-0.05 0.05			Concrete (Fill) gravel Base rock	No sample
BH41	0.0-0.05 0.05	0.2	25	Concrete (Fill) gravel Weathered phyllite, stiffness increasing with depth	1,2
BH42	0.0-0.02 0.02			Concrete (Fill) Gravel Weathered phyllite	No sample
BH43	0.0-0.2 0.2-0.9	0.2	26	Concrete (Fill) gravelly clay, light brown, grey, mottled red, dark red Extremely weathered phyllite	1,2,4,5
BH44	0.0-0.5 0.5-1.5	0.2 1.0	27 28	Concrete (Fill) silty sand, some clay, brown (All.) sandy clay, brown, light brown	1,2,3 1,2
BH45				Concrete rubble fill	No sample
BH46	0.0-0.2 0.2-1.5 1.5-	0.2 0.5 1.5	29 30	(Fill) weathered phyllite (All.) sandy clay, brown, moisture increasing with depth Residual clay, green, light brown, mottled grey, dark brown	1,2 1,2
BH47	0.0-0.2 0.2	0.2		Concrete Weathered phyllite Base rock	
BH48	0.0-0.1 0.1-0.2 0.2	0.1	31	Concrete (Fill) sand, medium to coarse grain, possible bedding sand Weathered rock Base rock	1,2

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Table 1 (Cont) Sampling Location Descriptions

Sampling Location Number	Depth (m)	Sample Interval (m)	Seq No.	Lithology	Analytical Parameters / Comments
BH49	0.0-0.02 0.02			Concrete (Fill) gravel Base rock	No sample
BH50	0.0-0.2 0.4	0.12	32	Concrete (Fill) sand, medium to coarse grain, possible bedding sand Base rock	1,2 Water inflow observed at 0.2m
BH51	0.0-	0.2	33	Concrete Weathered phyllite, increasing in stiffness with depth	1,2,3
BH52	0.0-0.2 0.2	0.2	34	Ash, some gravel Base rock	1,2,3,4 Water observed, not odourous

Notes: (1) pH
 (2) Heavy metal analysis (As, Cd, Cr, Cu, Pb, Zn)
 (3) TPH/BTEX analysis
 (4) OC/OP Pesticides
 (5) PAH
 (All.) = Alluvium

5.0 LABORATORY ANALYSIS

5.1 Analytical Results

50 soil samples at 41 sampling locations were collected. 34 samples were selected and despatched to laboratory for analysis. Remaining samples were stored under refrigeration at BCC Geotechnical & Environmental Engineering Laboratory. Laboratory analysis was undertaken by BCC Scientific Analytical Services and Australian Laboratory Services.

Soil analytical results have been compared to the environmental and health-based investigation thresholds outlined in the *DEH Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland, May 1998*. The health-based investigation thresholds specified in the guidelines are based upon the proposed end land use of the site. The proposed end land use of the Howard Smith Wharf site has not been finalised, however, it is understood that the site will likely be used for a combination of commercial/industrial and open space recreational uses. For this reason, the conservative values of Category E (Parks, Recreational Open Space) health-based investigation thresholds were considered when discussing the analytical results. Draft guidelines prepared by the Qld CHEM Unit in 1991 provide a guideline for the assessment of hydrocarbon contamination in soil. Where guidelines for certain contaminants are not available, Dutch guidelines which provide intervention levels have been used (*Environmental Quality Objectives in the Netherlands, Ministry of Housing, Spatial Planning and the Environment, 1994*). United States EPA Preliminary Remediation Goals were also used for comparison purposes.

Summary soil analysis results for the site are presented in **Table 2** in **Appendix A**. Concentrations above guideline levels are highlighted in **Table 2**, and **Figure 3** shows these concentrations on a site plan.

Heavy Metals

All samples despatched to the laboratory were analysed for the presence of selected heavy metals. Nine samples had reported concentrations above DEH environmental investigation thresholds for lead, zinc, cadmium and arsenic. The following two samples reported concentrations exceeding health-based investigation thresholds:

- BH10 (0.5m) – lead concentration 710 mg/kg; and
- BH20 (0.2m) – lead concentration 650 mg/kg,

slightly above the health-based investigation threshold for lead - 600 mg/kg.

All other metal results were below the relevant DEH environmental guidelines.

Organochlorine and Organophosphorus Pesticides

Six samples were analysed for organochlorine and organophosphorus pesticides. All pesticide levels were below the limit of reporting specified by the analytical laboratory.

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Total Petroleum Hydrocarbons (TPH)

Eleven samples were analysed for TPH. The following two samples reported concentrations exceeding CHEM Unit guidelines:

- BH51 (0.2m) – C₁₀-C₁₄ fraction concentration of 127 mg/kg; and
- BH52 (0.2m) – C₁₀-C₁₄ fraction concentration of 274 mg/kg
C₁₅-C₂₈ fraction concentration of 1830 mg/kg,

above the CHEM Unit guidelines for C₁₀-C₁₄ fraction of 100 mg/kg and C₁₅-C₂₈ fraction of 1000 mg/kg.

Slightly elevated TPH levels were also observed in BH22 (0.2m), however these levels are below health based threshold levels. This result coincided with the observation of hydrocarbon odours in the surface soil at BH22.

BTEX

Eleven samples were analysed for benzene, toluene, ethylbenzene and xylene (BTEX). All samples were below the limit of reporting specified by the analytical laboratory.

Polycyclic Aromatic Hydrocarbons (PAH)

Six samples were analysed for PAH. All samples were below health-based investigation thresholds for benzo(a)pyrene and total PAH.

5.2 Discussion of Results

From the analytical results of the soil samples, low level heavy metal contamination of fill exists in parts of the site. The majority of the contamination reported was in the open storage area located at the south-eastern end of the site. No heavy metal concentrations above investigation thresholds were reported in any of the samples obtained from under the concrete hardstand.

Hydrocarbon concentrations above guideline levels were reported in the samples obtained from the area opposite the government garage. Anecdotal evidence suggests that refuelling of vehicles may have occurred in this area. Low concentrations of hydrocarbons were detected in BH22 at 0.2m, however the sample taken from 0.5m was free from detectable hydrocarbons. BH51, located under the concrete hardstand also contained concentrations above guideline levels. These findings suggests that hydrocarbon contamination is confined to the surface layers, however, may have migrated under the concrete. The depth to base rock in this area was found to vary from 0.2m to approximately 1m.

6.0 QUALITY ASSURANCE / QUALITY CONTROL

6.1 Field Decontamination

In order to reduce the potential for cross contamination between sampling locations, all drilling equipment was washed after completion of sampling at each borehole. Latex gloves were also discarded between each sampling location to reduce potential cross contamination between samples.

6.2 Sampling and Analysis

All soil samples were collected in acid-washed, solvent-rinsed glass bottles supplied by SAS, placed in an esky containing ice immediately upon collection. Samples were stored under refrigeration in BCC Geotechnical & Environmental Engineering Laboratory until delivery to the analytical laboratory.

Laboratory analysis of soil samples was performed by Brisbane Water Scientific Analytical Services (SAS) and Australian Laboratory Services Pty Ltd (ALS). Both laboratories are National Association of Testing Authorities (NATA) accredited to perform the selected analyses. All sample containers and accompanying Chain of Custody records were marked with a unique identifying number. Copies of the Chain of Custody forms are presented in Appendix C.

6.3 Health and Safety

A Health & Safety Plan (HSP) was prepared for use by Geotechnical and Environmental Engineering personnel and contractors, during the site contamination assessment.

The purpose of this document is to inform all parties who will be involved in the site contamination assessment of expected site conditions, potential hazards, personal protective equipment and safety precautions required, decontamination procedures, and the emergency response plan.

7.0 REMEDIATION OPTIONS & RECOMMENDATIONS

It is evident from the soil sampling and laboratory testing detailed in this report that low level contamination by heavy metals and petroleum hydrocarbons is present within the site. As specified in the *DEH Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, levels of contaminants above the health investigation levels for the proposed use will require remediation or development of an appropriate plan for managing the contamination. The following options are available for remediation / management of the Howard Smith Wharf site:

1. Do nothing option ie. leave the site in its current state

This option is not recommended as a requirement of the DEH Draft Guidelines is that contamination exceeding health investigation levels be remediated or managed.

2. Removal of contaminated soil for disposal to landfill

This option is not recommended due to the uncertainty of the extent of contamination and the fact that the contaminant levels identified are considered to be acceptable, subject to proper site management (refer Option 4) for the proposed commercial / recreational final land use.

3. Conduct further sampling and laboratory testing

Due to the results obtained from this assessment, this option is not considered necessary.

4. Development and implementation of a site management plan

A site management plan (SMP) is a stand-alone public document which summarises the contamination issues and conditions associated with the use of the site. The objective of a site management plan (SMP) is to manage the chemical contamination on the site in manner which protects human health and the environment and ensures that the site is suitable for the specified use.

This is the recommended option, as development and implementation of an SMP will enable the contamination to remain on-site thus reducing the costs of remediating contaminated areas. Also, as the end land use for the site is not yet finalised, the SMP could be developed in consideration of the most sensitive proposed land uses (Category D – High/Medium Density Residential; Category E – Parks, Recreational Open Space; Category F – Commercial/Industrial Use). The contamination would be managed by a combination of the following:

- The placement and maintenance of a barrier which safely separates users of the site and the contamination as well as minimising surface water infiltration and restricting contaminant migration; and
- The application of procedures in order to control any site excavation and development works.

SMPs are submitted to DEH for approval and recording on the Environmental Management Register.

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8.0 REFERENCES

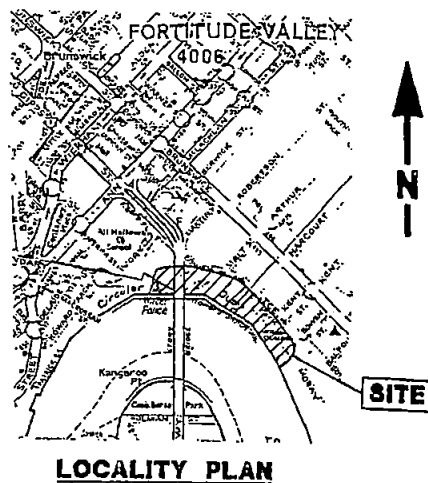
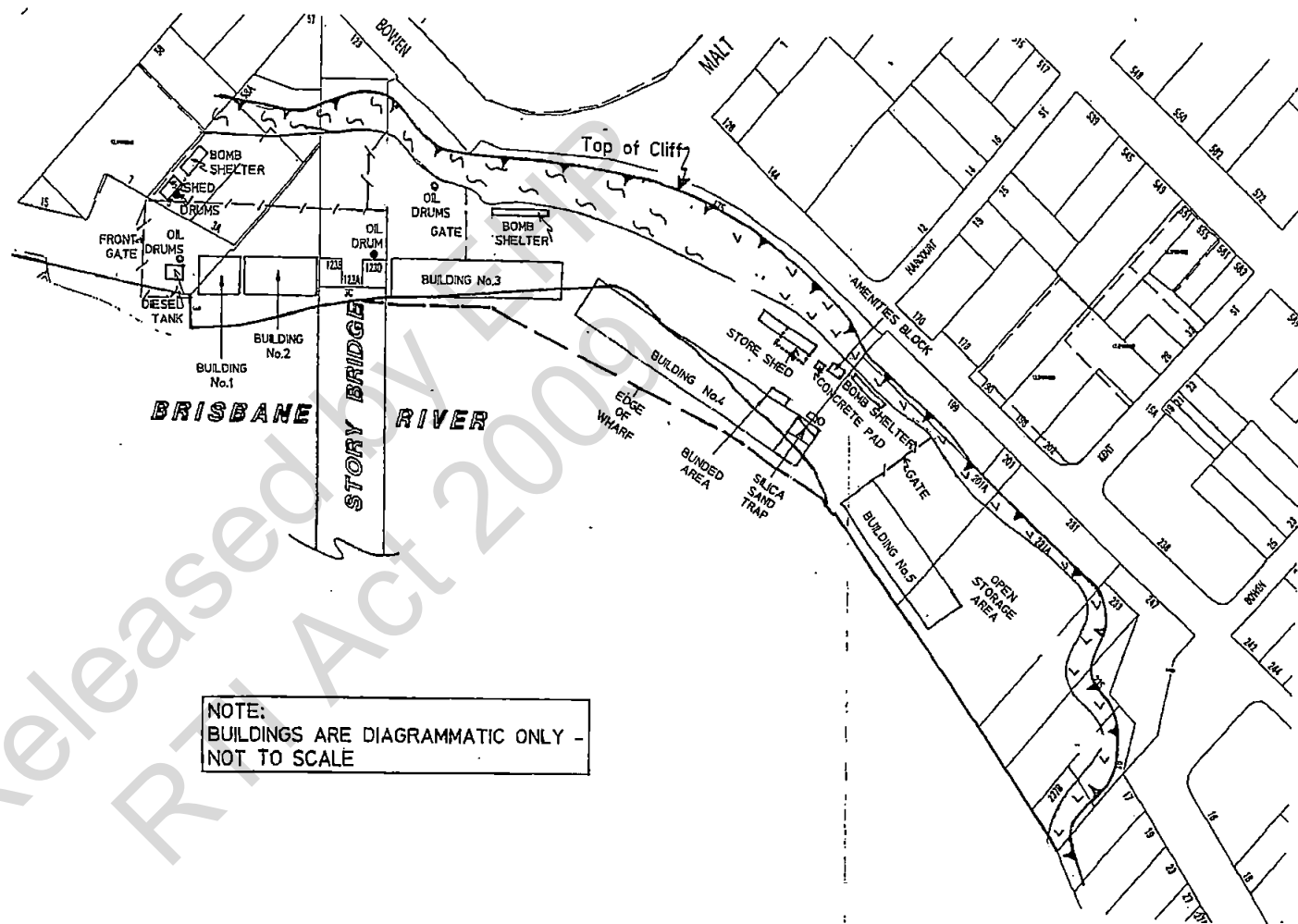
AS4482.1-1997 Guide to the sampling and investigation of potentially contaminated soil

Department of Environment & Heritage, Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, May 1998

Environmental Quality Objectives in the Netherlands, Ministry of Housing, Spatial Planning and the Environment, 1994

Guidelines for the Assessment of Contaminated Land in Queensland, CHEM Unit, 1992

Released by EHP
RTI Act 2009



LEGEND

- BRISBANE TUFF
 NERANLEIGH-FERNVALE BEDS
 FENCE

NOTE:
BUILDINGS ARE DIAGRAMMATIC ONLY -
NOT TO SCALE

17-086

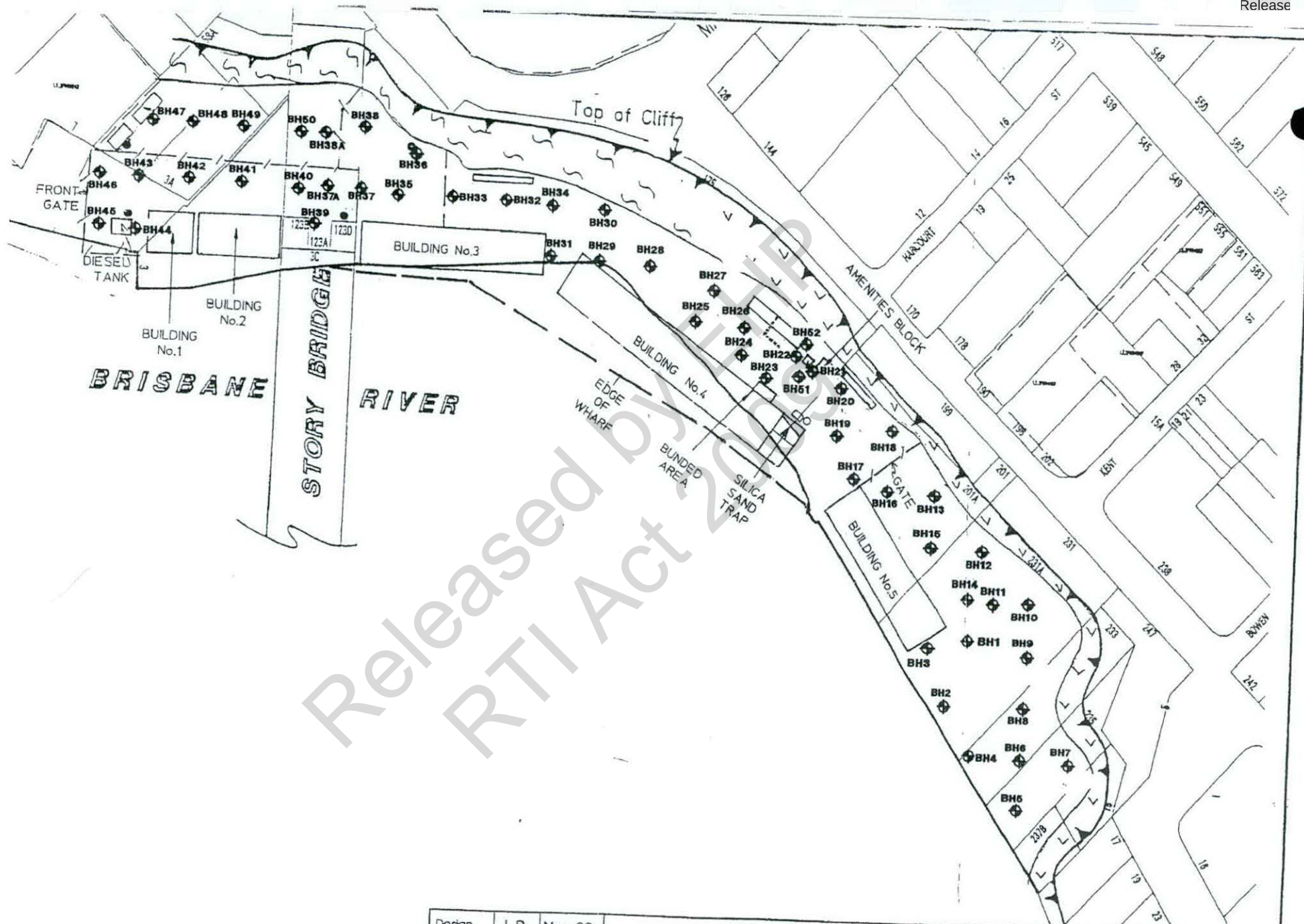
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CITY DESIGN
GEOTECHNICAL & ENVIRONMENTAL ENGINEERING
SITE CONTAMINATION ASSESSMENT
HOWARD SMITH WHARF
SITE PLAN



BRISBANE CITY COUNCIL
City Design
GEOTECHNICAL & ENVIRONMENTAL
ENGINEERING

Project No. 00155 63 of 141 Figure No. 1



Design	L.R.	Mar 99
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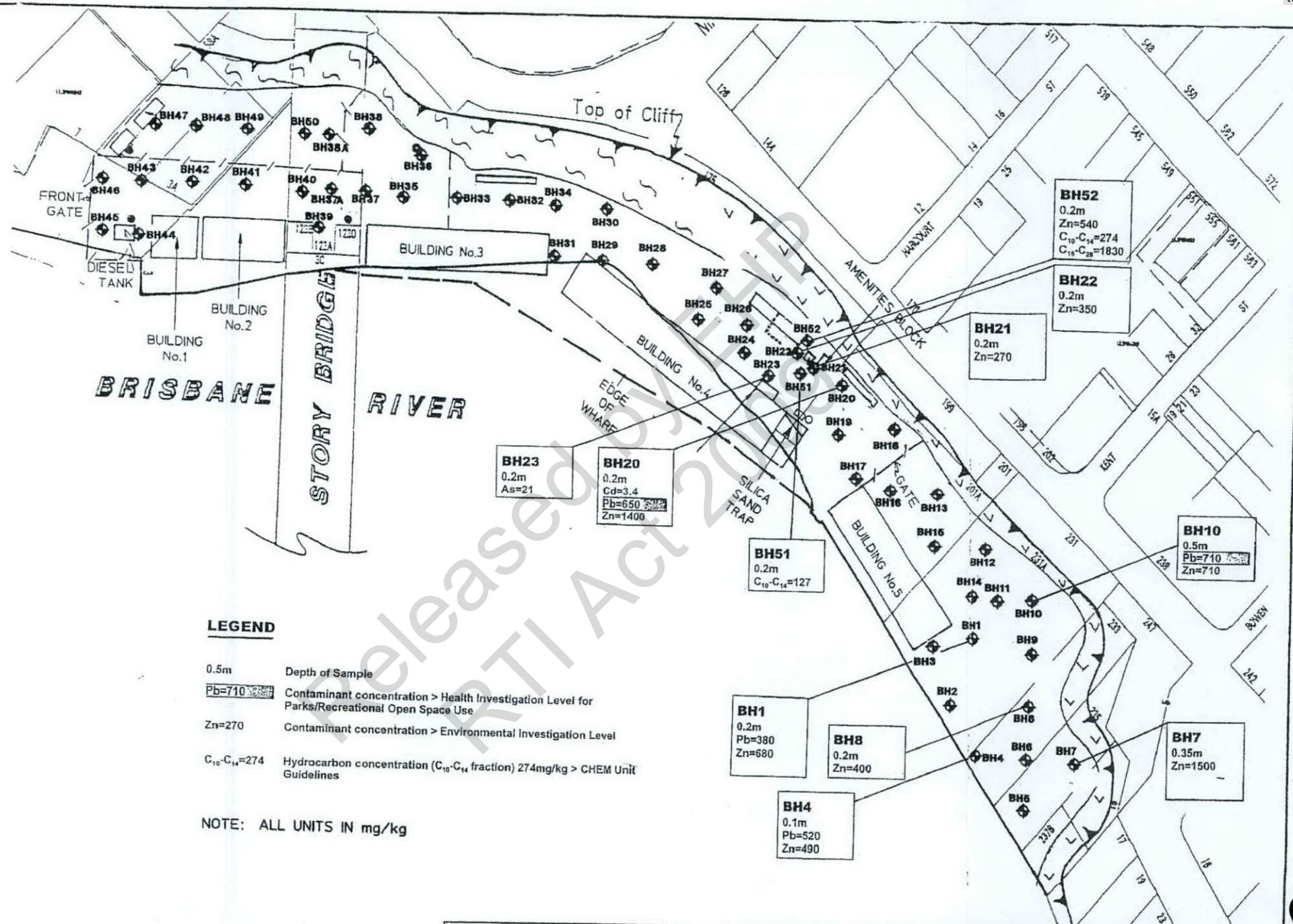
CITY DESIGN
 GEOTECHNICAL & ENVIRONMENTAL ENGINEERING
 SITE CONTAMINATION ASSESSMENT
 HOWARD SMITH WHARF
 SAMPLING LOCATIONS



BRISBANE CITY COUNCIL
 CITY DESIGN
 GEOTECHNICAL & ENVIRONMENTAL
 ENGINEERING

Project No.
 98155

Figure No.
 2



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CITY DESIGN
 GEOTECHNICAL & ENVIRONMENTAL ENGINEERING
 SITE CONTAMINATION ASSESSMENT
 HOWARD SMITH WHARF
 CONTAMINANT CONCENTRATIONS
 TOVE LIN ELS



BRISBANE CITY COUNCIL
 CITY DESIGN
 GEOTECHNICAL & ENVIRONMENTAL ENGINEERING
 Project No. 65011
 Figure No. 3

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**APPENDIX A
SUMMARY ANALYTICAL RESULTS**

March, 1999

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Table 2 - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	DEH Guidelines			Sample Locations						
Sequence No.			Background	Environmental	Health (E)	1	2	3	4	5	6	7
Borehole No.						BH1	BH1	BH3	BH4	BH6	BH7	BH8
Depth (m)						0.2	0.5	0.2	0.1	0.2	0.35	0.2
Metals												
Arsenic (Tot.) as As	mg/kg	10	0.2-30	20	200	<10	<10	<10	<10	<10	<10	<10
Cadmium (Tot.) as Cd	mg/kg	1	0.04-2	3	40	<1.0	<1.0	<1.0	<1.0	<1.0	1.3	<1.0
Chromium (Tot.) as Cr	mg/kg	2	0.5-110	50	200	16	3.1	2.3	17	7.3	19	8.5
Copper (Tot.) as Cu	mg/kg	1	1-190	60	2000	84	4.0	6.7	58	11	18	22
Lead (Tot.) as Pb	mg/kg	10	<2-200	300	600	380	53	99	520	38	210	100
Zinc (Tot.) as Zn	mg/kg	5	2-180	200	14000	680	70	120	490	120	1500	400
Percent Moisture	%					[NT]	[NT]	[NT]	[NT]	[NT]	11.8	[NT]
pH 1:5 Extract			6 - 8			7.8	8.1	7.7	7.0	9.4	8.6	8.1

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

E - Parks/Recreational Open Space health based criteria

NT - Not tested

Bold values indicate levels exceeding DEH environmental investigation threshold level

Shaded values indicate levels exceeding DEH health based investigation threshold level

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	DEH Guidelines			Sample Locations						
Sequence No.			Background	Environmental	Health (E)	8	9	10	11	12	13	14
Borehole No.						BH10	BH12	BH15	BH17	BH20	BH21	BH22
Depth (m)						0.5	0.5	0.2	0.2	0.2	0.2	0.2
Metals												
Arsenic (Tot.) as As	mg/kg	10	0.2-30	20	200	<10	<10	<10	<10	<10	<10	<10
Cadmium (Tot.) as Cd	mg/kg	1	0.04-2	3	40	<1.0	<1.0	<1.0	<1.0	3.4	<1.0	<1.0
Chromium (Tot.) as Cr	mg/kg	2	0.5-110	50	200	15	2.8	<2.0	4.4	19	3.3	7.1
Copper (Tot.) as Cu	mg/kg	1	1-190	60	2000	23	3.1	6.1	5.9	35	9.4	29
Lead (Tot.) as Pb	mg/kg	10	<2-200	300	600	710	36	100	48	650	110	130
Zinc (Tot.) as Zn	mg/kg	5	2-180	200	14000	710	71	67	84	1400	270	350
Percent Moisture	%					9.5	[NT]	[NT]	[NT]	[NT]	12.6	11.8
pH 1:5 Extract			6 - 8			8.7	8.1	8.1	8.5	7.3	9.0	8.9

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

E - Parks/Recreational Open Space health based criteria

NT - Not tested

Bold values indicate levels exceeding DEH environmental investigation threshold level

Shaded values indicate levels exceeding DEH health-based investigation threshold level

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	DEH Guidelines			Sample Locations						
Sequence No.			Background	Environmental	Health (E)	15	16	17	18	19	20	21
Borehole No.						BH22	BH23	BH25	BH27	BH28	BH33	BH34
Depth (m)						0.5	0.2	0.2	0.2	0.5	0.2	0.1
Metals												
Arsenic (Tot.) as As	mg/kg	10	0.2-30	20	200	<10	21	<10	<10	<10	<10	<10
Cadmium (Tot.) as Cd	mg/kg	1	0.04-2	3	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium (Tot.) as Cr	mg/kg	2	0.5-110	50	200	<2.0	<2.0	24	3.2	2.8	<2.0	<2.0
Copper (Tot.) as Cu	mg/kg	1	1-190	60	2000	8.7	8.9	2.9	3.1	<1.0	9.9	15
Lead (Tot.) as Pb	mg/kg	10	<2-200	300	600	11	<10	24	12	<10	<10	<10
Zinc (Tot.) as Zn	mg/kg	5	2-180	200	14000	100	77	50	69	37	100	84
Percent Moisture	%					4.6	14.7	[NT]	[NT]	[NT]	[NT]	[NT]
pH 1:5 Extract			6 - 8			9.4	9.3	5.5	8.8	6.2	9.1	9.6

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

E - Parks/Recreational Open Space health based criteria

NT - Not tested

Bold values indicate levels exceeding DEH environmental investigation threshold level

Striked values indicate levels exceeding DEH health-based investigation threshold level

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	DEH Guidelines			Sample Locations						
Sequence No.			Background	Environmental	Health (E)	22	23	24	25	26	27	28
Borehole No.						BH36	BH37	BH39	BH41	BH43	BH44	BH44
Depth (m)						0.2	0.2	0.1	0.2	0.2	0.2	1.0
Metals												
Arsenic (Tot.) as As	mg/kg	10	0.2-30	20	200	<10	<10	<10	<10	<10	<10	<10
Cadmium (Tot.) as Cd	mg/kg	1	0.04-2	3	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium (Tot.) as Cr	mg/kg	2	0.5-110	50	200	6.6	2.4	5.0	3.0	20	28	40
Copper (Tot.) as Cu	mg/kg	1	1-190	60	2000	5.1	19	12	26	8.5	8.3	9.7
Lead (Tot.) as Pb	mg/kg	10	<2-200	300	600	19	11	31	14	<10	16	<9.9
Zinc (Tot.) as Zn	mg/kg	5	2-180	200	14000	74	110	110	130	39	44	46
Percent Moisture	%					8.3	[NT]	7.6	[NT]	[NT]	12.9	[NT]
pH 1:5 Extract			6 - 8			9.1	9.2	9.8	8.4	8.5	8.2	6.2

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

E - Parks/Recreational Open Space health based criteria

NT - Not tested

Bold values indicate levels exceeding DEH environmental investigation threshold level

Shaded values indicate levels exceeding DEH health based investigation threshold level

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	DEH Guidelines			Sample Locations					
Sequence No.			Background	Environmental	Health (E)	29	30	31	32	33	34
Borehole No.						BH46	BH46	BH48	BH50	BH51	BH52
Depth (m)						0.2	0.5	0.1	0.2	0.2	0.2
Metals											
Arsenic (Tot.) as As	mg/kg	10	0.2-30	20	200	<10	<10	<10	<10	<10	<10
Cadmium (Tot.) as Cd	mg/kg	1	0.04-2	3	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chromium (Tot.) as Cr	mg/kg	2	0.5-110	50	200	6.9	28	5.4	7.8	<2.0	19
Copper (Tot.) as Cu	mg/kg	1	1-190	60	2000	13	6.8	12	25	8.0	43
Lead (Tot.) as Pb	mg/kg	10	<2-200	300	600	23	20	11	18	21	180
Zinc (Tot.) as Zn	mg/kg	5	2-180	200	14000	99	56	56	51	94	540
Percent Moisture	%					[NT]	[NT]	[NT]	[NT]	7.3	23.8
pH 1:5 Extract			6 - 8			9.5	6.1	8.5	9.3	9.3	7.3

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

E - Parks/Recreational Open Space health based criteria

NT - Not tested

Bold values indicate levels exceeding DEH environmental investigation threshold level

Shaded values indicate levels exceeding DEH health-based investigation threshold level

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	Guidelines		Sample Locations							
Sequence No.			CHEM Unit	Dutch	6	8	13	14	15	16	22	24
Borehole No.					BH7	BH10	BH21	BH22	BH22	BH23	BH36	BH39
Depth (m)					0.35	0.5	0.2	0.2	0.5	0.2	0.2	0.1
TPH												
C ₆ -C ₉ Fraction	mg/kg	2	100		<2	<2	<2	<2	<2	<2	<2	<2
C ₁₀ - C ₁₄ Fraction	mg/kg	50	100		<50	<50	<50	<50	<50	<50	<50	<50
C ₁₅ - C ₂₈ Fraction	mg/kg	100	1000		<100	<100	<100	240	<100	<100	<100	<100
C ₂₉ - C ₃₆ Fraction	mg/kg	100	1000		<100	<100	<100	<100	<100	<100	<100	<100
Total C ₁₀ - C ₃₆ Fraction				5000				240				
			DEH Environmental									
BTEX												
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Meta- & para-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

LOR - Limit of Reporting

Bold values indicate levels exceeding CHEM Unit/DEH guidelines

CHEM Unit- Draft guidelines for TPH contamination

DEH - Draft Guidelines investigation thresholds

Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	Guidelines		Sample Locations		
Sequence No.			CHEM Unit	Dutch	27	33	34
Borehole No.					BH44	BH51	BH52
Depth (m)					0.2	0.2	0.2
TPH							
C ₆ -C ₉ Fraction	mg/kg	2	100		<2	<2	<2
C ₁₀ - C ₁₄ Fraction	mg/kg	50	100		<50	127	274
C ₁₅ - C ₂₈ Fraction	mg/kg	100	1000		<100	265	1830
C ₂₉ - C ₃₆ Fraction	mg/kg	100	1000		<100	<100	862
Total C ₁₀ - C ₃₆ Fraction				5000		392	2966
			DEH Environmental				
BTEX							
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2
Toluene	mg/kg	0.2			<0.2	<0.2	<0.2
Chlorobenzene	mg/kg	0.2			<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2			<0.2	<0.2	<0.2
Meta- & para-xylene	mg/kg	0.2			<0.2	<0.2	<0.2
ortho-Xylene	mg/kg	0.2			<0.2	<0.2	<0.2

Notes:

LOR - Limit of Reporting

CHEM Unit- Draft guidelines for TPH contamination

DEH - Draft Guidelines investigation thresholds

Bold values indicate levels exceeding CHEM Unit/DEH guidelines

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	Guidelines		Sample Locations					
Sequence No.			DEH Health(E)	USEPA	1	5	8	12	21	26
Borehole No.					BH1	BH6	BH10	BH20	BH34	BH43
Depth (m)					0.2	0.2	0.5	0.2	0.2	0.2
Organochlorine Pesticides										
alpha-BHC	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
HCB	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC & gamma-BHC	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	20		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane - cis	mg/kg	0.05	100	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05	20	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DDE	mg/kg	0.05		5.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 2	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DDD	mg/kg	0.05		7.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
DDT	mg/kg	0.2	400	5.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

USEPA - United States Environmental Protection Agency Region IX Preliminary Remediation Goals (PRGs) for Industrial Land Uses

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	Guidelines		Sample Locations					
Sequence No.			DEH Health(E)	USEPA	1	5	8	12	21	26
Borehole No.					BH1	BH6	BH10	BH20	BH34	BH43
Depth (m)					0.2	0.2	0.5	0.2	0.2	0.2
Organophosphorus Pesticides										
Dichlorvos	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
demeton-s-methyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos E	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos Z	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
fenamiphos	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos-methyl	mg/kg	0.05			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

USEPA - United States Environmental Protection Agency Region IX Preliminary Remediation Goals (PRGs) for Industrial Land Uses

March, 1999

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Table 2 (Cont) - SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOIL)

Analysis	Units	LOR	Guidelines		Sample Locations					
Sequence No.			DEH Health(E)	USEPA	1	4	6	14	26	34
Borehole No.					BH1	BH4	BH7	BH22	BH43	BH52
Depth (m)					0.2	0.2	0.35	0.2	0.2	0.2
PAH Analysis										
Naphthalene	mg/kg	0.5		800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylnaphthalene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chloronaphthalene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5		360	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5		300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			1.4	0.5	<0.5	1.5	<0.5	0.7
Anthracene	mg/kg	0.5		19	<0.5	<0.5	<0.5	0.8	<0.5	<0.5
Fluorathene	mg/kg	0.5			2.0	0.9	<0.5	4.1	<0.5	<0.5
Pyrene	mg/kg	0.5		20,000	2.1	0.9	<0.5	4.0	<0.5	<0.5
N-2-Fluorenylacetamide	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			1.0	0.5	<0.5	2.6	<0.5	<0.5
Chrysene	mg/kg	0.5		24	1.3	1.2	<0.5	2.5	<0.5	<0.5
Benzo(b) & (k)fluoranthene	mg/kg	1		2.6 to 26	2	1	<1	4	<1	<1
7,12-Dimethylbenz(a)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5	2	0.26	1.2	<0.5	<0.5	1.9	<0.5	<0.5
3-Methylcholanthrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.5			0.6	<0.5	<0.5	1.0	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5		26	<0.5	<0.5	<0.5	0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.7	<0.5	<0.5	0.9	<0.5	<0.5
TOTAL PAH	mg/kg		40		12.3	5	0	23.8	0	0.7

Notes:

LOR - Limit of Reporting

DEH - Draft Guidelines investigation thresholds

USEPA - United States Environmental Protection Agency Region IX Preliminary Remediation Goals (PRGs) for Industrial Land Uses

Geotechnical and Environmental Engineering

Released by EHP
RTI Act 2009

APPENDIX B
LABORATORY ANALYTICAL RESULTS

**SCIENTIFIC ANALYTICAL SERVICES LABORATORY**

Scientific Analytical Services
240 Donaldson Road
Rocklea Brisbane Qld 4106

Telephone 07 3403 2611
Facsimile 07 3403 2646

A unit of the Brisbane City Council

Attention: Liz Boczek
Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Sampling Date: 02/02/99

Sampled By: Client

Sampling Method: Grab

Sample Matrix: Solid

Batch Number: 99/0933

Registration Date: 4 February 1999

Date of Report: 5 March 1999

Sequence Number	Sample Description
/1	BH1 0.2 M
/2	BH1 0.5 M
/3	BH3 0.2 M
/4	BH4 0.2 M
/5	BH6 0.2 M
/6	BH7 0.35 M
/7	BH8 0.2 M
/8	BH10 0.5 M
/9	BH12 0.5 M
/10	BH15 0.2 M
/11	BH17 0.2 M
/12	BH20 0.2 M
/13	BH21 0.2 M
/14	BH22 0.2 M
/15	BH22 0.5 M
/16	BH23 0.2 M
/17	BH25 0.2 M
/18	BH27 0.2 M
/19	BH28 0.5 M
/20	BH33 0.2 M

Please note that the above results refer only to the samples tested,
and not to the batches from which they were drawn.

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Client: City Design, Ground Engineering
Job Name: 08155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Sequence Number	Sample Description
/21	BH34 0.2 M
/22	BH36 0.2 M
/23	BH37 0.2 M
/24	BH39 0.1 M
/25	BH41 0.2 M
/26	BH43 0.2 M
/27	BH44 0.2 M
/28	BH44 1.0 M
/29	BH46 0.2 M
/30	BH46 0.5 M
/31	BH48 0.1 M
/32	BH50 0.2 M
/33	BH51 0.2 M
/34	BH52 0.2 M

TPH/BTEX, PAH's and OC/OP Pesticides analysis performed by ALS EB19245.
This report supersedes any previous report of the same batch number.

Please note that the above results refer only to the samples tested,
and not to the batches from which they were drawn.

Page 2 of 9

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Method	Test	Units	/1	/2	/3	/4
5.002	pH 1:5 Extract		7.8	8.1	7.7	7.0
External	Hydrocarbon Banding		[NR]	[NR]	[NR]	[NR]
External	BTEX		[NR]	[NR]	[NR]	[NR]
External	Polyaromatic Hydrocarbons		Complete	[NR]	[NR]	Complete
External	OC/OP Pesticides		Complete	[NR]	[NR]	[NR]
Method	Test	Units	/5	/6	/7	/8
5.002	pH 1:5 Extract		9.4	8.6	8.1	8.7
External	Hydrocarbon Banding		[NR]	Complete	[NR]	Complete
External	BTEX		[NR]	Complete	[NR]	Complete
External	Polyaromatic Hydrocarbons		[NR]	Complete	[NR]	[NR]
External	OC/OP Pesticides		Complete	[NR]	[NR]	Complete
Method	Test	Units	/9	/10	/11	/12
5.002	pH 1:5 Extract		8.1	8.1	8.5	7.3
External	Hydrocarbon Banding		[NR]	[NR]	[NR]	[NR]
External	BTEX		[NR]	[NR]	[NR]	[NR]
External	Polyaromatic Hydrocarbons		[NR]	[NR]	[NR]	[NR]
External	OC/OP Pesticides		[NR]	[NR]	[NR]	Complete
Method	Test	Units	/13	/14	/15	/16
5.002	pH 1:5 Extract		9.0	8.9	9.4	9.3
External	Hydrocarbon Banding		Complete	Complete	Complete	Complete
External	BTEX		Complete	Complete	Complete	Complete
External	Polyaromatic Hydrocarbons		[NR]	Complete	[NR]	[NR]
External	OC/OP Pesticides		[NR]	[NR]	[NR]	[NR]
Method	Test	Units	/17	/18	/19	/20
5.002	pH 1:5 Extract		5.5	8.8	6.2	9.1
External	Hydrocarbon Banding		[NR]	[NR]	[NR]	[NR]
External	BTEX		[NR]	[NR]	[NR]	[NR]
External	Polyaromatic Hydrocarbons		[NR]	[NR]	[NR]	[NR]
External	OC/OP Pesticides		[NR]	[NR]	[NR]	[NR]
Method	Test	Units	/21	/22	/23	/24
5.002	pH 1:5 Extract		9.6	9.1	9.2	9.8
External	Hydrocarbon Banding		[NR]	Complete	[NR]	Complete
External	BTEX		[NR]	Complete	[NR]	Complete
External	Polyaromatic Hydrocarbons		[NR]	[NR]	[NR]	[NR]
External	OC/OP Pesticides		Complete	[NR]	[NR]	[NR]

CTPI - Personal information

Please note that the above results refer only to the samples tested, and not to the batches from which they were drawn.

Page 3 of 9

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Method	Test	Units	/25	/26	/27	/28
5.002	pH 1:5 Extract		8.4	8.5	8.2	6.2
External	Hydrocarbon Banding		[NR]	[NR]	Complete	[NR]
External	BTEX		[NR]	[NR]	Complete	[NR]
External	Polyaromatic Hydrocarbons		[NR]	Complete	[NR]	[NR]
External	OC/OP Pesticides		[NR]	Complete	[NR]	[NR]
Method	Test	Units	/29	/30	/31	/32
5.002	pH 1:5 Extract		9.5	6.1	8.5	9.3
External	Hydrocarbon Banding		[NR]	[NR]	[NR]	[NR]
External	BTEX		[NR]	[NR]	[NR]	[NR]
External	Polyaromatic Hydrocarbons		[NR]	[NR]	[NR]	[NR]
External	OC/OP Pesticides		[NR]	[NR]	[NR]	[NR]
Method	Test	Units	/33	/34		
5.002	pH 1:5 Extract		9.3	7.3		
External	Hydrocarbon Banding		Complete	Complete		
External	BTEX		Complete	Complete		
External	Polyaromatic Hydrocarbons		[NR]	Complete		
External	OC/OP Pesticides		[NR]	[NR]		

CTPI - Personal information

Please note that the above results refer only to the samples tested, and not to the patches from which they were drawn.

Page 4 of 9

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Method	Test	Units	/1	/2	/3	/4
5.304	Calcium (Tot.) as Ca	mg/kg	25000	1700	550	3200
5.304	Magnesium (Tot.) as Mg	mg/kg	1100	<200	340	980
5.304	Sodium (Tot.) as Na	mg/kg	470	<400	<400	<400
5.304	Potassium (Tot.) as K	mg/kg	260	320	740	680
5.304	Aluminium (Tot.) as Al	mg/kg	6000	3000	2300	7000
5.304	Barium (Tot.) as Ba	mg/kg	190	41	74	220
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	16	3.1	2.3	17
5.304	Copper (Tot.) as Cu	mg/kg	84	4.0	6.7	58
5.304	Iron (Tot.) as Fe	mg/kg	21000	8100	12000	55000
5.304	Manganese (Tot.) as Mn	mg/kg	290	110	220	550
5.304	Nickel (Tot.) as Ni	mg/kg	14	<2.0	<2.0	13
5.304	Lead (Tot.) as Pb	mg/kg	380	53	99	520
5.304	Zinc (Tot.) as Zn	mg/kg	680	70	120	490
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10
Method	Test	Units	/5	/6	/7	/8
5.304	Calcium (Tot.) as Ca	mg/kg	2800	6900	1900	6500
5.304	Magnesium (Tot.) as Mg	mg/kg	3700	1100	1100	980
5.304	Sodium (Tot.) as Na	mg/kg	<400	<400	<400	<400
5.304	Potassium (Tot.) as K	mg/kg	980	400	900	1200
5.304	Aluminium (Tot.) as Al	mg/kg	6200	6300	6500	11000
5.304	Barium (Tot.) as Ba	mg/kg	83	120	130	270
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	1.3	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	7.3	19	8.5	15
5.304	Copper (Tot.) as Cu	mg/kg	11	18	22	23
5.304	Iron (Tot.) as Fe	mg/kg	16000	17000	22000	26000
5.304	Manganese (Tot.) as Mn	mg/kg	330	480	400	270
5.304	Nickel (Tot.) as Ni	mg/kg	4.3	5.9	4.6	7.4
5.304	Lead (Tot.) as Pb	mg/kg	38	210	100	710
5.304	Zinc (Tot.) as Zn	mg/kg	120	1500	400	710
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10

CTPI - Personal information

Please note that the above results refer only to the samples tested, and not to the batches from which they were drawn.

Page 5 of 9

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Method	Test	Units	/9	/10	/11	/12
5.304	Calcium (Tot.) as Ca	mg/kg	1700	770	1200	1300
5.304	Magnesium (Tot.) as Mg	mg/kg	<200	<200	280	400
5.304	Sodium (Tot.) as Na	mg/kg	<390	<400	<400	<400
5.304	Potassium (Tot.) as K	mg/kg	620	510	1500	1000
5.304	Aluminium (Tot.) as Al	mg/kg	4400	3000	7900	11000
5.304	Barium (Tot.) as Ba	mg/kg	90	110	33	260
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	3.4
5.304	Chromium (Tot.) as Cr	mg/kg	2.8	<2.0	4.4	19
5.304	Copper (Tot.) as Cu	mg/kg	3.1	6.1	5.9	35
5.304	Iron (Tot.) as Fe	mg/kg	13000	18000	15000	15000
5.304	Manganese (Tot.) as Mn	mg/kg	97	550	90	240
5.304	Nickel (Tot.) as Ni	mg/kg	<2.0	<2.0	<2.0	3.8
5.304	Lead (Tot.) as Pb	mg/kg	36	100	48	650
5.304	Zinc (Tot.) as Zn	mg/kg	71	67	84	1400
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10
Method	Test	Units	/13	/14	/15	/16
5.304	Calcium (Tot.) as Ca	mg/kg	3900	3600	590	800
5.304	Magnesium (Tot.) as Mg	mg/kg	1000	690	<200	580
5.304	Sodium (Tot.) as Na	mg/kg	<400	1100	600	<400
5.304	Potassium (Tot.) as K	mg/kg	490	1000	1800	2400
5.304	Aluminium (Tot.) as Al	mg/kg	2600	5300	3000	4200
5.304	Barium (Tot.) as Ba	mg/kg	160	490	210	65
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	3.3	7.1	<2.0	<2.0
5.304	Copper (Tot.) as Cu	mg/kg	9.4	29	8.7	8.8
5.304	Iron (Tot.) as Fe	mg/kg	22000	26000	26000	16000
5.304	Manganese (Tot.) as Mn	mg/kg	670	600	470	510
5.304	Nickel (Tot.) as Ni	mg/kg	3.7	10	5.4	2.9
5.304	Lead (Tot.) as Pb	mg/kg	110	130	11	<10
5.304	Zinc (Tot.) as Zn	mg/kg	270	350	100	77
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	21

CTPI - Personal information

Please note that the above results refer only to the samples tested,
and not to the batches from which they were drawn.

Page 6 of 8

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/98

Method	Test	Units	/17	/18	/19	/20
5.304	Calcium (Tot.) as Ca	mg/kg	1100	690	<200	2100
5.304	Magnesium (Tot.) as Mg	mg/kg	2100	420	1100	960
5.304	Sodium (Tot.) as Na	mg/kg	<390	<400	<390	<400
5.304	Potassium (Tot.) as K	mg/kg	1500	1300	3100	<200
5.304	Aluminium (Tot.) as Al	mg/kg	20000	3200	7100	1600
5.304	Barium (Tot.) as Ba	mg/kg	35	75	46	18
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	24	3.2	2.8	<2.0
5.304	Copper (Tot.) as Cu	mg/kg	2.9	3.1	<1.0	9.9
5.304	Iron (Tot.) as Fe	mg/kg	32000	17000	11000	33000
5.304	Manganese (Tot.) as Mn	mg/kg	49	81	28	850
5.304	Nickel (Tot.) as Ni	mg/kg	4.8	2.5	<2.0	15
5.304	Lead (Tot.) as Pb	mg/kg	24	12	<10	<10
5.304	Zinc (Tot.) as Zn	mg/kg	50	69	37	100
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10
Method	Test	Units	/21	/22	/23	/24
5.304	Calcium (Tot.) as Ca	mg/kg	3800	890	1500	1900
5.304	Magnesium (Tot.) as Mg	mg/kg	470	650	520	890
5.304	Sodium (Tot.) as Na	mg/kg	<400	<400	<390	420
5.304	Potassium (Tot.) as K	mg/kg	480	<200	<200	1100
5.304	Aluminium (Tot.) as Al	mg/kg	1300	1500	1200	5100
5.304	Barium (Tot.) as Ba	mg/kg	19	15	28	57
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	<2.0	6.6	2.4	5.0
5.304	Copper (Tot.) as Cu	mg/kg	15	5.1	19	12
5.304	Iron (Tot.) as Fe	mg/kg	17000	8000	36000	28000
5.304	Manganese (Tot.) as Mn	mg/kg	130	91	610	650
5.304	Nickel (Tot.) as Ni	mg/kg	5.4	6.5	15	9.3
5.304	Lead (Tot.) as Pb	mg/kg	<10	19	11	31
5.304	Zinc (Tot.) as Zn	mg/kg	84	74	110	110
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10

CTPI - Personal information

Please note that the above results refer only to the samples tested, and not to the batches from which they were drawn.

Page 7 of 9

Client: City Design, Ground Engineering
 Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
 Report Date: 5/03/99

Method	Test	Units	/25	/26	/27	/28
5.304	Calcium (Tot.) as Ca	mg/kg	1000	2600	2600	1200
5.304	Magnesium (Tot.) as Mg	mg/kg	310	1800	2500	3500
5.304	Sodium (Tot.) as Na	mg/kg	<400	730	<400	570
5.304	Potassium (Tot.) as K	mg/kg	480	480	620	430
5.304	Aluminium (Tot.) as Al	mg/kg	2900	13000	14000	14000
5.304	Barium (Tot.) as Ba	mg/kg	20	66	73	58
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	3.0	20	28	40
5.304	Copper (Tot.) as Cu	mg/kg	26	8.5	8.3	9.7
5.304	Iron (Tot.) as Fe	mg/kg	39000	26000	19000	25000
5.304	Manganese (Tot.) as Mn	mg/kg	590	70	260	130
5.304	Nickel (Tot.) as Ni	mg/kg	9.3	10	13	11
5.304	Lead (Tot.) as Pb	mg/kg	14	<10	16	<10
5.304	Zinc (Tot.) as Zn	mg/kg	130	39	44	46
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10
Method	Test	Units	/29	/30	/31	/32
5.304	Calcium (Tot.) as Ca	mg/kg	2700	1900	980	1900
5.304	Magnesium (Tot.) as Mg	mg/kg	2500	2800	410	790
5.304	Sodium (Tot.) as Na	mg/kg	550	<400	<400	<400
5.304	Potassium (Tot.) as K	mg/kg	2700	1100	230	200
5.304	Aluminium (Tot.) as Al	mg/kg	12000	16000	2400	3000
5.304	Barium (Tot.) as Ba	mg/kg	160	97	17	20
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	6.9	28	5.4	7.8
5.304	Copper (Tot.) as Cu	mg/kg	13	6.8	12	25
5.304	Iron (Tot.) as Fe	mg/kg	31000	25000	16000	11000
5.304	Manganese (Tot.) as Mn	mg/kg	170	400	300	210
5.304	Nickel (Tot.) as Ni	mg/kg	8.1	17	7.1	7.3
5.304	Lead (Tot.) as Pb	mg/kg	23	20	11	18
5.304	Zinc (Tot.) as Zn	mg/kg	99	56	56	51
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10	<10	<10

CTPI - Personal information

Please note that the above results refer only to the samples tested, and not to the patches from which they were drawn.

Page 8 of 9

Client: City Design, Ground Engineering
Job Name: 98155 Howard Smith Walk

Batch Number: 99/0933
Report Date: 5/03/99

Method	Test	Units	/33	/34
5.304	Calcium (Tot.) as Ca	mg/kg	1500	4400
5.304	Magnesium (Tot.) as Mg	mg/kg	450	1200
5.304	Sodium (Tot.) as Na	mg/kg	<400	500
5.304	Potassium (Tot.) as K	mg/kg	890	480
5.304	Aluminium (Tot.) as Al	mg/kg	1600	9400
5.304	Barium (Tot.) as Ba	mg/kg	68	1200
5.304	Cadmium (Tot.) as Cd	mg/kg	<1.0	<1.0
5.304	Chromium (Tot.) as Cr	mg/kg	<2.0	19
5.304	Copper (Tot.) as Cu	mg/kg	8.0	43
5.304	Iron (Tot.) as Fe	mg/kg	19000	19000
5.304	Manganese (Tot.) as Mn	mg/kg	340	530
5.304	Nickel (Tot.) as Ni	mg/kg	3.3	21
5.304	Lead (Tot.) as Pb	mg/kg	21	180
5.304	Zinc (Tot.) as Zn	mg/kg	94	540
5.304	Arsenic (Tot.) as As	mg/kg	<10	<10

[ND] - Not Detected [NR] - Not Required [NT] - Not Tested

CTPI - Personal information

Authorised Signatory

Please note that the above results refer only to the samples tested,
and not to the batches from which they were drawn.

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**SCIENTIFIC ANALYTICAL SERVICES LABORATORY**

Scientific Analytical Services
240 Donaldson Road
Rocklea Brisbane Qld 4106

Telephone 07 3403 2611
Facsimile 07 3403 2646

A unit of the Brisbane City Council

Attention: Liz Boczek
Client: City Design, Ground Engineering
Job Name: 98113 Quarry Rd - Extra Analyses

Sampling Date: 20/01/99

Sampled By: Client

Sampling Method: Grab

Sample Matrix: Soil/sediment

Batch Number: 99/1286

Registration Date: 17 February 1999

Date of Report: 17 February 1999

Method	Test	Units	/1 TP7 0.2m (0534/7)	/2 TP8 0.2m (0534/9)	/3 TP9 0.2m (0534/10)	/4 TP17 0.2m (0534/24)	/5 TP18 0.2m (0534/26)
External	OC/OP Pesticides		Complete	Complete	[NR]	[NR]	Complete
External	Hydrocarbon Banding		[NR]	[NR]	Complete	Complete	[NR]
External	BTEX		[NR]	[NR]	Complete	Complete	[NR]

[ND] - Not Detected [NR] - Not Required [NT] - Not Tested

OC/OP Pesticides, Total Petroleum Hydrocarbons and BTEX analysis performed by ALS EB19357.

CTPI - Personal information

Authorised Signatory

Please note that the above results refer only to the samples tested,
and not to the patches from which they were drawn.

Page 1 of 1

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

PAGE 1 of 2

CONTACT: MS P BIANCHI
CLIENT: BRISBANE CITY COUNCIL
ADDRESS: ANALYTICAL SERVICES SECTION
240 DONALDSON ROAD
ROCKLEA QLD 4106

LABORATORY: ENV BRISBANE
BATCH NUMBER: EB19357
SUB BATCH: 0
No. OF SAMPLES: 3
DATE RECEIVED: 11/02/99
DATE COMPLETED: 17/02/99

ORDER No.:

SAMPLE TYPE: SOIL

PROJECT:

Method	Analysis description	Units	LOR	99/0534/7	99/0534/9	99/0534/26
EA-D55	Moisture Content (dried @ 103°C)	%	0.1	10.2	10.0	5.4
EP-D68A-SS	ORGANOCHLORINE PESTICIDES					
	alpha-BHC	ng/kg	0.05	<0.05	<0.05	<0.05
	HCB	ng/kg	0.05	<0.05	<0.05	<0.05
	beta-BHC & gamma-BHC	ng/kg	0.1	<0.1	<0.1	<0.1
	delta-BHC	ng/kg	0.05	<0.05	<0.05	<0.05
	Heptachlor	ng/kg	0.05	<0.05	<0.05	<0.05
	Aldrin	ng/kg	0.05	<0.05	<0.05	<0.05
	Heptachlor epoxide	ng/kg	0.05	<0.05	<0.05	<0.05
	Chlordane - trans	ng/kg	0.05	<0.05	<0.05	<0.05
	Endosulfan I	ng/kg	0.05	<0.05	<0.05	<0.05
	Chlordane - cis	ng/kg	0.05	<0.05	<0.05	<0.05
	Dieldrin	ng/kg	0.05	<0.05	<0.05	<0.05
	DDE	ng/kg	0.05	<0.05	<0.05	<0.05
	Endrin	ng/kg	0.05	<0.05	<0.05	<0.05
	Endosulfan 2	ng/kg	0.05	<0.05	<0.05	<0.05
	DDD	ng/kg	0.05	<0.05	<0.05	<0.05
	Endrin aldehyde	ng/kg	0.05	<0.05	<0.05	<0.05
	Endosulfan sulfate	ng/kg	0.05	<0.05	<0.05	<0.05
	DDT	ng/kg	0.2	<0.2	<0.2	<0.2
	Endrin ketone	ng/kg	0.05	<0.05	<0.05	<0.05
	Methoxychlor	ng/kg	0.2	<0.2	<0.2	<0.2
EP-D68B-SS	ORGANOPHOSPHORUS PESTICIDES					
	Dichlorvos	ng/kg	0.05	<0.05	<0.05	<0.05
	Demeton-S-methyl	ng/kg	0.05	<0.05	<0.05	<0.05
	Monocrotophos	ng/kg	0.2	<0.2	<0.2	<0.2
	Dinethoate	ng/kg	0.05	<0.05	<0.05	<0.05
	Diazinon	ng/kg	0.05	<0.05	<0.05	<0.05
	Chlorpyrifos-methyl	ng/kg	0.05	<0.05	<0.05	<0.05
	Parathion-methyl	ng/kg	0.2	<0.2	<0.2	<0.2

COMMENTS:

Samples analysed on an as received basis. Results reported on a dry weight basis.

CTPI - Personal information

This is the Final Report which supersedes any preliminary reports with this batch number.

RECEIVED

19 FEB 1999

Results apply to sample(s) as submitted by client.



Brisbane
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Sydney
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Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
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ANALYTICAL SERVICES
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No. 625

AUSTRALIAN LABORATORY SERVICES P/L

A.O.N. 008 996 029

ANALYTICAL REPORT

PAGE 2 of 2

CONTACT: MS P BIANCHI
CLIENT: BRISBANE CITY COUNCIL
ADDRESS: ANALYTICAL SERVICES SECTION
240 DONALDSON ROAD
ROCKLEA QLD 4106

LABORATORY: ENV BRISBANE
BATCH NUMBER: EB19357
SUB BATCH: 0
No. OF SAMPLES: 3
DATE RECEIVED: 11/02/99
DATE COMPLETED: 17/02/99

ORDER No.: SAMPLE TYPE: SOIL PROJECT:
99/0534/7 99/0534/9 99/0534/26

Method	Analysis description	Units	LOR	99/0534/7	99/0534/9	99/0534/26
EP-068B-SS	Malathion	mg/kg	0.05	<0.05	<0.05	<0.05
	Fenthion	mg/kg	0.05	<0.05	<0.05	<0.05
	Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	<0.05
	Parathion	mg/kg	0.2	<0.2	<0.2	<0.2
	Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.05
	Chlorfenvinphos E	mg/kg	0.05	<0.05	<0.05	<0.05
	Chlorfenvinphos Z	mg/kg	0.05	<0.05	<0.05	<0.05
	Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.05
	Fenamiphos	mg/kg	0.05	<0.05	<0.05	<0.05
	Prothiofos	mg/kg	0.05	<0.05	<0.05	<0.05
	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
	Carbophenothion	mg/kg	0.05	<0.05	<0.05	<0.05
	Azinphos-methyl	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068S-SS	DREBANDCHLORINE PESTICIDE SURROGATE					
	Dibromo-DDE	%	1	97	83	94
EP-068T-SS	DREBANDPHOSPHORUS PESTICIDE SURROGATE					
	DEF	%	1	91	66	91

COMMENTS:

CTPI - Personal information

RECEIVED

19 FEB 1999

This is the Final Report which supersedes any preliminary reports with this batch number

Results apply to sample(s) as submitted by client.



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Sydney
Phone: (02) 841 0600 Fax: (02) 841 0620
Melbourne
Phone: (03) 883 8229 Fax: (03) 883 0730
Perth
Phone: (08) 249 2888 Fax: (08) 249 2842

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AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

ANALYTICAL REPORT

PAGE 1 of 1

CONTACT: MS P BIANCHI
CLIENT: BRISBANE CITY COUNCIL
ADDRESS: ANALYTICAL SERVICES SECTION
240 DONALDSON ROAD
ROCKLEA QLD 4106

LABORATORY: ENV BRISBANE
BATCH NUMBER: EB19357
SUB BATCH: 1
No. OF SAMPLES: 2
DATE RECEIVED: 11/02/99
DATE COMPLETED: 17/02/99

ORDER No.:

SAMPLE TYPE: SOIL

PROJECT:

99/0534/10

99/0534/24

Method	Analysis description	Units	LOR		
EA-055	Moisture Content (dried @ 103°C)	%	0.1	9.6	8.9
EP-071-SS	TOTAL PETROLEUM HYDROCARBONS				
	C6 - C9 Fraction	mg/kg	2	<2	<2
	C10 - C14 Fraction	mg/kg	50	<50	<50
	C15 - C28 Fraction	mg/kg	100	196	<100
	C29 - C36 Fraction	mg/kg	100	398	169
EP-080-SS	BTEX				
	Benzene	mg/kg	0.2	<0.2	<0.2
	Toluene	mg/kg	0.2	<0.2	<0.2
	Chlorobenzene	mg/kg	0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	0.2	<0.2	<0.2
	meta- & para-Xylene	mg/kg	0.2	<0.2	<0.2
	ortho-Xylene	mg/kg	0.2	<0.2	<0.2
EP-080S-SS	VOLATILE TPH/BTEX COMPOUND SURROGATES				
	1,2-Dichloroethane-D4	%	1	81	85
	Toluene-D8	%	1	89	97
	4-Bromofluorobenzene	%	1	90	93

COMMENTS:

Samples analysed on an as received basis. Results reported on a dry weight basis.

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**APPENDIX C
CHAIN OF CUSTODY FORMS**

+29/1/99

**BRISBANE WATER
SCIENTIFIC ANALYTICAL SERVICES**

ENVIRONMENTAL SAMPLES
Location: 98155 - Howard Smith Wharf.

Batch No	0933	Analysis Code	W-MISCENT
Date	27/1/99 + 2-2-99	Matrix	SOIL
Sampler	CLIENT	Client	CD-ENG
Date/Time Recd	4-2-99 1550	Job	98155
Received by	CS	Sampling Method	GRAB
Correct Containers	Yes	Preservation	CHILLED
Sampling Time	—	hrs.	

Sample	Analysis Method Code	PH Result	HEAVY METAL Result	TPH Result	BTEX Result	PAH Result	OC/OP					
	Seq No											
BH1 0.2m	1	✓	✓			✓	✓					
0.5m	2	✓	✓									
BH3 0.2m	3	✓	✓									
BH4 0.2m	4	✓	✓			✓						
BH6 0.2m	5	✓	✓				✓					
BH7 0.35m	6	✓	✓	✓	✓	✓						
BH8 0.2m	7	✓	✓									
BH10 0.5m	8	✓	✓	✓	✓		✓					

CTPI - Personal information

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Date: 12/10/97

**BRISBANE WATER
SCIENTIFIC ANALYTICAL SERVICES**
ENVIRONMENTAL SAMPLES

Location:

Batch No	0933	Analysis Code	W-MISCIENT
Date	27/1 + 2/2/99	Matrix	SOIL
Sampler	CLIENT	Client	CO-ENG
Date/Time Recd	2/2/99 1550	Job	94155
Received by	CS	Sampling Method	GRAB
Correct Containers	YES	Preservation	CHILLED
Sampling Time		hrs.	

Sample	Analysis Method Code Seq No	pH	Heavy Metals	TPH	BTEX	PAH	OC/OP						
		Result	Result	Result	Result	Result							
BH12 0.5m	9	✓	✓										
BH15 0.2m	10	✓	✓										
BH17 0.2m	11	✓	✓										
BH20 0.2m	12	✓	✓				✓						
BH21 0.2m	13	✓	✓	✓	✓								
BH22 0.2m	14	✓	✓	✓	✓	✓							
0.5m	15	✓	✓	✓	✓								
BH23 0.2m	16	✓	✓	✓	✓								

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Date: 12/10/97

**BRISBANE WATER
SCIENTIFIC ANALYTICAL SERVICES**
ENVIRONMENTAL SAMPLES

Location:

Batch No	0933	Analysis Code	W-MISCENT
Date	27/1 + 2/2/99	Matrix	SOIL
Sampler	CLIENT	Client	CD-ENG
Date/Time Recd	4/2/99 1550	Job	98155
Received by	CS.	Sampling Method	GRAB
Correct Containers	YES	Preservation	CHILLED
Sampling Time	hrs.		

Sample	Analysis Method Code	pH	Heavy Metals	TPH	BTEX	PAH	OC/OP						
	Seq No	Result	Result	Result	Result	Result							
BH25 0.2m	17	✓	✓										
BH27 0.2m	18	✓	✓										
BH28 0.5m	19	✓	✓										
BH33 0.2m	20	✓	✓										
BH34 0.2m	21	✓	✓										
BH36 0.2m	22	✓	✓	✓	✓								
BH37 0.2m	23	✓	✓										
BH39 0.1m	24	✓	✓	✓	✓								

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Date: 12/10/97

**BRISBANE WATER
SCIENTIFIC ANALYTICAL SERVICES**
ENVIRONMENTAL SAMPLES

Location:

Batch No	0933	Analysis Code	W-MISCENT
Date	27/1 + 2/2/99	Matrix	SOIL
Sampler	CLIENT	Client	CD-EN6
Date/Time Recd	4/2/99 1350	Job	98155
Received by	CS.	Sampling Method	GRAB
Correct Containers		Preservation	CHILLED
Sampling Time	hrs.		

Sample	Analysis Method Code	P _H	HEAVY METALS	TPH	BTEX	PAH	OC/OP						
	Seq No	Result	Result	Result	Result	Result							
BH41 0.2m	25	✓	✓										
BH43 0.2m	26	✓	✓			✓	✓						
BH44 0.2m	27	✓	✓	✓	✓								
1m	28	✓	✓										
BH46 0.2m	29	✓	✓										
0.5m	30	✓	✓										
BH48 0.1m	31	✓	✓										
BH50 0.2m	32	✓	✓										

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Date: 12/10/97

**BRISBANE WATER
SCIENTIFIC ANALYTICAL SERVICES**
ENVIRONMENTAL SAMPLES

Location:

Batch No	0933	Analysis Code	W-MISCINT
Date	27/1 + 2/2/99	Matrix	SOIL
Sampler	CLIENT	Client	CD-ENG
Date/Time Recd	4/2/99 1350	Job	98155
Received by		Sampling Method	GRAB
Correct Containers		Preservation	CHILLED
Sampling Time	hrs.		

Sample	Analysis Method Code	PH	HEAVY METALS	TPH	BTEX	PAH	OC/OP						
	Seq No	Result	Result	Result	Result	Result							
BH51 0.2m	33	✓	✓	✓	✓								
BH52 0.2m	34	✓	✓	✓	✓	✓							

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Date: 12/10/97

Appendix B – Summary of Soil Analysis Results and Statistical Analysis

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SUMMARY OF SOIL ANALYSIS RESULTS

Location (refer site layout plan) Laboratory ID Sample ID and Depth (mBGL)		Assessment Guidelines							1 BH1-0.2	2 BH1-0.5	3 BH3-0.2	4 BH4-0.1	5 BH6-0.2	6 BH7-0.35	7 BH8-0.2	8 BH10-0.5
Analyte	Limit of Reporting	Background	EITL	HIL 'A'	HIL 'D'	HIL 'E'	HIL 'F'	EPA								
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals																
Antimony		20														
Arsenic	0.5	0.2-30	20	100	400	200	500	-	10	10	10	10	10	10	10	10
Cadmium	0.5	0.04-2	3	20	80	40	100	-	1	1	1	1	1	1	1	1
Chromium (Total)	0.5	-	50	120,000	-	240,000	-	-	16	3.1	2.3	17	7.3	19	8.5	15
Copper	0.5	1-190	60	1,000	4,000	2,000	5,000	-	84	4.0	6.7	58	11	18	22	23
Lead	0.5	<2-200	300	300	1,200	600	1,500	300	380	53	99	520	38	210	100	710
Zinc	0.5	2-180	200	7,000	28,000	14,000	35,000	-	680	70	120	490	120	1500	400	710
TPH																
C6-C9	2	-	-	-	-	-	-	100						<2		<2
C10-C14	50	-	-	-	-	-	-	100						50		50
C15-C28	100	-	-	-	-	-	-	1,000						100		100
C29-C36	100	-	-	-	-	-	-	1,000						<100		<100
PAHs																
Napthalene	0.5	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Acenaphthylene	0.5	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Acenaphthene	0.5	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Flourene	0.5	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Phenanthrene	0.5	-	-	-	-	-	-	-	1.4			0.5		<0.5		
Anthracene	0.5	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Flouranthene	0.5	-	-	-	-	-	-	-	2			0.9		<0.5		
Pyrene	0.5	-	-	-	-	-	-	-	2.1			0.9		<0.5		
Benzo(a)anthracene	0.5	-	-	-	-	-	-	-	1			0.5		<0.5		
Chrysene	0.5	-	-	-	-	-	-	-	1.3			1.2		<0.5		
Benzo (b&k) flouranthene	1.0	-	-	-	-	-	-	-	2			1		<1.0		
Benzo(a)pyrene	0.5	-	-	1	4	2	5	1	1.2			0.5		0.5		
Indeno(1,2,3-cd)pyrene	1.0	-	-	-	-	-	-	-	0.6			<0.5		<0.5		
Dibenz(ah)anthracene	1.0	-	-	-	-	-	-	-	<0.5			<0.5		<0.5		
Benzo(ghi)perylene	1.0	-	-	-	-	-	-	-	0.7			<0.5		<0.5		
Total PAHs	-	0.95-5	-	20	80	40	100	20	15.3			9.5		8		

Notes:

LOR	All results in mg/kg unless otherwise specified
Background	Limit of Laboratory Reporting
EITL	Levels Commonly Found in the Local Environment (EPA, 1998)
HIL 'A'	Urban Ecological Investigation Threshold Levels (EPA, 1998)
HIL 'D'	Health Investigation Level - Residential with Soil Access (EPA, 1998)
HIL 'E'	Health Investigation Level - Residential with Minimum Opportunity for Soil Access (EPA, 1998)
HIL 'F'	Health Investigation Level - Parks, Recreational Open Spaces and Playign Fields (EPA, 1998)
EPA	Health Investigation Level - Commercial Industrial (EPA, 1998)
-	QLD EPA Draft 'Clean Site' Guidelines (EPA, 1999)
n/a	Not Available/Not Relevant
n/t	Not Applicable
	Not Tested

SUMMARY OF SOIL ANALYSIS RESULTS

Location (refer site layout plan) Laboratory ID Sample ID and Depth (mBGL)	9 BH12-0.5	10 BH15-0.2	11 BH17-0.2	12 BH20-0.2	13 BH21-0.2	14 BH22-0.2	15 BH22-0.5	16 BH23-0.2	17 BH25-0.2	18 BH27-0.2	19 BH28-0.5	20 BH33-0.2	21 BH34-0.1	22 BH36-0.2	23 BH37-0.2	24 BH39-0.1
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ng/kg
Metals																
Antimony																
Arsenic	10	10	10	10	10	10	10	21	10	10	10	10	10	10	10	10
Cadmium	1	1	1	3.4	1	1	1	1	1	1	1	1	1	1	1	1
Chromium (Total)	2.8	2	4.4	19	3.3	7.1	2	2	24	3.2	2.8	1	2	6.6	2.4	5
Copper	3.1	6.1	5.9	35	9.4	29	8.7	8.9	2.9	3.1	<1.0	9.9	15	5.1	19	12
Lead	36	100	48	650	110	130	11	10	24	12	10	10	10	19	11	31
Zinc	71	67	84	1400	270	350	100	77	50	69	37	100	84	74	110	110
TPH																
C6-C9					<2	<2	<2	<2						<2		<2
C10-C14					50	50	50	50						50		50
C15-C28					100	240	100	100						100		100
C29-C36					<100	<100	<100	<100						<100		<100
PAHs																
Napthalene						<0.5										
Acenaphthylene						<0.5										
Acenaphthene						<0.5										
Flourene						<0.5										
Phenanthrene						1.5										
Anthracene						0.8										
Flouranthene						4.1										
Pyrene						4										
Benzo(a)anthracene						2.6										
Chrysene						2.5										
Benzo (b&k) flouranthene						4										
Benzo(a)pyrene						1.9										
Indeno(1,2,3-cd)pyrene						1										
Dibenz(ah)anthracene						0.5										
Benzo(ghi)perylene						0.9										
Total PAHs						25.8										

Notes:

LOR
Background
EITL
HIL 'A'
HIL 'D'
HIL 'E'
HIL 'F'
EPA

n/a
n/t

SUMMARY OF SOIL ANALYSIS RESULTS

Location (refer site layout plan) Laboratory ID Sample ID and Depth (mBGL)	25 BH41-0.2	26 BH43-0.2	27 BH44-0.2	28 BH44-1.0	29 BH46-0.2	30 BH46-0.5	31 BH48-0.1	32 BH50-0.2	33 BH51-0.2	34 BH52-0.2	Mean	SD	Upper Mean 95% Confidence
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Metals													
Antimony			<10										
Arsenic	10	10	10	10	10	10	10	10	10	10	10.3	1.9	11.0
Cadmium	1	1	1	1	1	1	1	1	1	1	1.1	0.4	1.2
Chromium (Total)	3	20	28	40	6.9	28	5.4	7.8	2	19	10.0	9.7	13.2
Copper	26	8.5	8.3	9.7	13	6.8	12	25	8	43	17.0	17.2	22.8
Lead	14	10	16	<9.9	23	20	11	18	21	180	110.5	184.3	172.4
Zinc	130	39	44	46	99	56	56	51	94	540	244.1	357.2	364.1
TPH													
C6-C9			<2						<2	<2			
C10-C14			50						127	274	77.36	69.19	118.25
C15-C28			100						100	193	270.00	519.10	576.77
C29-C36			<100						<100	<100			
PAHs													
Napthalene		<0.5								<0.5			
Acenaphthylene		<0.5								<0.5			
Acenaphthene		<0.5								<0.5			
Flourene		<0.5								<0.5			
Phenanthrene		<0.5								0.7			
Anthracene		<0.5								<0.5			
Flouranthene		<0.5								<0.5			
Pyrene		<0.5								<0.5			
Benzo(a)anthracene		<0.5								<0.5			
Chrysene		<0.5								<0.5			
Benzo (b&k) flouranthene		<1.0								<1.0			
Benzo(a)pyrene		0.5								0.5	0.85	0.59	1.32
Indeno(1,2,3-cd)pyrene		<0.5								<0.5			
Dibenz(ah)anthracene		<0.5								<0.5			
Benzo(ghi)perylene		<0.5								<0.5			
Total PAHs		8								8.2	12.47	7.11	18.16

Notes:

LOR

Background

EITL

HIL 'A'

HIL 'D'

HIL 'E'

HIL 'F'

EPA

-

n/a

n/t

Appendix C Photographs

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View of Building Number 2 with walkway/cycle way in foreground



View of fenced holding area on Lot 4



View of Building Number 3 and walkway/cycle way looking east.



View of fenced car parking area on Lot 3.



View of masonry structure on Lot 4



View of site looking west



View of south west portion of Lot 4



View of disused diesel AST (Lot 3).

Appendix D Draft Site Management Plans

Released by EHP
RTI Act 2009

DRAFT SITE MANAGEMENT PLAN (SMP) –

LOT :4 PLAN : SP 128032 FILE REF : BNEXXXX

PRINTED:

DATE OF EFFECT:

1.0 SUMMARY OF CONTAMINATION

The site, Lot 4 SP 128032, 175 Bowen Terrace Fortitude Valley is currently used as a walkway with the remaining portion of the lot vacant and secured. The wharves on site were reportedly in use for most of last century and were also reportedly used in wartime by the Navy for ship maintenance and storage and loading of supplies. More recently (up to the late 1990s) the wharf buildings were used by various government departments to store various plant and equipment and to conduct maintenance and workshop activities. Low level radioactive materials such as medical equipment and consumables were stored on the site up until about 1989. A Queensland Health survey of the area where radioactive materials were stored reportedly cleared the area of any residual radioactivity at levels exceeding NHMRC guidelines. The site has largely remained vacant for the past 8 years.

Lot 4 is generally paved in concrete and bitumen with the exception of the wharf area which is constructed from timber. The site is characterised as a benched area between the southern face of a cliff/former quarry face and the Brisbane River. The bench area consists of a shallow layer (varying up to 1.0 metre) of fill overlying bedrock. The fill appears to predominantly consist of material consistent in terms of geological origin with the material observed in the cliff face.

The following maximum contaminants of concern were identified on the Howard Smith Wharf site of which Lot 4 on SP 128032 is part

arsenic 21 mg/kg
cadmium 3.4 mg/kg)
lead 710 mg/kg)
zinc 1500 mg/kg).
TPH (C₁₀-C₁₄ fraction) 274 mg/kg.
TPH (C₁₅-C₂₈ fraction) 1830 mg/kg.
Benzo(a)pyrene 1.9 mg/kg

These maximum contaminant contaminants were reported within shallow fill at the site.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 *Responsibility.* The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 *Site Use.* The intended use of the site is for mixed use including commercial and open space and recreational use.

3.3 *Site Provision of SMP to appropriate persons.* The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.4 *Surface Capping and Protective Barriers.* As the contaminant levels are generally below levels that would pose a risk to human health and the environment given any use for the site there are no specific requirements to maintain surface capping or protective barriers over the site.

3.5 *Soil excavation & Removal.* Soil material excavated on the site should be assessed for contaminants of concern and/or physical properties to determine if the material is contaminated and to identify appropriate management and disposal/re-use options.

Representative sampling and analysis of soil from excavation in areas of fill must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.6 *Unexpected Contamination.* If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected is observed, site works are to cease in that area and action taken to immediately prevent or minimise environmental harm. The administering authority is to be notified in writing within two (2) business days of detection and advised of any remedial action undertaken.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.7 *General Environmental Protection.* All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.8 *Workplace Health and Safety.* A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

Records are to be kept of any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time.

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

DRAFT SITE MANAGEMENT PLAN (SMP) –

LOT 3 PLAN : SP 190810 FILE REF : BNEXXXX

PRINTED:

DATE OF EFFECT:

1.0 SUMMARY OF CONTAMINATION

The site, Lot 3 SP 190810, 5 Boundary Street Brisbane is currently used as a walkway with the remaining portion of the lot vacant and secured. The wharf area and buildings on the site had previously been used by the water police and police diving squad for administration and storage purposes as well as housing refuelling facilities.

Lot 3 is paved in concrete and bitumen with the exception of the wharf area which is constructed from timber. The site is characterised as a benched area between the southern face of a cliff/former quarry face and the Brisbane River. The bench area consists of a shallow layer (varying up to 1.0 metre) of fill overlying bedrock. The fill appears to predominantly consist of material consistent in terms of geological origin with the material observed in the cliff face.

The following maximum contaminants of concern were identified on the Howard Smith Wharf site of which Lot 3 on SP 190810 is part

arsenic 21 mg/kg
cadmium 3.4 mg/kg
lead 710 mg/kg
zinc 1500 mg/kg.
TPH (C₁₀-C₁₄ fraction) 274 mg/kg.
TPH (C₁₅-C₂₈ fraction) 1830 mg/kg.
Benzo(a)pyrene 1.9 mg/kg

These maximum contaminant contaminants were reported within shallow fill at the site.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 *Responsibility.* The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 *Site Use.* The intended use of the site is for mixed use including commercial and open space and recreational use.

3.3 *Site Provision of SMP to appropriate persons.* The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.4 *Surface Capping and Protective Barriers.* As the contaminant levels are generally below levels that would pose a risk to human health and the environment given any use for the site there are no specific requirements to maintain surface capping or protective barriers over the site.

3.5 *Soil excavation & Removal.* Soil material excavated on the site should be assessed for contaminants of concern and/or physical properties to determine if the material is contaminated and to identify appropriate management and disposal/re-use options.

Representative sampling and analysis of soil from excavation in areas of fill must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.6 *Unexpected Contamination.* If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected is observed, site works are to cease in that area and action taken to immediately prevent or minimise environmental harm. The administering authority is to be notified in writing within two (2) business days of detection and advised of any remedial action undertaken.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.7 *General Environmental Protection.* All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.8 *Workplace Health and Safety.* A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

Records are to be kept of any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time.

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

STATUTORY DECLARATION

(INVESTIGATION REPORT PREPARER)

Address of Site Investigated: 3 Boundary Street Brisbane, Queensland 4000 and 175 Bowen Terrace Fortitude Valley, Queensland 4006

Real Property Descriptions: Lot 3 on SP 190810 and Lot 4 on SP 128032

Title of Report: Report Review Howard Smith Wharf
May 2008

I, Gregory James McPherson of Brisbane City Council, Level 1, Green Square, South Tower, 505 St Paul's Terrace, Fortitude Valley, in the State of Queensland, do solemnly and sincerely declare that;

- I was the investigator and preparer of the report described above;
- I am a member of Environment Institute of Australia and New Zealand (EIANZ); and my qualifications and experience as previously submitted to the Environmental Protection Agency are relevant to this investigation,
- I have not knowingly included any false, misleading or incomplete information in the report;
- I have not knowingly failed to reveal any relevant information or document to the administering authority; and

I certify that:

- The report addresses the relevant matters for the investigation and is factually correct; and
- The opinions expressed in it are honestly and reasonably held.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the *Oaths Act 1867*

CTPI - Personal information

Signature

Name

GREGORY JAMES MCPHERSON

Taken and Declared before me at BRISBANE this 29TH day of MAY 2008

Witness (Justice of the Peace/Commissioner for Declarations)

Signature

Jeffrey James Dowling
Jeffrey James Dowling
JP (Qual) 29422

Name (& JP Number if applicable).....