08 Land Contamination

Section 08 Land Contamination

8.1 Introduction

8.1.1 Overview

Land can become contaminated if hazardous chemical substances (contaminants) are accidentally or deliberately released to soils. The chemicals can then pose a threat to human health or the environment.

Common land uses in rural areas which may cause contamination include service stations and fuel storage, cattle dips, tanneries, wood treatment sites, landfills and other waste disposal sites. In Queensland, activities that have been identified as likely to cause land contamination are listed as *notifiable activities* and landholders undertaking notifiable activities are required to notify the local government authority and the Department of Environment and Resource Management (DERM). This information is then included on the Qld DERM's Environmental Management Register (EMR).

Where it has been demonstrated through investigations that contaminants are present in soils above defined safe exposure limits, this land is recorded by DERM on the Contaminated Land Register (CLR). The EMR and the CLR are managed by the Qld DERM and can be accessed by the public to assist in identifying where soil contamination may have occurred.

The Alpha Coal Project (Rail) (herein referred to as the Project) crosses a number properties, being largely rural landholdings. There is potential for activities to have been carried out on some properties that are crossed by the Project to have led to land contamination. This initial study is intended to identify the potential for land contamination to have occurred. A detailed survey of potentially contaminated land will be undertaken as part of the detailed design phase of the Project, when defined areas of impact are finalised.

The investigation to identify contaminated sites that may be of interest for the purposes of this EIS included:

- a review of properties listed on the DERM EMR / CLR database; and
- a request for information from DERM for properties listed on the EMR / CLR to ascertain any available information on the contamination status. This includes information on the location of the notifiable activity listed for the property, any contamination assessments, complaints or pollution reports held on file for the property.

8.1.2 Legislation and Criteria

The legislative requirements covering contaminated land in Queensland are primarily contained in the *Environmental Protection Act 1994* (EP Act) and subordinate policies and regulations. The EP Act is administered by DERM, and includes a list of Notifiable Activities in Schedule 3, which have the potential for contamination impacts, as discussed above.

Among other things, it is an offence under the EP Act to remove soils from a site listed on the CLR without a permit.

The extent to which contaminants may pose a risk to human health and the environment depends on the quantity and concentration of contaminants. Many contaminants are in fact naturally occurring and

are not hazardous at low levels. Other contaminants are anthropogenic but may not be harmful at low levels. Levels at which contaminants may be considered harmful have been set based on data on toxicity and other hazardous properties. In Queensland, contaminant levels are set in:

- National Environment Protection (Assessment of Site Contamination) Measure (NEPM); and
- Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, (Department of Environment (DoE)), 1998.

Appendix 9 of the *Draft Guidelines* provides investigation thresholds for contaminated soils in Queensland.

8.2 Existing Environment

A review was undertaken of the DERM EMR / CLR database of the 57 properties that have been identified likely to be impacted on by the Project. A total of 11 properties are registered on the EMR / CLR for a notifiable activity with the potential to contaminate land.

Table 8-1 details the properties within the Project that is listed on the EMR as having a notifiable activity registered to the site. Figure 8-1 shows the location and types of notifiable activities for those properties listed on the EMR likely to be traversed by the Project.

Table 8-1: Notifiable activities of EMR registered properties

Lot / Plan Detail	Notifiable Activity Listing				
	Livestock Dip or Spray Race	Petroleum Product or Oil Storage	Explosives Production	Waste Storage, Treatment or Disposal	Mineral Processing
Lot 10 on BL58	√	√			
Lot 2 on CP866147	√	√			
Lot 4 on RU83 (parent site of Lot 2 on SP186058)	√				
Lot 5 on RU81	√	√			
Lot 4 on DK264		√	√	√	√
Lot 4 on DC93	√				
Lot 3 on RU5		√			
Lot 3 on DK236		√		√	√
Lot 1 on BF51		√			
Lot 4 on RU83 (parent site of Lot 1 on SP186058)	√				
Lot 4 on BL51 (parent site of Lot 4 on SP137517)	√				

As shown in Table 8-1, some properties have multiple notifiable activities registered to them which may potentially increase the number of contaminants that may be within the soils and / or groundwater for those sites.

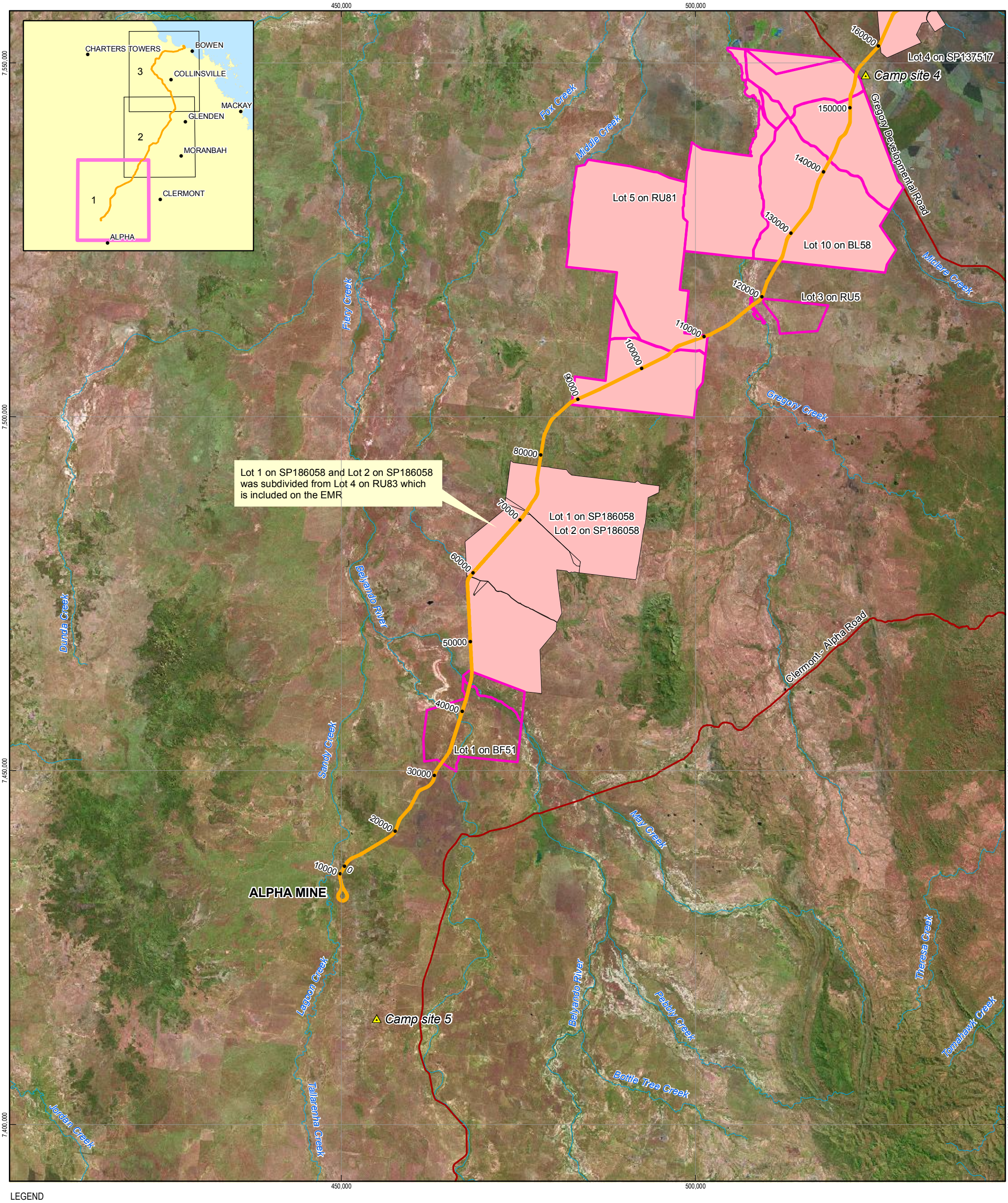
When lots are reconfigured the resultant lots remain on the EMR/CLR until an application to the Qld DERM to have them removed is accepted. On this basis, Lot 4 on SP137517, and Lot 1 and Lot 2 on SP186058 remain on the EMR even though the Notifiable Activity, in this case being a Livestock Dip or Spray Race, may not be located within the actual subdivided parcel.

While sites are listed on the EMR using the lot and plan description, a mining lease may affect only a limited area of the lot. In many instances with large rural properties, only a small area may be potentially affected by the notifiable activities and the majority of the ongoing land use is unaffected, this is the case particularly for the livestock dips / spray races.

Details regarding the Notifiable Activities are provided in Table 8-2. An overview of the operations / activities that have resulted in these 11 properties being listed on the EMR have also been provided.

Table 8-2: Details on Notifiable Activities

Notifiable Activity	Details
Petroleum Product or Oil Storage	Storing petroleum products or oil - (a) in underground tanks with more than 200 L capacity; or (b) in above ground tanks with: • petroleum products or oil in Class 3 (C3) in packaging groups 1 and 2 of the Dangerous Goods Code - more than 2500 L capacity; or • for petroleum products or oil in Class 3 (C3) in packaging groups 3 of the Dangerous Goods Code - more than 5000 L capacity; or • for petroleum products that are combustible liquids in class C1 or C2 in Australian Standard AS1940, 'The storage and handling of flammable and combustible liquids' published by Standards Australia - more than 25000 L capacity.
Livestock Dip or Spray Race	Operating a livestock dip or spray race facility.
Mineral Processing	Chemically or physically extracting or processing metalliferous ores.
Explosives Production or Storage	Operating a factory under the *Explosives Act 1952.*
Waste Storage, Treatment or Disposal	Storing, treating, reprocessing or disposing of regulated waste (other than at the place it is generated), including operating a nightsoil disposal site or sewage treatment plant where the site or plant has a design capacity that is more than the equivalent of 50,000 persons having sludge drying beds or on-site disposal facilities.



LEGEND

- Town
- Camp
- Marshalling Yards
- Depot
- Proposed Alignment
- State Road
- Existing Railway
- Watercourse
- Waterbody
- Petroleum Product or Oil Storage
- Mineral Processing
- Livestock Dip or Spray Race
- Explosives Production or Oil Storage
- Waste Storage, Treatment or Disposal

Source: See Copyright Details below and for full disclosure please refer to the EIS ***Volume 4 - References***

1:500,000 (at A3)

0 2.5 5 10 15 20 25

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N W E S

HANCOCK PROSPECTING PTY LTD

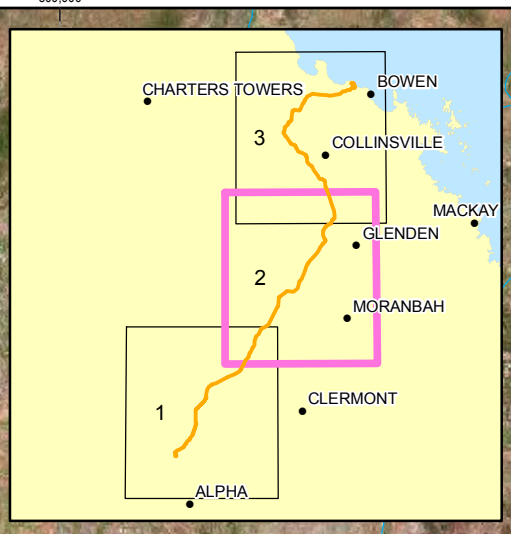
Alpha Coal Project
Environmental Impact Statement

PROPERTIES LISTED ON THE ENVIRONMENTAL MANAGEMENT REGISTER

Job Number	41-22090
Revision	A
Date	21-09-2010

Figure: 8-1
Sheet 1 of 3

G:\41\22090\GIS\MAPS\MXD\300_Soils_Contamination\41-22090_308_rev_a.mxd



500,000 550,000 600,000

7,650,000 7,600,000 7,550,000

Rosetta Creek
Suttor River
Kangaroo Creek
Exe Creek
Police Creek
Bowen Dev Road
Blowfly Creek
Logan Creek
Diamond Creek
Collinsville - Elphinstone Road
Suttor Creek
Isaac River
Suttor Dev Road
Peak Downs Highway
Peak Downs - Dysart Road
Gregory Developmental Road
Brown Creek
Harrow Creek

320000 310000 300000 290000 280000 270000 260000 250000 240000 230000 220000 210000 200000 190000 180000 170000 160000 150000 140000 130000

Lot 2 on CP866147
Lot 3 on DK236
Lot 4 on DK264
Lot 4 on DC93
Lot 4 on SP137517
Lot 5 on RU81
Lot 10 on BL58

Camp site 3
Camp site 4

GLENDEN
MORANBAH

Lot 4 on SP137517 was subdivded from Lot 4 on BL51 which is listed on the EMR

LEGEND

- Town
- Camp
- Marshalling Yards
- Depot
- Proposed Alignment
- State Road
- Existing Railway
- Watercourse
- Waterbody
- Petroleum Product or Oil Storage
- Mineral Processing
- Livestock Dip or Spray Race
- Explosives Production or Oil Storage
- Waste Storage, Treatment or Disposal

Source: See Copyright Details below and for full disclosure please refer to the EIS ***Volume 4 - References***

1:500,000 (at A3)

0 2.5 5 10 15 20 25

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N W E S

HANCOCK PROSPECTING PTY LTD

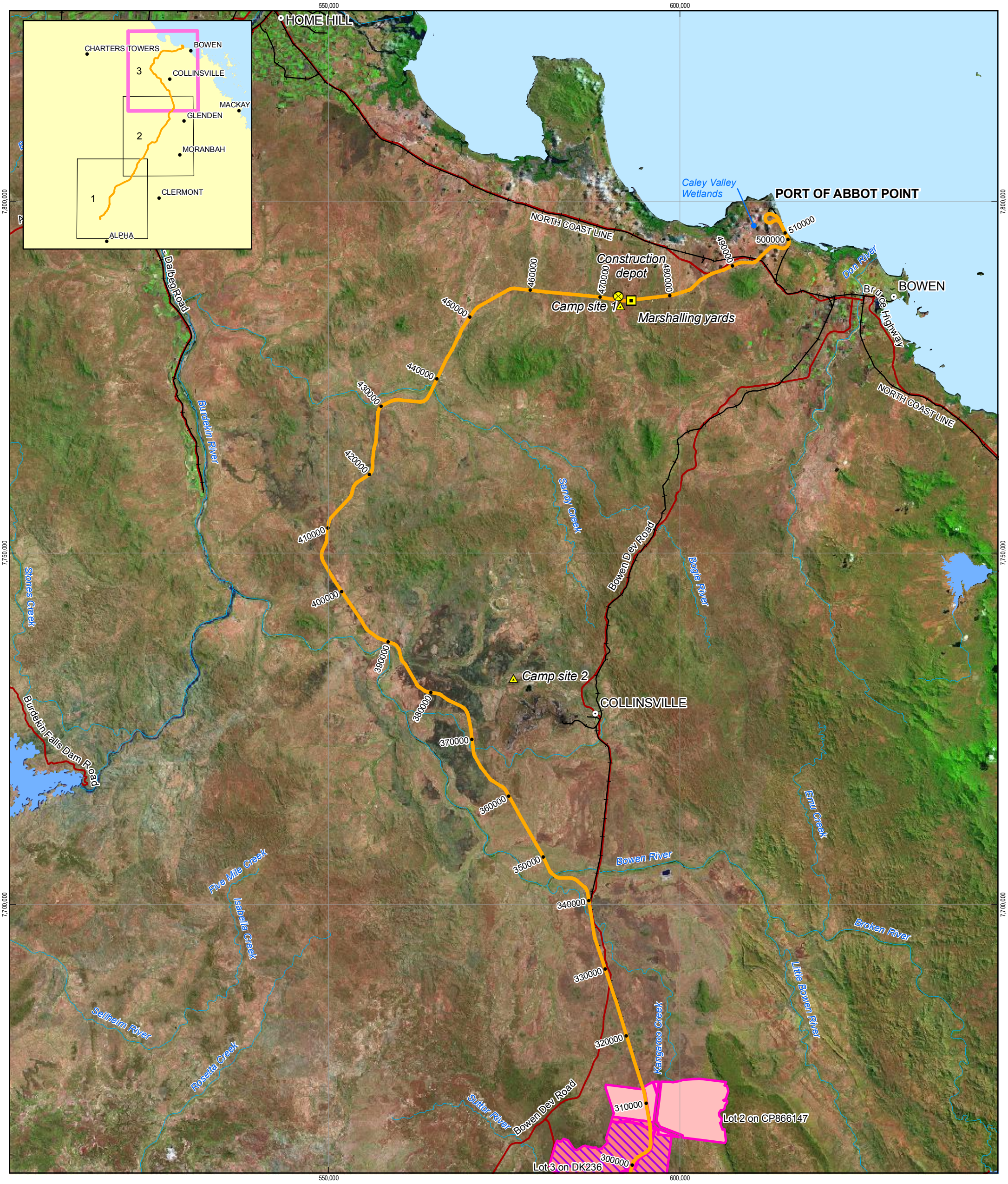
Alpha Coal Project
Environmental Impact Statement

PROPERTIES LISTED ON THE ENVIRONMENTAL MANAGEMENT REGISTER

Job Number	41-22090
Revision	A
Date	21-09-2010

Figure: 8-1
Sheet 2 of 3

G:\41\22090\GIS\MAPS\MXD\300_Soils_Contamination\41-22090_308_rev_a.mxd



LEGEND

- Town
- Camp
- Marshalling Yards
- Depot
- Proposed Alignment
- State Road
- Existing Railway
- Watercourse
- Waterbody
- Petroleum Product or Oil Storage
- Mineral Processing
- Livestock Dip or Spray Race
- Explosives Production or Oil Storage
- Waste Storage, Treatment or Disposal

Source: See Copyright Details below and for full disclosure please refer to the EIS ***Volume 4 - References***

1:500,000 (at A3)

0 2.5 5 10 15 20 25

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 55

N W E S

HANCOCK PROSPECTING PTY LTD

Alpha Coal Project
Environmental Impact Statement

PROPERTIES LISTED ON THE ENVIRONMENTAL MANAGEMENT REGISTER

Job Number	41-22090
Revision	A
Date	21-09-2010

Figure: 8-1
Sheet 3 of 3

G:\41\22090\GIS\MAPS\MXD\300_Soils_Contamination\41-22090_308_rev_a.mxd

As part of the investigation DERM was contacted to ascertain whether additional information was recorded for the listed properties such as location, quantities and any environmental incidences. This information is further detailed in Table 8-3.

Table 8-3: Additional information supplied by DERM

Lot / Plan Detail	Notifiable Activity Listing – DERM Supplied Additional Information
Lot 10 on BL58	There are approximately six different livestock dips located within the property (House Yards, Mud Tank Yards, Mistake Paddock, Mt Rolf Holding Paddock, Bottom Blackwood Paddock). An underground fuel storage tank is located within the property, location was not provided.
Lot 2 on CP866147	Above ground fuel storage includes a 10,000L Diesel, 2,500L Unleaded, and 600L Oil.
Lot 4 on RU83 (parent site of Lot 2 on SP186058)	No further information relating to notifiable activity location or quantities was provided.
Lot 5 on RU81	Livestock dip is located at Boggy Yards, approximately 18km from the homestead station yards. Additional information also mentioned the presence of a household dump within the house paddock and another dump facility within the holding paddock. A 200L underground fuel storage tank is located within the property.
Lot 4 on DK264	The comments provided on the explosives production activities that are registered to the site were that it was for an Imperial Chemical Industries Plant. The petroleum product storage includes: • underground bulk storage of diesel / oil; • light vehicle bulk oil storage; • bulk diesel / oil storage; and • two ML diesel tank. Waste storage includes a chemical dump and the location was not provided.
Lot 4 on DC93	No further information relating to notifiable activity location or quantities was provided.
Lot 3 on RU5	Above ground 4000L fuel storage.
Lot 3 on DK236	Diesel and fuel storage.
Lot 1 on BF51	Above ground storage of 3,000L petrol and 14,000L diesel tank.
Lot 4 on RU83	No further information relating to notifiable activity location or quantities was provided.
Lot 4 on BL51 (parent site of Lot 4 on SP137517)	No further information relating to notifiable activity location or quantities was provided.

8.3 Potential Impacts and Mitigation Measures

8.3.1 Overview

Construction and operation activities associated with the Project also have potential to cause soil contamination if contaminants are accidentally released to soil. This section also addresses requirements for avoiding and managing this risk.

8.3.2 Existing Contamination

8.3.2.1 Potential Impacts

Although a detailed contamination assessment of the Project alignment has not been undertaken, there is information to suggest that contamination may be present as a result of the notifiable activities of the sites / properties being impacted on by the Project. The potential for other areas within the Project is considered low due to an overall lack of development activity.

Construction activities will include earthworks, both excavation and filling of land. Where the alignment passes through areas that may be contaminated, excavation may expose contaminants and increase the risk of these contaminants coming into contact with humans or sensitive environmental receptors such as streams. This exposure may occur through:

- gaseous emissions from volatile (easily evaporated) contaminants such as fuels which are then breathed in by humans and other animals
- water running across contaminated soils and dissolving contaminants; the water then enters streams and this can affect aquatic ecosystems
- contaminants may be attached to dust particles which may be breathed in by humans and other animals, or may deposit on adjacent lands and vegetation
- contaminated soils may be physically removed to another location for reuse or disposal resulting in the contaminant being transported to another location.

It is difficult to establish the level of impact on the Project associated with a potentially contaminated property. In order to accurately evaluate the impacts of each EMR listed site, additional information would be required from the land owner, DERM, local council authority, and property owners familiar with the sites. It is most likely that the land parcel would require further investigation in accordance with State and/or National Guidelines. This applies to all potentially contaminated land parcels identified within the Project.

Further investigations of potentially contaminated landholdings will be required during the detailed design phase of the Project to identify whether potentially contaminated areas will be disturbed by the Project, and if so, to investigate the nature and extent of contamination.

If contaminants are identified, these will need to be managed so that impacts on the environment and community do not occur, and also to meet legislative requirements in relation to contamination of land.

8.3.2.2 Mitigation Measures

Prior to any activities in an EMR listed site that may contain contaminated soil; a preliminary contaminated land assessment will be carried out to identify any contaminants and location of such contaminants in relation to the Project works. If contaminants appear likely, further investigations will

be undertaken to quantify the type and extent of contamination, and a remediation plan will be developed and implemented. Appropriate disposal methods for contaminated soils and other materials will also need to be developed and may include:

- off-site disposal at a suitable site such as an authorised landfill. This will require a Disposal Permit from DERM. or
- disposal on the site in a suitably constructed waste disposal facility.

For all other areas, an inspection will be carried out prior to commencement of vegetation clearing to identify any signs of contamination. This can be carried out concurrently with flora, fauna and cultural heritage clearances of the site by a person trained in identifying signs of soil contamination. Any dealings with contaminated land need to be done in accordance with the relevant guidelines mentioned earlier.

Provided the following measures are carried out, the risk of environmental harm arising from disturbance of contaminated soils is considered low:

- conduct contaminated soil assessment prior to works in EMR sites;
- conduct pre-clearing checks for potential soil contamination across the Project footprint;
- remove and remediate any contaminated soils identified within areas of disturbance;
- dispose of contaminated soils to authorised facilities on-site or off-site in accordance with Disposal Permits;
- contaminated water to be treated until in accordance with relevant water quality objectives prior to disposal;
- avoid disturbance of known contaminated areas;
- development of a site management plan (SMP) limiting the nature of activities that can be carried out on the site, and detail management responses if contaminated land is identified;
- remediate the contaminated area prior to construction activities.

8.3.3 Rail Construction Activities

8.3.3.1 Potential Impacts

Activities that will be carried out as part of the construction activity which might result in soil contamination include:

- hydrocarbon storage, transport, and disposal. Bulk fuel and oil storage will be required to power and maintain all of the vehicles and machinery;
- refuelling through use of mobile fuel trucks; and
- storage and handling of other chemicals and hazardous substances. These might include minor quantities of chemicals required for water and wastewater treatment, soil treatment ameliorants, and small quantities of commercial cleaning products, solvents, degreasers, and chemicals.

In addition, minor leaks of oils may occur from plant and equipment, particularly if hydraulic hoses are damaged or lost during construction activities.

Spills or leaks could result in contamination of soil, groundwater, and surrounding waters and could cause adverse impacts to terrestrial, aquatic, and estuarine ecosystems if not promptly contained and cleaned up. The following impacts may occur:

- contamination of surface water/soil/groundwater through hydrocarbon, chemical and industrial waste spills; and
- nutrient contamination of surface water/soil/groundwater through spills associated with storage of fertilizers, soil ameliorants, temporary sewage treatment facility at construction accommodation villages etc.

8.3.3.2 Mitigation Measures

Mitigation measures for storage and handing of fuels and chemicals include:

- design fuel, oil and chemical storage areas in accordance with Australian Standards;
- inspect and maintain all vehicles, plant and machinery to ensure they are not at risk of leaking, or spilling contaminants;
- prepare a spill response plan including requirements for spills to be reported and immediately contained and cleaned up;
- develop procedures for handling and using fuels, oils and other chemicals;
- train workers in proper procedures for handling and use of fuels, oils and other chemicals;
- incorporate spill response procedures into incident response plan;
- train personnel in spill response;
- maintain spill response kits and personal protective equipment in tanker trucks and at all locations where spills may occur. Ensure spill response kits are appropriately sized for the potential spill volumes;
- transport dangerous goods and potential contaminants in accordance with Australian Code for Transport of Dangerous Goods by Road and Rails (ADG) Code;
- establish and implement procedures for storage and handling including refuelling;
- provide spill response equipment in a location that is readily available for clean up of spills.

If significant soil contamination occurs as a result of a major spill, a site management plan may need to be developed and approved by DERM in relation to ongoing clean up.

With the mitigation measures in place, as a minimum, the likelihood of any spills of any significant volume occurring is low and a prompt clean up will minimise release of contaminants to the environment.

8.3.4 Rail Operation

8.3.4.1 Potential Impacts

The potential for soil contamination to occur during rail operation is low, but may arise from:

- use of pesticides to control weeds along the Project alignment. Provided that pesticides with low residual potential are used, and application is by trained operators, this is not likely to cause any significant impacts.
- spills of diesel from accidents involving locomotives or maintenance vehicles. Refuelling will not take place along the alignment during operations. If spills were to occur, the quantity would be low and overall impacts minimal; provided that the contaminated area was cleaned up promptly.
- spills of coal from trains. Coal is relatively inert but can cause physical smothering. Provided coal spills are cleaned up regularly, impacts are not expected. Air quality issues in relation to coal dust are assessed in Volume 3, Section 13.3.3 of this EIS.

8.3.4.2 Mitigation Measures

The following mitigation measures are required during operation:

- use only low residual pesticides such as glyphosate;
- use licenced operators for pesticide application;
- clean up any spills of diesel promptly; and
- clean up coal spillage adjacent to the track promptly.

8.4 Conclusions

A review was undertaken of the DERM EMR/CLR database for properties along the alignment. Results indicate that some properties may have contaminants present from activities such as cattle dips and fuel storage. Further investigations will be required during detailed design and construction environmental management plans will need to be updated to reflect results of these investigations.

There is some potential for soil contamination to occur during construction and operation; however with standard management measures, this should not result in any harm to the environment or community.