

**Phase I Contaminated Land Assessment
Site 289 – Saughton Goods Station**

City of Edinburgh Council

May 2010

QM

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Site Executive Summary

Site Ref	Site No 289	Priority Category
Site Name, Address and Telephone	Saughton Goods Station Saughton Mains Street, Saughton, Edinburgh, EH11 3NR	2
Site Owner	Various / unknown	Risk Assessment
Leaseholder	Various / unknown	
Grid Reference	323786, 672624	
Area (Ha)	Approximately 2.8	
		Medium

Environmental Risk Assessment Summary

There is a risk of residual on site contamination associated with the rail yard across the whole site. There is no evidence to suggest that appropriate investigation / remedial works were carried out prior to the development of the current units. There is potential for ground gas / volatile vapours to be generated by potential made ground on site, however significant flow rates and/or migration is considered to be unlikely. The risk of ingress and build-up of gases is limited on site due to the open style of buildings, and at the adjacent residential properties due to the likely absence of basements / confined spaces. There is a potential risk of contaminants leaching into the local groundwater, given the permeable glacial sands and gravels underlying the site, although this may be limited by current hardstanding over a large portion of the site.

Status Under Part IIA, the Environmental Protection Act 1990

Potentially contaminated

Current Land Use	Light industrial / railway / derelict land
Proposed Land Use	As current. No known change of use proposed.
Remediation Status	Not Known

Land Use	<table> <tr> <td>Site History</td><td>The site comprised a railway with station pre 1853 to pre 1898 when a railway goods yard was developed, comprising a number of tracks used for engine storage and loading. This remained until pre 1968 when the site was cleared with the exception of the current rail line bisecting the site from east to west. Small structures, similar to the current site layout were present on the site from pre 1997 when the site formed its current use as light industrial, lock up garages and derelict land.</td></tr> </table>	Site History	The site comprised a railway with station pre 1853 to pre 1898 when a railway goods yard was developed, comprising a number of tracks used for engine storage and loading. This remained until pre 1968 when the site was cleared with the exception of the current rail line bisecting the site from east to west. Small structures, similar to the current site layout were present on the site from pre 1997 when the site formed its current use as light industrial, lock up garages and derelict land.
Site History	The site comprised a railway with station pre 1853 to pre 1898 when a railway goods yard was developed, comprising a number of tracks used for engine storage and loading. This remained until pre 1968 when the site was cleared with the exception of the current rail line bisecting the site from east to west. Small structures, similar to the current site layout were present on the site from pre 1997 when the site formed its current use as light industrial, lock up garages and derelict land.		

Surrounds	Potentially contaminative historical land uses in the close vicinity are limited. Surrounding land has generally been undeveloped prior to the construction of residential properties to the north and south of the site pre 1931.
Landfill	There are no known operational landfills at or adjacent to the site.
UST	Information from the City of Edinburgh Council's (CEC's) Petroleum Officer (PO) does not indicate any current or historical petrol USTs at the site; although the PO does not hold information on storage of other fuels such as diesel.

Site Sensitivity

Groundwater	Moderate vulnerability. Permeable drift over moderately permeable bedrock.
Surface Water	Low vulnerability. No surface watercourses within the vicinity of the site.
Other	There are no designated ecological sites on or in the vicinity of the site. There are no Scheduled Ancient Monuments on or adjacent to the site. Residential properties with gardens are located to the north of the site and allotment gardens are located to the southeast of the site.

Additional Information

With respect to current land uses on site, there is the potential for localised oil / fuel / chemical contamination across the site.
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1 Land Use

1.1 CURRENT LAND USE

1.1.1 Site Details

Site Reference and Name	Site No 289 Saughton Goods Station
Site Address	Saughton Mains Street, Saughton, Edinburgh, EH11 3NR
Grid Reference	323786, 672624
Site Area (Ha)	Approximately 2.8
Details of Current Site Owner / Leaseholder	Unknown
Current Site Use	Railway, auto repair shop, lock-up garages, derelict land.
Proposed Use	As current. No known change of use proposed.

1.1.2 Site Inspection

A site visit was undertaken on 25th November 2009.

The following occupiers were noted as site users during the site visit:

- On the south western part of the site Saughton Skips occupies a generally square slightly elevated piece of land with gated access, comprising a number of temporary cabins and a fenced skip storage area. The operation on the site comprises renting out, retrieving, storing and emptying skips containing building and general waste via collection from waste transfer companies. The site representative reported that there were no underground storage tanks (USTs) at the site, and no evidence of any above ground storage tanks (ASTs) was observed during the site visit. Surfacing was observed to comprise a mixture of tarmac hardstanding, loose gravel and exposed soils in some areas, with evidence of waste materials such as metals and wood scattered across the site. A JCB-type excavator was present on site during the time of the site visit and is reportedly used to empty out skips. A number of scrap motor vehicles, storage containers and a bus were observed to be stored on the eastern part of this area of the site.
- Advanced Autos and an access and parking area occupy the area adjacent to Saughton skips. This area is accessed by a gate and tarmac access area. Advanced Autos comprises one small warehouse style metal unit with roller doors and a temporary cabin used as office space. The site representative reported that site operation comprises undertaking MOT's on motor vehicles, and that there are no above ground or below ground storage tanks at the site. Small amounts of oil are reportedly stored within a locked cupboard at the back of the unit. Hardstanding, observed to be in satisfactory condition was observed to surface the site.
- MK Auto Repairs occupies the area adjacent to Advanced Autos and comprises one temporary cabin, used as an office/reception, a small metal garage unit with roller doors and a tarmac and gravel surfaced rear area, used for washing vehicles after servicing. Drainage from this area was observed to be directly to ground as no grate or interceptor drains were observed. The site representative reported that there are no above ground or underground storage tanks onsite and that small quantities of oil are stored in a locked container at the rear of the unit. Three 45 gallon drums, labelled paint thinner and oil, were observed to be located within a gravel area adjacent to the unit. The drums were not contained within a bund. Access to this part of the site is via a tarmac ramp built upon a former railway platform, evident from platform stonework which is visible.

- The area to the south of the railway embankment was observed to comprise a row of metal storage containers. It is unclear what these are used for, however, a few appear to contain joiners' tools and are possibly lock-ups.
- The eastern most part of the occupied site comprises an area which is used for motorcycle training. A temporary cabin used as an office, electric lighting and an area of tarmac hardstanding painted with "obstacles" occupies the area. No site representative was available to further report on activities undertaken in this area.
- A telecommunications mast with associated electronics is located beyond the motorcycle training yard. The transmitter was observed to serve Vodafone and O2.
- An area of derelict land, observed to comprise overgrown grass and weeds, is located beyond the transmitter on the eastern part of the site.
- The central part of the site was observed to comprise the main Edinburgh to Glasgow rail link, located upon an embankment. The embankment was observed to be bound by trees and a metal fence on both the northern and southern sides.
- A number of lock-up garages are located on the north western part of the site, to the north of the railway. Surfacing in this area was observed to comprise tarmac hardstanding. The garages have been constructed in two levels in a stepped design, sloping up towards the railway embankment. Access to this part of the site is via the road to the west.
- Derelict land, comprising grass and shrubs, is located to the east of the lock up garages on the northern part of the site.

The site comprises a number of levels and gradients, is approximately 2.8 Ha in size and in a generally elongated rectangular shape. It includes light industrial use, hardstanding and derelict land to the south of the railway line and lock up garages and derelict land to the north of the railway line.

The northern site boundary is formed by fence lines adjacent to residential gardens, whilst the southern boundary is formed by Saughton Mains Street, currently used as access to the occupied part of the site. The eastern boundary was observed to follow a fence line to the railway, whilst the western boundary is formed by Saughton Road North and a stone walled access to the garages.

Most of the site surface comprises hardstanding on the southern part of the site apart from the skip depot and small areas and derelict land and gravel. Site surfacing on the northern part of the site was observed to comprise hardstanding in the area of the lock up garages and overgrown grass.

No observations of invasive species or vegetative stress were noted during the site walkover.

No obvious visual evidence of subsidence was noted during the site walkover.

Areas of fuel / chemical storage on the site include three 45 gallon drums labelled oil/paint thinner outside MK Auto Repairs. Other smaller containers of unknown liquids were also observed within this area. The drums were observed to be positioned on a gravel surface.

No substations / transformers were observed to be present on the site.

There are no watercourses on site. Surface water drainage was generally observed to be directly into the ground across the majority of the site.

The surrounding land use is predominantly residential to the north, infrastructure comprising roads and a guided bus link to the south and west, and railway land / undeveloped land to the east. Allotment gardens are located to the south east of the site.

A site plan is provided in Appendix A. Site photographs are provided in Appendix B.

1.2 HISTORICAL LAND USE

The following summary of historical site development is based upon information obtained from available historical maps and air photographs provided in digital format by CEC. Copies of selected historical map and air photograph extracts are contained in Appendix C.

Land Use On Site	Dates
Railway trends west to east across site with station on the western part of the site.	Pre 1853 to Pre 1898
As previous, however, railway splits into two beyond the western part of the site. The whole site area comprises tracks used for storing engines and carriages.	Pre 1898 to Pre 1968
Site comprises station and dismantled railway with live tracks on the central part of the site.	Pre 1968 to Pre 1997
The site has been cleared and comprises one main railway line trending west to east across the centre of the site. Small structures are located on the southern part of the site.	Pre 1997 to Pre 2008
As previous, however, small structures are located on the north western part of the site.	Pre 2008 to Present

Surrounding Land Use	Dates	Distance	Orientation
Residential properties	Pre 1940s to Present	From adjacent	North
Residential properties	Pre 1940s to Present	From 50m	South

1.2.1 Other Information

Landfill Sites in the Vicinity	There are no known operational landfills at or adjacent to the site.
Underground Storage Tanks (USTs) on Site	Information from CEC's Petroleum Officer (PO) does not indicate any potential for current or historical petrol USTs at the site (see Section 1.4).

1.3 CONTAMINATION

1.3.1 Known Contaminants

No known contaminants have been identified / confirmed.

1.3.2 Potential Contaminants

Source	Potential Associated Contaminants
Railway Land	Toxic Metals/Semi-metals. Phytotoxic Metals/Semi-metals. Sulphate. Asbestos. Acids/Alkalis. Phenols/Chlorophenols. Oil/Fuel Hydrocarbons. Polyaromatic Hydrocarbons (PAHs). Chlorinated Aliphatic Hydrocarbons. Polychlorinated Biphenyls (PCBs.) Ground Gas, e.g. CH ₄ and CO ₂ .

Potential for Elevated Ground	Given the historical land uses (railway land) at the site there is considered to be potential for elevated ground gas, likely to primarily comprise carbon
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Gas	dioxide due to potential ashy fill. The potential for continued generation of gas is unknown.
Potential for Volatile Organic Compound (VOC) Vapours	Given the historical railway lines on site and the current land uses (garages and skip depot), there is considered to be potential for generation of volatile vapours.
Remediation Status	Not Known

1.4 CONSULTATIONS AND OTHER INFORMATION

Mining Information:	Information supplied by the Coal Authority indicates that underground or opencast coal mining activity has not taken place within the vicinity of the site. Historical maps do not show any mining activity at or in the immediate vicinity of the site.
Planning / Building Control Information	The CEC on-line Planning and Building Control Portal was consulted and a planning application for the construction of a tramway was identified. This was granted on 23rd May 2008 and has reference number 08/01262/PA. Furthermore, a certificate of lawful use for existing use of the southern part of the site as a garage for repairs and MOT's was granted in 2001 (01/01382/CLU). Planning Consent for development of 19 lock-up garages was granted in 2002 on land in the north western corner of the site. This area is currently subject to an enforcement case due to development constraints, reference number 04/00021/E05.
SEPA Information	The GIS based data provided by CEC includes SEPA data. This dataset shows that John A Fraser held a license at Humble Garage, Saughton Mains Street (within subject site) for a scrap yard with waste products consisting of fuel oils, special wastes, flammable solvents, batteries, scrap vehicles and tyres of less than 10,000 tonnes per year. This is dated 1993 and the license has been completed/surrendered. The site is currently operated as a scrap yard and wastes include scrap, batteries and oil.
Petroleum Officer Information	Information from CEC's PO does not indicate any current or historical petrol USTs at the site, although the PO does not hold information on storage of other fuels such as diesel.
Information from Other Consultees	No further information available.
Existing Reports	No previous reports have been identified.
Other	RCHAMS holds a National Monument Record of Scotland for Saughton Junction Railway Station operated by North British Railway.

2 Environmental Setting

2.1 GEOLOGY

<i>Geological Maps Consulted</i>	Digital Geological Map Sheet no.32E, Edinburgh, 1:50,000, Solid and Drift (2001)
<i>Geological Setting</i>	Published geological maps indicate that the south western part of the site is underlain by glacio-fluvial sands and gravels. The rest of the site is underlain by glacial deposits, mainly comprising poorly sorted sands and gravels. The north eastern part of the site is underlain by glacial till. Bedrock beneath the site comprises Lower Oil Shales with West Lothian Oil Shales on the eastern tip of the site. A fault line trends from southwest to northeast across the southern part of the site.
<i>Hydrogeology Summary</i>	The BGS 1:625,000 scale Groundwater Vulnerability Map of Scotland (1995) indicates that the strata beneath the site are classified as moderately permeable. The BGS 1:625,000 Hydrogeological Map of Scotland (1988) indicates that the site is underlain by a highly productive (not extensive) aquifer in which flow is dominantly in fissures and other discontinuities – Carboniferous: Dinantian and Namurian.
<i>Groundwater Vulnerability</i>	The overall groundwater vulnerability is assessed as medium .

2.2 SURFACE WATER

There are no surface water features in the vicinity of the subject site therefore surface water vulnerability is assessed as **low**.

SEPA's Indicative River and Coastal Flood Map (Scotland) shows the site is not within an area where there is an estimated flood risk of 0.5% (1:200) or greater in any given year.

2.3 FURTHER INFORMATION

<i>Ecological Receptors</i>	There are no designated ecological sites within the vicinity of the subject site.
<i>Archaeological Sites</i>	There are no Scheduled Ancient Monuments on or adjacent to the site.
<i>Surrounding Land Use</i>	There are residential properties, comprising flats, beyond the site boundary and road to the south of the site and there are residential properties with gardens to the north of the site. Allotment gardens are located to the southeast of the site.

3 Environmental Risk Ranking Model

Source Pathway Receptor Analysis

Land Use Source 1 – Railway Land – across whole site				
Source	Pathway	Receptor	Risk	Comment
Contaminated soils – inorganics	Direct contact / inhalation or ingestion	Site workers	Low-Medium	Potential for contact with contaminated soils across the site, however most work areas are surfaced with hardstanding.
		Site users	Low-Medium	Assumes short periods of time onsite and within areas of tarmac hardstanding.
		Construction / maintenance workers	Low-Medium	Assumes appropriate use of PPE.
	Leaching into local groundwater, aqueous migration via drift geology, services, contact or ingestion of groundwater	Site workers	Low-Medium	Potential for contact with contaminated groundwater limited by hardstanding across occupied areas.
		Site users	Low-Medium	Potential for contact with contaminated groundwater limited by hardstanding across occupied areas.
		Construction / maintenance workers	Low-Medium	Assumes appropriate use of PPE.
		Neighbouring residents	Low-Medium	Potential for migration of localised residual contaminants off site.
		Users of neighbouring allotments.	Medium	Potential for leaching of contaminants to neighbouring vegetation in allotments, representing an ingestion pathway to allotment users as well as potential contact/ ingestion of groundwater.
	Leaching into local groundwater	Local groundwater	Medium	Potential for leaching of localised residual contaminants into local groundwater given absence of visible drainage and soft ground cover bordering hardstanding areas.
	Leaching into local groundwater, aqueous migration via drift geology, bedrock geology, services	Regional groundwater	Medium	Contaminants could travel via services and permeable deposits to impact groundwater in the wider area.

Land Use Source 1 – Railway Land – across whole site				
Source	Pathway	Receptor	Risk	Comment
	Leaching into local groundwater, aqueous migration via drift geology, bedrock geology, services	Surface water	Low	Contaminants could travel via shallow drift deposits and services to impact surface water. However, no surface water courses were observed within the vicinity of the site.
Contaminated soils - organics	Direct contact / inhalation or ingestion	Site workers	Low-Medium	Potential for contact with contaminated soils across the site, however most work areas are surfaced with hardstanding.
		Site users	Low-Medium	Assumes short periods of time onsite and within areas of tarmac hardstanding.
		Construction / maintenance workers	Low-Medium	Assumes appropriate use of PPE.
	Leaching into local groundwater, aqueous migration via drift geology, services, contact or ingestion of groundwater	Site workers	Low-Medium	Potential for contact with contaminated groundwater limited by hardstanding over occupied areas.
		Site users	Low-Medium	Potential for contact with contaminated groundwater limited by hardstanding across occupied areas and length of time onsite.
		Construction / maintenance workers	Low-Medium	Assumes appropriate use of PPE.
		Neighbouring residents	Low-Medium	Potential for migration of localised residual contaminants off site.
		Users of neighbouring allotments.	Medium	Potential for leaching of contaminants to neighbouring vegetation in allotments, representing an ingestion pathway to allotment users as well as potential contact/ ingestion of groundwater.
	Leaching into local groundwater	Site structures / services	Low-Medium	Potential for leaching of contaminants that may impact structures and services.
		Neighbouring structures / services	Low-Medium	Potential for leachates to impact neighbouring structures and services given distance to residential properties.

Land Use Source 1 – Railway Land – across whole site				
Source	Pathway	Receptor	Risk	Comment
		Local groundwater	Medium	Potential for leaching of localised residual contaminants into local groundwater given absence of visible drainage and soft ground cover bordering hardstanding areas.
	Leaching into local groundwater, aqueous migration via drift geology, bedrock geology, services	Regional groundwater	Medium	Contaminants could travel via services and permeable deposits to impact shallow groundwater in the wider area.
	Leaching into local groundwater, aqueous migration via drift geology, bedrock geology, services	Surface water	Low	Contaminants could travel via shallow drift deposits and services to impact surface water. However, no surface water sources were observed in the vicinity of the site.
Contaminated Soils - Sulphates/acids	Leaching into local groundwater	Local groundwater	Medium	Potential for leaching of localised residual contaminants into local groundwater given absence of visible drainage and soft ground cover bordering hardstanding areas.
	Direct contact (with services/structures)	Site structures / services	Low-Medium	Potential for residual contamination leaching in to the vicinity of structures / water pipes.
	Leaching into local groundwater; direct contact by structures/ services with groundwater	Site structures/ services	Low-Medium	Potential for residual contamination in the vicinity of structures / water pipes.
	Leaching into local groundwater, aqueous migration via drift geology, services	Neighbouring structures/ services	Low-Medium	Potential for residual contamination leaching in to the vicinity of structures / water pipes.
Ground Gas - CO ₂ and CH ₄	Direct ingress/pooling	Site workers, site users	Low	Potential risk, but is limited by the slab foundations and open, warehouse / temporary cabin style of site structures
		Construction/ maintenance workers	Low-Medium	Potential risk for any workers entering confined spaces, e.g. drainage pipes/ chambers. Assumes suitable use of PPE.
		Site structures/ services	Low	Potential risk limited by open warehouse / temporary cabin style structures onsite.

Land Use Source 1 – Railway Land – across whole site				
Source	Pathway	Receptor	Risk	Comment
	Gaseous migration via drift geology, bedrock geology, services	Neighbouring residents	Low	Potential for CO ₂ to be generated on site, however significant off-site migration is considered unlikely.
		Neighbouring structures/ Services	Low	Potential for CO ₂ to be generated on site, however significant off-site migration is considered unlikely.
Volatile Organic Compounds	Indoor inhalation	Site workers, site users	Low	Potential risk, but is limited by the slab foundations and open, warehouse / temporary cabin style of site structures.
		Construction/ maintenance workers	Low-Medium	Potential risk for any workers entering confined spaces, e.g. drainage pipes/ chambers. However, assumes use of appropriate PPE.
	Gaseous migration via services and drift geology	Neighbouring residents	Low	Potential for generation of volatile organic compounds however significant off-site migration is unlikely.
	Gaseous migration via bedrock geology	Neighbouring residents	Low	Potential for generation of volatile organic compounds however significant off-site migration is unlikely.

Appendix D provides a graphical representation of the Source-Pathway-Receptor model.

4 Conclusions and Recommendations

4.1 CONCLUSIONS

Environmental Risk Assessment Summary

The following summarises the potential environmental risks identified, to each receptor:

- Human Health – Medium
- Property (Crops, plants, domestic pets) – Low
- Property (Buildings) – Low/Medium
- Groundwater – Medium
- Surface Water – Low
- Ecology – Low

Status Under Part IIA, the Environmental Protection Act 1990

Potentially contaminated

Overall Environmental Risk Assessment

Medium

Overall Priority Category

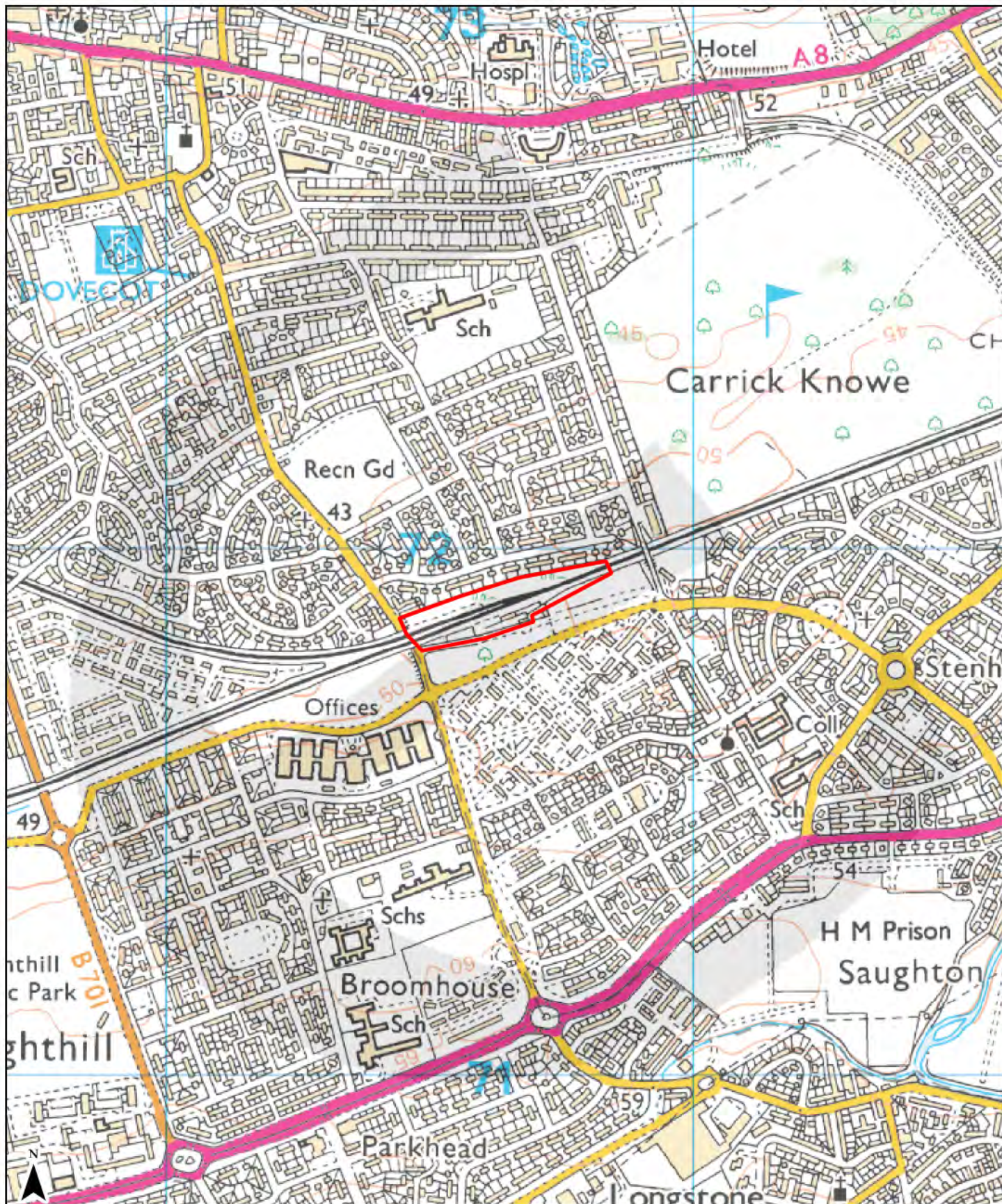
2

4.2 RECOMMENDATIONS

Recommendation	Indicative Cost (£)	Timescale
<i>Further Investigations</i>		
Given that the status of any investigation / remedial action at the site is unknown, WSP would recommend an initial site investigation of minimal intrusion comprising window sampling and trial pits to obtain soil samples for chemical testing, and allow installation of groundwater monitoring wells, both to assess risks to human health and the water environment.	12,000 to 18,000	8 to 12 weeks
<i>Remediation</i>		
Remedial works may be required dependant on site investigation findings.	N/A	N/A
<i>Monitoring</i>		
Subsequent site monitoring dependant on site investigation findings.	N/A	N/A



Appendix A Site Location Plan and Source Location Plan



Legend

 Site Boundary

Notes

Appendix A

Site Location Plan

3 - Saughton Goods Depot

Size: A4

Scale: 1:10,000

Project: 12141480 - Edinburgh Con Land

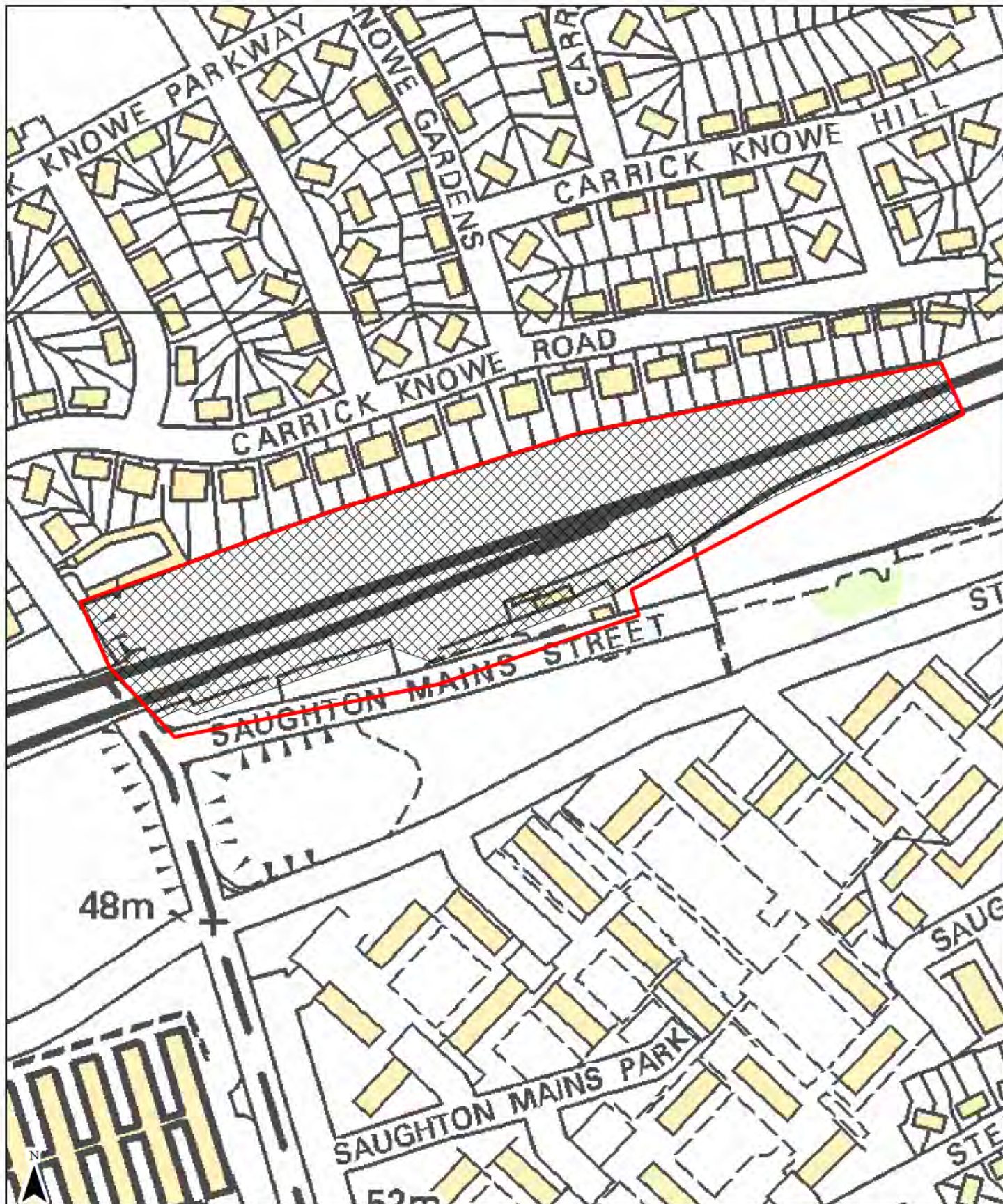


Date: 11.11.09

Revision: -

Drawn by: RM

Checked by: -



Legend

 Site Boundary  Adjacent Sites

Potential Sources of Contamination

 Railway Land

Notes

The locations of potential sources of contamination have been digitised from OS historical mapping.

Appendix A

Site Location Plan & Sources 289 Saughton Goods Depot

Size: A4

Scale: 1:2,400

Project: 12141480 - Edinburgh Con Land



Date: 24.05.10
Revision: -
Drawn by: AD
Checked by: -



Appendix B Site Photographs



PLATE 1: Saughton Skips yard viewed from the east.



PLATE 2: Saughton Skips yard entrance.





PLATE 3: External Advanced Autos area



PLATE 4: MK Auto Repairs yard



PLATE 5: Oil drums located on gravel surface at rear of MK Auto Repair yard.



PLATE 6: Historic railway loading platform





PLATE 7: Storage containers lining railway embankment in south



PLATE 8: Motorcycle training yard with temporary cabins, radio transmitter beyond and railway to north





PLATE 9: Lock up garages on north western part of site

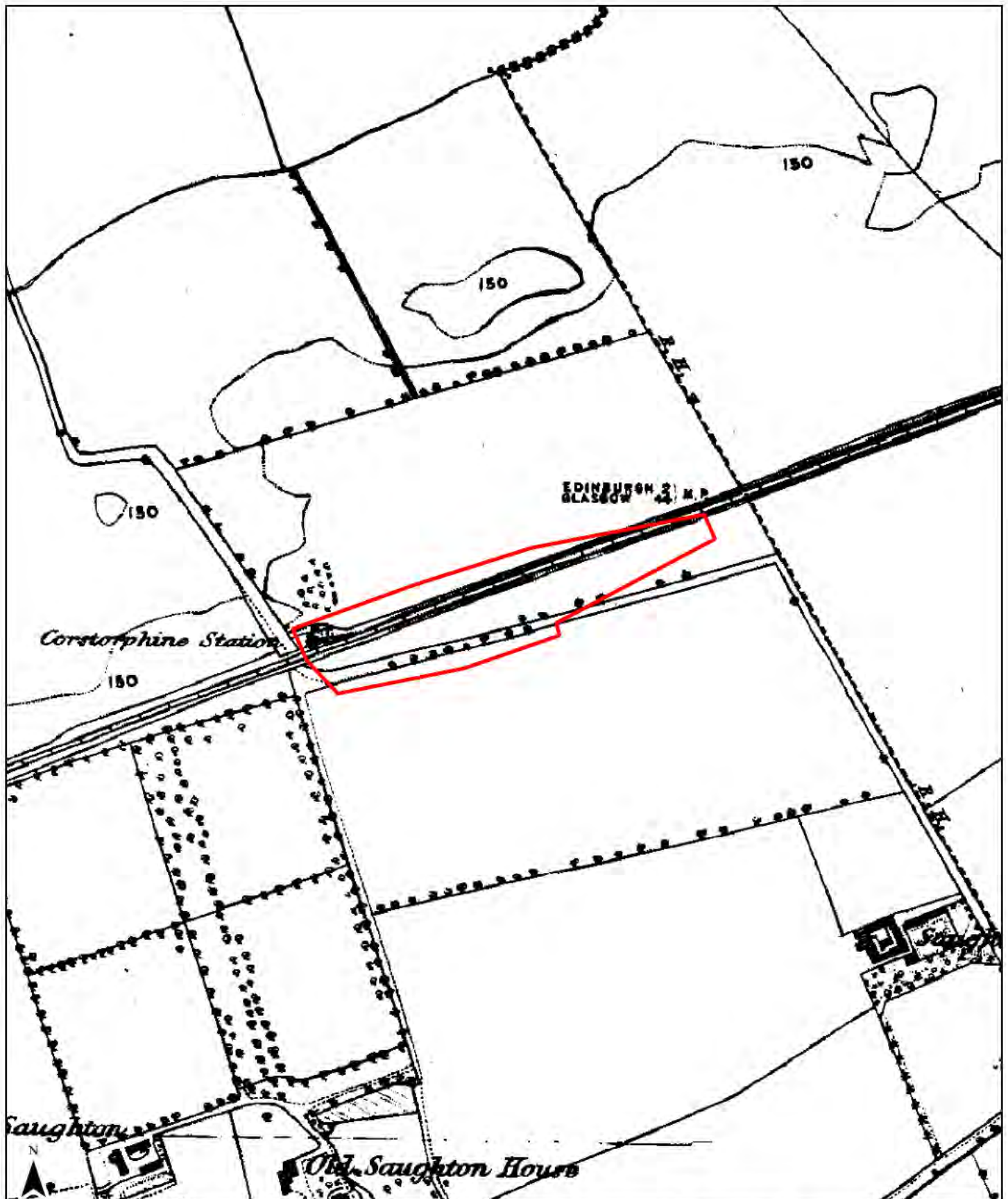


PLATE 10: Derelict land north of railway line





Appendix C Historical Map and Air Photograph Extracts



Legend

 Site Boundary

Notes

Historical Mapping from
Ordnance Survey
County Series 1:10560
(Edinburghshire)
1853 to 1855

Appendix C

Historical Map and Air Photograph Extracts

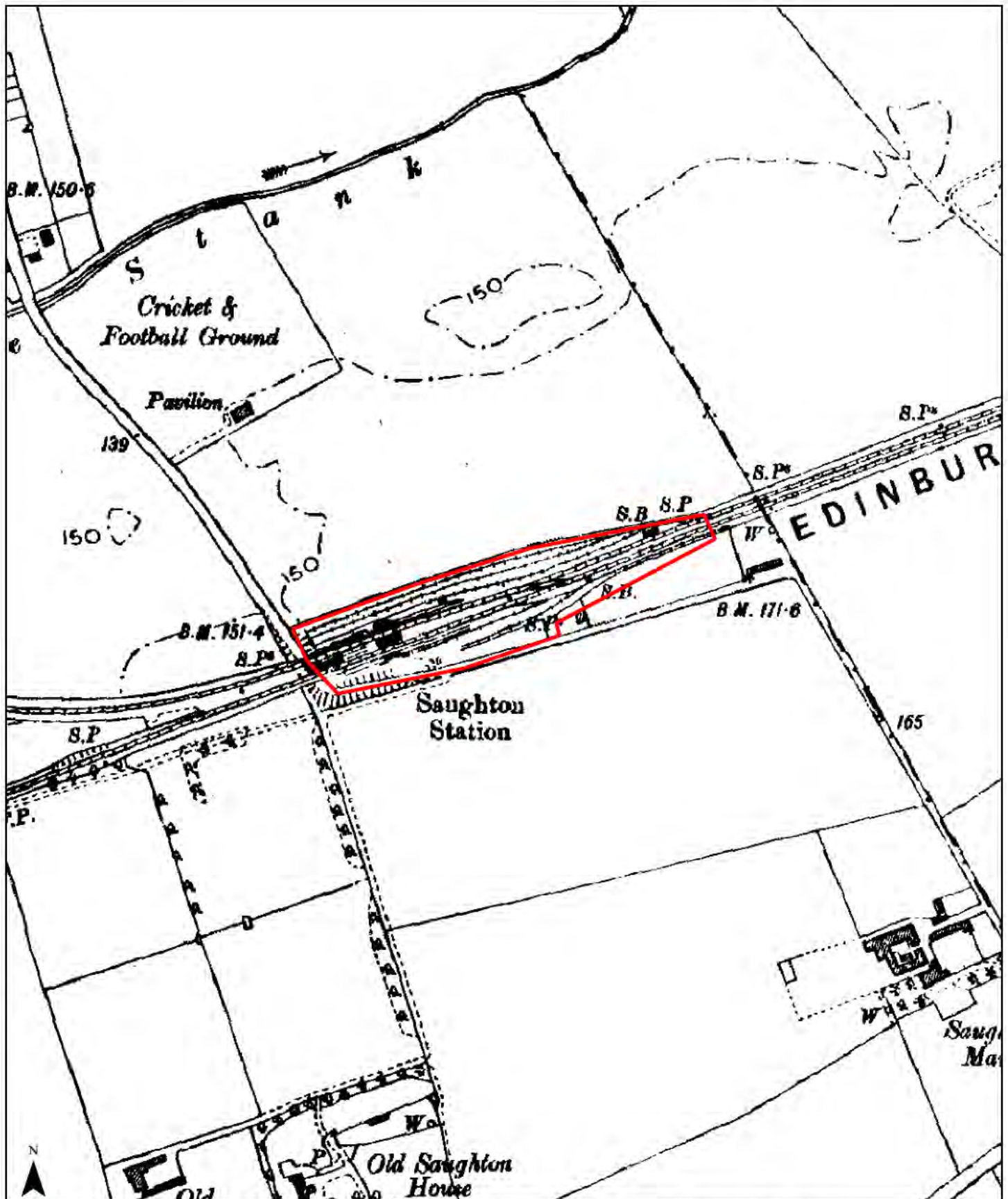
Size: A4

Scale: 1:5,000

Project: 12141480 - CEC 10 Desk Studies



Date: 18.11.09
Revision: -
Drawn by: RM
Checked by: -



Legend

Site Boundary

Notes

Historical Mapping from
Ordnance Survey
County Series 1:10560
(Edinburghshire)
1908 to 1909

Appendix C

Historical Map and Air Photograph Extracts

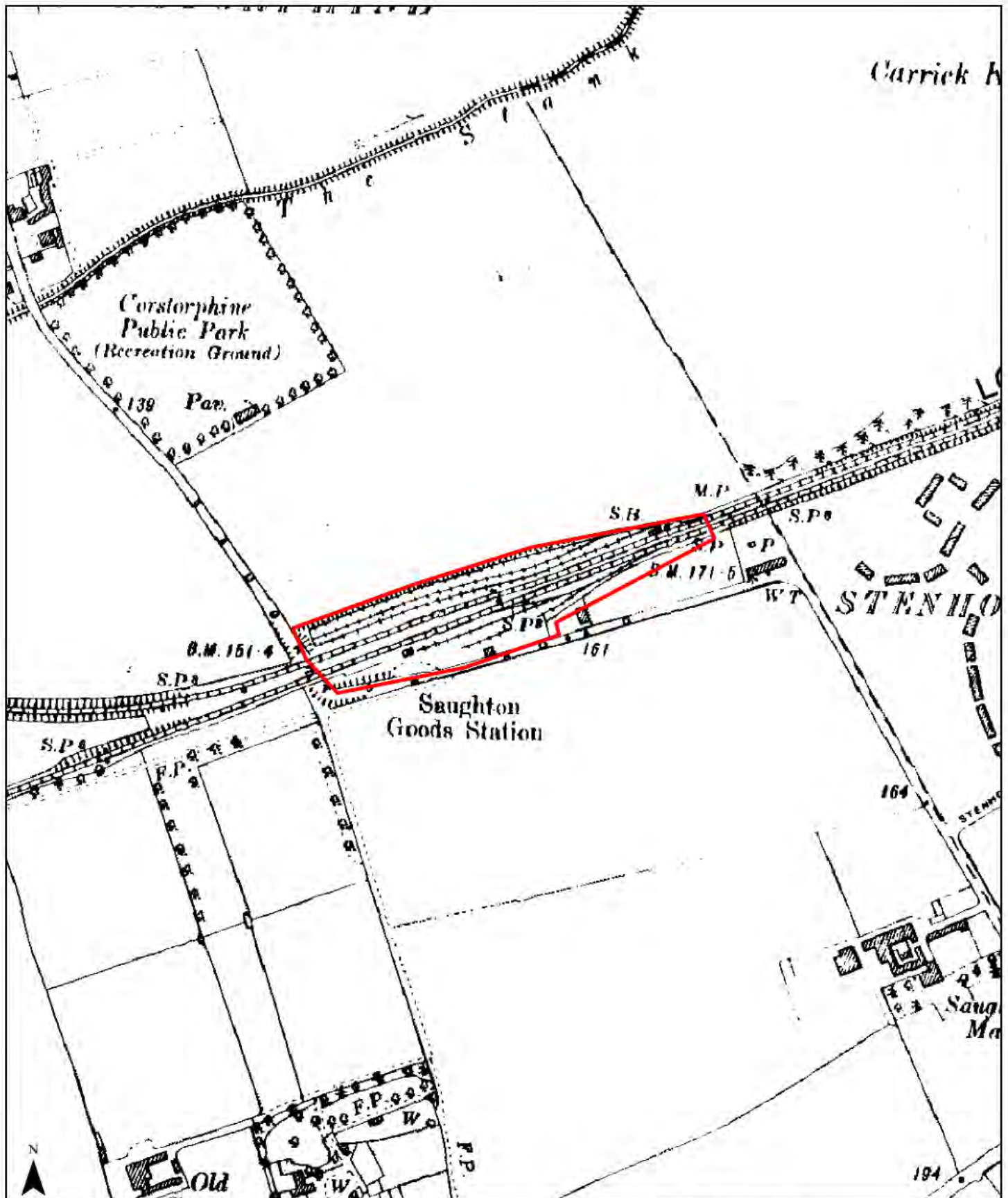
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Scale: 1:5,000

Project: 12141480 - CEC 10 Desk Studies



Date: 18.11.09
Revision: -
Drawn by: RM
Checked by: -



Legend

Site Boundary

Notes

Historical Mapping from
Ordnance Survey
County Series 1:10560
(Edinburghshire)
1931 to 1938

Appendix C

Historical Map and Air Photograph Extracts

Size: A4

Scale: 1:5,000

Project: 12141480 - CEC 10 Desk Studies

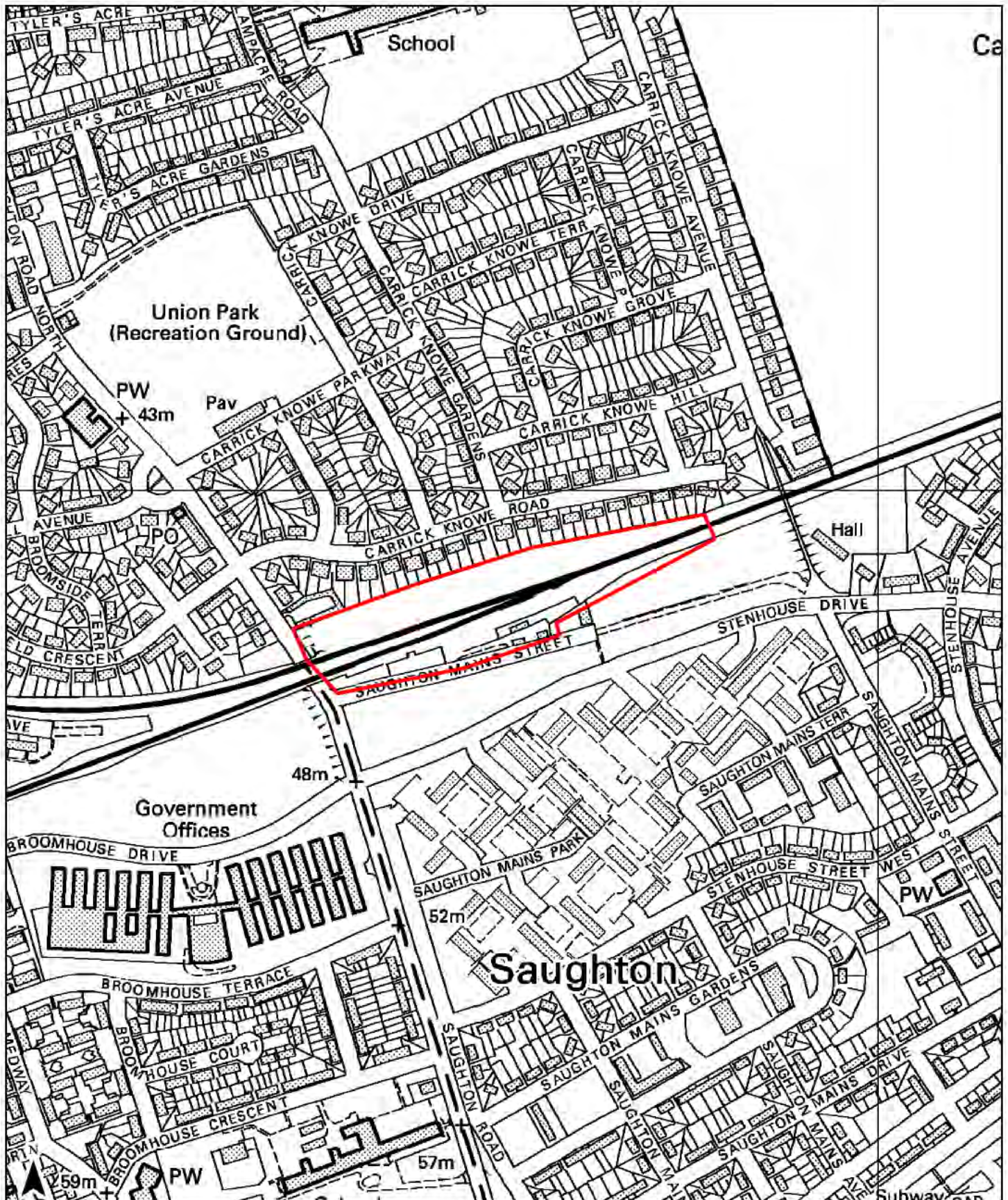


Date: 18.11.09

Revision: -

Drawn by: RM

Checked by: -



Legend

 Site Boundary

Notes

Historical Mapping from
Ordnance Survey
National Grid 1:2500
1997

Appendix C

Historical Map and Air Photograph Extracts

Size: A4

Scale: 1:5,000

Project: 12141480 - CEC 10 Desk Studies



Date: 18.11.09

Revision: -

Drawn by: RM

Checked by: -



Appendix D Source-Pathway-Receptor Model

SW
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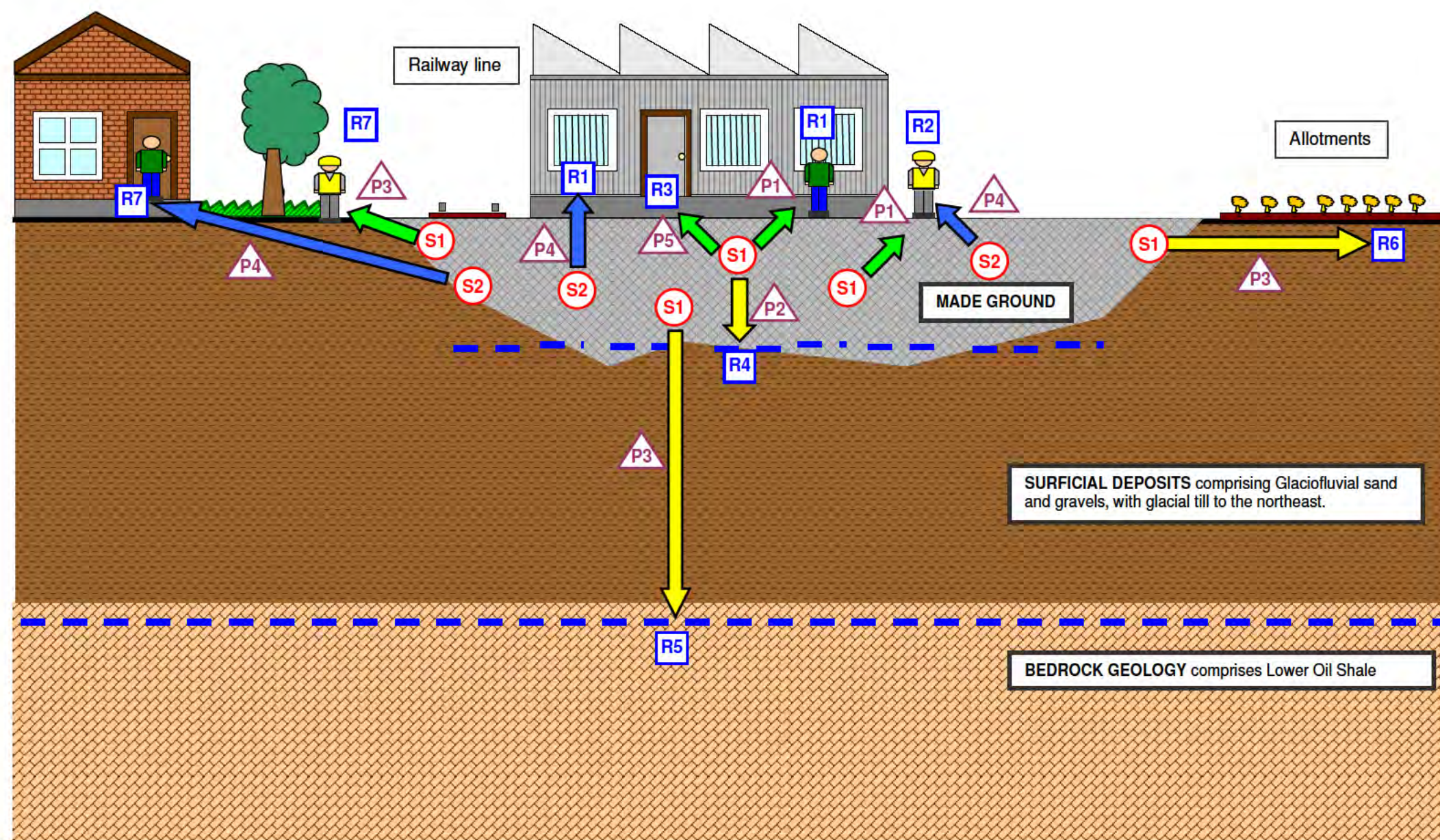
NE
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SUBJECT SITE

- Former railway land, now light industrial land including skip hire and cabins
- Lockup garages are now located in the northwest
- Railway bisects central part of the site

SURROUNDING AREA

- Allotments to the northeast
- Residential beyond the north boundary



LEGEND

- Potential Contaminant Sources**
- S1 Potentially contaminated made ground associated with former railway land
 - S2 Ground Gas / VOCs
- Potential Pathways**
- P1 Dermal contact, ingestion, and inhalation
 - P2 Leaching of contaminants to groundwater
 - P3 Leaching of contaminants to groundwater and migration via drift bedrock and or services
 - P4 Migration to indoor air / pooling of ground gas / VOCs
 - P5 Contact with construction materials
- Potential Receptors**
- R1 Site Users / Workers
 - R2 Construction / Maintenance worker
 - R3 Construction Materials / Services
 - R4 Local Groundwater
 - R5 Regional Groundwater
 - R6 Neighbouring allotments
 - R7 Neighbouring Site Users / Residents / workers
- Pollutant Linkage Risk**
- Low Risk Pathway
 - Low/Moderate Risk Pathway
 - Moderate Risk Pathway
 - Moderate/High Risk Pathway
 - High Risk Pathway

APPENDIX D CONCEPTUAL SITE MODEL

SITE: 289 Saughton Goods Station

SCALE: Not to Scale
DATE: 26/05/2010
PROJECT NUMBER: 12141480/289
DRAWN BY: GB
CHECKED BY: RM



WSP Environmental UK
4/5 Lochside View
Edinburgh Park
Edinburgh EH12 9DH
Tel: +44 (0)131 344 2300
Fax: +44 (0)131 344 2301

Appendix E Notes on Limitations

General

WSP Environmental Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from WSP Environmental Limited; a charge may be levied against such approval.

WSP Environmental Limited accepts no responsibility or liability for:

- a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and
- b) this document to any third party with whom an agreement has not been executed.

Phase I Environmental Audits

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Geo-environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to site remediation these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site, can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.