DEFENCE ESTATE ORGANISATION (WORKS)

RAF UPPER HEYFORD

LAND QUALITY ASSESSMENT PHASE ONE : DESK STUDY INTERPRETIVE REPORT

PROJECT NO: 07686
REPORT

March 1997

Defence Estate Organisation (Works)
Blakemore Drive
Sutton Coldfield
West Midlands
B75 7RL

Prepared by
ERM EnviroClean Ltd for
Ministry of Defence
Defence Estate Organisation
(Works) under commission
WS13/1982/3 June 1995

ERM

REPORT RELEASE SHEET

DEFENCE ESTATE ORGANISATION (WORKS)

RAF UPPER HEYFORD

LAND QUALITY ASSESSMENT
PHASE ONE : DESK STUDY
INTERPRETIVE REPORT

PROJECT NO: 07686 - REPORT

Task Officer
[redacted]
Senior Environmental Engineer
Defence Estate Organisation (Works)
Blakemore Drive
Sutton Coldfield
West Midlands
B75 7RL

Tel: [redacted]

Prepared by
ERM EnviroClean Ltd
for the Ministry of Defence
Defence Estate Organisation (Works)
under commission WS13/1982/3
June 1995

Reference 3377.19

For and on behalf of
ERM Enviro[redacted]
Approved by
Signed:
Position: [redacted] DIRECTOR
Date: 10/3/97

Approved by Task Officer:- [redacted]

Approved by Sponsor:-

.....

ERM EnviroClean Ltd, Eaton House, Wallbrook Court, North Hinksey Lane, Oxford, OX2 0QS, England. Tel. [redacted] Fax. [redacted]
204982 Email [redacted] http://www.ermuk.com

1 INTRODUCTION

ERM were appointed on 5th August 1996, by Defence Works Services, under the terms of the three year commission ref WS13/1982/3, to undertake a Land Quality Assessment of RAF Upper Heyford, Cambridgeshire.

The objectives of the Land Quality Assessment are as follows:

- *To provide information relating to the environmental quality of the ground conditions present on the establishment.*
- *To consider the potential for future ground contamination occurring as a result of demolition of the existing buildings.*
- *To assess the potential human health and environmental risks at the site.*

This section forms the executive summary of the interpretative report and provides a summary of the environmental conditions at RAF Upper Heyford, the suitability of the site for re-use and the effects of contamination on development potential.

2 ENVIRONMENTAL SETTING

The environmental setting of the site has been described with reference to the following sources of information.

- *Geological Sheet 218, Chipping Norton 1:50000, published by the British Geological Survey, 1968.*
- *Ordnance Survey Landranger Sheet 164, Oxford and surrounding area 1989, published at a scale of 1:50000.*
- *The Quality of Rivers and Canals in England and Wales (1990-1992), NRA River Quality Map, 1:750000.*
- *Policy and Practice for the Protection of Groundwater, Regional Appendix Thames Region, published by the National Rivers Authority (NRA), 1992.*
- *Policy and Practice for the Protection of Groundwater, Regional Appendix Anglian Region, published by the National Rivers Authority (NRA), 1992.*
- *Groundwater Vulnerability Map Series, Sheet 30 Northern Cotswolds, 1:100000, published by the Environment Agency (EA), 1996.*
- *EA database of licensed surface water and groundwater abstractions (1996).*

RAF Upper Heyford is situated approximately 5km to the north-west of Bicester, Oxfordshire. The 494 hectare site is located at approximately 130 metres above ordnance datum (mAOD) on a plateau structure and is bounded to the east and southwest by the communities of Ardley and Upper Heyford, respectively (national

grid reference: SP 51 27). On the western edge of the airfield, the elevation drops approximately 50m over 1 km down to the River Cherwell and the Oxford Canal. The site comprises of runways, aircraft hangars, offices, workshops, fuel installation and weapons storage facilities.

In addition to the Oxford Canal and River Cherwell to the west, several surface water courses drain radially away from the plateau. Gallos Brook and Gagle Brook are noted to the south and further small brooks are observed around the site area in the north, north-west and westward towards the Oxford Canal. Several of these small streams are spring fed and are therefore dependant on groundwater discharges for flow. The Oxford Canal and the River Cherwell are classified as Class C (fair) according to the NRA's General Quality Assessment (GQA) Scheme.

One spring water abstraction is situated in close proximity of the site at national grid reference SP496253. The supply is used for domestic and agricultural use.

The site is immediately underlain by approximately 3m of silty clays with minor sandy and gravelly horizons. This unconsolidated superficial material is underlain by the weathered top of the 20 to 34 m thick, Great Oolite Limestone unit. The limestone is in turn underlain by several hundred metres of mudstones, limestones and sandstones of the Lias group.

Groundwater is used extensively throughout the region for industrial purposes, public water supply and domestic use. Most large scale abstraction comes from the Great Oolite Limestone although the Lower Lias and the unconsolidated drift deposits may contain locally important minor aquifers where permeable horizons are sufficiently thick and continuous.

Hydraulic continuity between the superficial material and the underlying limestone bedrock is considered likely across the site. Given the prominence of the plateau feature and relative high exposure of the Oolite, it is expected that the limestone aquifer receives recharge water in the form of infiltrating precipitation. The groundwater elevation in the limestone is not known, although the presence of spring issues on the flanks of the plateau surrounding the site indicate the likely elevation of the water table. Five licensed groundwater abstractions are situated within 3km of the site and used for both domestic purposes and supplies.

3 *SITE HISTORY*

The history of the site has been described with reference to the following historical maps held at the Bodleian Map Library in Oxford.

- *Ordnance Survey County Series, 1:2500, editions Oxfordshire Sheets: XXII.3, XVI.10, XVI.11, XVI.14, XVI.15, from: 1875, 1900, 1922.*

- *Ordnance Survey County Series, 1:10 560, edition Oxfordshire Sheet: XVI from 1885.*

- *Ordnance Survey County Series, 1:10 560, editions Oxfordshire Sheets: XVI.SW, XVI.SE from 1900, 1923.*

- *Ordnance Survey SP 52 NW, 1:10 560, from 1955, 1966, 1982, 1993.*

- *Ordnance Survey SP 42 NE, 1:10 560, from 1955, 1979.*

- *Ordnance Survey SP 4826-4926, SP 5025-5125, SP 5226-5326, SP 5227-5327, SP 5026-5126, SP 5027-5127, 1:2500, 1974.*

The site had a 'greenfield' landuse prior to being occupied by Canadian Airforce in 1916. RAF Upper Heyford covers an area of 494 hectares and was originally laid down in the traditional 'A' shape pattern. Only the main runway remains from the original configuration.

The site closed in 1920 and was then re-opened as a bomber station in 1927 and later utilized for leaflet dropping sorties in 1940. The base was taken over by the USAF in 1951 and the main runway was then increased to 10,000ft. Further extensive modifications were carried out with the arrival in 1970 of the 20th Tactical Fighter Wing and the first F-111E swing wing bombers. Base population levels have peaked at 4,500 including non-military personnel. The base closed and was passed back to the RAF in 1994.

POTENTIAL CONTAMINATION AND ENVIRONMENTAL RISK

4.1 CONTAMINANT SOURCES, PATHWAYS AND RECEPTORS

The current most sensitive receptors to the potential release of contaminants from past and/or present activities at the site are ground and surface waters and the abstractions that rely on them. The soil cover provided by the superficial deposits is thin and as such it provides only limited protection to the underlying limestone aquifer. As such the aquifer unit is susceptible to impaction from surface or sub-surface releases of site-related constituents.

The on-site surface water drainage network, feeds into a series of oil interceptors across the site and, as such, the discharge of free phase oil product is prevented. It should be noted, however, that dissolved phase contaminants are not prevented from draining off-site by these interceptors. As such, the surface water drainage network may historically have and in the event of shallow groundmass contaminant source areas, may continue to provide off-site containment migration pathways.

Any future site personnel/construction workers may also be potential receptors due to direct contact with on-site contaminant source areas within the shallow groundmass. Grazing animals may also be receptors of concern due to grazing in source areas located on the site, and by drinking potentially contaminated surface waters on the flanks of the plateau (off-site).

The ESR states that there are no historical records of significant spillage incidents occurring at the Upper Heyford site since the USAF began using the site in 1950. The ESR does indicate, however, that there have been a number of fuel spill incidents over the years, as well as two aircraft mishaps, one of which occurred off-base.

The only documented evidence of these spillages and aircraft mishaps were included in the ESR report and the information supplied is limited in detail. The report indicates fuel leaks and spills at POL 17 and on the south side of Facility 221 and states that all potential contamination was cleaned up to 'above standards'. Whilst the ESR was being prepared, POL 19 was in the process of investigation by Miller Environmental Limited. Miller Environmental were undertaking an investigation in order to assess the degree of potential contamination within the subsurface deposits at POL 19 located in Area A. This was carried out following the loss of 1,145 US gallons (4.3m^3) of unleaded fuel to the groundmass from an offset fill pipe of which only 2.63m^3 of emulsified product were recovered from an adjacent interceptor. Investigation of POL 19 was still being carried out at the time of the ESR publication.

The 'on-site' aircraft incident involved an aircraft over-run to the '09' (west) end of the runway. It is reported that all contaminated soils resulting from the incident were disposed of to a site licensed by the Oxfordshire County Council under the Environmental Protection Act 1990 and the site of the incident was cleaned up to the satisfaction of the National Rivers Authority (NRA), now part of the EA. No other details of the incident, including nature of contaminant impact, its extent or impact on underlying groundwaters were available. Further discussions with the EA highlighted a potential contamination incident resulting from integrity failure of the POL supply pipeline at Upper Heyford. No further details on the incident were available.

MOD supplied anecdotal evidence indicated two further spill incidents relating to the POL fuel storage facilities. The only information on the spill incidents is as follows:

- *Fuel spill at POL 21 (May 1990). Some contaminated soil removed.*
- *Fuel spill at POL 23 (1992). 350m^3 spillage.*

No visual evidence of contamination was observed during the site reconnaissance.

During the site history several potential contamination incidents were documented by the EA. Their records include a POL supply pipeline failure at RAF Upper Heyford and several further POL fuel spillages. They were, however, unable to supply details of the incidents or locations of the spillage events.

There are a number of potential sources of contamination located within RAF Upper Heyford. The areas of most immediate concern are tabulated in Table 4.1a below.

Table 4.1a ***Potential Sources of Human/Environmental Risk***

POL site	*Human Health*	*Groundwater*	*Surface Water*
POL 1 *Area A* *Fac 270*	E	C	C
POL 2 *Area A* *Fac 254*		C	C
POL 3 *Area A* *Fac 274*	E	C	C
POL 5 *Area D* *Fac 385*	E	C	C
POL 6 *Area D* *Fac 382*	E	C	C
POL 7 *Area D* *Fac 385*	E	C	C
POL 8 *Area D* *Fac 386*	E	C	C
POL 9 *Area C* *Fac 215*	E	C	C
POL 10 *Area C* *Fac 219*	E	C	C
POL 11 *Area C* *Fac 229*	E	C	C
POL 13 *Area B* *Fac 283*	E	C	C
POL 14 *Area B* *Fac 284*	E	C	C
POL 15 *Area B* *Fac 241*	E	C	C
POL 16 *Area B* *Fac 242*	E	C	C
POL 17 *Area B* *Fac 245*	E	C	C

POL site	Human Health	Groundwater	Surface Water
POL 19 Area A Fac 614	E	C	C
POL 20 Area D Fac 375	E	C	C
POL 21A Area A Fac 392	E	C	C
POL 21B Area A Fac 393	E	C	C
POL 21C Area A Fac 394	E	C	C
POL 22 Area C Fac 395	E	C	C
POL 23A Area B Fac 285	E	C	C
POL 23B Area B Fac 269	E	C	C
POL 24 Area A Fac 269	E	C	C
POL 25A Area D Fac 376	E	C	C
POL 25B Area D Fac 377	E	C	C
Fuel Tank Area C Fac. un-named	E	C	C
POL fuel supply pipeline	E	C	C
Former Waste Area adjacent to POL 20	C/D	C	C
Fire Training Area A	C/D	C	C
Fuel Supply Station Fac. 493	C/D	C	C

KEY:

A: Immediate significant risk to human health

B: Immediate significant risk of damage to the environment

C: Major Remediation Liability

D: Minor Remediation Liability

E: Minor Significance, no remediation required

F: No effect on re-use options or site value

4.2 *ENVIRONMENTAL RISK*

ERM consider that the nature of the activities carried out on-site since 1916, the presence of the potential contaminant sources identified at RAF Upper Heyford, together with its location on a major aquifer unit (Great Oolite Limestone) and the presence of nearby potable supply abstractors suggest that the site represents a potentially serious risk to the environment.

Due to the absence of any extensive superficial cover, the limestone aquifer will have been vulnerable to spillage/leakage of contaminants on-site. The rate of groundwater flow within limestone deposits, generally controlled by fractures and fissures, permits the rapid transfer of contamination through the saturated groundmass. In addition, the site is situated on a plateau area and all groundwater and surface water flow is expected to flow down gradient into several catchments areas. From the reviewing the Ordnance Survey mapping of the site area, and from discussions within the EA, it is apparent that several spring issues exist on the plateau flanks supported from groundwater flow. As such off-site impacts may already have occurred, although no documented impacts are known.

Surface water drainage systems leaving the site are a further potential contaminant pathways for impact of surrounding surface water resources. Although interceptors were present on the drains at the periphery of the site. Such units will not intercept dissolved phase contaminants. As such off-site impacts could have occurred. In the event of groundmass source areas being present, the surface drains could continue to provide a pathway for contaminant seepages from source areas.

Given the sensitivity of the setting and nature of operations, intrusive investigations are required to confirm, or otherwise, the potential for detrimental impacts on groundwater/surface water resources. In terms of the potential redevelopment of the site, this will be a requirement of the Environment Agency, as statutory consultee to any planning permission process (per discussions between ERM and EA). Additionally, even without redevelopment proposals, the EA would in all likelihood require evaluation of impacts, in their primary role of protection of water resources.

Such investigations for environmental risk evaluation could initially be focused on the sampling of surface water/springs on the periphery of the plateau. Given the predicted groundwater flows, analysis of such water would provide an initial indicator of site impacts on groundwater resources. Supporting information from the installation of a small number of groundwater monitoring wells, down hydraulic gradient of the identified potentail source areas is also likely to be required by the EA In the event of impacts being identified, further and more detailed groundwater investigations will be required to understand impacts and allow risks posed to be evaluated and appropriate remedial actions scoped.

The site clearly has high redevelopment potential. However, the results of the LQA suggest potentially significant sources of groundmass impact from site activities, particularly associated with the POL installations and POL distribution ring main pipeline. Given the nature of the activities on-site therefore, the current suitability of the site for a range of redevelopment end users (without remedial action) cannot be predicted without confirmation of groundmass quality. Therefore intrusive investigations are required, focused on areas of contaminant concern. Such investigation in parallel with the groundwater/surface water investigations identified above, are likely to be required to demonstrate the suitability of the site for redevelopment (with or without remediation) based on risk to future end-users and impacts on water resources.

Such information is likely to be a major component of any potential purchaser's due-diligence programme, will allow the MOD to assess the liability exposure as land owner and is likely to be requirement of any planning process related to redevelopment of the site. The data will also allow decision's to be made on the need for remedial action, either to allow redevelopment for intended land use or mitigate impacts on water resources, and allow costs for such actions to be provisionally set.

CONTENTS

This report outlines ERM EnviroClean's interpretive analysis of the environmental setting at RAF Upper Heyford, along with the nature and location of potential sources of contamination at the site. It makes an assessment of the anticipated contaminants present and their potential fate and migration within the environment.

Based on an analysis of the environmental risks prevailing at the site, the report assesses the need for, and extent of, any further work at the site to determine potential liability exposure to the MOD, particularly given the MOD's desire to divest of the property.

The recommended phased programme of works, together with cost implications to the MOD are provided within *Section 4.*

The remainder of this report is structured as follows:

- *Section 2* - Contamination Model
- *Section 3* - Options and Recommendations for Further Investigations
- *Section 4* - Recommended Option, Costs & Timescale

- *Annex A* - Technical Brief
- *Annex B* - Site Index
- *Annex C* - Environmental Risk Assessment - Existing Use
- *Annex D* - Environmental Risk Assessment - Housing and Gardens
- *Annex E* - Environmental Risk Assessment - Agriculture
- *Annex F* - Proposed Timescale

2.1 INTRODUCTION

This section identifies the potential sources, pathways and receptors related to any potential environmental contamination from RAF Upper Heyford. The list of potential sources has been compiled from site walkover observations and after the review of all relevant documents concerning the environmental status and history of the site.

The groundmass at the site area consists of a thin superficial unit recorded to a depth of approximately 3m below ground level (bgl) which in turn rests directly on limestone deposits that represent a regionally important aquifer. The site is situated on groundmass highly sensitive to potential contaminants. Rapid transfer and migration of these contaminants is anticipated should surface and subsurface spillage occur.

The limestone aquifer is afforded only minimal protection from the overlying superficial deposits from surface and near surface contaminant impact. Consequently, the most sensitive receptor at the RAF Upper Heyford site is the groundwater resource and the surface abstractions and groundwater abstraction wells in close proximity to the site.

RAF Upper Heyford is surrounded by an extensive network of surface water drains (with associated oil traps) and springs that lead into streams and brooks.

Should impaction of the groundmass and groundwater have occurred further receptors at potential risk from contamination include current and future site users/construction workers. In this instance, human health could be adversely affected by dermatological contact, inhalation and ingestion of both soils and groundwater. Grazing animals, currently on-site and situated in the surrounding farmland may also be potential receptors, impacted directly from ingestion of impacted soils and/or spring waters.

The site layout plan and accompanying index are presented as *Annex B.*

2.2 SOURCE-PATHWAY-RECEPTOR RELATIONSHIP

2.2.1 *Potential Contaminant Source Areas*

From the site reconnaissance visit undertaken at the RAF Upper Heyford site, it was apparent that the airbase has undergone a thorough surface clean-up programme on cessasation of USAF flight activities. In addition to the surface clean-up, the cleansing and drainage of POL facilities, UST's, AST's, and POL ring main pipelines on-site is also documented. Little visual evidence of surface groundmass contamination was apparent during the

visual inspection and there was no evidence of associated features such as vegetation die-back.

However, the potential does exist for previous site activities to have impacted the underlying groundmass and groundwaters. Of particular concern are the POL facilities, the POL supply ring main and the fire practise area. In addition, underground and semi-buried tanks and pipelines are anticipated to rest directly on the underlying weathered limestone and limestone bedrock and could potentially be in contact with shallow groundwaters. As such, surface clean-up operations do not in themselves imply that no sub-surface impacts have occurred historically.

It is not possible to confirm whether the groundmass has been impacted from previous site activities without intrusive investigations. The remainder of this sub-section reviews the locations on-site considered to have the potential to have impacted the groundmass and/or underlying and surrounding groundwater and surface water resources. In addition, the risk to a number of identified potential receptors has been assessed. For ease of reference the site has been divided into five areas A, B, C, D & E. A diagram showing the location of these areas is presented as *Figure 2.2a.* More detail on potential source areas in each Area are provided in *Sections* 2.3 to 2.6.

Area A

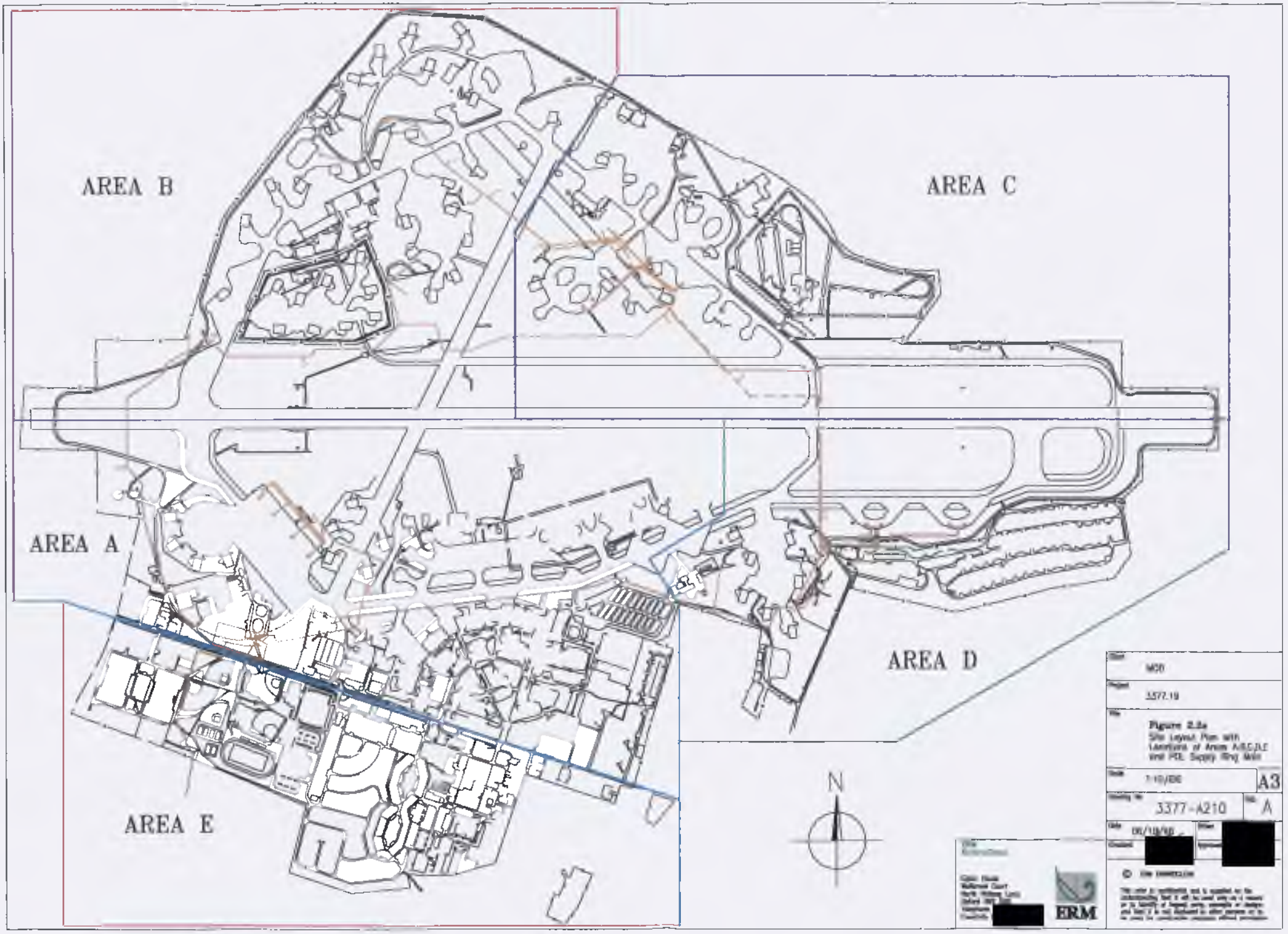
The main activities undertaken in Area A included the maintenance, refuelling, painting and storage of aircraft, and the storage of POL. Various engine and truck maintenance workshops are situated within this area, together with deicing agent storage tanks.

The majority of potential source areas within Area A are therefore associated with the possibility of leaks/spills of jet fuel, diesel, and heating oil from underground and above ground storage tanks and underground pipelines. Minor leakage of hydraulic oils from plant located within the hangars and evidence of paint spraying was also observed at the time of the site reconnaissance. Further potential contaminants include paints, paint thinning and stripping chemicals and degreasing agents.

A spillage incident occurring at POL 19 was investigated by Miller Environmental Limited in 1994. The conclusions of the investigation was that both soil and groundwater had been locally impacted by the loss of unleaded fuel from the bulk storage facility. No record of remedial action has been available to ERM.

Area B

The main activities undertaken in Area B included the maintenance, refuelling, painting and storage of aircraft, and the storage of POL. As with Area A, the majority of potential source areas are associated with the possibility of leaks or spills of jet fuel, diesel, and heating oil from underground and above ground storage tanks and underground pipelines. Minor leakage of hydraulic oils from plant located within the hangars and



MOD

3377.19

Figure 2.2a
Site Layout Plan with Identification of Areas A,B,C,D,E and PDL Supply Ring Main

1:10,000 A3

3377-A210 A

05/10/10

ERM

evidence of paint spraying was again observed during the site reconnaissance.

Area C

The main activities undertaken in Area C included the maintenance, refuelling, painting and storage of aircraft, the storage of POL and the storage of munitions. The majority of potential sources within Area C are again associated with the possibility of leaks or spills of jet fuel, diesel, and heating oil from underground and above ground storage tanks and underground pipelines. No visual evidence of contamination arising from the storage of munitions was observed.

Area D

As above, the main potential sources of contamination are associated with the possibility of spillages or leakages of POL. Additionally, munitions storage was undertaken in this area of the site within concrete lined facilities. The risk associated with the munitions storage relates to the continued presence of munitions in unsuitable facilities. No visual degradation of the storage areas was observed at the site, and no remaining munitions or evidence of contamination was noted.

From the results of the site audit it is felt that no current/future risk is associated with the former storage of munitions.

Area E

Area E is predominantly an area of residential property and as such the potential for contaminative activities to have occurred is considerably lower than the other areas. There were, however, some facilities whose operations could cause environmental risk. These include the former base petrol and diesel filling station, the laundry/dry cleaning facility, and a photographic processing facility. In addition, several UST and AST locations were present within the area.

POL Supply Ring Main

MOD personnel informed ERM that the POL supply ring main had been replaced and re-routed during USAF operations. In addition, the EA informed ERM that leakage to the groundmass from the supply line had occurred previously, although no details were available on the spillage incident.

Asbestos

The asbestos Register and Management Plan for RAF Upper Heyford confirmed Chrysotile, Crocidolite and Amosite (white, blue and brown) were present within several facilities across the site. The condition of the asbestos at the time of preparation of the ESR varied around the site from good to

poor and was observed to be brittle or friable in many cases. Weathering of the asbestos where it had been used for roofing materials was also noted. In order to fully assess the current status of the asbestos present within the site area it is considered necessary to carry out an up to date field survey.

Current Site Usage

Most buildings on the RAF Upper Heyford site are currently unoccupied although much of the site was utilized by private tenants at the time of site reconnaissance.

Grazing of sheep is currently carried out over much of the central and eastern area of the site as is the storage of motor vehicles by two large car distribution companies. Other site activities currently carried out on-site include crane repair and maintenance workshop and firework storage.

2.2.2 *Potential Contaminant Migration Pathways*

The potential exists for any contaminant releases from the aforementioned sources to enter the groundwater of the superficial deposits and groundwaters of the limestone aquifer. Superficial soil cover at the site is minimal and as such can only afford limited protection to the underlying limestone aquifer.

The main site lies on a plateau feature and the groundwater table is considered to follow topography to some degree. Spring discharge points are recorded around the plateau edge and this is expected to be the surface manifestation of the limestone groundwater table.

The main potential migration pathway for potential contaminants released within the sub-surface on-site is therefore groundwater and contamination transfer down gradient, away from the plateau area. Due to the nature of the topography and the lateral extent of the site, the groundwater and any potential associated contamination could migrate to various surface water catchment areas surrounding the site, particularly those fed by the springs on the plateau edge. Groundwater flow is considered to be strongly controlled by localised fractures within the limestone aquifer and therefore preferential flow via fracture systems is expected. Seasonal fluctuation of groundwater levels will vary considerably with recharge conditions.

The surface water drainage network on-site feeds into a series of oil interceptors across the site and, as such, the discharge of free phase oil product is likely to have been prevented. It should be noted, however, that dissolved phase contaminants are not prevented from draining off-site by these interceptors, and any such compounds within the surface waters could have therefore impacted off-site surface water resources.

In addition to the potential migration of contaminants from the source areas into the environment, there is also potential direct exposure pathways that could impact directly upon human health. Given the extensive surface clean-up carried out as part of Base closure, it is considered likely that such pathways would only exist during disturbance of the impacted groundmass during site redevelopment works.

The potential pathways associated with impacts on human health are considered to be as follows:

- ingestion of contaminated soil, food produce grown in, or on, impacted areas, and contaminated waters;
- inhalation of contaminated dust and vapours;
- dermatological contact with contaminated soils, waters and chemical product.

Given the proposals for the redevelopment of the site, these pathways are expected to play an important role in defining the significance of any observed source areas, and the need for remedial action to render the site suitable for the envisaged new land-use.

2.2.3 *Receptors*

The principal receptors of any contamination originating from the site area will be groundwater, spring and surface water abstractions situated around the site. Potential receptors include abstractions sourced within the superficial deposits and the underlying major limestone aquifer. Water from abstractions within the area are utilized for both potable and agricultural supply.

Given the potentially high permeability of the limestone groundmass it is considered likely that rapid migration of potential impacted waters could occur. Consequently, impaction of water quality at receptors in close proximity to the site could occur within a relatively short space of time. It should be noted however, that no documented evidence of receptor water quality problems was identified during this LQA.

In addition to receptors identified above, direct exposure to humans as a consequence of the use and development of the site is possible should the shallow groundmass/groundwater be found to have been impacted. These are identified as follows:

- human dermatological contact, inhalation and ingestion of impacted soils through recreational and everyday activity, particularly if impacted areas do not have restricted access (potential exists for inhalation of asbestos fibres (if present); and

- construction workers working in and around impacted groundmass.

2.3 *SOURCE/PATHWAY/RECEPTOR: AREA A*

A review of potential sources, pathways and receptors specific to Area A is provided below.

2.3.1 *Potential Source Areas*

The potential source areas identified within Area A are illustrated in *Figure 2.3a*. Previously identified potential sources of contamination located within Area A are described in *Table 2.3a*. From the site reconnaissance ERM have identified potential sources at the POL sites (*Table 2.3b*), AST's (*Table 2.3c*), UST's (*Table 2.3d*), and maintenance areas and workshops (*Table 2.3e*). In addition to these, further potential sources of contamination are described in *Table 2.3f*.

Table 2.3a ***Previously Identified Potential Sources of Contamination, 1992 and 1993***

Area	Date	Description	Status at time of ERM site visit
A	1993	POL 19: Leakage of Petroleum and diesel to the groundmass.	No evidence of contamination
A	1993	Gravel area behind the special purpose section is oil stained at Facility 80	No evidence of contamination
A	1993	Car wash at the auto hobby shop (Fac 80) is located on a slope and the discharge of soap, water, oil and grease drains to the storm drain adjacent to the base commissary.	Car wash no longer operational. No evidence of contamination.

Table 2.3b ***POL sites***

POL site	Volume (m^3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 1/ Area A Fac 270	1x141.9 Underground Tank (UST) Tank cleaned and water filled in 1993.	Diesel	No visual evidence of contamination.
POL 2/ Area A Fac 254	6x54.9 (UST) Tanks cleaned and water filled in 1993.	Diesel	No visual evidence of contamination.
POL 3/ Area A Fac 274	2x378.5 (UST) Tanks cleaned and water filled in 1993.	JP-8[2]	No visual evidence of contamination.

Key:

- AST's
- Former Site of AST's
- UST's
- POL Facilities and Bulk Fuel Storage Locations
- POL Supply Ring Main

Client: MOD

Project: 3377.19

Figure 2.3a
POL Facilities, POL Supply Mains, AST's and UST's.
Area A

Scale: 1:5,000 Approx. A3

Drawing No: 3377-A199 No: A

Date: 28/09/96

ERM EnviroClean

Exton House
Wellbrook Court
North Hinksey Lane
Oxford OX2 0QS
Telephone: [redacted]
Facsimile: [redacted]

ERM

Drawn: [redacted]

Checked: [redacted]

POL site	Volume (m^3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 19/ Area A Fac 614	3x54.5 3x54.5 In use by contractor. Tanks 1 and 6 filled with concrete. Tanks 2 and 3 diesel. Tanks 4 and 5 unleaded petrol.	MOGAS[3] DIESEL	No visual evidence of contamination or of former spillage incident. On going use as fuel store for by car distribution company.
POL 21A Area A Fac 392	1x736.2 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 21B Area A Fac 393	1x736.2 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 21C Area A Fac 394	1x1453.4 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 24 Area A Fac 269	1x4753.8 (Semi-buried) Tank cleaned and water filled.	JP-8	No visual evidence of contamination.

[1] In addition to the POL facilities the POL supply pipeline is partially situated within this area.

[2] JP-8 is primarily composed of a middle distillate group of kerosene based product with the following known additives:

Icing Inhibitors: ethylene glycol monoethyl ether, diethylene glycol monomethyl ether.
Static Dissipators: toluene, isopropanol, xylene and chromium
Metal Deactivator: N, N-Disalieylidine-1, 2-Propane Diamine, xylene
Corrosion inhibitors.

[3] MOGAS (motor gasoline) is American terminology for 'petrol' for use in road vehicles.

Table 2.3c Above Ground Storage Tanks (AST's)

Building	Area	Contents/Capacity	Comments
32	A	2 boiler houses with possible former AST's. Details unknown.	Former diesel fuel heating supply. No visual evidence of contamination.
68	A	Possible site of two former AST's.	No visual evidence of contamination.
Approx. 100m to north of Fac. 68.	A	2 x 22.71m^3 fuel oil AST's in brick bund.	Bulk fuel installation drained in 1994. No visual signs of contamination.
77	A	Boiler House and associated fuel AST of approximately 4m^3.	No visual evidence of contamination.

Building	Area	Contents/Capacity	Comments
78	A	Boiler House and associated fuel AST of approximately $4m^3$.	No visual evidence of contamination.
80	A	Unknown.	Former workshops with associated former boilers and possible AST inside.
81	A	Unknown.	As 80.
85	A	Unknown.	As 80.
86	A	Possible site of two former AST's.	Associated plant rooms attached to former maintenance shop. Former AST/below ground pipework.
101 Fire Station	A	Possible site of former AST.	No visual evidence of contamination.
106	A	Former AST of $2.5m^3$ capacity.	No visual evidence of contamination.
114	A	3 x $5m^3$ fuel oil AST's	Former boiler house/generator building. Inside concrete floor stained with oil.
151	A	Unknown.	Empty warehouse facility with associated boiler house and former AST. No visual evidence of contamination.
250	A	Unknown.	No visual evidence of contamination.
288	A	Unknown.	Associated site of former AST. Only bund remains. No visual evidence of contamination.
299	A	Unknown.	Associated boiler house with two oil fuel fill points and former AST's. No visual evidence of contamination.
301	A	Redundant $22.73m^3$ oil fuel tank.	Tank cleaned and water filled March 1994. No visual evidence of contamination.
313	A	Unknown.	Associated site of a former boiler house and AST. No visual evidence of contamination.
320	A	Unknown.	Associated five small boiler houses and locations of five (now removed) AST's.
326	A	Facility adjacent to 326 with boiler house containing 3 x $11.66m^3$ oil fuel AST's	No visual evidence of contamination.
335	A	Unknown.	Boiler room to rear of building with possible AST. Details unknown. No evidence of contamination.
338	A	Unknown.	Boiler room to rear with possible AST. Details unknown. No evidence of contamination.
345	A	Unknown.	Associated five small boiler houses and locations of five (now removed) AST's.
350	A	Unknown.	Possible location of former AST. No visual evidence of contamination.

Building	Area	Contents/Capacity	Comments
354	A	Unknown.	Former workshops and associated former boilers and possible AST. No evidence of contamination.
1368	A	Unknown.	former Hush House. Site of former AST noted along with associated below ground pipework.
1443	A	Unknown.	Former Hush House. Site of former AST noted along with associated below ground pipework.
1403	A	1 x $6m^3$ fuel oil AST and possibly another two since removed.	Location of the incoming external POL ring main. Underground pipework in area and oil interceptors. No visual evidence of contamination.
3043	A	1 x metal bunded oil fuel AST, volume unknown.	Associated with decontamination area of hardened shelter. no visual evidence of contamination.

Table 2.3d ***Underground Storage Tanks (UST's)***

Building	Area	Contents/Capacity	Comments
69	A	2 x UST's and two former pumps.	No visual evidence of contamination.
88	A	1 x UST and one oil fill point.	Oily odour and limited staining around entrance to UST.
103	A	2 x UST's.	No visual evidence of contamination except for minor oil stains on the concrete hardstanding.
126	A	UST	Diesel Fuel. No visual evidence of contamination.
131	A	4 x UST's	Associated boiler house with UST's. No visual evidence of contamination.
198	A	5 x UST's and associated pipework.	Hydrocarbon odour and some oil noted within UST chamber. Two re-fill points (diesel and petrol) were unbunded although no visual evidence of contamination.
268	A	1 x possible UST.	No visual evidence of contamination.
299	A	UST	Fuel Oil. No visual evidence of contamination.
346	A	At least 12 x UST's	Deicing fluid, oils, water UST's at former truck service area. No visual evidence of contamination.

Table 2.3e *Workshops and Maintenance Facilities.*

Facility N°.	Facility	Potential Contaminants	ERM Observations & Comments on Contamination
56 Area A	Maintenance workshop	Unknown.	No visual evidence of contamination.
79 Area A	Vehicle Maintenance Shop.	POL, Solvents and unknowns.	No visual evidence of contamination.
80 Area A	Vehicle Maintenance Shop.	POL, Solvents and unknown.	No visual evidence of contamination.
85 Area A	Vehicle Maintenance Shop.	POL, Solvents and unknown.	No visual evidence of contamination.
86 Area A	Maintenance Shop.	Unknown.	No visual evidence of contamination.
88 Area A	Refuel Vehicle Maintenance Shop.	POL, Solvents, Acids, Alkalis.	No visual evidence of contamination.
316 Area A	Workshop.	Unknown.	No visual evidence of contamination.
318 Area A	Paint Spray Shop	Thinners, and Paint and Paint Stripping Chemicals.	No visual evidence of contamination.
324 Area A	Warehouse/ Workshop	Unknown.	No visual evidence of contamination.
325 Area A	Warehouse/ workshop	Unknown.	No visual evidence of contamination.
327 Area A	Maintenance Dock.	Oils and other unknowns.	No visual evidence of contamination.
328 Area A	Maintenance Dock.	Unknown.	No visual evidence of contamination.
335 Area A	Maintenance Dock.	Unknown.	No visual evidence of contamination.
336 Area A	Hangar Wash Down.	Degreasers, Oils Detergents and other unknowns.	No visual evidence of contamination.
341 Area A	Maintenance Shop - General Purpose.	Unknown.	No visual evidence of contamination.
354 Area A	Garage Refuelling Workshop.	POL, Solvents, Acids and Alkalis	No visual evidence of contamination.
1368 Area A	Hush House.	POL, solvents, unknown.	No visual evidence of contamination.
1443 Area A	Hush House.	POL, solvents, unknown.	No visual evidence of contamination.

Table 2.3f ***Further Potential Sources of Contamination within Area A***

Facility	Facility Use	Potential Contamination	ERM Observations
38	Car Wash Facility	POL waste and detergents.	No visual evidence of contamination.
86	Automobile Hobby Shop	POL, Solvents, Acids, Alkalis.	No visual evidence of contamination.
156	Hazard Store	Unknown.	No visual evidence of contamination.
302	Hazard Store	Unknown.	No visual evidence of contamination.
Adjacent to 330	Fire Practise Pond and Building	POL, Solvents, Fire Fighting Chemicals. Fire pond area drained to storm water drainage.	No visual evidence of contamination.
354	Garage Refuelling Facility	POL, Solvents	Concrete base stained from oil. Central sump shows thin oil film.
424	Hazardous Waste Facility	Unknown	No visual evidence of contamination.

2.3.2 *Pathways, Area A*

Area A lies to the central south of the airfield site and is situated on the shallow gradient of southern flank of the plateau area. Surface water drains to the south. Groundwater is also anticipated to flow in a generally southerly direction (although localized fractures within the limestone may influence the overall direction of groundwater flow).

2.3.3 *Area A Receptors*

Human and Environmental receptors as identified in *Section 2.2.3* above.

2.4 *SOURCE/PATHWAY/RECEPTOR: AREA B*

2.4.1 *Potential Source Areas*

The potential source areas identified within Area B are illustrated in *Figure 2.4a*. Previously identified potential sources of contamination located within Area B are described in *Table 2.4a*. From the site reconnaissance ERM have identified potential sources at the POL sites (*Table 2.4b*), AST's (*Table 2.4c*), UST's (*Table 2.4d*), and maintenance areas and workshops (*Table 2.4e*).

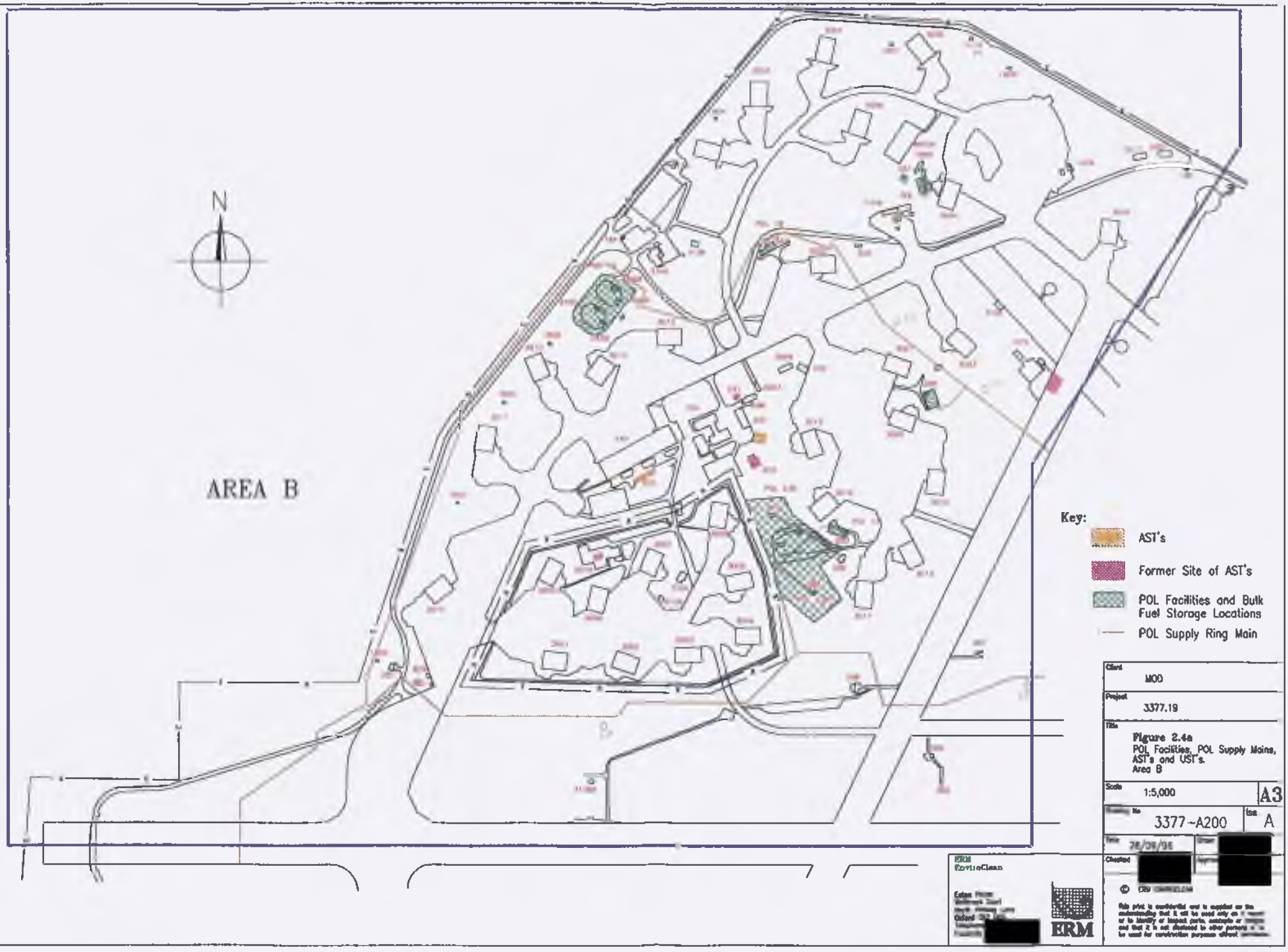

N
AREA B
Key:
AST's
Former Site of AST's
POL Facilities and Bulk Fuel Storage Locations
POL Supply Ring Main
Client
MOD
Project
3377.19
Title
Figure 2.4a
POL Facilities, POL Supply Mains, AST's and UST's.
Area B
Scale
1:5,000
A3
3377-A200
Iss
A
28/09/05
ERM

Table 2.4a ***Previously Identified Potential Sources of Contamination, 1992 and 1993***

Area	Date	Description	Status at time of ERM site visit
B	1993	Unidentified material was dumped at the POL 17 disposal facility during site operations.	No evidence of contamination.
B	1993	Oil spill on grass at POL 17. No obvious spill clean-up material located at the site. Subsequent concrete pad built to prevent direct spillage to the natural ground.	No evidence of contamination

Table 2.4b ***POL sites***

POL site	Volume (m3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 13/ Area B Fac 283	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 14/ Area B Fac 284	2x189.3 (UST) Tanks cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 15/ Area B Fac 241	Volume not known (UST)	Not known	No visual evidence of contamination.
POL 16/ Area B Fac 242	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 17/ Area B Fac 245	12x54.9 (UST) Tanks 7,8,9,10,11 cleaned and water filled. Tank 12 contained lead product but now concrete filled. Tanks 1,2,3,4,5,6 still operational.	PRODUCT WASTE	No visual evidence of contamination.
POL 23A Area B Fac 285	1x4440.5 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 23B Area B Fac 269	1x1946.6 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.

[1] In addition to the POL facilities the POL supply pipeline is partially situated within this area.

Table 2.4c *Above Ground Storage Tanks*

Building	Area	Contents/Capacity	Comments
231	B	Unknown.	Associated former plant room and potential for former AST. No visual evidence of contamination.
233	B	Unknown.	Associated former AST site (now removed). No visual evidence of contamination.
239	B	Unknown.	Associated fuel oil AST with concrete bund. No visual evidence of contamination.
253	B	2 x 15.14m3 fuel oil AST's	No visual evidence of contamination. Two adjacent former re-fuelling points observed.
1319	B	Unknown.	Former test cell and former AST (details unknown). No visual evidence of contamination.
1372	B	Unknown	Former Hush House. Site of former AST noted.

Table 2.4d *Underground Storage Tanks*

Building	Area	Contents/Capacity	Comments
234	B	UST within Squadron Building.	Fuel Oil. No visual evidence of contamination.
2010	B	2 x UST's	Details unknown. No visual evidence of contamination.

Table 2.4e *Workshops and Maintenance Facilities.*

Facility N°.	**Facility**	**Potential Contaminants**	**Observations & Comments on Contamination**
237 Area B	Maintenance Shop.	Unknown.	No visual evidence of contamination.
238 Area B	Workshop.	Unknown.	No visual evidence of contamination.
1372 Area B	Hush House.	POL, solvents, unknown.	No visual evidence of contamination

2.4.2 *Area B Pathways*

Area B is situated to the north-west of the site and is situated on the approximately level and flat plateau top. Surface water drainage is to the

south and to the east of the site and feeds to a series of oil interceptors before discharging off-site.

The potential contaminant migration pathways are considered to be the same as those identified in *Section 2.3.2* above.

2.4.3 *Area B Receptors*

As per *Section 2.2.3* above.

2.5 *SOURCE/PATHWAY/RECEPTOR: AREA C*

2.5.1 *Potential Source Areas*

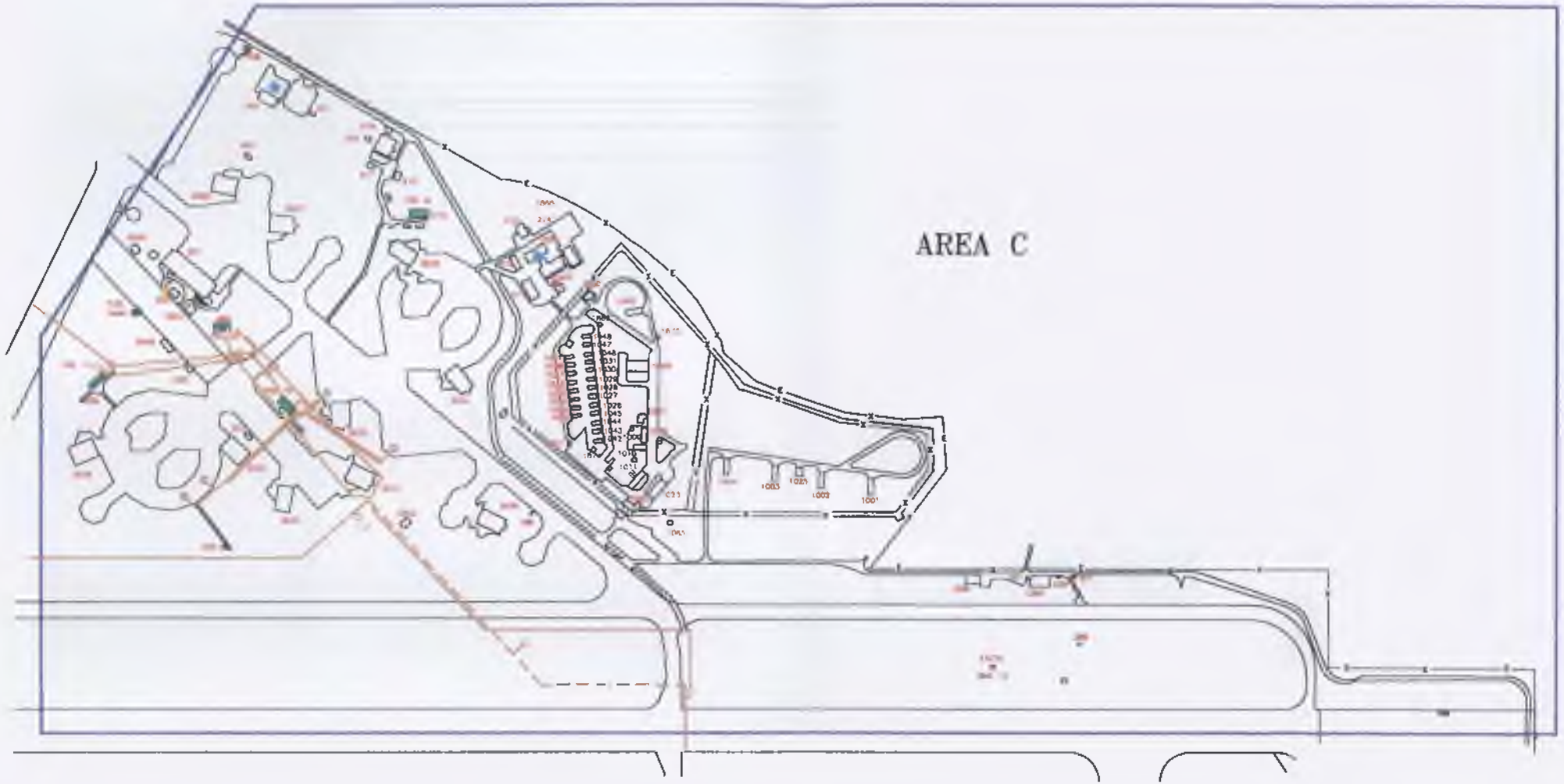
The potential source areas identified within Area C are illustrated in *Figure 2.5a*. Previously known potential sources of contamination, located within Area C are described in *Table 2.5a* below. ERM have further identified potential sources at POL sites (*Table 2.5b*), AST's and UST's (*Tables 2.5c&d*) and Engineering Workshops (*Table 2.5e*). In addition, a number of other sites were identified as potential sources of contamination, and are described in *Table 2.5f*.

Table 2.5a Previously Identified Potential Sources of Contamination, 1992 and 1993

Area	Date	Description	Status at time of ERM site visit
C	1993	North side sewage treatment facilities (Fac 214 and the WSA area) were not constantly operating. The National Rivers Authority were constantly monitoring water quality of the local water course.	Not Applicable

Table 2.5b POL sites

POL site	Volume (m^3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 9/ Area C Fac 215	2x189.3 (UST) Tanks cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 10/ Area C Fac 219	2x189.3 (UST) Tanks cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 11/ Area C Fac 229	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.



Key:

- POL Facilities and Bulk Fuel Storage Locations
- POL Supply Ring Main
- POL Supply Ring Main Re-routed from this Previous Location
- AST's
- Former Site of AST's
- UST's

ERM EnviroClean

[redacted]

ERM

Project 3377.19

Figure 2.5a
POL Facilities, POL Supply Mains, AST's and UST's.
Area C

Scale 1:5,000 Approx A3

Drawing No. 3377-A197 Iss. A

Date [redacted] Drawn [redacted]

Checked [redacted]

POL site	Volume (m^3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 22 Area C Fac 395	1x1456.8 (Semi-buried) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
Fuel Tank Area C Fac. un-named	Unknown.	Unknown	No visual evidence of contamination at this area for potential bulk storage.

[1] In addition to the POL facilities the POL supply pipelines is partially situated within this area.

Table 2.5c Above Ground Storage Tanks

Building	Area	Contents/Capacity	Comments
207	C	Unknown.	Associated former oil-fired boiler (AST possibly inside or below ground pipework). No visual signs of contamination.
255	C	Redundant 22.71m^3 diesel tank.	Redundant tank shows little visual evidence of contamination other than approximately 1cm in concrete sump of bund.
1011	C	Unknown.	Boiler house and former AST for office area.

Table 2.5d Underground Storage Tanks

Building	Area	Contents/Capacity	Comments
209	C	UST within Squadron Building.	Fuel Oil. No visual evidence of contamination.
383	C	UST within Squadron Building.	Fuel Oil. No visual evidence of contamination.

Table 2.5e Workshops and Maintenance Facilities.

Facility N°.	**Facility**	**Potential Contaminants**	**Observations & Comments on Contamination**
239 Area C	Engine Shop.	POL, Solvents Acids, Alkalis.	No Visual evidence of contamination.

Table 2.5f ***Further Potential Sources of Contamination, Area C***

Facility	Facility Use	Potential Contamination	Observed Contamination
3200	Hardened Vehicle Refuelling Shelter.	POL	No visual evidence of contamination.
3201	Hardened Vehicle Refuelling Shelter.	POL	No visual evidence of contamination.
3202	Hardened Vehicle Refuelling Shelter.	POL	No visual evidence of contamination.
3203	Hardened Vehicle Refuelling Shelter.	POL	No visual evidence of contamination.

2.5.2 Area C Pathways

Area C lies in the north-east quadrant of the site on the top and north-eastern flank of the topographical plateau area. The surface drainage path is to the east and south-east via oil interceptors before drainage off-site.

The potential contaminant migration pathways are considered to be the same as those identified in *Section* 2.3.2 above.

2.5.3 Area C Receptors

As per *Section* 2.2.3 above.

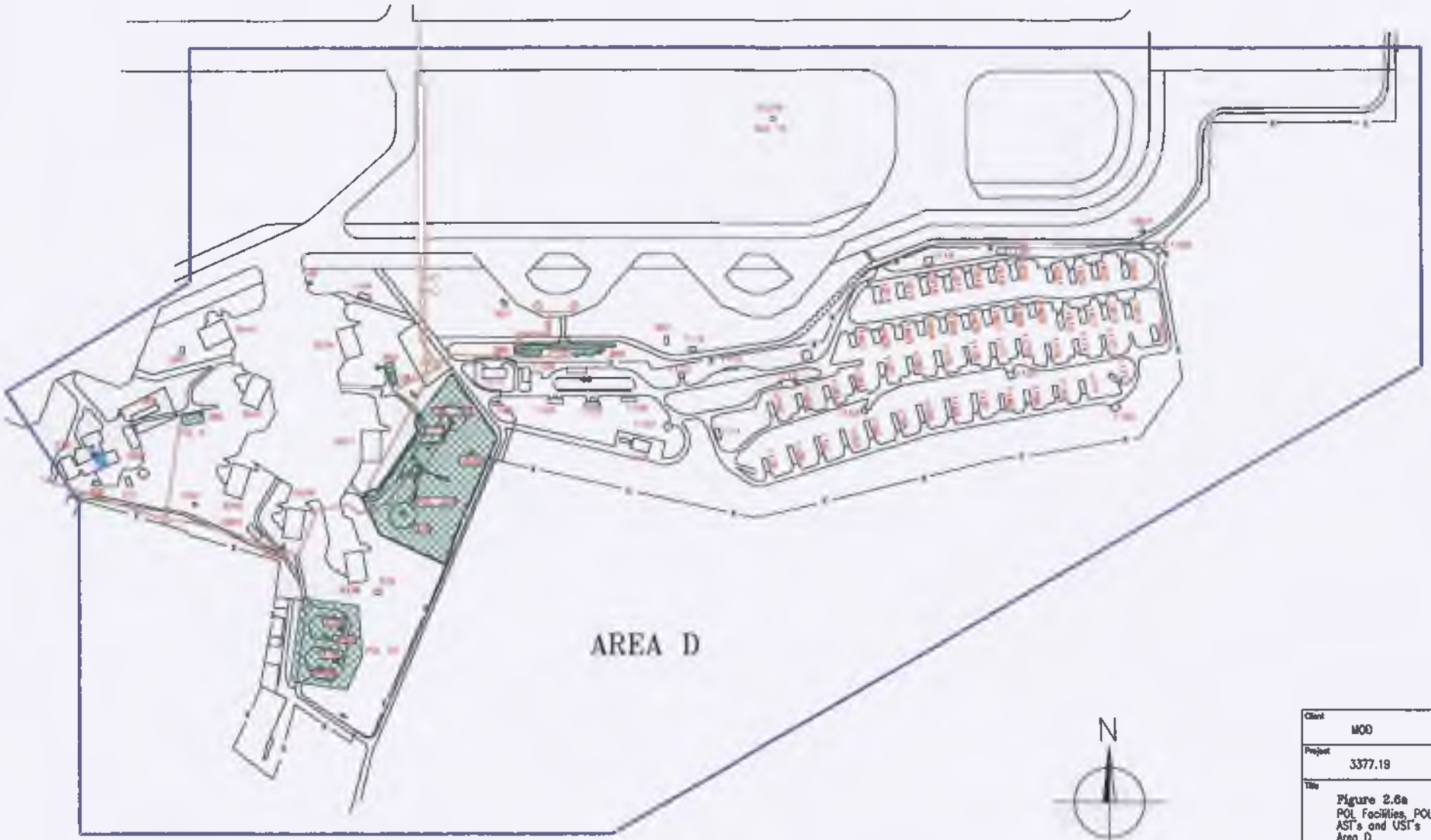
2.6 SOURCE/PATHWAY/RECEPTOR: AREA D

2.6.1 Potential Source Areas

The potential source areas identified within Area D are illustrated in *Figure 2.6a*. Based on site documentation and field observations ERM have identified potential sources at POL sites and UST's (*Tables 2.6a&b*).

Table 2.6a ***POL sites***

POL site	Volume (m3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 5/ Area D Fac 385	2x378.5 (UST) Tanks cleaned and water filled in 1993.	MOGAS	No visual evidence of contamination.
POL 6/ Area D Fac 382	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.



Key:

- POL Facilities and Bulk Fuel Storage Locations
- UST's
- POL Supply Ring Main
- POL Supply Ring Main Re-routed from this Previous Location

ERM EnviroClean

Eden House
Wallbrook Court
North [redacted] Lane
Oxford [redacted]
[redacted]

ERM

Client: MOD

Project: 3377.19

Title: Figure 2.6a
POL Facilities, POL Supply Mains, AST's and UST's
Area D

Scale: 1:5,000 A3

Drawing No: 3377-A196 Iss: A

Date: 28/09/96 Drawn: [redacted]

Checked: [redacted]

POL site	Volume (m3) and DEO Status Details, 1996	Original Contents	Comments[1] and Status at time of ERM site reconnaissance
POL 7/ Area D Fac 385	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 8/ Area D Fac 386	1x189.3 (UST) Tank cleaned and water filled in 1993.	JP-8	No visual evidence of contamination.
POL 20/ Area D Fac 375	6x56.0 (UST) 6x56.4 (UST) All tanks with the exception of 5 and 9 cleaned and water filled. Tank 5 contains MOGAS Tank 9 contains DIESEL.	DIESEL MOGAS	No visual evidence of contamination.
POL 25A Area D Fac 376	1x4507.9 (Semi-buried) Tank cleaned and water filled in 1994.	JP-8	No visual evidence of contamination.
POL 25B Area D Fac 377	1x4503.2 (Semi-buried) Tank cleaned and water filled in 1994.	JP-8	No visual evidence of contamination.

[1] In addition to the POL facilities the POL supply pipeline is partially situated within this area.

Table 2.6b ***Underground Storage Tanks***

Building	Area	Contents/Capacity	Comments
370	D	UST within Squadron Building.	Fuel Oil. No visual evidence of contamination.

Table 2.6c ***Potential Sources of Contamination***

Facility	Facility Use	Potential Contamination	Observed Contamination
Near POL 20. Heavy equipment yard	Large above ground waste site.	Many Unknown	Site removed. No visual evidence of contamination.

2.6.2 *Area D Pathways*

Area D lies to the east of the site, to the top and on the eastern flank of the plateau area. The surface drainage path is to the south-east and south via oil interceptors before drainage off-site.

The potential contaminant migration pathways are considered to be the same as those identified in *Section 2.3.2* above.

2.6.3 *Area D Receptors*

As per Section 2.2.3 above.

2.7 *SOURCE/PATHWAY RECEPTOR: AREA E*

2.7.1 *Potential Source Areas*

The potential source areas identified within Area E are illustrated in *Figure 2.7a*. Based on site documentation and field observations, ERM have identified potential sources at AST's and UST's (*Table 2.7a&b*) and in addition to these locations a number of other sites were identified as potential source of contamination, and are described in *Table 2.7c*.

Table 2.7a ***Previously Identified Potential Sources of Contamination, 1992 and 1993***

Area	Date	Description	Status at time of ERM site visit
E	1993	Dried sewage, residue from tank cleaning at the water treatment plant, was stockpiled on site.	No evidence of contamination.

Table 2.7b ***Above Ground Storage Tanks***

Building	Area	Contents/Capacity	Comments
401	E	Petroleum Volume unknown.	Between buildings 401 and 455 is one drained (May 1994) AST and a bunded area that may have formerly contained another. The associated fill points show fuel staining. Underground pipework.
441	E	Unknown	Two small, now removed AST's. No visual evidence of contamination.
492	E	0.34m^3 bunded and drained heating oil AST.	No evidence of contamination.
570	E	Small oil fuel AST; volume unknown.	Empty metal tank, bunded. No visual evidence of contamination.
826	E	Unknown.	Former boiler house with possible associated bulk storage facility for fuel oil. No visual evidence of contamination.
867	E	Fuel Oil/Capacity Unknown.	Former boiler house with three AST's for fuel oil. No visual evidence of contamination.
1368	A	Unknown.	Former Hush House. Site of former AST noted along with associated below ground pipework.

Key:

- AST's
- Former Site of AST's
- UST's
- POL Supply Ring Main

ERM EnviroClean

Eden House
Wallbrook Court
North Hinksey Lane
Oxford OX2 0QS
Telephone: [redacted]
Facsimile

ERM

Client: MOD

Project: 3377.19

Title: **Figure 2.7a**
POL Facilities, POL Supply Mains, AST's and UST's.
Area E

Scale: 1:5,000 | A3

Drawing No: 3377-A198 | Iss A

Date: 28/09/96 | Drawn: [redacted]

Checked: [redacted] | Approved: [redacted]

Table 2.7c ***Underground Storage Tanks***

Building	Area	Contents/Capacity	Comments[1]
467	E	4 x 12,000 gallon fuel oil UST's.	Former boiler house. No visual evidence of contamination.
579	E	4 x UST's and four re-fill points and an additional possible UST to rear.	As 467.
493 Petrol Station	E	8 x UST's	Former diesel and petrol supply. No visual evidence of contamination.

[1]In addition the POL supply pipeline passes through Area E.

Table 2.7d ***Further Potential Sources of Contamination, Area E***

Facility	Facility Use	Potential Contamination	Observed Contamination
408	Laundry/Dry Cleaners.	Solvents	No visual evidence of contamination.
455	Photographic Laboratory.	Metals, Solvents, Photographic developing and printing chemicals	No visual evidence of contamination.

2.8 ENVIRONMENTAL RISK ASSESSMENT

An environmental risk assessment has been completed for the site on the basis of three different potential end uses. These are:

- existing landuse/light industrial;
- housing with gardens;
- agriculture.

The results of these assessments are presented in the form of summary tables in *Annex C, Annex D* and *Annex E*, respectively. *Annex D* and *E* relate to both existing and future redevelopment uses of the site.

There are a number of potential sources of contamination that represent areas of immediate concern to the environment and these are summarised below in *Table 2.8a.*

Table 2.8a ***Potential Sources and Human/Environmental Risk***

POL site	Human Health	Groundwater	Surface Water
POL 1 Area A Fac 270	E	C	C

POL site	Human Health	Groundwater	Surface Water
POL 2 Area A Fac 254	E	C	C
POL 3 Area A Fac 274	E	C	C
POL 5 Area D Fac 385	E	C	C
POL 6 Area D Fac 382	E	C	C
POL 7 Area D Fac 385	E	C	C
POL 8 Area D Fac 386	E	C	C
POL 9 Area C Fac 215	E	C	C
POL 10 Area C Fac 219	E	C	C
POL 11 Area C Fac 229	E	C	C
POL 13 Area B Fac 283	E	C	C
POL 14 Area B Fac 284	E	C	C
POL 15 Area B Fac 241	E	C	C
POL 16 Area B Fac 242	E	C	C
POL 17 Area B Fac 245	E	C	C
POL 19 Area A Fac 614	E	C	C
POL 20 Area D Fac 375	E	C	C

POL site	Human Health	Groundwater	Surface Water
POL 21A Area A Fac 392	E	C	C
POL 21B Area A Fac 393	E	C	C
POL 21C Area A Fac 394	E	C	C
POL 22 Area C Fac 395	E	C	C
POL 23A Area B Fac 285	E	C	C
POL 23B Area B Fac 269	E	C	C
POL 24 Area A Fac 269	E	C	C
POL 25A Area D Fac 376	E	C	C
POL 25B Area D Fac 377	E	C	C
Fuel Tank Area C Fac. un-named	E	C	C
POL fuel supply pipeline	E	C	C
Former Waste Area adjacent to POL 20.	C/D	C	C
Fire Training Area A	C/D	C	C
Fuel Supply Station Fac. 493	C/D	C	C

KEY:
A: Immediate significant risk to human health
B: Immediate significant risk of damage to the environment
C: Major Remediation Liability
D: Minor Remediation Liability
E: Minor significance, no remediation required
F: No effect on re-use options or site value

2.9 *SOURCE-PATHWAY-RECEPTOR RELATIONSHIP, ASBESTOS*

From the information on the site area it was apparent that asbestos was present in several of the facilities on site. The nature and condition of the asbestos was recorded to be variable across the site at the time of the

preparation of the ESR report. In order to fully assess the full degree of risk associated within the asbestos present it is considered necessary to carry out a further, up to date, survey of the facilities. The potential exists for asbestos dust to affect human health by inhalation. The risk associated with the presence of asbestos the site cannot be assessed until an up to date survey has been carried out.

The potential sources of pollution and their associated risks to human health, and the surrounding environment have been described in *Annexes B, C & D.* From the site reconnaissance assessment of potential source areas it is apparent that the major potential threats to the environment exist from the POL facilities located across the site area, the POL supply ring main, the fire practise area and the former above ground waste area.

If contaminant sources are present within the groundmass underlying the site, the potential exists for the impaction of underlying groundwaters. Due to the nature of the groundmass and anticipated high permeabilities and flow rates within the limestone bedrock, it is considered likely that the migration of contaminants to the groundwaters and within the groundwater resource is relatively rapid. In addition, there is potential for contaminant migration from source areas to surface drains and/or migration via permeable backfill around storm drains.

Risk to human health from site contamination is only considered likely if either potentially impacted sources area are excavated during redevelopment or if surface waters and/or groundwaters potable abstractions are, or become, impacted.

As no extensive intrusive investigations have been carried out at RAF Upper Heyford, it is not currently known therefore whether considerable contamination is present within the groundmass or groundwater. The site has clearly undergone extensive surface clean-up operations since the completion of USAF aviation activities and little visual evidence of surface contamination exists. However, considering the vulnerability of the groundmass, the long term historic use of the site and the nature of the activities involved, it is recommended that investigation of the major potential sources be carried out to evaluate the presence and extent of any impaction and the implications of such impact on the divestitive/redevelopment of the site on surrounding sensitive receptors, and the liability exposure to MOD from current ownership of the site. In addition, the EA confirmed that prior to redevelopment, it would require an extensive intrusive investigation be undertaken due to the vulnerability of the groundwater within the site area, to demonstrate either the lack of impacts, or if present, their implications and the need for remedial action to protect groundwater resources.

The results of such "baseline quality" investigations will, it is envisaged, be an integral part of due diligence works carried out by prospective purchasers and will be needed to facilitate the redevelopment of the site.

From the assessment of the site topography, geology and hydrogeology it is apparent that the site is situated on a limestone plateau and surface waters and groundwaters are expected to flow down the plateau flanks towards neighbouring valleys. From a review of existing data, the water table is

observed to intersect the surface on the plateau side slopes and manifest itself as spring issues. As groundwater is likely to be the source of the spring issues, much of the assessment of the quality of groundwaters migrating off-site can be established from the analysis of spring waters.

ERM recommend sampling and quality analysis of spring and surface water drainage sources, both on the site and in close proximity to it to provide an initial indication of the presence of groundwater impact from site operations. Information on the quality of surface and spring waters migrating off-site can be quickly established from such sampling. This will highlight whether any current contamination of sensitive receptors is occurring, resulting from previous site activity and will provide guidelines for any subsequent phase of work. Should little or no evidence of contamination be observed within the springs and surface water courses, it is considered likely that the intrusive investigation can be limited to confirmation of shallow groundmass quality in and around major potential contaminant source areas (such as the POL facilities) to provide data for redevelopment purposes.

In advance of spring/surface water sampling, it is envisaged that a more detailed review of the hydraulics of the plateau area is undertaken. The objective of such a review would be to check that all likely migration pathways from the plateau had been identified. In the event that catchment areas exist that do not feed spring issues (or that as yet unidentified spring issues are suggested), the advancement and sampling of groundwater monitoring wells would be prudent to assess impacts from the site in such catchment areas. In addition, a reconnaissance visit of the spring line would be prudent to confirm the spring and surface watercourse locations.

Should the initial quality assessment indicate impaction of water resources, then it is considered likely that further groundwater investigations would be required in order to identify sources of the contamination and the extent of impact. The scope of this further investigation (if any) would be defined on completion of the quality assessment and would be presented in interim reporting.

The groundmass underlying the site is particularly 'vulnerable' to the effects of contamination, as only a thin protective soil cover overlies the limestone aquifer. In addition, potentially rapid migration of potential contamination is expected within the fissure flow controlled limestone hydraulic regime increasing the risk of impact at nearby groundwater and spring fed receptors. Therefore, at a minimum, intrusive investigation of the main POL facilities, the POL supply ring main (at least areas around major junctions and where repairs or replacements may have occurred) and the fire practise area is considered necessary in order to establish the degree of groundmass impact from former site activities, and its implications on site redevelopment.

Full quantification of the degree, type and condition of asbestos present at the site is not included within the details of the recommended further investigations below. However, full details and associated costings for an asbestos survey at the site can be provided, as required. A survey of

asbestos present and the degree of associated risk is recommended prior to any redevelopment of the site facilities.

4.1 SCOPE OF WORKS PROPOSED

The two main environmental concerns at the RAF Upper Heyford site are firstly, the actual impact site activities have had on groundwater, surface water and spring receptors down hydraulic gradient of the site, and secondly, the impact on the groundmass from previous site activities and the suitability of the site for re-development (with or without remedial action). ERM's recommended scheme of intrusive works are based upon providing initial indicators of the extent of impacts from site activities for both of these issues in focused screening level investigations carried out in parallel. The results of such investigations are designed to provide a level of initial data sufficient to assess the level of risk to off-site receptors and the implications of site activities on redevelopment.

It is recommended that the investigation should comprise of the tasks summarised below and described in more detail in this section.

Objective 1
Assessment of Groundwater, Surface Water and Spring Issues

- *Task 1 - Assessment of Spring and Surface Water Drainage Quality*
- *Task 2 - Installation of Groundwater Monitoring Wells*
- *Task 3 - Groundwater Sampling*
- *Task 4 - Hydrogeological Testing*
- *Task 5 - Reporting*

Objective 2
Assessment of On-Site, Near Surface, Contamination

- *Task 1 - Near Surface Soil and Groundwater Sampling*
- *Task 2 - Detailed Building (Asbestos) Survey*
- *Task 3 - Reporting*

Objective 1 : Impacts on Water Resources
Assessment of Groundwater, Surface Water and Spring Issues

The measurement of the groundwater, surface water and spring quality, coupled with evaluation of hydraulic parameters within the limestone aquifer will provide the necessary information for the assessment of the impact on these receptors from the activities carried out at RAF Upper Heyford. In addition, the data from the investigation will permit development of a conceptual contaminant transfer model and highlight migration pathways and likely levels of impacts.

Quality assessment of the spring issues will provide an initial indicator of the quality of the groundwaters from beneath the site. By targeting the spring discharges surrounding RAF Upper Heyford, a rapid insight into the potential for off-site contaminant migration will be available and an investigative strategy leading to remedial measures (if required) can be more clearly defined. All information on spring quality in the vicinity of the site held by the Environment Agency is included within the RAF Upper Heyford Factual Report. Spring sampling and analysis was carried out on only one occasion in March 1995 and did not include any analysis of organic contaminant concentrations. A further assessment of the spring quality is required in order to assess the continued impact (if any) of potential contaminant sources on the hydrogeological and hydrological regime.

The type of contamination present in the spring issues (if any) will enable ERM to focus clearly on probable contaminant source areas and provide ERM with information on the potential risk to off-site receptors. In addition, it is recommended that surface water samples be collected from the off-site drainage discharge points in order to confirm surface water quality.

It is proposed that repeat sampling of the eight spring locations originally sampled by the EA is carried out, in conjunction with the collection of up to fifteen surface waters samples. It is recommended that the surface water analytical suite includes the following parameters: Ionic balance, total petroleum hydrocarbons (TPH), semi-volatile organics (SVOC's), ammoniacal nitrogen and chromium concentrations and volatile organic carbon (VOC) concentrations.

In addition, analysis of ethylene glycol concentrations will be carried out on the spring samples. The degradation half-life of ethylene glycol is short so the presence of ethylene glycol in the springs would indicate on-going impact on off-site receptors from free product JP-8 contaminant source areas. If no impact on off-site receptors is noted then it is not envisaged that ethylene-glycol analysis will be required on soil or groundwater samples.

Task 2 - Installation of Groundwater Monitoring Wells

In order to further establish whether groundwater within the limestone aquifer flowing down gradient, away from the plateau, has been impacted by site activities it is recommended that a network of groundwater monitoring wells is installed around the Air Base. The analysis of groundwater samples from such wells will provide information on the presence and nature of groundwater contamination down gradient of key potential source areas identified by the LQA and will confirm the presence of potential contamination migration pathways.

As such, it is proposed that ten groundwater monitoring boreholes are installed into the limestone aquifer around the perimeter of the site and a further borehole installed towards the centre of the site in order to provide information on the groundwater quality and the flow regime. A walk-over

survey with relevant site personnel would be carried out to finalize locations prior to commencement of drilling. It is currently envisaged that borehole locations will be sited down hydraulic gradient of the main potential contaminant source areas. (see *Figure 4.1a* for provisional locations).

It is recommended that the boreholes are advanced using mist flush rotary drilling techniques. During drilling the superficial deposits should be cased off in order to isolate any perched water located within the superficial deposits during advancement through the limestone. Due to the potential for large fluctuations of groundwater level within limestone aquifers drilling should be continued to a depth of 10m below groundwater strike or to the base of the limestone unit. All wells will be screened within the limestone unit. The geological strata in each borehole should be logged by an experienced geologist to include full visual and olfactory assessments of the material encountered. Total drilling depth is anticipated to be less than 40m bgl.

The boreholes will be typically installed as follows. The installation details quoted assume depth to groundwater in the limestone is 30m.

- Approximately 0.0m-0.5m bgl; lockable, steel access cover.

- Approximately 0.0m-30.0m bgl; plain 110mm I.D. poly-propylene well casing sealed by a bentonite plug at approximately 27.5m-29.0m bgl and bentonite/cement grout to surface.

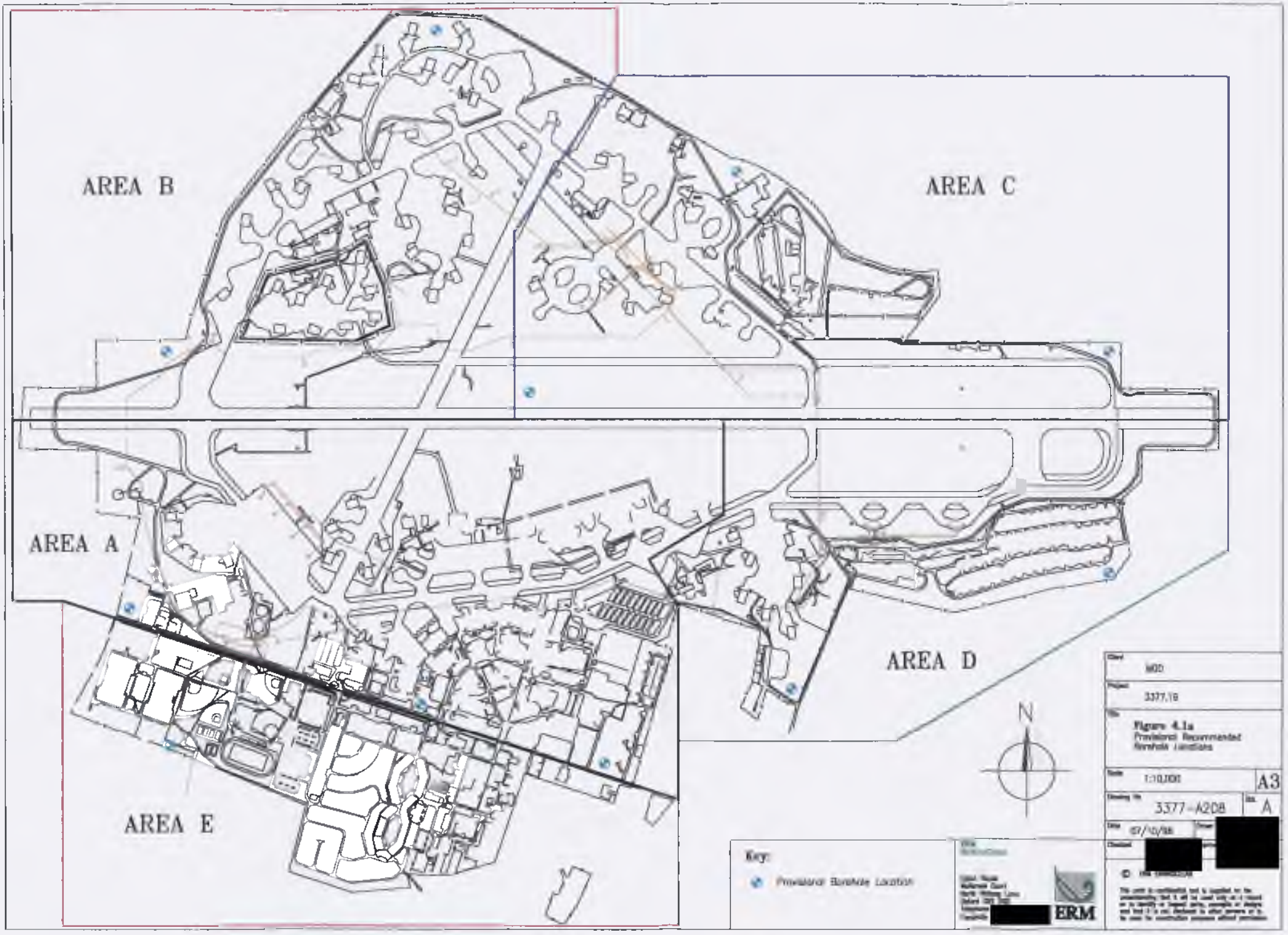
- Approximately 30.0m-<40.0m bgl; 110mm I.D. slotted, poly-propylene well casing incorporating a graded and washed sand pack to stabilise the formation, and an end cap to prevent the vertical migration of fines into the borehole.

Final installations details will depend on lithology, the thickness of the limestone unit, and the depth to groundwater in the limestone.

Following completion and development of all borehole installations, each borehole will be topographically surveyed in order to establish the spatial positioning and its elevation in relation to Ordnance Datum. This will allow comparison of geological logs and development of groundwater contour plots. The exact locations will be decided on review of the spring and surface water sampling results and with discussions between ERM and relevant site personnel.

Task 3 - Groundwater Sampling

Groundwater samples will be obtained from each of the boreholes. Prior to sampling a minimum of ten well volumes will be pumped to develop and purge the well using a submersible pump. This is to remove any remaining material introduced during drilling and enables a representative sample of groundwater to be obtained. During pumping, continuous measurement of conductivity and redox should be taken to ascertain whether a return to representative 'formation' water has been achieved. It should be assumed


AREA B
AREA C
AREA A
AREA D
AREA E
N
Key:
Provisional Borehole Location
ERM
MOD
3377.19
Figure 4.1a
Provisional Recommended
Borehole Locations
1:10,000
A3
3377-A208
A
07/10/98
[redacted]
[redacted]
[redacted]
[redacted]

that such conditions have been achieved once readings for conductivity and redox are stabilised within +/- 10%.

Sampling and decontamination procedures used in the course of the groundwater sampling are designed to allow the collection of representative samples and to minimise the potential for cross contamination between samples. The pump will be subject to decontamination between locations which will consist of:

- Manual scrub and 'pump through' with a non-phosphate soap solution.
- Rinse and 'pump through' with tap water.

All groundwater sampling will be carried out using fully decontaminated, stainless steel, bailers in order to ensure minimal volatilization of contaminants during the sampling recovery. Decontamination of the bailers between locations will be carried out as follows:

- Manual Scrub with a non-phosphate solution.
- Tap water rinse.
- 10% nitric acid rinse.
- Distilled water rinse.
- Pesticide grade methanol rinse.
- Triple rinse with distilled water.
- Air dry.

During sampling and decontamination activities, dedicated disposable latex gloves will be worn at each location to prevent transfer of contaminants from other source. Disposable equipment such as latex gloves and bailer twine will be discarded after each use.

Quality Assurance/Quality Control (QA/QC) Protocols

Groundwater samples will be immediately transferred to pre-labelled bottles, and then placed in sample coolers and stored at temperatures nominally at 4°C±2°C. As part of the overall sampling QA/QC package, 'Chain of Custody' travel documents will be completed for each sample. This will allow tracking of the samples from acquisition, through analysis, to reporting of results. These forms will be enclosed in the sample coolers shipped to the laboratory.

Task 4 - Hydrogeological Testing

This task aims to assess the permeability at the borehole locations at the site undertaking recovery tests in a number of wells. During both pumping and recovery water levels were measured using a pressure transducer and data logger.

The data obtained from the recovery tests will be analysed using rising head test methodologies outlined in *BS5930, Code of Practise for Site Investigations, 1981* and the permeability of the groundmass established.

Hydrogeological testing of these wells and analysis of springs and surface water quality will provide information on groundwater levels, aquifer permeability, the rate of groundwater flow, and assist in defining the location of potential pathways.

Following completion of the field programme the results will be presented as a factual report incorporating the following key sections:

- Site Investigation Programme - detailing the field programme and general observations.

- Environmental Setting- this section will use the results of the investigation programme to produce a detailed geological/hydrogeological assessment of the site, indicating the likely direction and the rate of groundwater migration. This will be achieved by means of potentiometric contour plots and detailed geological sections.

- Analytical Results - this section will provide a factual report of the analytical results obtained and indicate the location and extent of the key elevated parameters encountered either in spring and surface waters and/or groundwater.

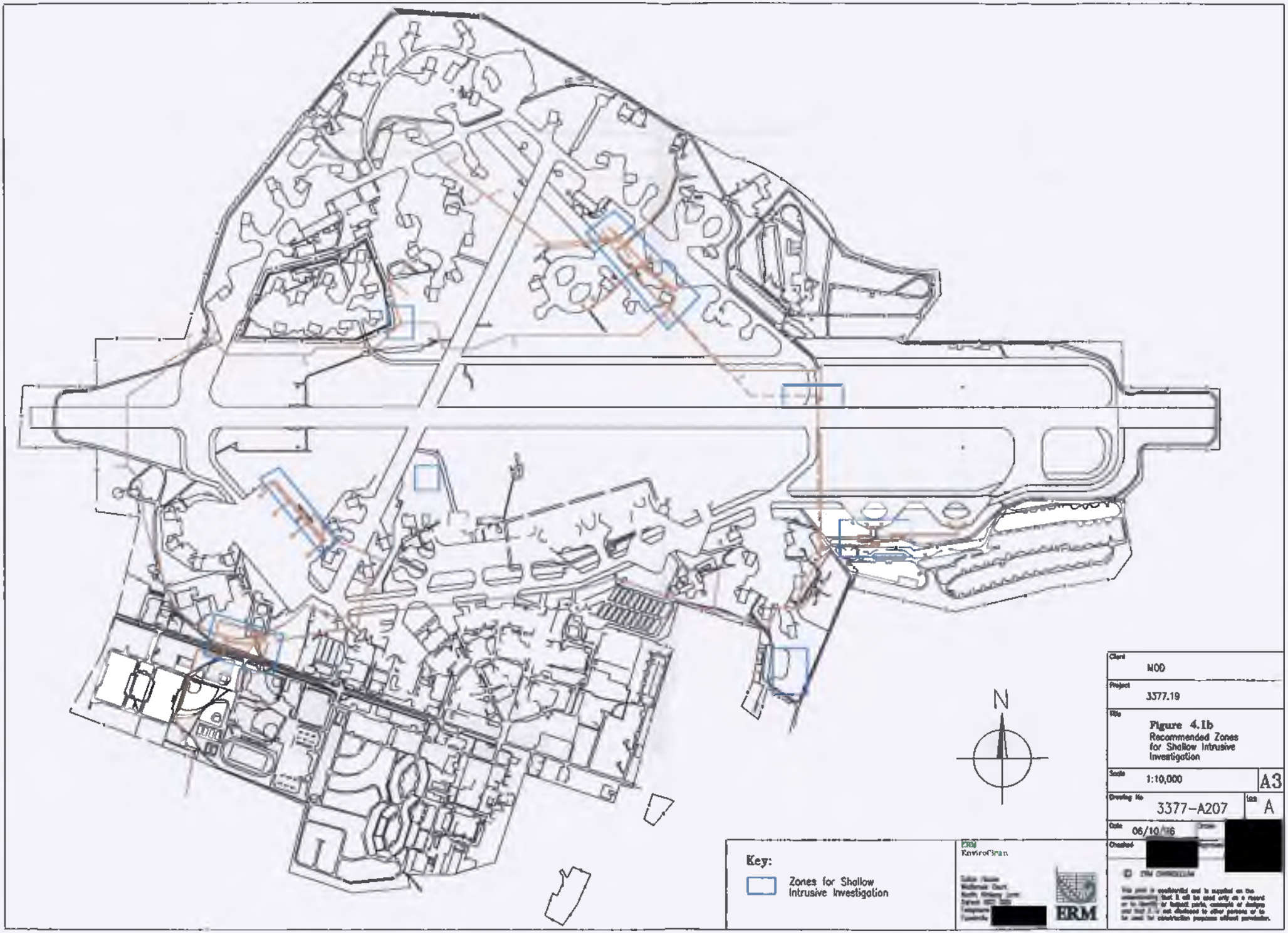
- Conclusions and Recommendations - this section will draw together the key hydrological and hydrogeological parameters relating to the site and indicate the likely longer term behaviour of the elevated compounds detected and make recommendations for any further work required.

In addition to the factual report, a summary interpretive report will be produced detailing the likely further work, including any remedial measures required, based on the results obtained. This report, as necessary, will recommend a series of options and costs, and include the implications associated with each option.

Objective 2 : Redevelopment Potential and Building (Asbestos) Assessment of On-site, Near Surface Soil Quality

RAF Upper Heyford covers a surface area of 494 hectares and as such a comprehensive assessment of soil quality across the Base is impractical in timeframe and cost terms. Therefore it is recommended that the assessment of near surface soil quality be targeted on the major areas of particular concern identified by the LQA. The site reconnaissance survey highlighted the POL facilities, the POL supply ring main, the fire practise area and the former waste storage area adjacent to POL 20 as locations on site which are considered to have a major potential impact on the groundmass.

ERM recommend that as an initial screen of on-site soil quality, a shallow intrusive survey should be carried out at the target zones as shown on *Figure 4.1b.* These zones incorporate the major valve and junction areas along the POL ring main facilities (mostly associated with the transfer of


N
Key:
Zones for Shallow Intrusive Investigation
Client
MOD
Project
3377.19
Title
Figure 4.1b
Recommended Zones for Shallow Intrusive Investigation
Scale
1:10,000
A3
Drawing No
3377-A207
Issue
A
Date
06/10/16
Drawn
Checked
ERM
EnviroStrat
ERM

fuels into POL bulk storage facilities), the fire practise area and the waste storage area.

A review of the asbestos survey (undated) contained within the ESR identified a number of key issues regarding asbestos and asbestos containing materials within remaining buildings structures. As such a more detailed asbestos survey of all key buildings is strongly recommended. This work would include the visual assessment of buildings and confirmatory sampling of building fabric where asbestos containing material is suspected.

Task 1 - Near Surface Soil Gas Survey and Soil and Groundwater Sampling

It is proposed that a soil gas survey (utilising the *Geoprobe* system) be undertaken at the eight target areas highlighted on *Figure 4.1b*. These locations are considered to be areas of increased potential risk and, as such, are the first recommended for investigation. Prior to the commencement of the investigation, further detailed discussions will be held with appropriate site personnel to ensure that the currently identified target areas truly represent the likeliest areas of contaminant concern.

It is envisaged currently that up to 20 gas survey points per area should be carried out in order to assess the potential for volatile organic/hydrocarbon impact of the shallow groundmass. The *Geoprobe* system will enable the mapping of elevated volatile compounds using a portable Photoionisation Detector (PID) which measures total volatile organic compounds (TVOC). The soil gas analysis will identify areas of volatile organic contamination, a major constituent of JP-8, the main source of potential risk to the environment and the soil gas mapping will identify areas that require further contamination.

Borings are advanced by driving hollow one metre lengths of threaded steel probes to the selected sampling depths. Dedicated detachable steel points enable the probe to be driven into the subsurface using the *Geoprobes* integral rotary, percussion, hydraulic hammer. Samples of soil gas are taken by withdrawing the probe away from the steel drive point, thereby creating a void and allowing soil gas from the surrounding groundmass to enter the probe.

The validity of the soil gas sample is checked by analysing the vacuum applied to the probe to withdraw a sample of soil gas. Should the vacuum recover rapidly to ambient conditions a breach in the integrity of the seal between the probe and the formation would be suspected and the soil gas tested for CO_2 and O_2 to ascertain whether ambient surface air had diluted the sample. A total of up to 160 locations are recommended for the screening soil gas survey and probings would be advanced to a maximum depth of 3m or refusal. Gas readings should be taken at 1m intervals.

In addition, to the soil gas survey up to 60 shallow soil borings (again utilizing the *Geoprobe* system) should be advanced to a depth of 3m or refusal and soil cores recovered and geologically logged. The location of the soil borings will be dependant of the results of the soil gas survey within the

target areas and locations displaying elevated volatile gas concentrations would be investigated. One to two soil samples should be taken per hole (to a maximum 120) with the sample depth dependant on the field screening and visual and olfactory evidence of contamination observed during drilling. These soil samples would be analysed in the field with *Hanby* test kits to establish benzene, toluene, ethyl-benzene and xylene (BTEX) concentrations within the groundmass.

It is considered likely that the number of soil samples required to fully classify the soil quality in areas identified from the soil gas survey will be 20. However, provision for up to 40 soil samples has been made in the costings in order to cover the possibility of extensive soil mass contamination. Exact numbers of soil samples required will be decided on-site from the results of the initial screening by the *EnviroClean* field specialist.

Up to 40 samples will therefore be sent for laboratory analysis for VOC's, SVOC's, TPH, and chromium (fuel additive). The BTEX compounds are included within this sampling suite. Ethylene glycol is present as a further additive within JP-8, although due to fast degradation rates it is felt that there is no longer any requirement for concentration analysis to be carried out (as no JP-8 has been stored at the site for some time). On other significant JP-8 additive is chromium, and this has been included in the analytical programme.

During the shallow soil boring investigation it is recommended that where groundwater is observed within the shallow groundmass, a sample be recovered for analysis. It is, therefore, anticipated that up to 60 groundwater samples would be collected and sent for the following suite: ionic balance, VOC's, SVOC's, TPH, ammoniacal nitrogen and ethylene glycol analysis.

Task 2 - Building (Asbestos) Survey

It is proposed that an up to date detailed building asbestos survey be conducted in all main buildings with confirmatory sampling where asbestos containing material is suspected (up to 1000 samples). As any redevelopment plans are likely to include some renovation works and possible demolition of structures we consider that a detailed survey of this stage will provide invaluable information to facilitate the costs required to make safe any asbestos containing materials prior to renovation/demolition.

Task 3 - Reporting

Following the completion of the shallow groundmass the groundwater investigation a factual report covering the shallow site investigation and will incorporate the following key sections:

- Site Investigation Programme - detailing the field programme, methodologies and observations.

- Environmental Setting - the results of the investigation programme will be utilised to provide a detailed geological and hydrogeological assessment of

the shallow groundmass and to assess shallow, perched, groundwater systems. In addition, the result of visual and olfactory evidence will be presented.

- Analytical Results - factual assessment of the analytical parameters obtained from the soil gas survey, soil and groundwater sampling will be presented. Comparison with current soil and water concentration guidelines will be carried out.

- Conclusions and Recommendations - this section will draw together the key parameters relating to the site and indicate the likely longer term behaviour of the elevated compounds detected in the soil and shallow groundwater and make recommendations for any further work required.,

In addition to the factual reports a summary interpretive report will be produced detailing the likely further work, including any remedial measure required, based on the results obtained. This report, as necessary will recommend a series of options and costs, and include the implications associated with each option. Assessment of the environmental suitability of the site for re-development will also be carried out.

4.2 *COSTS AND TIMESCALES*

The proposed costs estimate for the above recommended option are presented as *Table 4.2a*. A breakdown of the proposed soil and water sample analytical schedule and costs are presented as *Table 4.2b*. The costs for each task have been estimated separately and include ERM labour, expenses, travel, subcontractors and laboratory costs. Care has been taken to ensure all costs are at competitive market rates. **All costs are exclusive of VAT.**

The proposed timescale is included as *Annex F*. The timescale for the recommended Phase II option has been designed to minimise downtime, and to allow the safe and steady progression of the investigation.

It is envisaged that both investigations will run concurrently. Reporting will commence once all the intrusive investigations have been completed and field data validated.

Table 4.2a Proposed Costs for the Recommended Phase II Option

Objective 1

Task 1 - Spring and Surface Water Drainage Quality Report

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Field Technician	*hour*	*35*	*52.5*	*1837.5*
Expenses	*day*	*59.3*	*6*	*355.8*
Car Hire/Fuel	*day*	*25*	*6*	*150*
Contract Lab Analyses				
Spring Waters	*No.*	*350*	*8*	*2800*
Surface Waters	*No.*	*220*	*15*	*3300*
			sub-total	*8443.30*

Task 2 - Installation of Groundwater Monitoring Wells

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Walk Over Survey				
*Geologist **	*hour*	*35*	*15*	*525*
Investigation				
Geologist	*hour*	*55*	*300*	*16500*
Drilling	*No.*	*30000*	*1*	*30000*
Expenses	*day*	*59.3*	*40*	*2372*
Car Hire/Fuel	*day*	*25*	*40*	*1000*
Surveyors	*No.*	*1100*	*1*	*1100*
			sub-total	*51497*

** Based on 2 people supervising 2 rigs on a time and expenses basis up to a maximum 4 weeks on-site for this task.*

Task 3 - Well Development and Groundwater Sampling

Item	*Unit*	*Unit Cost*	*Number*	*Total*
*Field Technician***	*hour*	*35*	*37.5*	*1312.5*
Hydrogeologist	*hour*	*55*	*37.5*	*2062.5*
Pump	*day*	*30*	*5*	*150*
Generator	*day*	*12*	*5*	*60*
Filters	*-*	*8*	*11*	*88*
Decon Chemicals	*-*	*223*	*1*	*223*
Consumables	*-*	*122*	*1*	*122*
pH meter	*day*	*10*	*5*	*50*
EC meter	*day*	*10*	*5*	*50*
Dip meter	*day*	*5*	*5*	*25*
Expenses	*day*	*59.3*	*10*	*593*
Car Hire/Fuel	*day*	*25*	*5*	*125*
Groundwater Analysis	*No.*	*370*	*11*	*4070*
			sub-total	*8931*

*** Two people are required on-site in order to install and operate pumps and carry out sampling*

Task 4 - Hydraulic Testing

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Hydrogeologist	*hour*	*55*	*30*	*1650*
Expenses	*day*	*59.3*	*4*	*237.2*
Loggers/Equipment	*day*	*65*	*4*	*260*
Car Hire	*day*	*25*	*4*	*100*
			sub-total	*2247.20*

Task 5 - Reporting

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Researcher	*hour*	*35*	*100*	*3500*
Consultant	*hour*	*55*	*80*	*4400*
Tech Director	*hour*	*70*	*22.5*	*1575*
Director	*hour*	*90*	*7.5*	*675*
			sub-total	*10150*

Objective 2

Task 1 - Near Surface Soil and Groundwater Sampling

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Walk Over Survey				
Geologist	*hour*	*35*	*15*	*525*
Investigation				
Field Technician	*hour*	*20*	*140*	*2800*
Geologist	*hour*	*55*	*140*	*7700*
Expenses	*day*	*59.3*	*36*	*2134.8*
Car Hire/Fuel	*day*	*25*	*20*	*500*
Geoprobe Hire	*week*	*1500*	*3.5*	*5250*
BTEX Hanby Test Kits	*No.*	*25*	*120*	*3000*
Cutting Shoes	*No.*	*6*	*80*	*480*
Liners	*metre*	*3.5*	*240*	*840*
Fuel	*week*	*50*	*3.5*	*175*
PID	*week*	*225*	*3.5*	*787.5*
CAT	*day*	*10*	*18*	*180*
Corers	*No.*	*20*	*40*	*800*
Soil Analysis	*No.*	*260*	*40*	*10400*
Groundwater Analysis	*No.*	*280*	*60*	*16800*
			sub-total	*52372.30*

Task 2 - Detailed Building Asbestos Survey

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Consultant	*hour*	*55*	*262.5*	*14437.5*
Technician	*hour*	*35*	*262.5*	*9187.5*
Car Hire	*day*	*25*	*20*	*500*
Day Subsistence	*day*	*9.3*	*40*	*372*
Equipment	*day*	*50*	*20*	*1000*
Building Masonry/Asbestos Analysis	*sum*	*22.50*	*1000*	*22500*
			sub-total	*47997*

Task 3 - Reporting

Item	*Unit*	*Unit Cost*	*Number*	*Total*
Researcher	*hour*	*35*	*112.5*	*3937.5*
Consultant	*hour*	*55*	*112.5*	*6187.5*
Tech Director	*hour*	*70*	*50*	*3500*
Director	*hour*	*90*	*20*	*1800*
			sub-total	*15425*

Project Management

PM during field work	*hour*	*55*	*22.5*	*1237.5*
Consultant (Project Manager)	*hour*	*55*	*15*	*825*
QA/QC (Project Manager)	*hour*	*55*	*67.5*	*3712.5*
QA/QC (Project Director)	*hour*	*70*	*22.5*	*1575*
Technician Mobilization	*hour*	*35*	*7.5*	*262.5*
Technician Demobilization	*hour*	*35*	*15*	*525*
PM during mobilzation	*hour*	*55*	*15*	*825*
Couriers	*sum*	*700*	*1*	*700*
Invoicing	*hour*	*35*	*7.5*	*262.5*
PM Meeting	*hour*	*35*	*7.5*	*262.5*
PD Meeting	*hour*	*70*	*7.5*	*525*
Expenses	*day*	*30*	*3*	*90*
			sub-total	*10802.50*

GRAND TOTAL (£ excl. VAT)	***207,865.30***

Table 4.2b Analytical Schedule

Parameter	*Ionic Balance*	*pH*	*SVOC's*	*VOC's*	*TPH*	*chromium*	*Ammoniacal Nitrogen*	*Target Metals*	*Ethylene Glycol*	*Nitrate, Sulphate, Chloride*	*Cyanide*	*Unit Cost (£)*	*Total Cost (£)*
Springs	*8*	*8*	*8*	*8*	*8*	*8*	*8*		*8*			*350*	*2,240*
Surface Waters	*15*	*15*	*15*		*15*	*15*	*15*					*220*	*3,300*
Groundwaters (Deep)	*11*	*11*	*11*	*11*	*11*	*11*	*11*	*11*		*11*	*11*	*370*	*4,070*
Soils	*40*		*40*	*40*	*40*	*40*						*260*	*10,400*
Groundwaters (Shallow)	*60*	*60*	*60*	*60*	*60*	*60*	*60*					*280*	*16,800*
												Total (excl. VAT)	*36,810*

Annex A

Technical Brief

MINISTRY OF DEFENCE

DEFENCE ESTATE ORGANISATION (WORKS)

RAF UPPER HEYFORD

LAND QUALITY ASSESSMENT

PHASE ONE: DESK STUDY

Project No. 07686

CONSULTANT'S DIRECTIVE

Client's Representative:

[redacted]
Infrastructure & Organisation Branch - Infra C3a
RAF Benson, Wallingford
Oxon OX10 6AA

DEO(W) Officer:

[redacted] Environmental Engineer
Defence Estate Organisation (Works)
Blakemore Drive
Sutton Coldfield
W Midlands
B75 7RL

Date: 5 August 1996
DEO Project Ref: 07686
Clients Ref:

LAND QUALITY ASSESSMENT: PHASE ONE - DESK STUDY

RAF UPPER HEYFORD

CONTENTS

LAND QUALITY ASSESSMENT: PHASE ONE - DESK STUDY

RAF UPPER HEYFORD

BACKGROUND

1. RAF UPPER HEYFORD is no longer be required by the MOD and in order to release the sites for sale the MOD needs to know more details of the land quality on the site and the health & environmental risk that any contamination may present in association with changing the use of the land.

2. MOD propose to achieve this by undertaking a phased investigation of the site as described in DWS Technical Bulletin 95/28 entitled Land Quality Assessment Management Guide. Phase One comprises a Desk Study assessment and site reconnaissance. Phase Two will only proceed if a requirement is identified at Phase One and it may include intrusive physical investigation of the site using trial excavations and boreholes. This Directive initiates the Phase One study.

3. The reports which result from this study (the Land Quality Assessment and Statement (LQA and LQS)) will be used by MOD's selling agent and as such may be relied upon by purchasers.

LOCATION

4 RAF UPPER HEYFORD is located at the following address:

RAF UPPER HEYFORD

A site location plan is (to be) provided in Annex A

ADDITIONAL INFORMATION

5 MOD held information pertinent to the study is available through the Site Liaison Officer and may include:-

- USAF Environmental Status Report
- Plans, maps and technical/process drawings (all available dates).
- Deeds and other estate records.
- Existing aerial and other photographs.
- Records/files detailing former and current uses/activities on the site.
- Anecdotal evidence from former and present employees.

PROJECT OBJECTIVE

6 The objectives of the study are to provide information, in the form of reports, relating to the environmental quality of the ground conditions present on the establishment. Information should also be gathered relating to the potential for future ground contamination occurring as a result of demolition of the existing buildings. Assessment is to be made of the potential health and environmental risks at the site and the degree of confidence in the assessment. If this assessment shows that further work is required then outlines of a follow up sampling and analysis regime should be designed in order to allow prediction of risks with reasonable confidence.

SCOPE OF THE WORKS

7 The assessment comprises a Phase One Land Quality Assessment relating to the whole of the RAF UPPER HEYFORD establishment as shown on the Site Plan and also its interaction with neighbouring land.

8 The scope of work includes an option study relating to future management of the land and buildings, financial and environmental risk assessments and the design of a phase two LQA if required as a result of the risk assessment.

9 The scope of work also includes the provision of Collateral Warranties.

REQUIREMENTS OF THE STUDY

HAZARD ASSESSMENT

10 Before entry is made to the site, the Consultant should make an assessment to ensure that adequate Health and Safety safeguards are employed by his personnel at all times.

RECONNAISSANCE

11 An initial walk over reconnaissance of the site should be undertaken by the Consultant in order to gain an understanding of the establishment and all matters pertaining to the Land Quality Assessment This is likely to include an appraisal of the site infrastructure, drainage, services and site operating procedures past and present. Any environmental issues requiring urgent attention should be reported immediately.

12. Information should also be gathered relating to the potential for future ground contamination occurring as a result of any demolition or re-furbishment of the existing buildings.

DESK STUDY

13 The Consultant should collect and appraise all relevant desk based information on the site to enable assessment of all previous uses and misuses of the site, the potential for contamination to exist and the susceptibility of the site to the migration of contaminants. This should include a radiological risk assessment undertaken in conjunction with the Defence Radiological Protection Service (DRPS).

COLLATERAL WARRANTY

14 The Land Quality Assessment and Statement (LQA and LQS) produced under this directive will be used by MOD's selling agent and may be relied upon by purchasers. The Consultant shall therefore provide a Collateral Warranty, acceptable to MOD, regarding their professional work. The Warranty must be assignable to purchasers and their funders as required.

PRESENTATION OF INFORMATION

15 Information from the Investigation should be provided by way of three separate reports . The first report; The Land Quality Assessment (LQA) Factual Report, should comprise the factual information and other evidence gathered relating to the environmental quality of the site. The second report; The LQA Interpretive Report, should comprise interpretation and opinions on liability, costs, remediation and disposal options. It should include the Land Quality Statement, the Environmental Risk Assessment and an Option Study into future handling of the site. The third report; The Land Quality Statement, should comprise a short non-technical summary of the environmental condition of the site.

FACTUAL REPORT

16 Typical information to be presented within the desk study Factual Report will include:-

A General

- All information considered relevant by the Consultant

B. MOD usage of the site including:

- EOD Clearance reports
- Plans indicating the site boundary, site area and building locations past and present
- Locations of dumping areas including official, unofficial and anecdotal reports
- Description of the uses of the site past and present including individual building usage, Petrol, Oil and Lubricant areas, Military Transport areas, chemical stores, workshops, transformers, boilers, cleaning equipment etc
- Plans showing past and present drainage and sewerage arrangements including any soakaways and oil

traps etc
- Usage of burning grounds
- Asbestos Register
- COSHH Register
- Records which may detail any spills etc or statements saying records have been carefully checked and no instances recorded etc.
- Records of previous Site Investigations or contamination remediation
- Interviews with long standing staff giving job titles (not names), work histories and knowledge of processes / past incidents
- Records from museums and historical information held centrally

C Pre MOD history of the site including:

- Previous editions of OS Maps showing the history of the site back to "green field" status.
- Details of the location and history of any previous industrial usage of the site
- Council records of any waste disposal or similar activities taking place on or near the site.
- British Geological Survey plans and borehole records indicating the geology and hydro-geology of the site.
- Environment Agency records

D Neighbouring land use including:

- Any land use past or present which may have polluted the site or vice-versa.

INTERPRETIVE REPORT

17 The information gathered as a result of the above work should be interpreted to develop a contamination model of the site which gives a clear indication of the areas where there is the potential for contamination to exist and those areas likely to be clean.

Environmental Risk Assessment

18 The Consultant should incorporate into the study an Environmental Risk Assessment. This should consider individual potential pollutants and their potential hazards, pathways and receptors for different types of afteruse. The key objective is to identify issues which may lead to significant harm or a significant possibility of such harm or pollution or likely pollution of controlled waters. Hence all areas of potential contamination should be prioritised in terms of health and environmental risk. This information should be shown on a clear plan and related to a summary table as outlined in Annex B.

19 Not used.

Options and Recommendations For Further Work

20 The study should include an assessment of the options for how to proceed and the potential consequences of each option.

Options will include:

. All options considered potentially valuable by the Consultant
. Do nothing / minimum
. Undertake a risk management based or phased investigation
. Undertake an extended or single pass intrusive investigation

21 Potential consequences shall include the effects on:

. All factors considered important by the Consultant
. Timescale

- Cost
- Disruption of the site
- Risk and liability
- Future development proposals

22 A recommended option should be identified together with specific reasons for the recommendation.

23 Where the Environmental Significance is considered to be high then recommendations should be made regarding any remediation required to meet different types of land use. This should include outline costs and timescales of any remediation for each scenario.

Recommended Option

24 Where the recommended option includes elements of physical ground investigation the Consultant should provide outline proposals for a sampling and analysis regime, together with an outline description of the procedures to be followed. The Consultant should consider and suggest the location of trial holes and other investigation techniques, identifying them on a plan and schedule, and obtain preliminary agreement from the Property Manager, to ensure no hazards or services exist in the immediate vicinity.

25 The report should include details of the aims of the follow-up investigation, showing clearly for each option how the investigation locations relate to the findings of the environmental risk assessment. A rough order of costs for the physical site investigation should be given, identifying the individual costs of excavation, reinstatement, sampling and appropriate analysis. A programme for the works should also be included.

26 The proposed excavation and sampling regime should employ industry's best practice for investigation, sample extraction and preservation. Laboratory analysis should be planned to be undertaken by laboratories with appropriate NAMAS or similar accreditation.

27 The objective if proposing a physical (Phase Two) investigation is to undertake any investigation on a logical and rational basis to enable the maximum value to be drawn from the information obtained in order to achieve economy in the expenditure of resources and confidence in the end result.

28 Conversely, the evidence may suggest that the site is unlikely to be contaminated, or if contaminated, not significantly so. In this case further investigation may be un-warranted or limited to low-density sampling and analysis to confirm the Desk Study conclusions.

29 The report should conclude with discussion and recommendations relating to the contaminated land issues and the most appropriate way to release the site from MOD ownership.

Financial Appraisal

30 A reliable Order of Cost Estimate (OCE) is required for each option, and shall be carried out in accordance with DWS Technical Bulletin 6/94, entitled Order of Cost Estimates, dated February 1994. Costs are to be current quarter price levels without inflation and the relevant cost index and its source should be quoted. VAT and fees should be itemised clearly. The OCE should include a Financial Risk Analysis, carried out and presented in accordance with DWS Technical Bulletin 7/94, entitled Estimating using Risk Analysis, dated February 1994. Costs for both "Average Risk" and "Maximum Likely Risk" cases are required and full details of the risks and their individual contribution to the risk element shall be identified in the Report.

LAND QUALITY STATEMENT

31 The model developed above should be used to form the basis for an Environmental Land Quality Statement. This statement should summarize in layman's terms the environmental condition of the site, its suitability for re-use and the effects of any contamination on development potential. It should also include a summary of the sources of information together with a site boundary plan and other useful summary plans. The LQS should also form the basis for an executive summary within the main interpretative report.

LIMITATIONS AND STANDARDS

CONSTRAINTS

32 The following constraints must be taken into consideration:-

a. Prior to any work commencing on site, a Method Statement is to be provided for approval by the Client, in consultation with the Water and Environmental Engineering Branch of Defence Estate Organisation (Works). Health and safety aspects are to be addressed at all stages of the work.
b. Any investigations must be undertaken at such times and in such a manner as to avoid disruption to routine operation and maintenance of the Site.
c. A photographic pass for the site will be required before photographs of the site are taken.
d. Although the reconnaissance will take place mainly within the establishment's boundary it shall be undertaken in such a manner as to avoid concern to the general public. In the event of any approach by the press or broadcasting media they are to be referred immediately to the Property Manager and no comment whatsoever shall be made.

CONTACT WITH THE ENVIRONMENT AGENCY / SCOTTISH ENVIRONMENTAL PROTECTION AGENCY

33 Any contact with the Environment Agency or the Scottish Environmental Protection Agency must be made only after receiving the written approval of the Water and Environmental Engineering Branch of Defence Estate Organisation (Works).

HEALTH AND SAFETY

34 All members of the study team are to be suitably briefed and a written Method Statement shall be required before any site work is undertaken. All MOD regulations and instructions concerning safe working procedures shall be rigorously adhered to.

35 Recommendations made shall comply fully with all relevant Health and Safety Legislation.

36 The Study shall identify any special health and safety hazards which should be considered when operating on the Site.

DELIVERABLES

TIMESCALE

37 4no. copies of the First Draft Land Quality Assessment Factual, Interpretive and Land Quality Statement reports are to be delivered by 16 September, for discussion at a meeting to be arranged. The target for issue of the final Desk Study Reports is 10 working days following the above meeting.

DISTRIBUTION

38 8 no. copies of the Final Land Quality Assessment and Land Quality Statement Reports are to be delivered to the Task Officer.

FORMAT OF REPORTS

39 The format of the report for this Land Quality Assessment is to conform with the DEO(W) "Standard Framework", attached at Annex C. When the DEO(W) Task Officer is satisfied that this commission has been completed, the Report is to be signed by both the Consultant and the Task Officer.

ADMINISTRATION OF THE STUDY

SECURITY

40 This assessment is classified as RESTRICTED - COMMERCIAL. The Factual Report and the Land Quality Statement are however unrestricted but should only be discussed with staff nominated by the Client's Representative. Each page of the Interpretative report should be marked RESTRICTED - COMMERCIAL.

41 The names of individual MOD staff connected with this project should not appear within the body of the report but should instead be provided in a letter to accompany the report. It is acceptable for post titles to be mentioned within the main text of the report.

ACCESS

42 Entry to RAF UPPER HEYFORD is strictly controlled, and all personnel requiring repeated access must be in possession of MOD Security Clearance.

43 When the Consultant wishes to visit the Site all study team members are required to obtain visitor's passes for each visit, notwithstanding any security clearances already held, and to give prior notice of intended visits to the Site Liaison Officer.

POINTS OF CONTACT

44 Details of the MOD staff connected with this project, their duties and their responsibilities will be provided in an accompanying letter.

LOCATION PLAN FOR RAF UPPER HEYFORD

LAND QUALITY ASSESSMENT: ENVIRONMENTAL RISK ASSESSMENT: SUMMARY TABLE

AREA / BUILDING	POTENTIAL POLLUTANT	POTENTIAL RECEPTORS	POTENTIAL PATHWAYS TO RECEPTOR	ASSOCIATED HAZARD	RISK (LIKELIHOOD) OF OCCURRENCE	POTENTIAL SIGNIFICANCE
		(specific to pollutant)	(specific to pollutant)	(specific to pollutant)	Certain High Medium Low Very Low Negligible	e.g A: Immediate significant risk of health hazard occurring B: Immediate significant risk of unacceptable damage to environment C: Large Remediation liability D: Minor Remediation liability E: Minor significance, no remediation required F: No effect on re-use options or site value

REPORT - STANDARD FRAMEWORK

1. **Content**

a. Terms of Reference A copy of the Client's written instruction to DEO(W) to carry out an Investigatory Study should be included, along with the scope of the Study.

b. Background Brief details of the site, or sites, giving location(s), MOD. unit, any environmental constraints, including details of any historical listings, any anticipated geotechnical problems and any operational, time or security needs stipulated by the Client. Where the aspects can be more clearly shown in the drawn form then drawings and/or diagrams should be included.

c. Summary of Options A very brief comparison of advantages and disadvantages of each option considered presented on one page, including the cost.

d. Conclusion and Recommendation Giving clear cut recommendations. the option preferred and the operational and economic advantages (including timescales) that justify the recommendation(s).

e. Options Each option dealt with in depth, including the costs and the contractual approach (if any) inherent in each option. Drawings sufficient to explain the option(s) to those unfamiliar with the site should be included.

2. **Face Sheet**

This should contain:

a. DEO(W) title "DEFENCE ESTATE ORGANISATION (WORKS)" centred at the top of the sheet.

b. Name and address of the relevant DEO(W) office in the bottom left hand corner of the sheet.

c. Title as shown on the Directive in the centre of the sheet, with the Project No immediately below.

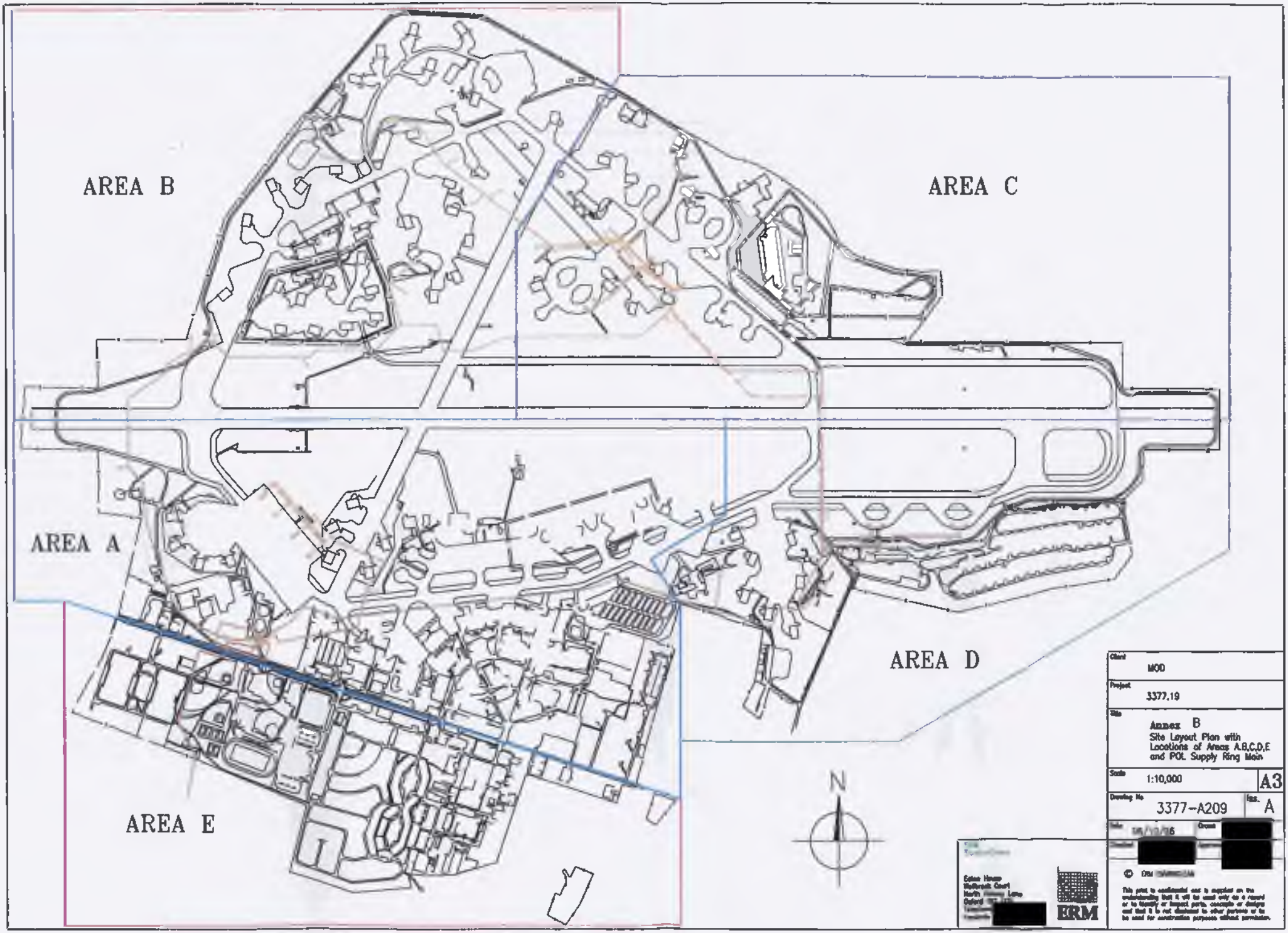
d. The legend "Prepared by (the Consultant's name) for the Ministry of Defence, Defence Estate Organisation (Works), under commission (number)" in the bottom right hand corner of the sheet along with the month and year in which the Study was produced.

3. **Size**

This should always be A4 vertical format, but may contain folded A3 or larger sized sheets in clear A4 pocket inserts in the case of the Summary of Options and drawings.

Annex B

Site Index



Client: MOD

Project: 3377.19

Title: Annex B
Site Layout Plan with Locations of Areas A,B,C,D,E and POL Supply Ring Main

Scale: 1:10,000 A3

Drawing No: 3377-A209 Iss. A

Date: [redacted] Drawn: [redacted]

Checked: [redacted] Approved: [redacted]

ERM

[redacted]

Annex C

Environmental Risk Assessment - Existing Use

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
POL 1	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 270	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 2	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 254	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 3	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 274	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 5	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 385	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 6	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 382	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 7	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 385	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 8	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 386	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 9	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 215	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 10	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 219	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	Potential Pollutant	Potential Receptors	Potential Pathways	Associated Hazard	Risk of Occurrence	Potential Significance
	polycarboxylic acids					
POL 11 Area C Fac. 229	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Low	C C E
POL 13 Area B Fac. 283	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Low	C C E
POL 14 Area B Fac. 284	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Low	C C E
POL 15 Area B Fac. 241	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Low	C C E
POL 16	BTEX, hydrocarbons	Surface Water	Drains, streams,	Teratogen, carcinogen	Medium	C

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 242	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 17	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 245	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 19	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 614	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 20	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 375	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 21A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 392	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
POL 21B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 393	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 21C	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 394	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 22	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 395	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 23A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 285	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 23B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	***Potential Pollutant***	*Potential Receptors*	***Potential Pathways***	*Associated Hazard*	*Risk of Occurrence*	***Potential Significance***
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 281	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 24	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 269	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 25A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 270	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 25B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 377	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
Fuel Tank	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. un-named	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	Potential Pollutant	Potential Receptors	Potential Pathways	Associated Hazard	Risk of Occurrence	Potential Significance
	polycarboxylic acids					
AST(s) *Area A* *Fac. 32*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Low* *Low* *Low*	*E* *E* *E*
AST(s) *Area A* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Low* *Low* *Low*	*E* *E* *E*
AST(s) *Area A* *100m north of* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Low* *Low* *Low*	*E* *E* *E*
AST(s) *Area A* *Fac. 77*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Low* *Low* *Low*	*E* *E* *E*
AST(s) *Area A* *Fac. 78*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Low* *Low* *Low*	*E* *E* *E*

Area	***Potential Pollutant***	***Potential Receptors***	***Potential Pathways***	***Associated Hazard***	***Risk of Occurrence***	***Potential Significance***
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 80		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 81		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 85		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 86		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 101		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Fac. 106		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 114		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 151		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 207		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 231		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 233		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 239		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 250		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 253		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 255		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 288		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 299		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 301		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 313		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 320		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 326		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 335		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 338		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 345		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 350		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 354		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 401		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			

Area	***Potential Pollutant***	*Potential Receptors*	***Potential Pathways***	*Associated Hazard*	*Risk of Occurrence*	***Potential Significance***
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 441		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 492		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 570		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 826		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 827		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Fac. 1011		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 1319		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 1368		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 1372		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 1443		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 1403		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Low*	*E*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Low*	*E*
Fac. 3043		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 69		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 88		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 103		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 126		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 131		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 198		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 209		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 234		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 268		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*E*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 299		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A	*glycol's, Urea*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 346		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area D		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 370		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 383		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 467		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 579		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*E*
			Inhalation, Ingestion			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
UST(s) *Area E* *Fac. 493* *Fuel Station*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
UST(s) *Area B* *Fac. 2010*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
Car Wash Facility *Area A* *Fac. 38*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid waste and lead and detergents*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
Auto Hobby Shop *Area A* *Fac. 38*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
Hazard Store *Area A* *Fac. 156*	*Unknown*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Unknown*	

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
Hazard Store *Area A* *Fac. 302*	*Unknown*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Unknown*	
Fire Practise Area *Area A* *Adjacent to 330*	*Hydrocarbons, organic* *solvents, heavy metals* *ordnance, asbestos* *unknown chemicals*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*C* *C* *C/D*
Garage Refuelling *Facility* *Area A* *Fac. 354*	*BTEX, hydrocarbons* *ethylene glycol,* *diethylene glycol,* *isopropanol, chromium* *polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
Vehicle Refuelling *Area C* *Fac. 3200*	*BTEX, hydrocarbons* *ethylene glycol,* *diethylene glycol,* *isopropanol, chromium* *polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*
Vehicle Refuelling *Area C* *Fac. 3201*	*BTEX, hydrocarbons* *ethylene glycol,* *diethylene glycol,*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	isopropanol, chromium polycarboxylic acid		*Inhalation, Ingestion*			
Vehicle Refuelling Area C Fac. 3202	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D E*
Vehicle Refuelling Area C Fac. 3203	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D E*
Laundry Area E Fac. 408	*Solvents*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D E*
Photographic Laboratory Area E Fac. 408	*Metals, solvents, SVOC's*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D E*

Annex D

Environmental Risk Assessment - Housing

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
POL 1 *Area A* *Fac. 270*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *High*	*C* *C* *C*
POL 2 *Area A* *Fac. 254*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *High*	*C* *C* *C*
POL 3 *Area A* *Fac. 274*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *High*	*C* *C* *C*
POL 5 *Area D* *Fac. 385*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *High*	*C* *C* *C*
POL 6	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 382	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 7	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 385	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 8	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 386	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 9	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 215	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 10	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 219	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	***Potential Pollutant***	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
POL 11	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 229	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 13	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 283	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 14	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 284	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 15	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 241	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 16	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 242	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 17	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 245	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 19	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 614	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 20	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 375	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 21A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 392	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	***Potential Pollutant***	***Potential Receptors***	***Potential Pathways***	***Associated Hazard***	***Risk of Occurrence***	***Potential Significance***
	polycarboxylic acids					
POL 21B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 393	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 21C	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 394	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 22	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 395	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 23A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 285	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*High*	*C*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 23B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 281	*diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*High*	*C*
POL 24	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 269	*diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*High*	*C*
POL 25A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 270	*diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*High*	*C*
POL 25B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 377	*diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*High*	*C*
Fuel Tank	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. un-named	*diethylene glycol, isopropanol, chromium*	*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*High*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
AST(s) *Area A* *Fac. 32*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
AST(s) *Area A* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
AST(s) *Area A* *100m north of* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
AST(s) *Area A* *Fac. 77*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
AST(s) *Area A* *Fac. 78*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 80		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 81		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 85		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 86		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 101		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*

Area	*Potential Pollutant*	***Potential Receptors***	***Potential Pathways***	***Associated Hazard***	***Risk of Occurrence***	***Potential Significance***
Fac. 106		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 114		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 151		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 207		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 231		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 233		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 239		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 250		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 253		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 255		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 288		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	***Risk of Occurrence***	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 299		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 301		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 313		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 320		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 326		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 335		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 338		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 345		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*C*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 350		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 354		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 401		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 441		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 492		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 570		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*C*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 826		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 827		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Fac. 1011		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1319		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1368		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1372		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1443		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1403		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 3043		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 69		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 88		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 103		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 126		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 131		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 198		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 209		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 234		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 268		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 299		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*

Area	***Potential Pollutant***	***Potential Receptors***	***Potential Pathways***	***Associated Hazard***	***Risk of Occurrence***	***Potential Significance***
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A	*glycol's, Urea*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 346		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area D		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 370		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 383		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 467		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 579		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	***Risk of Occurrence***	*Potential Significance*
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 493		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
Fuel Station			*Inhalation, Ingestion*			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 2010		*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
			Inhalation, Ingestion			
Car Wash Facili	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 38	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acid					
	waste and lead and					
	detergents					
Auto Hobby Sho	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 38	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Medium*	*D*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acid					
Hazard Store	*Unknown*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Unknown*	
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*		
Fac. 156		*Human Health*	*Dermatological Contact*	*odour/taste*		

Area	Potential Pollutant	Potential Receptors	Potential Pathways	Associated Hazard	Risk of Occurrence	Potential Significance
			Inhalation, Ingestion			
Hazard Store Area A Fac. 302	Unknown	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Unknown	
Fire Practise Ar Area A Adjacent to 330	Hydrocarbons, organic solvents, heavy metals ordnance, asbestos unknown chemicals	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Medium	C C C
Garage Refuelli Facility Area A Fac. 354	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Medium	D D D
Vehicle Refuelli Area C Fac. 3200	BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Medium	D D D
Vehicle Refuelli Area C Fac. 3201	BTEX, hydrocarbons ethylene glycol, diethylene glycol,	Surface Water Groundwater Human Health	Drains, streams, Groundwater, springs Dermatological Contact	Teratogen, carcinogen toxin, irritant & odour/taste	Medium Medium Medium	D D D

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	isopropanol, chromium polycarboxylic acid		*Inhalation, Ingestion*			
Vehicle Refuelli *Area C* *Fac. 3202*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
Vehicle Refuelli *Area C* *Fac. 3203*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
Laundry *Area E* *Fac. 408*	*Solvents*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*
Photographic Laboratory *Area E* *Fac. 408*	*Metals, solvents, SVOC's*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Medium*	*D* *D* *D*

Annex E

Environmental Risk Assessment - Agriculture

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
POL 1 *Area A* *Fac. 270*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 2 *Area A* *Fac. 254*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 3 *Area A* *Fac. 274*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 5 *Area D* *Fac. 385*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 6	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 382	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 7	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 385	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 8	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 386	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 9	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 215	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 10	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 219	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
POL 11 *Area C* *Fac. 229*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 13 *Area B* *Fac. 283*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 14 *Area B* *Fac. 284*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 15 *Area B* *Fac. 241*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 16	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	***Potential Pollutant***	*Potential Receptors*	***Potential Pathways***	*Associated Hazard*	***Risk of Occurrence***	***Potential Significance***
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 242	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 17	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 245	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 19	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 614	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 20	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 375	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 21A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 392	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
POL 21B *Area A* *Fac. 393*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 21C *Area A* *Fac. 394*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 22 *Area C* *Fac. 395*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 23A *Area B* *Fac. 285*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acids*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
POL 23B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*

Area	***Potential Pollutant***	***Potential Receptors***	***Potential Pathways***	***Associated Hazard***	***Risk of Occurrence***	***Potential Significance***
Area B	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 281	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 24	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 269	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 25A	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area A	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 270	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
POL 25B	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area D	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. 377	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			
	polycarboxylic acids					
Fuel Tank	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*C*
Area C	*ethylene glycol,*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*C*
Fac. un-named	*diethylene glycol,*	*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
	isopropanol, chromium		*Inhalation, Ingestion*			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
	polycarboxylic acids					
AST(s) *Area A* *Fac. 32*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
AST(s) *Area A* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
AST(s) *Area A* *100m north of* *Fac. 68*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
AST(s) *Area A* *Fac. 77*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
AST(s) *Area A* *Fac. 78*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 80		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 81		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 85		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 86		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 101		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Fac. 106		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 114		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 151		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 207		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 231		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 233		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 239		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 250		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 253		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 255		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 288		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 299		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 301		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 313		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 320		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 326		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 335		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 338		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 345		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 350		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 354		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 401		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 441		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 492		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 570		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 826		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 827		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Fac. 1011		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1319		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1368		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1372		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1443		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 1403		*Human Health*	*Dermatological Contact Inhalation, Ingestion*	*odour/taste*	*Low*	*D/E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
AST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 3043		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 69		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 88		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 103		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 126		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 131		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 198		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 209		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area B		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 234		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 268		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 299		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area A	*glycol's, Urea*	*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 346		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area D		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 370		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area C		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 383		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 467		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			
UST(s)	*BTEX, hydrocarbons*	*Surface Water*	*Drains, streams,*	*Teratogen, carcinogen*	*Medium*	*D*
Area E		*Groundwater*	*Groundwater, springs*	*toxin, irritant &*	*Medium*	*D*
Fac. 579		*Human Health*	*Dermatological Contact*	*odour/taste*	*Low*	*D/E*
			Inhalation, Ingestion			

Area	***Potential Pollutant***	*Potential Receptors*	***Potential Pathways***	*Associated Hazard*	***Risk of Occurrence***	***Potential Significance***
UST(s) *Area E* *Fac. 493* *Fuel Station*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
UST(s) *Area B* *Fac. 2010*	*BTEX, hydrocarbons*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
Car Wash Facility *Area A* *Fac. 38*	*BTEX, hydrocarbons* *ethylene glycol,* *diethylene glycol,* *isopropanol, chromium* *polycarboxylic acid* *waste and lead and* *detergents*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
Auto Hobby Shop *Area A* *Fac. 38*	*BTEX, hydrocarbons* *ethylene glycol,* *diethylene glycol,* *isopropanol, chromium* *polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
Hazard Store *Area A* *Fac. 156*	*Unknown*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Unknown*	

Area	*Potential Pollutant*	*Potential Receptors*	*Potential Pathways*	*Associated Hazard*	*Risk of Occurrence*	*Potential Significance*
			Inhalation, Ingestion			
Hazard Store *Area A* *Fac. 302*	*Unknown*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Unknown*	
Fire Practise Area *Area A* *Adjacent to 330*	*Hydrocarbons, organic solvents, heavy metals ordnance, asbestos unknown chemicals*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*C* *C* *D/E*
Garage Refuelling Facility *Area A* *Fac. 354*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
Vehicle Refuellin *Area C* *Fac. 3200*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact* *Inhalation, Ingestion*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*
Vehicle Refuellin *Area C* *Fac. 3201*	*BTEX, hydrocarbons ethylene glycol, diethylene glycol,*	*Surface Water* *Groundwater* *Human Health*	*Drains, streams,* *Groundwater, springs* *Dermatological Contact*	*Teratogen, carcinogen* *toxin, irritant &* *odour/taste*	*Medium* *Medium* *Low*	*D* *D* *D/E*

Area	***Potential Pollutant***	*Potential Receptors*	***Potential Pathways***	*Associated Hazard*	*Risk of Occurrence*	***Potential Significance***
	isopropanol, chromium polycarboxylic acid		*Inhalation, Ingestion*			
Vehicle Refuelling Area C Fac. 3202	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D D/E*
Vehicle Refuelling Area C Fac. 3203	*BTEX, hydrocarbons ethylene glycol, diethylene glycol, isopropanol, chromium polycarboxylic acid*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D D/E*
Laundry Area E Fac. 408	*Solvents*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D D/E*
Photographic Laboratory Area E Fac. 408	*Metals, solvents, SVOC's*	*Surface Water Groundwater Human Health*	*Drains, streams, Groundwater, springs Dermatological Contact Inhalation, Ingestion*	*Teratogen, carcinogen toxin, irritant & odour/taste*	*Medium Medium Low*	*D D D/E*

Annex F

Proposed Timescale

Week	1	2	3	4	5	6	7	8	9	10

Objective 1: Assessment of Groundwater, Surface Water and Spring Issues

Task 1 *Assessment of Spring and* *Surface Water Drainage Quality*										
Task 2 *Installation of Groundwater* *Monitoring Wells*										
Task3 *Groundwater Sampling*										
Task 4 *Hydrogeological Testing*										
Task 5 *Reporting (Draft)*										

Objective 2: Assessment of On-Site, Near Surface, Contamination

Task 1 *Near Surface soil and* *Groundwater Sampling*										
Task 2 *Building (Asbestos) Survey*										
Task 3 *Reporting (Including Analysis)*										