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Lydiate Lane Quarry

Hydrogeological Risk Assessment

J A Jackson Contractors (Leyland) Limited

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1 Introduction

1.1 Report Objectives

This Hydrogeological Risk Assessment Review (HRAR) has been prepared by ByrneLooby Partners (UK) Limited on behalf of J A Jackson Contractors (Leyland) Limited (the Operator) to support an application to vary environmental permit reference EPR/LB3834AE/V004 for Lydiate Lane Quarry (the Site). The Site is currently permitted to operate as an inert landfill.

This permit variation application proposes to vary the permit to a non-hazardous landfill, accepting low activity wastes specified by His Majesty's Revenue and Customs (HMRC) in The Landfill Tax (Qualifying Material) Order 2011 (as amended)[1] (i.e. Qualifying Materials (QMs)).

No additional changes are proposed.

This Hydrogeological Risk Assessment (HRA) builds on the conceptualisation of the site as detailed within the 2012 Environmental Setting and Installation Design Report (ESID)[2] and associated HRA[3] that accompanied the Site's "Inert Permit Application" dated December 2012, referenced 1607 (reports 1607/R/001/1 to 1607/R/003/1, LL_ESID, LL_HRA, 1607/R/005/1 to 1607/R/007/1 and 1607/R/010/1 including drawings as amended during determination).

Utilising multiple sources of information, including the recent 2020 Hydrogeological Risk Assessment Review (HRAR), a detailed discussion on the source-pathway-receptor relationship is presented with specific reference to the amendment to the waste acceptance and associated change of source term. The report provides a quantitative assessment for completeness.

1.2 Proposed Scheme - Overview

Lydiate Lane Quarry is an active quarry for the extraction of sand and gravel from Devensian (Quaternary Period) superficial strata. These materials are of glacial origin and are extracted above the water table.

To date, out of the originally proposed 10 Phases (drawing reference 1607/1/005B) the "inert waste" infilling has partially restored Phases 1 and 6 within the central area of the landfill complex (installation). An overview of site development, including post permit issue is provided in Section 3.3.

The proposal moving forward, is to complete the infilling of the remaining void with "non-hazardous" wastes as a result of a scarcity in "inert only" waste (as specified by the Landfill

[1] The Landfill Tax (Qualifying Material) Order 2011 (as amended) - https://www.legislation.gov.uk/uksi/2011/1017/contents/made
[2] Conceptual model, Environmental Setting and Installation Design Report. Lydiate Lane Quarry and Landfill Report Reference: LL/ESID Final. December 2012
[3] Hydrogeological Risk Assessment Report. Lydiate Lane Quarry and Landfill Report Reference: LL/HRA Final. December 2012

Directive). The limited availability of commercially viable inert materials is evidenced by the acceptance of "zero" waste inputs during the period January to December 2022.

Widening the waste acceptance (that geotechnically are the same construction and demolition wastes already consented) that includes materials associated with larger development projects (like HS2) will enable a more efficient use of the site and to achieve the approved restoration scheme in a shorter timeframe. The current Planning Permission end dated for completion and restoration of the site is 01/06/2031 (LCC/2016/0035).

Using a conversion factor of 1.8 - 2.2 tonnes / m^3 it has been estimated[4] that the remaining capacity at site approximates to between ~936,000 and 950,000m^3. The infilling of the associated void will be completed to a level coincident with previous infilling of Phases 1 and 6, and accord with the profile previously consented[5,6].

It is proposed to utilise a supply of waste materials associated with excavation and construction works for the infilling scheme, these wastes are of lower polluting potential than those infilled at typical non-hazardous waste landfill sites (i.e. there are no biodegradable wastes). The infill material is to comprise only of the low activity wastes specified by His Majesty's Revenue and Customs (HMRC) in The Landfill Tax (Qualifying Material) Order 2011 (as amended)[1] (*i.e*. Qualifying Materials (QMs)). The permit application submission addresses the requirement for a revised scheme for restoration for the quarry, this assessment report supports the submission to the Environment Agency.

The proposals are as follows:

- installation of a suitable engineered barrier;
- continue landfilling using low pollution potential material (Qualifying Materials) – non-hazardous soil wastes (including residual silt and clays from a wash plant located at another site within the applicant's portfolio);
- restoration in accordance with the existent planning permission and permit; and
- landscaping of the site to a suitable restored surface.

1.3 Relevant Information & Previous Reporting

To avoid repetition, reference has been made to the following technical reports and data in this review previously submitted to the Agency:

[4] Lydiate Lane Quarry Landfill Site. J A Jacksons (Leyland) Limited. Annual Report 2022, Report No. 1798/R/023/01. 12 January 2023
[5] Permit - EPR/LB3834AE/V004
[6] LCC/2016/0035. VARIATION OF CONDITION 1 OF PERMISSION 07/11/0739 TO ALLOW THE DEVELOPMENT TO CONTINUE UNTIL 01 JUNE 2031 AND VARIATION OF CONDITION 26 OF PERMISSION 07/11/0739 TO ALLOW SITE OPERATIONS FROM 06.30AM MONDAYS TO FRIDAYS, IN RELATION TO THE EXTRACTION OF SAND AND RESTORATION TO AGRICULTURAL LAND BY THE IMPORTATION OF WASTE AT LYDIATE LANE SAND QUARRY, LYDIATE LANE, FARINGTON, LEYLAND.

- Hafren Water (2012) Hydrogeological Risk Assessment Report, Lydiate Lane Quarry and Landfill, LL/HRA, Final, December 2012 (Permit Application January 2013);
- Hafren Water (2012) Conceptual Model, Environmental Setting and Installation Design, Lydiate Lane Quarry and Landfill, LL/ESID, Final, December 2012 (Permit Application January 2013) (ESID);
- Terraconsult Ltd (2020) 2020 Hydrogeological Risk Assessment Review, Lydiate Lane Quarry Inert Landfill, September 2020.
- Data collected from the monitoring regime;
- ByrneLooby (previously TerraConsult) Annual reviews 2013 to 2022

The site has been subject to prior site investigations which are described in detail in the 2012 ESID referenced above (an updated ESID / ESSD report accompanies this variation application). The specifics of this information will not be repeated herein unless relevant.

This HRA has been undertaken based on information considered correct on the time of preparation. Future changes in operation, construction and/or site management are not considered as part of this review. Further reviews of the HRA should be undertaken as required in accordance with current regulatory requirements.

2 Groundwater Risk Assessments for Environmental Permits

2.1 Guidance

On-line guidance "Groundwater risk assessment for your environmental permit"[7] outlines the current content requirement for inclusion within associated assessments, this includes: -

Develop your conceptual model, Sources, pathways and receptors, Research the source, Understand the pathways, Identify the receptors, Carry out a site investigation, How to present your conceptual model, Use a tiered approach to your risk assessment, Identify compliance points, Qualitative risk screening, Generic quantitative risk assessment, Detailed quantitative risk assessment, Lifecycle phases and scenarios to assess, Review your risk management options, Groundwater monitoring.

The on-line guidance refers to the following additional information: -

- Protect groundwater and prevent groundwater pollution (published 14 March 2017)
- Groundwater protection technical guidance
- Groundwater activity exclusions from environmental permits, in addition to: -
  - Landfill developments: groundwater risk assessment for leachate
  - Groundwater protection technical guidance (published 14 March 2017)

[7]Groundwater risk assessment for your environmental permit - https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit

- Groundwater protection position statements (last update 22 March 2018)

2.2 HRA Report Content

The detail used to develop the site's conceptual model (that underpins this assessment) is outlined in full within the Environmental Permit Application / ESID report (submitted to the Environment Agency 03/03/2023). Pertinent aspects of the detail are reproduced herein for context to the assessment report and to avoid a requirement for cross referencing significantly between the permit application documentation.

The following key sections and associated subsections of this report are:

- Proposed Development (Section 4)
- Conceptual Site Model (Section 5, Section 6)
- Requirement for Risk Assessment (Section 7)
- Risk Assessment (Section 7)
- Review of Technical Precautions & Requisite Surveillance (Section 8, Section 9)
- Conclusions (Section 10)

3 Site Location and History and Key Design Summary

3.1 Site Location

Lydiate Lane Quarry / landfill is located at Cuerden Green, Lancashire, ~5km south of Preston, ~1.5km northeast of Leyland at National Grid Reference (NGR) SD 55376 23956 (Figure 1). Access to the site is from the A5083, Lydiate Lane, located to the southwest. The M6 motorway is located immediately to the east of the site (refer to drawing 1607/1/005B for the permit boundary).

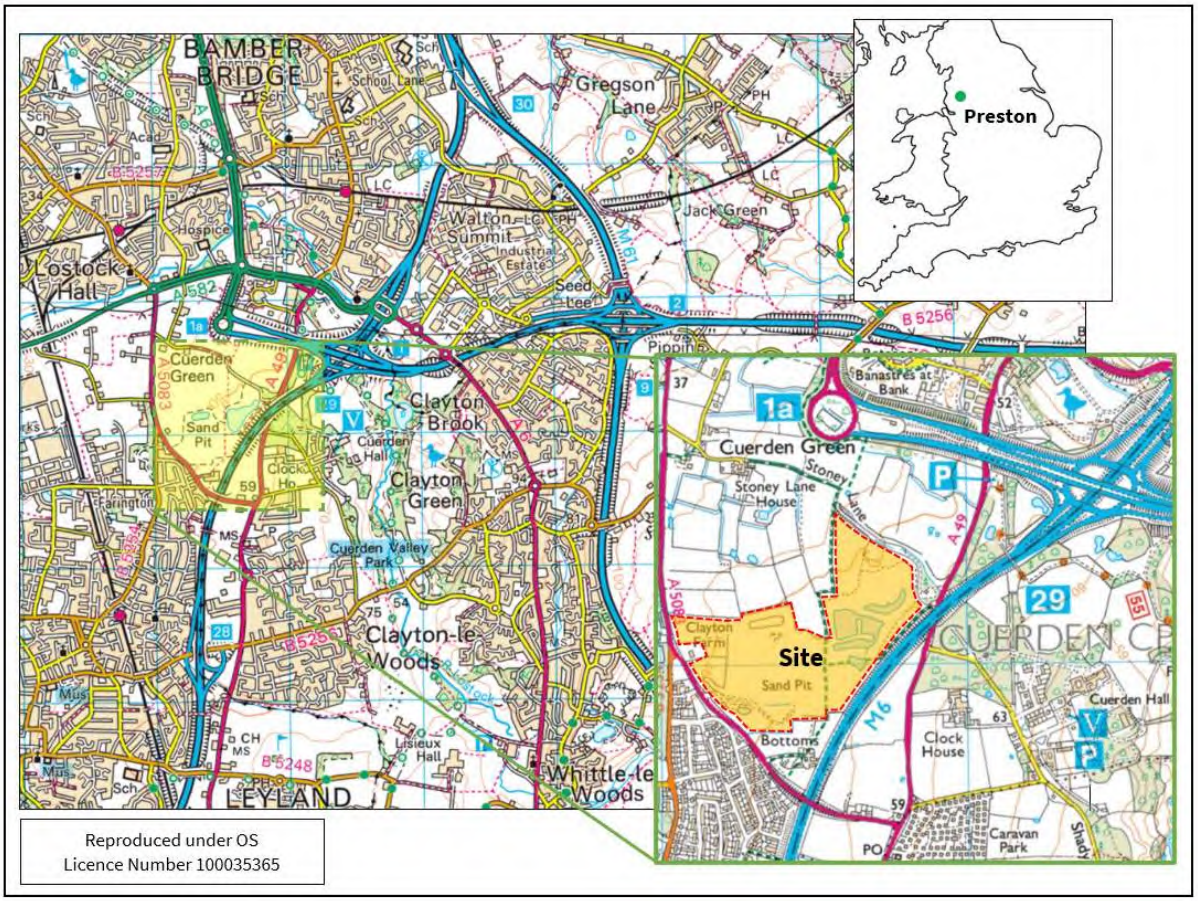
3.2 Surrounding Land Use and Topography

The surrounding area is a mixture of semi-rural with some agricultural areas to the northwest, with significant areas of urban development to the south and southwest (Leyland) and southeast (Clayton-le-Woods). Bamber Bridge and Preston are located to the north. The M6 is located directly to the east with Cuerdon Country Park beyond.

Peripheral areas to the west of the installation range between 52mAOD and 50mAOD (south to north), ~60mAOD at the boundary with the M6, with a fall on the eastern perimeter from ~60mAOD to ~50mAOD in a north-westerly direction. To the east beyond the M6, topographic level increase to ~82mAOD towards the north-south ridge at Cuerdon Hall (defined by the lithological transgression from the Singleton and Tarporley Mudstones / Siltstones to the Sherwood Sandstone Group strata) which then fall within the Cuerdon Country Park to ~52mAOD and River Lostock (US Farrington Wier).

Overall, topography increases to the east (towards Blackburn) and falls in a westerly direction towards the coast at Lytham St Annes and Southport and marsh areas associated with the tidal influences of the River Ribble.

Figure 1 Site Location



3.3 Site History and Development

3.3.1 Extraction Summary

The GroundSure Report (GS-9S2-2QT-S8G-IHW)[8] indicates that sand extraction at the site was occurring as early as 1848 (County Series Map 1:10, 560) in a small area to the north in close proximity to 'Stoney Lane' / New Plantation. Significant expansion of the site area occurred after Planning Consent (reference 07/91/648) was issued in August 1993[9], the current permission[6] is referenced LCC/2016/0035. A photographic account of the site development between 2005 and 2023 is provided in Figure 2 for context.

The site will continue to undergo mineral extraction, and corresponding infilling and restoration, in a phased manner, in the 10 phases identified on the Site Layout and Waste Deposition Plan (Drawing

[8] GroundSure – Enviro+Geo Insight (GS-9S2-2QT-S8G-IHW), dated 14/09/2023.
[9] Environmental Permit Application, Non-Technical Summary Lydiate Lane Quarry, Leyland, Lancashire. (TerraConsult December 2012, Reference 1607/LR/002/01.

Ref: 1607/1/005B) and Phasing and filling Plan (referenced Figure 8, part of permission LCC/2016/0035). Although extraction and infilling may vary these are dictated by operational constraints (e.g. location of wash plant / stockpiles).

Figure 2 Progressive Site Development (2005 – 2023)

Indicative areas, extraction, processing, infilling provided for context. Planning Boundary and phasing shown on Figure 8, part of Planning Permission LCC/2016/0035, Permit Boundary and phasing shown on drawing 1697/1/005B and schedule 7 of Permit EPR/LB3834AE/V004.

The extraction will be completed in accordance with the requirements of the current Planning Permission. The infilling and restoration will also be completed in accordance with the

environmental permit. Although it should be noted that it is proposed to leave a low-level access route to Phase 4 thus minimising surface vehicle movements and facilitating surface water drainage from Phase 4. Phase areas are presented in Figure 3 and Figure 4 for completeness.

Figure 3 Site Phasing – Permit (extract from drawing 1607/1/005B)

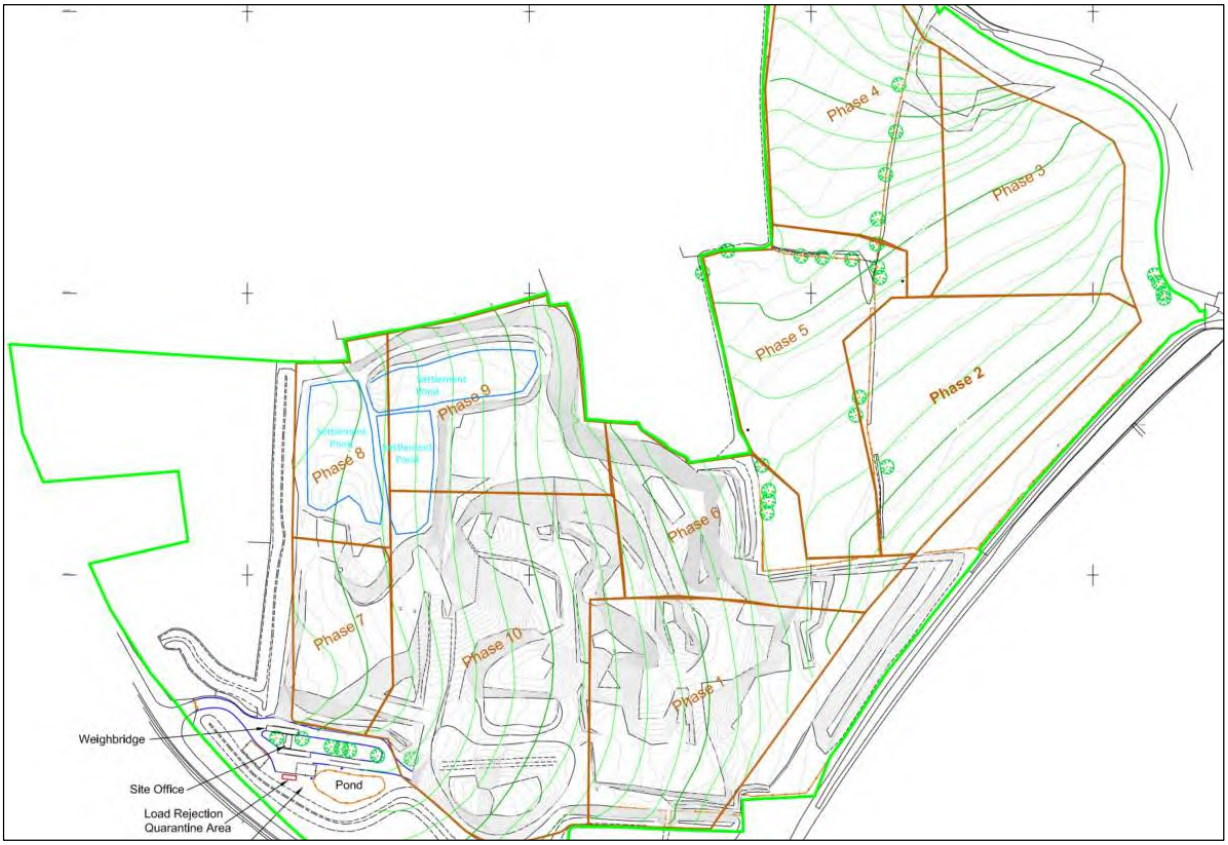


Figure 4 Site Phasing – Planning Ref LCC/2016/0035 (extract from Figure 8)

Limitations on the extractive depth are contained within the planning permission and require that no mineral extraction shall be extracted below the depth identified as the 'Sand Extraction extent', drawings and previous works have defined an extraction limit of 44mAOD.

These aspects are not amended as a result of this variation application.

3.3.1 Landfilling and Permitting Summary

Environmental permit reference EPR/LB3834AE was issued in July 2013 for an inert landfill and standard rules mining waste operation (SR 2009 No.8). The permit was varied in December 2014 to add waste type (10 10 08) and varied subsequently in January 2015 to increase the annual throughput from 99,000 to 200,000. The Environment Agency issued a varied permit in August 2020 following a statutory review of permits in the landfill sector and changed the groundwater quality monitoring tables (Schedule 3) and standard reporting table (Schedule 4).

3.3.2 Progressive Landfill Development

The infilling of "inert" waste to date has commenced primarily in the Phase 1 and 6 areas (Figure 3, Figure 4; drawings 1607/1/005B and Planning Figure 8). Development has been undertaken in accordance with permit EPR/LB3834AE and CQA protocol. CQA validated areas of liner are depicted on drawings 1833/2/001 (Phase 1A), 2032/1/001 (Phase 1B) and 2282/1/001 (Phase 1C).

It is noted that some of the associated areas referenced as "Phase 1B" transgress into the Phase 6 designated area on the phase layout drawings. It is also noted that some of the associated areas referenced as "Phase 1C" transgress into part of the Phase 10 area (east), Phase 6 designated area, Phase 5 area (south) and Phase 2 area (southwest).

3.4 Site Design Summary

Previously established and consented design standards are provided in Table 1. Proposed changes justified within this assessment are summarised in Section 8 (Table 10, Table 11).

The engineering requirements for an inert landfill (current site) are limited to ensuring a suitable geological barrier is present that must meet the equivalent standard of a mineral layer of 1m thickness at a permeability of no greater than 1 x 10^{-7} m/s (further reference to design standards are provided Section 4.4 and 4.5). The design standards for Phase 1A, 1B and 1C areas are outlined below.

Report 1833-R3-1 (April 2014)[10] documents the CQA validation for **Phase 1A**.

The measured particle density of the material used to construct the Phase 1A clay liner was between 2.64Mg/m^3 and 2.66Mg/m^3, the thickness of the liner ranged between 0.55m and 0.97m. Permeability of the liner (samples defined as slightly sandy CLAY) were reported at 5.1x10^{-11}m/s, 6.8x10^{-11}m/s, 7.9x10^{-11}m/s, 6.9x10^{-11}m/s, 8.8x10^{-11}m/s, 7.7x10^{-11}m/s.

The results far exceeded the design requirements for the site, the placed liner was up to 2 orders of magnitude lower in permeability than some results related to the source evaluation data and trial liner (all data < 1x10^{-9}m/s).

Table 1 Operations, Previous Construction and Site Management

Installation Variable	2012 Application - Assessment	2020 Review
Site Phasing	10 Phases (referenced 1 to 10). Phases 7 & 8 are located on the western boundary. Phases 3 and 4 are to the eastern boundary. Extraction limit of 44 mAOD.	Phase 1 and 6 partially filled. It is understood phasing will progress as dictated by operational constraints. Current base of the void is approximately 45 mAOD in areas.
Restoration Specification	The quarry will be restored using inert material in accordance with the planning permission.	No change.
Liner Specification	Base and side-slopes: minimum thickness of 1 m of compacted clay (max. hydraulic conductivity of 1 x 10^{-7} m/s).	No change.
Capping Specification	No requirement for a low permeability cap or an inert landfill.	No change.
Wastes Types	Those listed in Appendix A of Report referenced 1607/R/006/1 of the 2012 permit application.	Variation in 2014 to add EWC 10 10 08 Variation in 2015 to increase tonnage from 99,000 to 200,000 tonnes per year.

[10] Lydiate Lane Landfill Site Phase 1A Construction Works Validation Report (Report 1833-R3-1, April 2014) TerraConsult.

Installation Variable	2012 Application - Assessment	2020 Review
Leachate Management	None proposed and none required by issued permit.	No change.

Report 2032-R1-1 (January 2015)[11] documents the CQA validation for **Phase 1B**. It is noted that this sub-component area referenced as part of Phase 1B partly transgressed into Phase 6.

The thickness of the liner ranged predominantly between 0.52m and 0.67m with localised areas extending up to 1.1m. Permeability of the liner (samples defined as brown sandy CLAY) were reported at $1.5x10^{-10}$m/s, $1.1x10^{-10}$m/s, $1.4x10^{-10}$m/s, $1.1x10^{-10}$m/s and $1.1x10^{-10}$m/s.

Report 2282-R1-1 (September 2015)[12] documents the CQA validation for **Phase 1C**. It is noted that this sub-component area transgresses into multiple phase areas (Section 3.3.2).

The thickness of the liner ranged predominantly between 0.54m and 0.78m with localised areas up to a maximum of 1.23m. Permeability of the liner (samples defined as brown gravelly slightly sandy CLAY) were reported at $5.4x10^{-11}$m/s, $7.2x10^{-11}$m/s, $8.1x10^{-11}$m/s and $4.4x10^{-11}$m/s. The results far exceeded the design requirements for the site.

4 Proposed Development

4.1 Nature of the Qualifying Materials & Additional Waste Inputs

The proposed wastes (a change from inert to non-hazardous) will consist of excavation, construction/demolition wastes and similar industrial wastes within the Qualifying Materials Order that have similar low pollution potential to inert wastes. Currently the permit allows for disposal of mineral wastes (e.g. sand and clays), ceramics, bricks, concrete and glass, tiles, ceramics, and soil excluding top-soil. All these waste types will continue to be accepted. Top-soil will continue to be excluded.

The current permit also allows disposal of wastes from the processing of sand excavated on site (washing with water to remove silt and clay). However, similar wastes from processing inert construction and excavation wastes are not permitted by the inert landfill permit. This is because the Environment Agency now advise that "soil and aggregate washing is a physico-chemical treatment activity"[13] and consequently the appropriate EWC code for wet silt/clay washed from inert waste would be “19 02 06 sludges from physico/chemical treatment other than those mentioned in 19 02 05”. EWC code 19 02 06 cannot be accepted at inert landfill without leaching tests as specified in Council Decision (2003/33/EC). Overall chemical composition of the washed silt/clay residue and leachability are very low. However, sulphate exceeds the inert limit when compared to the L/S 10 l/kg methodology specified in Schedule 10 of the Environmental Permitting (England and Wales) Regulations 2016 (as amended) but noting the sulphate results are comparable

[11] Lydiate Lane Landfill Site Phase 1B Construction Works Validation Report (Report 2032-R1-1, January 2015) TerraConsult.
[12] Lydiate Lane Landfill Site Phase 1C Construction Works Validation Report (Report 2282-R1-1, September 2015) TerraConsult.
[13] Environment Agency Appropriate Measures Guidance, Non-hazardous and inert waste: appropriate measures for permitted facilities - 5. Waste treatment - Guidance - GOV.UK (www.gov.uk)

with the first eluate percolation test for inert landfill as specified in Council Decision. The elevated sulphate is considered to be a result of small residual fragments of Calcium Sulphate based materials found in construction wastes and natural occurring gypsum materials.

The silt/clay residue meets the definition of Qualifying Material as prescribed by the Landfill Tax (Qualifying Material) Order 2011 (as amended) and does not undergo any significant physical, chemical or biological transformation.

Qualifying Materials include wastes in the following groups:

- Group 1 Rocks and soils
- Group 2 Ceramics or concrete materials
- Group 3 Minerals, processed or prepared
- Group 4 Furnace slags
- Group 5 Ash

Of these the vast majority of the materials accepted in the current inert landfill and expected to continue to be accepted are:

- Soil (including mixed clays, silts and sands); and
- Stones.

Construction based materials are expected to be diverted from landfill and recovered as recycled aggregate with only the silt and clay component landfilled. The process of screening and washing wastes to generate a recycled aggregate removes the small amounts of organic materials (e.g. leaf litter, wood, plastics) that may have been present and may have historically been accepted at inert landfills.

Therefore, it is not expected that the change from inert waste to limited non-hazardous waste (consisting only of qualifying materials) will generate landfill gas, malodorous emissions or that active management of landfill gas will be required.

Such restrictions will also ensure that the generation of the primary soluble landfill leachate pollutant (i.e. ammonium) as well as the organic degradation by-products, namely hydrolysis products such as the phenols and the hazardous substances such as BTEX (benzene, toluene, ethylbenzene and xylene) compounds will continue to be prevented.

The proposed change to the wastes will maintain the negligible pollution potential solubility and settlement potential; thus, the site is highly likely to rapidly stabilise (akin to the previously deposited inert waste) to a state where the permitted area could be surrendered upon or shortly after completion of the restoration works.

The soil washing residues (with a high silt and clay content) will be incorporated into leachate source term for the site. The wash plant is currently operational at another site within the applicant's portfolio and leachable and water data is available to inform the likely leachate composition.

In addition to the inclusion of the source term for data relevant to the silt and clay washing residue overall source term for the inert landfill has been updated to consider the potential leachate generation from non-hazardous Qualifying Material. Although it is anticipated that the majority of wastes accepted will continue to be classed as inert.

4.2 Waste Inputs

The permitted maximum is 200,000t/y. No changes are proposed. Infill phasing will continue to be undertaken in accordance with drawing 1607/1/005B.

4.3 Phasing

The proposed changes of this variation application will not necessitate a change to the already consented Phasing Scheme[5,6], although Phases 1 and 6 have been partially infilled to date (to consented pre-settlement levels), any shortfall in these areas to tie in with the overall landform will be undertaken with inert wastes only. Extraction and infilling may differ from the phasing as identified sequentially as a result of operational constraints e.g. quality of reserve, location of the mineral wash plant, stockpiles, and settlement lagoons.

4.4 Directive Requirements – Landfilling and Engineering Framework

The European Directive 1999/31/EC on the Landfill of Waste (Landfill Directive)[14] sets minimum standards for the location, design and construction of landfills and supplements the requirements of the Waste Framework Directive (2006/12/EC)[15] to prevent (or reduce as far as possible) the negative effects of landfilling on the environment or risk to human health. English and Welsh law was updated on 1 October 2020 to include changes to the Waste Framework Directive (WFD) made in 2018, undertaken through the Waste (Circular Economy) (Amendment) Regulations 2020[16].

Requirements of the Landfill Directive were transposed into national legislation through the Landfill (England and Wales) Regulations 2002[17], subsequently amended in 2004 and 2005 to transpose the requirements of Council Decision 2003/33/EC on Waste Acceptance Criteria[18].

[14] Council Directive 1999/31/EC The Landfill Directive. https://www.legislation.gov.uk/eudr/1999/31/contents (accessed March 2023)
[15] European Community (EC) Directive 2006/12/EC on waste. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0009:0021:en:PDF (accessed March 2023)
[16] Definition of waste: 2018 Waste Framework Directive amendments. https://www.gov.uk/government/publications/legal-definition-of-waste-guidance/definition-of-waste-2018-waste-framework-directive-amendments (accessed March 2023).
[17] The Landfill (England and Wales) Regulations 2002. SI 2002 No. 1559.https://www.legislation.gov.uk/uksi/2002/1559/contents/made (accessed March 2023)
[18] 2003/33/EC: Council Decision. https://www.legislation.gov.uk/eur/2003/33/contents (accessed March 2023)

The provisions were re-transposed as part of the Environmental Permitting (England and Wales) Regulations 2007 and are now regulated by the Environmental Permitting (England and Wales) Regulations 2016 (as amended).

Environmental Permitting guidance for both the Landfill Directive[19,20,21] and Waste Framework Directive[22] are available from the Department for Environment, Food and Rural Affairs (DEFRA).

4.5 Engineering Standards – Basal / Side Slope Lining Systems

Paragraph 1.2 of Annex I to the Landfill Directive states that a landfill can only be authorised if it does not pose serious environmental risk. Paragraph 3.1 provides that a combination of either geological barrier and a bottom liner or a geological barrier and top liner must always be in place in order to protect soil, groundwater and surface water. Paragraphs 3.2 and 3.3 provide technical detail on what these requirements entail, whilst Paragraph 3.4 allows for a reduction in what is required under Paragraph 3.2 and 3.3 commensurate to the risk posed.

Paragraph 2 states that appropriate measures for water control and leachate management shall be taken with respect to the collection of leachate. However, the third point in this paragraph says that if an assessment of the location of the landfill and the waste to be accepted shows that the landfill poses no potential hazard to the environment, the measures to collect contaminated water and leachate may be dis-applied. Paragraph 2 therefore indicates that in addition to landfills for inert waste (i.e. the existing site), leachate collection may not be required at landfills for selected non-hazardous waste.

The Environment Agency previously provided guidance on 'Understanding the Landfill Directive Version 2 (March 2010)[21] which requires that the design of a landfill site should be based on site specific risk assessments[19]. It states that a particular element of design criteria of the Annex I may be removed where demonstrated as unnecessary by appropriate risk assessment. As such the conceptual site design as set out within this document conforms to the appropriate standards as per the guidance set out above for the level of risk posed as well as the requirements of the following:

- Landfill Directive (99/31/EC)[14];
- The Environmental Permitting (England and Wales) Regulations 2016 (as amended) (2016 Regulations)[23];

[19] Environmental Permitting Guidance. The Landfill Directive. For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1, DEFRA (accessed March 2023)
[20] Environmental permitting: Core guidance For the Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No 1154) Last revised: March 2020, DEFRA (accessed March 2023)
[21] Regulatory Guidance Series, No LFD 1 Understanding the Landfill Directive (now withdrawn for online guidance) - https://www.gov.uk/guidance/landfill-operators-environmental-permits (accessed March 2023)
[22] Environmental Permitting Environmental Permitting Guidance. The Waste Framework Directive. For the Environmental Permitting (England and Wales) Regulations 2007 Updated October 2009 Version 2.0, DEFRA (accessed March 2023)
[23] SI 2016 No. 1154 - The Environmental Permitting (England and Wales) Regulations 2016
NOTE: The Environmental Permitting (England and Wales) Regulations 2016 ("the 2016 Regulations") consolidate and replace the Environmental Permitting (England and Wales) Regulations 2010 (S.I. 2010/675) ("the 2010 Regulations"), which

- The Environment Agency's Landfill Engineering guidance documents – Sector Technical Guidance (LFE series)[24].

Infilling will be undertaken in accordance with Section 5.2, Part A(1) (a) of The Environmental Permitting (England and Wales) Regulations 2016 "Disposal of waste in a Landfill" (Schedule 1, Part 2 "Activities", Chapter 5 "Waste Management").

Annex 1 of the Landfill Directive outlines the design requirements needed to achieve a successful permit application. The Landfill Directive requires all landfills to have a geological barrier and the Environment Agency have further qualified the directive such that a geological barrier must:

- Extend across the entirety of the base and side walls of the landfill;
- Provide a barrier to contaminant emissions; and
- Provide sufficient attenuation to prevent pollution to soil and groundwater.

The site does not have the benefit of an '*in-situ* natural geological barrier'. As such a re-engineered 'artificial' geological barrier (AGB) comprising of the silt / clay component of the superficial strata will be placed across the sidewalls and landfill base. Previous site development and liner placement / engineering under CQA has demonstrated this material far exceeds regulatory requirements (Section 3.4).

The Directive states that the artificially established geological barrier should be no less than 0.5 m thick (Annex I, Paragraph 3.2).

Engineering requirements for the construction of an AGB are outlined in Environment Agency guidance 'How to comply with your environmental permit, Landfill (EPR 5.02)' – Now Withdrawn (21st April 2021) and replaced with on-line guidance[25]. The 500mm minimum thickness AGB comprising at least two layers of clay compacted, each to a thickness of 250mm and to a permeability no greater than $1x10^{-8}$m/s is proposed on the base and sides of the site (an equivalency greater than 1m @ $1x10^{-7}$m/s in regard to basal seepage).

In reality, however, the compacted clay barrier and the infilled waste mass (in itself and in its entirety) are expected to act as a geological barrier with an expectation for a hydraulic conductivity / permeability in the order of $1x10^{-10}$m/s – $1x10^{-9}$m/s (as described in the additional information Section 5.1.2 of this report). The mineral liner will be placed in accordance with the Environment Agency guidance LFE4 – Earthworks in Landfill Engineering and will be subject to independent third party CQA[26].

have been amended 15 times to date. The 2016 Regulations set out an environmental permitting and compliance regime that applies to various activities and industries

[24] https://www.gov.uk/government/collections/environmental-permitting-landfill-sector-technical-guidance (accessed March 2023)

[25] https://www.gov.uk/guidance/landfill-operators-environmental-permits (accessed March 2023)

[26] LFE4 - Earthworks in landfill engineering Design, construction and quality assurance of earthworks in landfill engineering (published 23 June 2014)

4.6 Groundwater Management

The depth of sand and gravel excavation is controlled by the extant planning permission (44mAOD). The current quarry void is in places at the water table however it is not intended to dewater the mineral to permit sub-water table mineral extraction. As the base of the site is above the water table, groundwater management will not be required.

4.7 Surface Water Management – Infilling Phase

Surface water management bunds and a series of ditch-courses and ponds are present as necessary to direct surface water run-off away from the active landfill area during its operational phases. This will change as dictated by operational constraints and progression of infilling.

4.8 Capping System

Under the Landfill Directive there are no requirements for an engineered low permeability cap on an inert landfill. The proposed change will now include a cap as part of the site design. On completion of the filling a cap will be placed using selected low-permeability materials to limit infiltration.

A design standard of 500mm minimum thickness, at a permeability no greater than $1x10^{-8}$m/s is proposed however it is expected that the placed wastes will be two to three orders of magnitude lower in permeability.

The final capping layer will be installed over the site as filling is completed, the cap is designed to:

- prevent the waste from being disturbed;
- control water infiltration (albeit that this will be achieved indirectly by the placement and nature of the infill);
- be stable to erosion;
- be resistant to penetration by roots; and
- be able to tolerate the long-term strains caused by differential settlement.

4.9 Surface Water Management – Post Infilling / Restoration Phase

Post-operation, the restoration profile is such that drainage will occur from the southeast to the northwest, draining passively to the superficial strata at the site periphery.

4.10 Restoration and Aftercare

Restoration soils (~1m in thickness) placed over the waste will comprise of topsoil and subsoil stripped from the site prior to mineral extraction (if available). The restoration scheme will be in

keeping with the surrounding area and will undergo a period of maintenance and aftercare management in accordance with the Planning Permission[6].

4.11 Life Cycle Phases and Post Closure Controls

Completion criteria (when the waste is physically and chemically stabilised) will be determined having regard to the collection and assessment of monitoring data. This information will be assessed at least annually and used as input parameters into future risk assessments which will delineate when the operator can apply to surrender the Permit.

The conceptualisation of how the containment systems will operate throughout the life cycle of the proposed development is presented within Table 2.

Monitoring of placed fill pore-water (leachate / porewater) and gas will continue until permit surrender. Post closure checks will be undertaken to periodically review the on-site management systems, and to check for subsidence or differential settlement.

Table 2 – Management Measures and Technical Controls Throughout the Landfill Cycle

Landfill Phase	Leachate Management	Gas Management	Containment System	Landfill Cap
			Artificial Geological Barrier	
Operational (non-hazardous wastes)	No requirement for management, no specified leachate limits required. Periodic monitoring undertaken for establishing surrender point	No requirement for management, no specified leachate limits required. Periodic monitoring undertaken for establishing surrender point	Operates as designed	N/A
Post Closure & Aftercare Period	Periodic monitoring undertaken for establishing surrender point, some degradation/ clogging of the drainage system	Periodic monitoring undertaken for establishing surrender point, some degradation/ well clogging of the monitoring system	Operates as designed	Operates as designed
Site Completion	None	None	Operates as designed	Operates as designed
Post Site Completion	None	None	Operates as designed	Operates as designed

Note: The waste mass itself conforms to the requirements of a "geological barrier" – see Section 5.1.2

5 Conceptual Site Model

5.1 Source Term

5.1.1 Expectation for Leachate / Porewater Generation

The infill materials proposed consist of excavation, construction and demolition wastes and potentially some similar industrial wastes that are inert or non-hazardous with low levels of contamination to be confirmed by waste pre-acceptance procedures. It is anticipated that the majority of wastes will be either:

- excavated soil and stones including clays and silts; or
- similar materials resulting from the treatment of mixed construction, demolition and excavation wastes.

Experience at other, similarly permitted waste sites has shown that such materials tend to have a relatively high silt and clay content, especially after recoverable materials have been removed and as a result following placement achieve low vertical permeability.

In such a compact low permeability matrix, the actual moisture level in the pore space will result from seasonal upwards capillary movement and downwards surface ingress through the cap / restored surface. There is no expectation that this will become a “free flowing” liquid (leachate) within a permeable waste mass (Section 5.1.2 below).

Conceptually, it is considered appropriate to refer to this liquid as a soil infill or “leachate porewater”.

5.1.2 Hydraulic Properties, Requirements for Basal Drainage and Leachate Management

When overall drainage behaviour has been assessed in similar applications for the infilled wastes, it is the ‘large-scale’ or mass permeability that controls drainage behaviour.

The mass permeability of compacted well graded materials will tend toward the median or mean of the range of permeability that might be expected if individual loads were tested. The action of tipping, dozing and compaction results in mixing of loads and means that even multiple loads of slightly higher or lower permeability do not have a significant effect on the mass permeability of the substantially clay/silt infill material. Therefore, the mass permeability of the placed infill is expected to be of the order of $1x10^{-8}$ to $1x10^{-9}$m/s (equivalent to the Landfill Directive requirements for geological barriers) or even lower.

There are three mechanisms for estimating the potential hydraulic flux through the proposed non-hazardous (qualifying materials) fill.

The first is that there is a general requirement for a geological barrier with properties equivalent to 0.5m thick and hydraulic conductivity of ≤$1x10^{-8}$m/s (or conversely 1m with a hydraulic conductivity of $1x10^{-7}$m/s for an inert site). The second mechanism is to calculate a hydraulic conductivity of the

expected materials using particle size distributions and the third is from site-based measurements accepting a similar type of fill.

Any hardcore, gravel or sand type materials that can be recovered at source are unlikely to be imported to site as this material has a commercial value and therefore it is likely to be diverted. Conversely however, if this material is imported, there is an intention for recyclable materials to be recovered through screening, hence this component will not form a large part of the infilled and deposited waste mass. Consequently, it is expected that the site will be restored primarily with clay and silt dominated soil forming materials.

This includes the silt and clay soil wash residue (geotechnical detail 2010), described as brown silty clay with soil classification as "SILT" (permeability result of $1.8x10^{-10}$m/s).

Hydraulic calculations (e.g. Hazen formula particle size / hydraulic conductivity relationships) demonstrate that as long as 10% of the infill material contains a medium silt or smaller grain size, a $1x10^{-8}$m/s hydraulic conductivity criteria would be met (Table 3).

This conclusion is also supported from permeability measurements of placed soils in five similar infill schemes undertaken by different operators. 16 laboratory measurements from a non-hazardous soils site (Site A) reported a dry density range of between 1.48 and 1.93Mg/m^3 and a hydraulic conductivity range of between $4.9x10^{-10}$ and $6.9x10^{-11}$m/s (most likely conductivity of $2.05x10^{-10}$m/s), see Table 3.

Table 3– Hazen Formula Particle Size – Hydraulic Conductivity Relationship

Grain Size (Lower Size)	Particle Size 10% Passing		Hydraulic Conductivity
	d10		K
	micron	mm	m/s
Medium Gravel		8	0.100
Fine Gravel		4	0.025
V. Fine Gravel		2	0.006
V. Coarse Sand		1	0.002
Coarse Sand	500	0.5	$3.9x10^{-4}$
Medium Sand	250	0.25	$9.8x10^{-5}$
Fine Sand	125	0.125	$2.5x10^{-5}$
V. Fine Sand	63	0.063	$6.2x10^{-6}$
Coarse Silt	20	0.02	$6.3x10^{-7}$
Medium Silt	6.3	0.0063	$6.2x10^{-8}$
Fine Silt	2	0.002	$6.3x10^{-9}$
Clay	<2-0.06	<0.002 0.00006	$5.7x10^{-12}$

Hazens Formula

$$K = C_H . d_{10}^2$$

Where

K = Hydraulic Conductivity
d_{10} = Particle Size 10% Passing
C_H = Hazen Constant (0.00157)

A second site importing inert wastes only (Site B) reported a range of hydraulic conductivity of $7.2x10^{-10}$, $4.4x10^{-10}$ and $1.6x10^{-10}$m/s within the uppermost 2m of the infill profile without "best practice" compaction procedures.

Sites C, D and E information has been obtained from an additional site operator's inert site portfolio (including materials suitable for placement under a recovery operation for quarry restoration) and the data confirms the low hydraulic conductivities noted above.

In all cases the hydraulic conductivity properties demonstrate that the infill readily meets and is an improvement on the barrier requirements for non-hazardous and also hazardous landfill sites (e.g. 1m at $1x10^{-9}$m/s and 5m at $1x10^{-9}$m/s). The data demonstrates that the placement of the clay soils with an informal compaction, i.e. deposited, spread and machine compacted without the benefit of third-party supervision or to a CQA plan that an impermeable layer is produced.

The re-compaction testing carried out for the inert Site B demonstrates that the compaction achieved using this methodology is consistent with that which could reasonably be expected from formal on-site compaction ($5.1x10^{-10}$, $1.6x10^{-10}$ and $1.5x10^{-10}$m/s compared to $7.2x10^{-10}$, $1.6x10^{-10}$, $4.4x10^{-10}$m/s, when presented as maximum, minimum and most likely conductivities).

This re-compaction data does demonstrate is that the likelihood that lower hydraulic conductivities will be achieved with depth throughout the vertical profile of the deposited mass. As such, the waste mass can be considered as a "soil plug" in its entirety, which has essentially the same properties of a geological barrier, i.e. a low permeability (<$1x10^{-9}$m/s). The expectation for total porosity and effective porosity in such low-bulk hydraulic conductivity infill is between 0.3 to 0.6 (total) and between 0.05 to 0.2 (effective) as compared to dry bulk density of between 1.15 and 2.1Mg/kg (comparable to Site A laboratory data, Table 4). These figures are representative of those obtained from other referenced data sources.

Table 4 – Placed Soil Hydraulic Conductivity Testing

Site A Placed Soil – Restored Surface

Non-Haz Soil Site A		
Laboratory		
Dry Density		Hydraulic Conductivity
Mg/m³		m/s
1.715		$2.5x10^{-10}$
1.623		$1.1x10^{-10}$
1.672		$7.8x10^{-11}$
1.750		$6.9x10^{-11}$
1.480		$2.6x10^{-10}$
1.735		$8.1x10^{-11}$
1.653		$1.1x10^{-10}$
1.711		$1.5x10^{-10}$
1.690		$4.3x10^{-11}$
1.693		$7.3x10^{-11}$
1.559		$3.9x10^{-10}$
1.628		$1.4x10^{-10}$
1.695		$4.9x10^{-10}$
1.930		$4.5x10^{-10}$
1.744		$8.5x10^{-11}$
1.673		$1.1x10^{-10}$

Site A and B Summarised in a Disposal Context

	Site A	Site B (near Surface)	Site B (at Depth)
	m/s	m/s	m/s
Maximum	$4.9x10^{-10}$	$7.2x10^{-10}$	$5.1x10^{-10}$
Most Likely	$2.1x10^{-10}$	$4.4x10^{-10}$	$1.5x10^{-10}$
Minimum	$6.9x10^{-11}$	$1.6x10^{-10}$	$1.0x10^{-10}$

Site B Soil Infill Material Properties

In-situ	Laboratory Recompacted
m/s	m/s
$7.2x10^{-10}$	to $5.1x10^{-10}$
$1.6x10^{-10}$	to $1.0x10^{-10}$
$4.4x10^{-10}$	to $1.5x10^{-10}$

Site C, D, E Soil Infill Permeability Testing Summary

Site C	Site D	Site E
m/s	m/s	m/s
$1.2x10^{10}$	$1.1x10^{-10}$	$6.3x10^{-11}$
$1.9x10^{-10}$	$1.2x10^{-10}$	$4.9x10^{-11}$
$1.2x10^{-10}$	$2.9x10^{-10}$	$9.5x10^{-11}$

Even where larger materials are co-disposed with soils, the hydraulic characteristics are based on the lower permeability surround.

For example, natural gravelly clay and Boulder Clays, contain large particle sized materials within the clay matrix, and retain low overall bulk permeability properties. A similar effect is expected for components of construction/demolition material (e.g. brick and concrete) entrained within the imported fill.

With an expected low effective porosity (5% to 20%) and bulk hydraulic properties approximating to $1x10^{-10}$m/s, drainage measures become problematic (if warranted or required), as such the ability to manage or influence leachate / porewater under such conditions are recognised in UK construction industry guidance CIRIA Report C750 Groundwater Control – Design and Practice, 2nd Edition (Preene et al., 2016)[27]. Figure 1.10 of Preene et al (2016) states that below a permeability of approximately 10^{-7}m/s 'Dewatering may not be feasible and may not be necessary'. The 'may not be feasible' comment reflects the poor drainage behaviour discussed above.

The 'may not be necessary' comment reflects the fact that very low permeability soils are often hardly affected by destabilising effects of groundwater flow that can occur in more permeable soils.

[27] Preene, M. Roberts, T.O.L. and Powrie (2016). Groundwater Control – Design and Practice, 2nd Edition. Construction Industry Research and Information Association, CIRIA Report C750, London

However, it is considered unlikely that the soil fill will exhibit uniformly the same hydraulic properties[28,29], with the soil likely to be anisotropic with reduced vertical porosity/permeability.

Consequently, it is considered highly likely that layers of soil will have varied composition and similarly variable permeability and porosity. The transit of liquid vertically downwards through this soil fill will therefore be limited by the soil layers of the lowest permeability. The location of such layers may vary throughout the fill and thus it is considered probable that the vertical transit of incident rainfall to the base of the site will be minor compared to the lateral flow in the upper layers of saturated soils.

Any extraction of liquid from a "basal drainage layer" (if in fact there was a requirement for extraction) is limited by the rate of liquid ingress to the drainage layer. Initially as the soils at the base of the site consolidate and excess pore pressure dissipates liquid may enter the drainage layer, however any vertical flow to the drainage layer will be limited by the low permeability of the soils above. Therefore, if the drainage layer is 'pumped dry' the impact of this on the liquid content of the soils above will in all likelihood to be localised. It is considered improbable that all liquid within the significant thickness of overlying soils can be removed or that the upper level of saturated soil could be lowered by extraction of liquid at the base of the site.

As such, a drainage layer at the base of the site would be superfluous based on the above and laboratory determinations presented at Table 4. However, the retainment of discretionary spine drains and monitoring chamber for "monitoring purposes", i.e. to validate the anticipated source term porewater (Section 5.1.3 below) is proposed in coincidence with already consented schemes of an identical design.

5.1.3 Expectation for Leachate Porewater Quality and Risk Screening

Qualifying Materials

The proposed source term is considered to be of a low-pollution potential compared to putrescible landfill leachates. Any leachate porewater generated from the non-hazardous qualifying materials will differ significantly from a typical Municipal Solid Waste (MSW) leachate as there is not a putrescible component to the waste stream. Consequently, the significant ammoniacal-N and dissolved organic matter (as represented by the COD) as well as other soluble salts will not be present as readily degradable organic matter and soluble salts are specifically excluded from the list of wastes described as qualifying materials.

Given that the proposed waste types are unlikely to contain a degradable organic content, elevated ammoniacal-N and BOD is not expected to be associated with the Lydiate Lane proposed scheme. Similarly, solvents, refined petroleum fuels or other chemical sources will be excluded.

[28] Ahuja LR et al, 1981, A Theoretical Analysis of Interflow of Water Through Surface Soil Horizons with Implications for Movement of Chemicals in Field Runoff, Water Resources Research Vol 17, No 1 pp65-71
[29] Ahuja LR & Ross JD, 1983, Effect of Subsoil Conductivity and thickness on Interflow Pathways, Rates and Source Areas for Chemicals in a Sloping Layered Soil with Seepage Face, J. of Hydrology, 64, 189-204

In simple terms, source characterisation will preclude any significantly contaminated soils. Some ammonium is inevitable in soils, particularly in agricultural areas where there is an expectation of manure spreading or the addition of ammonium nitrate fertilisers. Nevertheless, it is considered appropriate to consider these substances and their effects on the water system.

For the purposes of this assessment, a source term has been derived for initial risk screening based on the leaching data that ByrneLooby (formerly TerraConsult) have compiled from 7 sites (including a hazardous soil landfill) over a 7-10 year period, as well as qualifying material data from identically proposed infill schemes (Table 5). This associated leachate / porewater source term is derived from non-inert soil-forming wastes and similar materials.

Table 5– Source Term Waste Leaching Data compared to Drinking Water Standards

Determinand	Soil Infill Site data			No. of Samples	% of samples < LOD	DWS	Comment
	25%ile	Median	95%ile				
	mg/l					mg/l	
Hazardous Metals							
Mercury	<0.00003	<0.00010	0.00025	331	87%	0.001	Below DWS at source
Lead	<0.001	<0.001	0.300	580	89%	0.01	Above DWS at source, actual presence of lead is considered negligible
Hazardous Metalloid							
Arsenic	0.003	0.005	0.021	593	4%	0.01	Above DWS at source
Non-hazardous Metals							
Cadmium	<0.00003	<0.00010	0.0006	593	66%	0.005	Below DWS at source
Nickel	0.007	0.011	0.052	579	3%	0.02	Above DWS at source
Chromium	0.001	0.002	0.015	586	61%	0.05	Below DWS at source
Copper	0.002	0.007	0.039	566	31%	2	Below DWS at source
Zinc	0.003	0.006	0.128	383	19%	5	
Matrix and Minor ions							
Chloride	69	133	637	768	0	250	Above DWS at source
Sulphate	607	912	1,731	600	1%	250	
NH_4-N	0.2	1.1	15.6	757	11%	0.39*	Above DWS at source
Herbicide and Hydrocarbons							
Mecoprop	0.006	0.013	0.034	61	77%	0.0001	Above DWS at source
Benzene	0.0013	0.0015	0.0020	50	96%	0.001 (MRV)	Above MRV at source
Toluene	0.0011	0.0012	0.0037	68	96%	0.004 (MRV)	≈ to MRV at source

DWS from 2016 No. 614, The Water Supply (Water Quality) Regulations 2016 https://www.legislation.gov.uk/uksi/2016/614/pdfs/uksi_20160614_en.pdf, Minimum Reporting Values, MRV concentrations (https://www.gov.uk/government/publications/values-for-groundwater-risk-assessments/hazardous-substances-to-groundwater-minimum-reporting-values#:~:text=o%2Dxylene%20and%20m%2Fp,to%203%20micrograms%20per%20litre), mercury 0.00001mg/l
*Ammonium (units of measurement as mg/NH_4/l) DWS 0.5mg/l guide value – (referenced standard for NH_4-N 0.39mg/l)
Mecoprop is not hazardous – as defined by JAGDAG 2017 (non-hazardous pollutant), DWS (DWS (organic herbicide "total" 0.0005mg/l, "other pesticides" 0.0001mg/l, EQS 0.018mg/l)

Under normal circumstances a contaminant "risk factor" is usually calculated simply by dividing the maximum leachate / source term concentration by the most stringent EAL. For example, a risk factor of 1 would denote that the site did not represent a hazard to groundwater for that particular contaminant as the maximum leachate concentration is identical to the EAL. It provides a very simple indication of the potential hazard presented by a contaminant to the water environment. Of the potential contaminants screened ammoniacal-N, sulphate, chloride, nickel and arsenic, risk

factors of 40, 7, 3, 3 and 2 are noted respectively. Chromium approximates to 1 whereas cadmium, copper and zinc are <1.

As evident (based on a significant dataset collected to date), the collated source term summary presented in Table 5 at similar sites contain a definitively different composition to the biochemically derived solutions typical of most non-hazardous landfill leachates which contain significant concentrations of ammoniacal-N and organic content. These are products of the breakdown of the types of bulk organic materials which are excluded prior to disposal.

As a dissolution derived liquor in this type of fill, the two primary constituents calcium and sulphate are limited by the solubility of gypsum under oxidising to anoxic conditions, ammoniacal-N is consistently low in these sites with median concentration of 1.1mg/l.

Chloride is typically <500mg/l in these sites, with median and average concentrations of 133mg/l and 214mg/l respectively. Infrequent or short term outliers can skew statistical appraisals, however, these are not reflective of the overall bulk infill chemistry. In this case a 95th %ile concentration of 637mg/l is reported.

It is recognised that this can occur for all substances analysed and in all likelihood the outlier data is considered an analytical error (c.f. ammoniacal-N 95th %ile of 15.6mg/l compared to 85th %ile of 5.9mg/l).

Another significant factor for low organic and soil-based materials is that the primary vector which mobilises heavy metals, i.e. colloidal organo-metallic complexes are not present. Consequently, metals such as nickel and chromium which are also uniquely present within methanogenic and acetogenic leachates (as compared to other metals which can be present in UK groundwaters and geological strata) are in the case of nickel low within soil disposal sites whilst cadmium and chromium are invariably absent (>60% of all data reported at < LOD).

Copper and zinc data report occasional outliers, overall however these concentrations are insignificant compared to their 2mg/l and 5mg/l DWS.

Arsenic is also environmentally low, with only 19% of all concentrations above the 10µg/l DWS (593 samples), the hazardous metals mercury and lead are not considered present in the source term (87% and 89% of all samples reported at <LOD).

Specific organic substances are rarely reported in soil infill cells / schemes, i.e. the majority of substances are reported as “below detection level” or <LOD. Small quantities of mecoprop can be reported, with almost all data reported less than the 18µg/l EQS. However, this non-hazardous herbicide is not reported above 1µg/l for some of the sites evaluated and is <LOD for ~80% of the dataset. All other organic substances reported are single occurrences at the individual locations sampled, which are not repeated on consecutive hazardous substance screens at those locations demonstrating that there is not a risk to groundwater.

Soil Wash Residue

As part of the current variation application (source term change from inert to non-hazardous wastes) it is proposed to include the soil wash residue silt and clay fraction from another site in the

operator's portfolio. Chemical data has been summarised in Table 6 below from both the silt clay residue and the direct wash water from the washing process and is considered in the context of the qualifying material bulk infill for the proposed scheme (Table 5).

It is noted that the residue will only constitutes a ratio of ~20% of the overall bulk infill scheme, however the analytical data available indicates that concentrations are predominantly less than the modelled 95th %ile concentrations for the qualifying material as described above. Hazardous metals and BTEX substances are not present within the soil wash residue.

Table 6– Soil Wash Residue Leaching Data compared to QM's 95th %ile concentration

Determinand	Soil Filter Residue			Soil Wash Sample		95Th %ile QM con.	Comment
	Feb 22	April 22	March 23	Average	Max		
	mg/l						
Hazardous Metals							
Mercury	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	**0.00025**	Below DWS at source, not present in filter residue or wash sample
Lead	<0.001	<0.001	<0.001	<0.001	<0.001	**0.300**	Above DWS at source, not present in filter residue or wash sample
Hazardous Metalloid							
Arsenic	0.005	0.003	0.007	0.009	0.012	**0.021**	Above DWS at source, less than modelled QM inventory
Non-hazardous Metals							
Cadmium	0.00006	0.00011	<0.00002	0.0007	0.0023	**0.0006**	Below DWS at source, less than modelled QM inventory
Nickel	0.004	0.003	0.006	0.032	0.056	**0.052**	Above DWS at source, max wash ≈ modelled QM inventory
Chromium	-	<0.001	0.002	0.010	0.018	**0.015**	Below DWS at source, max wash ≈ modelled QM inventory
Copper	0.02	0.007	0.014	0.112	0.217	**0.039**	Below DWS at source, average and max wash > than modelled QM
Zinc	0.005	0.003	0.006	0.115	0.331	**0.128**	
Matrix and Minor ions							
Chloride	33	11	12	261	306	**637**	Above DWS at source, less than modelled QM inventory
Sulphate	1,480	445	1,660	1,312	1,570	**1,731**	
NH_4-N	-	-	-	1.1	1.5	**15.6**	Above DWS at source, max wash < modelled QM
Herbicide and Hydrocarbons							
Mecoprop	-	-	-	-	-	0.034	Not analysed
Benzene	<0.0026	<0.0013	<0.0013	-	-	0.0020	Not present in wash sample
Toluene	<0.0026	<0.0013	<0.0013	-	-	0.0037	Not present in wash sample

Soil wash samples (x 4, date March 2022 – March 2023) from Bradley Wash Plant / Landfill, – direct process wash-off.

5.2 Pathways

5.2.1 Worked Ground and Made Ground

Areas of "worked ground" are noted at 'BGS GeoIndex' to the west of the installation, areas of landfilling are reported to the west and southwest at distances >0.7km and to the southeast at distances >1.5km.

5.2.2 Geological Succession – Overview

The geological succession has been outlined fully in the previous ESID and HRA[2,3] and subsequent review[30], a summarised account is provided below for context. There are extensive thicknesses of natural Superficial Strata in the area (Till, Glaciofluvial deposits) with minor deposits of "head" and "alluvium" present to the east in the course of the River Lostock.

The site is located above the Singleton Mudstone with the eastern most margin of Phase 3 above the Tarporley Siltstone, the geological sequence transgresses into the Sherwood Sandstone Group Strata to the east beyond the M6.

5.2.3 Superficial Geology

The superficial strata have been described previous as a varied sequence of interbedded fine grained silty sand, sand and gravel, silt, clay and occasional cobbles[2]. BGS GeoIndex indicates the area is predominantly covered by "Till" and "Glaciofluvial Deposits" (Devensian Substage of the Pleistocene Epoch).

5.2.4 Bedrock Geology

Stratigraphy

The Preston geological map (BGS, 1982, Solid[31]) indicates near surface Permo-Triassic strata of the Mercia Mudstone Group which overlies the Sherwood Sandstone Group. Underneath the Sherwood Sandstone are the Permian Manchester Marls which unconformably overlie the Westphalian (Coal Measures) and Namurian 'Millstone Grit'. As such, the Preston district is described within published literature as commencing with the formation of the upper part of the Bowland Shale Group[32]. *Deposition towards the end of the Lower Carboniferous period introduced large quantities of argillaceous sediment with minor amounts of sandy detritus were introduced, and a sequence of shales and mudstones with thin sandstones and limestones was deposited. Sedimentation was accompanied by somewhat variable subsidence, and a thick sequence of shales, mudstones and sandstones was formed. In later Millstone Grit times, and throughout the period of the Coal Measures, silting up of the depositional basin sometimes occurred, leading to the formation of seatearths and coals.*

Recent changes in nomenclature indicate that the Mercia Mudstone strata are subdivided into:

- Singleton Mudstone (Halite and Mudstone) – early Triassic (Anisian Age), at site
- Tarporley Siltstone (Siltstone, Mudstone) – early Triassic (Anisian Age), east of site
- Sherwood Sandstone, part of New Red Sandstone Supergroup (Sandstone) - Triassic (Induan to Anisian Age), east of site.

[30] Lydiate Lane Quarry Inert Landfill Site 2020 Hydrogeological Risk Assessment Review. September 2020, TerraConsult, 1607/R/021/01
[31] BGS Map Sheet 75 Preston. Solid, 1:50 000 New Series
[32] Price, D. et al. 1963. Geology of the Country around Preston (One-inch geological sheet 75 New Series). London: Her Majesty's Stationery Office [for Geological Survey of Great Britain].

Structure

Carboniferous sedimentation was terminated by the oncoming of the later and more intense phases of the Armorican orogeny. The area was subjected to uplift, folding and faulting, which produced the major tectonic features now recognizable in the Carboniferous rocks. Extensive denudation occurred[32]. The fault pattern of the Carboniferous is also seen in the Permo-Triassic. The major faults vary in trend from north to north-west.

5.2.5 Pathway Properties

Superficial Strata

Detail on the glacial sequence is provided in in the nearby "Fylde" Quaternary Geological Report[33], glaciofluvial deposits comprise well sorted and often free-running, sands and gravels however as noted (consistent with site observations) *"Till" is the most extensive of the glacial deposits, and is found in all sections. Till lithologies can be typically described as reddish, ill-sorted mixture of firm to stiff clay/sandy matrix with scattered gravel (and less frequently, with coarser grain sizes such as cobbles and boulders).*

Site investigations carried out between 1998 and 2008 confirmed that the site is situated on an upper clay horizon, sand and gravel, silty sand, clay and cobbles and a lower clay horizon. Lydiate Lane Quarry continues to extract sand and gravel deposits from the glacial sequence which range in thickness between 7.5m to 31m, thickening towards the west. The upper and lower clay horizons occurred in thickness between 0.4m to 4.5m and at least 10.5m respectively[30]. A report dated 2012 report further outlined the lateral and vertical variation of the sequence[34] and thicknesses of extractable resource approximating to 23 - 30m range.

Bedrock Strata

The underlying Singleton Mudstone is at a considerable depth below the site (~80m)[35], expectations are of a "low permeability" in accordance with on-line data sources for Mercia Mudstone Group strata.

5.2.6 Hydrogeology

Superficial Strata

Hydraulic details are not available from site, on account of the heterogeneous nature of glacial deposits[36,37], large variations in permeability can be reported. *The spatial variability of tills makes it difficult to select representative samples. The size of samples in relation to the fabric makes it difficult to*

[33] C CRIPPS, H F BURKE, J R LEE, E HOUGH. 2016. The Fylde, Lancashire: Summary of the Quaternary Geology. British Geological Survey Open Report, OR/16/013. 47pp.
[34] Geological and Quarry Development Appraisal, Lydiate Lane Quarry March 2012. Stephenson Halliday.
[35] https://api.bgs.ac.uk/sobi-scans/v1/borehole/scans/items/11208 BGS borehole SD52SW14
[36] The engineering properties of glacial tills. Clarke, B.G. Research Article Paper. Geotechnical Research, https://doi.org/10.1680/jgere.18.00020
[37] An approach to hydrogeological assessment of Quaternary deposits in the UK Part 2 Methodology and Testing October 2006. Project WFD 34.

determine the mass strength, stiffness and permeability of these tills. Matrix-dominated tills with a fine-grained content in excess of 35% have a conductivity of less than 10^{-9} m/s. The conductivity of clast-dominated soils is typically greater than 10^{-7} m/s. There is a transition zone between these two, which depends on the soil density, type of fine-grained particle and confining pressure[36].

It is additionally noted that *"The mass (in situ) permeability of glacial tills is a function of the intrinsic conductivity and the secondary conductivity, which is a function of the soil fabric, which in glacial soils can have a significant effect. Thus, the mass permeability is likely to exceed the intrinsic permeability".*

Recent site hydraulic testing in two site boreholes demonstrated that groundwater inflow was too rapid to allow drawdown for rising head test purposes, confirming the high "water bearing" yield / permeability and low silt / clay content of the associated worked strata. As such, the inferred expectations are that permeabilities greater than the transition zone "literature value" of $1x10^{-7}$m/s.

Groundwater Level and Flow Direction

Water levels from the glacial deposits are monitored at 4 locations as depicted on the monitoring location plan referenced 1607/1/007. Time series graphical representation of water levels between 20015 and 2023 is presented below in Figure 6. The data translates to the information depicted on the shaded colour contour plot in Figure 6, flow direction is westerly with a gradient of 0.016 falling from ~43 – 45mAOD in the east to ~34 – 36m AOD in the west. The information is consistent with previous reviews[2].

Figure 5 Groundwater Level Time-Series (mAOD)

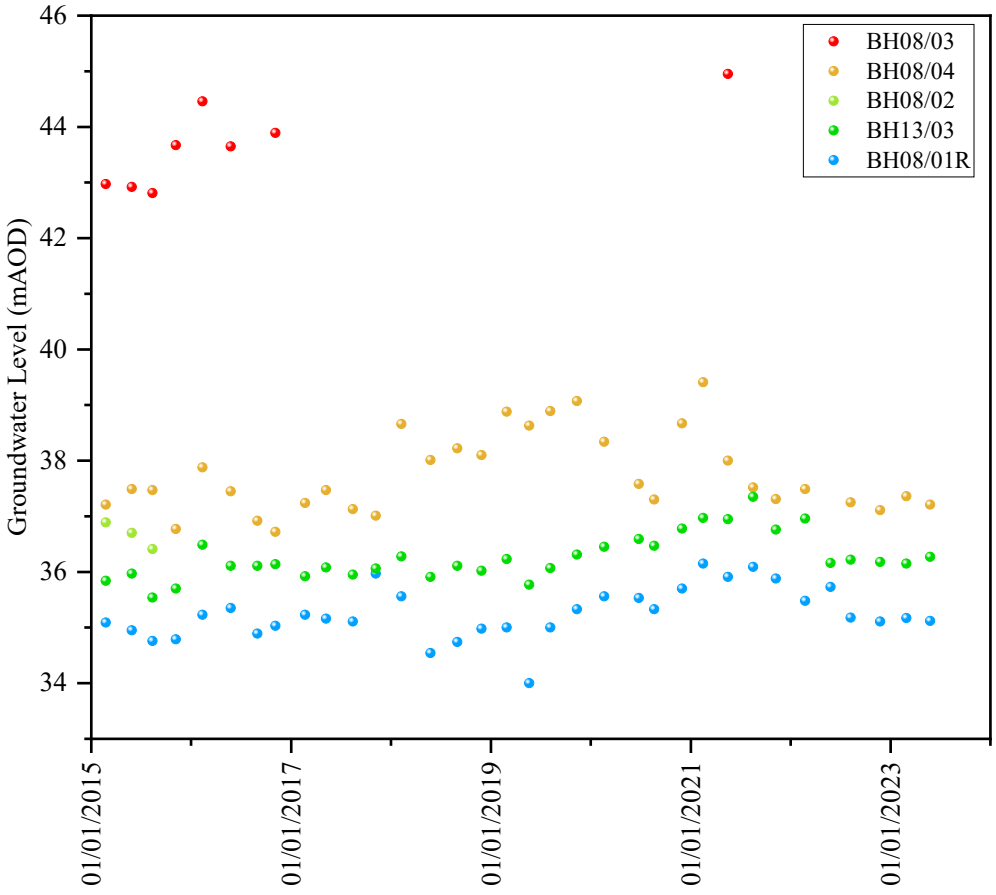
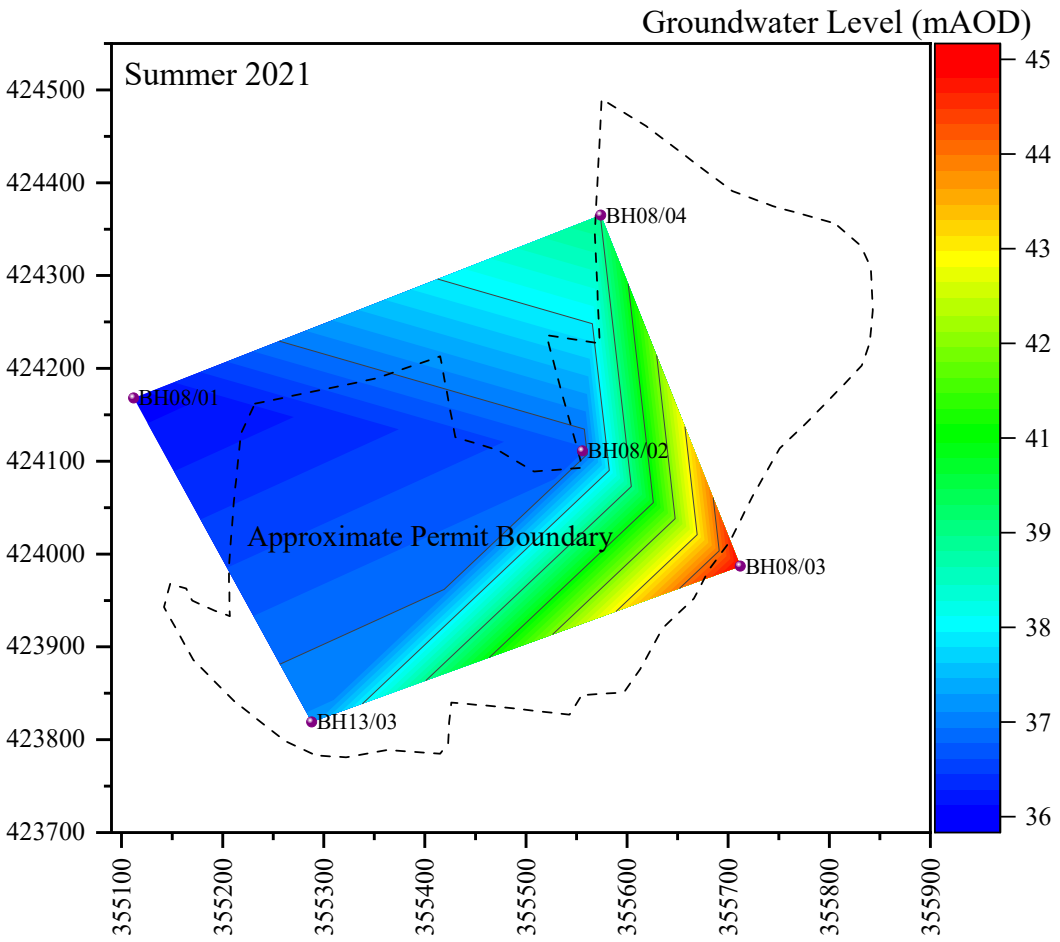


Figure 6 Groundwater Level Shaded Contour Plot



5.3 Receptors

5.3.1 Aquifers and Groundwater Status

Aquifer Classification

The "Till" superficial strata are classified as Secondary "undifferentiated" aquifers[8], referenced as *Secondary undifferentiated are aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value*[38].

Source Protection Zones (SPZ) and Safeguard zones (SgZs)

The site is outside any Source Protection Zone (SPZ), Total Catchment area (SPZ3). The closest SPZ is located 3.8km to the northeast, as such the site is not within a SgZs (Groundwater), mapping available at: https://environment.data.gov.uk/farmers/.

[38] Protect groundwater and prevent groundwater pollution Published 14 March 2017. https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution

Abstractions and Private Water Supplies

There are no known active groundwater abstractions or private water supplies within 2km. There are two historical mineral washing licences related to the site, current usage is below 20m^3/d.

Drinking Water protected areas (DrWP's)

The site is located within a DrWPAs, all groundwater bodies in England are designated, identified as a requirement of the Water Framework Directive[39] (West Lancashire Quaternary Sand and Gravel Aquifers)[40,41].

Groundwater Vulnerability

Vulnerability is classified as low - medium.

Springs

A water features survey has not identified any springs within 1km, however it was reported historically that a spring was located near Lydiate farm (<1km to southeast of site) but was stated as being capped according to local resident[2,3].

5.3.2 Hydrological Setting

The site lies within River Lostock catchment with the closest part of the river approximately 1.6 km to the west. Topography of site indicates drainage towards west towards River Lostock. An ephemeral stream located near Stoney Lane to north of site.

Drainage ditches located primarily to north of site and on site itself. On site ditches located in proximity to quarry access road which transfers run-off to the collection pond (SW01), location depicted on drawing 1607/1/007A. Water is not currently discharged from site.

A spring was referenced[2] in the 2012 ESID, located near Lydiate farm (<1km to southeast) however the report states that it had been "capped". There are no direct connections to surface water courses.

Surface Water Abstractions

There are no known[8] active surface water abstractions within 2km.

Flooding

The site is not within an area prone to flooding[8] (river and coastal), designated Flood Zone 1 for planning[42]. Surface water flooding 0.3-1m is not predicted at site, groundwater flooding is considered "moderate".

[39] Water Framework Directive (2000/60/EC) https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32000L0060
[40] WFD Groundwater Bodies (Cycle 2) | Catchment Based Approach Data Hub
[41] WFD Groundwater Bodies Cycle 2 - data.gov.uk
[42] Get flood risk information for planning in England. https://flood-map-for-planning.service.gov.uk/location

5.3.3 Groundwater Quality

Overview

Groundwater quality is currently obtained from the superficial strata at:

- BH08/03 (upgradient – east) monitored periodically,
- BH08/04 BH13/03 (cross gradient – north and south),
- BH08/02 (downgradient) monitored historically,
- BH08/01R (downgradient – west).

Matrix Ions

Groundwater quality time series plots are provided in Appendix A in addition to major ion chemistry for each monitoring point and summary of monitoring data. Inert waste landfilling has taken place to date, as such all monitoring data is considered to represent "baseline" conditions.

Ammoniacal-N concentrations are typically below 0.64mg/l, chloride and sulphate concentrations are below 75 and 90mg/l respectively. Sulphate concentrations are most elevated at location BH13/03 and are in the 40 – 85mg/l rang, potassium concentrations are <10mg/l.

Priority and Minor Metals

A summary of the non-hazardous priority metals cadmium, chromium, copper nickel, zinc and minor REDOX sensitive metals iron and manganese is provided in Appendix A.

There is an expectation of some variability based on the host glacial strata mineralogy and iron / manganese variability and REDOX state. Nickel and chromium are reported predominantly below or at detection limit 0.001mg/l and are below DWS concentrations of 0.02 and 0.05mg/l respectively, chromium is more variable with some increases in the 0.002 to 0.005mg/l range.

Copper and cadmium concentrations (DWS concentrations of 2 and 0.005mg/l) are typically reported below 0.014mg/l and 0.0002mg/l (sporadic outliers are noted in the dataset). Zinc is reported typically below 0.02mg/l.

Hazardous Metals

Lead is reported at the detection limit of either 0.001mg/l or 0.0003mg/l, mercury is reported at the detection limit of 0.001mg/l or 0.00005mg/l. The hazardous metalloid arsenic is variable with a concentrations range between 0.0003mg/l and 0.018mg/l (approximate to the DWS concentration of 0.01mg/l), the majority of data is <0.005mg/l.

Specific Organic Substances

Organic substances are not monitored as part of Permit EPR/LB3834AE/V004, the 2012 ESID[2] however reported that *No organic compounds were found to be present above the lower detection limits, except for TPH in three boreholes (08/01, 08/02 and 08/03). In these boreholes, TPH in the range C16-C24 were detected at concentrations between 23 and 34 µg/l. Benzene was also detected in the sample from BH 08/03 at a concentration of 1.1µg/l.*

Groundwater Compliance Limits

Compliance limits are currently set for ammoniacal-N at 4.5mg/l, chloride at 250mg/l and cadmium at 0.9µg/l (Permit Table S3.1).

5.3.4 Surface Water Quality

Surface water quality monitoring is a requirement of Permit Table S3.4 if water is discharged from site, no limits are set or currently required.

5.3.5 Site Sensitivity

As detailed above, and outlined previously, the location of the Site is not considered to fall within a particularly sensitive hydrogeological / hydrological area. There are no public water supply (potable) abstractions within 2km, and all historical nearby uses were for industrial processes, and any baseflow contributions to surface water ecosystems are at a distance of at least 1.6km downgradient of the landfill.

It is clear from the conceptual model and the very limited (if any) pollution potential of the proposed infill Qualifying Materials that the hazards are low and the environmental setting is sufficiently insensitive to negate the possibility of significant impacts (aquifer status of secondary A, 'undifferentiated' which is considered by the Environment Agency as having "*a minor value*".

Notwithstanding the above, in accordance with good environmental practices and due consideration of the water quality in the receiving superficial strata, a "quantitative" assessment is provided for completeness.

5.3.6 Assessment Scenarios

Hydrogeological risk assessment for landfill operations must assess the proposed development's compliance with the requirements of the relevant Regulations throughout the lifecycle of the landfill *i.e.* from the start of the operational phases until the point at which the landfill is no longer capable of posing an unacceptable environmental risk.

These lifecycle phases are summarised as a conceptualisation framework as:

1. Quarry ongoing with associated areas of infilling (with an unsaturated zone), lined with an AGB at 0.5m, $1x10^{-8}$m/s and infilled – Years 1-5 (2024 – 2028, unless extended)
    a. Waste infill, placed and compacted through depositional process (recoverable aggregates and large stones / boulders are to be removed at source or screened prior to waste placement) such that machine and natural compaction achieves a bulk hydraulic conductivity in the order of $1x10^{-10}$m/s.
    b. Waste infill is to be placed dry.
    c. Minimum basal elevation of cell at 44mAOD, with an infill depth of ~ 2 - 12m.
    d. Across an area of ~440 x 620m at the base (modelled dimensions).
    e. Infill mass is considered analogous as a low permeability "plug" equivalent in entirety to the placement of a geological barrier.

2. Completion of infilling – Years 5-7 (2028 – 2030)
    a. Waste infilling / deposition completed to a surface elevation of 44–56mAOD
    b. Seepage of porewater to groundwater at the edge of the infill / AGB in a down gradient direction (compliance point = monitoring point (BH08/01).
3. Restoration – Year 7 and 8 (2030 and 2031)
    a. Placement of 0.5m layer, $1x10^{-8}$m/s and 1m of soils to complete the proposed landform.
    b. Completion of surface water scheme if required, inclusion of attenuation pond.
4. Aftercare period – Year 8 to 18 (expectation based on waste types)
    a. Continued stabilisation of the infilled materials.
    b. Monitoring and periodic review to be undertaken as per Environmental Permit requirements.

The lifecycle phases therefore include an "operational phase" (Stages 1 and 2 above), "post closure phase" (Stage 3 above) and "long-term closure phase" (Stage 4 above).

Additionally, the potential source, pathway and receptor terms can all be defined with sufficient certainty so as to be confidently represented by conservative inputs, models and assumptions, e.g. a single homogenous source of non-hazardous soils / construction / demolition wastes with conceptually understood flow characteristics and directions.

5.3.7 Accidents and Consequences

In regard to accidents, they are considered to be unintentional incidents that could reasonably occur, which are unforeseeable in terms of their time of occurrence. The process of evaluating environmental risks should therefore include the consideration of the potential impact of accidents as well as the resulting harm.

Based on the site setting and associated design and proposed infilling / restoration, potential accidents such as flooding, subsidence, landslides, fires and explosions are all considered to be unlikely / very unlikely. As such, further assessment is not considered necessary.

5.3.8 Receptor Summary

The groundwater in the glacial superficial strata have been considered receptors in previous reviews and assessments. There are no recognised upward / deteriorating chemical trends identifiable in the groundwater from current inert landfilling activities.

All groundwater collected to date is considered as representative of the background system and activities on surrounding lands independent of the operation and disposal within the engineered containment cells.

6 Conceptual Site Model Summary

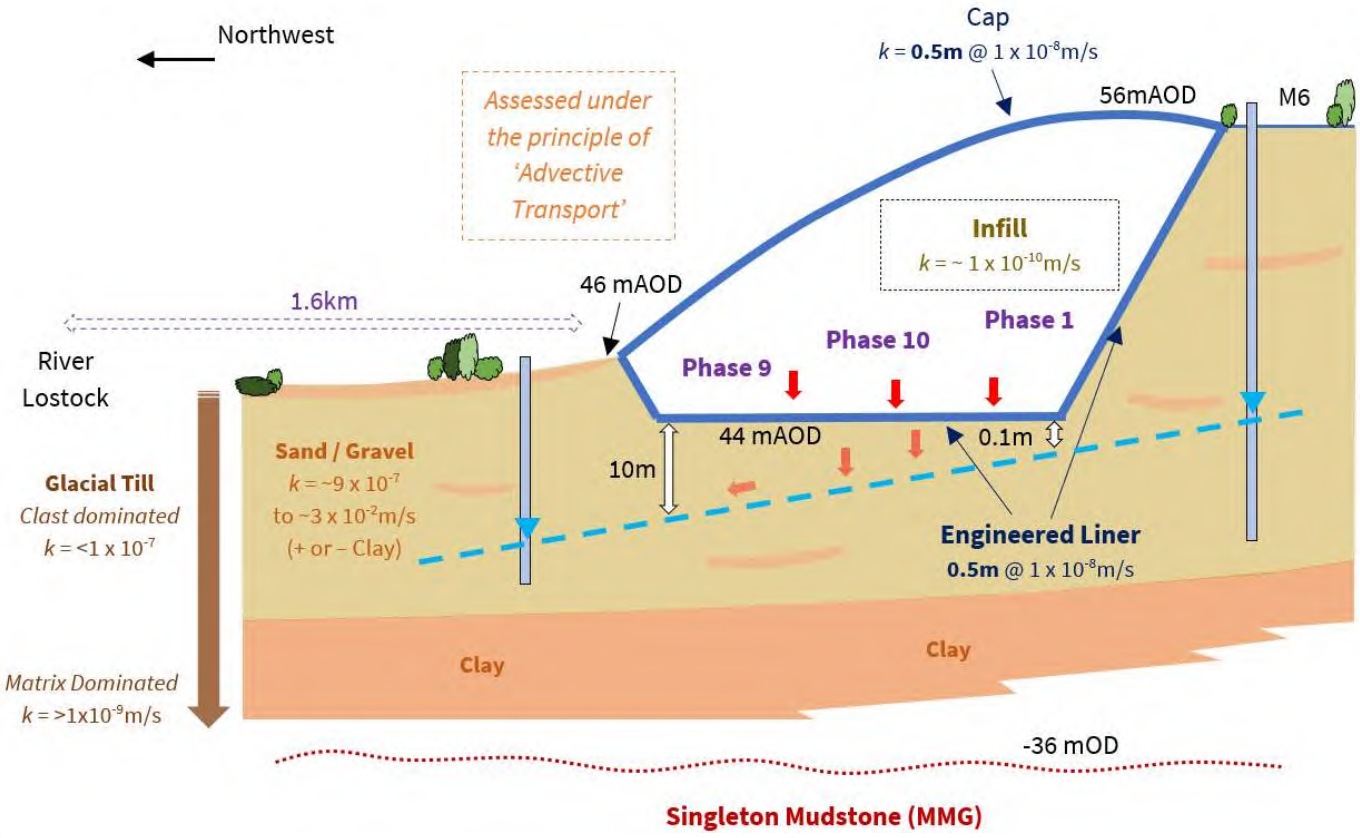
A simple conceptual model can be constructed for this site based on the relationship;
Source → Pathway → Receptor

Where the:

- Landfill is the source,
- The pathway is the engineered containment system and the variable underlying superficial sands, gravels , clays,
- The receptor is the groundwater in the sands / gravels measured at the down gradient site boundary.

A representation of the CSM is provided in Figure 7 for completeness.

Figure 7 Conceptual Site Model



Sand / gravel (hydraulic conductivity) range taken from the LandSim Manual, bulk glacial till from "*The engineering properties of glacial tills. Clarke, B.G. Research Article Paper. Geotechnical Research, https://doi.org/10.1680/jgere.18.00020*"

Sand and gravels predominate the glacial sequence based on the previous intrusive investigations[34] (figure 01 contained therein), Appendix C.

7 Requirement for Risk Assessment

7.1 The Priority Contaminants to be Modelled & Qualitative Screening

After a review of the potential source term and consideration of concentrations relative to DWS in Section 5.1.3 (Table 5, Table 6 - a Tier 1 approach), it is considered appropriate to assess the following contaminants:

Hazardous Substances:

- Arsenic – Present in the source term as concentrations above DWS and site groundwater concentrations (metalloid included for completeness as mercury and lead are not present in the source term).

Non-Hazardous Pollutants:

- Nickel – Non-hazardous metal present in the source term at concentrations above DWS and local groundwater concentration.
- Chloride, sulphate and ammoniacal-N – Matrix and minor ions present in the source term at concentrations above DWS and local groundwater concentration. Ammoniacal-N is however only included based on "perceived water impact sensitivity" (most likely concentration 1.1mg/l, Table 5).

7.2 Determination and Appropriateness of Environmental Assessment Limits (EALs)

With a soil infill scheme as proposed which excludes putrescible wastes and their associated biodegradation by-products as well as the exclusion of industrial chemical wastes there is a limited number of potential contaminants compared to conventional waste landfill sites.

The EAL's appropriate are either defined as a water quality standard or local groundwater concentration. The EAL's appropriate to Lydiate Lane proposed non-hazardous landfill are presented in Table 7.

Table 7 Derivation of Environmental Assessment Limits (mg/l)

Determinand	UK DWS	MRV	Maximum Concentration in groundwater	EAL
Arsenic	0.01	-	0.014 #	0.014
Nickel	0.02	-	0.006	0.02
Chloride	250	-	72	250
Sulphate	250	-	80	250
Ammoniacal-N*	0.5*	-	0.64	0.64

DWS from 2016 No. 614 The Water Supply (Water Quality) Regulations 2016
https://www.legislation.gov.uk/uksi/2016/614/pdfs/uksi_20160614_en.pdf
*Ammonium (units of measurement as mg/NH_4/l) DWS 0.5mg/l guide value – (referenced standard for NH_4-N 0.39mg/l)
Some groundwater variability noted for arsenic (above DWS)

It is noted that the current permit includes cadmium, not considered a priority substance in the source term (Table 5, Table 6, Section 5.3.1). Permit limits (and priority substances) should be re-confirmed during application determination.

7.3 The Nature of the Hydrogeological Risk Assessment

The Lydiate Lane Hydrogeological assessment has been undertaken utilising a tiered approach, firstly by an appraisal of the CSM (source-pathway-receptor) and nature of the infilling scheme (including timeframe of deposition) which allows a qualitative assessment of contaminant risk (*Tier 1*). The assessment concludes with a "*Tier 3*" assessment in accordance with current guidance[43].

Assessment of Lifecycle Phases

This site can be conceptually understood with the characteristics, for investigation and assessment purposes to be a low permeability soil plug, which may or may not contain contaminants. This plug will be infilled in a manner which encourages the shedding of incident rainwater into a sump which will be removed prior to it infiltrating into the soil fill. In this respect, the infilling period will differ from that of a conventional landfill in which rainfall readily percolates through the waste mass to generate a free-flowing liquid.

On restoration completion, the majority of the incident rainfall will also preferentially shed laterally to the site perimeter, if volumes are such that management is required, perimeter ditches / managed surface water system will be considered accordingly. Previous studies on landfill cap infiltration (R&D Technical Report P227) suggests that 90% of all rainfall excess is shed laterally in a sloped "agricultural layer" (restoration soils) with average slope gradients of 7.5% (~4°) over an engineered cap at 1m thickness ($k = 1x10^{-9}$m/s, design standard).

As such, and although a potential "theoretical" seepage of incident rainfall could transit vertically through the infill to the placed liner, seepages to groundwater are considered minimal in the longer term (lifecycle phases 2, 3 and 4) as drainage will be limited by the clay rich content of the infill materials (i.e. with a bulk infill permeability approximating to $1x10^{-10}$m/s).

7.4 Quantitative Assessment

Modelling Approach

As such, considering the site as a low permeability soil plug above groundwater, this conceptual framework could be assessed using the Environment Agency's "ConSim" modelling package[44]. However, LandSim[45] has been utilised in this instance which is also a probabilistic simulator that assesses contaminant migration from a source through a barrier system which underlies the

[43] Groundwater risk assessment for your environmental permit - https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit (accessed July 2023)
[44] Golder Associates (UK) Ltd. ConSim V2.5
[45] Golder Associates (UK) Ltd (2003) LandSim. Landfill Performance Simulation by Monte Carlo Method. Environment Agency R&D Publication 120

potential polluting source, vertically through an unsaturated zone beneath the barrier, and a saturated pathway before entering an aquifer.

The model (like ConSim) also performs multiple simulation runs and the simulation programme compiles the results as a statistical probability of a particular result occurring. When the results are statistically combined, the likelihood of each of the 'worst-case' parameters occurring simultaneously can be compared with the general case which is actually expected to happen. The impact of each of these cases and that of intervening probabilities can then be compared with relevant water quality standards to determine if the risk is acceptable.

Model Parameterisation

The probabilistic model has been assigned input parameterisation that includes a design standard lining system of 0.5m at hydraulic conductivity of $1x10^{-8}$m/s. The model assumptions include:

- Declining source term,
- Allows for dispersivity and flow within an aquifer pathway to a receptor.

The input values to the non-hazardous soil source risk model (including soil wash residues) are presented for ease of reference in Table 8.

Table 8 LandSim Parameterisation Table

Parameter	Unit	Input Values	Justification
Infiltration Information			
Infiltration to open waste	mm/annum	50	Standard infiltration through landfill cap
Infiltration (cap design)	mm/annum	50	Standard infiltration through landfill cap
Infiltration to grassland (effective rainfall)	mm/annum	-	Not included
Waste Thickness	m	2,7,12	Design
Waste Porosity	%	0.3, 0.61	"silt" – LandSim manual
Waste Density	kg/l	1, 2.4	ConSim default "clay"
Waste Field Capacity	%	0.23, 0.40	Literature values (sandy clay to clay)
End of Filling	year	8	Considered appropriate (end date of 2031)
Management Control	year	11	Considered appropriate
Time Offset	year	0	Considered appropriate
Landfill Geometry			
No of LandSim Phases	-	1	Assessment considers the entire site
LandSim Modelled Phase – Single Phase			
No of cells	-	1	Liner Comparison only
Area of Phase base	Ha	27	440m x 620m
Area of Phase top	Ha	30	Appropriate for modelled Phase Area
Drainage system		N/A	Head on EBS simulated
Head of leachate at point of breakout	m	2	West area of site (c.f. Figure 7), relative to base elevation of 44mAOD
Leachate Head	m	1	Considered relevant for simulation
Priority Compounds to me modelled			
Ammoniacal-N	mg/l	0.2, 1.1, 15.6	Qualifying Materials Soils Inventory (soil wash data and filter residue within modelled range). Nickel includes maximum from soil wash samples.
Chloride	mg/l	69,133,637	
Nickel	mg/l	0.007,0.011,0.056	
Arsenic	mg/l	0.003, 0.005,0.021	
Sulphate	mg/l	607,912,1731	
Decay Rates			

Ammoniacal N	Years	0	Not included (conservative assumption)
Chloride	Years	0	
Nickle	Years	0	
Arsenic	Years	0	
Sulphate	Years	0	
Liner Assessments Scenario – Clay Barrier			
Sim (A) – 0.5m engineered clay liner @ 1 x 10^{-8}m/s			ASL included in the simulation
Moisture Content	%	0.1	Assumed for "clay"
Bulk Density	kg	1.8, 2.2	Range that includes ConSIm Help File mid value (2kg – Silt)
Dispersion - longitudinal	m	0.05	10% pathway length
Retardation (Kd) – clay liner			
Ammoniacal Nitrogen	l/kg	2-4	Assumes material is from surface / Lancs region (ConSim Help Files state 3.2 – glacial till)
Chloride	l/kg	0	Non retarded species
Nickel	l/kg	175 - 2496	Fannin 2006 (Glacial strata - Lancs)
Arsenic		25, 250, 500	Sand / Loam - LandSim 2.5 default and literature, Soil Guideline Values for inorganic arsenic in soil Science Report SC050021/ arsenic SGV
Sulphate	l/kg	0	Non retarded species
Unsaturated pathway			
Pathway length	m	0.1, 6,10	Judged against base elevation of 44mAOD
Moisture Content	%	0.1, 0.3	Assumed "clay"
Density	kg/l	1.8, 2.2	Range that includes ConSIm Help File mid value (2kg – Silt)
Hydraulic Conductivity	m/s	$9.0x10^{-7}$, $3.0x10^{-2}$	LandSim 2.5 default (sand, coarse / medium to gravel). Conservative assumption as the majority of the near surface sequence is "sand" or "gravel".
Dispersion - longitudinal	m	0.01, 0.6, 1	10% pathway length
Retardation (Kd) – Unsaturated zone & Aquifer Pathway			
Ammoniacal Nitrogen	l/kg	0.5,2	Sand/Loam – LandSim 2.5 default (applicable to "sandier sequence beneath site) – defined by BH logs
Chloride	l/kg	0	Non retarded species
Arsenic	l/kg	25, 250, 500	Sand / Loam - LandSim 2.5 default and literature, Soil Guideline Values for inorganic arsenic in soil Science Report SC050021/ arsenic SGV
Nickel	l/kg	20,800	Sand/Loam – LandSim 2.5 default
Sulphate	l/kg	0	Non retarded species
Vertical pathway			
Not simulated			
Aquifer Flow			
Pathway Width	m	650	LandSim Maximum – greatest distance between flow lines
Mixing Zone thickness	m	7.5,31	Site information – thickness of sand / gravels (full aquifer thickness is ~80m)
Darcy Flux	m/s	-	Not used
Hydraulic Conductivity	m/s	$2.0x10^{-5}$, $6.0x10^{-3}$, $3.0x10^{-2}$	(Till) – Transition zone between clast and matrix dominated sequences[36] is $1x10^{-7}$m/s, sand grade material predominates at site (i.e. $6x10^{-3}$m/s) with areas of gravel (LandSim default used) – silt to gravel
Hydraulic Gradient	-	0.016	Calculated from site data
Pathway Porosity	%	0.25,0.61	ConSim files – silt to gravel
Aquifer Thickness	m	-	Not included
Dispersion - longitudinal	m	0.75,3.1	10% pathway length
Dispersion - Transverse	m	0.225,0.93	3% pathway length
Background Groundwater Quality		-	Not Included

Fannin (2006). An evaluation of the chemical attenuation capacity of UK mineral liner and geological barrier materials for landfill leachate components. Quarterly Journal of Engineering Geology and Hydrogeology. 39, 267 - 281

Emissions to Groundwater

The assessment has been undertaken at the two compliance points, namely:

- for hazardous substances after mixing with groundwater at the edge of the site (Monitor Well); and
- for non-hazardous substances at a downgradient monitoring point (Compliance Point - CP) - monitoring borehole referenced BH08/01.

The results of the quantitative assessment are provided in Table 9.

Table 9 LandSim Model Results

Substance	EAL	Simulation 1 as per Table 8 Basic Model			Simulation 2 (Mixing Zone Reduced to 4, 15m)			Simulation 3 (Decreased Infiltration - Reduced flushing depletion to 25mm/yr)		
		Most Likely	95th%ile	year	Most Likely	95th%ile	year	Most Likely	95th%ile	year
		mg/l	mg/l		mg/l	mg/l		mg/l	mg/l	
Predicted Groundwater Concentration - Compliance Point (Monitoring Borehole)										
NH_4-N	0.64	0.001	0.04	77	0.002	0.08	120	0.0002	0.009	106
Chloride	250	1	20	19	2	48	28	5	15	28
Sulphate	250	5	96	26	6	240	30	3	81	29
Nickel	0.02	$4x10^{-6}$	0.0002	13,400	$4x10^{-6}$	0.0003	6,900	$<1x10^{-9}$	$<1x10^{-9}$	-
Predicted Groundwater Concentration - Monitor Well (edge of phase)										
Arsenic	0.01	$2x10^{-5}$	0.0006	20,000	$2x10^{-5}$	0.001	13,300	$9x10^{-6}$	0.0007	14,360

Current ammoniacal-N EAL as per permit ref EPR/LB3834AE/V004 = 4.5mg/l. Distance to the compliance point measured at 91m, modelled distance (for conservatism) 40m.

The model predicted concentrations (simulation 1, base case model) demonstrates that there will be no cumulative deterioration in downgradient water quality, as the 95th%ile predicted ammoniacal-N concentration is significantly lower the current permit limit of 4.5mg/l and approximate an order of magnitude below the assigned EAL of 0.64mg/l.

The model results are overly conservative as biodegradation is not included within the simulation, half-life degradation of 5-10 years[46] or potentially ~6 years as calculated for a shallow sand and gravel aquifer[46,47].

The 95th%ile chloride concentration at 20mg/l is significantly below the current background concentration at ~70mg/l, the predicted sulphate concentration at 96mg/l is an increase above current background (maximum of 80mg/l) however there is no significance to this increase from a usage perspective of the groundwater with concentrations significantly below DWS and EQS water quality standards respectively. Consequently, there is no expectation of a discernible change in

[46] Environment Agency 2004. Review of ammonium attenuation in soil and groundwater. S. R. Buss, A. W. Herbert, P. Morgan & S. F. Thornton. NGWCLC report NC/02/49

[47] A Review of Ammonium Attenuation in Soil and Groundwater, November 2004. S. R. Buss, A. W. Herbert, P. Morgan & S. F. Thornton, J Smith. Quarterly Journal of Engineering Geology and Hydrogeology 37(4):347-359

downgradient groundwater quality at the monitoring location. Concentrations will not be discernible above current background with the exception of sulphate. Incorporation of background sulphate groundwater concentrations (range of 15 to 80mg/l) indicates a short-term increase to a maximum of 116mg/l (at 25 years), the increase however remains <50% of the DWS concentration at 250mg/l. Most likely concentrations do not exceed 50mg/l.

Nickel concentrations are not predicted to exceed 0.0002mg/l, two orders of magnitude below the EAL, while the hazardous metalloid arsenic is not predicted to exceed 0.0006mg/l.

As part of the assessment process, a series of sensitivity analyses have been undertaken to understand the effects on the baseline simulation by changing parameterisation independently of other model parameters. This included a reduction in the aquifer mixing zone (Simulation 2) and reducing the infiltration through the waste infill (Simulation 3) in order to decrease source term depletion rates. Reducing the mixing zone thickness of the aquifer by 50% increased the predicted concentration of all substances, sulphate however remained below the DWS.

Conversely, reducing the infiltration by 50% improved the predicted outcome as judged against simulation 1, this is considered more likely on account of the predicted infill characteristics / associated permeability of the infill (Section 5) that will include soil filter residue and soil wash particulates (fine grained silt / clay fraction). Arsenic is not predicted to exceed the EAL at the base of clay liner (0.007mg/l at 20,000 years).

There are no environmental concerns in reverting to non-hazardous wastes from inert waste in regard to the usage and quality of the superficial aquifer groundwater, with no exceedances of the EAL's for ammoniacal-N, chloride, sulphate, nickel or arsenic. All predictions remain below background groundwater maximum concentrations identified in Table 7.

7.5 Assessment Summary

A Tier 1 and Tier 3 assessment has been undertaken in accordance with current guidance that includes an Environment Agency approved model for quantitative assessment. It is additionally noted that:

- Current and potential use of the water resource is limited (use for industrial purposes / mineral washing on site).
- Downgradient water resources are not at risk.
- The aquifer does not provide "any" potable supplies within 2km.
- The superficial aquifer is not regarded as a sensitive receptor – Environment Agency aquifer designation "*variable characteristics……only minor value*"[48].
- There are no known springs or linkages to surface water systems or dependant ecosystems.
- The source term is relatively benign in comparison to putrescible wastes.

[48] Section 6.3 Secondary Undifferentiated Aquifers:- https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution

- There is no expectation for groundwater deterioration for the restoration of the site using solely Qualifying Materials under an Environmental Permit.
- An AGB is proposed only to accord with Landfill Directive requirements, in actuality the waste mass itself far exceeds the minimum (hydraulic) requirements (hydraulic conductivity) for a placed engineered liner / barrier (i.e. ~$1x10^{-10}$m/s).
- The placed liner to date, beneath the "inert fill" (range of thickness 0.5m to 1.1m, hydraulic conductivity $5.4x10^{-10}$m/s to $8.1x10^{-11}$m/s – see Section 3.4) far exceed the "inert" requirement of 1m at $1x10^{-7}$m/s and the proposed "non-hazardous" soil infill at 0.5m at $1x10^{-8}$m/s.

8 Review of Technical Precautions

The primary technical precaution implemented for the future void restoration scheme is through restricting the quarry restoration materials to QMs only.

These materials have negligible organic content, of a low polluting potential and negligible leachate generating potential. This qualitative and quantitative hydrogeological risk assessment has demonstrated that technical precautions are not required for the restoration of Lydiate Lane Quarry Landfill using QMs.

Protection is provided for by the properties of infill in combination with the artificial sealing liner / geological barrier, which have a low seepage rate compared to dilution afforded within the superficial strata (sand / gravels). The report has demonstrated that leachate (pore-water) control is not necessary and that any substances exiting the site either under advective transport would not lead to a change in groundwater quality through the processes of dispersion, dilution, retardation and degradation.

It is however, considered that the majority of the rainfall will not infiltrate into the deposited materials and will run-off and pond as surface water unless managed (bulk infill ≈$1x10^{-10}$m/s). Therefore, some surface water management will be required, this will be collected and incorporated into the current on-site surface water management.

The site design includes an AGB in accordance with the Landfill Directive requirements for a site of this type however conceptually the entire infill is the equivalent to a geological barrier and conceptually the infill is deemed a "soil plug". Additionally however, and in accordance with previously consented schemes at identical sites, a series of spine-drains and leachate / porewater monitoring chambers are proposed to monitor the evolution of the source term in accordance with quality assumptions and drainage principles as outlined in Section 5.1.3 and 5.1.2 respectively.

There are no identifiable, or further "risk management options" considered appropriate.

The proposed design standards and management measures are outlined in Table 10 and Table 11.

Table 10 Operations, Previous Construction and Design Standards

Installation Variable	2012 Application – Assessment Inert Site	2023 Application – Assessment Non-hazardous Site
Site Phasing	10 Phases (referenced 1 to 10). Phases 7 & 8 are located on the western boundary. Phases 3 and 4 are to the eastern boundary. Extraction limit of 44 mAOD.	Phase 1 and 6 partially filled. Phasing will progress as dictated by operational constraints. Current base of the void is approximately 45 mAOD in areas.
Restoration Specification	The quarry will be restored using inert material in accordance with the planning permission.	No change, to include appropriate soil forming material (on-site derived where possible)
Liner Specification	Base and side-slopes: minimum thickness of 1 m of compacted clay (max. hydraulic conductivity of 1 x 10^{-7} m/s).	Base and side-slopes: minimum thickness of 0.5 m of compacted clay (max. hydraulic conductivity of 1 x 10^{-8} m/s).
Capping Specification	No requirement for a low permeability cap or an inert landfill.	0.5 m of compacted clay (max. hydraulic conductivity of 1 x 10^{-8} m/s).
Wastes Types	Those listed in Appendix A of Report referenced 1607/R/006/1 of the 2012 permit application.	Non-hazardous waste, conforming to Qualifying Materials Order.
Leachate Management	None proposed and none required by issued permit.	Discretional spine drains and leachate / porewater monitoring chambers.

Table 11 Management and Technical Controls Throughout the Landfill Life Cycle

Landfill Phase	Leachate Management	Gas Management	Containment System Artificial Geological Barrier	Landfill Cap
Operational (non-hazardous wastes)	No requirement for management, no specified leachate limits required. Periodic monitoring undertaken for establishing surrender point	No requirement for management, no specified limits required. Periodic monitoring undertaken for establishing surrender point	Inert & non-hazardous areas – Operates as designed	Inert area - N/A Non-hazardous – 0.5m @ $1x10^{-8m}$m/s
Post Closure & Aftercare Period	Periodic monitoring undertaken for establishing surrender point, some degradation/ clogging of the drainage system	Periodic monitoring undertaken for establishing surrender point, some degradation/ well clogging of the monitoring system	Operates as designed	Operates as designed
Site Completion	None	None	Operates as designed	Operates as designed
Post Site Completion	None	None	Operates as designed	Operates as designed

Note: The waste mass itself conforms to the requirements of a "geological barrier" – see Section 5.1.2

9 Requisite Surveillance

A monitoring schedule has been proposed based on this risk assessment which has demonstrated that provided that the robust waste acceptance control procedures are implemented, monitoring of the leachate and groundwater is unlikely to be necessary.

However, as per previously determined permit applications by the Environment Agency for equivalent schemes, a monitoring network for off-waste and in-waste monitoring is proposed that

accords with guidance LFGTN02[49]. Spine drains beneath the infill will convey porewater collection to the monitoring chamber. Monitoring the quality will allow cross-referencing with the assumed source term contained herein, schedules are proposed elsewhere within the permit application.

10 Conclusions

The site is located within a low-sensitivity area, namely an excavation within superficial glacial strata.

It is considered that given the current groundwater quality and the attenuation capacity of the geological barrier (including the waste mass itself) that it is highly unlikely that the proposed restoration scheme could discernibly impact on groundwater quality. Consequently, the requirements of the Groundwater Directive (1998) have been met. The nature of the proposed materials and the associated hydrogeological risk is consistent with that for an inert site.

Such sites do not require active management controls and there is not a sensitive underlying water resource. There is not a risk-based justification for implementing active management controls for leachate within the site. However, a monitoring schedule has been proposed in the permit application which will enable the design assumptions to be validated.

This monitoring schedule will however include infrastructure capable of being utilised for leachate abstraction should a condition arise where active leachate management is required.

10.1 Compliance with Schedule 10 (Landfill) of the Environmental Permitting (England and Wales) Regulations 2016

The Landfill Regulations have been superseded by the Environmental Permitting (England and Wales) Regulations 2016 (as amended). These regulations implement the underlying Landfill Directive.

The conclusions of this report are that:

- The development does not pose a hazard to groundwater and surface water quality, subject to the technical precautions identified with regards to passive controls (*i.e.* waste acceptance criteria to be followed as per agreed Site Management Systems / EMS and adherence to waste acceptance criteria).

The site therefore complies with the Schedule 10 of the Regulations.

[49] Monitoring of landfill leachate, groundwater and surface water: LFTGN 02 (2003) Environment Agency

10.2 Compliance with Schedule 22 (Groundwater Activities) of the Environmental Permitting (England and Wales) Regulations 2016

This Schedule implements the Water Framework Directive, which requires that hazardous (formerly List I) substances are prevented from entering groundwater and that non-hazardous pollutants (formerly List II) substances are controlled so as to prevent pollution.

The risk assessment has demonstrated that the technical precautions identified and implemented at the site are sufficient to:

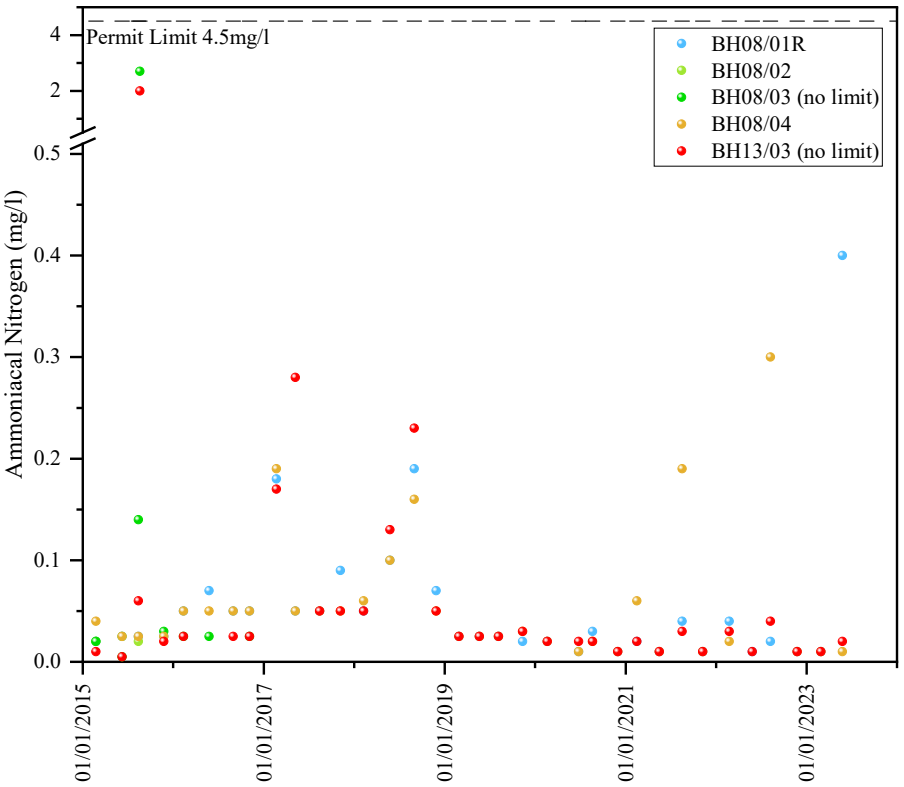
- prevent a direct discharge of hazardous substances
- prevent hazardous substances entering groundwater at discernible concentrations; and
- prevent pollution by non-hazardous substances.

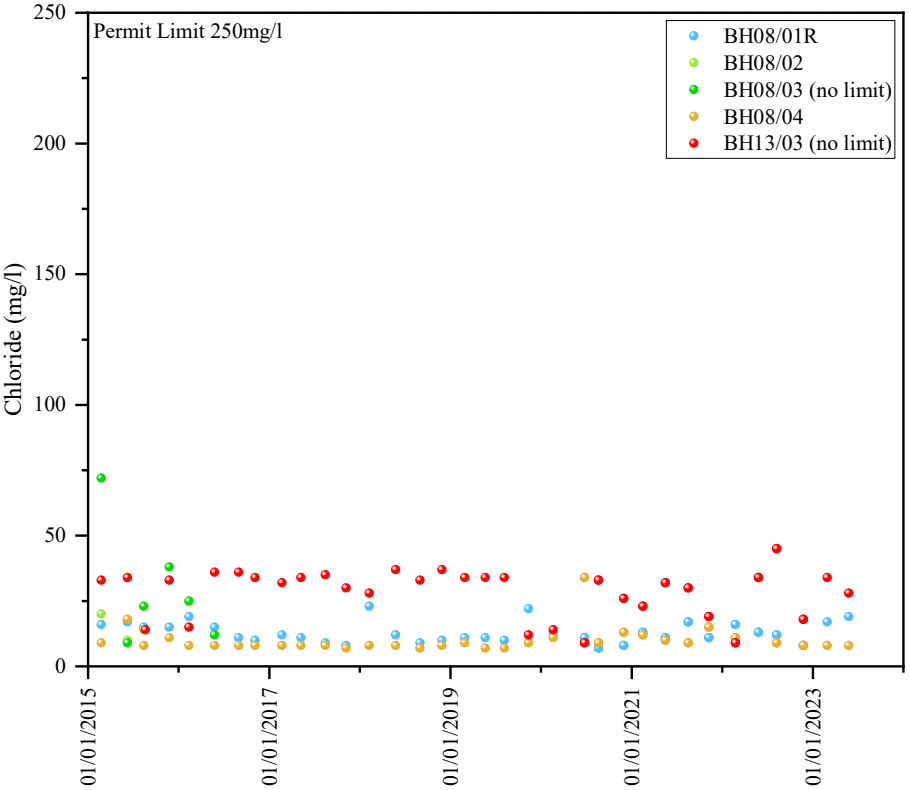
The risk assessments in association with the monitoring data demonstrate that the site is highly unlikely to have a discernible impact on groundwater quality.

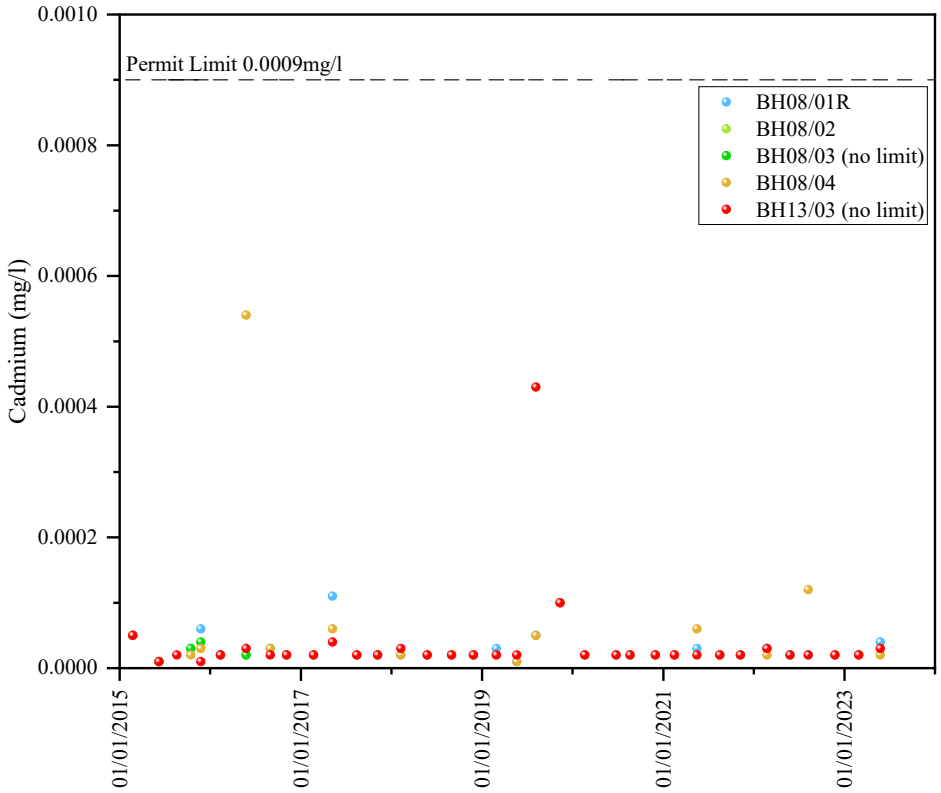
The site therefore complies with the relevant requirements of the Regulations and the Water Framework Directive.

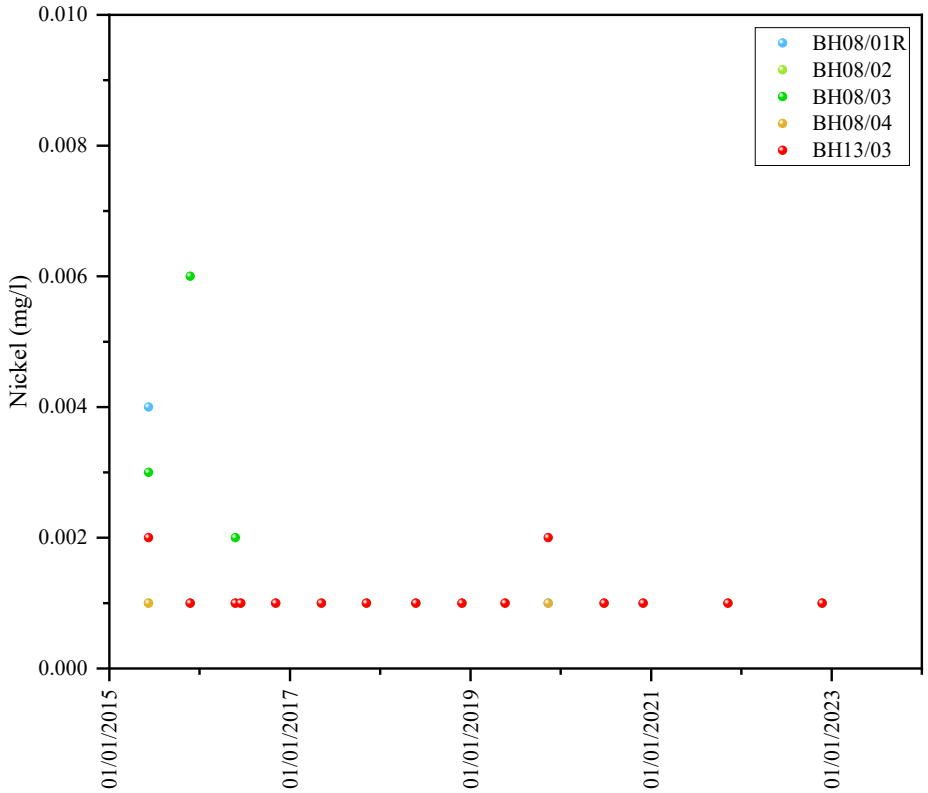
Appendix A –

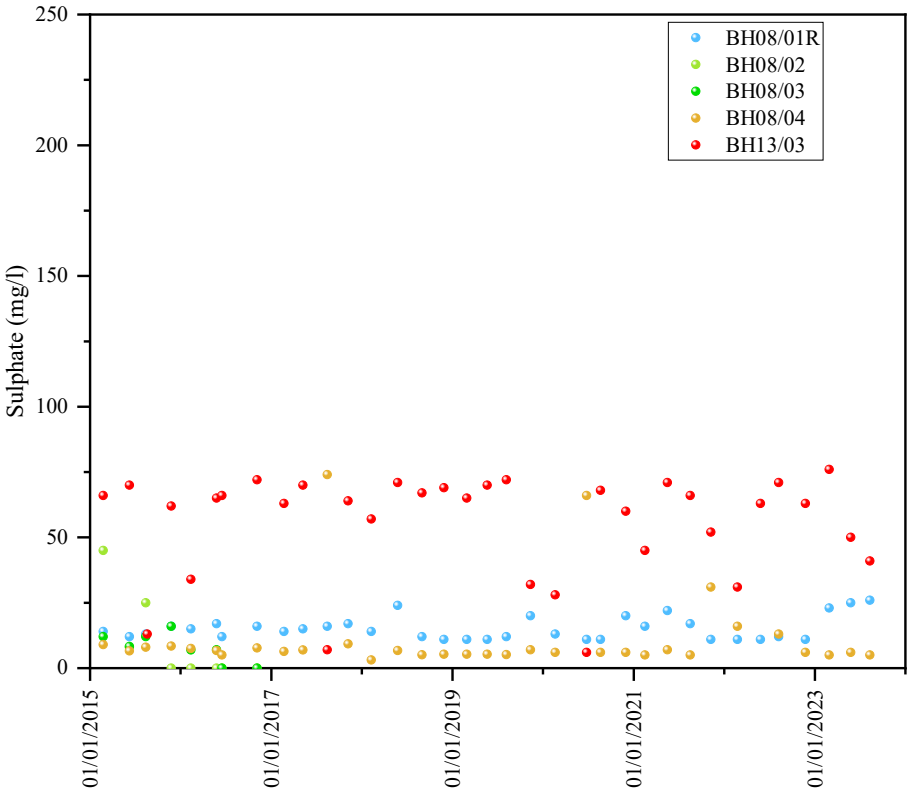
Groundwater Time Series Data

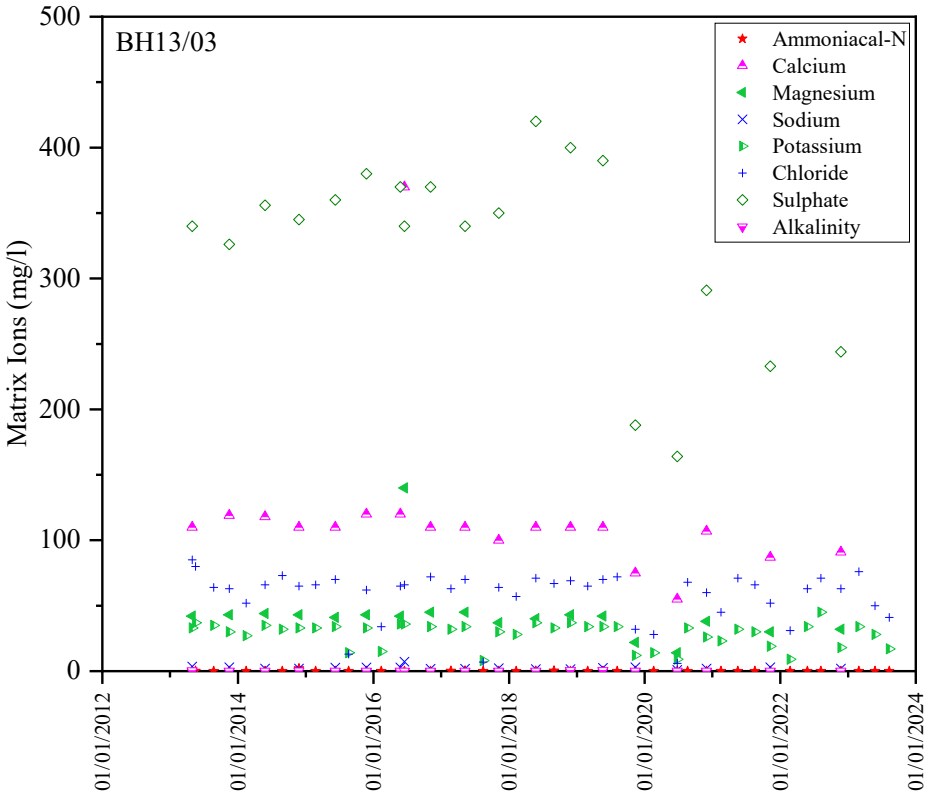

Permit Limit 4.5mg/l
BH08/01R
BH08/02
BH08/03 (no limit)
BH08/04
BH13/03 (no limit)
Ammoniacal Nitrogen (mg/l)
4
2
0.5
0.4
0.3
0.2
0.1
0.0
01/01/2015
01/01/2017
01/01/2019
01/01/2021
01/01/2023

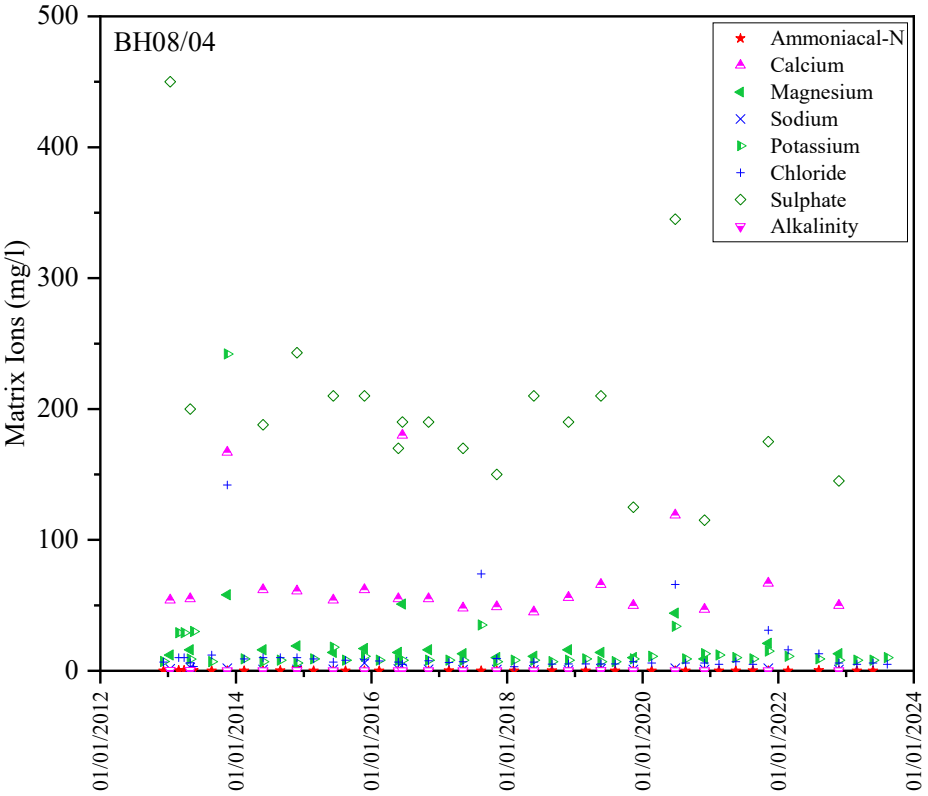

Permit Limit 250mg/l
BH08/01R
BH08/02
BH08/03 (no limit)
BH08/04
BH13/03 (no limit)
Chloride (mg/l)
250
200
150
100
50
0
01/01/2015
01/01/2017
01/01/2019
01/01/2021
01/01/2023

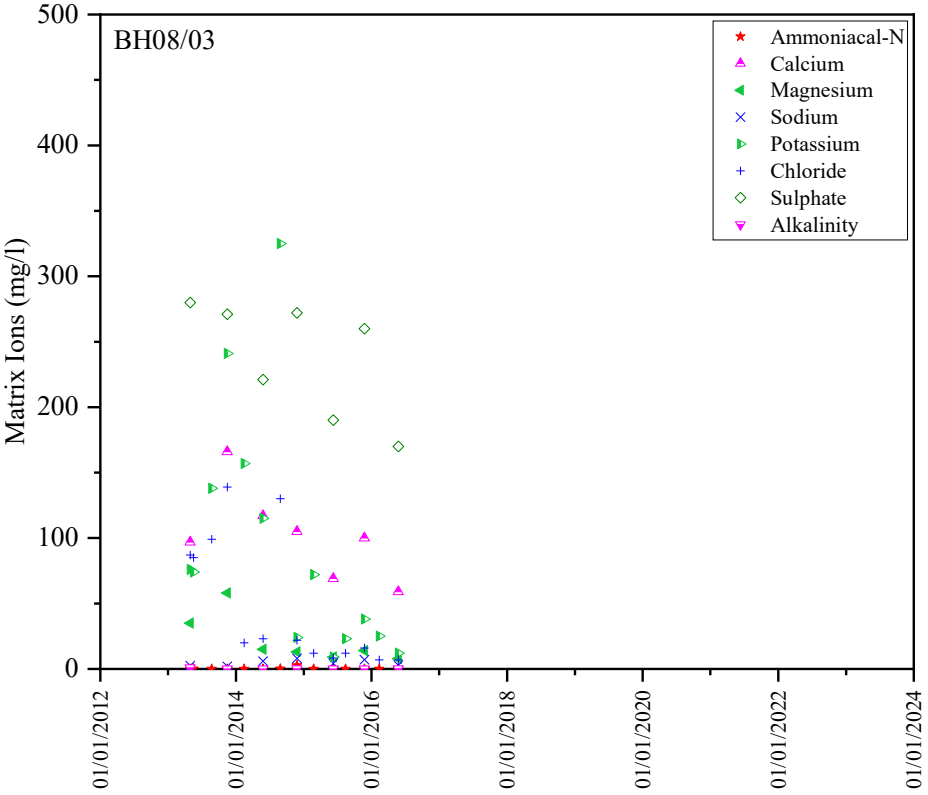

Permit Limit 0.0009mg/l
BH08/01R
BH08/02
BH08/03 (no limit)
BH08/04
BH13/03 (no limit)
Cadmium (mg/l)
0.0010
0.0008
0.0006
0.0004
0.0002
0.0000
01/01/2015
01/01/2017
01/01/2019
01/01/2021
01/01/2023

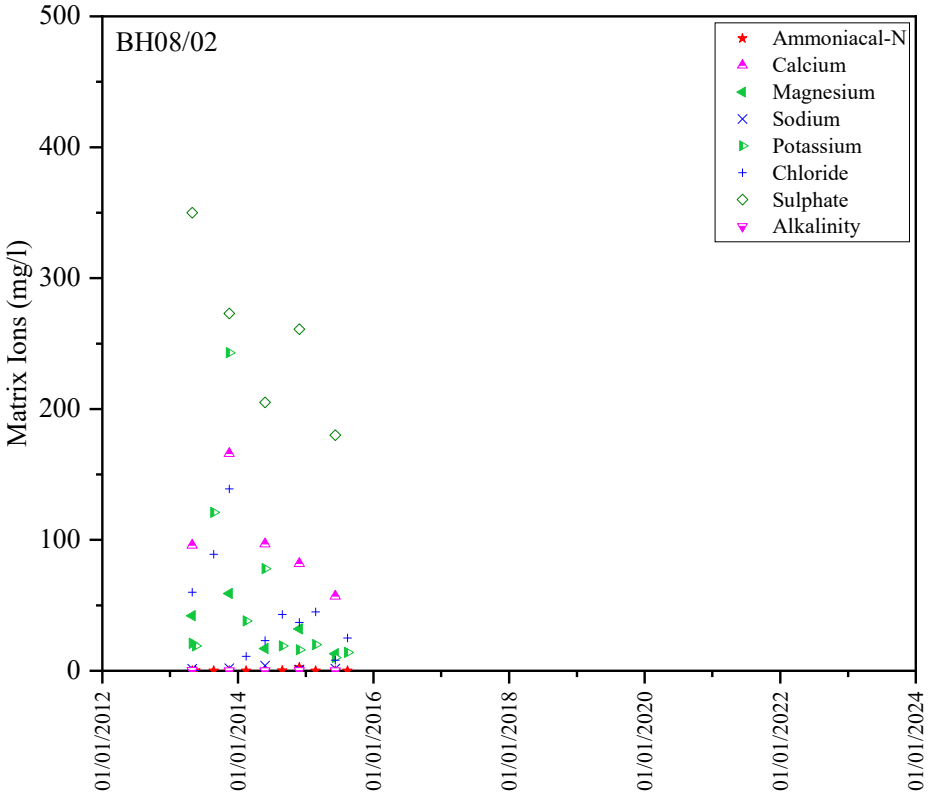

BH08/01R
BH08/02
BH08/03
BH08/04
BH13/03
Nickel (mg/l)
0.010
0.008
0.006
0.004
0.002
0.000
01/01/2015
01/01/2017
01/01/2019
01/01/2021
01/01/2023

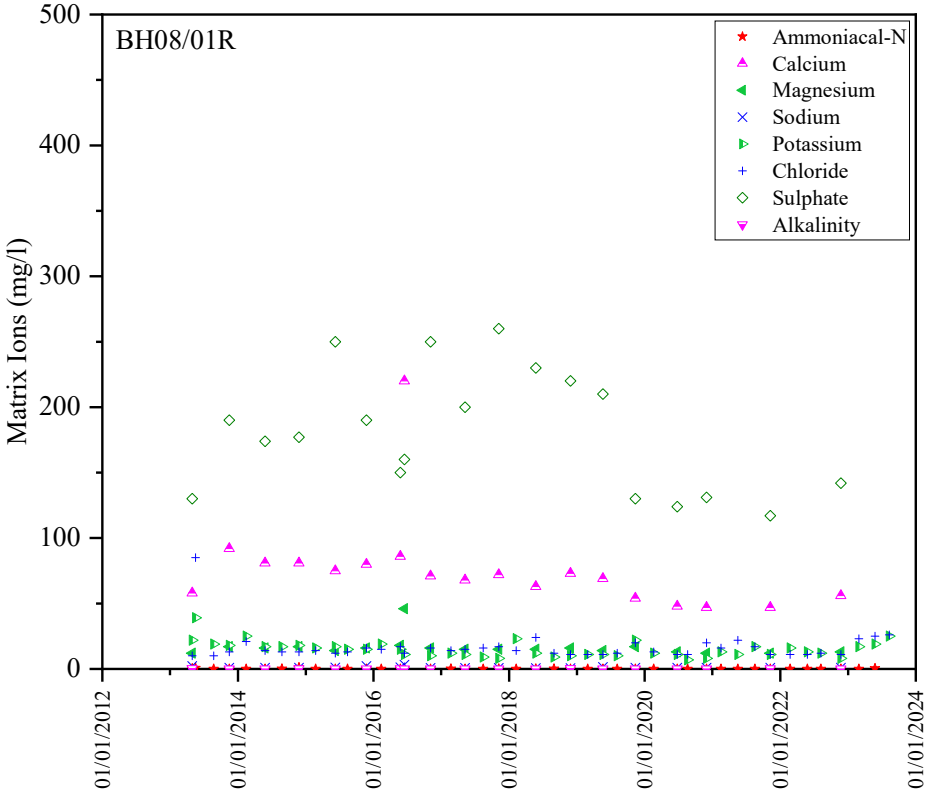

BH08/01R
BH08/02
BH08/03
BH08/04
BH13/03
Sulphate (mg/l)
250
200
150
100
50
0
01/01/2015
01/01/2017
01/01/2019
01/01/2021
01/01/2023


BH13/03
Ammoniacal-N
Calcium
Magnesium
Sodium
Potassium
Chloride
Sulphate
Alkalinity
Matrix Ions (mg/l)
500
400
300
200
100
0
01/01/2012
01/01/2014
01/01/2016
01/01/2018
01/01/2020
01/01/2022
01/01/2024


BH08/04
Ammoniacal-N
Calcium
Magnesium
Sodium
Potassium
Chloride
Sulphate
Alkalinity
Matrix Ions (mg/l)
0
100
200
300
400
500
01/01/2012
01/01/2014
01/01/2016
01/01/2018
01/01/2020
01/01/2022
01/01/2024


BH08/03
Ammoniacal-N
Calcium
Magnesium
Sodium
Potassium
Chloride
Sulphate
Alkalinity
Matrix Ions (mg/l)
0
100
200
300
400
500
01/01/2012
01/01/2014
01/01/2016
01/01/2018
01/01/2020
01/01/2022
01/01/2024


BH08/02
Ammoniacal-N
Calcium
Magnesium
Sodium
Potassium
Chloride
Sulphate
Alkalinity
Matrix Ions (mg/l)
0
100
200
300
400
500
01/01/2012
01/01/2014
01/01/2016
01/01/2018
01/01/2020
01/01/2022
01/01/2024


BH08/01R
Ammoniacal-N
Calcium
Magnesium
Sodium
Potassium
Chloride
Sulphate
Alkalinity
Matrix Ions (mg/l)
0
100
200
300
400
500
01/01/2012
01/01/2014
01/01/2016
01/01/2018
01/01/2020
01/01/2022
01/01/2024

Appendix B –

LandSim Results File

Project: Ravenhead Quarry

Project Number: K0158

Project Details

Title: Ravenhead Quarry

Project Number: K0158

Prepared By: AS

Date: 2023-09-21 11:18:04

Client Name:

Comments:

Consim version 2.05

Simulation Level

Level 3

Simulation Parameters

Iterations 1000

Timeslices:1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 25, 50, 75, 100, 300, 1000, 7000

Water Quality Standard

Lowest Value Selected from UK and EU Drinking Water Standards

Source

Landfill
Dry Bulk Density [g/cm³] SINGLE(2)
Air Filled Porosity [fraction] SINGLE(0.345)
Water Filled Porosity [fraction] SINGLE(0.129)
Thickness [m] TRIANGULAR(2,7,12)
Contaminated Land
Declining Source Term

Overall Unsaturated Zone Thickness [m] TRIANGULAR(0.6,6.5,10.5)

Infiltration

Infiltration [mm/year] SINGLE(50)

Source Inventory:

Ammonium (NH4+)
Measured as Leachable Concentration
Inorganic
Partition Coefficient [ml/g] UNIFORM(2,4)
Leachate Concentration [mg/l] TRIANGULAR(0.2,1.1,15.6)

Arsenic
Measured as Leachable Concentration
Inorganic
Partition Coefficient [ml/g] SINGLE(117)
Leachate Concentration [mg/l] TRIANGULAR(0.003,0.005,0.021)

Chloride
Measured as Leachable Concentration
Inorganic
Partition Coefficient [ml/g] SINGLE(0)
Leachate Concentration [mg/l] TRIANGULAR(69,133,637)

Nickel
Measured as Leachable Concentration
Inorganic
Partition Coefficient [ml/g] SINGLE(66)
Leachate Concentration [mg/l] TRIANGULAR(0.007,0.011,0.052)

Pesticides (Individual)
Measured as Leachable Concentration
Organic
Partition Coefficient [ml/g] SINGLE(68)
Henry's Law Constant SINGLE(7.44e-007)
Leachate Concentration [mg/l] TRIANGULAR(0.0058,0.013,0.0337)

Sulphate (as S042-)

Measured as Leachable Concentrate

Inorganic

Partition Coefficient [ml/g] SINGLE(0)

Leachate Concentration [mg/l] TRIANGULAR(607,912,1731)

Unsaturated Pathway: Liner

Active

Porous Medium

Thickness [m] SINGLE(0.5)

Dry Bulk Density [g/cm³] UNIFORM(1,2.4)

Vertical Dispersivity [m] SINGLE(0.05)

Water Filled Porosity [fraction] UNIFORM(0.34,0.6)

Unsaturated Conductivity [m/s] SINGLE(1e-008)

Unsaturated Pathway Contaminants

Ammonium (NH4+)

Partition Coefficient [ml/g] SINGLE(3.2)

Arsenic

Partition Coefficient [ml/g] SINGLE(117)

Chloride

Partition Coefficient [ml/g] SINGLE(0)

Nickel

Partition Coefficient [ml/g] SINGLE(66)

Pesticides (Individual)

Partition Coefficient [ml/g] SINGLE(0)

Sulphate (as S042-)

Partition Coefficient [ml/g] SINGLE(0)

Unsaturated Pathway: Sand and Gravel

Active

Porous Medium

Thickness [m] TRIANGULAR(0.1,6,10)

Dry Bulk Density [g/cm³] UNIFORM(1.82,2.15)

Vertical Dispersivity [m] TRIANGULAR(0.01,0.6,1)

Water Filled Porosity [fraction] UNIFORM(0.34,0.61)

Unsaturated Conductivity [m/s] UNIFORM(2e-007,0.006)

Unsaturated Pathway Contaminants

Ammonium (NH4+)

Partition Coefficient [ml/g] TRIANGULAR(0.4,2,4)

Arsenic

Partition Coefficient [ml/g] SINGLE(117)

Chloride

Partition Coefficient [ml/g] SINGLE(0)

Nickel

Partition Coefficient [ml/g] LOGTRIANGULAR(20,400,8100)

Pesticides (Individual)

Partition Coefficient [ml/g] SINGLE(0)

Sulphate (as S042-)

Partition Coefficient [ml/g] SINGLE(0)

Aquifer Pathway

Thickness [m] SINGLE(80)
Dry Bulk Density [g/cm³] UNIFORM(1.15,2.1)
Mixing Zone Thickness [m] UNIFORM(7.5,31)
Hydraulic Conductivity [m/s] LOGUNIFORM(2e-007,0.006)
Effective Porosity [fraction] UNIFORM(0.25,0.61)
Hydraulic Gradient SINGLE(0.016)
Groundwater Flow Direction (degrees), 270.00
Longitudinal Dispersivity [m] SINGLE(8)
Lateral Dispersivity [m] SINGLE(2.4)

Contaminant Inventory

Ammonium (NH4+)
Background Concentration [mg/l] SINGLE(0.64)
Partition Coefficient [ml/g] TRIANGULAR(0.4,2,4)

Arsenic
Background Concentration [mg/l] SINGLE(0.014)
Partition Coefficient [ml/g] SINGLE(117)

Chloride
Background Concentration [mg/l] SINGLE(72)
Partition Coefficient [ml/g] SINGLE(0)

Nickel
Background Concentration [mg/l] SINGLE(0.002)
Partition Coefficient [ml/g] LOGTRIANGULAR(20,400,8100)

Pesticides (Individual)
Background Concentration [mg/l] SINGLE(0.018)
Partition Coefficient [ml/g] UNIFORM(0.07,0.2)

Sulphate (as S042-)
Background Concentration [mg/l] SINGLE(80)
Partition Coefficient [ml/g] SINGLE(0)

Project: Ravenhead Quarry

Project Number: K0158

Receptor

Landfill Receptor	X 355137.000000	Y 423943.000000
BH08/01	X 355112.000000	Y 424168.000000

Input Correlations

No Correlations

Landfill - Ammonium (NH4+)

Concentration at Source [mg/l] - 1 years

05% of values less than 1.02639	10% of values less than 1.45144	25% of values less than 2.76947
50% of values less than 5.12866	75% of values less than 8.16807	90% of values less than 10.8232
Minimum 0.354878 than 12.0989	Maximum 15.1076	
Mean 5.691	SD 3.48427	Variance 12.1401

Concentration at Source [mg/l] - 2 years

05% of values less than 1.02424	10% of values less than 1.4484	25% of values less than 2.76691
50% of values less than 5.12416	75% of values less than 8.1592	90% of values less than 10.8037
Minimum 0.354481 than 12.0887	Maximum 15.0894	
Mean 5.68345	SD 3.4797	Variance 12.1083

Concentration at Source [mg/l] - 3 years

05% of values less than 1.02208	10% of values less than 1.44537	25% of values less than 2.76091
50% of values less than 5.11965	75% of values less than 8.14539	90% of values less than 10.7825
Minimum 0.354085 than 12.0793	Maximum 15.0713	
Mean 5.6759	SD 3.47513	Variance 12.0765

Concentration at Source [mg/l] - 4 years

05% of values less than 1.01993	10% of values less than 1.44235	25% of values less than 2.75492
50% of values less than 5.11516	75% of values less than 8.13092	90% of values less than 10.7613
Minimum 0.35369s than 12.07	Maximum 15.0532	
Mean 5.66837	SD 3.47058	Variance 12.0449

Concentration at Source [mg/l] - 5 years

05% of values less than 1.01779	10% of values less than 1.43933	25% of values less than 2.74895
50% of values less than 5.11066	75% of values less than 8.11392	90% of values less than 10.7402
Minimum 0.353294 than 12.0596	Maximum 15.0351	
Mean 5.66085	SD 3.46604	Variance 12.0134

Concentration at Source [mg/l] - 6 years

05% of values less than 1.01565	10% of values less than 1.43631	25% of values less than 2.74298
50% of values less than 5.10617	75% of values less than 8.09695	90% of values less than 10.7191
Minimum 0.3529ss than 12.044	Maximum 15.017	
Mean 5.65334	SD 3.46151	Variance 11.9821

Landfill - Ammonium (NH4+)

Concentration at Source [mg/l] - 7 years

05% of values less than 1.01352	10% of values less than 1.43375	25% of values less than 2.73704
50% of values less than 5.09866	75% of values less than 8.09056	90% of values less than 10.698
Minimum 0.352505 than 12.0284	Maximum 14.999	
Mean 5.64585	SD 3.45699	Variance 11.9508

Concentration at Source [mg/l] - 8 years

05% of values less than 1.01138	10% of values less than 1.43176	25% of values less than 2.7311
50% of values less than 5.08603	75% of values less than 8.08435	90% of values less than 10.6811
Minimum 0.352112 than 12.0129	Maximum 14.9809	
Mean 5.63836	SD 3.45249	Variance 11.9197

Concentration at Source [mg/l] - 9 years

05% of values less than 1.00926	10% of values less than 1.42977	25% of values less than 2.72518
50% of values less than 5.07788	75% of values less than 8.07813	90% of values less than 10.6723
Minimum 0.351718 than 11.9974	Maximum 14.9629	
Mean 5.63089	SD 3.44799	Variance 11.8886

Concentration at Source [mg/l] - 10 years

05% of values less than 1.00714	10% of values less than 1.42779	25% of values less than 2.71927
50% of values less than 5.07335	75% of values less than 8.06312	90% of values less than 10.6635
Minimum 0.351325 than 11.9819	Maximum 14.948	
Mean 5.62343	SD 3.44351	Variance 11.8577

Concentration at Source [mg/l] - 25 years

05% of values less than 0.983828	10% of values less than 1.39838	25% of values less than 2.65777
50% of values less than 4.97214	75% of values less than 7.91127	90% of values less than 10.4108
Minimum 0.345483 than 11.6966	Maximum 14.8198	
Mean 5.51289	SD 3.37754	Variance 11.4078

Concentration at Source [mg/l] - 50 years

05% of values less than 0.959742	10% of values less than 1.35071	25% of values less than 2.59612
50% of values less than 4.81585	75% of values less than 7.63423	90% of values less than 10.047
Minimum 0.335961 than 11.3486	Maximum 14.6085	
Mean 5.33431	SD 3.27276	Variance 10.7109

Landfill - Ammonium (NH4+)

Concentration at Source [mg/l] - 75 years

05% of values less than 0.924456	10% of values less than 1.30224	25% of values less than 2.50434
50% of values less than 4.66534	75% of values less than 7.37772	90% of values less than 9.74426
Minimum 0.326702 than 10.9544	Maximum 14.4003	
Mean 5.1625	SD 3.17386	Variance 10.0734

Concentration at Source [mg/l] - 100 years

05% of values less than 0.893368	10% of values less than 1.25511	25% of values less than 2.44187
50% of values less than 4.50103	75% of values less than 7.1023	90% of values less than 9.46573
Minimum 0.313419 than 10.6663	Maximum 14.1951	
Mean 4.99714	SD 3.08031	Variance 9.48833

Concentration at Source [mg/l] - 300 years

05% of values less than 0.673428	10% of values less than 0.933677	25% of values less than 1.83756
50% of values less than 3.48051	75% of values less than 5.55643	90% of values less than 7.40295
Minimum 0.223875 than 8.35017	Maximum 12.6549	
Mean 3.87495	SD 2.47666	Variance 6.13382

Concentration at Source [mg/l] - 1000 years

05% of values less than 0.20223	10% of values less than 0.316974	25% of values less than 0.665385
50% of values less than 1.43227	75% of values less than 2.38306	90% of values less than 3.56524
Minimum 0.0312054 than 4.3631	Maximum 8.46618	
Mean 1.69899	SD 1.32964	Variance 1.76793

Concentration at Source [mg/l] - 7000 years

05% of values less than 1.99174E-007	10% of values less than 2.74204E-006	25% of values less than 7.19029E-005
50% of values less than 0.00106666	75% of values less than 0.00572966	90% of values less than 0.0213042
Minimum 3.47639E-015 0.0398935	Maximum 0.269995	
Mean 0.00797116	SD 0.0213332	Variance 0.000455108

Landfill - Arsenic

Concentration at Source [mg/l] - 1 years

05% of values less than 0.0044221	10% of values less than 0.00489243	25% of values less than 0.00640437
50% of values less than 0.00891254	75% of values less than 0.0125885	90% of values less than 0.0155288
Minimum 0.00314438an 0.0172672	Maximum 0.0206748	
Mean 0.00965629	SD 0.00405456	Variance 1.64394E-005

Concentration at Source [mg/l] - 2 years

05% of values less than 0.00442199	10% of values less than 0.00489233	25% of values less than 0.00640419
50% of values less than 0.00891211	75% of values less than 0.0125881	90% of values less than 0.0155283
Minimum 0.00314428an 0.0172668	Maximum 0.0206743	
Mean 0.00965597	SD 0.00405442	Variance 1.64383E-005

Concentration at Source [mg/l] - 3 years

05% of values less than 0.00442189	10% of values less than 0.00489224	25% of values less than 0.00640401
50% of values less than 0.00891168	75% of values less than 0.0125877	90% of values less than 0.0155278
Minimum 0.00314418an 0.0172664	Maximum 0.0206739	
Mean 0.00965564	SD 0.00405428	Variance 1.64372E-005

Concentration at Source [mg/l] - 4 years

05% of values less than 0.00442179	10% of values less than 0.00489214	25% of values less than 0.00640382
50% of values less than 0.00891125	75% of values less than 0.0125872	90% of values less than 0.0155272
Minimum 0.00314408an 0.017266	Maximum 0.0206734	
Mean 0.00965532	SD 0.00405415	Variance 1.64361E-005

Concentration at Source [mg/l] - 5 years

05% of values less than 0.00442169	10% of values less than 0.00489205	25% of values less than 0.00640364
50% of values less than 0.00891081	75% of values less than 0.0125868	90% of values less than 0.0155267
Minimum 0.00314398an 0.0172655	Maximum 0.020673	
Mean 0.00965499	SD 0.00405401	Variance 1.6435E-005

Concentration at Source [mg/l] - 6 years

05% of values less than 0.00442159	10% of values less than 0.00489195	25% of values less than 0.00640346
50% of values less than 0.00891038	75% of values less than 0.0125863	90% of values less than 0.0155261
Minimum 0.00314387an 0.0172651	Maximum 0.0206725	
Mean 0.00965467	SD 0.00405387	Variance 1.64339E-005

Landfill - Arsenic

Concentration at Source [mg/l] - 7 years

05% of values less than 0.00442149	10% of values less than 0.00489186	25% of values less than 0.00640328
50% of values less than 0.00890995	75% of values less than 0.0125859	90% of values less than 0.0155256
Minimum 0.00314377an 0.0172647	Maximum 0.0206721	
Mean 0.00965435	SD 0.00405373	Variance 1.64328E-005

Concentration at Source [mg/l] - 8 years

05% of values less than 0.00442138	10% of values less than 0.00489176	25% of values less than 0.00640309
50% of values less than 0.00890952	75% of values less than 0.0125855	90% of values less than 0.0155251
Minimum 0.00314367an 0.0172643	Maximum 0.0206717	
Mean 0.00965402	SD 0.0040536	Variance 1.64316E-005

Concentration at Source [mg/l] - 9 years

05% of values less than 0.00442128	10% of values less than 0.00489167	25% of values less than 0.00640291
50% of values less than 0.00890909	75% of values less than 0.012585	90% of values less than 0.0155245
Minimum 0.00314357an 0.0172639	Maximum 0.0206712	
Mean 0.0096537	SD 0.00405346	Variance 1.64305E-005

Concentration at Source [mg/l] - 10 years

05% of values less than 0.00442118	10% of values less than 0.00489157	25% of values less than 0.00640273
50% of values less than 0.00890866	75% of values less than 0.0125846	90% of values less than 0.015524
Minimum 0.00314347an 0.0172635	Maximum 0.0206708	
Mean 0.00965337	SD 0.00405332	Variance 1.64294E-005

Concentration at Source [mg/l] - 25 years

05% of values less than 0.00441966	10% of values less than 0.00489014	25% of values less than 0.00639999
50% of values less than 0.00890219	75% of values less than 0.012578	90% of values less than 0.0155159
Minimum 0.00314196an 0.0172575	Maximum 0.020664	
Mean 0.0096485	SD 0.00405126	Variance 1.64127E-005

Concentration at Source [mg/l] - 50 years

05% of values less than 0.00441712	10% of values less than 0.00488775	25% of values less than 0.00639543
50% of values less than 0.00889142	75% of values less than 0.0125677	90% of values less than 0.0155024
Minimum 0.00313943an 0.0172474	Maximum 0.0206528	
Mean 0.0096404	SD 0.00404784	Variance 1.6385E-005

Landfill - Arsenic

Concentration at Source [mg/l] - 75 years

05% of values less than 0.00441379	10% of values less than 0.00488536	25% of values less than 0.00639087
50% of values less than 0.00888066	75% of values less than 0.0125595	90% of values less than 0.0154889
Minimum 0.00313691an 0.0172374	Maximum 0.0206417	
Mean 0.0096323	SD 0.00404442	Variance 1.63574E-005

Concentration at Source [mg/l] - 100 years

05% of values less than 0.00440971	10% of values less than 0.00488298	25% of values less than 0.00638632
50% of values less than 0.00886991	75% of values less than 0.0125516	90% of values less than 0.0154754
Minimum 0.0031344¬an 0.0172273	Maximum 0.0206305	
Mean 0.00962421	SD 0.00404101	Variance 1.63298E-005

Concentration at Source [mg/l] - 300 years

05% of values less than 0.00437818	10% of values less than 0.00485428	25% of values less than 0.00635039
50% of values less than 0.00880121	75% of values less than 0.0124829	90% of values less than 0.0153747
Minimum 0.00311432an 0.0170954	Maximum 0.0205413	
Mean 0.00955975	SD 0.00401392	Variance 1.61116E-005

Concentration at Source [mg/l] - 1000 years

05% of values less than 0.00428908	10% of values less than 0.00473082	25% of values less than 0.00619917
50% of values less than 0.00857361	75% of values less than 0.0121803	90% of values less than 0.0150029
Minimum 0.00304508an 0.0165746	Maximum 0.020232	
Mean 0.00933799	SD 0.00392194	Variance 1.53816E-005

Concentration at Source [mg/l] - 7000 years

05% of values less than 0.00340261	10% of values less than 0.00387545	25% of values less than 0.00495417
50% of values less than 0.00697745	75% of values less than 0.0100548	90% of values less than 0.0124059
Minimum 0.00248972an 0.0136654	Maximum 0.0177654	
Mean 0.00765808	SD 0.00327932	Variance 1.07539E-005

Landfill - Chloride

Concentration at Source [mg/l] - 1 years

05% of values less than 104.325	10% of values less than 122.24	25% of values less than 163.198
50% of values less than 248.923	75% of values less than 346.357	90% of values less than 441.412
Minimum 66.2357s than 482.241	Maximum 592.148	
Mean 265.032	SD 119.07	Variance 14177.6

Concentration at Source [mg/l] - 2 years

05% of values less than 97.3323	10% of values less than 115.677	25% of values less than 153.753
50% of values less than 233.495	75% of values less than 328.573	90% of values less than 412.179
Minimum 61.9444s than 455.281	Maximum 562.701	
Mean 249.52	SD 112.525	Variance 12661.9

Concentration at Source [mg/l] - 3 years

05% of values less than 90.2555	10% of values less than 109.164	25% of values less than 143.225
50% of values less than 219.766	75% of values less than 309.43	90% of values less than 388.548
Minimum 57.9311s than 431.903	Maximum 534.718	
Mean 235.017	SD 106.602	Variance 11363.9

Concentration at Source [mg/l] - 4 years

05% of values less than 85.294	10% of values less than 102.257	25% of values less than 135.669
50% of values less than 206.466	75% of values less than 293.072	90% of values less than 365.818
Minimum 49.2569s than 411.342	Maximum 509.365	
Mean 221.449	SD 101.211	Variance 10243.7

Concentration at Source [mg/l] - 5 years

05% of values less than 80.0681	10% of values less than 95.5285	25% of values less than 126.867
50% of values less than 193.569	75% of values less than 278.801	90% of values less than 345.773
Minimum 41.5863s than 388.47	Maximum 491.485	
Mean 208.748	SD 96.2808	Variance 9269.99

Concentration at Source [mg/l] - 6 years

05% of values less than 75.5292	10% of values less than 90.2106	25% of values less than 119.208
50% of values less than 181.781	75% of values less than 261.614	90% of values less than 326.723
Minimum 35.1102s than 369.29	Maximum 474.233	
Mean 196.853	SD 91.7475	Variance 8417.6

Landfill - Chloride

Concentration at Source [mg/l] - 7 years

05% of values less than 70.3284	10% of values less than 84.1954	25% of values less than 112.269
50% of values less than 171.456	75% of values less than 246.613	90% of values less than 309.958
Minimum 29.6426s than 349.037	Maximum 457.587	
Mean 185.705	SD 87.5592	Variance 7666.61

Concentration at Source [mg/l] - 8 years

05% of values less than 65.2298	10% of values less than 79.3068	25% of values less than 105.015
50% of values less than 160.675	75% of values less than 230.723	90% of values less than 293.09
Minimum 25.0265s than 331.117	Maximum 441.525	
Mean 175.252	SD 83.6718	Variance 7000.97

Concentration at Source [mg/l] - 9 years

05% of values less than 60.1813	10% of values less than 74.6208	25% of values less than 99.8063
50% of values less than 150.705	75% of values less than 216.856	90% of values less than 277.958
Minimum 21.1292s than 314.568	Maximum 426.027	
Mean 165.446	SD 80.0481	Variance 6407.7

Concentration at Source [mg/l] - 10 years

05% of values less than 56.1099	10% of values less than 69.5517	25% of values less than 94.4943
50% of values less than 142.025	75% of values less than 205.359	90% of values less than 263.607
Minimum 17.8388s than 298.699	Maximum 411.072	
Mean 156.243	SD 76.6569	Variance 5876.28

Concentration at Source [mg/l] - 25 years

05% of values less than 13.5528	10% of values less than 22.4685	25% of values less than 37.7049
50% of values less than 58.3339	75% of values less than 93.9452	90% of values less than 126.46
Minimum 1.40804s than 153.609	Maximum 240.514	
Mean 68.5722	SD 42.3476	Variance 1793.32

Concentration at Source [mg/l] - 50 years

05% of values less than 1.14584	10% of values less than 2.65608	25% of values less than 7.27797
50% of values less than 14.6715	75% of values less than 27.2582	90% of values less than 42.9086
Minimum 0.0175585an 51.2475	Maximum 98.4417	
Mean 19.3025	SD 16.3287	Variance 266.625

Landfill - Chloride

Concentration at Source [mg/l] - 75 years

05% of values less than 0.0789214	10% of values less than 0.30559	25% of values less than 1.24658
50% of values less than 3.83728	75% of values less than 8.57653	90% of values less than 14.9204
Minimum 0.000183125า 18.6358	Maximum 40.2918	
Mean 5.90968	SD 6.26481	Variance 39.2479

Concentration at Source [mg/l] - 100 years

05% of values less than 0.00614132	10% of values less than 0.0314071	25% of values less than 0.225862
50% of values less than 0.944176	75% of values less than 2.71758	90% of values less than 5.24774
Minimum 1.90989E-006 6.79288	Maximum 16.8995	
Mean 1.91278	SD 2.41409	Variance 5.82785

Concentration at Source [mg/l] - 300 years

05% of values less than 5.16792E-012	10% of values less than 6.63095E-010	25% of values less than 1.93159E-007
50% of values less than 1.62845E-005	75% of values less than 0.000315377	90% of values less than 0.0016193
Minimum 0ɹes less than 0.00320214	Maximum 0.0190556	
Mean 0.000576834	SD 0.00162013	Variance 2.62481E-006

Concentration at Source [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 1.22125E-015
Minimum 0ɹes less than 1.05749E-014	Maximum 9.98021E-013	
Mean 7.82923E-015	SD 5.96986E-014	Variance 3.56393E-027

Concentration at Source [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Source [mg/l] - 1 years

05% of values less than 0.00991558	10% of values less than 0.0112379	25% of values less than 0.0154828
50% of values less than 0.0219617	75% of values less than 0.0304757	90% of values less than 0.0388504
Minimum 0.0071958	an 0.041947	Maximum 0.0517595
Mean 0.0236142	SD 0.0101713	Variance 0.000103455

Concentration at Source [mg/l] - 2 years

05% of values less than 0.00991505	10% of values less than 0.0112372	25% of values less than 0.015482
50% of values less than 0.0219598	75% of values less than 0.0304742	90% of values less than 0.0388485
Minimum 0.00719551	an 0.0419446	Maximum 0.0517563
Mean 0.0236128	SD 0.0101707	Variance 0.000103443

Concentration at Source [mg/l] - 3 years

05% of values less than 0.00991452	10% of values less than 0.0112365	25% of values less than 0.0154813
50% of values less than 0.0219589	75% of values less than 0.0304727	90% of values less than 0.0388465
Minimum 0.00719522	an 0.0419422	Maximum 0.051753
Mean 0.0236114	SD 0.0101701	Variance 0.000103431

Concentration at Source [mg/l] - 4 years

05% of values less than 0.00991399	10% of values less than 0.0112358	25% of values less than 0.0154805
50% of values less than 0.0219581	75% of values less than 0.0304713	90% of values less than 0.0388446
Minimum 0.00719493	an 0.0419398	Maximum 0.0517498
Mean 0.02361	SD 0.0101695	Variance 0.000103419

Concentration at Source [mg/l] - 5 years

05% of values less than 0.00991346	10% of values less than 0.0112351	25% of values less than 0.0154797
50% of values less than 0.0219572	75% of values less than 0.0304698	90% of values less than 0.0388427
Minimum 0.00719464	an 0.0419374	Maximum 0.0517466
Mean 0.0236086	SD 0.0101689	Variance 0.000103408

Concentration at Source [mg/l] - 6 years

05% of values less than 0.00991293	10% of values less than 0.0112344	25% of values less than 0.015479
50% of values less than 0.0219564	75% of values less than 0.0304684	90% of values less than 0.0388408
Minimum 0.00719435	an 0.041935	Maximum 0.0517433
Mean 0.0236072	SD 0.0101684	Variance 0.000103396

Landfill - Nickel

Concentration at Source [mg/l] - 7 years

05% of values less than 0.0099124	10% of values less than 0.0112337	25% of values less than 0.0154782
50% of values less than 0.0219555	75% of values less than 0.0304669	90% of values less than 0.0388388
Minimum 0.00719406an 0.0419326	Maximum 0.0517401	
Mean 0.0236058	SD 0.0101678	Variance 0.000103384

Concentration at Source [mg/l] - 8 years

05% of values less than 0.00991187	10% of values less than 0.011233	25% of values less than 0.0154775
50% of values less than 0.0219547	75% of values less than 0.0304655	90% of values less than 0.0388369
Minimum 0.00719377an 0.0419302	Maximum 0.0517369	
Mean 0.0236044	SD 0.0101672	Variance 0.000103372

Concentration at Source [mg/l] - 9 years

05% of values less than 0.00991134	10% of values less than 0.0112324	25% of values less than 0.0154767
50% of values less than 0.0219538	75% of values less than 0.030464	90% of values less than 0.038835
Minimum 0.00719348an 0.0419278	Maximum 0.0517337	
Mean 0.023603	SD 0.0101666	Variance 0.00010336

Concentration at Source [mg/l] - 10 years

05% of values less than 0.00991082	10% of values less than 0.0112317	25% of values less than 0.015476
50% of values less than 0.021953	75% of values less than 0.0304625	90% of values less than 0.0388331
Minimum 0.00719319an 0.0419254	Maximum 0.0517304	
Mean 0.0236015	SD 0.010166	Variance 0.000103348

Concentration at Source [mg/l] - 25 years

05% of values less than 0.00990289	10% of values less than 0.0112214	25% of values less than 0.0154647
50% of values less than 0.0219403	75% of values less than 0.0304407	90% of values less than 0.0388042
Minimum 0.00718883an 0.0418894	Maximum 0.0516821	
Mean 0.0235805	SD 0.0101572	Variance 0.000103168

Concentration at Source [mg/l] - 50 years

05% of values less than 0.00988719	10% of values less than 0.0112042	25% of values less than 0.015446
50% of values less than 0.0219192	75% of values less than 0.0303889	90% of values less than 0.0387561
Minimum 0.00718158an 0.041804	Maximum 0.0516015	
Mean 0.0235455	SD 0.0101425	Variance 0.00010287

Landfill - Nickel

Concentration at Source [mg/l] - 75 years

05% of values less than 0.0098765	10% of values less than 0.0111871	25% of values less than 0.0154272
50% of values less than 0.0218981	75% of values less than 0.030322	90% of values less than 0.0387081
Minimum 0.00717433an 0.0416979	Maximum 0.0515211	
Mean 0.0235106	SD 0.0101279	Variance 0.000102574

Concentration at Source [mg/l] - 100 years

05% of values less than 0.00986333	10% of values less than 0.01117	25% of values less than 0.0154085
50% of values less than 0.0218573	75% of values less than 0.0302762	90% of values less than 0.0386602
Minimum 0.00716709an 0.0415921	Maximum 0.0514408	
Mean 0.0234757	SD 0.0101133	Variance 0.000102278

Concentration at Source [mg/l] - 300 years

05% of values less than 0.00975861	10% of values less than 0.0110343	25% of values less than 0.0152118
50% of values less than 0.0215957	75% of values less than 0.0298246	90% of values less than 0.0382788
Minimum 0.00710942an 0.0411856	Maximum 0.0508031	
Mean 0.0231987	SD 0.00999785	Variance 9.9957E-005

Concentration at Source [mg/l] - 1000 years

05% of values less than 0.00940018	10% of values less than 0.0105719	25% of values less than 0.0145386
50% of values less than 0.0205823	75% of values less than 0.0286445	90% of values less than 0.0367993
Minimum 0.00691122an 0.039613	Maximum 0.0486327	
Mean 0.0222576	SD 0.00961259	Variance 9.24018E-005

Concentration at Source [mg/l] - 7000 years

05% of values less than 0.00638577	10% of values less than 0.00727544	25% of values less than 0.0100742
50% of values less than 0.0141672	75% of values less than 0.0201842	90% of values less than 0.0265391
Minimum 0.00247423an 0.0291508	Maximum 0.0378057	
Mean 0.0157334	SD 0.0071715	Variance 5.14304E-005

Landfill - Pesticides (Individual)

Concentration at Source [mg/l] - 1 years

05% of values less than 0.00882707	10% of values less than 0.01011	25% of values less than 0.0127983
50% of values less than 0.0168342	75% of values less than 0.021753	90% of values less than 0.0261124
Minimum 0.00644999an 0.0284857	Maximum 0.0329835	
Mean 0.0174526	SD 0.00592228	Variance 3.50734E-005

Concentration at Source [mg/l] - 2 years

05% of values less than 0.00882673	10% of values less than 0.0101093	25% of values less than 0.0127973
50% of values less than 0.0168332	75% of values less than 0.0217522	90% of values less than 0.0261107
Minimum 0.00644959an 0.0284847	Maximum 0.032982	
Mean 0.0174516	SD 0.00592193	Variance 3.50692E-005

Concentration at Source [mg/l] - 3 years

05% of values less than 0.00882639	10% of values less than 0.0101086	25% of values less than 0.0127964
50% of values less than 0.0168322	75% of values less than 0.0217514	90% of values less than 0.0261091
Minimum 0.00644919an 0.0284837	Maximum 0.0329805	
Mean 0.0174506	SD 0.00592157	Variance 3.5065E-005

Concentration at Source [mg/l] - 4 years

05% of values less than 0.00882605	10% of values less than 0.0101079	25% of values less than 0.0127955
50% of values less than 0.0168312	75% of values less than 0.0217507	90% of values less than 0.0261075
Minimum 0.00644879an 0.0284826	Maximum 0.032979	
Mean 0.0174496	SD 0.00592122	Variance 3.50608E-005

Concentration at Source [mg/l] - 5 years

05% of values less than 0.00882571	10% of values less than 0.0101072	25% of values less than 0.0127945
50% of values less than 0.0168302	75% of values less than 0.0217499	90% of values less than 0.0261058
Minimum 0.0064484an 0.0284816	Maximum 0.0329775	
Mean 0.0174486	SD 0.00592086	Variance 3.50566E-005

Concentration at Source [mg/l] - 6 years

05% of values less than 0.00882537	10% of values less than 0.0101065	25% of values less than 0.0127936
50% of values less than 0.0168292	75% of values less than 0.0217491	90% of values less than 0.0261042
Minimum 0.006448than 0.0284806	Maximum 0.032976	
Mean 0.0174476	SD 0.0059205	Variance 3.50524E-005

Landfill - Pesticides (Individual)

Concentration at Source [mg/l] - 7 years

05% of values less than 0.00882503	10% of values less than 0.0101058	25% of values less than 0.0127927
50% of values less than 0.0168282	75% of values less than 0.0217483	90% of values less than 0.0261025
Minimum 0.0064476ɹan 0.0284796	Maximum 0.0329745	
Mean 0.0174466	SD 0.00592015	Variance 3.50482E-005

Concentration at Source [mg/l] - 8 years

05% of values less than 0.00882469	10% of values less than 0.0101051	25% of values less than 0.0127922
50% of values less than 0.0168272	75% of values less than 0.0217476	90% of values less than 0.0261009
Minimum 0.0064472ɹan 0.0284785	Maximum 0.0329729	
Mean 0.0174455	SD 0.00591979	Variance 3.5044E-005

Concentration at Source [mg/l] - 9 years

05% of values less than 0.00882435	10% of values less than 0.0101044	25% of values less than 0.0127916
50% of values less than 0.0168262	75% of values less than 0.0217468	90% of values less than 0.0260992
Minimum 0.0064468ɹan 0.0284775	Maximum 0.0329714	
Mean 0.0174445	SD 0.00591944	Variance 3.50397E-005

Concentration at Source [mg/l] - 10 years

05% of values less than 0.00882401	10% of values less than 0.0101033	25% of values less than 0.012791
50% of values less than 0.0168252	75% of values less than 0.021746	90% of values less than 0.0260976
Minimum 0.0064464ɹan 0.0284765	Maximum 0.0329699	
Mean 0.0174435	SD 0.00591908	Variance 3.50355E-005

Concentration at Source [mg/l] - 25 years

05% of values less than 0.00881892	10% of values less than 0.0100858	25% of values less than 0.0127827
50% of values less than 0.0168015	75% of values less than 0.0217344	90% of values less than 0.0260729
Minimum 0.00644042ɜn 0.0284612	Maximum 0.0329472	
Mean 0.0174284	SD 0.00591376	Variance 3.49725E-005

Concentration at Source [mg/l] - 50 years

05% of values less than 0.00881044	10% of values less than 0.0100692	25% of values less than 0.0127688
50% of values less than 0.0167544	75% of values less than 0.021715	90% of values less than 0.0260333
Minimum 0.00643047ɜn 0.0284356	Maximum 0.0329094	
Mean 0.0174031	SD 0.0059049	Variance 3.48679E-005

Landfill - Pesticides (Individual)

Concentration at Source [mg/l] - 75 years

05% of values less than 0.00879743	10% of values less than 0.0100567	25% of values less than 0.012755
50% of values less than 0.0167213	75% of values less than 0.0216933	90% of values less than 0.0260098
Minimum 0.00642053an 0.028407	Maximum 0.0328716	
Mean 0.017378	SD 0.00589608	Variance 3.47638E-005

Concentration at Source [mg/l] - 100 years

05% of values less than 0.00878144	10% of values less than 0.0100416	25% of values less than 0.0127411
50% of values less than 0.0167051	75% of values less than 0.0216719	90% of values less than 0.0259863
Minimum 0.0064106an 0.0283591	Maximum 0.0328338	
Mean 0.0173528	SD 0.00588729	Variance 3.46602E-005

Concentration at Source [mg/l] - 300 years

05% of values less than 0.0086641	10% of values less than 0.00990484	25% of values less than 0.0125983
50% of values less than 0.0165081	75% of values less than 0.0213459	90% of values less than 0.0257991
Minimum 0.00633176an 0.0279784	Maximum 0.0325335	
Mean 0.0171532	SD 0.0058181	Variance 3.38503E-005

Concentration at Source [mg/l] - 1000 years

05% of values less than 0.00837206	10% of values less than 0.00944396	25% of values less than 0.0120134
50% of values less than 0.0158567	75% of values less than 0.0205167	90% of values less than 0.024604
Minimum 0.00606335an 0.0266537	Maximum 0.0315037	
Mean 0.0164748	SD 0.00559074	Variance 3.12563E-005

Concentration at Source [mg/l] - 7000 years

05% of values less than 0.00567307	10% of values less than 0.00642998	25% of values less than 0.00840921
50% of values less than 0.0112148	75% of values less than 0.0145848	90% of values less than 0.0175644
Minimum 0.00306538an 0.019697	Maximum 0.0244756	
Mean 0.011753	SD 0.0042736	Variance 1.82636E-005

Landfill - Sulphate (as S042-)

Concentration at Source [mg/l] - 1 years

05% of values less than 677.035	10% of values less than 743.529	25% of values less than 843.914
50% of values less than 1006.72	75% of values less than 1196.4	90% of values less than 1345.08
Minimum 569.337s than 1431.83	Maximum 1592.26	
Mean 1024.62	SD 228.628	Variance 52270.9

Concentration at Source [mg/l] - 2 years

05% of values less than 637.854	10% of values less than 692.425	25% of values less than 789.585
50% of values less than 949.869	75% of values less than 1124.85	90% of values less than 1267.76
Minimum 480.487s than 1358.49	Maximum 1521.12	
Mean 964.807	SD 218.587	Variance 47780.4

Concentration at Source [mg/l] - 3 years

05% of values less than 603.323	10% of values less than 643.332	25% of values less than 742.824
50% of values less than 896.638	75% of values less than 1058.15	90% of values less than 1204.07
Minimum 405.503s than 1281.01	Maximum 1460.04	
Mean 908.888	SD 210.479	Variance 44301.3

Concentration at Source [mg/l] - 4 years

05% of values less than 562.068	10% of values less than 594.028	25% of values less than 700.33
50% of values less than 839.082	75% of values less than 999.246	90% of values less than 1134.83
Minimum 342.221s than 1220.45	Maximum 1409.02	
Mean 856.573	SD 203.803	Variance 41535.6

Concentration at Source [mg/l] - 5 years

05% of values less than 519.443	10% of values less than 557.144	25% of values less than 662.137
50% of values less than 792.762	75% of values less than 945.96	90% of values less than 1078.48
Minimum 288.814s than 1158.74	Maximum 1359.78	
Mean 807.601	SD 198.163	Variance 39268.5

Concentration at Source [mg/l] - 6 years

05% of values less than 473.232	10% of values less than 516.209	25% of values less than 621.468
50% of values less than 747.408	75% of values less than 892.06	90% of values less than 1025.7
Minimum 243.742s than 1094.7	Maximum 1312.26	
Mean 761.729	SD 193.252	Variance 37346.4

Landfill - Sulphate (as S042-)

Concentration at Source [mg/l] - 7 years

05% of values less than 429.07	10% of values less than 481.978	25% of values less than 586.276
50% of values less than 702.645	75% of values less than 850.044	90% of values less than 976.245
Minimum 205.704s than 1042.32	Maximum 1266.41	
Mean 718.738	SD 188.839	Variance 35660.2

Concentration at Source [mg/l] - 8 years

05% of values less than 388.425	10% of values less than 446.279	25% of values less than 548.887
50% of values less than 662.767	75% of values less than 806.396	90% of values less than 930.612
Minimum 173.602s than 993.827	Maximum 1222.15	
Mean 678.422	SD 184.753	Variance 34133.6

Concentration at Source [mg/l] - 9 years

05% of values less than 354.386	10% of values less than 411.234	25% of values less than 517.355
50% of values less than 627.775	75% of values less than 764.194	90% of values less than 891.343
Minimum 146.51ss than 948.117	Maximum 1179.44	
Mean 640.596	SD 180.871	Variance 32714.3

Concentration at Source [mg/l] - 10 years

05% of values less than 325.935	10% of values less than 381.952	25% of values less than 482.969
50% of values less than 592.982	75% of values less than 724.242	90% of values less than 851.346
Minimum 123.646s than 902.695	Maximum 1138.23	
Mean 605.088	SD 177.107	Variance 31366.9

Concentration at Source [mg/l] - 25 years

05% of values less than 71.1283	10% of values less than 105.728	25% of values less than 175.701
50% of values less than 264.125	75% of values less than 346.909	90% of values less than 425.448
Minimum 9.70202s than 469.241	Maximum 667.584	
Mean 266.357	SD 121.436	Variance 14746.7

Concentration at Source [mg/l] - 50 years

05% of values less than 5.41816	10% of values less than 11.2056	25% of values less than 31.4172
50% of values less than 66.699	75% of values less than 111.544	90% of values less than 150.338
Minimum 0.105043 than 166.087	Maximum 274.348	
Mean 75.1944	SD 52.6689	Variance 2774.02

Landfill - Sulphate (as S042-)

Concentration at Source [mg/l] - 75 years

05% of values less than 0.407466	10% of values less than 1.18762	25% of values less than 5.39603
50% of values less than 16.9131	75% of values less than 36.3219	90% of values less than 53.5497
Minimum 0.00109554an 62.7921	Maximum 112.745	
Mean 23.0363	SD 21.0953	Variance 445.013

Concentration at Source [mg/l] - 100 years

05% of values less than 0.0314392	10% of values less than 0.126039	25% of values less than 0.921
50% of values less than 4.2569	75% of values less than 11.7147	90% of values less than 19.6386
Minimum 1.14258E-005 24.6787	Maximum 46.3332	
Mean 7.45311	SD 8.31486	Variance 69.1368

Concentration at Source [mg/l] - 300 years

05% of values less than 2.40612E-011	10% of values less than 2.52451E-009	25% of values less than 6.78319E-007
50% of values less than 6.67259E-005	75% of values less than 0.00132051	90% of values less than 0.00674663
Minimum 0ues less than 0.0124745	Maximum 0.045867	
Mean 0.0022453	SD 0.0057903	Variance 3.35276E-005

Concentration at Source [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 5.55112E-015
Minimum 0ues less than 4.45199E-014	Maximum 2.6833E-012	
Mean 2.93953E-014	SD 1.95667E-013	Variance 3.82856E-026

Concentration at Source [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 13.488	10% of values less than 19.0136	25% of values less than 32.9548
50% of values less than 52.7408	75% of values less than 79.7105	90% of values less than 115.61
Minimum 0.0109909an 158.328	Maximum 438.807	
Mean 64.1755	SD 50.0794	Variance 2507.95

Landfill - Arsenic

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 444.472	10% of values less than 644.998	25% of values less than 1085.96
50% of values less than 1774.93	75% of values less than 2702.54	90% of values less than 3966.15
Minimum 0.362706 than 5282.72	Maximum 14874.9	
Mean 2157.97	SD 1691.72	Variance 2.8619E+006

Landfill - Chloride

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Nickel

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 251.602	10% of values less than 364.717	25% of values less than 614.137
50% of values less than 1002.77	75% of values less than 1526.84	90% of values less than 2240.75
Minimum 0.205083 than 2986.89	Maximum 8405.31	
Mean 1219.63	SD 955.994	Variance 913924

Landfill - Ammonium (NH4+)

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Retarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 218.274	10% of values less than 266.178	25% of values less than 339.938
50% of values less than 491.955	75% of values less than 669.506	90% of values less than 825.354
Minimum 77.1353s than 917.638	Maximum 1455.61	
Mean 520.71	SD 222.937	Variance 49700.8

Landfill - Arsenic

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 444.472	10% of values less than 644.998	25% of values less than 1085.96
50% of values less than 1774.93	75% of values less than 2702.54	90% of values less than 3966.15
Minimum 0.362706	than 5282.72	Maximum 14874.9
Mean 2157.97	SD 1691.72	Variance 2.8619E+006

Landfill - Chloride

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Nickel

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 251.602	10% of values less than 364.717	25% of values less than 614.137
50% of values less than 1002.77	75% of values less than 1526.84	90% of values less than 2240.75
Minimum 0.205083	than 2986.89	Maximum 8405.31
Mean 1219.63	SD 955.994	Variance 913924

Landfill - Pesticides (Individual)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085	an 13.9402	Maximum 37.0444
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Arsenic

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Retarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 10276.6	10% of values less than 12761.3	25% of values less than 18054.6
50% of values less than 25448.7	75% of values less than 30932.4	90% of values less than 35846.9
Minimum 3301.56s than 38336	Maximum 45935.2	
Mean 24735.9	SD 8636.58	Variance 7.45905E+007

Landfill - Chloride

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Nickel

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 251.602	10% of values less than 364.717	25% of values less than 614.137
50% of values less than 1002.77	75% of values less than 1526.84	90% of values less than 2240.75
Minimum 0.205083 than 2986.89	Maximum 8405.31	
Mean 1219.63	SD 955.994	Variance 913924

Landfill - Pesticides (Individual)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Sulphate (as S042-)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Chloride

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Retarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Landfill - Nickel

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 251.602	10% of values less than 364.717	25% of values less than 614.137
50% of values less than 1002.77	75% of values less than 1526.84	90% of values less than 2240.75
Minimum 0.205083 than 2986.89	Maximum 8405.31	
Mean 1219.63	SD 955.994	Variance 913924

Landfill - Pesticides (Individual)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Sulphate (as S042-)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Retarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Nickel

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Retarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 8606.18	10% of values less than 11514.5	25% of values less than 25052.7
50% of values less than 65328.4	75% of values less than 172969	90% of values less than 365285
Minimum 3037.4ss than 602908	Maximum 1.9334E+006	
Mean 152328	SD 225400	Variance 5.08051E+010

Landfill - Pesticides (Individual)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

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50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Sulphate (as S042-)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
50% of values less than 4.30578	75% of values less than 6.2396	90% of values less than 9.88436
Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

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Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Pesticides (Individual)

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Retarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

05% of values less than 22.3964	10% of values less than 27.1024	25% of values less than 36.2459
50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Landfill - Sulphate (as S042-)

Unretarded Travel Time to Base of Unsaturated Zone Liner [years]

05% of values less than 1.02717	10% of values less than 1.6301	25% of values less than 2.78874
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Minimum 0.00110085an 13.9402	Maximum 37.0444	
Mean 5.299	SD 4.32873	Variance 18.7379

Landfill - Sulphate (as S042-)

Unretarded Travel Time to Base of Unsaturated Zone Sand and Gravel [years]

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Minimum 7.60876s than 82.1078	Maximum 114.347	
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50% of values less than 50.6539	75% of values less than 64.5328	90% of values less than 75.8034
Minimum 7.60876s than 82.1078	Maximum 114.347	
Mean 51.0841	SD 18.818	Variance 354.117

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.68163	
Mean 0.0017864	SD 0.0532777	Variance 0.00283851

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 3.35777	
Mean 0.0060267	SD 0.128645	Variance 0.0165496

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 4.31836	
Mean 0.00853978	SD 0.1782	Variance 0.0317553

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 4.92719	
Mean 0.0130669	SD 0.227485	Variance 0.0517495

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 5.34381	
Mean 0.021115	SD 0.291517	Variance 0.0849822

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 5.72084	
Mean 0.0244472	SD 0.325502	Variance 0.105951

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 6.12181	
Mean 0.0393618	SD 0.405592	Variance 0.164505

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 6.4362	
Mean 0.0702426	SD 0.562577	Variance 0.316493

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 7.17099	
Mean 0.0841282	SD 0.630931	Variance 0.398074

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 7.90664	
Mean 0.0990608	SD 0.6966	Variance 0.485251

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 2.49114
Minimum 0ues less than 5.25949	Maximum 12.5158	
Mean 0.634472	SD 1.82867	Variance 3.34404

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 3.66087	90% of values less than 6.59256
Minimum 0ues less than 8.30034	Maximum 14.0052	
Mean 2.0407	SD 2.92804	Variance 8.57343

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 2.64547	75% of values less than 5.48234	90% of values less than 8.20339
Minimum 0ues less than 9.86319	Maximum 13.8031	
Mean 3.34636	SD 3.26534	Variance 10.6625

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 1.31034
50% of values less than 3.6601	75% of values less than 6.16611	90% of values less than 8.7846
Minimum 0ues less than 10.1483	Maximum 13.654	
Mean 4.08147	SD 3.26338	Variance 10.6496

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 3.39029	
Mean 0.00339029	SD 0.107211	Variance 0.0114941

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 0.676103	10% of values less than 1.00509	25% of values less than 1.92995
50% of values less than 3.6982	75% of values less than 5.94916	90% of values less than 7.92985
Minimum 0ues less than 8.93641	Maximum 13.0403	
Mean 4.14978	SD 2.65231	Variance 7.03473

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 2.44006	Maximum 9.77774	
Mean 0.309671	SD 1.29038	Variance 1.66508

Landfill - Ammonium (NH4+)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0.232549	10% of values less than 0.359266	25% of values less than 0.736489
50% of values less than 1.53344	75% of values less than 2.54616	90% of values less than 3.84236
Minimum 0.0374054ɲan 4.6336	Maximum 8.72405	
Mean 1.8268	SD 1.40289	Variance 1.96811

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 1.33809	75% of values less than 3.44923	90% of values less than 5.84614
Minimum 0ɹes less than 7.31231	Maximum 12.5458	
Mean 2.13261	SD 2.49111	Variance 6.20563

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 2.3241E-007	10% of values less than 3.23431E-006	25% of values less than 7.69248E-005
50% of values less than 0.00112439	75% of values less than 0.00610471	90% of values less than 0.0229438
Minimum 5.32907E-015 0.0410244	Maximum 0.278219	
Mean 0.00836531	SD 0.0220312	Variance 0.000485372

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 2.17231E-007	10% of values less than 1.10498E-005	25% of values less than 0.000319432
50% of values less than 0.00369911	75% of values less than 0.022841	90% of values less than 0.101
Minimum 0ɹes less than 0.32117	Maximum 7.9751	
Mean 0.105105	SD 0.555537	Variance 0.308621

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.34862E-014	
Mean 1.34862E-017	SD 4.26472E-016	Variance 1.81879E-031

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.73297E-010	
Mean 1.73297E-013	SD 5.48014E-012	Variance 3.00319E-023

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 5.95812E-008	
Mean 5.95812E-011	SD 1.88412E-009	Variance 3.54992E-018

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.14549E-006	
Mean 1.14549E-009	SD 3.62236E-008	Variance 1.31215E-015

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 6.88998E-006	
Mean 6.88998E-009	SD 2.1788E-007	Variance 4.74718E-014

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 2.30868E-005	
Mean 2.30868E-008	SD 7.30067E-007	Variance 5.32998E-013

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 5.52516E-005	
Mean 5.52516E-008	SD 1.74721E-006	Variance 3.05274E-012

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.000106999	
Mean 1.06999E-007	SD 3.3836E-006	Variance 1.14488E-011

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.000179774	
Mean 1.79774E-007	SD 5.68497E-006	Variance 3.23189E-011

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.000273294	
Mean 2.73294E-007	SD 8.64232E-006	Variance 7.46898E-011

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00290532	
Mean 3.0639E-006	SD 9.20062E-005	Variance 8.46514E-009

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00697403	
Mean 7.92121E-006	SD 0.000222533	Variance 4.95211E-008

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00958945	
Mean 1.32251E-005	SD 0.000313833	Variance 9.84913E-008

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0113426	
Mean 1.63411E-005	SD 0.000375527	Variance 1.41021E-007

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0161725	
Mean 0.000138054	SD 0.000984339	Variance 9.68924E-007

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0.00651698
Minimum 0ues less than 0.00918094	Maximum 0.0177395	
Mean 0.00149436	SD 0.0032044	Variance 1.02682E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 0.00323438	10% of values less than 0.00388037	25% of values less than 0.00510142
50% of values less than 0.00719782	75% of values less than 0.0104442	90% of values less than 0.012805
Minimum 0ues less than 0.0142563	Maximum 0.0185797	
Mean 0.00785235	SD 0.00360029	Variance 1.29621E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0068894	
Mean 1.10731E-005	SD 0.000254774	Variance 6.49097E-008

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 334.238	
Mean 7.94806	SD 40.9761	Variance 1679.04

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 122.838
Minimum 0ues less than 224.579	Maximum 425.198	
Mean 27.091	SD 75.7151	Variance 5732.77

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 92.7695	90% of values less than 229.357
Minimum 0ues less than 297.746	Maximum 441.901	
Mean 56.4598	SD 103.392	Variance 10689.9

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 174.11	90% of values less than 284.562
Minimum 0ɹes less than 330.621	Maximum 450.408	
Mean 91.718	SD 118.851	Variance 14125.6

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 108.447	75% of values less than 212.754	90% of values less than 306.67
Minimum 0ɹes less than 347.053	Maximum 481.446	
Mean 123.24	SD 123.332	Variance 15210.8

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 136.629	75% of values less than 240.011	90% of values less than 315.267
Minimum 0ɹes less than 358.02	Maximum 490.367	
Mean 146.563	SD 121.145	Variance 14676.1

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 82.8706
50% of values less than 151.843	75% of values less than 246.818	90% of values less than 321.304
Minimum 0ues less than 363.88	Maximum 485.981	
Mean 161.134	SD 116.271	Variance 13519

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 94.2476
50% of values less than 160.192	75% of values less than 248.963	90% of values less than 318.093
Minimum 0ues less than 360.405	Maximum 475.3	
Mean 169.047	SD 110.727	Variance 12260.5

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 96.4239
50% of values less than 163.927	75% of values less than 246.889	90% of values less than 315.811
Minimum 0ues less than 355.43	Maximum 464.94	
Mean 170.643	SD 106.171	Variance 11272.2

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 142.82	
Mean 0.14282	SD 4.51636	Variance 20.3975

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 19.5771	25% of values less than 96.2444
50% of values less than 161.067	75% of values less than 241.455	90% of values less than 306.564
Minimum 0ɹes less than 345.986	Maximum 459.22	
Mean 169.459	SD 101.314	Variance 10264.6

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 156.946	
Mean 0.156946	SD 4.96308	Variance 24.6322

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 20.6758	10% of values less than 29.5798	25% of values less than 49.3453
50% of values less than 77.9568	75% of values less than 121.958	90% of values less than 163.301
Minimum 0ɹes less than 195.575	Maximum 323.941	
Mean 89.9488	SD 54.6194	Variance 2983.28

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 477.128	
Mean 4.66626	SD 33.8331	Variance 1144.68

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 1.8647	10% of values less than 3.75058	25% of values less than 10.0798
50% of values less than 19.4342	75% of values less than 37.6531	90% of values less than 55.6088
Minimum 0.0224442ɹan 68.1763	Maximum 296.856	
Mean 25.8173	SD 22.8653	Variance 522.82

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 131.085
Minimum 0ɹes less than 196.434	Maximum 412.38	
Mean 31.667	SD 70.3112	Variance 4943.67

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0.131791	10% of values less than 0.423316	25% of values less than 1.82804
50% of values less than 4.90512	75% of values less than 11.1232	90% of values less than 18.7262
Minimum 0.000325976า 23.7997	Maximum 91.5847	
Mean 7.75968	SD 8.31279	Variance 69.1026

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 2.31621	75% of values less than 65.8447	90% of values less than 150.19
Minimum 0ɹes less than 211.741	Maximum 411.231	
Mean 46.1905	SD 73.7995	Variance 5446.37

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0.00951903	10% of values less than 0.0473208	25% of values less than 0.320363
50% of values less than 1.27801	75% of values less than 3.54483	90% of values less than 6.6234
Minimum 4.73443E-006 8.77633	Maximum 27.2495	
Mean 2.47558	SD 3.08738	Variance 9.53192

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 6.35424	75% of values less than 34.8151	90% of values less than 82.5801
Minimum 0ɹes less than 128.204	Maximum 450.55	
Mean 28.3029	SD 50.4339	Variance 2543.58

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 7.783E-012	10% of values less than 1.02431E-009	25% of values less than 2.9351E-007
50% of values less than 2.18817E-005	75% of values less than 0.000434856	90% of values less than 0.00199821
Minimum 0ɹes less than 0.00373745	Maximum 0.022399	
Mean 0.000707562	SD 0.00194853	Variance 3.79677E-006

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 5.80848E-007
50% of values less than 0.000494169	75% of values less than 0.00995106	90% of values less than 0.267734
Minimum 0ɹes less than 3.5429	Maximum 264.034	
Mean 2.60657	SD 19.0344	Variance 362.309

Landfill - Chloride

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 1.66533E-015
Minimum 0ues less than 1.22957E-014	Maximum 1.19132E-012	
Mean 9.41072E-015	SD 7.15039E-014	Variance 5.11281E-027

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 3.30985E-015	90% of values less than 5.53504E-012
Minimum 0ues less than 4.23807E-009	Maximum 138.345	
Mean 0.156127	SD 4.40461	Variance 19.4006

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 2.7841E-011	
Mean 2.7841E-014	SD 8.80409E-013	Variance 7.75121E-025

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 5.5851E-007	
Mean 5.5851E-010	SD 1.76616E-008	Variance 3.11933E-016

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.63308E-005	
Mean 1.63308E-008	SD 5.16426E-007	Variance 2.66696E-013

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 9.12432E-005	
Mean 9.12432E-008	SD 2.88536E-006	Variance 8.32532E-012

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.000260859	
Mean 2.60859E-007	SD 8.24909E-006	Variance 6.80475E-011

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00053146	
Mean 5.3146E-007	SD 1.68062E-005	Variance 2.8245E-010

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00089033	
Mean 8.9033E-007	SD 2.81547E-005	Variance 7.92687E-010

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00131817	
Mean 1.31817E-006	SD 4.16842E-005	Variance 1.73757E-009

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00179584	
Mean 1.79584E-006	SD 5.67895E-005	Variance 3.22505E-009

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00230696	
Mean 2.30696E-006	SD 7.29524E-005	Variance 5.32205E-009

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00966304	
Mean 1.22504E-005	SD 0.000316257	Variance 1.00019E-007

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0165792	
Mean 2.78025E-005	SD 0.000587773	Variance 3.45477E-007

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0201567	
Mean 5.96662E-005	SD 0.000908739	Variance 8.25806E-007

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0223032	
Mean 9.36473E-005	SD 0.00115603	Variance 1.3364E-006

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0.0114688	Maximum 0.0411816	
Mean 0.00108632	SD 0.00442187	Variance 1.95529E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0.0164123	90% of values less than 0.0249179
Minimum 0ɹes less than 0.0320223	Maximum 0.0485067	
Mean 0.00911226	SD 0.0111199	Variance 0.000123651

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 0.00678872	10% of values less than 0.00782997	25% of values less than 0.0107268
50% of values less than 0.0152678	75% of values less than 0.0216577	90% of values less than 0.0279302
Minimum 0ɹes less than 0.0313033	Maximum 0.0402692	
Mean 0.0167926	SD 0.00761308	Variance 5.7959E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0.0286247	
Mean 0.00010011	SD 0.001395	Variance 1.94603E-006

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0224141	
Mean 0.000457964	SD 0.00230101	Variance 5.29464E-006

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0.00889078
Minimum 0ues less than 0.0131886	Maximum 0.0292674	
Mean 0.00167388	SD 0.00456147	Variance 2.0807E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0.00666625	90% of values less than 0.0138505
Minimum 0ues less than 0.0170686	Maximum 0.0312099	
Mean 0.00348625	SD 0.00625924	Variance 3.9178E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0.0113211	90% of values less than 0.0168928
Minimum 0ɹes less than 0.019905	Maximum 0.0318842	
Mean 0.00593816	SD 0.00738002	Variance 5.44647E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0.00873453	75% of values less than 0.0139361	90% of values less than 0.0188799
Minimum 0ɹes less than 0.0220758	Maximum 0.0321446	
Mean 0.00838609	SD 0.00785858	Variance 6.17573E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0.010936	75% of values less than 0.0160524	90% of values less than 0.0210458
Minimum 0ɹes less than 0.0233118	Maximum 0.0322517	
Mean 0.010455	SD 0.00790322	Variance 6.24609E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.00765531
50% of values less than 0.0123369	75% of values less than 0.0176709	90% of values less than 0.0218265
Minimum 0ɹes less than 0.0245499	Maximum 0.0322974	
Mean 0.012074	SD 0.00777039	Variance 6.03789E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.00909045
50% of values less than 0.0135205	75% of values less than 0.0187592	90% of values less than 0.0229201
Minimum 0ɹes less than 0.0251715	Maximum 0.0323171	
Mean 0.0132771	SD 0.00759157	Variance 5.76319E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.00991239
50% of values less than 0.0141289	75% of values less than 0.019483	90% of values less than 0.0235689
Minimum 0ɹes less than 0.025828	Maximum 0.0323254	
Mean 0.014097	SD 0.00748686	Variance 5.60531E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0.0112158	
Mean 1.12158E-005	SD 0.000354674	Variance 1.25793E-007

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 0.00507892	25% of values less than 0.0105036
50% of values less than 0.0147432	75% of values less than 0.0198627	90% of values less than 0.0242989
Minimum 0ɹes less than 0.0263418	Maximum 0.0323687	
Mean 0.0147424	SD 0.00733402	Variance 5.37878E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0.0138308	
Mean 1.38308E-005	SD 0.000437369	Variance 1.91292E-007

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 0.0084989	10% of values less than 0.00970455	25% of values less than 0.0126451
50% of values less than 0.0166779	75% of values less than 0.0216545	90% of values less than 0.0259908
Minimum 0ɹes less than 0.0282293	Maximum 0.0326206	
Mean 0.0172064	SD 0.00611513	Variance 3.73948E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0.0319644	
Mean 0.000364095	SD 0.0026367	Variance 6.95221E-006

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 0.00881098	10% of values less than 0.0100724	25% of values less than 0.0127707
50% of values less than 0.016762	75% of values less than 0.0217161	90% of values less than 0.0260375
Minimum 0.00643244ɜn 0.0284447	Maximum 0.0325206	
Mean 0.0174067	SD 0.00590392	Variance 3.48562E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0.016849
Minimum 0ɹes less than 0.0221536	Maximum 0.0325835	
Mean 0.00389241	SD 0.00768305	Variance 5.90293E-005

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0.0087993	10% of values less than 0.0100584	25% of values less than 0.0127569
50% of values less than 0.0167235	75% of values less than 0.0216967	90% of values less than 0.026014
Minimum 0.00642249an 0.028413	Maximum 0.0329273	
Mean 0.0173833	SD 0.00589805	Variance 3.4787E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0.0161893	90% of values less than 0.0227823
Minimum 0ues less than 0.0261841	Maximum 0.0329307	
Mean 0.00830036	SD 0.0096356	Variance 9.28447E-005

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0.00878331	10% of values less than 0.0100442	25% of values less than 0.012743
50% of values less than 0.0167073	75% of values less than 0.0216774	90% of values less than 0.0259905
Minimum 0.00641257an 0.0283651	Maximum 0.0328898	
Mean 0.0173582	SD 0.00588926	Variance 3.46834E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0.0114385	75% of values less than 0.0182486	90% of values less than 0.0238936
Minimum 0ues less than 0.0269653	Maximum 0.0328936	
Mean 0.010495	SD 0.0097413	Variance 9.4893E-005

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 0.00867064	10% of values less than 0.00990741	25% of values less than 0.0126002
50% of values less than 0.0165098	75% of values less than 0.0213468	90% of values less than 0.0258032
Minimum 0.0063337an 0.0279843	Maximum 0.0325889	
Mean 0.0171585	SD 0.00582002	Variance 3.38727E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.00901219
50% of values less than 0.0146991	75% of values less than 0.0201553	90% of values less than 0.0246263
Minimum 0ues less than 0.0273584	Maximum 0.0325927	
Mean 0.0138758	SD 0.00872837	Variance 7.61845E-005

Landfill - Pesticides (Individual)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0.0083727	10% of values less than 0.00944581	25% of values less than 0.0120163
50% of values less than 0.0158609	75% of values less than 0.0205193	90% of values less than 0.0246061
Minimum 0.00606521an 0.026658	Maximum 0.0315574	
Mean 0.0164798	SD 0.00559251	Variance 3.12761E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0.00765647	10% of values less than 0.00918434	25% of values less than 0.0119574
50% of values less than 0.015849	75% of values less than 0.0205512	90% of values less than 0.0248049
Minimum 0ues less than 0.0267643	Maximum 0.031561	
Mean 0.0162745	SD 0.00609221	Variance 3.7115E-005

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 0.00567505	10% of values less than 0.00643174	25% of values less than 0.00841085
50% of values less than 0.0112162	75% of values less than 0.0145856	90% of values less than 0.0175702
Minimum 0.0030667an 0.0197041	Maximum 0.0244853	
Mean 0.0117564	SD 0.00427463	Variance 1.82724E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 0.00574581	10% of values less than 0.00656491	25% of values less than 0.00848301
50% of values less than 0.0113294	75% of values less than 0.0147314	90% of values less than 0.0176669
Minimum 0.00324651an 0.0199194	Maximum 0.0246279	
Mean 0.0118816	SD 0.00430145	Variance 1.85025E-005

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1324.55	
Mean 28.7984	SD 139.429	Variance 19440.6

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 612.977
Minimum 0ues less than 788.265	Maximum 1355.98	
Mean 101.584	SD 264.205	Variance 69804.4

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 512.115	90% of values less than 801.028
Minimum 0ues less than 960.048	Maximum 1364.77	
Mean 208.185	SD 351.997	Variance 123902

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 703.517	90% of values less than 908.199
Minimum 0ues less than 1010.54	Maximum 1390.08	
Mean 343.522	SD 398.87	Variance 159097

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 576.569	75% of values less than 792.278	90% of values less than 957.694
Minimum 0ues less than 1067.06	Maximum 1384.01	
Mean 467.471	SD 403.323	Variance 162669

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 650.226	75% of values less than 838.608	90% of values less than 1002.77
Minimum 0ues less than 1096.91	Maximum 1380.38	
Mean 559.139	SD 381.158	Variance 145281

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 501.4
50% of values less than 683.364	75% of values less than 860.106	90% of values less than 1018.17
Minimum 0ues less than 1089.44	Maximum 1351.48	
Mean 617.2	SD 351.906	Variance 123838

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 541.453
50% of values less than 696.174	75% of values less than 865.128	90% of values less than 1004.01
Minimum 0ues less than 1091.85	Maximum 1312.63	
Mean 646.586	SD 322.845	Variance 104229

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Liner [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 539.084
50% of values less than 695.293	75% of values less than 856.183	90% of values less than 988.556
Minimum 0ues less than 1077.63	Maximum 1270.42	
Mean 652.932	SD 301.917	Variance 91154.1

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 769.321	
Mean 0.769321	SD 24.3281	Variance 591.856

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 10 years

05% of values less than 0	10% of values less than 151.544	25% of values less than 529.37
50% of values less than 677.624	75% of values less than 835.676	90% of values less than 968.232
Minimum 0ues less than 1045.32	Maximum 1252.42	
Mean 649.408	SD 281.812	Variance 79417.8

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 845.417	
Mean 0.845417	SD 26.7344	Variance 714.73

Concentration at Base of Unsaturated Zone Liner [mg/l] - 25 years

05% of values less than 101.22	10% of values less than 150.381	25% of values less than 232.8
50% of values less than 340.921	75% of values less than 452.924	90% of values less than 558.374
Minimum 0ues less than 631.419	Maximum 945.617	
Mean 351.389	SD 161.713	Variance 26151

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1071.46	
Mean 18.0345	SD 114.931	Variance 13209

Concentration at Base of Unsaturated Zone Liner [mg/l] - 50 years

05% of values less than 8.36341	10% of values less than 17.7981	25% of values less than 44.1047
50% of values less than 88.6653	75% of values less than 143.653	90% of values less than 189.19
Minimum 0.173738 than 226.459	Maximum 615.23	
Mean 101.021	SD 74.6956	Variance 5579.43

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 557.018
Minimum 0ues less than 708.024	Maximum 1109.3	
Mean 122.555	SD 246.166	Variance 60597.9

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 75 years

05% of values less than 0.563187	10% of values less than 1.97376	25% of values less than 7.63454
50% of values less than 22.571	75% of values less than 47.103	90% of values less than 68.0982
Minimum 0.00252335 an 81.5918	Maximum 199.968	
Mean 30.393	SD 28.1567	Variance 792.798

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 11.9514	75% of values less than 270.279	90% of values less than 590.576
Minimum 0 ues less than 746.099	Maximum 1236.12	
Mean 177.325	SD 259.633	Variance 67409.4

Concentration at Base of Unsaturated Zone Liner [mg/l] - 100 years

05% of values less than 0.0417704	10% of values less than 0.215918	25% of values less than 1.34485
50% of values less than 5.68403	75% of values less than 15.3272	90% of values less than 24.8929
Minimum 2.95457E-005 31.1027	Maximum 64.8243	
Mean 9.69631	SD 10.7141	Variance 114.791

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 29.9535	75% of values less than 140.168	90% of values less than 342.695
Minimum 0 ues less than 475.113	Maximum 974.446	
Mean 106.698	SD 167.095	Variance 27920.7

Concentration at Base of Unsaturated Zone Liner [mg/l] - 300 years

05% of values less than 3.72309E-011	10% of values less than 4.3466E-009	25% of values less than 1.11396E-006
50% of values less than 8.89732E-005	75% of values less than 0.00177652	90% of values less than 0.00831652
Minimum 0 ues less than 0.0155839	Maximum 0.0531744	
Mean 0.00276772	SD 0.00699222	Variance 4.88912E-005

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 2.17535E-006
50% of values less than 0.00199616	75% of values less than 0.0423276	90% of values less than 1.06335
Minimum 0 ues less than 13.8858	Maximum 952.704	
Mean 8.99127	SD 63.2988	Variance 4006.74

Landfill - Sulphate (as S042-)

Concentration at Base of Unsaturated Zone Liner [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 6.88338E-015
Minimum 0ues less than 6.02851E-014	Maximum 3.17546E-012	
Mean 3.52413E-014	SD 2.32343E-013	Variance 5.39832E-026

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 1.43219E-014	90% of values less than 2.4605E-011
Minimum 0ues less than 2.07498E-008	Maximum 417.96	
Mean 0.497463	SD 13.4129	Variance 179.905

Concentration at Base of Unsaturated Zone Liner [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Concentration at Base of Unsaturated Zone Sand and Gravel [mg/l] - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Ammonium (NH4+)

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00990711	
Mean 9.90711E-006	SD 0.00031329	Variance 9.81508E-008

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0.0356866
Minimum 0ues less than 0.541024	Maximum 8.48499	
Mean 0.128075	SD 0.643248	Variance 0.413768

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 0.000447023	10% of values less than 0.00137017	25% of values less than 0.00730817
50% of values less than 0.109189	75% of values less than 0.875393	90% of values less than 2.28706
Minimum 0ues less than 3.19377	Maximum 7.7399	
Mean 0.696945	SD 1.18842	Variance 1.41234

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 8.46418E-009	10% of values less than 1.15027E-007	25% of values less than 2.87955E-006
50% of values less than 5.3991E-005	75% of values less than 0.00092425	90% of values less than 0.00570072
Minimum 8.54199E-018 0.0120097	Maximum 0.309645	
Mean 0.00318455	SD 0.015536	Variance 0.000241369

Landfill - Arsenic

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Arsenic

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.00212049	
Mean 6.7838E-006	SD 0.00010551	Variance 1.11324E-008

Landfill - Chloride

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Chloride

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.286782	
Mean 0.000286782	SD 0.00906885	Variance 8.22441E-005

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.370541	
Mean 0.000370541	SD 0.0117175	Variance 0.0001373

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.407926	
Mean 0.000407926	SD 0.0128997	Variance 0.000166403

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0.952198	Maximum 184.587	
Mean 2.22772	SD 14.2139	Variance 202.036

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 4.46814	90% of values less than 43.4868
Minimum 0ues less than 74.7124	Maximum 200.067	
Mean 11.6537	SD 28.4811	Variance 811.172

Landfill - Chloride

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.0613797
50% of values less than 1.20061	75% of values less than 13.4822	90% of values less than 45.1276
Minimum 0ues less than 64.4725	Maximum 178.119	
Mean 12.8938	SD 24.9794	Variance 623.973

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 0.00243439	10% of values less than 0.00724728	25% of values less than 0.0430372
50% of values less than 0.660635	75% of values less than 5.74725	90% of values less than 19.9325
Minimum 0ues less than 35.7123	Maximum 155.694	
Mean 6.80375	SD 15.9703	Variance 255.052

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 1.42811E-011	10% of values less than 7.2169E-010	25% of values less than 1.64796E-007
50% of values less than 8.49542E-006	75% of values less than 0.000192891	90% of values less than 0.00231527
Minimum 0ues less than 0.00648844	Maximum 0.0812779	
Mean 0.00140211	SD 0.00610645	Variance 3.72888E-005

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 1.04663E-018	90% of values less than 3.98074E-016
Minimum 0ues less than 6.26593E-015	Maximum 2.052E-012	
Mean 1.20223E-014	SD 1.07196E-013	Variance 1.14909E-026

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Nickel

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0.0244223	
Mean 0.000123318	SD 0.00132915	Variance 1.76663E-006

Landfill - Pesticides (Individual)

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Pesticides (Individual)

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 2.23198E-005	
Mean 2.23198E-008	SD 7.05815E-007	Variance 4.98175E-013

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 3.17218E-005	
Mean 3.17218E-008	SD 1.00313E-006	Variance 1.00628E-012

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 3.84138E-005	
Mean 3.84138E-008	SD 1.21475E-006	Variance 1.47562E-012

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0.000101895	Maximum 0.013554	
Mean 0.00018248	SD 0.00110686	Variance 1.22513E-006

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0.000798288	90% of values less than 0.00685923
Minimum 0ues less than 0.0103585	Maximum 0.0240661	
Mean 0.00167052	SD 0.00370851	Variance 1.37531E-005

Landfill - Pesticides (Individual)

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 2.09426E-005
50% of values less than 0.000441351	75% of values less than 0.00522403	90% of values less than 0.0110003
Minimum 0ues less than 0.0137393	Maximum 0.0259887	
Mean 0.00325152	SD 0.0049151	Variance 2.41582E-005

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 7.08621E-006	10% of values less than 1.39085E-005	25% of values less than 5.55608E-005
50% of values less than 0.000955766	75% of values less than 0.00681189	90% of values less than 0.0118969
Minimum 0ues less than 0.0155146	Maximum 0.02641	
Mean 0.0039245	SD 0.00535881	Variance 2.87169E-005

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 8.08521E-006	10% of values less than 1.62255E-005	25% of values less than 6.33874E-005
50% of values less than 0.00109785	75% of values less than 0.00745241	90% of values less than 0.0125638
Minimum 2.18371E-006 0.0163334	Maximum 0.0262083	
Mean 0.0042011	SD 0.00560078	Variance 3.13687E-005

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 7.67906E-006	10% of values less than 1.57716E-005	25% of values less than 6.0556E-005
50% of values less than 0.00104893	75% of values less than 0.00712552	90% of values less than 0.0120397
Minimum 2.12437E-006 0.0157648	Maximum 0.0249732	
Mean 0.00403641	SD 0.00537991	Variance 2.89435E-005

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 5.39012E-006	10% of values less than 1.03764E-005	25% of values less than 4.18878E-005
50% of values less than 0.000680131	75% of values less than 0.00519313	90% of values less than 0.00867175
Minimum 1.56378E-006 0.0111676	Maximum 0.0180472	
Mean 0.00288402	SD 0.00387553	Variance 1.50198E-005

Landfill - Sulphate (as S042-)

Diluted Concentration [mg/l] Sand and Gravel - 1 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 2 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 3 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 4 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 5 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 6 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ɹes less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Landfill - Sulphate (as S042-)

Diluted Concentration [mg/l] Sand and Gravel - 7 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Diluted Concentration [mg/l] Sand and Gravel - 8 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.5448	
Mean 0.0015448	SD 0.0488508	Variance 0.0023864

Diluted Concentration [mg/l] Sand and Gravel - 9 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 1.99598	
Mean 0.00199598	SD 0.0631183	Variance 0.00398392

Diluted Concentration [mg/l] Sand and Gravel - 10 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 2.19736	
Mean 0.00219736	SD 0.0694865	Variance 0.00482838

Diluted Concentration [mg/l] Sand and Gravel - 25 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 5.45072	Maximum 638.667	
Mean 9.22149	SD 55.8792	Variance 3122.48

Diluted Concentration [mg/l] Sand and Gravel - 50 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 19.1166	90% of values less than 181.692
Minimum 0ues less than 302.784	Maximum 625.307	
Mean 47.2793	SD 110.243	Variance 12153.5

Landfill - Sulphate (as S042-)

Diluted Concentration [mg/l] Sand and Gravel - 75 years

05% of values less than 0	10% of values less than 0	25% of values less than 0.24987
50% of values less than 5.17056	75% of values less than 55.2675	90% of values less than 174.72
Minimum 0ues less than 262.075	Maximum 591.954	
Mean 51.2315	SD 94.5076	Variance 8931.68

Diluted Concentration [mg/l] Sand and Gravel - 100 years

05% of values less than 0.00934116	10% of values less than 0.0326477	25% of values less than 0.197998
50% of values less than 2.86935	75% of values less than 23.8361	90% of values less than 85.1389
Minimum 0ues less than 130.313	Maximum 555.359	
Mean 26.4526	SD 57.2121	Variance 3273.23

Diluted Concentration [mg/l] Sand and Gravel - 300 years

05% of values less than 5.99935E-011	10% of values less than 2.65483E-009	25% of values less than 7.03772E-007
50% of values less than 3.357E-005	75% of values less than 0.000837869	90% of values less than 0.00970781
Minimum 0ues less than 0.0255359	Maximum 0.357249	
Mean 0.00585614	SD 0.0277723	Variance 0.0007713

Diluted Concentration [mg/l] Sand and Gravel - 1000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 4.48386E-018	90% of values less than 1.52418E-015
Minimum 0ues less than 2.75734E-014	Maximum 6.49419E-012	
Mean 5.00047E-014	SD 4.28829E-013	Variance 1.83894E-025

Diluted Concentration [mg/l] Sand and Gravel - 7000 years

05% of values less than 0	10% of values less than 0	25% of values less than 0
50% of values less than 0	75% of values less than 0	90% of values less than 0
Minimum 0ues less than 0	Maximum 0	
Mean 0	SD 0	Variance 0

Ammonium (NH4+)

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 272.32	10% of values less than 319.443	25% of values less than 473.846
50% of values less than 743.057	75% of values less than 1499.42	90% of values less than 3258.86
Minimum 81.7293s than 4827.24	Maximum 10971.4	
Mean 1346.99	SD 1594.88	Variance 2.54364E+006

Arsenic

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 12951.8	10% of values less than 16481.1	25% of values less than 24712.8
50% of values less than 34706.9	75% of values less than 73128.1	90% of values less than 167031
Minimum 3430.43s than 241019	Maximum 540589	
Mean 65900.1	SD 75321.7	Variance 5.67336E+009

Chloride

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Nickel

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 15272.8	10% of values less than 24346.7	25% of values less than 54568.6
50% of values less than 156850	75% of values less than 408177	90% of values less than 1.03044E+006
Minimum 3964.21s than 1.6177E+006	Maximum 1.42788E+007	
Mean 426173	SD 871870	Variance 7.60157E+011

Pesticides (Individual)

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 28.9794	10% of values less than 35.5357	25% of values less than 52.1701
50% of values less than 77.5568	75% of values less than 221.802	90% of values less than 533.882
Minimum 8.15875s than 764.127	Maximum 1682.84	
Mean 190.216	SD 252.408	Variance 63709.8

Sulphate (as S042-)

Unretarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Retarded Travel Time to Landfill Receptor [years]

05% of values less than 28.1064	10% of values less than 34.4458	25% of values less than 49.6976
50% of values less than 71.6853	75% of values less than 155.9	90% of values less than 368.516
Minimum 8.0437ss than 524.235	Maximum 1235.12	
Mean 143.295	SD 170.54	Variance 29083.8

Ammonium (NH4+)

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Ammonium (NH4+)

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Ammonium (NH4+)

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.649268	
Mean 0.640009	SD 0.000293077	Variance 8.58943E-008

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64447	Maximum 0.958176	
Mean 0.64206	SD 0.016233	Variance 0.00026351

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.642405	75% of values less than 0.679903	90% of values less than 0.97001
Minimum 0.64 less than 1.37546	Maximum 5.10157	
Mean 0.768905	SD 0.408344	Variance 0.166745

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.640002
50% of values less than 0.64006	75% of values less than 0.641986	90% of values less than 0.669295
Minimum 0.64 less than 0.782802	Maximum 4.08827	
Mean 0.684249	SD 0.245397	Variance 0.0602197

Arsenic

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Arsenic

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Arsenic

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.0140212	
Mean 0.014	SD 7.16745E-007	Variance 5.13723E-013

Chloride

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Chloride

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72.3406	
Mean 72.0003	SD 0.0107722	Variance 0.000116041

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72.3963	
Mean 72.0004	SD 0.0125327	Variance 0.000157067

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 89.9015	
Mean 72.0631	SD 0.848088	Variance 0.719254

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72.0008	90% of values less than 72.4915
Minimum 72 values less than 74.4514	Maximum 164.488	
Mean 72.715	SD 4.80792	Variance 23.1161

Chloride

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72.0028	75% of values less than 72.2412	90% of values less than 75.4476
Minimum 72ɜs less than 79.4533	Maximum 177.616	
Mean 73.6682	SD 6.98013	Variance 48.7222

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72.0137	75% of values less than 72.3668	90% of values less than 75.4073
Minimum 72ɜs less than 83.1778	Maximum 212.947	
Mean 74.1726	SD 9.19295	Variance 84.5103

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72.0004	90% of values less than 72.1252
Minimum 72ɜs less than 73.6617	Maximum 160.263	
Mean 73.1506	SD 7.05607	Variance 49.7881

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72ɜs less than 72	Maximum 76.0309	
Mean 72.0043	SD 0.127564	Variance 0.0162726

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72ɜs less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Nickel

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Nickel

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Nickel

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.00400747	
Mean 0.00200401	SD 8.63525E-005	Variance 7.45676E-009

Pesticides (Individual)

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Pesticides (Individual)

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.0180269	
Mean 0.018	SD 8.5058E-007	Variance 7.23486E-013

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018035	
Mean 0.018	SD 1.1081E-006	Variance 1.22788E-012

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.0185602	
Mean 0.0180017	SD 2.06563E-005	Variance 4.26684E-010

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018068
Minimum 0.018ess than 0.0182192	Maximum 0.025729	
Mean 0.0180713	SD 0.000418637	Variance 1.75257E-007

Pesticides (Individual)

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.0180445	90% of values less than 0.018411
Minimum 0.018ess than 0.0190701	Maximum 0.0281012	
Mean 0.0181858	SD 0.000689965	Variance 4.76052E-007

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.0180118	75% of values less than 0.0181672	90% of values less than 0.0189908
Minimum 0.018ess than 0.0201052	Maximum 0.0284527	
Mean 0.0183659	SD 0.00103226	Variance 1.06557E-006

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.0180059
50% of values less than 0.0180845	75% of values less than 0.0194559	90% of values less than 0.0237528
Minimum 0.018ess than 0.0267035	Maximum 0.0394912	
Mean 0.0195839	SD 0.0031389	Variance 9.85267E-006

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 0.0180028	10% of values less than 0.0180074	25% of values less than 0.0180333
50% of values less than 0.0185368	75% of values less than 0.0231916	90% of values less than 0.028993
Minimum 0.018ess than 0.0319262	Maximum 0.0418393	
Mean 0.0213687	SD 0.00502297	Variance 2.52302E-005

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 0.0180032	10% of values less than 0.0180068	25% of values less than 0.0180286
50% of values less than 0.0184735	75% of values less than 0.0221661	90% of values less than 0.0264551
Minimum 0.018ess than 0.0288789	Maximum 0.0362688	
Mean 0.0206261	SD 0.00382379	Variance 1.46214E-005

Sulphate (as S042-)

Concentration at Landfill Receptor [mg/l] - 1 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 2 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 3 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 4 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 5 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 6 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80ɜs less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Sulphate (as S042-)

Concentration at Landfill Receptor [mg/l] - 7 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 8 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at Landfill Receptor [mg/l] - 9 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 81.835	
Mean 80.0018	SD 0.0580263	Variance 0.00336706

Concentration at Landfill Receptor [mg/l] - 10 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 82.1348	
Mean 80.0021	SD 0.0675091	Variance 0.00455748

Concentration at Landfill Receptor [mg/l] - 25 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 231.914	
Mean 80.3324	SD 5.78185	Variance 33.4298

Concentration at Landfill Receptor [mg/l] - 50 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80.0017	90% of values less than 82.3137
Minimum 80₃s less than 91.5514	Maximum 405.335	
Mean 82.921	SD 16.6938	Variance 278.682

Sulphate (as S042-)

Concentration at Landfill Receptor [mg/l] - 75 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80.0132	75% of values less than 81.0114	90% of values less than 94.2888
Minimum 80₃s less than 117.075	Maximum 310.592	
Mean 86.6261	SD 23.2986	Variance 542.826

Concentration at Landfill Receptor [mg/l] - 100 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80.0606	75% of values less than 81.4981	90% of values less than 96.6973
Minimum 80₃s less than 122.383	Maximum 468.795	
Mean 87.6258	SD 27.2013	Variance 739.912

Concentration at Landfill Receptor [mg/l] - 300 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80.0018	90% of values less than 80.4517
Minimum 80₃s less than 88.0082	Maximum 365.655	
Mean 84.3578	SD 25.7348	Variance 662.281

Concentration at Landfill Receptor [mg/l] - 1000 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 92.178	
Mean 80.0134	SD 0.385836	Variance 0.148869

Concentration at Landfill Receptor [mg/l] - 7000 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Ammonium (NH4+)

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 274.023	10% of values less than 323.253	25% of values less than 480.187
50% of values less than 749.76	75% of values less than 1574.3	90% of values less than 3444.09
Minimum 82.4867s than 5015.51	Maximum 11392.1	
Mean 1403.42	SD 1676.71	Variance 2.81136E+006

Arsenic

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 13058.5	10% of values less than 16755.4	25% of values less than 24952.7
50% of values less than 35064	75% of values less than 78860.7	90% of values less than 174098
Minimum 3451.67s than 253246	Maximum 560341	
Mean 68680.5	SD 79107.5	Variance 6.258E+009

Chloride

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Nickel

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 15557.7	10% of values less than 24442.8	25% of values less than 55021.5
50% of values less than 162913	75% of values less than 415386	90% of values less than 1.04039E+006
Minimum 3973.67s than 1.72319E+006	Maximum 1.49099E+007	
Mean 444850	SD 915892	Variance 8.38858E+011

Pesticides (Individual)

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 29.1304	10% of values less than 35.7097	25% of values less than 52.3769
50% of values less than 79.056	75% of values less than 235.737	90% of values less than 570.622
Minimum 8.24942s than 800.717	Maximum 1745.07	
Mean 199.667	SD 265.293	Variance 70380.3

Sulphate (as S042-)

Unretarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Retarded Travel Time to BH08/01 [years]

05% of values less than 28.1674	10% of values less than 34.9518	25% of values less than 50.5465
50% of values less than 72.7011	75% of values less than 167.341	90% of values less than 392.366
Minimum 8.11541s than 548.65	Maximum 1278.51	
Mean 149.583	SD 179.298	Variance 32148

Ammonium (NH4+)

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Ammonium (NH4+)

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Ammonium (NH4+)

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.64	
Mean 0.64	SD 1.17717E-007	Variance 1.38574E-014

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.64	Maximum 0.645624	
Mean 0.640006	SD 0.000177845	Variance 3.16288E-008

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.64	75% of values less than 0.64	90% of values less than 0.64
Minimum 0.64 less than 0.644601	Maximum 0.89093	
Mean 0.641775	SD 0.0129041	Variance 0.000166515

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.64
50% of values less than 0.642644	75% of values less than 0.689255	90% of values less than 0.976179
Minimum 0.64 less than 1.33914	Maximum 4.89765	
Mean 0.764101	SD 0.382296	Variance 0.14615

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 0.64	10% of values less than 0.64	25% of values less than 0.640003
50% of values less than 0.640079	75% of values less than 0.642945	90% of values less than 0.683787
Minimum 0.64 less than 0.810154	Maximum 4.60154	
Mean 0.695037	SD 0.293662	Variance 0.0862376

Arsenic

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Arsenic

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Arsenic

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.014	
Mean 0.014	SD 2.60357E-009	Variance 6.77857E-018

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 0.014	10% of values less than 0.014	25% of values less than 0.014
50% of values less than 0.014	75% of values less than 0.014	90% of values less than 0.014
Minimum 0.014ess than 0.014	Maximum 0.0140131	
Mean 0.014	SD 4.83633E-007	Variance 2.33901E-013

Chloride

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72 values less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Chloride

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72₃s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72₃s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72₃s less than 72	Maximum 72.2058	
Mean 72.0002	SD 0.00650704	Variance 4.23416E-005

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72₃s less than 72	Maximum 72.242	
Mean 72.0002	SD 0.00765361	Variance 5.85778E-005

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72₃s less than 72	Maximum 87.8117	
Mean 72.06	SD 0.779888	Variance 0.608226

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72.5303
Minimum 72₃s less than 74.4512	Maximum 140.577	
Mean 72.58	SD 3.42468	Variance 11.7285

Chloride

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72.003	75% of values less than 72.2718	90% of values less than 75.2347
Minimum 72∋s less than 79.8181	Maximum 165.099	
Mean 73.6109	SD 6.49502	Variance 42.1853

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72.0165	75% of values less than 72.3916	90% of values less than 75.4134
Minimum 72∋s less than 82.2752	Maximum 189.785	
Mean 73.9559	SD 8.01249	Variance 64.2

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72.0005	90% of values less than 72.1055
Minimum 72∋s less than 73.5492	Maximum 160.915	
Mean 72.8899	SD 5.8922	Variance 34.718

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72∋s less than 72	Maximum 117.498	
Mean 72.0538	SD 1.45735	Variance 2.12388

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 72	10% of values less than 72	25% of values less than 72
50% of values less than 72	75% of values less than 72	90% of values less than 72
Minimum 72∋s less than 72	Maximum 72	
Mean 72	SD 0	Variance 0

Nickel

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Nickel

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Nickel

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.002	
Mean 0.002	SD 7.16478E-011	Variance -5.13341E-021

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 0.002	10% of values less than 0.002	25% of values less than 0.002
50% of values less than 0.002	75% of values less than 0.002	90% of values less than 0.002
Minimum 0.002ess than 0.002	Maximum 0.00332205	
Mean 0.00200147	SD 4.18965E-005	Variance 1.75532E-009

Pesticides (Individual)

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Pesticides (Individual)

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018	
Mean 0.018	SD 3.36363E-009	Variance -1.1314E-017

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018016	
Mean 0.018	SD 5.05725E-007	Variance 2.55758E-013

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.0180212	
Mean 0.018	SD 6.68919E-007	Variance 4.47452E-013

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.018
Minimum 0.018ess than 0.018	Maximum 0.018549	
Mean 0.0180015	SD 1.92823E-005	Variance 3.71808E-010

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.018	90% of values less than 0.0180691
Minimum 0.018ess than 0.0182152	Maximum 0.0217934	
Mean 0.0180511	SD 0.000251123	Variance 6.3063E-008

Pesticides (Individual)

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.018	75% of values less than 0.0180536	90% of values less than 0.0184282
Minimum 0.018ess than 0.0189026	Maximum 0.0258878	
Mean 0.0181664	SD 0.000575399	Variance 3.31084E-007

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.018
50% of values less than 0.0180136	75% of values less than 0.0181846	90% of values less than 0.0188778
Minimum 0.018ess than 0.0197319	Maximum 0.027893	
Mean 0.0183266	SD 0.000885975	Variance 7.84952E-007

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 0.018	10% of values less than 0.018	25% of values less than 0.0180074
50% of values less than 0.0181031	75% of values less than 0.0194948	90% of values less than 0.0233989
Minimum 0.018ess than 0.0261701	Maximum 0.0394638	
Mean 0.0195456	SD 0.00295109	Variance 8.70891E-006

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 0.0180052	10% of values less than 0.0180102	25% of values less than 0.0180484
50% of values less than 0.0187546	75% of values less than 0.0241049	90% of values less than 0.0290013
Minimum 0.018ess than 0.0315894	Maximum 0.0418938	
Mean 0.0215829	SD 0.00503294	Variance 2.53305E-005

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 0.0180051	10% of values less than 0.0180096	25% of values less than 0.0180417
50% of values less than 0.0186461	75% of values less than 0.0229309	90% of values less than 0.0266162
Minimum 0.0180008ɲan 0.0295243	Maximum 0.0362303	
Mean 0.0208618	SD 0.00391872	Variance 1.53564E-005

Sulphate (as S042-)

Concentration at BH08/01 [mg/l] - 1 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 2 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 3 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 4 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 5 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 6 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Sulphate (as S042-)

Concentration at BH08/01 [mg/l] - 7 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 8 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Concentration at BH08/01 [mg/l] - 9 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 81.1084	
Mean 80.0011	SD 0.0350512	Variance 0.00122859

Concentration at BH08/01 [mg/l] - 10 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 81.3037	
Mean 80.0013	SD 0.0412274	Variance 0.0016997

Concentration at BH08/01 [mg/l] - 25 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 211.42	
Mean 80.304	SD 5.05827	Variance 25.586

Concentration at BH08/01 [mg/l] - 50 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 82.5983
Minimum 80₃s less than 90.9387	Maximum 337.01	
Mean 82.5603	SD 14.4342	Variance 208.346

Sulphate (as S042-)

Concentration at BH08/01 [mg/l] - 75 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80.016	75% of values less than 81.1782	90% of values less than 93.5145
Minimum 80₃s less than 111.488	Maximum 358.67	
Mean 86.2817	SD 22.5366	Variance 507.9

Concentration at BH08/01 [mg/l] - 100 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80.0696	75% of values less than 81.5898	90% of values less than 96.1162
Minimum 80₃s less than 118.167	Maximum 332.555	
Mean 86.9221	SD 23.1901	Variance 537.782

Concentration at BH08/01 [mg/l] - 300 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80.0019	90% of values less than 80.3906
Minimum 80₃s less than 86.9517	Maximum 354.187	
Mean 83.101	SD 19.704	Variance 388.249

Concentration at BH08/01 [mg/l] - 1000 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 217.457	
Mean 80.1745	SD 4.46843	Variance 19.9668

Concentration at BH08/01 [mg/l] - 7000 years

05% of values less than 80	10% of values less than 80	25% of values less than 80
50% of values less than 80	75% of values less than 80	90% of values less than 80
Minimum 80₃s less than 80	Maximum 80	
Mean 80	SD 0	Variance 0

Aquifer Flow [m³/yr]

Landfill

05% of values less than 2032.32	10% of values less than 3029.28	25% of values less than 12511.5
50% of values less than 155210	75% of values less than 2.64683E+006	90% of values less than 1.35334E+007
Minimum 679.549s than 2.25692E+007	Maximum 6.41131E+007	
Mean 3.86328E+006	SD 8.80327E+006	Variance 7.74975E+013

Appendix C –

Lydiate Lane Quarry – Indicative Sand and Gravel Reserves (March 2012), Stephenson Halliday

STEPHENSON
HALLIDAY

ENVIRONMENTAL PLANNING - LANDSCAPE ARCHITECTURE

LYDIATE LANE QUARRY

INDICATIVE SAND AND GRAVEL RESERVES

PREPARED ON BEHALF OF:

J.A JACKSON LTD

PREPARED BY:

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MARCH 2012

LYDIATE LANE INDICATIVE SAND AND GRAVEL RESERVES

The potential indicative reserves of sand have been estimated, based on the 1991 and 1998 borehole logs, both above and below the assumed (based on 1998 logs) water table level, with likely overburden quantities. The figures should be treated with caution and are provided as indicative only. Decisions of a commercial nature should not be taken without further more detailed assessment.

For the purposes of this reserve assessment the site has been divided into 5 areas. These areas denoted A to E are shown on Figure 3 – Geological Borehole Plan with Indicative Reserve Areas and referred to in the attached Indicative Reserve Calculations Table.

For each area the Indicative Reserve Calculations Table gives the assessed volumes of overburden, and sand reserves both above and below the water table level. The reserves of sand are provided in tonnes using a conversion factor of 1.6 tonnes per cubic metre. A reduction of 25% for wastage and working batters has been applied to get indicative available reserve figures

Area A is the area to the north of the existing quarry without planning permission which comprises 17.3 ha. From the borehole information the average overburden depth is estimated at 3.5m, the thickness of sand above water table level is 7.0m, and below the water table it is 12.0m. Indicative available sand reserve is **3,943,000** tonnes

Areas B and C are within the planning permission boundary. Area B covers 5.7ha. based on the existing borehole information, the overburden is estimated to be 2.0m and the workable depth of sand is 8.0m. Indicative available reserve is **410,000** tonnes. Area C comprises some 3.8 ha, based on very limited borehole information, the estimated overburden depth is 1.5m, the sand reserves have been estimated based on a 10m thickness above the water table with a possible 8m thickness below the water table. Indicative available reserve is **728,000** tonnes

Areas D and E are within the existing quarry area although Area D comprising an area of 2.3 ha. is unworked with an estimated depth of 3.0m of overburden and thickness of sand above the water table of 8m and a similar thickness below the water table. Indicative available reserve is **469,000** tonnes

Area E is the existing quarried area which comprises an area of 8.8ha. Difficult to assess but assuming some 5ha being available to work 8m below the water table the indicative reserve is **528,000** tonnes.

INDICATIVE RESERVE CALCULATIONS TABLE

Quarry extension area:

Area A - 17.3 ha	Depth (m)	Volume (m^3)	Tonnage
Overburden depth	3.5	605,000	
Sand above water table level	7.0	1,211,000	1,937,000
Sand below water table level	12.0	2,076,000	3,321,000
Total indicative reserve of sand			5,258,000
Indicative available reserve less 25% wastage etc.			3,943,000

Areas with planning permission unworked:

Area B - 5.7 ha (Unworked eastern area)	Depth (m)	Volume (m^3)	Tonnage
Assume no mineral reserve below 8m from surface level			
Overburden depth	2.0	114,000	
Sand	6.0	342,000	547,000
Total indicative reserve of sand			547,000
Indicative available reserve less 25% wastage etc.			410,000

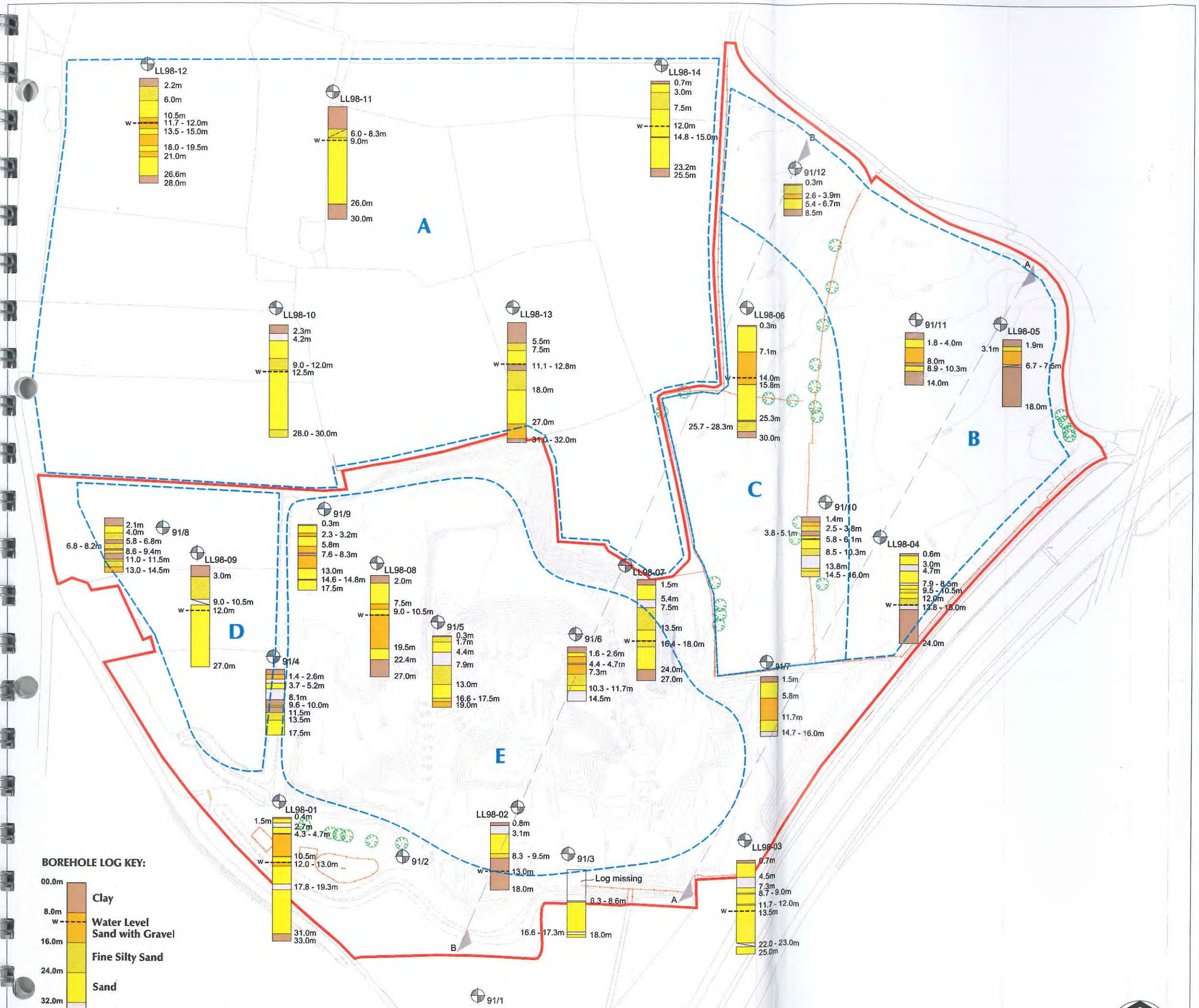
Area C - 3.8 ha (Central unworked area)	Depth (m)	Volume (m^3)	Tonnage
Overburden depth	1.5	57,000	
Sand above water table level	8.0	304,000	486,000
Sand below water table level	8.0	304,000	486,000
Total indicative reserve of sand			972,000
Indicative available reserve less 25% wastage etc.			728,000

Existing quarry area:

Area D - 2.3 ha (Unworked western area)	Depth (m)	Volume (m^3)	Tonnage
Overburden depth	3.0	69,000	
Sand above water table level	9.0	207,000	331,000
Sand below water table level	8.0	184,000	294,000
Total indicative reserve of sand			625,000
Indicative available reserve less 25% wastage etc.			469,000

Area E - 8.8 ha (Worked quarry area)	Depth (m)	Volume (m^3)	Tonnage
Assume 5.0 ha of sand available at 8m depth below water table level	8.0	440,000	704,000
Total indicative reserve of sand			704,000
Indicative available reserve less 25% wastage etc.			528,000

NB. The above reserve calculations are based on an assessment of the available 1991 and 1998 borehole logs, as is the estimated water table level. The conversion factor from cubic meters of sand to tonnes is taken as 1.6. A 25% reduction factor has been used to provide an indicative available reserve taking into account wastage and working buffers. Without further assessment the figures should be treated with caution and are indicative only.



KEY:

- Planning Consent Boundary Ref: 07/11/0739
- Ordnance Survey Mastermap data
- 2011 site survey undertaken by Edmonson's Surveys
- Existing hedgerows, fencelines & gates
- 91/1 — Boreholes - 1991 Geological Report
- LL98-01 — Boreholes - 1998 Geological Report
- A — Indicative Reserve Areas

0 25 50 100m

Scale 1:3000 @ A3

LYDIATE LANE, CUERDEN, NEAR PRESTON

GEOLOGICAL BOREHOLE PLAN WITH INDICATIVE RESERVE AREAS

STEPHENSON HALLIDAY

J.A JACKSON (LEYLAND) LTD

LYD / March 2012

FIGURE 03

Technology | Engineering | Consulting

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