

ENVIROSERV

**SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025**

Report No.: JW112/25/B196-25-Rev 0

January 2025



Jones & Wagener
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Leachate – Organic Water Quality Data

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Groundwater – Inorganic Water Quality Data

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Groundwater – Organic Water Quality Data

APPENDIX H

Surface Water – Inorganic Water Quality Data

APPENDIX I

Surface Water – Organic Water Quality Data

APPENDIX J

EnviroServ – Biomonitoring Report (December 2024)



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1. INTRODUCTION

1.1 Background

This report details the hydrogeological setting and the latest water quality results according to the monitoring protocol (JW270/19/B196), which stipulates the quarterly sampling of the groundwater, surface water, leachate, leachate detection pipes and sub-soil seepage at the site. Detailed analyses are undertaken in July each year, with indicator constituents analysed in January, April and October.

This report details the results up until and including the January 2025 sampling run.

2. SITE DESCRIPTION

2.1 Site Locality

The Shongweni Waste Management Facility (hereafter “Shongweni WMF”) is a hazardous waste landfill site located approximately 3.0 km south of the N3 Shongweni/Hillcrest offramp on portion Rem of Kirkfalls no 14227, Shongweni, as shown in **Figure 2.1.a**. The landscape is characterised by hilly terrain and a steeply dipping topography.

The site is accessed from the district road MR461, which bounds the western side of the site. The southern side is bounded by the main railway line to Gauteng and the eastern side is bounded by a natural watercourse.

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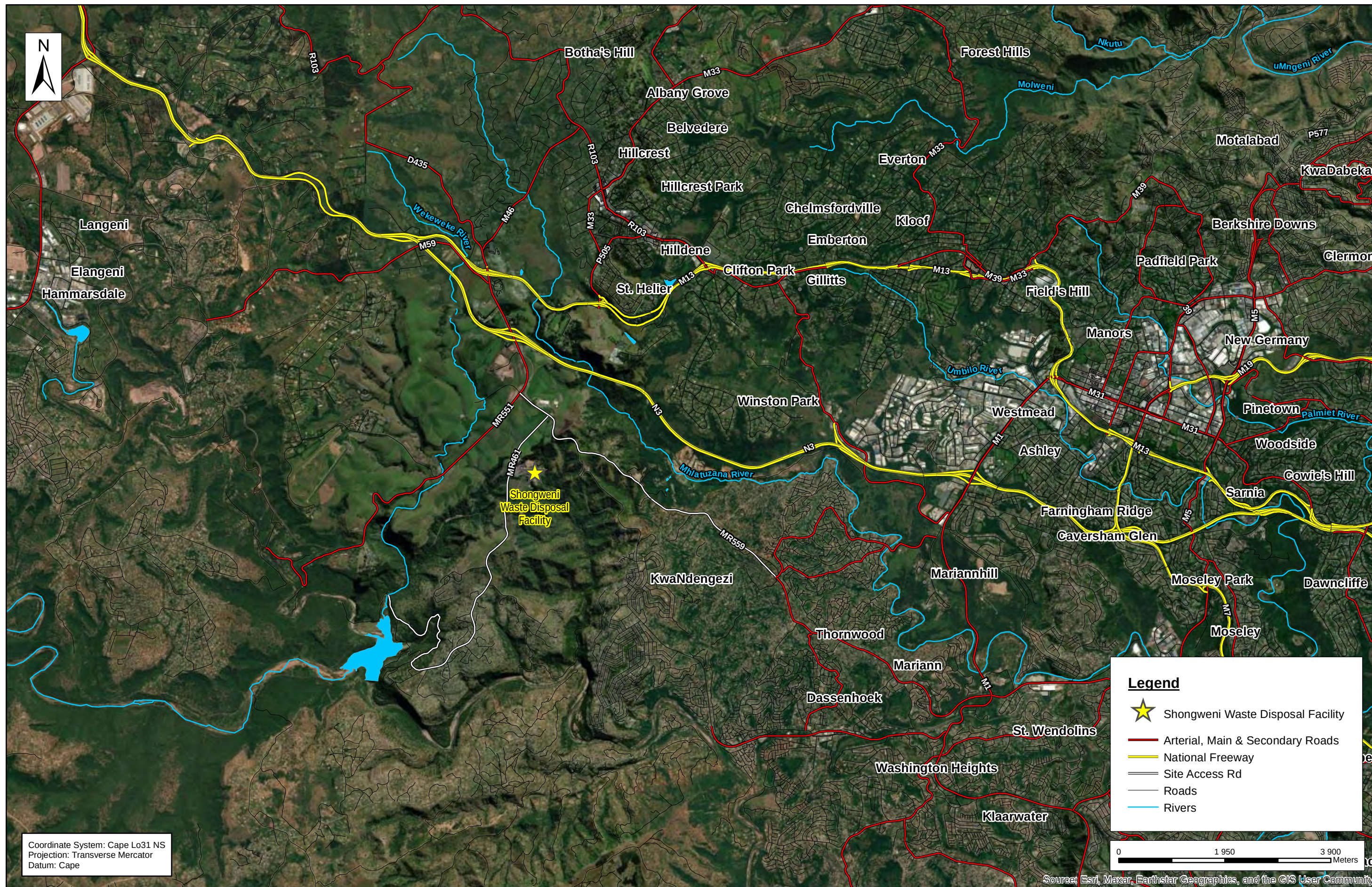
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2.2 Site Layout

The Shongweni WMF consists of two (2) valley fills, namely Valley 1 (closed and rehabilitated in 2015) and Valley 2 (current operational area) as indicated on **Figure 2.2.a**. The site is primarily used for the disposal of hazardous solid waste and liquid waste generated in the Durban/eThekweni Metropolitan area.

The Shongweni WMF (Cell 0) was commissioned in June 1993 for the disposal of general solid waste and low toxicity liquids. Cell 0 is located on a previously quarried weathered granite spur on the southern side of the site. The site was then permitted as a H:H (High Hazard) waste site in terms of the old Minimum Requirements for the disposal to Landfill and two (2) additional cells (1 and 2) were commissioned in May 1997. Cells 1 and 2 are situated in the adjacent valley to the north of Cell 0. Relatively large movements of the stability buttresses below cells 1 and 2 were identified during October 1997. As a result, the buttresses were raised and the allowable height of the cells was reduced. Consequently, the remaining life of the cells was reduced and a new cell, Cell 3, was constructed. Cell 3 is located immediately downstream of cells 1 and 2 and was commissioned in June 1999.

A contaminated stormwater dam, leachate transfer system, and another cell, Cell 4, were developed immediately downstream of Cell 3 to further stabilise the landfill and provide sufficient area for waste disposal, contain contaminated runoff and manage leachate generated in the cells. Cell 0 was also capped and rehabilitated in 1999.

The Valley 2 Cell 1 extension was commissioned in two (2) phases: Phase 1 in July 2010 and Phase 2 in August 2011. The Valley 2 Cell 2 extension was approved in August 2013 and was commissioned in August 2014. Due to complaints from the community in 2016, the Department of Forestry, Fisheries and the Environment (DFFE) conducted an investigation of the Shongweni WMF, which resulted in a suspension in waste disposal operations from April 2017 to October 2018. Operation of the site resumed in October 2018. Construction of Cell 3 Phase 1 was approved for commissioning by the DFFE on 5 August 2021 and Cell 3 Phase 2 was completed in December 2021.

The development of a new landfill site (Valley 3) commenced in 2023 due to the need for greater disposal storage capacity. Valley 3 will comprise three (3) cells, providing an additional airspace capacity of approximately 1 080 000 m³. This translates to an estimated four (4) years of additional operational time at the Shongweni WMF. The Valley 3 design was approved by the DFFE in July 2024 and is currently under construction (planned completion date – July 2025).

The site layout indicating the position of the cells and the contaminated stormwater dams is indicated in **Figure 2.2.a**.



Coordinate System: Cape Lo31 NS
 Projection: Transverse Mercator
 Datum: Cape
 November 2021 Lidar Image

3. CONCEPTUAL HYDROGEOLOGICAL MODEL

3.1 Geological Setting

The Shongweni WMF is situated on a faulted block of crystalline biotite granite that is surrounded by younger sandstones of the Natal Group (**Figure 3.1.a**).

A well-defined fault trending northeast–southwest defines the contact between the granites that characterise the geology in the Valley 1, Valley 2 and part of the new Valley 3 (under construction) waste disposal areas, and the sandstones that underlie the leachate tanks and office area in the north of the facility. To the west of the site, a north-south trending fault is present. Associated with this fault are biotite gneisses and subordinate pelitic schists of the Mapumulo Metamorphic Suite.

A brief description of the main geological formations and structures at the Shongweni site are described below.

Intrusive Rocks

The intrusive rocks at the Shongweni site comprise granites, granite gneisses and biotite-rich granites of the Mgeni Pluton¹ in the Natal-Namaqua Province. The granites in the Shongweni area are predominantly coarse-grained biotite granites containing megacrysts. These granitic rocks are characterised by strong foliation and have been intruded by aplite veins because of subsequent tectonic events. Megacrysts existed before metamorphism and tectonism and are thus primary structures of the granite.

The granitic rock has a light yellow to pink colour when fresh/unweathered. The megacrysts occur in a matrix of quartz, feldspar and biotite and consist mainly of alkali feldspar. On weathering, the material is a yellow-brown colour flecked with black. In addition, the weathered rock is highly friable due its coarse-grained nature.

Natal Group

The rocks surrounding the intrusive granites are sediments belonging to the Natal Group. These sedimentary rocks are described as red-brown coarse-grained arkosic to sub-arkosic sandstone, quartz arenite, micaceous sandstone, small pebble conglomerate and subordinate siltstone and mudstone

The Natal Group overlies the older granites and gneiss's with a sharp discordant contact. The basal part of the Natal Group consists of coarse-grained red-brown arkosic sandstone followed by reddish coarse-grained, cross-bedded sub-arkose. Thin layers of siltstone and mudstone are interlayered in these sandstones.

Lithologies of the Natal Group represent predominantly fluvial deposits by braided stream channels.

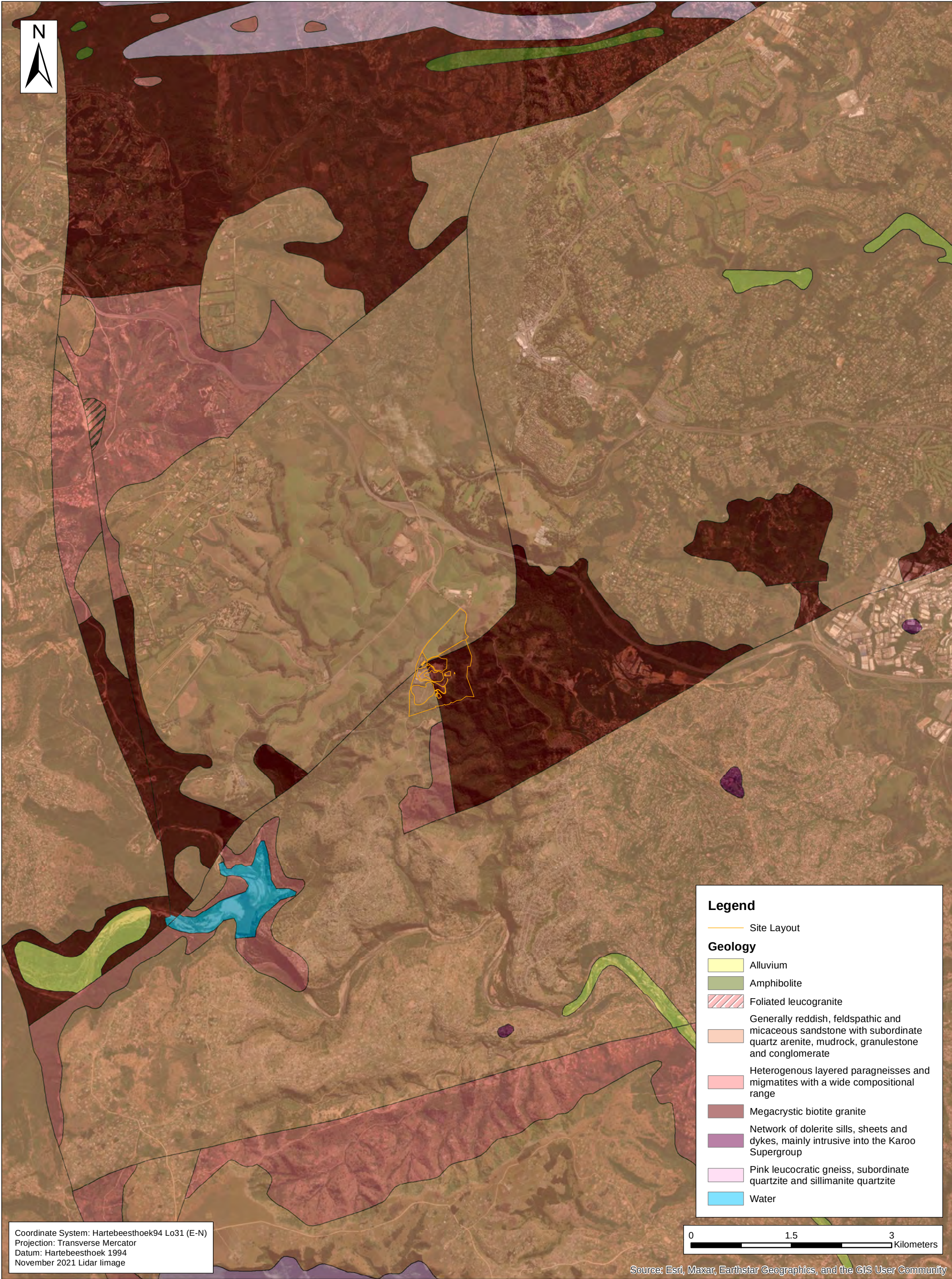
Structure

Faults are the most important structural element in the area. They are often identified by silicified breccia zones. Three (3) fault systems occur in the area, namely normal faults that strike north-south, northeast-southwest, and northwest-southeast. The fault-planes are virtually vertical and rearranged the Natal Group into a series of blocks.

¹ Cornell et al 2006 The Natal-Namaqua Province In Johnson,MR, Annhaeusser,CR, and Thomas RJ (eds)The Geology of South Africa. Geological Society of South Africa/Council of Geoscience Pretoria 325-379

The rocks were only slightly folded during tectonic events and have a dip of less than 5°. The most important fold structure in the area is undoubtedly the Natal Monocline. Sediments on the western side of the fold axis dip gently or lie horizontal while those on the eastern side of the fold axis dip between 10–14° east.

Dolerite intrusions occur in the form of dykes and sills. The rocks intruded by these dolerites appear to exhibit only slight contact metamorphism. Previous investigations have identified several faults/lineaments near the landfill.



3.2 Hydrogeological Setting

The Shongweni site is underlain by two (2) aquifers. The first being a shallow, unconfined weathered aquifer extending to approximately 5.0 mbgl. Within the weathered granite unit, a perched groundwater table exists at levels ranging between 3.0–5.0 mbgl. The hydraulic conductivity of the weathered aquifer is in the order of 0.050–0.10 m/day. Due to construction/excavation activities on site, large portions of the weathered material have been removed completely. The weathered aquifer is therefore not continuous across the site.

The second aquifer, considered to be the primary aquifer on site, comprises a deeper, fractured bedrock aquifer. Groundwater flow in the fractured aquifer occurs mainly through fractures. The groundwater levels in the fractured aquifer ranges between 7.0 mbgl in the granites to 26 mbgl in the sandstone formation. The hydraulic conductivity values of the fractured aquifer are significantly lower than that of the overlying weathered aquifer, with values in the order of 0.0010–0.0030 m/day.

The fault zone is characterised by hydraulic conductivity values ranging between 0.0020–0.0060 m/day, which is similar to that of the unweathered granite and sandstone formations. It is thus unlikely that the fault zone acts as a conduit for the preferential flow of groundwater.

4. GROUNDWATER, SURFACE WATER AND LEACHATE MONITORING

4.1 Location of the Groundwater, Surface Water and Leachate Sampling Positions

Numerous boreholes have been drilled at the site through the monitoring period; however, several of them have been damaged, destroyed or sealed and covered by the waste cells.

In September 2024, three (3) boreholes were drilled downstream (east) of the Valley 3 footprint to monitor any potential impacts from the Valley 3 cells on the groundwater once this landfill is operational.

There are 13 monitoring boreholes that make up the groundwater monitoring network at the site – five (5) upstream and eight (8) downstream of the site.

A summary of the groundwater, surface water and leachate sampling positions that comprise the monitoring network as well as the monitoring status of each sampling position is provided in **Table 4.1.a**. The locations of the boreholes, surface water and leachate sampling positions are indicated in **Figure 5.2.b**, **Figure 4.1.a**, **Figure 4.1.b** and **Figure 4.1.c**, respectively.

Table 4.1.a: Water Monitoring Positions and Monitoring Status

SAMPLE ID	SAMPLE DESCRIPTION	CURRENT MONITORING STATUS	
		INORGANIC CONSTITUENTS	ORGANIC CONSTITUENTS
Groundwater Sampling			
BH4C	Upstream Monitoring Borehole (mixed weathered and fractured Sandstone Aquifer)	Jan-25	Jul-24
BH6	Upstream Monitoring Borehole (mixed weathered and fractured Granite Aquifer))	Jan-25	Jul-24
BH09-07S	Upstream Monitoring Borehole (Weathered Granite Aquifer)	Jan-25	Jul-24
BH09-07D	Upstream Monitoring Borehole (Fractured Granite Aquifer)	Jan-25	Jul-24

SAMPLE ID	SAMPLE DESCRIPTION	CURRENT MONITORING STATUS	
		INORGANIC CONSTITUENTS	ORGANIC CONSTITUENTS
BH9	Upstream Monitoring Borehole (mixed weathered and fractured Sandstone Aquifer)	Jan-25	Jul-24
BH05-12S	Valley 1 Downstream Monitoring Borehole (Weathered Granite Aquifer)	Dry	
BH05-12D	Valley 1 Downstream Monitoring Borehole (Fractured Granite Aquifer)	Jan-25	Jul-24
BH09-13S	Valley 2 Downstream Monitoring Borehole (Weathered Granite Aquifer)	Jan-25	Jul-24
BH09-13M	Valley 2 Downstream Monitoring Borehole (Fractured Granite Aquifer)	Jan-25	Jul-24
BH09-13D	Valley 2 Downstream Monitoring Borehole (Fractured Granite Aquifer)	Jan-25	Jul-24
BH24-14S	Valley 3 Downstream Monitoring Borehole (Weathered Granite Aquifer)	Jan-25	Boreholes will be sampled in July 2025 (detailed analysis).
BH24-14M	Valley 3 Downstream Monitoring Borehole (Weathered Granite Aquifer)	Jan-25	
BH24-14D	Valley 3 Downstream Monitoring Borehole (Fractured Granite Aquifer)	Jan-25	
Surface Water Sampling			
13	Valley 1 Contaminated Stormwater Dam	Jan-25	Jul-24
11	Valley 2 Contaminated Stormwater Dam	Jan-25	Jul-24
29	Valley 2 Stormwater	Jan-25	Jul-24
27	Surface water coming out the base of the silt trap	Jan-25	Jul-24
SW2	At gabion baskets above railway line within Valley 1.	Jan-25	Jul-24
SW3	Downstream of Valley 2 (Upstream of Valley 1)	Jan-25	Jul-24
SW4	Downstream of the site above the confluence with the Mgoshongweni	Jan-25	Jul-24
SW5	Downstream of site above the confluence with the Mgoshongweni	Jan-25	Jul-24
SW6	Upstream of Valley 2	Jan-25	Jul-24
SW7	Upstream of Valley 3	Will be sampled going forward.	
Leachate Sampling			
Valley 1			
10	Leachate Tank	Jan-25	Jul-24
1	Leachate from Cell 0	Dry	
18	Leachate from site that has been diverted into the Leachate tank	Jan-25	Jul-24
30	Seepage Collector under capping Area South	Jan-25	Jul-24 (Dry)
Valley 2			
20	Leachate Collection 1	Jan-25	Jul-24
21	Leachate Collection 2	Jan-25	Jul-24
28	Leachate Tank	Jan-25	Jul-24
Leachate Detection Sampling			
Valley 1			
2	Leachate detection of Cell 4 south flank slopes, sampled at pipe number 2	Jan-25	Not Sampled

SAMPLE ID	SAMPLE DESCRIPTION	CURRENT MONITORING STATUS	
		INORGANIC CONSTITUENTS	ORGANIC CONSTITUENTS
3	Leachate detection Cell 1, 2 and 3, sampled at pipe number 3	Jan-25	Not Sampled
4	Leachate detection Cell 4 north flank slopes, sampled at pipe number 4	Jan-25	Not Sampled
5	Leachate detection extension to Cell 3 pipes, sampled at pipe number 5	Dry	
6	Sub-liner sand drain Cell 3, sampled at pipe number 6	Jan-25 (Dry)	Not Sampled
7	Sub-liner sand drain Cell 4, sampled at pipe number 7	Dry	
8	Leachate detection Cell 4 basin sampled at pipe number 8	Jan-25	Not Sampled
12	Drainage Blanket, sampled at pipe number 12.	Jan-25	Not Sampled
14	Leakage Detection Stormwater Dam	Jan-25	Not Sampled
15	Leakage Detection Stormwater Dam	Jan-25	Not Sampled
16	Leakage Detection Embankment Drainage from Stormwater Dam	Dry	
Valley 2			
19	Leachate Detection North Bench	Jan-25	Not Sampled
22	Leachate Detection Main Cell	Jan-25 (Dry)	Not Sampled
23	Leachate Detection South Bench	Jan-25	Not Sampled
26	Leakage Detection Stormwater Dam	Jan-25	Not Sampled
Subsoil Seepage Sampling			
Valley 1			
9	Drain on the downstream side of the Cell 1, 2 and 3 stability buttress, sampled at pipe number 9 or at culvert.	Jan-25	Jul-24
17	Downstream Sump	Jan-25	Jul-24
Valley 2			
24	Sub-soil seepage Main Cell	Jan-25	Jul-24
25	Sub-soil seepage Stormwater Dam	Jan-25	Jul-24

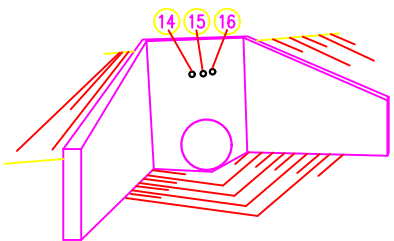
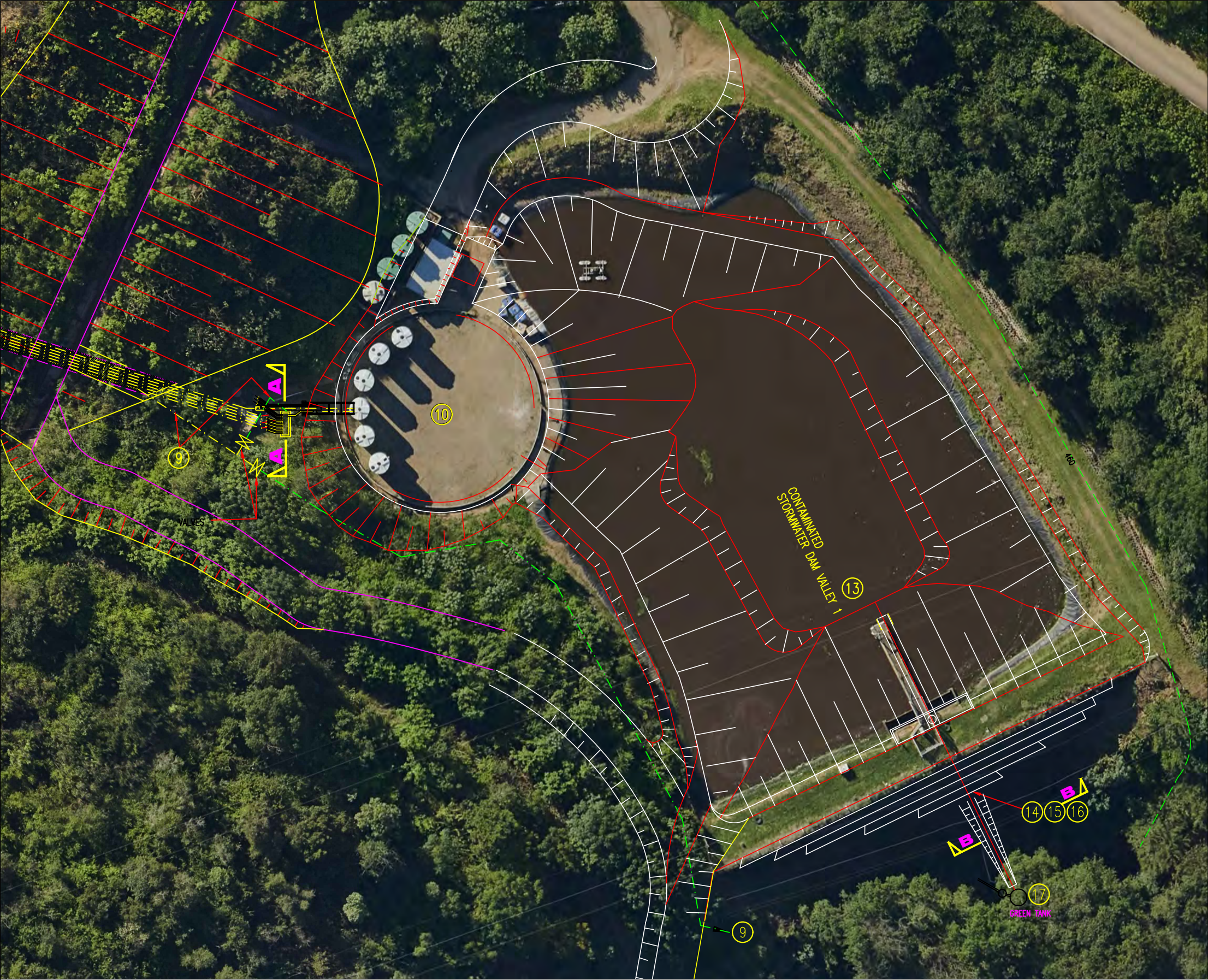
4.2 Monitoring Schedule

The groundwater, surface water, leachate, leachate detection and sub-soil seepage samples that comprise the monitoring network (**Table 4.1.a**) are collected and analysed on a quarterly basis for one (1) detailed analysis and three (3) indicator analyses. Detailed analyses are undertaken in July and the indicator constituents are analysed in January, April and October. Water levels, flow readings and in-field measurements of temperature, pH, electrical conductivity and total dissolved solids are obtained during each of the four (4) sampling events.

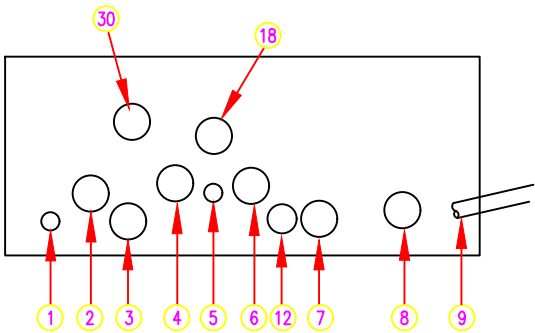
The detailed analysis includes inorganic, trace element and organic constituents of concern. Only selected inorganic constituents of concern related to the waste site are analysed during the indicator analysis. A tritium isotope analysis of selected samples is also undertaken during each sampling exercise to assist with the interpretation of the chemical results.

Once collected, the groundwater, surface water and leachate samples are submitted to various laboratories for analysis. EnviroServ Laboratory based in Johannesburg is used for the inorganic and trace element analysis and Element laboratory in the United Kingdom is used for the analysis of organic constituents. iThemba Laboratory in Johannesburg is used for tritium isotope analysis.





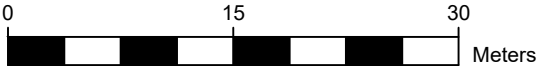
ELEVATION B-B (NTS)



ELEVATION A-A (NTS)

PIPE LABELING

PIPE No	TAG	SOURCE
1	CELL 0	VALLEY 1 LEACHATE FROM CELL 0
2	LD4 S	VALLEY 1 LEACHATE DETECTION CELL 4 (SOUTH FLANK)
3	LD3	VALLEY 1 LEACHATE DETECTION CELLS 1, 2 AND 3
4	LD4 N	VALLEY 1 LEACHATE DETECTION CELL 4 (NORTH FLANK)
5	LD3 P	VALLEY 1 LEAK DETECTION SYSTEM, EXTENSION TO CELL 3 PIPES
6	SLSD3	VALLEY 1 SUB LINER SAND DRAIN, CELL 3 BASIN
7	SLSD4	VALLEY 1 SUB LINER SAND DRAIN, CELL 4 BASIN
8	LD4 B	VALLEY 1 LEACHATE DETECTION CELL 4 BASIN
9	GW 123	VALLEY 1 GROUND WATER DIVERSION, CELL 1, 2 & 3
10	LT	VALLEY 1 LEACHATE TANK
12		VALLEY 1 DRAINAGE BLANKET PIPE Ø160
13		VALLEY 1 STORMWATER DAM
14		VALLEY 1 LEAKAGE DETECTION STORMWATER DAM
15		VALLEY 1 LEAKAGE DETECTION STORMWATER DAM
16		VALLEY 1 LEAKAGE DETECTION EMBANKMENT DRAINAGE FROM STORMWATER DAM
17		VALLEY 1 SUB SOIL SEEPAGE CELL 1, 2, 3 AND SUB SOIL SEEPAGE STORMWATER DAM
18	NL	VALLEY 1 LEACHATE DRAINING FROM SITE INTO LEACHATE TANK
30		VALLEY 1 LEACHATE DRAIN UNDER CAPPING FROM THE SOUTH



Lidar Image



PIPE LABELING	
PIPE No	SOURCE
11	VALLEY 2 CONTAMINATED STORMWATER DAM
19	VALLEY 2 LEACHATE DETECTION NORTH BENCH
20	VALLEY 2 LEACHATE COLLECTION 1
21	VALLEY 2 LEACHATE COLLECTION 2
22	VALLEY 2 LEACHATE DETECTION MAIN CELL
23	VALLEY 2 LEACHATE DETECTION SOUTH BENCH
24	VALLEY 2 SUB SOIL SEEPAGE
25	VALLEY 2 STORMWATER DAM SUB SOIL SEEPAGE
26	VALLEY 2 STORMWATER DAM LEAKAGE DETECTION
27	VALLEY 2 STORMWATER DAM WALL SUB SOIL SEEPAGE
28	VALLEY 2 LEACHATE TANK
29	VALLEY 2 STORMWATER IN SILT TRAP

Google Image

5. WATER LEVELS

5.1 Rainfall

The October to September cumulative rainfall from 2000–2024 is indicated in **Figure 5.1.a**. It is evident from this figure that higher-than-average rainfall occurred from 2021–2022, although the rainfall subsequently decreased in 2024.

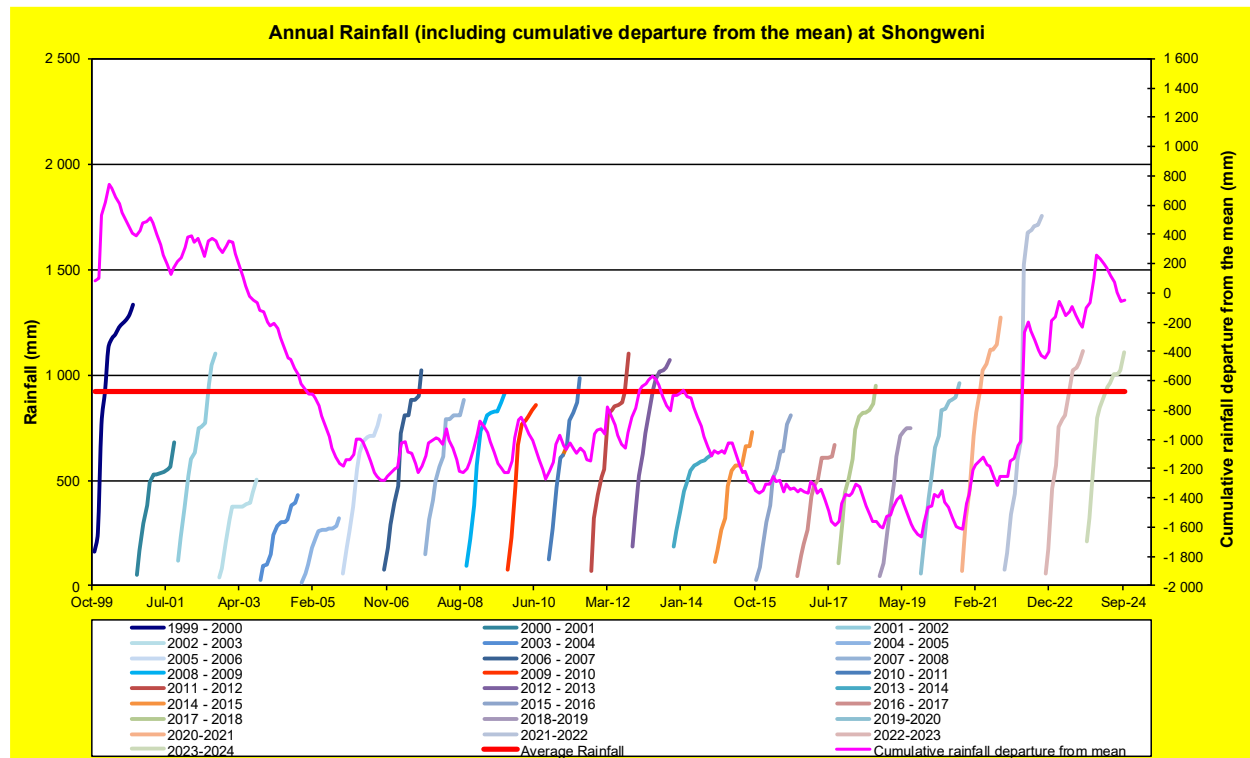


Figure 5.1.a: Annual rainfall (including cumulative departure from the mean) for the Shongweni WMF

5.2 Groundwater Levels and Flow Directions

The groundwater levels for the boreholes are shown in **Figure 5.2.a**. It is evident from this figure that, overall, the water levels in the boreholes have remained relatively consistent throughout the monitoring period.

The water levels in the Valley 1 downstream boreholes are approximately 10 m lower than those in Valley 2 (**Figure 5.2.a**), indicating separate groundwater flow systems between Valley 1 and Valley 2.

In Valley 1, the perched water level in the weathered aquifer borehole BH05-12S was approximately 12 m higher than that of the underlying fractured aquifer borehole BH05-12D when last sampled. This suggests limited hydraulic connectivity between the weathered and fractured aquifers. Borehole BH05-12S has remained predominantly dry since 2017, most likely due to a reduction in recharge following the capping of Valley 1.

For the Valley 2 downstream boreholes, the water levels in the weathered aquifer borehole BH09-13S are approximately 3.0 m higher than the fractured aquifer boreholes BH09-13M and BH09-13D, which exhibit similar water levels. This suggests a degree of hydraulic separation between the weathered and fractured aquifers in this area.

As expected, the highest water levels are recorded in the upstream boreholes BH4C and BH6, located on a topographic high.



As previously mentioned, three (3) boreholes were drilled downstream (east) of the Valley 3 footprint to monitor any potential impacts from the new cell on the groundwater once it is operational. As seen in **Figure 5.2.a**, the newly drilled boreholes (BH24-14D, BH24-14M and BH24-14S), have higher water levels similar to borehole BH6. The similarity in the water levels between the weathered and fractured aquifers suggests that these aquifers are also hydraulically connected (i.e., there is no confining layer separating the aquifers).

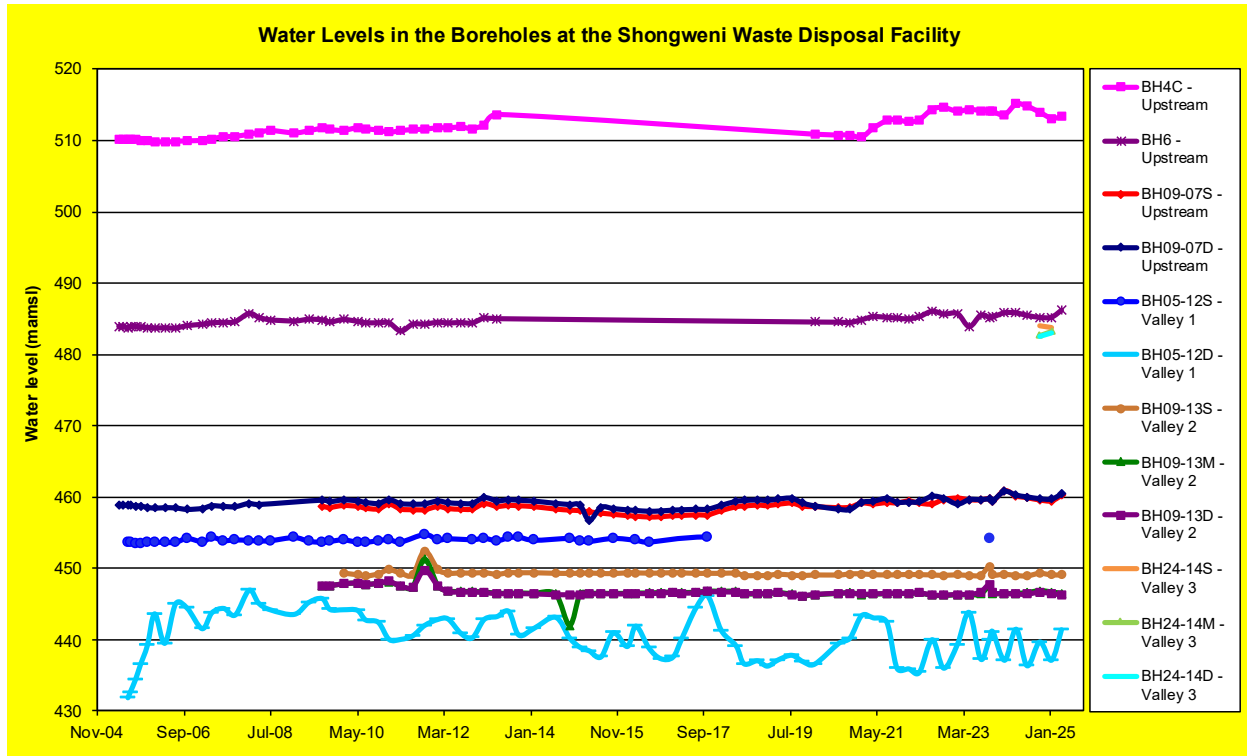


Figure 5.2.a: Water Levels in the Boreholes at the Shongweni WMF

A numerical groundwater flow model developed in 2023 indicated that the groundwater flow directions are generally in an easterly to south-easterly direction towards the valleys, dipping at a relatively steep gradient (**Figure 5.2.b**). The groundwater flow model also confirmed the existence of a divide (topographical high) separating groundwater flow between Valley 1 as well as Valleys 2 and 3.



Coordinate System: Hartebeesthoek94 Lo31 (E-N)
Projection: Transverse Mercator
Datum: Hartebeesthoek 1994
November 2021 Lidar Image

Legend

Borehole Locations

Groundwater Flow Direction

Site Layout

Rivers

6. WATER CHEMISTRY

6.1 Screening Guidelines

6.1.1 Inorganic and Trace Element Screening Guidelines

The guidelines indicated in the SANS 241 (2015) Drinking Water Specification are used to screen the inorganic and trace element chemistry results of the groundwater and surface water at Shongweni. These screening guidelines are provided in **Table 6.1.1.a**.

The SANS 241 Drinking Water Specification is the definitive reference on acceptable limits for drinking water quality parameters in South Africa and provides guideline values for a range of water quality characteristics. The SANS 241 (2015) Drinking-Water Specification effectively summarises the suitability of water for drinking water purposes for lifetime consumption. The limit for the consumption of water is based on the consumption of two (2) litres of water per day by a person of mass 60 kg over a period of 70 years.

In addition, the presence of tritium, an isotope of hydrogen, in leachate at several waste sites worldwide has been well documented and is believed to be derived principally from gaseous tritium lighting devices used in several emergency exit signs, compasses, and watches. Tritium is present in the leachate at the Shongweni WMF and has proven to be a useful indicator for establishing groundwater and surface water impacts at the site.

It is important to note that a tritium unit (TU) is defined as the ratio of ^3H to ^1H , which is $1 : 1 \times 10^{18}$. Therefore, although the leachate at the site can comprise several thousands of TU, the actual concentration of tritium is very low.

In addition, there is a natural background concentration of tritium at the Shongweni WMF, and therefore tritium units ≤ 4.0 are considered to represent the background tritium concentration. Selected samples are submitted for tritium analysis bi-annually.

6.1.2 Organic Screening Guidelines

Currently, no screening guidelines for organic chemical constituents exist in South Africa. Therefore, organic screening guidelines used for this site have been derived using a combination of the Dutch Intervention Values and, if not available, the USEPA and World Health Organisation guidelines. A summary of the international screening guidelines used in this assessment is provided in **Table 6.1.2.a**.

Table 6.1.1.a: SANS 241 (2015) screening guidelines for inorganic and trace element constituents

SANS 241 (2015)		
CONSTITUENT	UNIT	SCREENING GUIDELINE VALUE
INORGANIC CONSTITUENTS		
pH	N/A	> 5.0 to < 9.7
Electrical Conductivity (mS/m)	mS/m	170
Total dissolved solids at 180°C	mg/l	1 200
Ammonia as N	mg/l	1.5
Nitrate as N	mg/l	11
Chloride as Cl	mg/l	300
Sulfate as SO ₄	mg/l	500
Fluoride as F	mg/l	1.5
Sodium as Na	mg/l	200
Potassium as K	mg/l	NG
Calcium as Ca	mg/l	NG
Magnesium as Mg	mg/l	NG
Iron	mg/l	2.0
Manganese	mg/l	0.40
Aluminium	mg/l	0.30
TRACE ELEMENTS		
Arsenic	µg/l	10
Antimony	µg/l	20
Barium	µg/l	700
Beryllium	µg/l	NG
Cadmium	µg/l	3.0
Chromium	µg/l	50
Cobalt	µg/l	500
Copper	µg/l	2 000
Lead	µg/l	10
Mercury	µg/l	6.0
Molybdenum	µg/l	NG
Nickel	µg/l	70
Selenium	µg/l	10
Vanadium	µg/l	200
Zinc	µg/l	5 000
NG – No Guideline		

Table 6.1.2.a: Organic Constituent Guidelines

ORGANIC CONSTITUENT	UNIT	SCREENING GUIDELINE VALUE
<u>VOLATILE HALOGENATED HYDROCARBONS</u>		
Dichlorodifluoromethane	µg/l	200 ^
Vinyl chloride	µg/l	5.0 \$
Trichlorofluoromethane	µg/l	NG
1,1-Dichloroethene	µg/l	10 \$
Dichloromethane	µg/l	1 000 \$
trans-1,2-Dichloroethene	µg/l	20 \$
1,1-Dichloroethane	µg/l	900 \$
cis-1,2-Dichloroethene	µg/l	20 \$
2,2-Dichloropropane	µg/l	NG
Bromochloromethane	µg/l	83 ^
Chloroform	µg/l	400 \$
Carbon tetrachloride	µg/l	10 \$
1,1,1-Trichloroethane	µg/l	300 \$
1,1-Dichloropropene	µg/l	NG
1,2-Dichloroethane	µg/l	400 \$
Trichloroethene	µg/l	500 \$
Dibromomethane	µg/l	8.0 ^
1,2-Dichloropropane	µg/l	0.44 ^
Bromodichloromethane	µg/l	83 ^
cis-1,3-Dichloropropene	µg/l	0.47 ^
Tetrachloroethene	µg/l	40 \$
trans-1,3-Dichloropropene	µg/l	0.47 ^
1,1,2-Trichloroethane	µg/l	130 \$
Dibromochloromethane	µg/l	0.17 ^
1,3-Dichloropropane	µg/l	370 ^
1,2-Dibromoethane (EDB)	µg/l	0.0075 ^
1,1,1,2-Tetrachloroethane	µg/l	0.57 ^
Bromoform	µg/l	100!
Bromobenzene	µg/l	62 ^
1,1,2,2-Tetrachloroethane	µg/l	0.076 ^
1,2,3-Trichloropropane	µg/l	88 ^
1,2-Dibromo-3-chloropropane	µg/l	0.00033 ^
<u>MONO AROMATIC HYDROCARBONS</u>		
Benzene	µg/l	30 \$
Toluene	µg/l	1 000 \$
Ethylbenzene	µg/l	150 \$
m,p-Xylene	µg/l	70 \$

ORGANIC CONSTITUENT	UNIT	SCREENING GUIDELINE VALUE
o-Xylene	µg/l	70 \$
Styrene	µg/l	300 \$
Isopropylbenzene	µg/l	660 ^
n-Propylbenzene	µg/l	660 ^
1,3,5-Trimethylbenzene	µg/l	120 ^
tert-Butylbenzene	µg/l	690 ^
1,2,4-Trimethylbenzene	µg/l	15 ^
sec-Butylbenzene	µg/l	2 000 ^
4-Isopropyltoluene	µg/l	NG
n-Butylbenzene	µg/l	1 000 ^
CHLORINATED BENZENES		
Chlorobenzene	µg/l	180 \$
1,2-Dichlorobenzene	µg/l	50 \$
1,3-Dichlorobenzene	µg/l	NG
1,4-Dichlorobenzene	µg/l	50 \$
1,2,3-Trichlorobenzene	µg/l	NG
1,2,4-Trichlorobenzene	µg/l	10 \$
MISCELLANEOUS CHLORINATED HYDROCARBONS		
2-Chlorotoluene	µg/l	240 ^
4-Chlorotoluene	µg/l	250 ^
CHLORINE PESTICIDES		
Hexachlorobutadiene	µg/l	0.30 ^
POLYAROMATIC HYDROCARBONS		
Naphthalene	µg/l	70 \$
NG – No Guideline		

\$ Dutch Intervention Value, ^ USEPA (2014), ! SANS 241 (2015)

6.2 Leachate Quality

The list of leachate sampling positions that form part of the monitoring network at the Shongweni WMF are listed in **Table 6.2.a** and their localities are shown in **Figure 4.1.b** and **Figure 4.1.c**.

The inorganic and organic chemistry results are attached in **APPENDIX A** and **APPENDIX B**, respectively.

Table 6.2.a: Leachate Monitoring Positions at the Shongweni WMF

LEACHATE MONITORING POSITION	COMMENT
Valley 1	
10 LT	Valley 1: Leachate Tank
1 Cell 0	Valley 1: Leachate from Cell 0, sampled at pipe number 1
18 NL	Valley 1: Leachate from site that has been diverted into the Leachate tank
30	Valley 1: Seepage Collector under capping Area South
Valley 2	
20	Valley 2: Leachate Collection 1
21	Valley 2: Leachate Collection 2
28	Valley 2: Leachate Tank

6.2.1 Leachate Inorganic Chemistry

The electrical conductivity (EC) values in the leachate from Valley 1 (the Valley 1 Leachate Tank and the leachate draining out of Valley 1) and Valley 2 (the Valley 2 Leachate Tank and the leachate draining out of Valley 2) throughout the monitoring period are shown in **Figure 6.2.1.a** and **Figure 6.2.1.b**, respectively.

As a result of the capping and regeneration of Cell 0, there has been a reduction in the volume of leachate that is generated and, consequently, the Valley 1 Cell 0 sampling position has remained dry since 2014.

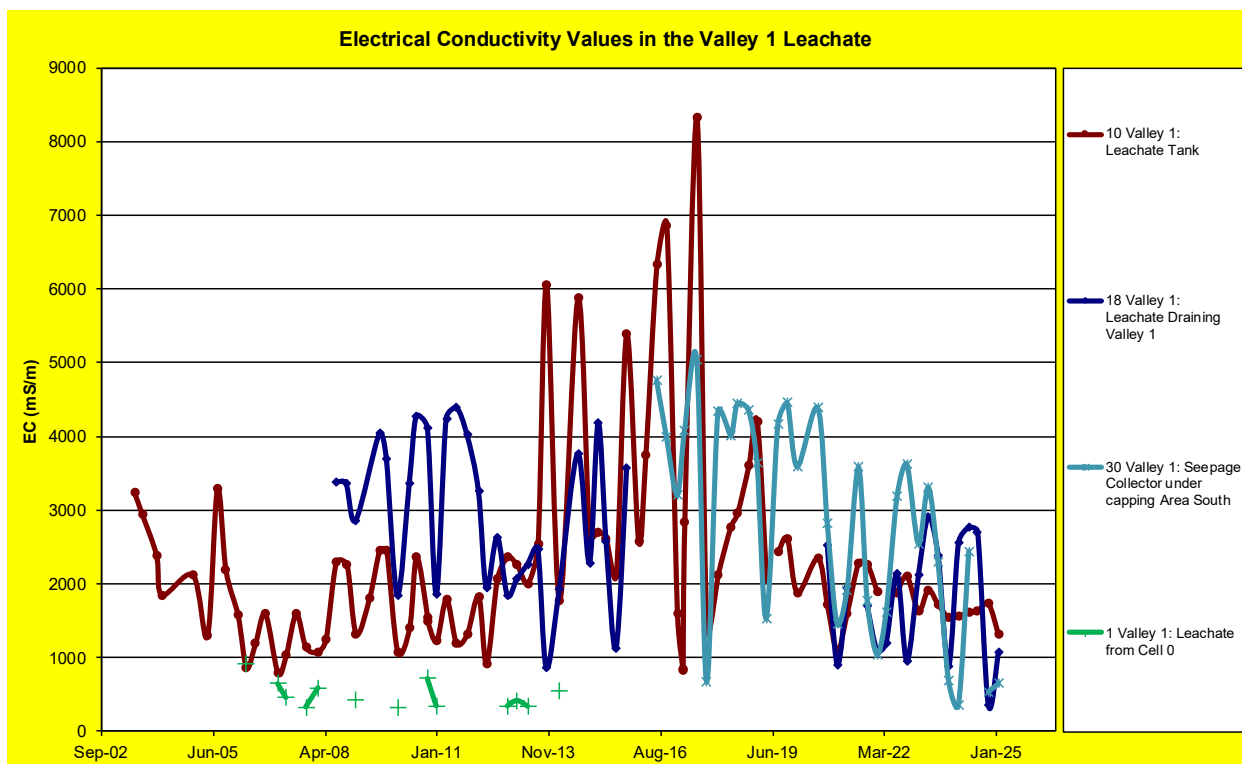


Figure 6.2.1.a: Electrical Conductivity Values in the Valley 1 Leachate

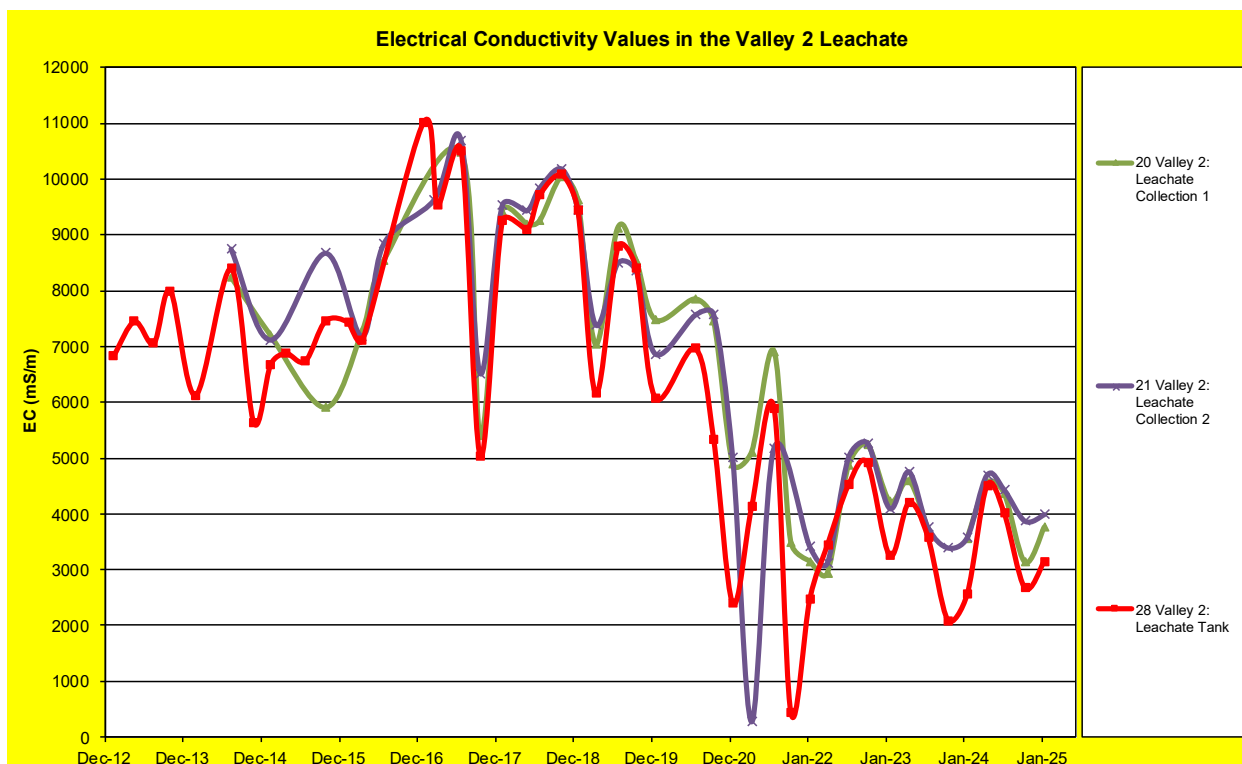


Figure 6.2.1.b: Electrical Conductivity Values in the Valley 2 Leachate

It is evident from **Figure 6.2.1.a** and **Figure 6.2.1.b** that the Valley 1 and Valley 2 leachate is characterised by fluctuating EC values that are generally showing a decreasing trend. This decreasing trend is likely due a change in the waste types disposed of at the WMF.

The inorganic chemistry results for the Valley 1 and Valley 2 leachate are discussed below:

Valley 1

In January 2025, the EC of leachate in the Valley 1 Leachate Tank (Position 10; **Figure 6.2.1.a**) was 1 318 mS/m, attributed to elevated ammonia, chloride, and sodium levels. This reflects a substantial decrease from 8 336 mS/m recorded in July 2017.

Leachate Position 18 (draining Valley 1) was dry between 2016–2020 and in July 2021, due to reduced leachate generation following Valley 1 capping. Sampling resumed in October 2021, with an EC of 1 072 mS/m measured in January 2025.

Sampling Position 1 (Cell 0) has remained dry since February 2014, also due to capping and rehabilitation.

Position 30, located in a seepage collector beneath the capped southern area of Valley 1 (**Figure 4.1.b**), has shown fluctuating but generally declining EC values since 2016. An EC of 643 mS/m was recorded in January 2025.

Valley 2

Leachate from Valley 2 Collection Systems 1 and 2 showed fluctuating but similar EC values of 3 761 mS/m and 3 988 mS/m, respectively, in January 2025 (**Figure 6.2.1.b**). The Valley 2 Leachate Tank recorded an EC of 3 152 mS/m. These values are significantly higher than those in Valley 1, likely reflecting differences in the chemical composition of the waste deposited in the two areas.

6.2.2 Leachate Organic Chemistry

Several organic compounds were detected in Valley 1 and Valley 2 leachate samples during the most recent detailed analysis (July 2024), including p/m-xylene and 1,2,4-trimethylbenzene in the Valley 1 Leachate Tank. Concentrations of these compounds have declined significantly since July 2022.

6.3 Leachate/Leakage Detection Quality

The leachate/leakage detection monitoring positions at the Shongweni WMF are indicated in **Table 6.3.a** and their localities are shown in **Figure 4.1.b** and **Figure 4.1.c**.

The inorganic chemistry results for the leachate/leakage detection sampling positions are attached in **APPENDIX C** (organic constituents are not analysed).

Table 6.3.a: Leachate Detection Monitoring Positions at the Shongweni WMF

LEACHATE DETECTION POSITION	COMMENT
Valley 1	
2 LD4S	Valley 1: Leachate detection of Cell 4 south flank slopes, sampled at pipe number 2
3 LD3	Valley 1: Leachate detection Cell 1, 2 and 3, sampled at pipe number 3
4 LD4N	Valley 1: Leachate detection Cell 4 north flank slopes, sampled at pipe number 4
5 LD3P	Valley 1: Leachate detection extension to Cell 3 pipes, sampled at pipe number 5
6 SLSD3	Valley 1: Sub-liner sand drain Cell 3, sampled at pipe number 6
7 SLSD4	Valley 1: Sub-liner sand drain Cell 4, sampled at pipe number 7
8 LD4B	Valley 1: Leachate detection Cell 4 basin sampled at pipe number 8
12 Drainage blanket	Valley 1: Sampled at pipe number 12
14	Valley 1: Leakage Detection Stormwater Dam
15	Valley 1: Leakage Detection Stormwater Dam
16	Valley 1: Leakage Detection Embankment Drainage from Stormwater Dam
Valley 2	
19	Valley 2: Leachate Detection North Bench
22	Valley 2: Leachate Detection Main Cell
23	Valley 2: Leachate Detection South Bench
26	Valley 2: Leakage Detection Stormwater Dam

6.3.1 Leachate/Leakage Detection Inorganic Chemistry

The EC values of the samples collected from the Valley 1 and Valley 2 leachate detection systems are shown in **Figure 6.3.1.a** and **Figure 6.3.1.b**, respectively. In addition, the flow rates in the Valley 1 leachate detection system are indicated in **Figure 6.3.1.c**.

A summary of the most recent Valley 1 and Valley 2 leachate/leakage detection chemistry results is provided below:

Valley 1

- As with the leachate, the EC values of the leachate collection sampling positions have decreased notably since 2016.
- The EC values of sampling positions 2 LD4S (Cell 4 leachate detection on the south flank slopes), 3 LD3 (Cells 1, 2 and 3 leachate detection), 4 LD4N (Cell 4 leachate detection on the north flank slopes) and 8 LD4B (Cell 4 leachate detection: basin) were 1 014 mS/m, 1 162 mS/m, 449 mS/m and 590 mS/m, respectively, in January 2025.

- Sampling position 6 SLSD3 (sub-liner sand drain for Cell 3) was dry in January 2025 and could therefore not be sampled. The EC value has, however, steadily decreased since January 2018 (2 061 mS/m) and recorded a value of 1 490 mS/m when it was last sampled in October 2024.
- Sampling positions 5 LD3P (extension to Cell 3), 7 SLSD4 (sub-liner sand drain for Cell 4) and 16 (Leakage Detection from the Embankment Drainage of the Stormwater Dam) have remained predominately dry throughout the monitoring period.
- The leachate and sub-soil drains from Cells 1, 2 and 3 as well as selected drains from Cell 4 were laid on a bench on the southern side of the stability buttress of Cell 4 (Drainage Blanket 12). The pipes were placed on a plastic lined surface with the pipes surrounded by sand and the plastic liner wrapped around the sand. A perforated drainage pipe was laid in this sandwich to drain any leakage that could occur. These sampling positions are referred to as the Drainage Blanket (sampling position 12). In January 2025, the EC value of this sampling position was 1 813 mS/m.

In addition to the above, there are three (3) leakage detection points in the vicinity of the Valley 1 Stormwater Dam. Liquids in these systems are pumped back into the stormwater dam:

- Sampling positions 14 and 15 (Leakage Detection from the Stormwater Dam) recorded EC values of 242 mS/m and 219 mS/m, respectively, in January 2025.
- Sampling position 16 (Leakage Detection Embankment Drainage from the Stormwater Dam) has remained predominantly dry throughout the monitoring period.
- The flow volumes in the Leachate Detection Stormwater Dams (refer to **Figure 6.3.1.c**) have decreased since January 2024. Long-term decreases in the flow volumes are expected as Valley 1 has been capped. However, it is possible that there is a leak in the Stormwater Dam lining system due to the higher volumes stored in the dam during the rainy season.

Valley 2

- Sampling position 19 (Valley 2 Leachate Detection North Bench) is located in the leachate tank. The electrical conductivity value of this sampling position was 1 753 mS/m in January 2025.
- Sampling position 22 (Valley 2 Leachate Detection Main Cell) is located in the leachate tank and has been periodically dry throughout the monitoring period (including January 2025). From July 2023 to October 2023, the EC value increased from 188 mS/m to 3 353 mS/m. Elevated EC values are periodically detected at this sampling position. However, when sampled in July 2024, the EC decreased to 155 mS/m. It is therefore likely that the October 2023 result is erroneous.
- Sampling position 23 (Valley 2 Leachate Detection South Bench) is located in the leachate tank. The EC value of this position was 2 098 mS/m in January 2025.
- The EC of sampling position 26 (Valley 2 Leakage Detection Stormwater Dam) was found to be low at 130 mS/m in January 2025. Water from this position is pumped back into the Valley 2 Stormwater Dam.

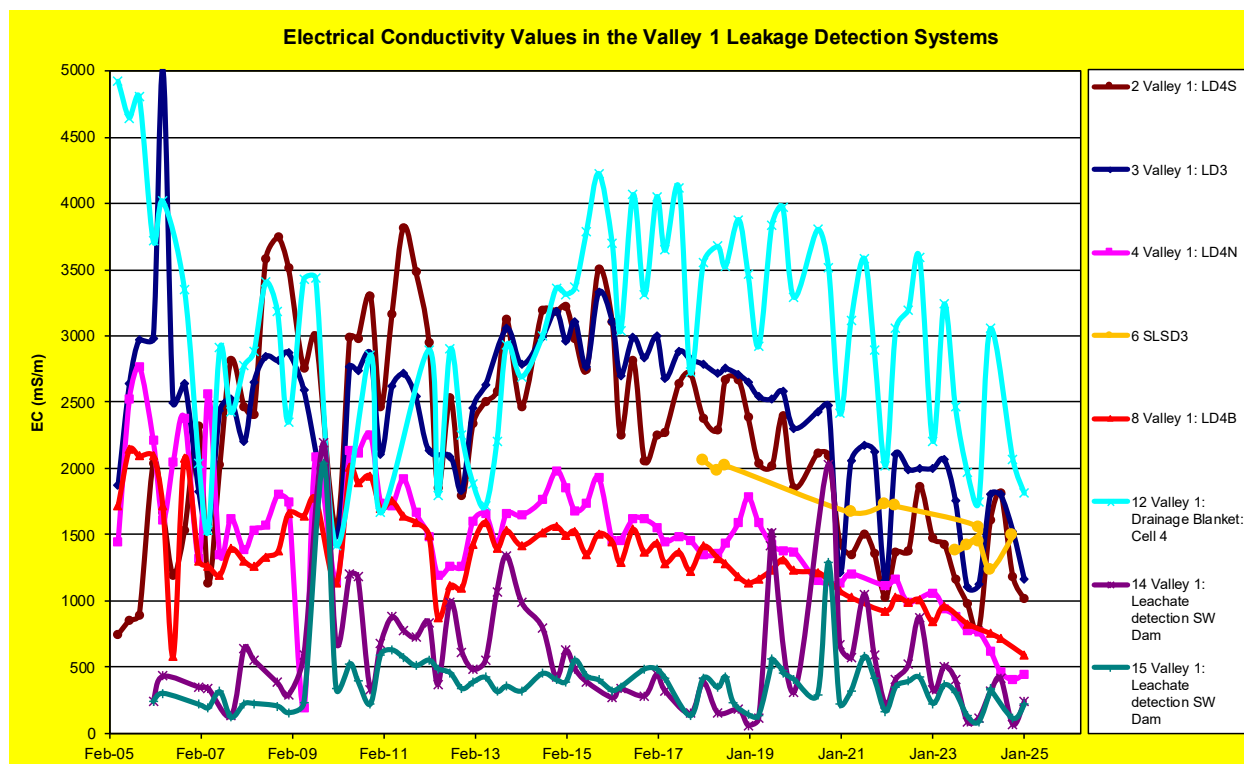


Figure 6.3.1.a: Electrical Conductivity Values in the Valley 1 Leakage Detection Systems

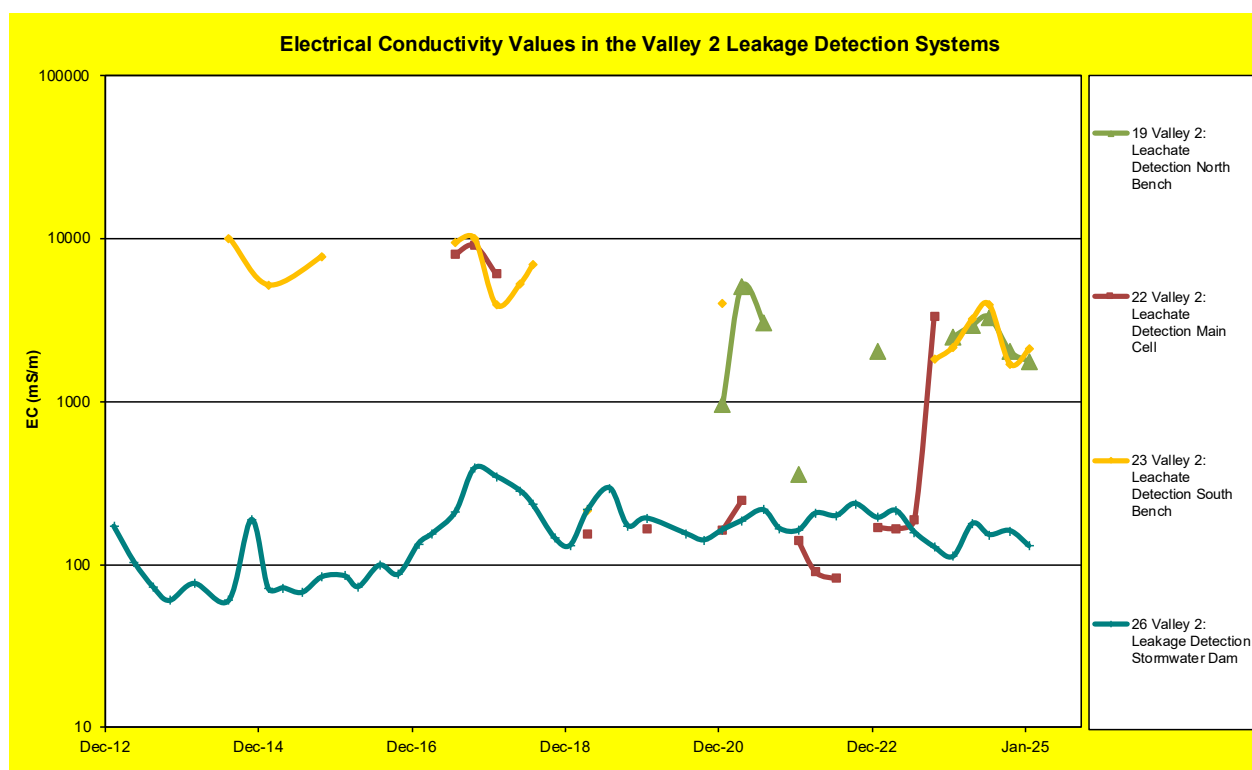


Figure 6.3.1.b: Electrical conductivity values in the Valley 2 Leakage Detection sampling points



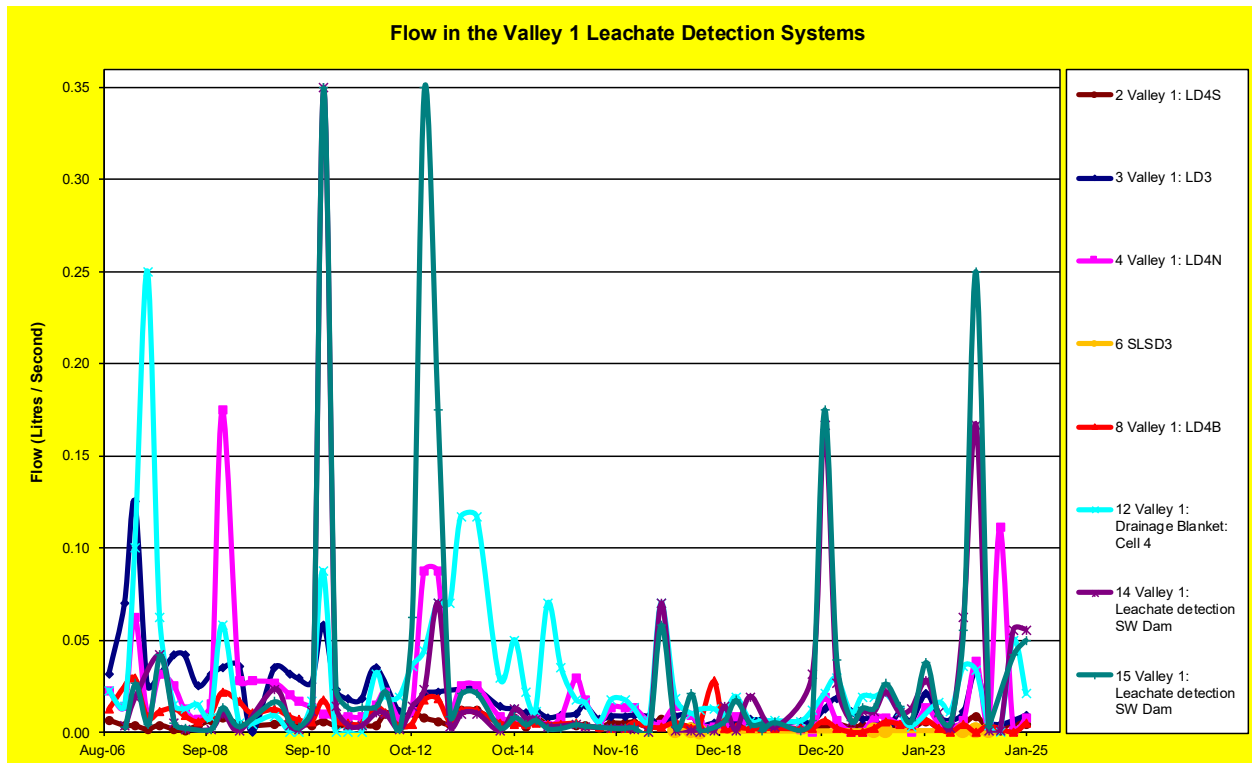


Figure 6.3.1.c: Leakage Decetion Flow (Valley 1)



6.3.2 Sub-soil Seepage Quality

The sub-soil seepage samples that form part of the monitoring network at the Shongweni WMF are listed in **Table 6.3.b** and their localities are shown in **Figure 4.1.b** and **Figure 4.1.c**.

The sub-soil seepage water chemistry results throughout the monitoring period are attached in **APPENDIX D** (inorganic) and **APPENDIX E** (organic).

Table 6.3.b: Sub-soil Seepage Sampling Positions at the Shongweni WMF

SUB-SOIL SEEPAGE SAMPLING POSITION	COMMENT
Valley 1	
9 GW123	Valley 1: Drain on the downstream side of the Cell 1, 2 and 3 stability buttress, sampled at pipe number 9 or at the culvert
17	Valley 1: Downstream Sump
Valley 2	
24	Valley 2: Sub-soil seepage Main Cell
25	Valley 2: Sub-soil seepage Stormwater Dam

6.3.3 Sub-soil Seepage Inorganic Chemistry

The EC values in the Valley 1 and Valley 2 Sub-Soil Seepage throughout the monitoring period are shown in **Figure 6.3.3.a** and **Figure 6.3.3.b**, respectively.

The inorganic chemistry results for the Valley 1 and Valley 2 sub-soil seepage sampling positions are summarised below.

Valley 1

- Sampling point 9 GW123 samples water in the toe drain on the downstream side of the Valley 1 cells 1, 2 and 3 stability buttress. The EC value of the liquids in 9 GW123 increased notably from 216 mS/m in January 2024 to 1 133 mS/m in January 2025, indicative of a larger leachate component (**Figure 6.3.3.a**).
- Sampling point 17 samples sub-soil seepage from cells 1, 2 and 3 in Valley 1 as well as sub-soil seepage from the Valley 1 Stormwater Dam. The water is captured in a sump on the downstream side of the Valley 1 Stormwater Dam. The EC values of these liquids decreased from 2024 (average value of 471 mS/m) to January 2025 (408 mS/m) (**Figure 6.3.3.a**).

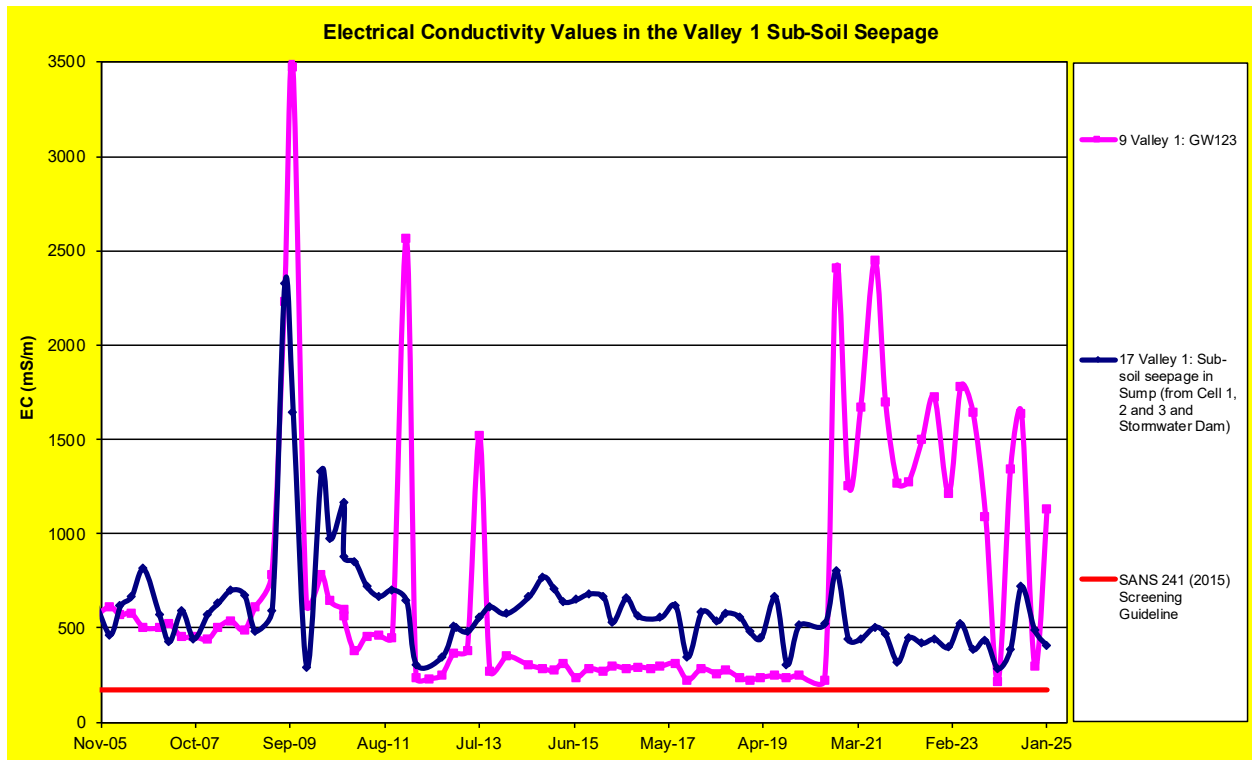


Figure 6.3.3.a: Electrical Conductivity Values in the Valley 1 Sub-Soil Seepage

Valley 2

Sub-soil seepage in Valley 2 is sampled from positions 24 (beneath the Main Cell) and 25 (beneath the Stormwater Dam). The locations of these sampling positions are indicated in **Figure 4.1.c** and the EC values are shown in **Figure 6.3.3.b**.

- Sampling position 24 contains two (2) valves that enable it to be diverted under gravity either into the Stormwater Dam or to the Stormwater Canal that connects to the spillway of the dam and flows into the environment. Currently, this water is captured in the Stormwater Dam. Sampling position 24 was characterised by a low EC value of 146 mS/m in January 2025.
- Sampling position 25 samples sub-soil seepage beneath the Stormwater Dam. The water drains into a sump and is gravitationally released into the environment through the silt trap. However, if that valve is closed, the water overflows into the detection part of the box and is pumped back into the dam. In January 2025, the EC value of the water at sampling position 25, which is currently pumped back into the Stormwater Dam, was also low (127 mS/m).



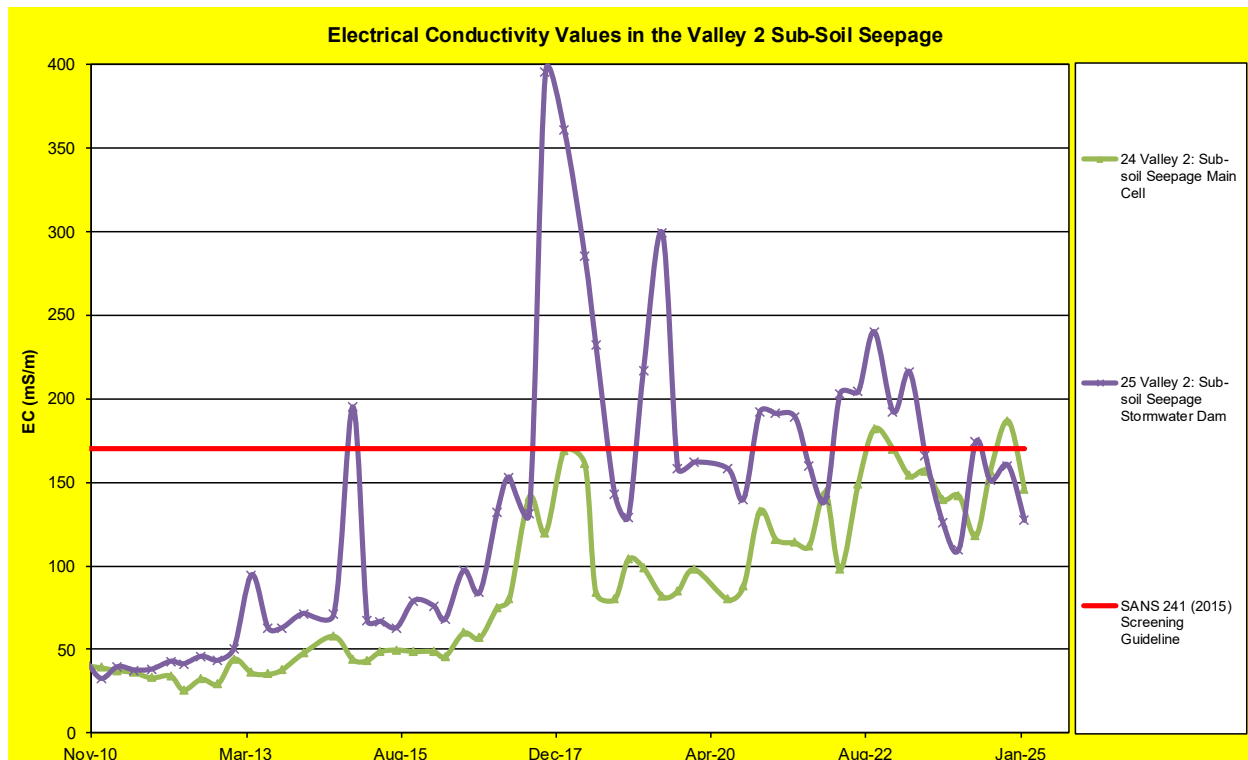


Figure 6.3.3.b: Electrical Conductivity Values in the Valley 2 Sub-Soil Seepage

6.3.4 Sub-soil Seepage Organic Chemistry

Several organic compounds were detected in the Valley 1 sub-soil samples in July 2024, notably vinyl chloride and p/m-xylene at sampling point 9 GW123 downstream of the Valley 1 Cells 1, 2 and 3 stability buttress. This indicates a more prominent leachate component. Continued monitoring will confirm if the increasing trend persists.

Conversely, the organic compounds remained below the laboratory detection limit in the Valley 2 sub-soil samples in July 2024. The sub-soil seepage organic chemistry results are attached in **APPENDIX E**.



6.4 Groundwater Quality

The boreholes that form part of the groundwater monitoring network at the Shongweni WMF are listed in **Table 6.4.a** and their localities are shown in **Figure 5.2.b**. Included in **Table 6.4.a** are the depths of each monitoring borehole.

The groundwater chemistry results obtained throughout the monitoring period are attached in **APPENDIX F** (inorganic) and **APPENDIX G** (organic).

Table 6.4.a: Groundwater Monitoring Boreholes at the Shongweni WMF

BOREHOLE ID	X-COORDINATE	Y-COORDINATE	GROUND ELEVATION	BOREHOLE DEPTH	AQUIFER MONITORED
	(CAPE LO31)		(MAMSL)	(MBGL)	
Upstream Monitoring Boreholes					
BH4C	24517.23	3300943.2	532.81	61	(Mixed weathered and fractured Sandstone Aquifer)
BH6	24225.98	3300729.84	510.96	75	(Mixed weathered and fractured Granite Aquifer)
BH9	24363.55	3300321.92	568.71	Unknown	(Assumed to be mixed weathered and fractured Sandstone Aquifer)
BH09-7D	24038.36	3300912.36	485.75	80	Fractured Granite Aquifer
BH09-7S	24036.07	3300912.99	485.77	36	Weathered Granite Aquifer
Valley 1 Downstream Monitoring Boreholes					
BH05-12D	24179.43	3300882.53	456.15	26	Fractured Granite Aquifer
BH05-12S	24180.37	3300883.49	455.92	3.5	Weathered Granite Aquifer
Valley 2 Downstream Monitoring Boreholes					
BH09-13S	23919.16	3300577.54	452.9	5.0	Weathered Granite Aquifer
BH09-13M	23919.18	3300578.72	452.89	16	Fractured Granite Aquifer
BH09-13D	23919.27	3300575.87	452.90	30	Fractured Granite Aquifer
Valley 3 Downstream Monitoring Boreholes					
BH24-14S	24000.41	3300477.30	486.07	4.0	Weathered Granite Aquifer
BH24-14M	23998.20	3300475.26	485.78	17	Weathered Granite Aquifer
BH24-14D	23998.90	3300479.08	485.99	30	Fractured Granite Aquifer

6.4.1 Groundwater Inorganic Chemistry

The EC values in the groundwater are indicated in **Figure 6.4.1.a** (upstream) as well as **Figure 6.4.1.b** and **Figure 6.4.1.c** (downstream). The most recent inorganic groundwater chemistry results for January 2025 are discussed below.

Upstream/Background Groundwater Quality

The predicted flow directions shown in **Figure 5.2.a** indicate that boreholes BH4C, BH6, BH9, BH09-07S and BH09-07D are not likely to be impacted by the waste from either Valley 1 or Valley 2 and are therefore upstream boreholes.

The upstream boreholes are generally characterised by low EC values (**Figure 6.3.3.a**), ranging between 18 mS/m and 99 mS/m in January 2025.

Borehole BH6 is characterised by an increasing EC trend. Since the borehole is located on a watershed, the reason for the increase is not known. However, BH6 is characterised by a higher chloride and lower sulfate component compared to the other upstream boreholes. This may indicate an impact from the waste body where low oxidation-redox potential (Eh) of the leachate has resulted in a reduction in the sulfate concentrations while the chloride remains unaffected and accumulates leading to the increased EC. Future trends within this borehole should be reviewed.

Elevated fluoride concentrations were detected in boreholes BH6 and BH9. Fluoride likely originates from the granitic geology of the area.

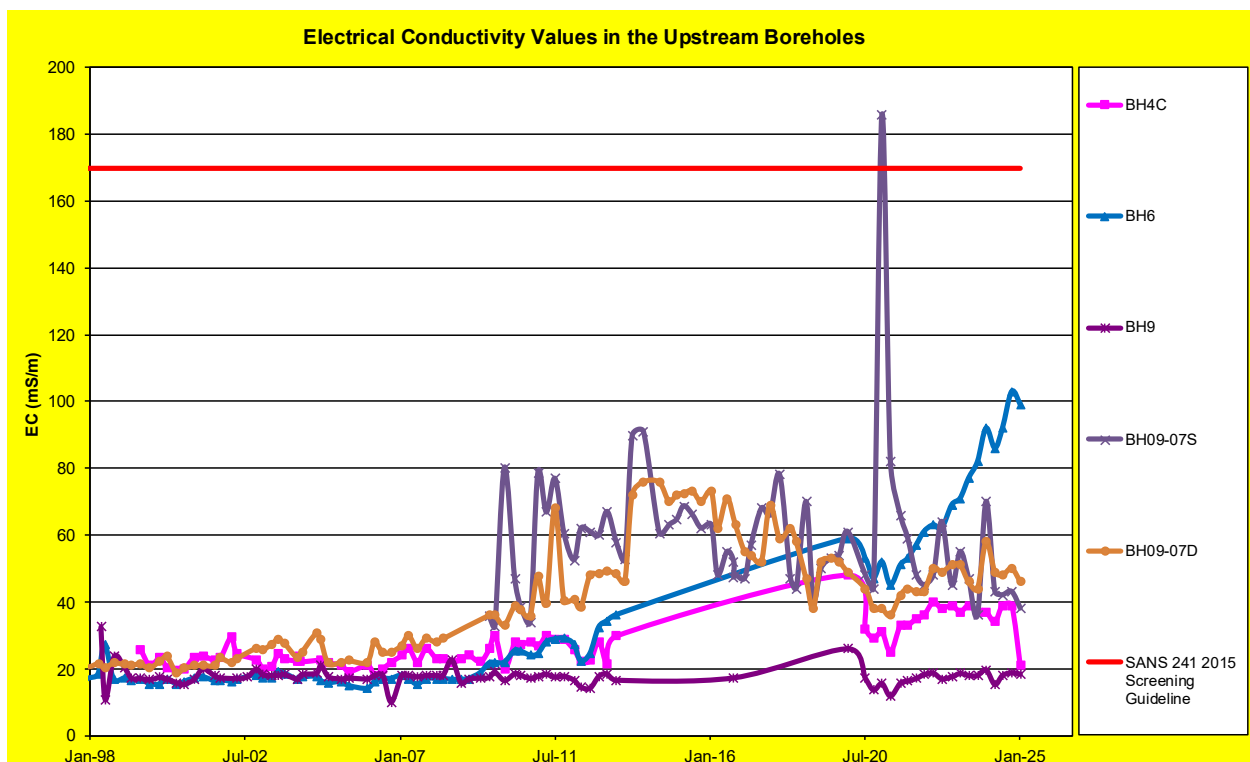


Figure 6.4.1.a: Electrical Conductivity Values in the Upstream Boreholes

Valley 1 – Downstream Groundwater Quality

The borehole pair BH05-12S/D, located between the Stormwater Dam and the Valley 1 waste body (**Figure 5.2.b**), provides an indication of downstream groundwater quality relative to Valley 1.

The shallow borehole, BH05-12S, historically exhibited elevated and fluctuating EC values (**Figure 6.4.1.b**), reflecting contamination from Valley 1. This perched aquifer was previously intercepted by a sub-soil seepage system, with water pumped back to the Stormwater Dam. Although Cells 1 and 2 were constructed with a flexible polypropylene (FPP) liner and leachate drainage layer, no sub-soil or leachate detection system was installed. It is likely that seepage from the drainage layer entered the shallow weathered



aquifer, contributing to the contamination observed in BH05-12S. Since 2017, this borehole has been dry, likely due to reduced recharge following the capping of Valley 1.

In contrast, the deeper fractured aquifer (BH05-12D) has consistently shown low EC values, generally below the screening guideline (**Figure 6.4.1.b**). Slight exceedances were recorded in October 2024 and January 2025, with EC values of 181 mS/m and 173 mS/m, respectively. The marked differences in EC and groundwater levels between the shallow and deep boreholes (**Figure 5.2.a**) indicate limited hydraulic connectivity between the two aquifer systems.

An elevated fluoride concentration was detected in BH05-12D during the July 2024 detailed analysis, attributed to the local geology.

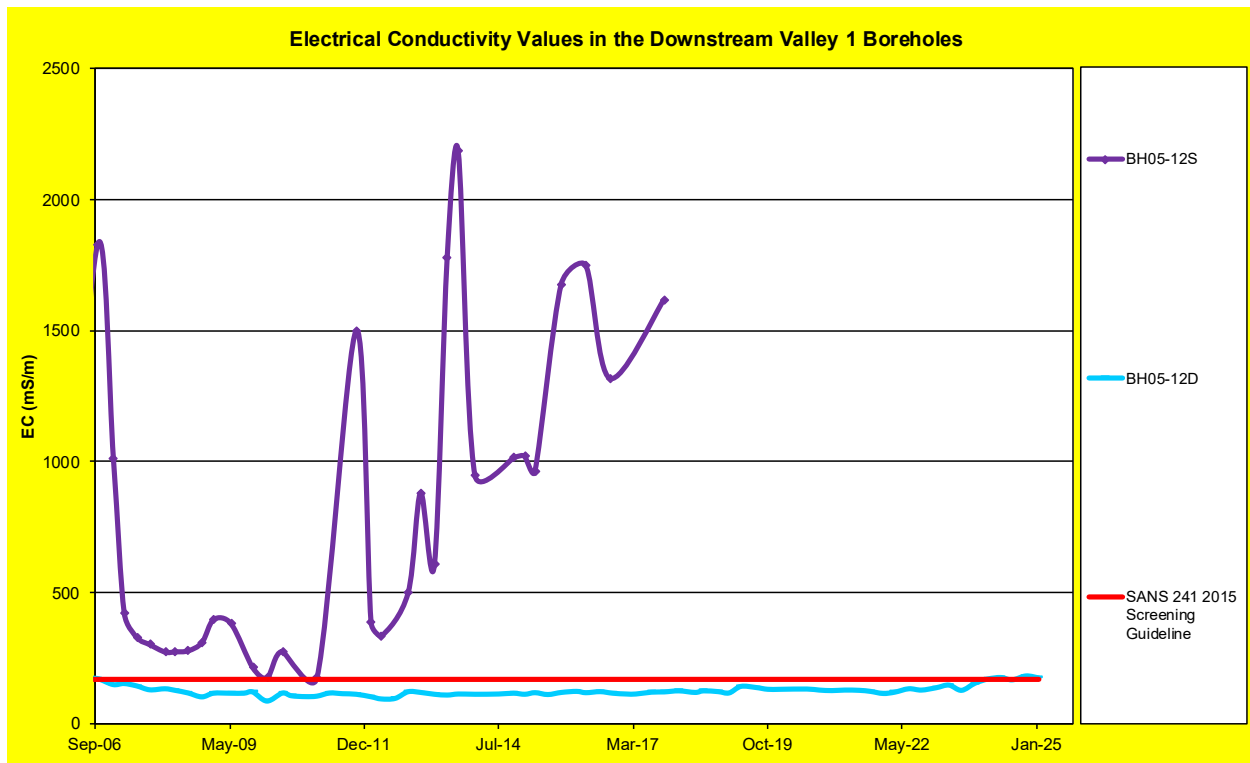


Figure 6.4.1.b: Electrical Conductivity Values in the Valley 1 Downstream Valley 1 Boreholes

Valley 2 - Downstream Groundwater Quality

Three (three) boreholes (BH09-13S, BH09-13M, and BH09-13D), drilled at the base of Valley 2 in July 2009, represent downstream groundwater quality relative to the Valley 2 waste body.

As shown in **Figure 6.4.1.c**, EC values in these boreholes have remained low (< 100 mS/m) throughout the monitoring period. In January 2025, EC values were 42 mS/m (BH09-13S), 99 mS/m (BH09-13M), and 28 mS/m (BH09-13D), comparable to upstream boreholes. These results suggest that, due to the effective liner and leachate removal systems, along with the site's steep topography, the Valley 2 waste body is not significantly impacting the underlying groundwater.

Elevated fluoride concentrations were recorded in BH09-13M and BH09-13D during the July 2024 detailed analysis, attributed to the area's granitic geology.



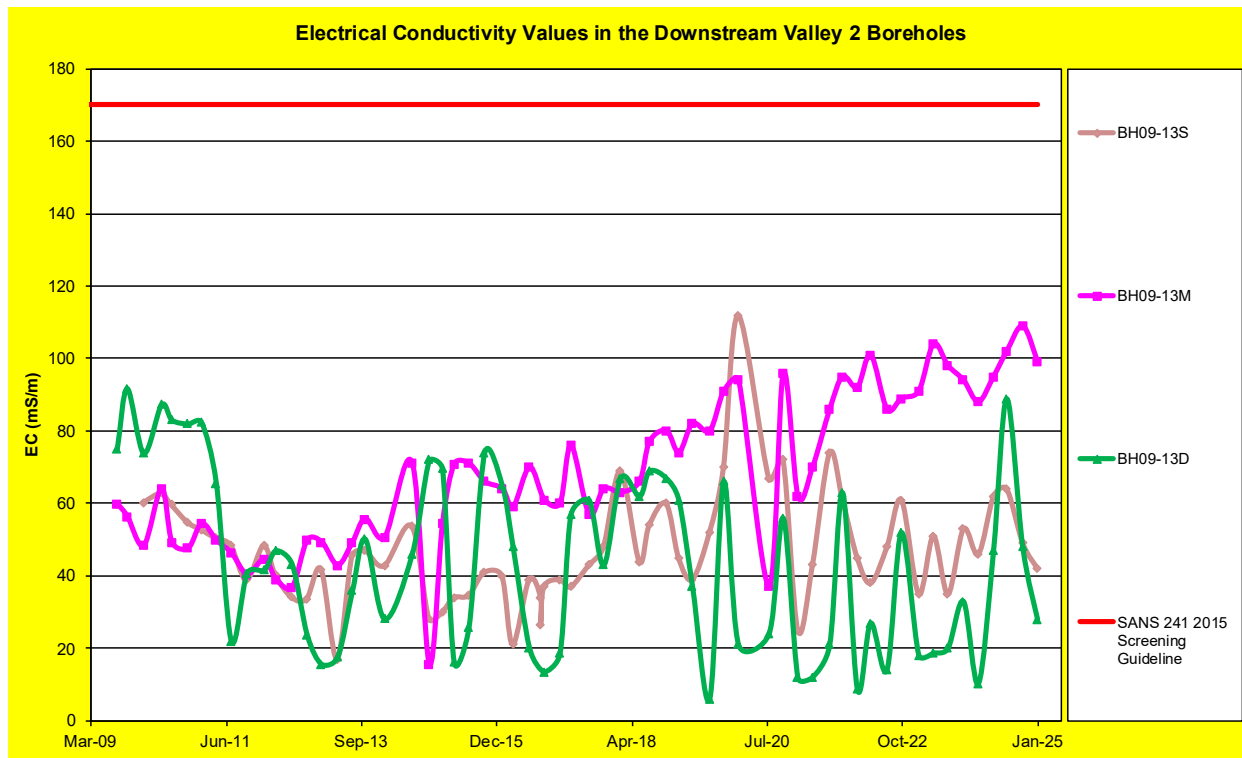


Figure 6.4.1.c: Electrical Conductivity values in the Downstream Valley 2 Boreholes

To evaluate the representative chemical signatures of the groundwater in the upstream boreholes against the groundwater in the downstream Valley 2 boreholes, a Piper diagram was constructed. This water type classification is based on the dominant ions and cations present in the water samples and provides insights into the major chemical composition and characteristics of the water samples. As illustrated in **Figure 6.4.1.d**, both the upstream and downstream boreholes have a chloride and sulfate signature, with negligible bicarbonate. This further supports the conclusion that the Valley 2 waste body is not significantly affecting the downstream groundwater.

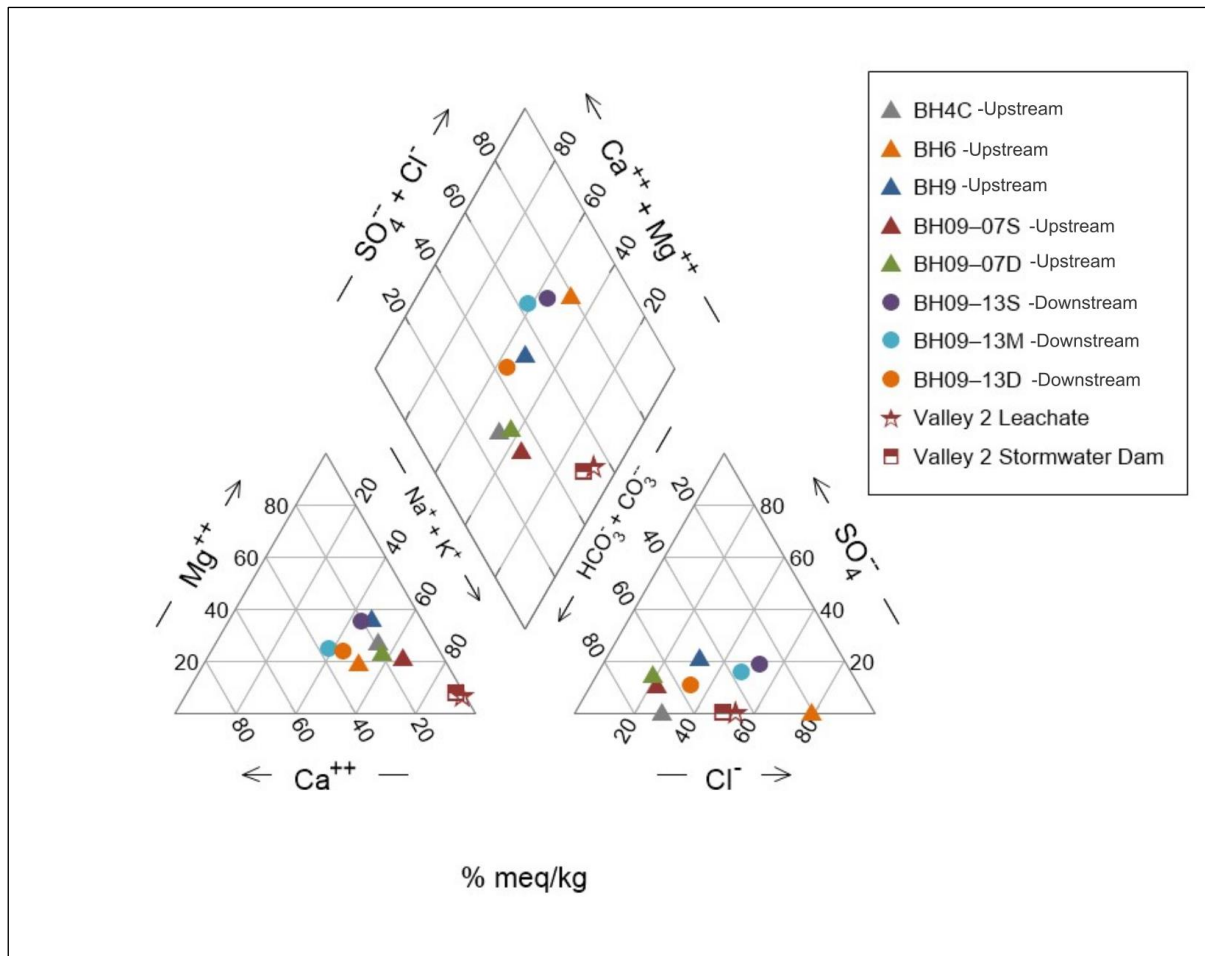


Figure 6.4.1.d: Water Chemistry Signatures (Upstream vs. Valley 2 Downstream)

Valley 3 – Downstream Groundwater Quality

Three (3) boreholes (BH24-14S, BH24-14M and BH24-14D) were drilled downstream of Valley 3 in September 2024 to monitor potential impacts from this landfill once it becomes operational. As shown in **Figure 6.4.1.e**, the EC values are currently below the screening guideline and reflect the background groundwater chemistry.

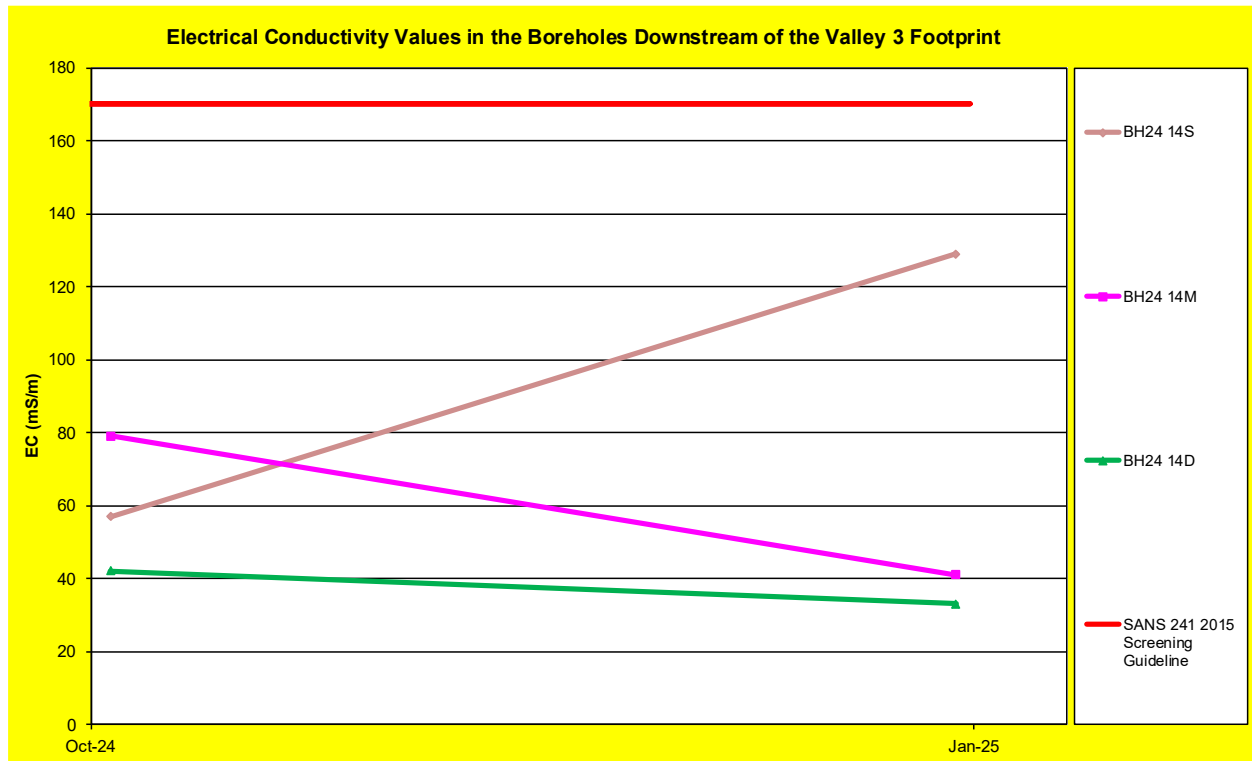


Figure 6.4.1.e: Electrical Conductivity Values in the Boreholes Downstream of the Valley 3 Footprint

6.4.2 Groundwater Organic Chemistry

Several organic compounds were detected in the upstream borehole BH4C in July 2024, with the concentration of *cis*-1-2-dichloroethene (*cis*-1-2-DCE) now exceeding the guideline value (**Figure 6.4.2.a**). The source of *cis*-1-2-DCE in borehole BH4C is not known as the parent products are either not detected (tetrachloroethene) or are detected at low concentrations (trichloroethene). It is recommended that this trend be monitored over the next few years.

No organic compounds were detected in the Valley 1 or Valley 2 downstream boreholes in July 2024. The organic chemistry results are attached in **APPENDIX G**.



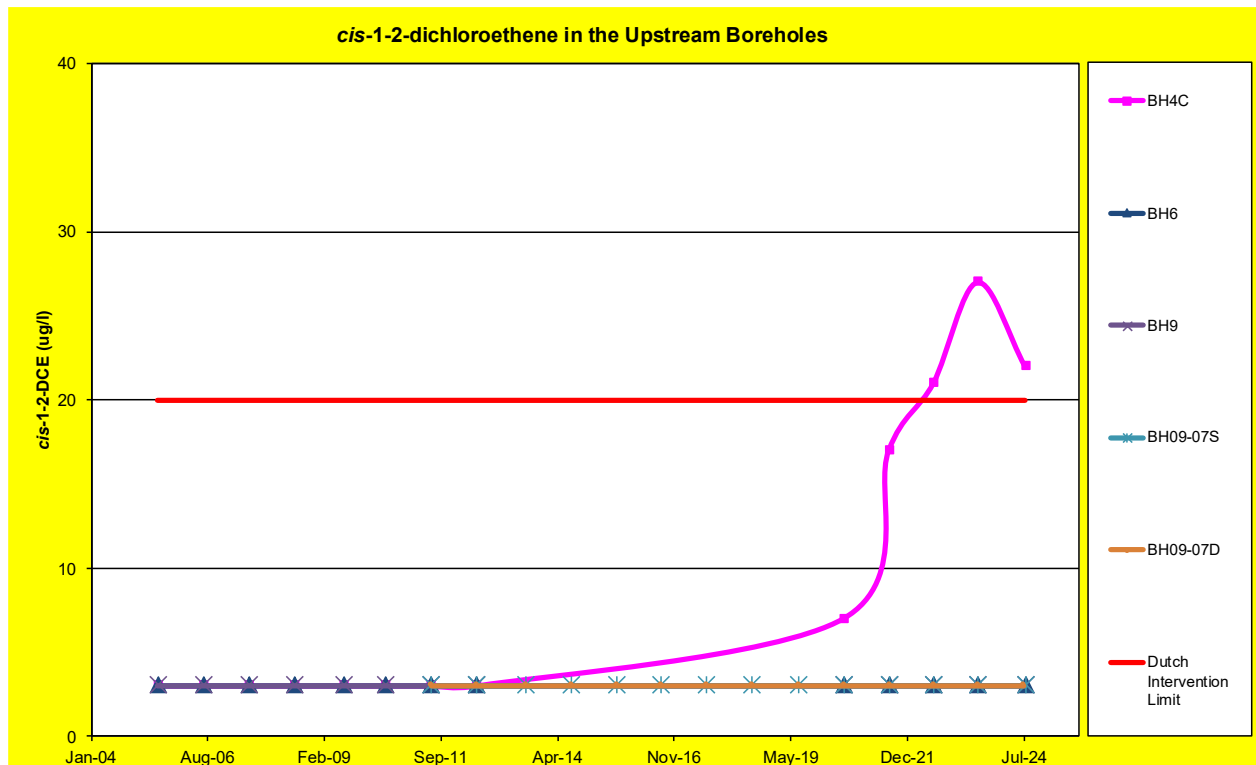


Figure 6.4.2.a: *cis*-1-2-DCE Concentrations in the Upstream Boreholes



6.5 Surface Water Quality

The locations of the surface water sampling positions at the Shongweni WMF are listed in **Table 6.5.a** and their localities are shown in **Figure 4.1.a**. The chemistry results are attached in **APPENDIX H** (inorganic) and **APPENDIX I** (organic).

Table 6.5.a: Surface Water Sampling Positions at the Shongweni WMF

SURFACE WATER POSITION	COMMENT
13. Valley 1 Contaminated Stormwater Dam	Sampled at number 13
11. Valley 2 Contaminated Stormwater Dam	Sampled at number 11
27	Valley 2: Surface water emanating from the base of the silt trap
29 Valley 2 Stormwater	Stormwater entering the catchment (plus overflow from 24). Sampled in the silt trap
SW2	At gabion baskets above railway line within Valley 1
SW3	Downstream of Valley 2 (Upstream of Valley 1)
SW4	Downstream of the site above the confluence with the Mgoshongweni
SW5	Downstream of site above the confluence with the Mgoshongweni
SW6	Upstream of Valley 2

6.5.1 Surface Water Inorganic Chemistry

The EC values in the Valley 1 Stormwater Dam (13) and Valley 2 Stormwater Dam (11) throughout the monitoring period are indicated in **Figure 6.5.1.a** and discussed below.

Valley 1 Stormwater Dam

Since the capping of Valley 1, it no longer serves as a stormwater catchment. The Stormwater Dam now functions primarily as a backup for Valley 2 overflow. Runoff from Valley 1 is diverted via northern and southern stormwater canals, which discharge below the dam and through the train culvert.

Water from the Valley 2 Stormwater Dam (V2 SWD) is pumped to the Valley 2 header tanks, then gravity-fed into Valley 1, from where it is pumped via the rising main to the top tanks. In January 2025, an elevated EC value of 295 mS/m was recorded in the Valley 1 Stormwater Dam 13, **Figure 6.5.1.a**. This is attributed to elevated concentrations of ammonia, sodium, chloride, and fluoride.

Valley 2 Stormwater Dam

The EC value in the Valley 2 Stormwater Dam (11) has shown significant fluctuations over the monitoring period, peaking at 7 612 mS/m in July 2017. These elevated values were attributed to intermittent overflows from the Valley 2 leachate tank. Since July 2019, EC levels have declined, suggesting that overflows have ceased. In January 2025, the EC value was 283 mS/m as a result of elevated ammonia, chloride and sodium.

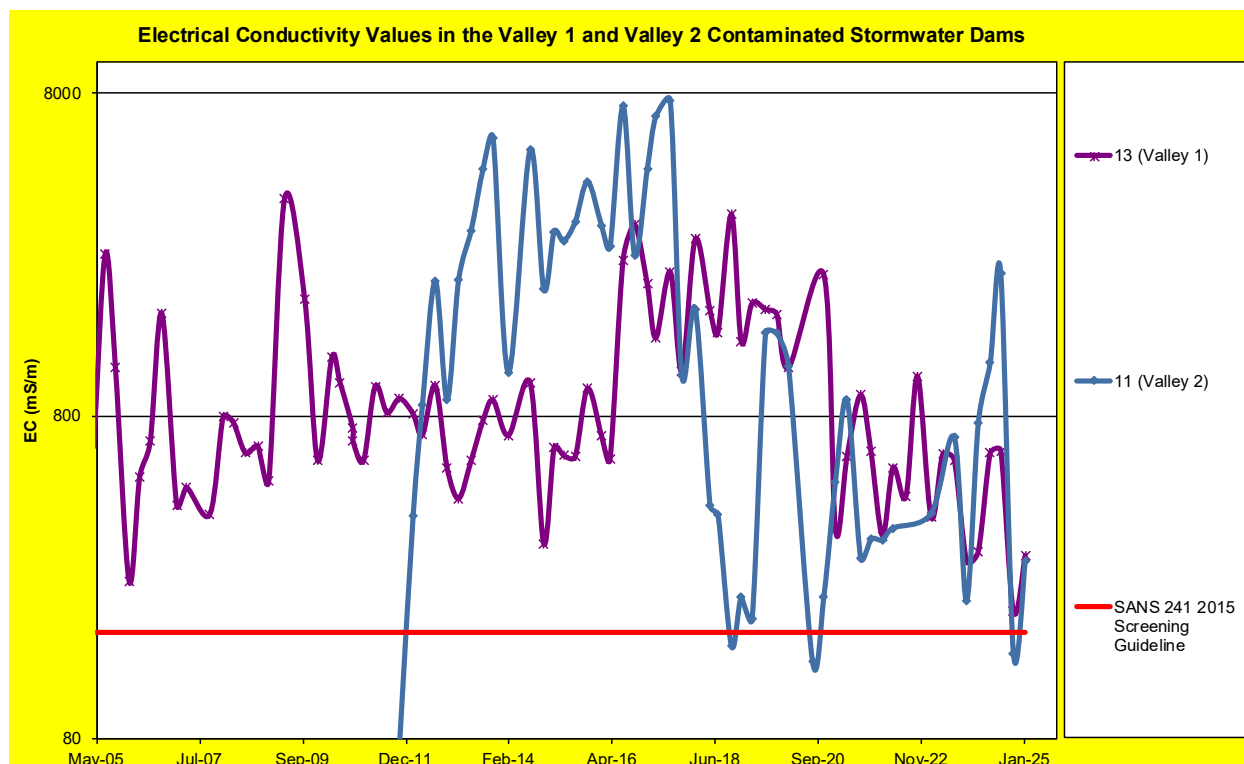


Figure 6.5.1.a: Electrical Conductivity Values in the Valley 1 and 2 Contaminated Stormwater Dams

General Surface Water

The EC value of SW2, which is located downstream of Valley 1, was below the screening guideline in January 2025 (**Figure 6.5.1.b**).

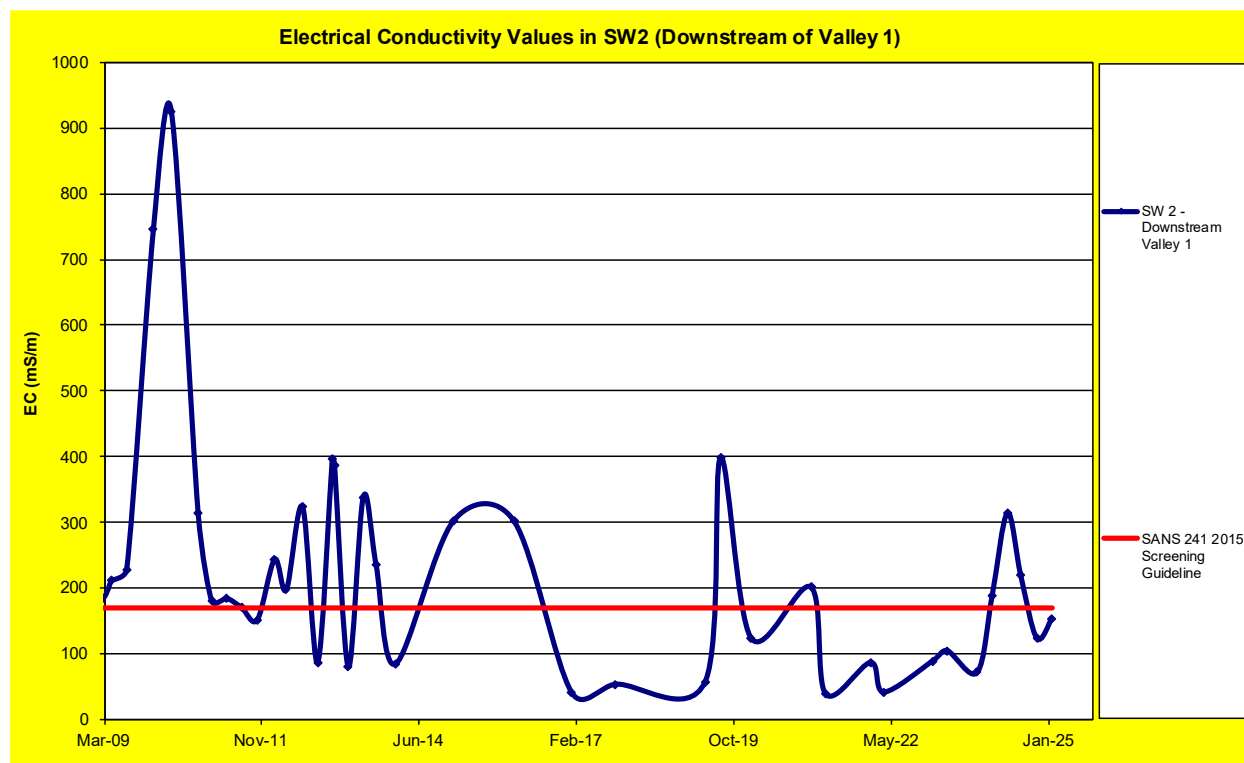


Figure 6.5.1.b: Electrical Conductivity Values in Surface Water Sampling Position SW2



The EC values of sampling positions SW3, SW4, SW5 and SW6, as well as the surface water at the base of the silt trap (sampling position 27) are shown in **Figure 6.5.1.c**.

Sampling position SW6, upstream of Valley 2, recorded an EC value of 20 mS/m in January 2025. The July 2024 detailed analysis showed sodium, sulfate and chloride concentrations of 23 mg/l, 18 mg/l and 42 mg/l, respectively, indicating that these constituents occur naturally in this catchment.

The surface water sample downstream of Valley 2 (SW3) recorded a low EC value of 54 mS/m in January 2025, with no inorganic or trace elements exceeding the screening guidelines. This suggests minimal impact from Valley 2 on the receiving surface water.

Sampling position 27 collects water from the silt trap, a mixture of contaminated stormwater from road runoff and sub-soil seepage beneath the Valley 2 Stormwater Dam wall. The EC value of this sampling position was below the screening guideline in January 2025. Water from the silt trap enters the stream between SW6 and SW3.

Positions SW4 and SW5 both recorded EC values of 54 mS/m in January 2025, with no inorganic or trace element guideline exceedances in July 2024. SW5 reflects combined influences from both valleys and local farming activities, and SW4 is located further downstream (refer to **Figure 6.5.1.c**).

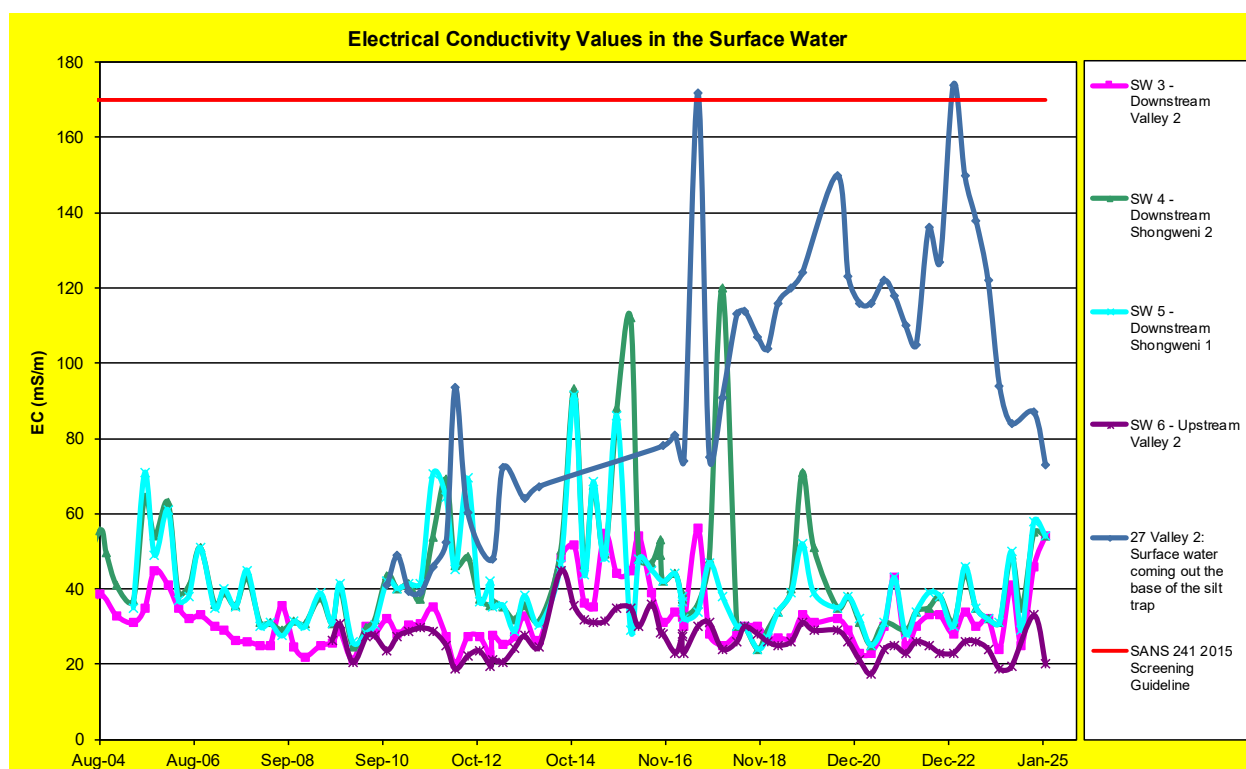


Figure 6.5.1.c: Electrical Conductivity Values in the Surface Water

6.5.2 Surface Water Organic Chemistry

No organic constituents exceeded the screening guidelines in the surface water samples during the July 2024 detailed analysis (**APPENDIX I**).

6.5.3 Surface Water Isotope Analysis

Tritium is analysed in selected surface water samples to support interpretation of water quality (**Figure 6.5.3.a**). Tritium values exceeding the natural background level (4.0 TU) indicate contamination from landfills, where tritium-bearing materials are disposed of.



Elevated tritium values have been recorded in several of the samples, indicating an on-site closed system tritium source (closed systems at the site are sampling positions 10, 11 and 17 – Valley 1 Leachate Tank, Valley 2 Contaminated Stormwater Dam and Valley 1 sub-soil seepage).

As shown in **Figure 6.5.3.a**, the tritium levels in SW2 have steadily increased in recent years, indicating an impact from Valley 1 as supported by the similarity in tritium levels in the Valley 1 Contaminated Stormwater Dam (13) and SW2. Conversely, the remaining surface water positions (SW3, SW4, SW5 and SW6) have shown a slight decrease.

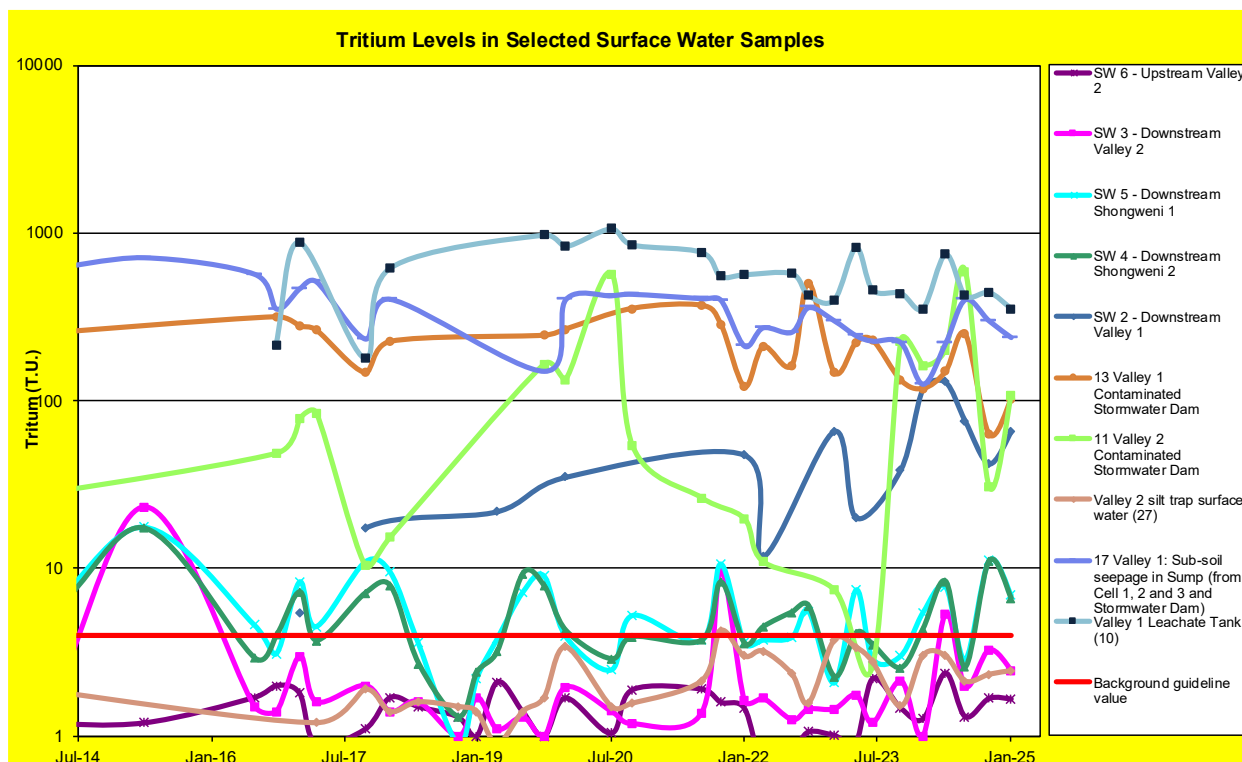
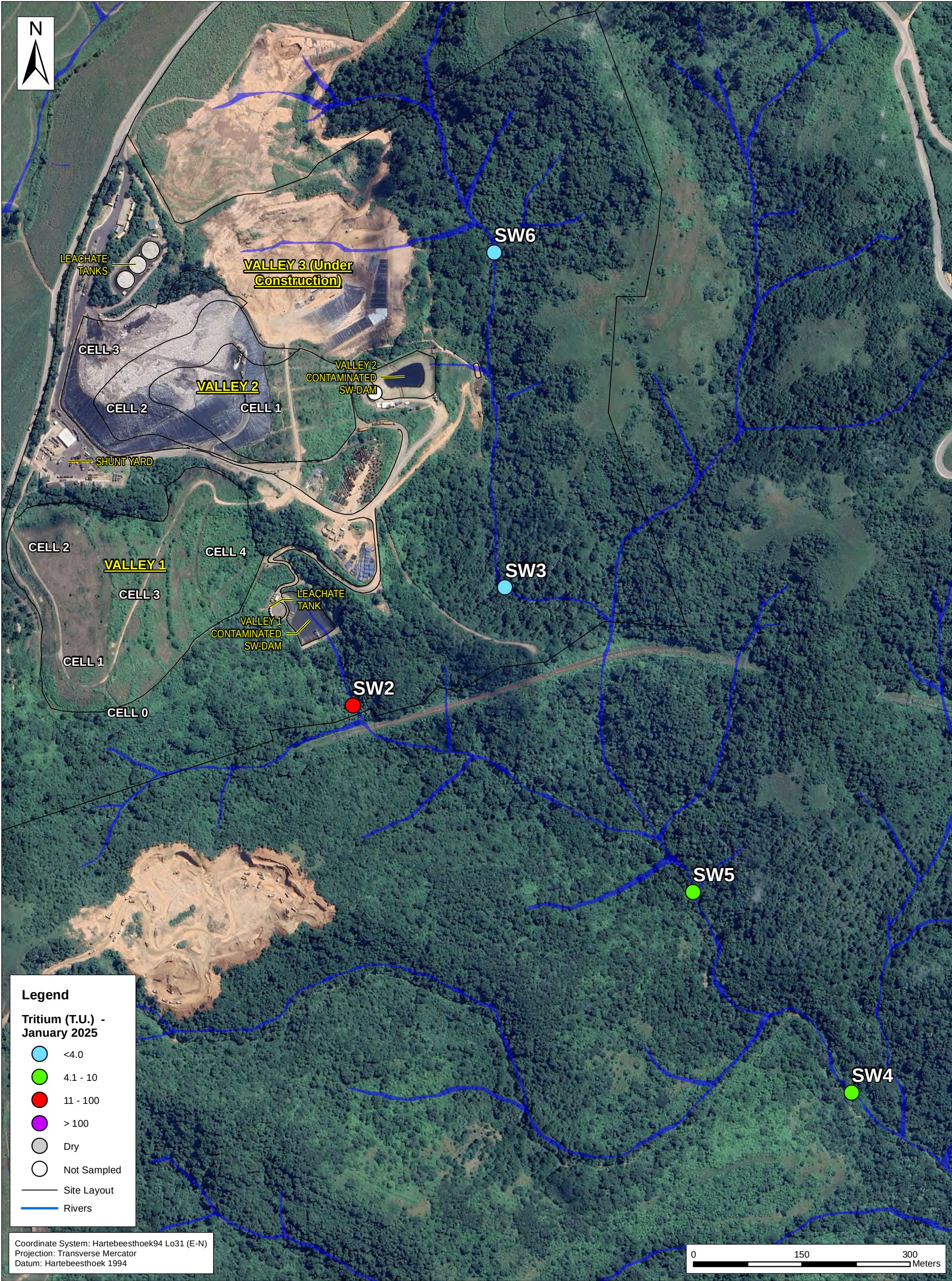


Figure 6.5.3.a: Tritium Levels in Selected Surface Water Samples at the Site

The January 2025 tritium values for sampling positions SW2, SW3, SW4, SW5 and SW6 are shown in **Figure 6.5.3.b**.



6.5.4 Biomonitoring

Biomonitoring of the streams in the vicinity of the Shongweni WMF is conducted biannually by GroundTruth Water Wetlands and Environmental Engineering Consultants (GroundTruth). The latest available report (GT0168-December 2024) is attached in **APPENDIX J**. Below is a summary of the findings from this biomonitoring report. Three (3) sampling positions are assessed for site biomonitoring – an upstream position (close to SW6), a central position (near to SW3) and a downstream position (in the vicinity of SW4). The locations of these sampling positions are indicated in **Figure 6.5.c**.



Figure 6.5.c: Locations of the Biomonitoring Sampling Positions (GroundTruth, 2024)

Large-scale habitat and river channel modifications were observed along the entire length of the Mgoshongweni River, which flows adjacent to the Shongweni WMF in a south-easterly direction, due to heavy flooding that occurred in this area in April and May 2022. Higher-than-average rainfall in June 2023 further exacerbated these impacts. The upstream biomonitoring site was less impacted than the lower sites due to its location higher up in the catchment.

The South African Scoring System (SASS) indicates the ecological condition of a river/aquatic resource using aquatic macroinvertebrates as bio-indicators of water quality and habitat diversity. The SASS scores at both the upstream and central sites improved compared to June 2024. However, the downstream site remains in poor condition largely due to a lack of habitat recovery at the site. In addition, diatoms remained limited at all three (3) sites likely as a result of scouring from mobilised sediments during the increased flows following the heavy rainfall events.

A comparison of the June 2024 and December 2024 data for the three (3) biomonitoring sites is summarised below:

- The EC values in the downstream sites were higher than in the upstream site due to a natural accumulation of dissolved salts as well as overland flow and sediment movement through the system. In addition, EC values in the downstream site

increased between June 2024 to December 2024 as a result of natural salts accumulation from an upstream Mgoshongweni tributary.

- The pH in the upstream site was slightly more acidic in December 2024 due to decaying detritus. However, higher pH values recorded in the downstream sites are not indicative of pollution originating from the Shongweni WMF.
- Overall, the biological and water quality results indicate that the Shongweni WMF Site operations are not impacting the Mgoshongweni River.
- Sedimentation and runoff from the area under the control of EnviroServ requires continued management and attention and should be addressed through rehabilitation and revegetation.

Although the Shongweni WMF is not currently causing any degradation to the system, continual management of the sediment and run-off from the site is required. This includes regular clearing of the sediment trap, maintenance of berms and roads and clearing of alien invasive plants from within the riparian areas.

7. SUMMARY

A summary of the most recent detailed and indicator (July 2024 and January 2025, respectively) water chemistry results is provided below:

Leachate

Leachate generation from Valley 1 has decreased due to capping and rehabilitation, with Cell 0 remaining dry since 2014 and Position 18 only resuming flow in late 2021. Despite this, elevated electrical conductivity values were recorded in January 2025 at Position 18 (1 072 mS/m) and in the Valley 1 Leachate Tank (1 318 mS/m), although both show a declining trend since 2017. Seepage from Position 30 also reflects a general electrical conductivity decline. In Valley 2, leachate systems continue to show higher, fluctuating EC values (3 761–3 988 mS/m), with the Leachate Tank recording 3 515 mS/m in January 2025—likely due to differences in waste composition. Low concentrations of organic compounds were detected in both valleys' leachate in July 2024, with levels decreasing since July 2022.

Leachate/Leakage Detection

The Valley 1 leachate/leakage detection network consists of eight (8) leachate and three (3) leakage detection points, several of which have remained dry throughout the monitoring period. Flow volumes declined in January 2025, consistent with long-term reductions expected after capping. However, potential leakage from the Stormwater Dam liner is suspected due to higher water levels during the rainy season. The electrical conductivity values in January 2025 varied: 1 014 mS/m (2 LD4S), 1 162 mS/m (3 LD3), 449 mS/m (4 LD4N), 590 mS/m (8 LD4B) and 1 813 mS/m (Drainage Blanket). Sampling points 5, 6, 7, and 16 were dry, in January 2025. Leakage points 14 and 15 (from the Stormwater Dam) are characterised by fluctuating and slightly elevated electrical conductivity values (242 mS/m and 219 mS/m, respectively, in January 2025).

Valley 2 includes three (3) leachate detection points and one (1) leakage detection point. Position 23 (Leachate Detection South Bench), usually dry, yielded a sample with an electrical conductivity value of 2 098 mS/m in January 2025. In addition, the electrical conductivity values in the Leachate Detection North Bench (sampling position 19) and the Stormwater Dam (26) were 1 753 mS/m and 130 mS/m, respectively, in January 2025.

Sub-soil Seepage

The sub-soil seepage from Cells 1, 2, and 3 in Valley 1, along with seepage from the Valley 1 Stormwater Dam (sampling point 17), is collected in a sump located downstream of the dam. The electrical conductivity value of the liquids collected from this sump slightly decreased from an average of 471 mS/m in 2024 to 408 mS/m in January 2025.

Sampling point 9 GW123, which monitors the toe drain below the Valley 1 buttress, typically shows elevated electrical conductivity due to high ammonia, chloride, and sodium levels. In January 2025, the electrical conductivity increased to 1 133 mS/m, suggesting a larger leachate component. Several organic compounds were also detected in the Valley 1 sub-soil samples during July 2024.

In Valley 2, sampling points 24 (beneath the Main Cell) and 25 (beneath the Stormwater Dam) recorded electrical conductivity values below the screening guideline in January 2025 (146 mS/m and 127 mS/m, respectively). The water in both systems is collected via gravity or pumps and transported to the Stormwater Dam.

Groundwater

Valley 1

The upstream boreholes generally showed low electrical conductivity values ranging from 18 mS/m to 99 mS/m in January 2025. However, an elevated *cis*-1,2-DCE concentration was detected in BH4C during the July 2024 detailed analysis. The Valley 1 downstream borehole pair BH05-12S/D, located between the Stormwater Dam and waste body, has seen historically elevated and fluctuating electrical conductivity values in BH05-12S. This borehole has remained dry since October 2017, likely due to reduced recharge following Valley 1 capping. Any water present is diverted via the sub-soil seepage system to the Stormwater Dam. Groundwater in the fractured aquifer typically exhibits low and stable electrical conductivity values, remaining below the screening guideline; however, BH05-12D marginally exceeded it in January 2025 (173 mS/m). The contrast in electrical conductivity and aquifer characteristics indicates poor hydraulic connectivity between the perched and fractured aquifers.

Valley 2

Boreholes BH09-13S, M and D at the base of Valley 2 recorded low electrical conductivity values in January 2025 (42 mS/m, 99 mS/m and 28 mS/m respectively), similar to upstream conditions. This suggests that the Valley 2 waste body is not impacting the groundwater due to effective containment systems and steep topography.

In July 2024, elevated fluoride levels were found in the upstream boreholes BH6 and BH9 as well as the downstream boreholes BH05-12D (Valley 1), BH09-13M and BH09-13D. This is attributed to the granitic geology of the area.

Valley 3

Three (3) new boreholes (BH24-14S/M/D) drilled in 2024 downstream of Valley 3 showed electrical conductivity values below the screening guideline in January 2025, representing baseline conditions ahead of Valley 3 operations.

Surface water

The Valley 1 Stormwater Dam no longer functions as a catchment due to capping and now serves primarily as a backup for Valley 2 overflow. Stormwater runoff from Valley 1 is diverted into northern and southern stormwater canals, which bypass the dam and discharge into the downstream valley via a culvert. In January 2025, the electrical conductivity at the Valley 1 Stormwater Dam (sampling point 13) was elevated (295 mS/m).

The electrical conductivity values in the Valley 2 Stormwater Dam (sampling point 11) have fluctuated throughout the monitoring period, with high values attributed to historical intermittent overflows from the leachate tank. Since July 2019, the electrical conductivity levels have steadily decreased, with a value of 283 mS/m measured in January 2025.

The electrical conductivity values at the downgradient stream sampling points SW2, SW3, SW4 and SW5 were below the screening guideline in January 2025. However, the tritium concentration in SW2 was slightly elevated relative to background levels and similar to the Valley 1 Stormwater Dam, suggesting that Valley 1 may be impacting the receiving environment.

A biomonitoring aquatic assessment conducted in December 2024 concluded that operations at the Shongweni WMF are not adversely affecting the Mgoshongweni River. Nonetheless, the assessment emphasised the need for continued sediment and stormwater management, including routine maintenance of stormwater infrastructure and erosion control measures.

8. RECOMMENDATIONS

The following is recommended based on the findings of the most recent chemical analyses and the biomonitoring assessment conducted by GroundTruth:

- Addition of a surface water monitoring position (SW7) upstream of Valley 3.
- Monitor the *cis*-1-2-dichloroethene concentrations in the upstream borehole BH4C.
- On-going active management of the Valley 1 and Valley 2 sumps.
- Continuation and improvement of the sediment trap clearing, maintenance of the berms, drains and roads, and control of alien invasive plants within the riparian areas. In addition, sedimentation and run-off emanating from the area under the control of EnviroServ requires continued management and attention.
- On-going quarterly water monitoring.

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX A

LEACHATE – INORGANIC WATER QUALITY DATA

1 Valley 1: Leachate from Cell 0		SANS 241																							
Date		22-Apr-05	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	28-Jan-08	07-Apr-08	07-Jul-08	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	
Flow Rate (Litres / sec)									0.013	0.100		0.250						0.088			0.015			0.0039	
pH	>5 or <9.7	Dry	Dry	Dry	Dry	7.6	Dry	Dry	7.9	7.9	Dry	6.5	8.2	Dry	Dry	Dry	Dry	8.1	Dry	Dry	8.1	Dry	Dry	8.5	
Electrical conductivity (mS/m)	170					905			644	453		323	588					427			314			714	
Chemical Oxygen Demand as O2	NG					494			464	293		536	496					256			3403			520	
Total Dissolved Solids	1200																								
Alkalinity as CaCO3	NG																								
Ammonia as N	1.5																								
Nitrate as N	11																								
Chloride as Cl	300																								
Sulfate as SO4	500																								
Boron as B	2.4																								
Fluoride as F	1.5																								
Phosphate as P	NG																								
Sodium as Na	200																								
Potassium as K	NG																								
Calcium as Ca	NG																								
Magnesium as Mg	NG																								
Arsenic as As	0.010																								
Barium as Ba	0.70																								
Cadmium as Cd	0.0030																								
Total Chromium as Cr	0.050																								
Hexalent Chromium as Cr	NG																								
Copper as Cu	2.0																								
Iron as Fe (Dissolved)	2.0																								
Iron as Fe (Total)																									
Lead as Pb	0.010																								
Manganese as Mn (Dissolved)	0.40																								
Manganese as Mn (Total)																									
Mercury as Hg	0.0060																								
Percentage balancing																									
All values in mg/l, unless otherwise indicated.																									

1 Valley 1: Leachate from Cell 0		SANS 241																				
Date		11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16
Flow Rate (Litres / sec)		0.1750	Dry	Dry	Dry	Dry	Dry	0.0192	0.0350	0.0175			0.0032									
pH	>5 or <9.7	7.4						7.1	8.3	7.4	Dry	Dry	8.4	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170	337						338	412	332			539									
Chemical Oxygen Demand as O2	NG	525						212	318	235			599									
Total Dissolved Solids	1200																					
Alkalinity as CaCO3	NG																					
Ammonia as N	1.5																					
Nitrate as N	11																					
Chloride as Cl	300																					
Sulfate as SO4	500																					
Boron as B	2.4																					
Fluoride as F	1.5																					
Phosphate as P	NG																					
Sodium as Na	200																					
Potassium as K	NG																					
Calcium as Ca	NG																					
Magnesium as Mg	NG																					
Arsenic as As	0.010																					
Barium as Ba	0.70																					
Cadmium as Cd	0.0030																					
Total Chromium as Cr	0.050																					
Hexalent Chromium as Cr	NG																					
Copper as Cu	2.0																					
Iron as Fe (Dissolved)	2.0																					
Iron as Fe (Total)																						
Lead as Pb	0.010																					
Manganese as Mn (Dissolved)	0.40																					
Manganese as Mn (Total)																						
Mercury as Hg	0.0060																					
Percentage balancing																						
All values in mg/l, unless otherwise indicated.																						

[illegible]

1 Valley 1: Leachate from Cell 0		SANS 241										
Date		13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)												
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170											
Chemical Oxygen Demand as O2	NG											
Total Dissolved Solids	1200											
Alkalinity as CaCO3	NG											
Ammonia as N	1.5											
Nitrate as N	11											
Chloride as Cl	300											
Sulfate as SO4	500											
Boron as B	2.4											
Fluoride as F	1.5											
Phosphate as P	NG											
Sodium as Na	200											
Potassium as K	NG											
Calcium as Ca	NG											
Magnesium as Mg	NG											
Arsenic as As	0.010											
Barium as Ba	0.70											
Cadmium as Cd	0.0030											
Total Chromium as Cr	0.050											
Hexalent Chromium as Cr	NG											
Copper as Cu	2.0											
Iron as Fe (Dissolved)	2.0											
Iron as Fe (Total)												
Lead as Pb	0.010											
Manganese as Mn (Dissolved)	0.40											
Manganese as Mn (Total)												
Mercury as Hg	0.0060											
Percentage balancing												
All values in mg/l, unless otherwise indicated.												

10 Valley 1: Leachate Tank		SANS 241																								
Date		02-Apr-98	11-Jun-98	15-Sep-98	04-Jan-99	16-Mar-99	24-Jun-99	28-Sep-99	11-Jan-00	03-Apr-00	07-Nov-00	26-Sep-00	09-Jan-01	18-Apr-01	15-Aug-01	18-Oct-01	08-Feb-02	11-Apr-02	31-Oct-02	14-Jan-03	15-Apr-03	25-Jun-03	04-Sep-03	13-Jan-04		
Infield Analysis																										
Temp °C	NG																									
pH	>5 or <9.7																									
EC [mS/m]	170																									
TDS [ppm]	1200																									
ORP [mV]	NG																									
pH	>5 or <9.7	7.3	7.8	7.0	7.5	7.8	7.9	7.5	7.2	7.4	7.3	7.7	7.5	7.8	7.9	8.0	7.9	7.6	7.9	7.8	7.9	8.0	7.9	7.8		
Electrical conductivity (mS/m)	170	659	1787	2040	1343	1946	2230	2650	1780	1644	1562	955	1524	1970	2980	2590	1810	1775	2670	1940	2300	3242	2947	2386		
Chemical Oxygen Demand as O2	NG		43371	22376	8416	18996	49146	34411	7317	30478	14680	5831	940	5120	8107	11952	4600	2742	4412	4830	2327	6551	7421	3666		
Total Dissolved Solids	1200	4613	12509	14280	9401	13622		18550	12460	11508	10934	6685	10668	13790	20860	18130	12670	12425	18690	13580	16100	22694	20629	16702		
Alkalinity as CaCO3	NG	2360	6816	5166	3768	5904	7178	7826	6558	3050	6500	2903	4751	7825	13850	11100	6500	9731	12145	8710	11354	12238	13142	9749		
Ammonia as N	1.5	184	668	776	541	520	416	680	550	600	604	282	515	664	1572	910	355	353	918	485	488	951	991	770		
Nitrate as N	11	<0.05	Nitrate as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	31	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
Chloride as Cl	300	578	2097	2049	1450	2615	3097	3292	2005	1941	2006	1073	418	2157	1826	2753	1473	1244	2334	1850	2736	3524	3666	2899		
Sulfate as SO4	500	17	600	1567	228	569	1068	748	274	183	124	124	30	50	29	26	145	135	11	15	<0.16	58	17	29		
Boron as B	2.4	0.164		6.9		4.8		2.2		4.3		3.0		5.3		5.9		3.3		6.6		6.1		5.5		
Fluoride as F	1.5	14		33		37		7.1		2.3		22	21	24		40	26	14		38	33	47	37	38		
Phosphate as P	NG			0.104		0.32		3.4		1.8		3.8		8.5		16		14		27		9.9		18		
Sodium as Na	200	824		2712		6200		1752	3670	2700	2929	1751	2650	3201	6032	4305	3939	3496	5644	3839	4549	6054	5903	4806		
Potassium as K	NG	226	876	609	2065	750	734	359	688	618	615	424	560	817	1689	1127	842	788	1294	1041	1110	1382	1340	1040		
Calcium as Ca	NG	219		423		735		203	624	384	403	212	370	182	144	131	123	97	90	205	89	75	72	101		
Magnesium as Mg	NG	136		337		201		109	287	195	186	127	181	151	156	142	124	96	123	126	96	96	114	126		
Arsenic as As	0.010	<0.0020		<0.0020		0.07		0.066		0.042		0.019		0.048		0.804		0.245	0.127		0.066		0.05			
Barium as Ba	0.70																									
Cadmium as Cd	0.0030	0.0034		<0.0010		0.076		<0.0010		0.015		0.013		0.051		0.185		<0.0010	0.104		<0.0010		<0.0010			
Total Chromium as Cr	0.050	0.077		2.3		2.7		0.604		2.1		0.548		0.899		0.838		0.10	1.16		0.854		1.59			
Hexalent Chromium as Cr	NG																									
Copper as Cu	2.0	<0.05		<0.05		0.11		<0.05		<0.05		<0.05		<0.05		<0.05		<0.05	<0.05		<0.05		<0.05			
Iron as Fe (Dissolved)																										
Iron as Fe (Total)		14	206	397	50	87	0.04	169	35	11	65	39	0.40	0.41	0.1	0.81		0.98	1.2	0.56	<0.02	1.9	1.8	1.6		
Lead as Pb		0.0073		0.199		0.174		0.029		0.0101		0.02		<0.0040		<0.0040		<0.0040	0.0053		0.014		0.008			
Manganese as Mn (Dissolved)																										
Manganese as Mn (Total)		20	30	37	15	19	0.06	15	0.34	13	6.7	4.8	0.40	5.7	4.6	3.5		1.4	1.8	5.6	1.9	1.2	1.3	1.2		
Mercury as Hg	0.0060	<0.00050		0.0012		0.0012		0.0017		0.0008		0.0007		<0.00050		0.0		0.0014	0.00154		<0.00050		<0.00050			
Antimony (Sb)	0.020																									
Beryllium (Be)	NG																									
Cobalt (Co)	NG																									
Molybdenum (Mo)	NG																									
Nickel (Ni)	0.070																									
Selenium (Se)	0.040																									
Tin (Sn)	NG																									
Vanadium (V)	NG																									
Zinc (Zn)	5.0																									
Percentage balancing		138.3%		123.0%		186.3%		57.8%	140.4%	176.9%	118.9%	134.6%	137.4%	103.9%	133.0%	98.6%	133.3%	89.5%	114.3%	108.9%	88.9%	108.9%	101.2%			
Total Coliform Bacteria / 100 mℓ	DWAF																									
Faecal Coliform Bacteria / 100 mℓ *	5.0																									
E. coli / 100 mℓ	0																									
Heterotrophic Plate Count / mℓ *	0																									
	100																									

10 Valley 1: Leachate Tank

SANS 241

Date02-Mar-0410-Dec-0422-Apr-0521-Jul-0507-Oct-0526-Jan-0613-Apr-0604-Jul-0602-Oct-0625-Jan-0710-Apr-0711-Jul-0708-Oct-0728-Jan-0807-Apr-0810-Jul-0816-Oct-0807-Jan-0909-May-0911-Aug-0912-Oct-0921-Jan-1010-May-10

Infield Analysis

Temp °CNG
pH>5 or <9.7
EC [mS/m]170
TDS [ppm]1200
ORP [mV]NG

pH>5 or <9.77.77.78.28.28.29.17.98.08.08.48.08.17.68.28.48.38.48.08.28.08.28.28.3
Electrical conductivity (mS/m)170184921201292329421861570860118915917861028158911341074124022912253132018022460245510741401
Chemical Oxygen Demand as O2NG3101277318802560416226271114211623329841318388832411720200460466418802660425750043773251

Total Dissolved Solids1200129431611491561112014314
Alkalinity as CaCO3NG8400842010728516068806720
Ammonia as N1.56186026642187943
Nitrate as N11<0.05<0.050.500.901.1
Chloride as Cl300212227433653246961005062
Sulfate as SO4500571563219131159
Boron as B2.44.66.89.29.713
Fluoride as F1.5322528181623
Phosphate as PNG6.9803104.63.54.9
Sodium as Na200360038504464261534054305
Potassium as KNG822877538781919
Calcium as CaNG199992561308896
Magnesium as MgNG17610696133123121

Arsenic as As0.0100.1230.260.0920.440.67
Barium as Ba0.700.300.450.730.64
Cadmium as Cd0.0030<0.00100.0190.012<0.0050<0.0050
Total Chromium as Cr0.0500.8021.10.230.490.62
Hexalent Chromium as CrNG<0.010<0.010<0.010
Copper as Cu2.0<0.05<0.0250.038<0.025<0.025
Iron as Fe (Dissolved)
Iron as Fe (Total)0.591.73.16.87.7<0.025
Lead as Pb0.032<0.0500.100.0200.030
Manganese as Mn (Dissolved)
Manganese as Mn (Total)4.23.32.22.62.52.2
Mercury as Hg0.0060<0.00050<0.00200.00170.00400.0020
Antimony (Sb)0.020
Beryllium (Be)NG
Cobalt (Co)NG
Molybdenum (Mo)NG
Nickel (Ni)0.070
Selenium (Se)0.040
Tin (Sn)NG
Vanadium (V)NG
Zinc (Zn)5.0

Percentage balancing97.796.195.898.1

DWAF
Total Coliform Bacteria / 100 mℓ5.0
Faecal Coliform Bacteria / 100 mℓ *0
E. coli / 100 mℓ0
Heterotrophic Plate Count / mℓ *100

All values in mg/l, unless otherwise indicated.

10 Valley 1: Leachate Tank		SANS 241		Waterlab																	
Date		13-Jul-10	21-Oct-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15
Infield Analysis																					
Temp °C	NG																				
pH	>5 or <9.7																				
EC [mS/m]	170																				
TDS [ppm]	1200																				
ORP [mV]	NG																				
pH	>5 or <9.7	8.3	8.7	8.4	8.1	8.4	7.9	8.4	8.2	8.2	8.2	8.2	8.4	8.2	8.1	8.1	8.2	8.3	8.1	8.2	8.3
Electrical conductivity (mS/m)	170	2363	1545	1494	1220	1789	1189	1311	1831	907	2068	2360	2252	2002	2534	6060	1777	5880	2639	2702	2619
Chemical Oxygen Demand as O2	NG	4177	7225		7414	2905	1244	2366	6175	3284	5956	14563	7165	3473	5601	711	3633	19993	3455	8410	5638
Total Dissolved Solids	1200	15188					5483				12795				17295			35626			
Alkalinity as CaCO3	NG	8056					2095				3648				7090			12592			
Ammonia as N	1.5	668		504			3.0				0.048				1071			1528			
Nitrate as N	11	<0.057					2.9				<0.057				1.0			2.0			
Chloride as Cl	300	4895					1831				5490				6435			11868			
Sulfate as SO4	500	<0.132					<0.132				<0.13				<0.040			490			
Boron as B	2.4	13					5.5				10				11			12			
Fluoride as F	1.5	21					9.9				29				31			294			
Phosphate as P	NG	3.5					1.2				7.7				6.0			2.1			
Sodium as Na	200	4305					1815				4033				3810			9897			
Potassium as K	NG	999					421				892				1461			3171			
Calcium as Ca	NG	64					77				67				116			35			
Magnesium as Mg	NG	92					80				95				115			50			
Arsenic as As	0.010	0.76					<0.023				<0.023				<0.0070			0.41			
Barium as Ba	0.70	0.58					0.40				0.31				0.44			0.23			
Cadmium as Cd	0.0030	<0.0010					0.0020				<0.0010				<0.0010			<0.0010			
Total Chromium as Cr	0.050	0.63					0.12				0.52				0.28			0.55			
Hexalent Chromium as Cr	NG	0.12					<0.0080				<0.010				<0.0020			0.030			
Copper as Cu	2.0	0.46					0.031				0.021				<0.0010			<0.0010			
Iron as Fe (Dissolved)																					
Iron as Fe (Total)		2.2					8.4				0.60				3.2			1.2			
Lead as Pb		0.48					0.030				<0.0010				0.051			<0.0040			
Manganese as Mn (Dissolved)																					
Manganese as Mn (Total)		1.5					1.3				0.51				1.3			1.8			
Mercury as Hg	0.0060	<0.0010					<0.0010				<0.0010				<0.0010			<0.0070			
Antimony (Sb)	0.020																				
Beryllium (Be)	NG																				
Cobalt (Co)	NG																				
Molybdenum (Mo)	NG																				
Nickel (Ni)	0.070																				
Selenium (Se)	0.040																				
Tin (Sn)	NG																				
Vanadium (V)	NG																				
Zinc (Zn)	5.0																				
Percentage balancing		96.0					96.4				95.3				95.1			98.9			
Total Coliform Bacteria / 100 mℓ	DWAF																				
	5.0																				
Faecal Coliform Bacteria / 100 mℓ *	0																				
E. coli / 100 mℓ	0																				
Heterotrophic Plate Count / mℓ *	100																				

10 Valley 1: Leachate Tank		SANS 241																				
Date		08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	EnviroServ 16-Jan-17	09-Mar-17 Waterlab	09-Mar-17 Analytico	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	09-Apr-19	26-Jul-19	16-Oct-19
Infield Analysis																						
Temp °C	NG												22	25	21	17	22	26	23	18		
pH	>5 or <9.7												8.0	8.2	8.4	9.4	9.4	9.2	8.5	8.6		
EC [mS/m]	170												1450	2031	2603	2457	2571	3510	1841	1684		
TDS [ppm]	1200												7248	10160	13020	12290	12870	17550	9240	8760		
ORP [mV]	NG														-322	-366	345	-386				
pH	>5 or <9.7	8.2	8.0	7.9	7.9	7.9	7.6	7.8	7.5	7.6	7.7	7.7	7.7	8.0	8.3	8.4	8.5	8.4	8.4		8.5	8.4
Electrical conductivity (mS/m)	170	2124	5392	2582	3748	6330	6867	1592	826	850	2829	8336	1394	2125	2770	2954	3606	4200	2069		2431	2614
Chemical Oxygen Demand as O2	NG	4754	13877	8379	20480	17473	20155	1754	2 150		3762	33881	1224	859	1188	3302	4060	4803	3254		5898	4382
Total Dissolved Solids	1200	11849				57480			4 636			52670				15250					12260	
Alkalinity as CaCO3	NG	2092				12713			1 880			16388				8153					5386	
Ammonia as N	1.5	<0.0040				<0.010			166			3785				1242					640	
Nitrate as N	11	0.44				3.0			<0.10			4.7				<0.50					<0.50	
Chloride as Cl	300	5443				17528			1 784			21601				5752					4538	
Sulfate as SO4	500	435				<8.3			207			1351				134					119	
Boron as B	2.4	7.0				17						21				13					1.1	
Fluoride as F	1.5	39				28			10			17				11					<0.10	
Phosphate as P	NG	2.7				5.5			1.5			2.2				8.5					5.7	
Sodium as Na	200	3349				11520			1 167			11860				4538					3713	
Potassium as K	NG	979				3851			327			4174				1106					815	
Calcium as Ca	NG	185				175			123			329				95					104	
Magnesium as Mg	NG	93				321			87			446				133					91	
Arsenic as As	0.010	0.22				<0.020			0.014	0.026		1.2				<0.010					<0.010	
Barium as Ba	0.70	0.30				0.58			0.89	0.25		0.36				<0.010					0.020	
Cadmium as Cd	0.0030	<0.0020				0.030			<0.0030	<0.00040		0.050				<0.0020					<0.0020	
Total Chromium as Cr	0.050	0.087				0.91			0.047	0.049		1.1				<0.010					0.050	
Hexalent Chromium as Cr	NG	0.035				BDL			<0.010			<1.0				<1.0					<1.0	
Copper as Cu	2.0	<0.0020				<0.013			<0.010	<0.0030		0.22				<0.010					<0.010	
Iron as Fe (Dissolved)									0.70			<0.10				<0.10					<0.10	
Iron as Fe (Total)		0.87				0.17			101							1.5					2.0	
Lead as Pb		<0.0030				<0.015			0.031	<0.0030		<0.010				<0.010					<0.010	
Manganese as Mn (Dissolved)									2.7			1.4				<0.010					<0.010	
Manganese as Mn (Total)		2.2				3.1			9.2							1.3					4.4	
Mercury as Hg	0.0060	<0.0040				<0.027			0.0010	0.000059		<0.0010				<0.0010						
Antimony (Sb)	0.020									0.0068												
Beryllium (Be)	NG									<0.0010												
Cobalt (Co)	NG									0.0054												
Molybdenum (Mo)	NG									0.0069												
Nickel (Ni)	0.070									0.029												
Selenium (Se)	0.040									<0.0050												
Tin (Sn)	NG									<0.0050												
Vanadium (V)	NG									0.028												
Zinc (Zn)	5.0									<0.0050												
Percentage balancing		95.2							95.1													
Total Coliform Bacteria / 100 mℓ	DWAF 5.0																					
Faecal Coliform Bacteria / 100 mℓ *	0																					
E. coli / 100 mℓ	0																					
Heterotrophic Plate Count / mℓ *	100																					

All values in mg/l, unless otherwise indicated.

10 Valley 1: Leachate Tank		SANS 241																			
Date		15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis																					
Temp °C	NG								25	Could not sample	25	25	28	27	25	25	28	26	20	No Infield Results	22
pH	>5 or <9.7								8.2		7.7	7.9	7.6	7.7	7.5	7.4	7.6	7.6	7.8		7.7
EC [mS/m]	170								1680		1422	1170	728	740	1442	1321	1076	928	894		1349
TDS [ppm]	1200								8410		7110	5860	3640	3700	7400	6610	5300	4650	4480		6780
ORP [mV]	NG																				
pH	>5 or <9.7	8.1	8.0	8.2	8.6	7.9	7.9	8.3	8.1		7.5	7.8	7.6	7.8	7.9	7.7	8.0	7.8	7.9	7.7	7.6
Electrical conductivity (mS/m)	170	1882	2349	1716	1086	1596	2283	2268	1895		1879	2105	1633	1919	1720	1544	1559	1611	1630	1734	1318
Chemical Oxygen Demand as O2	NG	1798	2653	1508	147	310	3417	922	1079		841	2061	2037	2562	1381	1868	1260	730	2368	2137	1375
Total Dissolved Solids	1200		12290				12770				10910				9670				9190		
Alkalinity as CaCO3	NG		6919				7340				5826				5172				5676		
Ammonia as N	1.5		1054				1071				730				669				766		
Nitrate as N	11		<0.50				0.53				<0.50				<0.50				<0.50		
Chloride as Cl	300		3938				4209				2771				3052				2927		
Sulfate as SO4	500		BDL				<8.3				103				<8.3				18		
Boron as B	2.4		<0.030				5.1				9.4				0.030				<0.030		
Fluoride as F	1.5		0.29				0.39				0.20				27				24		
Phosphate as P	NG		9.5				8.4				7.6				6.5				8.4		
Sodium as Na	200		3737				3493				3192				2100				2635		
Potassium as K	NG		689				672				580				366				549		
Calcium as Ca	NG		66				96				65				64				75		
Magnesium as Mg	NG		90				103				86				71				99		
Arsenic as As	0.010		<0.010				<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70		0.35				0.31				0.050				<0.010				<0.010		
Cadmium as Cd	0.0030		<0.0020				<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050		0.29				0.21				0.080				<0.010				<0.010		
Hexalent Chromium as Cr	NG		<1.0				<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0		0.53				<0.010				0.030				<0.010				<0.010		
Iron as Fe (Dissolved)			3.4				1.5				1.2				<0.10				<0.10		
Iron as Fe (Total)			4.8				5.1				19				25				6.4		
Lead as Pb			<0.010				<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)			0.97				0.48				0.12				<0.010				<0.010		
Manganese as Mn (Total)			1.9				1.1				1.0				<0.010				1.1		
Mercury as Hg	0.0060		<0.00050				<0.00050				<0.00050				<0.010						
Antimony (Sb)	0.020																				
Beryllium (Be)	NG																				
Cobalt (Co)	NG																				
Molybdenum (Mo)	NG																				
Nickel (Ni)	0.070																				
Selenium (Se)	0.040																				
Tin (Sn)	NG																				
Vanadium (V)	NG																				
Zinc (Zn)	5.0																				
Percentage balancing																					
Total Coliform Bacteria / 100 mℓ	DWAF																				
Faecal Coliform Bacteria / 100 mℓ *	5.0																				
E. coli / 100 mℓ	0																				
Heterotrophic Plate Count / mℓ *	0																				
	100																				

All values in mg/l, unless otherwise indicated.

18 Valley 1: Leachate Draining Valley 1

Date	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Flow Rate (Litres / sec)	0.35	0.070	0.175	0.175	0.35	0.12	0.35																
Temp °C																							
pH																							
EC [mS/m]																							
TDS [ppm]																							
pH	8.1	8.9	8.1	8.4	8.3	8.6	8.1	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	1935	3763	2280	4180	2568	1130	3570																
Chemical Oxygen Demand as O2	2642	4987	1820	6685	3053	15268	5006																
Total Dissolved Solids		24784				6313																	
Alkalinity as CaCO3		9198				1916																	
Ammonia as N		1076				0.62																	
Nitrate as N		2.6				0.36																	
Chloride as Cl		8577				2084																	
Sulfate as SO4		220				552																	
Boron as B		30				4.7																	
Fluoride as F		38				39																	
Phosphate as P		7.4				0.87																	
Sodium as Na		7097				1947																	
Potassium as K		1585				338																	
Calcium as Ca		47				85																	
Magnesium as Mg		96				48																	
Arsenic as As		<0.0070				<0.010																	
Barium as Ba		0.57				0.15																	
Cadmium as Cd		<0.0010				<0.0020																	
Total Chromium as Cr		0.57				0.016																	
Hexalent Chromium as Cr		<0.0020				<0.0020																	
Copper as Cu		<0.0010				<0.0020																	
Iron as Fe (Dissolved)																							
Iron as Fe (Total)		5.2				2.3																	
Lead as Pb		<0.0040				<0.0030																	
Manganese as Mn (Dissolved)																							
Manganese as Mn (Total)		1.6				4.1																	
Mercury as Hg		<0.0070				<0.0040																	
Percentage balancing		99.6				95.9																	
All values in mg/l, unless otherwise indicated.																							

30 Valley 1: Seepage Collector under capping Area South	SANS 241	EnviroServ					North enters North enters leachate line from Valley 3														
		13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21
Flow Rate (Litres / sec)	NG		0.035	0.035	0.027	0.015	0.35	0.023	0.021	0.013	0.014	0.017	0.050	0.0250	0.009	0.050	0.009	0.015	0.042	0.018	0.018
Infield Analysis																					
Temp °C	NG						24	27	22	19	22	24	24	19							
pH	>5 or <9.7						7.6	8.1	8.0	8.7	8.7	8.5	7.8	8.0							
EC [mS/m]	170						653	4000	3642	4252	3672	2940	1359	1000 be recorded							
TDS [ppm]	1200						3264	20000	18260	21260	18390	14710	6800	in field							
ORP [mV]	NG								-90	-194	-32	-15									
pH	>5 or <9.7	8.2	7.8	7.6	8.0	8.2	7.3	8.0	8.1	7.8	8.0	7.9	7.8	8.0	8.1	7.9	7.9	7.9	7.8	8.2	8.0
Electrical conductivity (mS/m)	170	4759	3991	3205	4085	5046	670	4341	4016	4446	4352	3635	1534	4162	4459	3596	4390	2822	1455	1918	3584
Chemical Oxygen Demand as O2	NG	11681	3261	3678	3451	8338	689	2242	1547	5873	3307	4752	2988	5647	4484	3408	4266	1465	300	328	3252
Total Dissolved Solids	1200																				
Alkalinity as CaCO3	NG																				
Ammonia as N	1.5																				
Nitrate as N	11																				
Chloride as Cl	300																				
Sulfate as SO4	500																				
Boron as B	2.4																				
Fluoride as F	1.5																				
Phosphate as P	NG																				
Sodium as Na	200																				
Potassium as K	NG																				
Calcium as Ca	NG																				
Magnesium as Mg	NG																				
Arsenic as As	0.010																				
Barium as Ba	0.70																				
Cadmium as Cd	0.0030																				
Total Chromium as Cr	0.050																				
Hexalent Chromium as Cr	NG																				
Copper as Cu	2.0																				
Iron as Fe (Dissolved)	2.0																				
Iron as Fe (Total)																					
Lead as Pb	0.010																				
Manganese as Mn (Dissolved)	0.40																				
Manganese as Mn (Total)																					
Mercury as Hg	0.0060																				
Percentage balancing																					
All values in mg/l, unless otherwise indicated.																					

30 Valley 1: Seepage Collector under capping Area South		SANS 241													
		14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)	NG	0.0109	0.0109	0.3500	0.0025	0.0012		0.0064	0.0036				Dry	0.0016	0.0011
Infield Analysis		Not recorded													
Temp °C	NG		26	23	21	23	29	25	19	23	23	23		20	22
pH	>5 or <9.7		8.0	8.0	8.3	8.4	8.1	8.3	7.9	7.8	7.9	8.1		7.8	8.0
EC [mS/m]	170		472	1310		1804	955	1077	1893	666	264	1311		471	683
TDS [ppm]	1200		9460	6550		9020	4770	5360	9480	3330	1320	6580		2350	3440
ORP [mV]	NG														
pH	>5 or <9.7	7.9	7.7	7.8	8.1	8.2	8.1	8.1	7.9	7.7	7.0	6.5		7.3	7.5
Electrical conductivity (mS/m)	170	1772	1036	1609	3191	3623	2544	3310	2292	687	362	2440		530	643
Chemical Oxygen Demand as O2	NG	1019	240	1689	4078	6991	1918	5630	2757	242	81	1777		406	562
Total Dissolved Solids	1200														
Alkalinity as CaCO3	NG														
Ammonia as N	1.5														
Nitrate as N	11														
Chloride as Cl	300														
Sulfate as SO4	500														
Boron as B	2.4														
Fluoride as F	1.5														
Phosphate as P	NG														
Sodium as Na	200														
Potassium as K	NG														
Calcium as Ca	NG														
Magnesium as Mg	NG														
Arsenic as As	0.010														
Barium as Ba	0.70														
Cadmium as Cd	0.0030														
Total Chromium as Cr	0.050														
Hexalent Chromium as Cr	NG														
Copper as Cu	2.0														
Iron as Fe (Dissolved)	2.0														
Iron as Fe (Total)															
Lead as Pb	0.010														
Manganese as Mn (Dissolved)	0.40														
Manganese as Mn (Total)															
Mercury as Hg	0.0060														
Percentage balancing															
All values in mg/l, unless otherwise indicated.															

20 Valley 2: Leachate Collection 1		SANS 241																							
Date		24-Jul-14	26-Jan-15	12-Oct-15	03-Apr-16	13-Jul-16	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	
Flow Rate (Litres / sec)	NG																			0.125	Position moved Cent		Position moved		
Infield Analysis																									
Temp °C	NG							50	49	48	46	46	46	44	45									35	
pH	>5 or <9.7							7.3	7.6	7.9	8.2	8.5	8.3	7.9	8.0									7.9	
EC [mS/m]	170							-	-	-	-	8728	-												
TDS [ppm]	1200							-	-	-	-	43740	-												
ORP [mV]	NG									-410	-437	-410	-419												
pH	>5 or <9.7	7.9	8.0	8.0	8.0	8.1	7.8	7.4	7.9	8.4	8.4	8.3	8.2	8.2	8.5	8.3	8.3	8.4	8.3	8.0	8.4	8.5	8.4	8.1	
Electrical conductivity (mS/m)	170	8240	7200	5903	7282	8538	10480	5400	9430	9193	9254	10053	9623	7039	9134	8538	7477	7853	7459	4901	5115	6914	3496	3148	
Chemical Oxygen Demand as O2	NG	40449	43054	29838	97797	41734	70882	7964	38536	24072	29194	19966	11270	17481	11414	19750	13631	11554	9024	13024	5365	5787	5295	2266	
Total Dissolved Solids	1200	57424				58480	71090				62420				60740							51315			
Alkalinity as CaCO3	NG	18060				16973	20171				21232				12159							15344			
Ammonia as N	1.5	3257				<0.010	5104				4275				2167							3078			
Nitrate as N	11	18				<0.50	<0.50				4.4				3.0							<0.50			
Chloride as Cl	300	19854				20268	31210				24847				25124							17231			
Sulfate as SO4	500	2991				2591	4849				862				1524							<8.3			
Boron as B	2.4	12				20	23				26				1.9							11.4			
Fluoride as F	1.5	22				12	1.7				1.2				0.98							<0.10			
Phosphate as P	NG	9.1				7.2	4.4				4.7				2.5							1.2			
Sodium as Na	200	14966				15040	15500				15329				14030							8551			
Potassium as K	NG	3852				5651	5611				4837				4765							2732			
Calcium as Ca	NG	286				132	898				41				30							41			
Magnesium as Mg	NG	113				435	692				368				296							304			
Arsenic as As	0.010	0.059				<0.020	1.3				<0.010				<0.010							<0.010			
Barium as Ba	0.70	0.41				0.19	0.24				<0.010				0.020							1.4			
Cadmium as Cd	0.0030	<0.0010				0.040	0.040				<0.0020				<0.0020							<0.0020			
Total Chromium as Cr	0.050	0.56				1.3	1.2				<0.010				0.070							0.30			
Hexalent Chromium as Cr	NG	<0.0020				<0.0020	<1.0				<1.0				1.2							<1.0			
Copper as Cu	2.0	<0.0010				0.020	0.18				<0.010				<0.010							<0.010			
Iron as Fe (Dissolved)	2.0	1.2				0.11	0.11				<0.10				<0.10							0.15			
Iron as Fe (Total)											0.82				0.85							1.6			
Lead as Pb	0.010	0.11				<0.015	<0.010				<0.010				0.010							<0.010			
Manganese as Mn (Dissolved)	0.40	2.7				3.4	1.2				<0.010				0.51							0.70			
Manganese as Mn (Total)											1.1				0.82							0.87			
Mercury as Hg	0.0060	<0.0070				<0.027	<0.0010				<0.0010											<0.00050			
Percentage balancing		99.1																							
All values in mg/l, unless otherwise indicated.																									

All values in mg/l, unless otherwise indicated.

21 Valley 2: Leachate Collection 2

SANS 241

Date		24-Jul-14	26-Jan-15	12-Oct-15	03-Apr-16	13-Jul-16	09-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	12-Jan-22
Flow Rate (Litres / sec)	NG																				0.250	Position moved. Cant be measured	Position moved. Cant be measured	
Infield Analysis																								
Temp °C	NG								48	49	46	45	42	44	44	42						24		39
pH	>5 or <9.7								7.6	7.8	7.9	8.4	8.6	8.5	8.0	8.2						6.5		8.0
EC [mS/m]	170								-	-	-	9038	8906	7745								273		
TDS [ppm]	1200								-	-	-	45240	44630	38820								1370		
ORP [mV]	NG										-411	-435	-417	-420										
pH	>5 or <9.7	7.8	8.1	8.0	8.2	8.2	8.0	7.9	7.5	8.1	8.4	8.4	8.3	8.4	8.4	7.4	8.5	8.4	8.5	8.4	8.2	6.7	8.5	8.0
Electrical conductivity (mS/m)	170	8750	7120	8676	7185	8843	9 640	10698	6521	9535	9436	9843	10186	9453	7393	8499	8355	6869	7565	7583	5020	274	5183	3412
Chemical Oxygen Demand as O2	NG	45494	42055	31364	70074	44202	33 466	38049	8530	30391	25404	21855	33302	13729	18032	9156	19624	9642	15326	8967	7207	146	8716	2398
Total Dissolved Solids	1200	61224				59790	78 700	71070				68040				56840							28890	
Alkalinity as CaCO3	NG	20027				17119	12 800	20439				15398				10760							10582	
Ammonia as N	1.5	3786				<0.010	4 848	5148				4355				1813							2117	
Nitrate as N	11	17				<0.50	<0.10	<0.50				24				2.6							<0.50	
Chloride as Cl	300	21301				20910	32 447	31348				26612				24608							12002	
Sulfate as SO4	500	3200				2707	7 257	4556				784				938							267	
Boron as B	2.4	13				20		18				25				1.7							6.6	
Fluoride as F	1.5	29				14	18	1.7				2.6				0.51							0.92	
Phosphate as P	NG	11				6.8	1.1	6.2				5.6				2.00							0.97	
Sodium as Na	200	14745				15970	4 695	15610				15778				13470							6041	
Potassium as K	NG	4276				5717	8 656	5778				5667				4738							1767	
Calcium as Ca	NG	300				117	1 132	352				59				24							18.8	
Magnesium as Mg	NG	140				385	1 074	699				428				224							163	
Arsenic as As	0.010	1.4				0.080	2.0	1.2				<0.010				<0.010							<0.010	
Barium as Ba	0.70	0.63				0.25	0.42	0.26				<0.010				0.020							1.1	
Cadmium as Cd	0.0030	<0.0010				0.040	<0.0030	0.030				<0.0020				<0.0020							<0.0020	
Total Chromium as Cr	0.050	0.82				1.2	1.3	1.0				<0.010				0.060							0.18	
Hexalent Chromium as Cr	NG	<0.0020				BDL	<0.010	<1.0				<1.0				<1.0							<1.0	
Copper as Cu	2.0	<0.0010				<0.013	<0.010	0.23				<0.010				<0.010							<0.010	
Iron as Fe (Dissolved)	2.0						<0.025	0.50				<0.10				0.37							0.21	
Iron as Fe (Total)		1.1				0.11	0.59					3.6				1.4							2.7	
Lead as Pb	0.010	<0.0040				<0.015	<0.010	<0.010				<0.010				0.010							<0.010	
Manganese as Mn (Dissolved)	0.40						9.3	2.2				<0.010				0.12							0.62	
Manganese as Mn (Total)		4.5				4.1	9.6					3.6				0.89							1.2	
Mercury as Hg	0.0060	<0.0070				<0.027	0.0030	<0.0010				<0.0010											<0.00050	
Antimony (Sb)																								
Beryllium (Be)																								
Cobalt (Co)																								
Molybdenum (Mo)																								
Nickel (Ni)																								
Selenium (Se)																								
Tin (Sn)																								
Vanadium (V)																								
Zinc (Zn)																								
Percentage balancing		98.9					81.8																	
Total Coliform Bacteria / 100 mℓ							0																	
Faecal Coliform Bacteria / 100 mℓ *							0																	
E. coli / 100 mℓ							0																	
Heterotrophic Plate Count / mℓ *							100																	

All values in mg/l, unless otherwise indicated.

21 Valley 2: Leachate Collection 2		SANS 241											
Date		04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)	NG					0.17	0.17			0.25	0.17	0.25	0.25
Infield Analysis													
Temp °C	NG	42	38	39	39	37	36	37	37	35	37	37	23
pH	>5 or <9.7	7.6	8.0	7.9	7.7	7.9	7.7	7.7	7.5	7.8	7.8	7.8	8.1
EC [mS/m]	170			High	1457	1655	High	High	High	High	1828	1796	High
TDS [ppm]	1200			High	7710	8270	High	High	High	High	9250	8510	High
ORP [mV]	NG												
pH	>5 or <9.7	7.7	8.2	8.0	7.8	8.0	8.1	7.9	7.7	8.2	8.2	8.2	7.9
Electrical conductivity (mS/m)	170	3116	5010	5275	4099	4758	3767	3392	3576	4696	4435	3873	3988
Chemical Oxygen Demand as O2	NG	2574	6211	10489	8474	7987	3061	1868	3576	4551	6383	3132	2094
Total Dissolved Solids	1200		33590				21120				25930		
Alkalinity as CaCO3	NG		10626				8543				13318		
Ammonia as N	1.5		<0.010				1516				2558		
Nitrate as N	11		<0.50				<0.010				<0.50		
Chloride as Cl	300		10932				9058				10494		
Sulfate as SO4	500		<3.0				394				13		
Boron as B	2.4		11				0.040				<0.030		
Fluoride as F	1.5		15.5				0.97				0.84		
Phosphate as P	NG		1.8				1.8				3.0		
Sodium as Na	200		7978				5061				7170		
Potassium as K	NG		1896				1303				2067		
Calcium as Ca	NG		48				58				76		
Magnesium as Mg	NG		271				205				313		
Arsenic as As	0.010		<0.010				<0.010				<0.010		
Barium as Ba	0.70		0.10				<0.010				<0.010		
Cadmium as Cd	0.0030		<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050		<0.010				<0.010				<0.010		
Hexalent Chromium as Cr	NG		<1.0				<1.0				<1.0		
Copper as Cu	2.0		<0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0		<0.10				<0.10				<0.10		
Iron as Fe (Total)			4.6				<0.10				1.0		
Lead as Pb	0.010		<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40		2.2				<0.010				<0.010		
Manganese as Mn (Total)			2.9				<0.010				1.2		
Mercury as Hg	0.0060		<0.00050				<0.010						
Antimony (Sb)													
Beryllium (Be)													
Cobalt (Co)													
Molybdenum (Mo)													
Nickel (Ni)													
Selenium (Se)													
Tin (Sn)													
Vanadium (V)													
Zinc (Zn)													
Percentage balancing													
Total Coliform Bacteria / 100 mℓ													
Faecal Coliform Bacteria / 100 mℓ *													
E. coli / 100 mℓ													
Heterotrophic Plate Count / mℓ *													
All values in mg/l, unless otherwise indicated.													

28 Valley 2: Leachate Tank		SANS 241																					
Date		08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24
Infield Analysis		Not recorded																					
Temp °C	NG	34	38									34	33	28	30	34	31	23	28	30	28	25	27
pH	>5 or <9.7	8.2	8.3									7.8	8.2	8.3	8.4	8.0	8.1	8.1	8.0	7.7	8.1	8.2	8.0
EC [mS/m]	170														High	1411	High	High	1717	1778	High	High	1575
TDS [ppm]	1200														High	7200	High	High	570	8910	High	High	7890
ORP [mV]	NG																						
pH	>5 or <9.7	8.2	8.3	8.4	8.2	8.4	8.1	7.8	8.4	8.7	7.8	8.0	8.2	8.3	8.3	8.0	8.2	8.2	8.1	7.9	8.3	8.4	8.2
Electrical conductivity (mS/m)	170	6159	8789	8411	6079	6967	5341	2396	4142	5895	439	2479	3433	4520	4909	3247	4202	3592	2089	2562	4509	4019	2670
Chemical Oxygen Demand as O2	NG	1389	19330	19177	8005	9622	1517	7266	1067	12204	31	1568	6442	5260	10171	2669	6958	2350	1749	3837	4659	5057	1653
Total Dissolved Solids		1200	53150			40930				33580				36185				23810				24130	
Alkalinity as CaCO3		NG	12094			14806				11730				8903				6023				11403	
Ammonia as N		1.5	2015			2721				2219				1635				8.8				2270	
Nitrate as N		11	3.0			<0.50				<0.50				<0.50				<0.50				<0.50	
Chloride as Cl		300	25099			17368				13834				8840				9601				9576	
Sulfate as SO4		500	855			BDL				794				280				566				38	
Boron as B		2.4	2.0			<0.030				8.2				6.5				<0.030				<0.030	
Fluoride as F		1.5	0.66			0.51				BDL				0.90				18				0.78	
Phosphate as P		NG	2.4			1.9				1.2				1.7				4.4				5.3	
Sodium as Na		200	13890			11590				7966				4615				4975				6872	
Potassium as K		NG	4855			3487				2395				1230				1237				2196	
Calcium as Ca		NG	32			23				24				17.2				221				89	
Magnesium as Mg		NG	273			297				204				179				229				339	
Arsenic as As		0.010	<0.010			<0.010				<0.010				<0.010				<0.010				<0.010	
Barium as Ba		0.70	0.020			1.3				1.2				<0.010				0.010				<0.010	
Cadmium as Cd		0.0030	<0.0020			<0.0020				<0.0020				<0.0020				<0.0020				<0.0020	
Total Chromium as Cr		0.050	0.070			0.22				0.19				0.19				<0.010				<0.010	
Hexalent Chromium as Cr		NG	<1.0			<1.0				<1.0				<1.0				<1.0				<1.0	
Copper as Cu		2.0	<0.010			0.64				0.010				<0.010				<0.010				<0.010	
Iron as Fe (Dissolved)		2.0	0.38			0.71				0.22				<0.10				<0.10				<0.10	
Iron as Fe (Total)			6.9			7.3				11.0				1.8				8.8				41	
Lead as Pb		0.010	<0.010			<0.010				<0.010				<0.010				<0.010				<0.010	
Manganese as Mn (Dissolved)		0.40	0.10			1.6				0.65				<0.010				<0.010				<0.010	
Manganese as Mn (Total)			0.86			1.8				1.6				0.87				<0.010				2.0	
Mercury as Hg		0.0060				<0.00050				<0.00050				<0.00050				<0.010					
Percentage balancing																							
All values in mg/l, unless otherwise indicated.																							

28 Valley 2: Leachate Tank		SANS 241	
Date		21-Jan-25	
Infield Analysis			
Temp °C	NG	28	
pH	>5 or <9.7	8.4	
EC [mS/m]	170	High	
TDS [ppm]	1200	High	
ORP [mV]	NG		
pH	>5 or <9.7	8.2	
Electrical conductivity (mS/m)	170	3152	
Chemical Oxygen Demand as O2	NG	4279	
Total Dissolved Solids	1200		
Alkalinity as CaCO3	NG		
Ammonia as N	1.5		
Nitrate as N	11		
Chloride as Cl	300		
Sulfate as SO4	500		
Boron as B	2.4		
Fluoride as F	1.5		
Phosphate as P	NG		
Sodium as Na	200		
Potassium as K	NG		
Calcium as Ca	NG		
Magnesium as Mg	NG		
Arsenic as As	0.010		
Barium as Ba	0.70		
Cadmium as Cd	0.0030		
Total Chromium as Cr	0.050		
Hexalent Chromium as Cr	NG		
Copper as Cu	2.0		
Iron as Fe (Dissolved)	2.0		
Iron as Fe (Total)			
Lead as Pb	0.010		
Manganese as Mn (Dissolved)	0.40		
Manganese as Mn (Total)			
Mercury as Hg	0.0060		
Percentage balancing			
All values in mg/l, unless otherwise indicated.			

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX B

LEACHATE – ORGANIC WATER QUALITY DATA

10 Valley 1: Leachate Tank		LOD	Screening guideline	LT (10) Jul-05	LT (10) Jul-06	LT (10) Jul-07	LT (10) Jul-08	LT (10) Aug-09	LT (10) Jul-10	LT (10) Jul-11	LT (10) Jul-12	LT (10) Jul-13	LT (10) Jul-14	LT (10) Jul-15	LT (10) Jul-16 NOD	LT (10) Mar-17	LT (10) Jul-17	LT (10) Jul-18	LT (10) Jul-19	LT (10) Jul-20	LT (10) Jul-21	LT (10) Jul-22	LT (10) Jul-23	LT (10) Jul-24
VOC MS																								
Dichlorodifluoromethane	ug/l	<2.0	200 ^																	<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10																		<0.10	<0.10	3.4	<0.10	<0.10
Chloromethane SA	ug/l	<3.0	190 ^																	-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$			15														<0.10	<0.10	4.5	1.6	<0.10
Bromomethane	ug/l	<1.0	7.5 ^																	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane SA	ug/l	<3.0	21 000 ^																	-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane SA	ug/l	<3.0	1100 ^																	-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3.0	10 \$																	-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) SA	ug/l	<5.0	1000 \$																	-	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene SA	ug/l	<3.0	20 \$																	-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane SA	ug/l	<3.0	900 \$																	-	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene SA	ug/l	<3.0	20 \$			13	2.0													-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0																		<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane SA	ug/l	<2.0	83 ^																	-	<2.0	<2.0	<2.0	<2.0
Chloroform SA (Trichloromethane)	ug/l	<2.0	400 \$																	-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane SA	ug/l	<2.0	300 \$																	-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene SA	ug/l	<3.0	NG																	-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2.0	10 \$																	-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane SA	ug/l	<2.0	400 \$																	-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$				5.0					11				0.22				2.6	11	42	21	13
Trichloroethene (TCE) SA	ug/l	<3.0	500 \$																	-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane SA	ug/l	<2.0	0.44 ^																	-	<2.0	<2.0	<2.0	<2.0
Dibromomethane SA	ug/l	<3.0	8.0 ^																	-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane SA	ug/l	<2.0	60 !																	-	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$																	-	<2.0	<2.0	<2.0	<2.0
Toluene SA	ug/l	<5.0	1000 \$	1.0		430	170	88	130	36	250	140	270	28		0.82	35		33	<2.0	<2.0	<2.0	<2.0	<2.0
trans-1-3-Dichloropropene	ug/l	<2.0																		-	69	301	93	36
1,1,2-Trichloroethane SA	ug/l	<2.0	130 \$																	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) SA	ug/l	<3.0	40 \$																	-	<2.0	<2.0	<2.0	<2.0
1,3-Dichloropropane SA	ug/l	<2.0	370 ^																	-	<3.0	<3.0	<3.0	<3.0
Dibromochloromethane SA	ug/l	<2.0	100 !																	-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane SA	ug/l	<2.0	0.0075 ^																	-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene SA	ug/l	<2.0	180 \$			99	37	25	28	28	25	12								-	<2.0	29	<2.0	<2.0
1,1,1,2-Tetrachloroethane SA	ug/l	<2.0	0.57 ^																	-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene SA	ug/l	<1.0	150 \$			330	180	69	200	30	370	100		20		2.0	33		55	-	29	497	123	46
p/m-Xylene SA	ug/l	<2.0	70 \$ (sum)			610	390	160	360	44	110	180		32		0.38		42	79	-	60	836	253	94
o-Xylene SA	ug/l	<1.0	70 \$ (sum)			200	110	46	98	11		52				0.20		13	48	-	20	211	69	34
Styrene	ug/l	<2.0	300 \$															4.0		<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform SA	ug/l	<2.0																		-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene SA	ug/l	<3.0	660 ^				8.0													-	<2.0	11	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																	<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene SA	ug/l	<2.0	62 ^																	-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane SA	ug/l	<3.0	88 ^																	-	<3.0	<3.0	<3.0	<3.0
Propylbenzene SA	ug/l	<3.0	660 ^															2.0		-	<3.0	14	<3.0	<3.0
2-Chlorotoluene SA	ug/l	<3.0	240 ^																	-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene SA	ug/l	<3.0	120 ^									17						4.0	31	-	<3.0	46	10	<3.0
4-Chlorotoluene SA	ug/l	<3.0	250 ^																	-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene SA	ug/l	<3.0	690 ^																	-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene SA	ug/l	<3.0	15 ^			130	92	40	81	13	76	29						10	37	-	7.0	193	49	19
sec-Butylbenzene SA	ug/l	<3.0	2000 ^				5.0													-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene SA	ug/l	<3.0					4.0			12	11							1.0		-	<3.0	43	9.0	6.0
1,3-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)																	-	4.0	5.0	<3.0	<3.0
1,4-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)			13	7.0		10											-	<3.0	40	<3.0	7.0
n-Butylbenzene SA	ug/l	<3.0	1000 ^				4.0													-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)																	-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)														39			<3.0	<3.0	10	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^																	<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$			21	3.0		16		26							3.0	38	4.0	13	21	10	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																	<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0																		99	151	92	101	92
Surrogate Recovery 4-Bromofluorobenzene	%	<0																		111	133	96	95	104
Dutch Intervention Limits \$																								
USEPA Region 3 ^																								
NOD - No Organics Detected																								

[illegible]

20 Valley 2: Leachate Collection 1			LOD	Screening guideline	20 Jul-14	20 Jul-16	20 Jul-17	20 Jul-18	20 Jul-19	20 Jul-20	20 Jul-21	20 Jul-22	20 Jul-23	20 Jul-24
VOC MS														
Dichlorodifluoromethane	ug/l	<2.0	200^								<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10									<0.10	24	32	24
Chloromethane SA	ug/l	<3.0	190 ^								<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$								<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^								<1.0	<1.0	<1.0	<1.0
Chloroethane SA	ug/l	<3.0	21 000 ^								<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane SA	ug/l	<3.0	1100 ^								<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3.0	10 \$								<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) SA	ug/l	<5.0	1000 \$								<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene SA	ug/l	<3.0	20 \$								<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane SA	ug/l	<3.0	900 \$								<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene SA	ug/l	<3.0	20 \$								<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0									<1.0	<1.0	<1.0	<1.0
Bromochloromethane SA	ug/l	<2.0	83 ^								<2.0	<2.0	<2.0	<2.0
Chloroform SA (Trichloromethane)	ug/l	<2.0	400 \$								<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane SA	ug/l	<2.0	300 \$								<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene SA	ug/l	<3.0	NG								<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2.0	10 \$								<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane SA	ug/l	<2.0	400 \$								<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$								<0.50	1.0	<0.50	1.2
Trichloroethene (TCE) SA	ug/l	<3.0	500 \$								<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane SA	ug/l	<2.0	0.44 ^								<2.0	<2.0	<2.0	<2.0
Dibromomethane SA	ug/l	<3.0	8.0 ^								<3.0	<3.0	<3.0	<3.0
Bromodichloromethane SA	ug/l	<2.0	60 !								<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$								<2.0	<2.0	<2.0	<2.0
Toluene SA	ug/l	<5.0	1000 \$	3.0	11	49	5.0				<5.0	11	20	15
trans-1-3-Dichloropropene	ug/l	<2.0									<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane SA	ug/l	<2.0	130 \$								<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) SA	ug/l	<3.0	40 \$								<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane SA	ug/l	<2.0	370 ^								<2.0	<2.0	<2.0	<2.0
Dibromochloromethane SA	ug/l	<2.0	100 !								<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane SA	ug/l	<2.0	0.0075 ^								<2.0	<2.0	<2.0	<2.0
Chlorobenzene SA	ug/l	<2.0	180 \$								<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane SA	ug/l	<2.0	0.57 ^								<2.0	<2.0	<2.0	<2.0
Ethylbenzene SA	ug/l	<1.0	150 \$	2.0	13		4.0				2.0	4.0	6.0	5.0

Z1 Valley 2: Leachate Collection 2			LOD	Screening guideline	21 Jul-14 NOD	21 Jul-15 Tank Full	21 Jul-16	21 Mar-17	21 Jul-17	21 Aug-18 NOD	21 Jul-19	21 Jul-20	21 Jul-21	21 Jul-22	21 Jul-23	21 Jul-24
VOC MS																
Dichlorodifluoromethane	ug/l	<2.0	200^									<2.0	<2.0	<2.0	<2.0	
Methyl Tertiary Butyl Ether	ug/l	<0.10										<0.10	23	25	22	
Chloromethane ^{SA}	ug/l	<3.0	190 ^									<3.0	<3.0	<3.0	<3.0	
Vinyl Chloride	ug/l	<0.10	5.0 \$									<0.10	<0.10	<0.10	<0.10	
Bromomethane	ug/l	<1.0	7.5 ^									<1.0	<1.0	<1.0	<1.0	
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^									<3.0	<3.0	<3.0	<3.0	
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^									<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$									<3.0	<3.0	<3.0	<3.0	
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$									<5.0	<5.0	<5.0	<5.0	
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$									<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$									<3.0	<3.0	<3.0	<3.0	
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$				3.3					<3.0	<3.0	<3.0	<3.0	
2,2-Dichloropropane	ug/l	<1.0										<1.0	<1.0	<1.0	<1.0	
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^									<2.0	<2.0	<2.0	<2.0	
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$									<2.0	<2.0	<2.0	<2.0	
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$									<2.0	<2.0	<2.0	<2.0	
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG									<3.0	<3.0	<3.0	<3.0	
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$									<2.0	<2.0	<2.0	<2.0	
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$									<2.0	<2.0	<2.0	<2.0	
Benzene	ug/l	<0.50	30 \$				2.2					<0.50	<0.50	<0.50	<0.50	
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$				0.50					<3.0	<3.0	<3.0	<3.0	
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^						1.0			<2.0	<2.0	<2.0	<2.0	
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^									<3.0	<3.0	<3.0	<3.0	
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !									<2.0	<2.0	<2.0	<2.0	
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$									<2.0	<2.0	<2.0	<2.0	
Toluene ^{SA}	ug/l	<5.0	1000 \$			15	97		18			10	13	11	11	
trans-1-3-Dichloropropene	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$									<2.0	<2.0	<2.0	<2.0	
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$				0.61					<3.0	<3.0	<3.0	<3.0	
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^									<2.0	<2.0	<2.0	<2.0	
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !									<2.0	<2.0	<2.0	<2.0	
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^									<2.0	<2.0	<2.0	<2.0	
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$									<2.0	<2.0	<2.0	<2.0	
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^									<2.0	<2.0	<2.0	<2.0	
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$			19	49		15		26	4.0	5.0	4.0	4.0	
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)				4.0	46			28	9.0	9.0	7.0	7.0	
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)					29	7.0		36	6.0	9.0	7.0	5.0	
Styrene	ug/l	<2.0	300 \$			3.0			2.0			<2.0	<2.0	<2.0	<2.0	
Bromoform ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^					0.34				<3.0	<3.0	<3.0	<3.0	
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^									<4.0	<4.0	<4.0	<4.0	
Bromobenzene ^{SA}	ug/l	<2.0	62 ^									<2.0	<2.0	<2.0	<2.0	
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^									<3.0	<3.0	<3.0	<3.0	
Propylbenzene ^{SA}	ug/l	<3.0	660 ^					0.24				<3.0	<3.0	<3.0	<3.0	
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^									<3.0	<3.0	<3.0	<3.0	
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^					0.86				<3.0	<3.0	<3.0	<3.0	
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^									<3.0	<3.0	<3.0	<3.0	
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^									<3.0	<3.0	<3.0	<3.0	
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^					4.2				<3.0	<3.0	<3.0	<3.0	
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^									<3.0	<3.0	<3.0	<3.0	
4-Isopropyltoluene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^									<3.0	<3.0	<3.0	<3.0	
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	
1,2-Dibromo-3-chloropropane	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)	10 \$					5.0			<3.0	<3.0	<3.0	<3.0	
Hexachlorobutadiene	ug/l	<3.0	0.30 ^									<3.0	<3.0	<3.0	<3.0	
Naphthalene	ug/l	<2.0	70 \$	70 \$					8.0			5.0	2.0	<2.0	<2.0	
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)									<3.0	<3.0	<3.0	<3.0	
Surrogate Recovery Toluene D8	%	<0										141	94	97	92	
Surrogate Recovery 4-Bromofluorobenzene	%	<0										132	99	100	97	
Dutch Intervention Limits \$																
USEPA Region 3 ^																
NOD - No Organics Detected																

28 Valley 2: Leachate Tank		LOD	Screening guideline	28 Jul-13 NOD	28 Jul-14 NOD	28 Jul-15	28 Jul-17	28 Jul-18	28 Jul-19	28 Jul-20	28 Jul-21	28 Jul-22	28 Jul-23	28 Jul-24
VOC MS														
Dichlorodifluoromethane	ug/l	<2.0	200^							<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10								<0.10	<0.10	8.5	11	10
Chloromethane ^{SA}	ug/l	<3.0	190 ^							-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$							<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^							<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^							-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^							-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$							-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$							-	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$							-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$							-	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$							-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0								<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^							-	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$							-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$							-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG							-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$							-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$							-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$							<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$							-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^							-	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^							-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !							-	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$			3.0	55	2.0		<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$							-	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0								<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$							-	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$							-	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^							-	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !							-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^							-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$							-	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^							-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$			4.0	44	5.0		-	<1.0	2.0	2.0	2.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)					11	3.0	-	<2.0	3.0	3.0	4.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)					5.0	4.0	-	<1.0	3.0	3.0	3.0
Styrene	ug/l	<2.0	300 \$					4.0	3.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0								-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^							-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^							<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^							-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^							-	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^							-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^							-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^							-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^							-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^							-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^						3.0	-	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^							-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0								-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)							-	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)							-	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^							-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)							-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0							2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)							<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^							<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$						4.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)							<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0								105	142	93	100	93
Surrogate Recovery 4-Bromofluorobenzene	%	<0								101	131	98	93	98

Dutch Intervention Limits \$

USEPA Region 3 ^

NOD - No Organics Detected

ENVIROSERV

**SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025**

Report: JW112/25/B196-25-Rev 0

APPENDIX C

LEACHATE/LEAKAGE DETECTION – INORGANIC WATER QUALITY DATA

2 Valley 1: LD4S

SANS 241

Date22-Apr-0521-Jul-0507-Oct-0526-Jan-0613-Apr-0604-Jul-0602-Oct-0625-Jan-0710-Apr-0711-Jul-0708-Oct-0720-Jan-0807-Apr-08

Flow Rate (Litres / sec)0.00640.00350.00330.00140.00360.00130.00083

Infield Analysis

Temp °CNG
pH>5 or <9.7
EC [mS/m]170
TDS [ppm]1200
ORP [mV]NG

pH	>5 or <9.7	7.8	7.1	8.1	7.3	8.0	7.8	8.2	7.9	8.4	8.5	8.1	8.0	8.2
Electrical conductivity (mS/m)	170	748	852	896	2034	1674	1198	1530	2317	1137	2024	2814	2469	2406
Chemical Oxygen Demand as O2	NG	680	480	1387	995	2030	2645	2117	5292	4441	4471	6587	4067	4467

All values in mg/l, unless otherwise indicated.

2 Valley 1: LD4S		SANS 241		
Date		10-Jul-08	16-Oct-08	07-Jan-09
Flow Rate (Litres / sec)		0.0033	0.0064	0.0078
Infield Analysis				
Temp °C	NG			
pH	>5 or <9.7			
EC [mS/m]	170			
TDS [ppm]	1200			
ORP [mV]	NG			
pH	>5 or <9.7	8.1	8.0	7.9
Electrical conductivity (mS/m)	170	3580	3744	3511
Chemical Oxygen Demand as O2	NG	6133	7696	4280
All values in mg/l, unless otherwise indicated.				

2 Valley 1: LD4S

SANS 241

Date	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12
Flow Rate (Litres / sec)	0.0045	0.0033	0.0041	0.0050	0.0041	0.0038	0.0057	0.0033	0.0036	0.0036	0.0035	0.0095

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG

pH	>5 or <9.7	8.1	8.1	8.1	7.7	8.2	8.6	7.9	7.8	8.2	8.1	7.9	7.7
Electrical conductivity (mS/m)	170	2761	2995	1543	2993	2983	3303	2464	3166	3820	3486	2952	1853
Chemical Oxygen Demand as O2	NG	3940	3981	6536	4661	4370	2911	5922	4580	5058	5265	5013	3175

All values in mg/l, unless otherwise indicated.

2 Valley 1: LD4S		SANS 241			
Date		19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013
Flow Rate (Litres / sec)		0.0036	0.0104	0.0076	0.0058
Infield Analysis					
Temp °C	NG				
pH	>5 or <9.7				
EC [mS/m]	170				
TDS [ppm]	1200				
ORP [mV]	NG				
pH	>5 or <9.7	7.8	7.6	8.2	7.8
Electrical conductivity (mS/m)	170	2532	1792	2339	2502
Chemical Oxygen Demand as O2	NG	5203	1477	3031	3001
All values in mg/l, unless otherwise indicated.					

2 Valley 1: LD4S

SANS 241

Date	24-Jul-2013	10-Oct-2013	06-Feb-2014	21-Jul-2014	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16
Flow Rate (Litres / sec)	0.0044	0.0117	0.0117	0.0050	0.0078	0.0029	0.0078	0.0037	0.0035	0.0037	0.0035	0.0024

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG

pH	>5 or <9.7	7.9	7.9	7.9	8.1	7.9	8.0	7.97	8.0	7.7	7.5	7.6	7.6
Electrical conductivity (mS/m)	170	2585	3129	2468	3191	3187	3221	2984	2743	3502	3106	2250	2816
Chemical Oxygen Demand as O2	NG	3766	1704	2578	4637	3780	6005	4023	3484	822	7401	5980	5973

All values in mg/l, unless otherwise indicated.

2 Valley 1: LD4S

SANS 241

Date		16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22
Flow Rate (Litres / sec)		0.0023	0.0023	0.0017	0.0029	0.0028	0.0043	0.0024	0.0033	0.0033	0.0034	0.0024	0.0017
Infield Analysis		Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded				
Temp °C	NG									26	24	20	22
pH	>5 or <9.7									7.5	7.4	7.4	7.5
EC [mS/m]	170									960	1163	1098	1073
TDS [ppm]	1200									4790	5810	5490	5360
ORP [mV]	NG												
pH	>5 or <9.7	7.6	7.5	7.5	7.7	7.6	7.8	7.3	7.7	7.7	7.3	7.4	7.6
Electrical conductivity (mS/m)	170	2395	1858	2113	2101	1440	1353	1508	1359	1027	1367	1375	1867
Chemical Oxygen Demand as O2	NG	1737	938	2271	705	272	150	1459	89	249	1346	1034	1485

All values in mg/l, unless otherwise indicated.

2 Valley 1: LD4S

SANS 241

Date		24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)		0.0059	0.0021	0.0025	0.0045	0.0085	0.0013	0.0010	0.0052	0.0044
Infield Analysis										
Temp °C	NG	27	25	20	23	23	23	19	22	22
pH	>5 or <9.7	7.5	7.5	7.0	7.1	7.0	7.2	8.0	7.1	7.4
EC [mS/m]	170	679	600	1097	912	460	993	1199	840	1049
TDS [ppm]	1200	3400	2970	5490	4570	2300	5010	6000	4230	5210
ORP [mV]	NG									
pH	>5 or <9.7	7.6	7.6	7.5	7.5	8.2	7.5	7.7	7.6	7.4
Electrical conductivity (mS/m)	170	1473	1430	1163	978	785	1608	1818	1182	1014
Chemical Oxygen Demand as O2	NG	1980	1313	841	524	235	1462	267	428	932

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3

SANS 241

Date	22-Apr-05	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08

Flow Rate (Litres / sec)							0.031	0.070	0.13	0.025	0.0313	0.0417	0.042

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG

pH	>5 or <9.7	8.1	7.9	8.0	7.9	7.7	7.9	7.9	8.0	7.7	8.4	7.9	7.8	8.0
Electrical conductivity (mS/m)	170	1876	2636	2972	2978	5015	2496	2643	1823	1532	2439	2525	2201	2650
Chemical Oxygen Demand as O2	NG	3774	5280	5005	6209	5811	4861	5553	4018	2001	6415	5291	3770	3667

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3

SANS 241

Date	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11
Flow Rate (Litres / sec)	0.025	0.0313	0.035	0.0357	Flooded	0.0350	0.0318	0.0292	0.0269	0.0583	0.0233	0.0179
Infield Analysis												
Temp °C												
pH												
EC [mS/m]												
TDS [ppm]												
ORP [mV]												
pH	>5 or <9.7	8.0	8.0	8.0	8.2	8.1	7.9	7.9	8.6	7.9	8.0	8.0
Electrical conductivity (mS/m)	170	2844	2814	2872	2592	1499	2768	2735	2865	2111	2619	2714
Chemical Oxygen Demand as O2	NG	11200	6032	5730	3940	5487	8501	4197	2662	4614	5378	4375

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3		SANS 241														
Date		17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	21-Jul-2014				
Flow Rate (Litres / sec)		0.0179	0.0350		0.0109	0.0104	0.0206	0.0219		0.0233	0.0233	0.0140				
Infield Analysis																
Temp °C	NG															
pH	>5 or <9.7															
EC [mS/m]	170															
TDS [ppm]	1200															
ORP [mV]	NG															
pH	>5 or <9.7	8.2	8.0	Dry				7.9	8.1	8.3	8.0	Dry		8.0	8.0	8.1
Electrical conductivity (mS/m)	170	2540	2132					2091	1830	2459	2629			3054	2785	2990
Chemical Oxygen Demand as O2	NG	5204	42608					7633	25551	8805	3388			6268	4890	10426
All values in mg/l, unless otherwise indicated.																

3 Valley 1: LD3

SANS 241

Date	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	
Flow Rate (Litres / sec)	0.0125	0.0103	0.0117	0.0080	0.0090	0.0100	0.0146	0.0070	0.0088	0.0088	0.0092	0.0083	
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	8.0	8.1	7.9	8.1	7.8	7.8	7.7	7.8	8.4	7.5	7.7	7.9
Electrical conductivity (mS/m)	170	3189	2958	3108	2769	3327	3110	2703	2989	2834	2997	2677	2884
Chemical Oxygen Demand as O2	NG	6467	6167	5955	7563	2774	10536	12744	8869	6067	5974	3656	5300

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3

SANS 241

Date		11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20
Flow Rate (Litres / sec)		0.0029	0.0088	0.0091	0.0033	0.0048	0.0020	0.0061	0.0067	0.0067	0.0045	0.0059	0.0054
Infield Analysis										Not recorded	Not recorded	Not recorded	Not recorded
Temp °C	NG	25	28	26	25	21	26	26	24				
pH	>5 or <9.7	7.9	7.7	7.7	8.1	8.3	8.2	7.7	7.7				
EC [mS/m]	170	2718	2661	2528	2610	2433	2230	Too high to be recorded in field	1822				
TDS [ppm]	1200	13590	13310	12640	13040	12170	11150		9480				
ORP [mV]	NG			-107	-198	25	-16						
pH	>5 or <9.7	7.8	7.7	7.7	7.5	7.8	7.7	7.7	7.7	7.8	7.7	7.8	7.7
Electrical conductivity (mS/m)	170	2823	2785	2716	2753	2708	2649	2540	2521	2580	2304	2427	2477
Chemical Oxygen Demand as O2	NG	1785	1682	1572	3616	1297	972	1046	5813	1236	1161	2440	904

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3

SANS 241

Date		13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23
Flow Rate (Litres / sec)		0.0125	0.0184	0.0109	0.0074	0.0074	0.0002	0.0104	0.0063	0.021	0.0088	0.0064	0.011
Infield Analysis		Not recorded	Not recorded	Not recorded	Not recorded								
Temp °C	NG					28	26	25	24	29	27	24	25
pH	>5 or <9.7					7.5	7.7	7.7	7.8	8.0	7.7	7.4	7.4
EC [mS/m]	170					1059	1673	1518	1140	805	771	1465	991
TDS [ppm]	1200					5290	8370	7600	5700	4020	3850	7300	4950
ORP [mV]	NG												
pH	>5 or <9.7	7.7	7.9	7.6	8.0	7.8	7.6	7.6	7.7	7.9	7.8	7.7	7.6
Electrical conductivity (mS/m)	170	1213	2056	2177	2128	1154	2107	1992	1998	2000	2066	1758	1103
Chemical Oxygen Demand as O2	NG	158	906	1785	1528	286	3136	2239	1500	2486	2563	2957	1056

All values in mg/l, unless otherwise indicated.

3 Valley 1: LD3

SANS 241

Date		24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)		0.033	0.0063	0.0042	0.0064	0.0093
Infield Analysis						
Temp °C	NG	29	26	23	23	22
pH	>5 or <9.7	7.2	7.5	7.6	7.5	7.7
EC [mS/m]	170	613	1042	915	932	1203
TDS [ppm]	1200	3080	5210	4560	4660	5970
ORP [mV]	NG					
pH	>5 or <9.7	7.9	7.8	7.6	7.8	7.6
Electrical conductivity (mS/m)	170	1123	1803	1801	1526	1162
Chemical Oxygen Demand as O2	NG	707	2411	1882	1715	1380

All values in mg/l, unless otherwise indicated.

4 Valley 1: LD4N

SANS 241

Date	22-Apr-05	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08

Flow Rate (Litres / sec)	0.023	0.014	0.063	0.010	0.0313	0.0250	0.013

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG

pH	>5 or <9.7	8.5	7.7	8.6	8.0	8.2	8.4	8.4	8.4	7.9	8.6	8.2	7.9	8.1
Electrical conductivity (mS/m)	170	1445	2526	2770	2214	1610	2047	2376	1324	2562	1350	1625	1384	1538
Chemical Oxygen Demand as O2	NG	2690	1600	4787	5094	2109	2778	3855	1927	1249	2255	2619	1746	1880

All values in mg/l, unless otherwise indicated.

4 Valley 1: LD4N

SANS 241

Date	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11
Flow Rate (Litres / sec)	0.0070	0.0156	0.18	0.0278	0.0278	0.0269	0.0206	0.0167	0.0135	0.0100	0.0080	0.0083
Infield Analysis												
Temp °C	NG											
pH	>5 or <9.7											
EC [mS/m]	170											
TDS [ppm]	1200											
ORP [mV]	NG											
pH	>5 or <9.7	8.2	8.4	7.9	8.2	8.1	8.2	8.1	8.4	8.7	8.0	8.3
Electrical conductivity (mS/m)	170	1574	1803	1743	189	2087	1149	2138	2120	2255	1742	1719
Chemical Oxygen Demand as O2	NG	9040	3120	3000	2180	891	4098	5764	3135	2678	5594	2382
												2141

All values in mg/l, unless otherwise indicated.

4 Valley 1: LD4N

SANS 241

Date		11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20
Flow Rate (Litres / sec)		0.0045	0.014	0.0091	0.0042	0.0025	0.0025	0.0083	0.0026	0.0026	0.0042	0.0015	Dry
Infield Analysis										Not recorded			
Temp °C	NG	21	24	21	19	21	23	23	20				
pH	>5 or <9.7	8.4	7.8	7.8	8.9	9.4	8.8	8.1	8.2				
EC [mS/m]	170	1460	1429	1336	1428	1493	1572	1448	1106				
TDS [ppm]	1200	7292	7145	6684	7135	7465	7858	7230	5740				
ORP [mV]	NG			-73	-185	30	-22						
pH	>5 or <9.7	7.9	8.5	7.5	7.9	8.4	8.1	8.0	7.8	8.0	8.4	7.2	
Electrical conductivity (mS/m)	170	1455	1350	1354	1434	1590	1783	1589	1422	1380	1372	1155	
Chemical Oxygen Demand as O2	NG	578	501	620	1396	1095	1108	1026	1406	1654	1230	3689	

All values in mg/l, unless otherwise indicated.

4 Valley 1: LD4N		SANS 241																										
Date		13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24														
Flow Rate (Litres / sec)		0.0192	0.0064	Dry	Dry	0.0080	0.0080	0.0042	Dry	0.0130	0.0051	0.0036	0.0063	0.038														
Infield Analysis		Not recorded																										
Temp °C	NG																											
pH	>5 or <9.7																											
EC [mS/m]	170				1025			1673			819			511			428			905			738			460		
TDS [ppm]	1200							8370			4100			2550			2130			4510			3680			2310		
ORP [mV]	NG																											
pH	>5 or <9.7	9.2		7.7		7.7		7.6		7.3		7.5		7.8		7.6		7.4		7.7								
Electrical conductivity (mS/m)	170	1138		1204		1115		1165		992		1061		945		887		773		765								
Chemical Oxygen Demand as O2	NG	197		121		140		1221		780		1435		766		280		532		747								
All values in mg/l, unless otherwise indicated.																												

4 Valley 1: LD4N

SANS 241

Date		26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)		0.0061	0.11	0.0010	0.0078
Infield Analysis					
Temp °C	NG	23	20	21	23
pH	>5 or <9.7	7.6	7.8	7.4	7.3
EC [mS/m]	170	459	321	293	474
TDS [ppm]	1200	2280	1600	1470	2380
ORP [mV]	NG				
pH	>5 or <9.7	7.7	8.1	7.4	7.7
Electrical conductivity (mS/m)	170	622	463	405	449
Chemical Oxygen Demand as O2	NG	442	430	194	371

All values in mg/l, unless otherwise indicated.

5 Valley 1: LD3P

SANS 241

Date _____

16-Oct-08

07-Jan-09

09-May-09

11-Aug-09

21-Jan-10

10-May-10

13-Jul-10

21-Oct-10 1

11-Jan-11 1

1-Apr-11 1

2-Jul-11 17

-Oct-11 30-

Jan-12 11-A

Apr-12

pH

>5 or <9.7

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Electrical conductivity (mS/m)

170

All values in mg/l, unless otherwise indicated.

6 Valley 1: SLSD3		SANS 241													
Date		22-Apr-05	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08	
Flow Rate (Litres/sec)	NG														
Infield Analysis															
Temp °C	NG														
pH	>5 or <9.7														
EC [mS/m]	170														
TDS [ppm]	1200														
ORP [mV]	NG														
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	
Electrical conductivity (mS/m)	170														
Chemical Oxygen Demand as O2	NG														
All values in mg/l, unless otherwise indicated.															

6 Valley 1: SLSD3		SANS 241											
Date		10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11
Flow Rate (Litres/sec)	NG												
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170												
Chemical Oxygen Demand as O2	NG												
All values in mg/l, unless otherwise indicated.													

6 Valley 1: SLSD3		SANS 241										
Date		17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	21-Jul-2014
Flow Rate (Litres/sec)	NG											
Infield Analysis												
Temp °C	NG											
pH	>5 or <9.7											
EC [mS/m]	170											
TDS [ppm]	1200											
ORP [mV]	NG											
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170											
Chemical Oxygen Demand as O2	NG											
All values in mg/l, unless otherwise indicated.												

6 Valley 1: SLSD3		SANS 241											
Date		07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	11-Oct-17
Flow Rate (Litres/sec)	NG												
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170												
Chemical Oxygen Demand as O2	NG												
All values in mg/l, unless otherwise indicated.													

6 Valley 1: SLSD3		SANS 241											
Date		14-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Flow Rate (Litres/sec)	NG			0.0010	0.00042	0.00028							
Infield Analysis													
Temp °C	NG			25	22	16	Dry	Dry	Dry	Dry	Dry	Dry	Dry
pH	>5 or <9.7			6.9	7.9	8.4							
EC [mS/m]	170			1983	1637	1852							
TDS [ppm]	1200			9914	8182	9267							
ORP [mV]	NG				-181	-83							
pH	>5 or <9.7	Dry	Dry	7.7	7.7	8.01							
Electrical conductivity (mS/m)	170			2061	1982	2020							
Chemical Oxygen Demand as O2	NG			785	916	1898							

6 Valley 1: SLSD3		SANS 241											
Date		15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-24	24-Apr-23	22-Jul-23
Flow Rate (Litres/sec)	NG						0.0008	0.00083			0.00076	Dry	No flow
Infield Analysis													
Temp °C	NG	Dry	Dry		Dry	Dry	27	24		Dry	Dry	30	20
pH	>5 or <9.7						7.9	7.9				7.9	7.7
EC [mS/m]	170						1548	1405				662	1250
TDS [ppm]	1200						7750	7030				3300	6240
ORP [mV]	NG												
pH	>5 or <9.7			7.9			8.0	7.8				7.8	8.0
Electrical conductivity (mS/m)	170			1667			1728	1714				1555	1376
Chemical Oxygen Demand as O2	NG			992			509	1632				1978	2783
All values in mg/l, unless otherwise indicated.													

Date

Flow Rate (Litres/sec)

	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
NG	0.00050	0.00042	0.00095	Dry	0.0010	Dry

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

7 Valley 1: SLSD4

SANS 241

Date _____

22-Apr-05

21-Jul-05

07-Oct-05

26-Jan-06

6 13-Apr-06

04-Jul-06

02-Oct-06

25-Jan-07

10-Apr-07

11-Jul-07

08-Oct-07

20-Jan-08

07-Apr-08

10-Jul-08

pH

>5 or <9.7

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dr

Dr

Electrical conductivity (mS/m)

170

All values in mg/l, unless otherwise indicated.

7 Valley 1: SLSD4

SANS 241

[illegible]

All values in mg/l, unless otherwise indicated.

7 Valley 1: SLSD4

SANS 241

Date _____

19-Jul-12

19-Oct-2012

16-Jan-2013

24-Apr-2013

24-Jul-2013

10-Oct-2013

06-Feb-2014

21-Jul-2014

07-Nov-2014

26-Jan-15

08-Apr-15 08

-Jul-15

pH

>5 or <9.7

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

y

Electrical conductivity (mS/m)

170

Chemical Oxygen Demand as O₂

NG

All values in mg/l, unless otherwise indicated.

[illegible]

8 Valley 1: LD4B		SANS 241											
Date		10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11
Flow Rate (Litres/sec)	NG	0.0057	0.0100	0.022	0.017	0.0104	0.0125	0.0085	0.0069	0.0058	0.0175	0.0065	0.0047
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	7.8	7.4	7.8	8.0	7.9	8.1	7.6	7.7	8.9	7.7	7.7	7.7
Electrical conductivity (mS/m)	170	1334	1374	1659	1644	1772	1131	2010	1894	1942	1698	1752	1638
Chemical Oxygen Demand as O2	NG	7920	2669	3200	2340	2631	4120	9561	3494	731	6084	2540	2067

All values in mg/l, unless otherwise indicated.

8 Valley 1: LD4B		SANS 241										
Date		17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	21-Jul-2014
Flow Rate (Litres/sec)	NG	0.0047	0.0135	0.0106	0.0036	0.0045	0.0175	0.0184	0.0058	0.0117	0.0117	0.0050
Infield Analysis												
Temp °C	NG											
pH	>5 or <9.7											
EC [mS/m]	170											
TDS [ppm]	1200											
ORP [mV]	NG											
pH	>5 or <9.7	8.0	7.7	7.7	7.5	7.4	8.3	7.7	7.5	7.9	7.9	8.0
Electrical conductivity (mS/m)	170	1593	1496	873	1115	1095	1428	1594	1396	1530	1418	1516
Chemical Oxygen Demand as O2	NG	2264	2750	1931	2267	1893	2751	1744	2528	5441	2574	2170

All values in mg/l, unless otherwise indicated.

8 Valley 1: LD4B		SANS 241											
Date		07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	EnviroServ 16-Jan-17	24-Mar-17	13-Jul-17
Flow Rate (Litres/sec)	NG	0.0044	0.0044	0.0047	0.0041	0.0045	0.0049	0.0033	0.0025	0.0023	0.0023	0.0050	0.0030
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	7.7	7.8	7.5	7.9	7.4	7.2	7.4	7.3	8.4	7.3	7.3	7.5
Electrical conductivity (mS/m)	170	1563	1496	1524	1352	1508	1446	1288	1540	1364	1436	1285	1367
Chemical Oxygen Demand as O2	NG	2283	2179	2511	2563	1979	3470	6246	3335	1412	2207	1210	1902
All values in mg/l, unless otherwise indicated.													

8 Valley 1: LD4B

SANS 241

Date		11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20

Flow Rate (Litres/sec)	NG	0.0026	0.0053	0.0024	0.0039	0.028	0.0018	0.0026	0.0019	0.0019	0.0021	0.0018	0.0019

Infield Analysis

Temp °C	NG	23	26	24	22	23	25	24	22				
pH	>5 or <9.7	7.4	7.2	7.6	7.2	7.8	7.1	7.1	7.4				
EC [mS/m]	170	1238	1409	1341	1246	1172	1033	1076	1035				
TDS [ppm]	1200	6180	7042	6701	6230	5855	5167	5440	5390				
ORP [mV]	NG			-124	-163	-99	-113						
pH	>5 or <9.7	7.3	7.2	7.3	7.0	7.5	7.2	7.2	8.9	7.3	7.4	8.1	7.6
Electrical conductivity (mS/m)	170	1227	1413	1323	1278	1180	1136	1165	1234	1313	1228	1216	1152
Chemical Oxygen Demand as O2	NG	516	633	494	1496	900	815	655	1434	1722	1707	1423	913

All values in mg/l, unless otherwise indicated.

8 Valley 1: LD4B

SANS 241

Date		13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23
Flow Rate (Litres/sec)	NG	0.0063	0.0022	Dry	Dry	0.0022	0.0056	0.0045	0.0036	0.0066	0.0022	Dry	0.0040
Infield Analysis		Not recorded		Not recorded									
Temp °C	NG					26	26	23	24	29	25		25
pH	>5 or <9.7					7.4	7.2	7.3	7.4	7.3	7.3		7.0
EC [mS/m]	170					960	890	814	636	420	438		785
TDS [ppm]	1200					4800	4450	4050	3190	2100	2200		3950
ORP [mV]	NG												
pH	>5 or <9.7		7.5	7.6		7.4	7.4	7.3	7.3	7.3	7.5		7.4
Electrical conductivity (mS/m)	170		1074	1025		924	1029	990	1007	839	958		828
Chemical Oxygen Demand as O2	NG		179	110		253	465	1048	1039	992	811		542

All values in mg/l, unless otherwise indicated.

8 Valley 1: LD4B		SANS 241				
Date		24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres/sec)	NG	Submerged (Not sampled)		0.0034	Dry	0.0050
Infield Analysis						
Temp °C	NG		26	23		22
pH	>5 or <9.7		6.9	6.8		7.2
EC [mS/m]	170		526	426		640
TDS [ppm]	1200		2650	2130		3220
ORP [mV]	NG					
pH	>5 or <9.7		7.3	7.6		7.5
Electrical conductivity (mS/m)	170		754	714		590
Chemical Oxygen Demand as O2	NG		249	742		545

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date	22-Apr-05	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08
Flow Rate (Litres / sec)	NG						0.023	0.014	0.10	0.25	0.0625	0.015

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
Orp [mV]	NG

pH	>5 or <9.7	8.1	7.8	7.9	7.7	7.7
Electrical conductivity (mS/m)	170	4922	4646	4802	3720	4015
Chemical Oxygen Demand as O2	NG	7867	8320	8595	6607	5811

Dry	7.8	8.0	7.7	8.7	7.8	7.8
	3349	2039	1532	2909	2422	2774
	5880	6795	2001	7076	4960	5039

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date		07-Apr-08	10-Jul-08	12-Oct-08	07-Jan-09	09-May-09	11-Aug-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11
Flow Rate (Litres / sec)	NG	0.013	0.015	0.0078	0.058	0.0051	0.0044	0.0088	Dry	Dry	0.017	0.088
Infield Analysis												
Temp °C	NG											
pH	>5 or <9.7											
EC [mS/m]	170											
TDS [ppm]	1200											
Orp [mV]	NG											
pH	>5 or <9.7	8.0	8.0	7.9	7.9	8.2	8.1	8.2			8.7	7.8
Electrical conductivity (mS/m)	170	2879	3403	3180	2350	3428	3436	1419			2857	1665
Chemical Oxygen Demand as O2	NG	4600	8110	6448	3680	5354	5262	4824			3196	5277

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date		11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013
Flow Rate (Litres / sec)	NG	Dry	Dry	Dry	0.032	0.019	0.019	0.036	0.044	0.070	0.070

Infield Analysis

Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
Orp [mV]	NG

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

7.9	8.0	7.9	7.6	8.2	7.8	7.7
2894	1797	2901	2249	1884	1714	2200
3862	3026	6131	4866	2681	1861	3247

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date		10-Oct-2013	06-Feb-2014	21-Jul-2014	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16
Flow Rate (Litres / sec)	NG	0.117	0.117	0.029	0.050	0.022	0.011	0.070	0.035	0.018	0.016
Infield Analysis											
Temp °C	NG										
pH	>5 or <9.7										
EC [mS/m]	170										
TDS [ppm]	1200										
Orp [mV]	NG										
pH	>5 or <9.7	8.0	7.9	8.1	7.8	8.0	7.7	8.1	7.6	7.5	7.6
Electrical conductivity (mS/m)	170	2932	2691	2996	3358	3314	3366	3790	4226	3702	3034
Chemical Oxygen Demand as O2	NG	2774	3266	3520	4145	4550	4593	6887	6767	9141	9000

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

Date		13-Jul-16	11-Oct-16	EnviroServ 16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19
Flow Rate (Litres / sec)	NG	0.0053	0.018	0.018	0.013	0.0060	0.070	0.018	0.010	0.012	0.013	0.0093
Infield Analysis												
Temp °C	NG						22	23	22	20	21	23
pH	>5 or <9.7						7.5	7.5	7.5	7.7	7.8	7.7
EC [mS/m]	170						2533	3266	3358	3282	3214	2830
TDS [ppm]	1200						12670	16330	16780	16410	16040	14150
Orp [mV]	NG								-172	-254	-180	-173
pH	>5 or <9.7	7.7	7.4	7.5	7.6	7.8	7.5	7.5	7.6	7.3	7.6	7.3
Electrical conductivity (mS/m)	170	4066	3312	4048	3646	4117	2725	3550	3676	3525	3878	3462
Chemical Oxygen Demand as O2	NG	9657	2779	6051	2930	7098	687	704	679	4035	3126	3297

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

Date		08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22
Flow Rate (Litres / sec)	NG	0.019	0.0060	0.0060	0.0061	0.0058	0.012	0.021	0.029	0.010	0.019	0.019
Infield Analysis												
Temp °C	NG	23	20									24
pH	>5 or <9.7	7.4	7.64									7.5
EC [mS/m]	170	Too high to be recorded in field	Too high to be recorded in field									1768
TDS [ppm]	1200											8830
Orp [mV]	NG											
pH	>5 or <9.7	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.6	7.5	8.0	7.6
Electrical conductivity (mS/m)	170	2921	3836	3974	3291	3802	3516	2414	3118	3585	2895	2020
Chemical Oxygen Demand as O2	NG	3827	2640	4092	4649	3303	3706	3314	1773	3688	3380	2244

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date		04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24
Flow Rate (Litres / sec)	NG	0.021	0.011	0.0032		0.016	0.011	0.036	0.033	0.0035	Dry	0.050
Infield Analysis												
Temp °C	NG	24	20	22	26	24	21	22	23	24		21
pH	>5 or <9.7	7.6	7.6	7.7	7.5	7.6	7.3	7.2	7.2	7.4		7.2
EC [mS/m]	170			1841	879	1117	High	1655	855	1477		1167
TDS [ppm]	1200			9210	4420	5590	High	8210	4280	7400		5830
Orp [mV]	NG											
pH	>5 or <9.7	7.7	7.6	7.7	7.6	7.8	7.7	7.6	7.4	7.7		7.7
Electrical conductivity (mS/m)	170	3054	3196	3588	2205	3240	2464	1975	1748	3055		2066
Chemical Oxygen Demand as O2	NG	2696	3028	3488	1728	3964	4035	1522	1936	3137		1750

All values in mg/l, unless otherwise indicated.

12 Valley 1: Drainage Blanket: Cell 4

SANS 241

Date		21-Jan-25
Flow Rate (Litres / sec)	NG	0.021

Infield Analysis

Temp °C	NG	22
pH	>5 or <9.7	7.5
EC [mS/m]	170	1850
TDS [ppm]	1200	9270
Orp [mV]	NG	
pH	>5 or <9.7	7.5
Electrical conductivity (mS/m)	170	1813
Chemical Oxygen Demand as O2	NG	1758

All values in mg/l, unless otherwise indicated.

14 Valley 1: Leachate detection SW Dam		SANS 241											
Date		16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	21-Jul-2014	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16
Flow Rate (Litres / sec)	NG	0.0233	0.0700	0.0029	0.0100	0.0100	0.0005	0.0125	0.0073	0.0071	0.0029		0.0039
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
												Dry	
pH	>5 or <9.7	8.3	7.7	8.1	8.1	7.6	7.8	7.8	7.0	7.1	8.2		6.4
Electrical conductivity (mS/m)	170	482	553	1070	1342	989	800	423	627	485	390		270
Chemical Oxygen Demand as O2	NG	503	403	1041	508	867	404	200	179	192	126		78

14 Valley 1: Leachate detection SW Dam		SANS 241											
Date		03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19
Flow Rate (Litres / sec)	NG	0.0028		0.0023	0.0023	0.0012	Dry	0.070	0.0010	0.00064	Dry	0.00052	0.014
Infield Analysis													
Temp °C	NG							19	22	20		18	23
pH	>5 or <9.7							7.0	7.0	8.0		7.7	6.7
EC [mS/m]	170							138	351	158		149	60
TDS [ppm]	1200							689	1755	789		743	297
ORP [mV]	NG									-55		-27	81
pH	>5 or <9.7	8.0	Dry	6.7	6.6	6.7		7.1	6.5	7.6		7.7	7.0
Electrical conductivity (mS/m)	170	336		284	445	322		150	385	156		181	61
Chemical Oxygen Demand as O2	NG	202		52	69	49		16	158	43		26	<6.7

14 Valley 1: Leachate detection SW Dam		SANS 241													
Date		08-Apr-19	12-Jul-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	
Flow Rate (Litres / sec)	NG	0.0010		0.019											
Infield Analysis					Dry		Dry								
Temp °C	NG	23	-	18		24		23	23	23	20	Not recorded			
pH	>5 or <9.7	6.3	-	7.2		6.8		8.6	7.8	8.2	7.6		24	22	
EC [mS/m]	170	111	-	1 103		316		1954	611	543	772		211	367	
TDS [ppm]	1200	560	-	5730		1960		9760	3060	2720	3870		1050	1840	
ORP [mV]	NG														
pH	>5 or <9.7	6.2	8.0	7.1		6.8		8.4	7.1	7.9	7.6	7.0	6.9	7.3	
Electrical conductivity (mS/m)	170	113	1 419	1 518		313		2032	669	570	1052	592	220	409	
Chemical Oxygen Demand as O2	NG	42	640	1303		89		2248	170	181	656	41	58	265	
All values in mg/l, unless otherwise indicated.															

14 Valley 1: Leachate detection SW Dam		SANS 241										
Date		13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)	NG	0.0106	0.013	0.028	0.010	0.0023	0.063	0.17	0.00086	0.00052	0.056	0.056
Infield Analysis												
Temp °C	NG	19	21	25	23	18	22	23	22	18	20	22
pH	>5 or <9.7	7.6	7.7	7.5	7.7	7.1	7.2	7.0	7.4	7.8	7.1	6.9
EC [mS/m]	170	426	589	139	209	439	114	104	242	270	67	277
TDS [ppm]	1200	2130	2950	700	1040	2190	570	520	1210	1340	330	1390
ORP [mV]	NG											
pH	>5 or <9.7	7.4	7.3	7.0	7.5	7.4	7.2	8.4	7.4	7.8	8.5	6.8
Electrical conductivity (mS/m)	170	519	876	330	507	406	91	117	315	415	67	242
Chemical Oxygen Demand as O2	NG	228	428	104	135	233	31	37	84	207	40	96

All values in mg/l, unless otherwise indicated.

[illegible]

All values in mg/l, unless otherwise indicated.

15 Valley 1: Leachate detection SW Dam		SANS 241							
Date		13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18
Flow Rate (Litres / sec)	NG		0.0023	0.0023	0.0025	Dry	0.058	0.0026	0.021
Infield Analysis									
Temp °C	NG						18	22	20
pH	>5 or <9.7						7.0	7.4	8.7
EC [mS/m]	170						129	408	360
TDS [ppm]	1200						646	2039	1799
ORP [mV]	NG								-63
pH	>5 or <9.7		7.0	6.9	6.9		7.2	6.5	7.1
Electrical conductivity (mS/m)	170	485	486	416			133	419	347
Chemical Oxygen Demand as O2	NG	53	110	59			13	125	121
Total Dissolved Solids	1200								
Alkalinity as CaCO3	NG								
Ammonia as N	1.5								
Nitrate as N	11								
Chloride as Cl	300								
Free Residual Chlorine as Cl ₂									
Sulfate as SO4	500								
Boron as B	2.4								
Boron as B (Dissolved)									
Fluoride as F	1.5								
Phosphate as P	NG								
Sodium as Na	200								
Potassium as K	NG								
Calcium as Ca	NG								
Magnesium as Mg	NG								
Arsenic as As	0.010								
Arsenic as As (Dissolved)									
Barium as Ba	0.70								
Cadmium as Cd	0.0030								
Cadmium as Cd (Dissolved)									
Total Chromium as Cr	0.050								
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0								
Copper as Cu (Dissolved)									
Iron as Fe	2.0								
Iron as Fe (Dissolved)	2.0								
Lead as Pb	0.010								
Lead as Pb (Dissolved)									
Manganese as Mn	0.40								
Manganese as Mn (Dissolved)	0.40								
Mercury as Hg	0.0060								
Mercury as Hg (Dissolved)									
Selenium as Se	0.040								
Selenium as Se (Dissolved)									
Zinc as Zn	5.0								
Zinc as Zn (Dissolved)									
Free Cyanide as CN	200								
Oil and Grease									
E. Coli/(100ml)	0.00								
% Balacing									

All values in mg/l, unless otherwise indicated.

15 Valley 1: Leachate detection SW Dam		SANS 241										
Date		22-Jul-19	16-Oct-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22
Flow Rate (Litres / sec)	NG	0.0045	0.0045	0.0010	0.0053	0.0010	0.0064	0.1750	0.0389	0.0063	0.0132	0.0132
Infield Analysis												
Temp °C	NG	18	28		23	17	22	23	23	20	Not recorded	
pH	>5 or <9.7	7.4	7.3		6.96	7.2	8.9	7.1	7.1	7.4		24
EC [mS/m]	170	450	424		399	307	1316	243	160	459		6.4
TDS [ppm]	1200	2330	2210		2000	1540	6570	1220	3210	2300		166
ORP [mV]	NG											830
pH	>5 or <9.7	6.8	7.2	7.5	7.0	7.8	8.4	7.2	6.8	7.1	6.8	6.6
Electrical conductivity (mS/m)	170	563	474	458	408	294	1291	226	324	581	416	168
Chemical Oxygen Demand as O2	NG	207	228		78	96	268	51	147	143	66	42
Total Dissolved Solids	1200			2948								
Alkalinity as CaCO3	NG			320								
Ammonia as N	1.5			0.10								
Nitrate as N	11			18								
Chloride as Cl	300			1265								
Free Residual Chlorine as Cl ₂				<0.10								
Sulfate as SO4	500			149								
Boron as B	2.4			1.33								
Boron as B (Dissolved)				1.25								
Fluoride as F	1.5			3.3								
Phosphate as P	NG			<0.10								
Sodium as Na	200			490								
Potassium as K	NG			45								
Calcium as Ca	NG			244								
Magnesium as Mg	NG			121								
Arsenic as As	0.010			<0.0010								
Arsenic as As (Dissolved)				<0.0010								
Barium as Ba	0.70											
Cadmium as Cd	0.0030			<0.0010								
Cadmium as Cd (Dissolved)				<0.0010								
Total Chromium as Cr	0.050											
Hexavalent chromium as Cr	NG			0.012								
Copper as Cu	2.0			0.029								
Copper as Cu (Dissolved)				0.022								
Iron as Fe	2.0			0.63								
Iron as Fe (Dissolved)	2.0			<0.025								
Lead as Pb	0.010			<0.0010								
Lead as Pb (Dissolved)				<0.0010								
Manganese as Mn	0.40			13								
Manganese as Mn (Dissolved)	0.40			12								
Mercury as Hg	0.0060			0.0010								
Mercury as Hg (Dissolved)				0.0010								
Selenium as Se	0.040			<0.0010								
Selenium as Se (Dissolved)				<0.0010								
Zinc as Zn	5.0			0.043								
Zinc as Zn (Dissolved)				0.043								
Free Cyanide as CN	200			<0.010								
Oil and Grease				1.0								
E. Coli/(100ml)	0.00			0								
% Balacing				97.8								

All values in mg/l, unless otherwise indicated.

[illegible]

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08	10-Jul-08

Flow Rate (Litres / sec)

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date

16-Oct-08

07-Jan-09

09-May-09

11-Aug-09

21-Jan-10

10-May-10

13-Jul-10

21-Oct-10

11-Jan-11

11-Apr-11

12-Jul-11

Flow Rate (Litres / sec)

pH
Electrical conductivity (mS/m)
Chemical Oxygen Demand as O2

>5 or <9.7
170
NG

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

ry

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date	17-Oct-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014
Flow Rate (Litres / sec)			0.0175		0.0139	0.0233	0.0250	Dry	Dry	Dry
pH	>5 or <9.7	Dry	Dry		7.2	8.3	7.8			
Electrical conductivity (mS/m)	170		824	Dry	392	409	472			
Chemical Oxygen Demand as O2	NG		670		553	434	272			

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date	21-Jul-2014	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17

[illegible]

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19

[illegible]

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22

[illegible]

pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

16 Valley 1: Leakage Detection Embankment Drainage from SW Dam

SANS 241

Date _____

24-Apr-23

22-Jul-23

25-Oct-23

24-Jan-24

26-Apr-24

16-Jul-24

22-Oct-24

21-Jan-25

Flow Rate (Litres / sec)

Dry

Dry

Dry

Dry

Dry

Dry

Dry

Dry

pH

>5 or <9.7

Electrical conductivity (mS/m)

170

Chemical Oxygen Demand as O2

NG

All values in mg/l, unless otherwise indicated.

19 Valley 2: Leachate Detection North Bench	SANS 241												
Date	21-Jul-2014	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	
Flow Rate (Litres / sec)	NG												
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	Dry	Tank Full	Dry	Tank Full	Tank Full	Dry	Tank Full	Pipe under water	Pipe under water	Dry	Pipe under water	Dry
Electrical conductivity (mS/m)	170												
Chemical Oxygen Demand as O2	NG		Sampling point under leachate		Sampling point under leachate	Sampling point under leachate		Sampling point under leachate					
All values in mg/l, unless otherwise indicated.													

19 Valley 2: Leachate Detection North Bench	SANS 241												
Date		13-Jul-16	11-Oct-16	24-Mar-17	13-Jul-17	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20
Flow Rate (Litres / sec)	NG												
Infield Analysis													
Temp °C	NG												
pH	>5 or <9.7												
EC [mS/m]	170												
TDS [ppm]	1200												
ORP [mV]	NG												
pH	>5 or <9.7	Dry	Roof	Roof	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Electrical conductivity (mS/m)	170												
Chemical Oxygen Demand as O2	NG		Closed	Closed									

All values in mg/l, unless otherwise indicated.

19 Valley 2: Leachate Detection North Bench		SANS 241										
Date		20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23
Flow Rate (Litres / sec)	NG			0.0058	POSITION moved Cent	POSITION moved Cent						
Infield Analysis												
Temp °C	NG			30				27				39
pH	>5 or <9.7			7.3				6.9				7.8
EC [mS/m]	170			926				350				1186
TDS [ppm]	1200			4630				1740				5960
ORP [mV]	NG											
pH	>5 or <9.7	Dry	Dry	6.7	8.3	7.9	Dry	7.1	Dry	Dry	Dry	7.5
Electrical conductivity (mS/m)	170			962	5052	3031		360				2035
Chemical Oxygen Demand as O2	NG			160	6876	3969		83				966

All values in mg/l, unless otherwise indicated.

19 Valley 2: Leachate Detection North Bench		SANS 241						
Date		24-Apr-23	22-Jul-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)	NG	Dry	Dry		0.0052	0.0030	0.13	0.25
Infield Analysis								
Temp °C	NG			29	26	26	27	24
pH	>5 or <9.7			7.8	8.3	8.2	7.3	7.9
EC [mS/m]	170			1695	1785	1952	1350	1742
TDS [ppm]	1200			8470	8890	9770	6500	8740
ORP [mV]	NG							
pH	>5 or <9.7			7.8	8.5	8.3	7.7	7.9
Electrical conductivity (mS/m)	170			2475	2941	3285	2032	1753
Chemical Oxygen Demand as O2	NG			1835	3138	3862	2941	3207

All values in mg/l, unless otherwise indicated.

22 Valley 2: Leachate Detection Main Cell	SANS 241									
Date		21-Jul-2014	26-Jan-15	12-Oct-15	03-Apr-16	13-Jul-16	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18
Flow Rate (Litres / sec)	NG									
Infield Analysis										
Temp °C	NG							21	26	Dry
pH	>5 or <9.7							7.4	8.1	
EC [mS/m]	170							8120	2213	
TDS [ppm]	1200							40070	11060	
ORP [mV]	NG									
pH	>5 or <9.7	Dry	Dry	Dry	Dry	Dry		7.6	7.7	8.0
Electrical conductivity (mS/m)	170							8101	9195	6059
Chemical Oxygen Demand as O2	NG							24604	9650	6200

All values in mg/l, unless otherwise indicated.

22 Valley 2: Leachate Detection Main Cell	SANS 241																
Date		18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21			
Flow Rate (Litres / sec)	NG										0.13	Position moved. Cont					
Infield Analysis																	
Temp °C	NG	Dry	Dry	Dry	36	Dry	Dry		Dry	Dry	38	25		Dry	Dry		
pH	>5 or <9.7				6.7						7.1	6.3					
EC [mS/m]	170				191						245	264					
TDS [ppm]	1200				960						1260	1320					
ORP [mV]	NG																
pH	>5 or <9.7				7.1			7.5			7.2	5.7					
Electrical conductivity (mS/m)	170				155			165			163	246					
Chemical Oxygen Demand as O2	NG				68			136			24	59					

All values in mg/l, unless otherwise indicated.

22 Valley 2: Leachate Detection Main Cell		SANS 241											
Date		12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24
Flow Rate (Litres / sec)	NG	0.13	0.035	0.021			0.0077	0.0050		Dry	Dry	0.0034	Dry
Infield Analysis													
Temp °C	NG	37	38	33	Dry	37	33	30	38			29	
pH	>5 or <9.7	6.4	6.3	6.1		6.9	6.7	6.4	7.6			6.4	
EC [mS/m]	170	174	132	80		145	114	204	High			161	
TDS [ppm]	1200	870	660	400		730	570	1020	High			810	
ORP [mV]	NG												
pH	>5 or <9.7	6.5	6.2	7.6		6.5	7.4	5.6	7.9			7.72	
Electrical conductivity (mS/m)	170	140	90	82		170	167	188	3353			155	
Chemical Oxygen Demand as O2	NG	44	7.1	27		50	46	79	2132			51	

All values in mg/l, unless otherwise indicated.

22 Valley 2: Leachate Detection Main Cell	SANS 241
Date	21-Jan-25
Flow Rate (Litres / sec)	NG Dry
Infield Analysis	
Temp °C	NG
pH	>5 or <9.7
EC [mS/m]	170
TDS [ppm]	1200
ORP [mV]	NG
pH	>5 or <9.7
Electrical conductivity (mS/m)	170
Chemical Oxygen Demand as O2	NG

All values in mg/l, unless otherwise indicated.

23 Valley 2: Leachate Detection South Bench		SANS 241									
Date		21-Jul-2014	26-Jan-15	12-Oct-15	03-Apr-16	13-Jul-16	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	
Flow Rate (Litres / sec)											
Infield Analysis											
Temp °C	NG					Dry		24	30	20	
pH	>5 or <9.7							7.5	8.0	7.8	
EC [mS/m]	170										n/a
TDS [ppm]	1200										n/a
ORP [mV]	NG										-375
pH	>5 or <9.7	8.2	8.2	8.4				8.2	8.2	7.6	7.8
Electrical conductivity (mS/m)	170	10090	5200	7807				9482	10005	3921	5288
Chemical Oxygen Demand as O2	NG	26086	12452	10715				10114	4367	2904	3888

All values in mg/l, unless otherwise indicated.

23 Valley 2: Leachate Detection South Bench		SANS 241												
Date		18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21
Flow Rate (Litres / sec)														
Infield Analysis														
Temp °C	NG	8.6	Dry	Dry	27	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
pH	>5 or <9.7	8.6			6.9									
EC [mS/m]	170	6655			108									
TDS [ppm]	1200	33260			2160									
ORP [mV]	NG	-391												
pH	>5 or <9.7	7.5			6.9						7.5			
Electrical conductivity (mS/m)	170	6968			214						4010			
Chemical Oxygen Demand as O2	NG	9405			104						11013			

All values in mg/l, unless otherwise indicated.

23 Valley 2: Leachate Detection South Bench		SANS 241											
Date		12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24
Flow Rate (Litres / sec)													0.063
Infield Analysis													
Temp °C	NG	Dry	Dry	Dry	Dry	Dry	Dry	Dry	27	27	25	26	25
pH	>5 or <9.7								7.8	7.5	8.1	7.7	7.4
EC [mS/m]	170								1777	915	1582	1704	931
TDS [ppm]	1200								8850	4530	7920	8500	4640
ORP [mV]	NG												
pH	>5 or <9.7								7.7	7.2	8.2	8.0	7.7
Electrical conductivity (mS/m)	170								1815	2168	3233	3941	1707
Chemical Oxygen Demand as O2	NG								1011	1379	1625	4081	2574

All values in mg/l, unless otherwise indicated.

23 Valley 2: Leachate Detection South Bench	SANS 241
Date	21-Jan-25
Flow Rate (Litres / sec)	0.036
Infield Analysis	
Temp °C	NG 23
pH	>5 or <9.7 8.2
EC [mS/m]	170 Value too high to be recorded
TDS [ppm]	1200 Value too high to be recorded
ORP [mV]	NG
pH	>5 or <9.7 8.0
Electrical conductivity (mS/m)	170 2098
Chemical Oxygen Demand as O2	NG 3193

All values in mg/l, unless otherwise indicated.

16-Jan-2013 24-Apr-2013 24-Jul-2013 10-Oct-2013 06-Feb-2014 21-Jul-2014 07-Nov-2014 26-Jan-15 08-Apr-15 08-Jul-15 12-Oct-15

NG
>5 or <9.7
170
1200
NG

NG
>5 or <9.7

>5 or <9.7

170

1200

NG

>5 or <9.7

170

NG

All values in mg/l, unless otherwise indicated.

[illegible]

08-Apr-1922-Jul-1916-Oct-1915-Jan-2020-Jul-2015-Oct-2013-Jan-2113-Apr-2127-Jul-2114-Oct-2112-Jan-2204-Apr-22

Infield Analysis

Temp °C
pH
EC [mS/m]
TDS [ppm]
ORP [mV]

	Not recorded											
NG	21	21	23	26	18	21	26	25	20		24	23
>5 or <9.7	6.4	4.4	6.2	6.6	6.3	6.4	6.2	6.4	6.9		6.6	6.6
170	215	264	166	217	145	179	177	200	190		157	196
1200	1080	1370	670	1090	730	880	860	1000	950		780	980
NG												
>5 or <9.7	7.1	4.2	6.0	6.5	6.8	6.8	7.0	6.8	6.3	6.2	7.1	6.6
170	216	294	173	192	155	141	163	185	216	166	162	206
NG	55	136	68	32	51	27	31	51	65	35	58	36

All values in mg/l, unless otherwise indicated.

All values in mg/l, unless otherwise indicated.

NG

21-Jan-25

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ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX D

SUB-SOIL SEEPAGE – INORGANIC WATER QUALITY DATA

9 Valley 1: GW123		SANS 241																				
		21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	
Flow Rate (Litres / sec)								0.10	0.083	0.083	0.083	0.25	0.10	0.063	0.063	0.18	0.13	0.25		0.058	0.039	
Infield Analysis																						
Temp °C	NG																					
pH	>5 or <9.7																					
EC [mS/m]	170																					
TDS [ppm]	1200																					
Orp [mV]	NG																					
pH	>5 or <9.7	7.0	7.2	6.8	6.9	6.8	6.8	7.1	8.0	7.6	6.8	6.8	6.8	7.1	6.9	7.5	704	7.8	8.2	7.9	7.2	
Electrical conductivity (mS/m)	170	528	558	613	568	579	504	500	526	452	456	439	502	538	487	612	785	2235	3473	622	780	
Chemical Oxygen Demand as O2	NG	213	1306	756	1711	5555	614	541	488	680	754	600	440	471	279	1 160	1 300	5020	500	2421	3676	
Total Dissolved Solids	1200														3520							
Alkalinity as CaCO3	NG														1300							
Ammonia as N	1.5														83							
Nitrate as N	11														0.20							
Chloride as Cl	300														800							
Sulfate as SO4	500														16							
Boron as B	2.4														1.4							
Fluoride as F	1.5														3.4							
Phosphate as P	NG														<0.20							
Sodium as Na	200														787							
Potassium as K	NG														80							
Calcium as Ca	NG														59							
Magnesium as Mg	NG														112							
Arsenic as As	0.010														<0.010							
Barium as Ba	0.70														0.798							
Cadmium as Cd	0.0030														<0.0050							
Total Chromium as Cr	0.050														<0.025							
Hexalent Chromium as Cr	NG														<0.010							
Copper as Cu	2.0														<0.025							
Iron as Fe (Dissolved)	2.0														0.18							
Iron as Fe (Total)																						
Lead as Pb	0.010														<0.020							
Manganese as Mn (Dissolved)	0.40														1.2							
Manganese as Mn (Total)																						
Mercury as Hg	0.0060														0.0010							
Percentage balancing															94.9							

All values in mg/l, unless otherwise indicated.

9 Valley 1: GW123	SANS 241	13-Jul-10	21-Oct-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-12	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Flow Rate (Litres / sec)		0.029	0.032	0.032	0.027	0.012	0.015	0.013	0.013		0.0093	0.010	0.013	0.019	0.035		0.0059	0.010	0.0097	0.025
Infield Analysis																				
Temp °C	NG																			
pH	>5 or <9.7																			
EC [mS/m]	170																			
TDS [ppm]	1200																			
Orp [mV]	NG																			
pH	>5 or <9.7	7.1	8.7	7.5	7.1	6.9	6.8	7.3	8.3	6.8	7.0	6.8	8.0	7.4	7.7	7.4	6.9	8.7	6.9	6.8
Electrical conductivity (mS/m)	170	643	600	561	380	458	462	448	2564	235	232	253	367	382	1518	271	351	304	284	275
Chemical Oxygen Demand as O2	NG	339	751		3704	475	379	495	4630	134	230	315	865	1536	1827	319	331	681	400	416
Total Dissolved Solids	1200	2355					2273				1589				10014			1769		
Alkalinity as CaCO3	NG	1098					993				712				4495			668		
Ammonia as N	1.5	80		127			55				35				596			54		
Nitrate as N	11	<0.057					5.6				<0.057				0.098			0.34		
Chloride as Cl	300	881					782				607				3529			670		
Sulfate as SO4	500	<0.132					<0.132				<0.13				<0.040			1.7		
Boron as B	2.4	1.793					1.3				0.94				7.9			0.96		
Fluoride as F	1.5	2.2					1.7				1.5				18			3.7		
Phosphate as P	NG	0.032					<0.025				<0.025				0.51			0.087		
Sodium as Na	200	616					684				413				2365			418		
Potassium as K	NG	88					63				38				605			54		
Calcium as Ca	NG	51					49				41				95			48		
Magnesium as Mg	NG	61					94				62				110			58		
Arsenic as As	0.010	<0.023					<0.023				<0.023				<0.0070			<0.0070		
Barium as Ba	0.70	0.73					0.72				0.52				0.33			0.46		
Cadmium as Cd	0.0030	<0.0010					0.0020				<0.0010				<0.0010			<0.0010		
Total Chromium as Cr	0.050	0.019					<0.0020				<0.0020				0.085			<0.0010		
Hexalent Chromium as Cr	NG	<0.0080					<0.0080				<0.010				<0.0020			<0.0020		
Copper as Cu	2.0	0.036					0.029				<0.0010	0.029			<0.0010			<0.0010		
Iron as Fe (Dissolved)	2.0	1.2					2.5				0.028				8.6			0.51		
Iron as Fe (Total)																				
Lead as Pb	0.010	0.040					<0.010				<0.0010				<0.0040			<0.0040		
Manganese as Mn (Dissolved)	0.40	2.4					2.5				0.93				1.5			2.6		
Manganese as Mn (Total)																				
Mercury as Hg	0.0060	<0.0010					<0.0010				<0.0010				<0.0010			<0.0070		
Percentage balancing		99.4					96.2				95.2				95.8			97.1		

All values in mg/l, unless otherwise indicated.

9 Valley 1: GW123		SANS 241	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Flow Rate (Litres / sec)			0.011	0.0097	0.012	0.0088	0.0063	0.0083	0.019	0.019	0.0085	0.0046	0.020	0.0083	0.0056	0.0046	0.028	0.0049	0.0089	0.012	0.028	0.0068	0.0053
Infield Analysis																							
Temp °C	NG												20	28	21	19	19	28	23	20			17
pH	>5 or <9.7												6.8	6.7	7.2	6.7	6.5	6.4	6.5	7.5			6.6
EC [mS/m]	170												236	279	249	231	178	216	243	244			197
TDS [ppm]	1200												1178	1397	1246	1153	889	1079	1220	1260			980
Orp [mV]	NG														-115	-67	-78	-94					
pH	>5 or <9.7		6.6	6.7	6.3	6.4	6.5	6.5	6.7	6.7	6.4	6.6	6.5	6.5	6.6	6.6	6.5	6.5	6.5	6.7	6.8	6.4	6.4
Electrical conductivity (mS/m)	170		312	238	285	271	300	286	294	286	296	311	224	284	257	279	237	224	238	249	234	249	226
Chemical Oxygen Demand as O2	NG		179	382	158	304	1463	215	199	173	201	178	55	77	72	159	196	105	185	225	236	160	159
Total Dissolved Solids	1200			1559				1540				1460				1270				1230			1230
Alkalinity as CaCO3	NG			652				679				527				488				313			420
Ammonia as N	1.5			43				40				38				35				21			28
Nitrate as N	11			0.43				<0.50				<0.50				<0.50				12			<0.50
Chloride as Cl	300			582				622				471				471				546			451
Sulfate as SO4	500			<0.287				11				<8.3				<8.3				<8.3			13.5
Boron as B	2.4			0.78				1.2				1.5				1.1				0.46			<0.030
Fluoride as F	1.5			2.4				1.6				<0.10				1.3				0.39			<0.10
Phosphate as P	NG			<0.0020				<0.010				0.11				0.11				0.080			<0.010
Sodium as Na	200			329				397				314				305				306			266
Potassium as K	NG			32				34				24				28				31			20
Calcium as Ca	NG			60				55				48				58				54			61
Magnesium as Mg	NG			60				70				59				74				66			69
Arsenic as As	0.010			<0.010				<0.020				0.26				<0.010				<0.010			<0.010
Barium as Ba	0.70			0.70				1.1				1.2				0.59				0.80			3.2
Cadmium as Cd	0.0030			<0.0020				<0.0030				<0.0020				<0.0020				<0.0020			<0.0020
Total Chromium as Cr	0.050			<0.0030				0.010				0.10				<0.010				0.010			0.010
Hexalent Chromium as Cr	NG			<0.0020				<0.0020				<1.0				<1.0				<1.0			<1.0
Copper as Cu	2.0			<0.0020				<0.013				0.040				<0.010				<0.010			0.040
Iron as Fe (Dissolved)	2.0			29				0.59				1.2				<0.10				50			<0.10
Iron as Fe (Total)																59				59			105
Lead as Pb	0.010			<0.0030				<0.015				<0.010				<0.010				<0.010			0.060
Manganese as Mn (Dissolved)	0.40			3.0				2.3				4.1				3.2				2.8			4.1
Manganese as Mn (Total)																3.4				3.5			4.3
Mercury as Hg	0.0060			<0.0040				<0.027				<0.0010				<0.0010							<0.00050
Percentage balancing			96.9																				

All values in mg/l, unless otherwise indicated.

9 Valley 1: GW123		SANS 241	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)			0.18	0.25	0.18		0.25	0.55	0.55	0.17	0.18		0.13	0.25				0.0029	0.056	0.083
Infield Analysis							Not recorded													
Temp °C	NG		29		25			25	25	24	24	28	28	23	25	25	26	23	21	22
pH	>5 or <9.7		7.4		7.7			7.7	7.8	7.6	7.6	7.3	7.8	6.7	7.6	7.8	7.7	7.4	7.1	7.6
EC [mS/m]	170		1161		1536			1182	1087	1095	1029	595	742	1380	1009	166	871	821	209	1177
TDS [ppm]	1200		5810		7660			5810	5330	5480	5150	2970	3710	6890	5050	830	4350	4110	1040	5850
Orp [mV]	NG																			
pH	>5 or <9.7		7.8	7.9	7.7	7.8	7.7	7.8	7.7	7.5	7.6	7.4	7.9	7.9	7.7	7.0	7.9	7.7	7.3	7.5
Electrical conductivity (mS/m)	170		2407	1255	1668	2449	1697	1265	1277	1502	1724	1212	1782	1646	1088	216	1346	1636	297	1133
Chemical Oxygen Demand as O2	NG		2205	344	936	4903	1150	1271	1214	824	1400	1252	1828	1652	994	32	1684	550	167	987
Total Dissolved Solids	1200					15550				8855				9180				9220		
Alkalinity as CaCO3	NG					7624				4001				4557				5544		
Ammonia as N	1.5					1135				505				645				764		
Nitrate as N	11					<0.50				48				<0.50				0.60		
Chloride as Cl	300					4469				2113				3119				3231		
Sulfate as SO4	500					<8.3				<3.0				<8.3				<8.3		
Boron as B	2.4					2.0				6.5				0.060				<0.030		
Fluoride as F	1.5					<0.10				15				21				<0.10		
Phosphate as P	NG					7.9				0.95				2.3				4.0		
Sodium as Na	200					3967				2395				2273				2711		
Potassium as K	NG					475				376				364				520		
Calcium as Ca	NG					77				59				61				76		
Magnesium as Mg	NG					73				75				67				98		
Arsenic as As	0.010					<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70					0.030				0.050				<0.010				<0.010		
Cadmium as Cd	0.0030					<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050					0.10				0.010				<0.010				<0.010		
Hexalent Chromium as Cr	NG					<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0					<0.010				0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0					1.5				0.21				<0.10				<0.10		
Iron as Fe (Total)						6.5				7.5				3.20				61		
Lead as Pb	0.010					<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40					0.36				0.080				<0.010				<0.010		
Manganese as Mn (Total)						1.6				1.3				<0.010				2.3		
Mercury as Hg	0.0060					<0.00050				<0.00050				<0.010						

Percentage balancing

All values in mg/l, unless otherwise indicated.

17 Valley 1: Sub-soil seepage in Sump (from Cell 1, 2 and 3 and Stormwater Dam)

SANS 241

22-Apr-0521-Jul-0507-Oct-0526-Jan-0613-Apr-0604-Jul-0602-Oct-0625-Jan-0710-Apr-0711-Jul-0708-Oct-0720-Jan-0807-Apr-0810-Jul-0816-Oct-0807-Jan-0909-May-0911-Aug-0912-Oct-0921-Jan-1010-May-10

Infield Analysis

Temp °CNG
pH>5 or <9.7
EC [mS/m]170
TDS [ppm]1200
ORP [mV]NG

pH>5 or <9.76.87.26.96.76.76.66.97.16.77.96.96.97.27.47.08.07.18.07.9
Electrical conductivity (mS/m)170581648631465617667814573427590444574633701677482594232916432931330
Chemical Oxygen Demand as O2NG56026489839818714661646455273700357600200314598240410409650024252514

Total Dissolved Solids12003848
Alkalinity as CaCO3NG1000
Ammonia as N1.513
Nitrate as N110.70
Chloride as Cl3001409
Sulfate as SO450031
Boron as B2.40.90
Fluoride as F1.54.3
Phosphate as PNG<0.20
Sodium as Na200742
Potassium as KNG16
Calcium as CaNG208
Magnesium as MgNG192

3684119615<0.201330450.974.4<0.2098917207178

4280164030<0.201280381.25.6<0.20114124162177

1357660009331.050627614172.74081862105137

Arsenic as As0.0100.0090
Barium as Ba0.701.4
Cadmium as Cd0.0030<0.010
Total Chromium as Cr0.050<0.025
Hexalent Chromium as CrNG<0.010
Copper as Cu2.0<0.025
Iron as Fe (Dissolved)2.044
Iron as Fe (Total)
Lead as Pb0.010<0.050
Manganese as Mn (Dissolved)0.4010
Manganese as Mn (Total)
Mercury as Hg0.0060<0.0020

0.00400.71<0.010<0.025<0.010<0.02540<0.0507.3

<0.0100.44<0.0050<0.025<0.010<0.0250.0880.0200.70

0.480.99<0.00500.51<0.010<0.025290.0393.0

0.00100.0030

99.394.896.596.9

All values in mg/l, unless otherwise indicated.

17 Valley 1: Sub-soil seepage in Sump (from Cell 1, 2 and 3 and Stormwater Dam)

SANS 241

13-Jul-10 21-Oct-10 21-Oct-10 11-Jan-11 11-Apr-11 12-Jul-11 17-Oct-11 30-Jan-12 11-Apr-12 19-Oct-2012 16-Jan-2013 30-Jan-2013 24-Apr-2013 24-Jul-2013 10-Oct-2013 06-Feb-2014 24-Jul-14 07-Nov-2014 26-Jan-15

Infield Analysis

Temp °C NG
pH >5 or <9.7
EC [mS/m] 170
TDS [ppm] 1200
ORP [mV] NG

pH >5 or <9.7 7.8 8.7 8.4 8.1 7.4 7.3 7.0 7.0 6.8 6.9 8.1 7.3 7.1 7.2 7.6 7.1 8.6 7.1 7.4
Electrical conductivity (mS/m) 170 974 1163 876 854 720 668 704 644 307 347 510 503 480 559 613 575 666 772 707
Chemical Oxygen Demand as O2 NG 1488 1720 8325 824 1736 496 465 449 313 562 425 1243 425 341 330 412 704 421

Total Dissolved Solids	1200	5231				3073					2767		3135		3571
Alkalinity as CaCO3	NG	2433				1327					829		1102		1029
Ammonia as N	1.5	370	176			36					39		58		40
Nitrate as N	11	<0.057				3.9					<0.017		0.28		0.29
Chloride as Cl	300	2156				1119					1171		1278		1585
Sulfate as SO4	500	<0.132				<0.132					33		33		3.3
Boron as B	2.4	3.5				1.1					1.5		1.6		1.3
Fluoride as F	1.5	3.0				4.4					5.0		4.3		4.0
Phosphate as P	NG	0.31				<0.025					0.010		<0.0080		0.010
Sodium as Na	200	1243				831					742		714		856
Potassium as K	NG	163				40					58		51		42
Calcium as Ca	NG	90				127					117		174		167
Magnesium as Mg	NG	120				156					105		161		170
Arsenic as As	0.010	<0.023				<0.023					<0.0070		<0.0070		<0.0070
Barium as Ba	0.70	0.95				2.0					0.51		0.84		1.1
Cadmium as Cd	0.0030	<0.0010				0.0110					<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050	0.093				0.016					<0.0010		<0.0010		<0.0010
Hexalent Chromium as Cr	NG	<0.0080				<0.0080					<0.0020		<0.0020		<0.0020
Copper as Cu	2.0	0.17				0.031					0.0070		<0.0010		<0.0010
Iron as Fe (Dissolved)	2.0	10				35					<0.0030		0.041		0.14
Iron as Fe (Total)															
Lead as Pb	0.010	0.15				<0.010					<0.0040		<0.0040		<0.0040
Manganese as Mn (Dissolved)	0.40	2.9				4.4					5.2		6.4		4.7
Manganese as Mn (Total)															
Mercury as Hg	0.0060	<0.0010				<0.0010					<0.0010		<0.0010		<0.0070
Percentage balancing		97.5				97.8					99.3		99.7		98.5

All values in mg/l, unless otherwise indicated.

17 Valley 1: Sub-soil seepage in Sump (from Cell 1, 2 and 3 and Stormwater Dam)

SANS 241

08-Apr-1508-Jul-1512-Oct-1528-Jan-1603-Apr-1613-Jul-1611-Oct-1624-Mar-1713-Jul-1711-Oct-1723-Jan-1818-May-1818-Jul-1830-Oct-1814-Jan-1908-Apr-1922-Jul-1916-Oct-1915-Jan-2020-Jul-2015-Oct-20

Infield Analysis

Temp °C	NG										22	26	23	20	23	23	27	23	29	30	17	28
pH	>5 or <9.7										6.9	6.6	7.5	7.0	6.9	6.7	7.0	7.1	7.0	6.5	7.0	7.2
EC [mS/m]	170										347	605	524	539	548	453	411	522	398	479	389	850
TDS [ppm]	1200										1733	3023	2659	2693	2739	2261	2660	2710	2070	2410	1930	4260
ORP [mV]	NG												-79	-107	-95	-57						
pH	>5 or <9.7	7.0	8.4	6.4	6.7	7.1	6.8	7.0	6.7	6.4	6.9	6.3	6.7	6.8	6.8	6.7	6.8	6.7	7.0	6.7	6.8	7.2
Electrical conductivity (mS/m)	170	639	650	681	664	529	658	561	555	618	346	586	534	580	560	480	447	664	308	514	520	803
Chemical Oxygen Demand as O2	NG	357	598	182	529	719	364	238	238	285	58	356	446	245	107	196	204	304	130	287	266	473
Total Dissolved Solids	1200		3946				4095			3820				3390				3640			3475	
Alkalinity as CaCO3	NG		946				928			796				721				754			666	
Ammonia as N	1.5		38				37			37				46				41			28	
Nitrate as N	11		0.43				<0.50			<0.50				<0.50				9.4			5.6	
Chloride as Cl	300		1848				1762			1743				1566				1719			1365	
Sulfate as SO4	500		44				56			39				<8.3				<8.3			39	
Boron as B	2.4		1.3				1.2			1.4				1.4				1.9			0.34	
Fluoride as F	1.5		3.2				4.6			3.9				4.7				0.17			3.7	
Phosphate as P	NG		<0.0020				<0.010			0.11				0.19				0.050			<0.010	
Sodium as Na	200		909				942			797				772				901			721	
Potassium as K	NG		42				38			41				34				78			28	
Calcium as Ca	NG		220				199			174				171				229			138	
Magnesium as Mg	NG		195				199			153				177				156			141	
Arsenic as As	0.010		<0.010				<0.020			0.040				<0.010				<0.010			<0.010	
Barium as Ba	0.70		1.1				1.1			1.4				0.79				1.0			1.2	
Cadmium as Cd	0.0030		<0.0020				<0.0030			<0.0020				<0.0020				<0.0020			<0.0020	
Total Chromium as Cr	0.050		<0.0030				0.030			0.020				<0.010				0.030			0.010	
Hexalent Chromium as Cr	NG		<0.0020				<0.0020			<1.0				<1.0				<1.0			<1.0	
Copper as Cu	2.0		<0.0020				<0.013			<0.010				<0.010				<0.010			<0.010	
Iron as Fe (Dissolved)	2.0		0.097				<0.010			0.44				<0.10				27			0.11	
Iron as Fe (Total)														1026				35			16	
Lead as Pb	0.010		<0.0030				<0.015			<0.010				<0.010				<0.010			<0.010	
Manganese as Mn (Dissolved)	0.40		7.2				6.0			5.5				0.92				3.9			3.8	
Manganese as Mn (Total)														6.7				5.0			3.9	
Mercury as Hg	0.0060		<0.0040				<0.027			<0.0010				<0.0010							<0.00050	
Percentage balancing			98.9																			

All values in mg/l, unless otherwise indicated.

17 Valley 1: Sub-soil seepage in Sump (from Cell 1, 2 and 3 and Stormwater Dam)

SANS 241

		13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis					Not recorded													
Temp °C	NG	26	27	24		23	24	22	26	27	23	21	26	23	25	24	21	22
pH	>5 or <9.7	7.2	6.8	7.3		6.7	6.9	7.2	7.1	7.2	6.9	6.6	6.7	6.6	6.3	6.7	6.5	6.8
EC [mS/m]	170	423	439	402		310	372	335	302	198	189	414	460	201	320	441	304	474
TDS [ppm]	1200	2120	2200	2010		1550	1870	1680	1510	990	950	2070	2300	1010	1560	2200	1510	2370
ORP [mV]	NG																	
pH	>5 or <9.7	7.1	7.5	6.9	7.2	7.0	6.8	6.9	7.0	6.9	7.4	7.3	6.9	7.3	6.9	7.7	7.0	7.3
Electrical conductivity (mS/m)	170	439	441	506	466	320	448	419	442	397	525	386	436	285	388	720	489	408
Chemical Oxygen Demand as O2	NG	148	70	45	91	54	98	202	150	143	256	147	154	139	251	1189	261	325
Total Dissolved Solids	1200			3420				2600				2270				4710		
Alkalinity as CaCO3	NG			852				566				508				1742		
Ammonia as N	1.5			40				<0.010				0.68				104		
Nitrate as N	11			0.78				26				26				<0.50		
Chloride as Cl	300			1235				866				1051				1612		
Sulfate as SO4	500			49				38				44				<8.3		
Boron as B	2.4			0.73				1.5				<0.030				<0.030		
Fluoride as F	1.5			3.8				3.3				4.2				5.2		
Phosphate as P	NG			<0.010				<0.10				0.010				<0.010		
Sodium as Na	200			634				672				619				1160		
Potassium as K	NG			44				27				23				85		
Calcium as Ca	NG			117				90				118				162		
Magnesium as Mg	NG			121				100				110				178		
Arsenic as As	0.010			<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70			0.36				<0.010				<0.010				<0.010		
Cadmium as Cd	0.0030			<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050			0.010				<0.010				<0.010				<0.010		
Hexalent Chromium as Cr	NG			<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0			0.020				<0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0			<0.10				<0.10				<0.10				<0.10		
Iron as Fe (Total)				4.7				15				9.6				8.0		
Lead as Pb	0.010			<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40			1.2				<0.010				0.010				0.010		
Manganese as Mn (Total)				2.6				1.8				0.21				4.4		
Mercury as Hg	0.0060			<0.00050				<0.00050				<0.00050						

Percentage balancing

All values in mg/l, unless otherwise indicated.

11-Jan-11 11-Apr-11 12-Jul-11 ##### 30-Jan-12 11-Apr-12 ##### ##### ##### ##### ##### ##### ##### 24-Jul-14 ##### 26-Jan-15 08-Apr-15 08-Jul-15 ##### 28-Jan-16 03-Apr-16 13-Jul-16

Flow Rate (Litres / sec)

Infield Analysis

Temp °C	NG																							
pH	>5 or <9.7																							
EC [mS/m]	170																							
TDS [ppm]	1200																							
ORP [mV]	NG																							
pH	>5 or <9.7	8.5	6.0	6.4	5.8	5.9	5.9	7.7	7.6	7.6	7.7	7.4	7.7	8.0	7.8	8.4	7.8	8.0	7.7	8.1	7.4	6.7	7.2	7.0
Electrical conductivity (mS/m)	170	41	39	38	36	33	34	26	32	30	45	36	35	38	48	58	44	44	49	50	49	49	46	60
Chemical Oxygen Demand as O2	NG	<3.0	<3.0	25	6.8	4.1	<3.0	<3.0	9.9	<3.0	8.2	39	12	70.6	<0.082	264	26	9.1	15.5	30	18	48	129	34
Total Dissolved Solids	1200				178				158				184			281				325				375
Alkalinity as CaCO3	NG				23				35				29.6			39				60				61
Ammonia as N	1.5				0.45				0.41				1.8			3.7				2.0				1.8
Nitrate as N	11				4.5				0.82				3.3			5.4				3.5				3.3
Chloride as Cl	300				45				41				63			77				81				87
Sulfate as SO4	500				55				37				37			28				55				78
Boron as B	2.4				0.049				0.050				0.082			0.097				0.11				0.36
Fluoride as F	1.5				0.27				0.31				0.42			0.40				0.54				0.64
Phosphate as P	NG				<0.025				<0.025				<0.0080			0.022				<0.0020				<0.010
Sodium as Na	200				45				43				42			57				68				79
Potassium as K	NG				1.5				1.8				2.5			2.8				3.1				3.9
Calcium as Ca	NG				6.2				5.6				6.8			7.4				8				10.9
Magnesium as Mg	NG				8.4				7.8				8.9			11				12				17.8
Arsenic as As	0.010				<0.023				<0.023				<0.0070			<0.0070				<0.010				<0.020
Barium as Ba	0.70				0.096				0.077				0.11			0.11				0.13				0.18
Cadmium as Cd	0.0030				<0.0010				<0.0010				<0.0010			<0.0010				<0.0020				<0.0030
Total Chromium as Cr	0.050				<0.0020				<0.0020				0.0010			<0.0010				<0.0030				<0.0070
Hexalent Chromium as Cr	NG				<0.0080				<0.010				<0.0020			<0.0020				<0.0020				<0.0070
Copper as Cu	2.0				<0.0010				<0.0010				<0.0010			<0.0010				<0.0020				<0.013
Iron as Fe (Dissolved)	2.0				<0.0060				<0.0060				<0.0030			<0.0030				<0.0040				<0.010
Iron as Fe (Total)																								
Lead as Pb	0.010				<0.010				<0.0010				<0.0040			<0.0040				<0.0030				<0.015
Manganese as Mn (Dissolved)	0.40				0.094				0.11				0.35			0.48				0.60				0.68
Manganese as Mn (Total)																								
Mercury as Hg	0.0060				<0.0010				<0.0010				<0.0010			<0.0070				<0.0040				<0.027
Percentage balancing					98.1				97.0				95.2			97.9				96.9				

All values in mg/l, unless otherwise indicated.

24 Valley 2: Sub-soil Seepage Main Cell	SANS 241	#####	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22
Flow Rate (Litres / sec)					0.071	0.088	0.18	0.10	0.063	0.042	0.10	0.02	0.0833	0.042	0.016	0.042	0.045	0.500	Position moved. Cant be measured	Position moved. Cant be measured	Position moved. Cant be measured	
Infield Analysis																						
Temp °C	NG					36	41	38	33	30	35	37	33	32	40	27	26	35	31	20		30
pH	>5 or <9.7					6.7	6.7	7.6	7.1	8.3	7.6	6.4	6.8	6.9	6.5	7.1	7.2	7.2	6.0	7.6		9.5
EC [mS/m]	170					120	129	101	82	115	110	102	91	103	104	82	98	149	134	107		140
TDS [ppm]	1200					603	644	500	412	571	550	510	470	530	520	410	490	750	670	540		700
ORP [mV]	NG							-267	30	-244	-230											
pH	>5 or <9.7	7.6	7.2	7.3	6.6	7.3	6.2	7.0	7.0	6.6	7.1	7.2	7.0	7.1	7.2	6.9	7.5	8.0	6.7	7.0	7.1	6.4
Electrical conductivity (mS/m)	170	57	75	80	141	120	169	161	84	80	104	99	82	85	98	80	88	133	116	114	112	144
Chemical Oxygen Demand as O2	NG	26	22	9.3	46	68	59	53	35	28	50	50	68	37	18.3	27	20	27	23	19	21	16
Total Dissolved Solids	1200				800				450				480			540				900		
Alkalinity as CaCO3	NG				79				121				73			68				45		
Ammonia as N	1.5				2.3				2.4				2.2			<0.010				0.88		
Nitrate as N	11				2.5				0.85				0.64			1.5				9.2		
Chloride as Cl	300				301				162				183			160				231		
Sulfate as SO4	500				80				54				60			79				111		
Boron as B	2.4				0.26				0.25				0.71			<0.030				0.66		
Fluoride as F	1.5				0.75				1.1				0.71			0.56				0.91		
Phosphate as P	NG				0.020				0.060				0.070			<0.010				<0.010		
Sodium as Na	200				127				106				101			102				139		
Potassium as K	NG				3.8				4.1				4.5			3.5				14		
Calcium as Ca	NG				23				17				18.5			17.5				28		
Magnesium as Mg	NG				42				33				30			32				40		
Arsenic as As	0.010				0.010				<0.010				<0.010			<0.010				<0.010		
Barium as Ba	0.70				0.49				<0.010				0.32			<0.010				0.15		
Cadmium as Cd	0.0030				<0.0020				<0.0020				<0.0020			<0.0020				<0.0020		
Total Chromium as Cr	0.050				0.010				<0.010				0.010			<0.010				<0.010		
Hexalent Chromium as Cr	NG				<1.0				<1.0				<1.0			<1.0				<1.0		
Copper as Cu	2.0				0.010				<0.010				<0.010			0.010				<0.010		
Iron as Fe (Dissolved)	2.0				1.6				<0.10				2.5			<0.10				<0.10		
Iron as Fe (Total)									3.7				2.5			3.8				1.2		
Lead as Pb	0.010				<0.010				<0.010				<0.010			0.010				<0.010		
Manganese as Mn (Dissolved)	0.40				<0.010				<0.010				1.9			3.1				<0.010		
Manganese as Mn (Total)									2.3				2.6			3.4				0.88		
Mercury as Hg	0.0060				<0.0010				<0.0010							<0.00050				<0.00050		
Percentage balancing																						
All values in mg/l, unless otherwise indicated.																						

[illegible]

25 Valley 2: Sub-soil Seepage Stormwater Dam

SANS 241

28-Jan-16 03-Apr-16 13-Jul-16 11-Oct-16 16-Jan-17 24-Mar-17 13-Jul-17 11-Oct-17 23-Jan-18 18-May-18 18-Jul-18 30-Oct-18 14-Jan-19 08-Apr-19 22-Jul-19 16-Oct-19 15-Jan-20 20-Jul-20 15-Oct-20 13-Jan-21 13-Apr-21

Flow Rate (Litres / sec)

Infield Analysis

Temp °C	NG								22	23	22	21	21	24	22	21	24	26	19	20	27	25
pH	>5 or <9.7								6.4	6.9	6.5	6.6	7.1	6.9	6.4	4.3	6.5	6.3	6.2	6.3	6.2	6.3
EC [mS/m]	170								375	328	271	198	115	103	210	136	160	167	141	155	225	196
TDS [ppm]	1200								1873	1639	1354	992	574	514	1040	1390	830	840	700	770	1110	980
ORP [mV]	NG										4.5	-28	-11	3.4								
pH	>5 or <9.7	6.9	6.4	6.3	6.7	6.7	6.8	6.6	6.8	6.3	6.6	6.9	6.3	6.7	6.7	4.1	6.3	6.4	6.3	6.7	8.6	6.9
Electrical conductivity (mS/m)	170	76	68	97	84	132	153	131	395	361	285	232	143	129	217	299	158	162	158	140	192	191
Chemical Oxygen Demand as O2	NG	20	28	49	12.5	16	7.6	33	135	115	114	71	40	78	78	114	94	19	59	28	50	25
Total Dissolved Solids	1200			480				830				1270				2010			24			
Alkalinity as CaCO3	NG			134				121				268				8.9			95			
Ammonia as N	1.5			1.1				<0.010				18				20			<0.010			
Nitrate as N	11			6.2				9.5				<0.50				2.9			1.5			
Chloride as Cl	300			181				228				498				504			269			
Sulfate as SO4	500			53				103				82				729			258			
Boron as B	2.4			0.39				0.15				0.28				0.68			<0.030			
Fluoride as F	1.5			1.4				1.2				1.8				<0.10			1.7			
Phosphate as P	NG			<0.010				0.10				0.090				0.010			<0.010			
Sodium as Na	200			113				126				320				247			155			
Potassium as K	NG			9.6				4.9				23				24			13.1			
Calcium as Ca	NG			34				37				53				114			51			
Magnesium as Mg	NG			35				35				62				111			48			
Arsenic as As	0.010			<0.020				<0.010				<0.010				<0.010			<0.010			
Barium as Ba	0.70			0.30				0.29				0.030				0.23			0.25			
Cadmium as Cd	0.0030			<0.0030				<0.0020				<0.0020				<0.0020			<0.0020			
Total Chromium as Cr	0.050			<0.0070				0.010				<0.010				0.030			<0.010			
Hexalent Chromium as Cr	NG			<0.0070				<1.0				<1.0				<1.0			<1.0			
Copper as Cu	2.0			<0.013				<0.010				<0.010				0.010			<0.010			
Iron as Fe (Dissolved)	2.0			<0.010				0.38				<0.10				37			0.11			
Iron as Fe (Total)	2.0											7.8				44			38			
Lead as Pb	0.010			<0.015				<0.010				<0.010				<0.010			<0.010			
Manganese as Mn (Dissolved)	0.40			3.5				0.64				5.9				25			8.0			
Manganese as Mn (Total)												5.9				31			8.2			
Mercury as Hg	0.0060			<0.027				<0.0010				<0.0010							<0.00050			

Percentage balancing

All values in mg/l, unless otherwise indicated.

25 Valley 2: Sub-soil Seepage Stormwater Dam

SANS 241

27-Jul-2114-Oct-2112-Jan-2204-Apr-2213-Jul-2210-Oct-2224-Jan-2324-Apr-2322-Jul-2325-Oct-2324-Jan-2426-Apr-2416-Jul-2422-Oct-2421-Jan-25

Flow Rate (Litres / sec)

Infield Analysis

Temp °C	NG	22		24	23	21	24	29	25	19	22	24	22	22	22	23
pH	>5 or <9.7	7.0		6.3	6.3	6.4	6.5	6.6	6.7	7.2	6.1	5.9	6.4	6.4	6.3	6.3
EC [mS/m]	170	179		135	190	193	185	113	148	179	160	107	194	140	123	151
TDS [ppm]	1200	900		680	950	970	920	570	740	900	810	530	960	700	610	760
ORP [mV]	NG															
pH	>5 or <9.7	6.3	6.1	6.5	6.2	6.9	6.4	6.8	7.0	7.7	6.3	7.8	7.8	6.8	6.5	7.0
Electrical conductivity (mS/m)	170	189	160	139	203	204	240	192	216	166	126	110	174	151	160	127
Chemical Oxygen Demand as O2	NG	15	16.2	28	31	83	68	112	60	56	32	23	42	54	17	26
Total Dissolved Solids	1200	1485				1490				1110				1200		
Alkalinity as CaCO3	NG	92				101				151				109		
Ammonia as N	1.5	8.7				3.0				10				0.040		
Nitrate as N	11	4.2				5.5				4.7				7.1		
Chloride as Cl	300	407				413				354				332		
Sulfate as SO4	500	178				184				155				106		
Boron as B	2.4	1.0				0.33				<0.030				<0.030		
Fluoride as F	1.5	1.3				0.99				0.93				1.3		
Phosphate as P	NG	<0.010				<0.10				<0.010				0.020		
Sodium as Na	200	204				283				208				208		
Potassium as K	NG	15.7				17				19				23		
Calcium as Ca	NG	58				53				49				43		
Magnesium as Mg	NG	60				63				54				60		
Arsenic as As	0.010	<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70	0.18				0.060				0.010				<0.010		
Cadmium as Cd	0.0030	<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050	0.010				<0.010				<0.010				<0.010		
Hexalent Chromium as Cr	NG	<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0	<0.010				<0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0	<0.10				<0.10				<0.10				<0.10		
Iron as Fe (Total)	2.0	38				4.7				<0.10				37		
Lead as Pb	0.010	<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40	5.8				<0.010				0.070				0.010		
Manganese as Mn (Total)		6.1				4.1				1.0				2.6		
Mercury as Hg	0.0060	<0.00050				<0.00050				<0.00050						

Percentage balancing

All values in mg/l, unless otherwise indicated.

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX E

SUB-SOIL SEEPAGE – ORGANIC WATER QUALITY DATA

9 Valley 1 GW 123			LOD	Screening guideline	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	9 GW 123	
					Aug-09	Jul-10	Jul-11	Jul-12	Jul-13	Jul-14	Jul-15	Jul-16	Jul-17	Jul-18	Jul-19	Jul-20	Jul-21	Jul-22	Jul-23	Jul-24
VOC MS																				
Dichlorodifluoromethane	ug/l	<2.0	200 ^													<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10														<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^													-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$	1.0											2.0	<0.10	<0.10	<0.10	2.2	5.9
Bromomethane	ug/l	<1.0	7.5 ^													<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^													-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^													-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$													-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$													-	<5.0	<5.0	<5.0	6.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$													-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$	1.0												-	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$													-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0														<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^													-	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$													-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$													-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG													-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$													-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$													-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$	22	17		12	16	32			2.0	49	1.0	38	22	5.2	<0.50	3.9	6.3
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$													-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^													-	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^													-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !													-	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$													<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$					20	20				1.0			-	59	<5.0	26	46
trans-1-3-Dichloropropene	ug/l	<2.0														<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$													-	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$													-	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^													-	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !													-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^													-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$	33	75	61	59	19	63			6.0	58	31	69	-	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^													-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$		12					1.0			2.0	2.0	3.0	-	8.0	<1.0	7.0	33
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)	24			4.0	27	27					6.0	4.0	-	76	<2.0	35	78
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)	8.0				18	18						4.0	-	19	<1.0	11	14
Styrene	ug/l	<2.0	300 \$										2.0			<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0														-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^				3.0			5.0				1.0	9.0	-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^													<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^													-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^													-	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^				2.0			3.0				3.0	6.0	-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^													-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^												3.0	-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^												2.0	-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^												2.0	-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^	18			6.0			1.0				2.0	3.0	-	<3.0	<3.0	6.0	14
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^				2.0			2.0			4.0	2.0	6.0	-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0													3.0	-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	2.0			3.0			4.0	5.0	3.0	3.0	3.0	6.0	-	3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	13	17	21	17	12	21	30	21	20	3.0			-	<3.0	<3.0	<3.0	7.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^												3.0	-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	2.0			1.0			1.0	1.0	1.0	2.0			-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0														<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										4.0		2.0	<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^													<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$	4.0			13			13		2.0	10		7.0	<2.0	5.0	<2.0	3.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)													<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0														97	152	93	100	93
Surrogate Recovery 4-Bromofluorobenzene	%	<0														102	135	97	98	100

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

Valley 1: Sub-soil seepage from Sump (from Cell 1, 2 and 3 and Stormwater Dam)				LOD	Screening guideline	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
						Jul-05	Jul-07	Jul-08	Aug-09	Jul-10	Jul-11	Jul-13	Jul-14	Jul-15	Jul-16	Jul-17	Jul-18	Jul-19	Jul-20	Jul-21	Jul-22	Jul-23	Jul-24
																NOD							
VOC MS																							
Dichlorodifluoromethane	ug/l	<2.0	200 ^															<2.0	<2.0	<2.0	<2.0	<2.0	
Methyl Tertiary Butyl Ether	ug/l	<0.10																<0.10	<0.10	2.9	2.6	<0.10	
Chloromethane ^{SA}	ug/l	<3.0	190 ^															-	<3.0	<3.0	<3.0	<3.0	
Vinyl Chloride	ug/l	<0.10	5.0 \$															<0.10	<0.10	<0.10	<0.10	<0.10	
Bromomethane	ug/l	<1.0	7.5 ^															<1.0	<1.0	<1.0	<1.0	<1.0	
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^															-	<3.0	<3.0	<3.0	<3.0	
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^															-	<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$															-	<3.0	<3.0	<3.0	<3.0	
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$															-	<5.0	<5.0	<5.0	<5.0	
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$															-	<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$															-	<3.0	<3.0	<3.0	<3.0	
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$															-	<3.0	<3.0	<3.0	<3.0	
2,2-Dichloropropane	ug/l	<1.0																	<1.0	<1.0	<1.0	<1.0	
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^															-	<2.0	<2.0	<2.0	<2.0	
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$															-	<2.0	<2.0	<2.0	<2.0	
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$															-	<2.0	<2.0	<2.0	<2.0	
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG															-	<3.0	<3.0	<3.0	<3.0	
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$															-	<2.0	<2.0	<2.0	<2.0	
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$															-	<2.0	<2.0	<2.0	<2.0	
Benzene	ug/l	<0.50	30 \$	10			11							18	6.0	14		23	0.90	6.1	<0.50	<0.50	7.4
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$																-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^															-	<2.0	<2.0	<2.0	<2.0	
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^															-	<3.0	<3.0	<3.0	<3.0	
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !															-	<2.0	<2.0	<2.0	<2.0	
cis-1,3-Dichloropropene ^{SA}	ug/l	<2.0	20 \$															<2.0	<2.0	<2.0	<2.0	<2.0	
Toluene	ug/l	<5.0	1000 \$			1.0	14												<2.0	<2.0	<2.0	<2.0	
trans-1,3-Dichloropropene	ug/l	<2.0																<2.0	<2.0	<2.0	<2.0	<2.0	
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$															-	<2.0	<2.0	<2.0	<2.0	
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$															-	<3.0	<3.0	<3.0	<3.0	
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^															-	<2.0	<2.0	<2.0	<2.0	
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !															-	<2.0	<2.0	<2.0	<2.0	
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^															-	<2.0	<2.0	<2.0	<2.0	
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$	71		170	160	54	57	41			76	31	65		85	72	-	21	7.0	<2.0	30
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^															-	<2.0	<2.0	<2.0	<2.0	
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$			2.0		29										-	<1.0	<1.0	<1.0	2.0	
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)		6.0	2.0		67									6.0	4.0	-	<2.0	<2.0	<2.0	3.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)					17										4.0	-	<1.0	<1.0	<1.0	1.0
Styrene	ug/l	<2.0	300 \$																<2.0	<2.0	<2.0	<2.0	
Bromoform ^{SA}	ug/l	<2.0																-	<2.0	<2.0	<2.0	<2.0	
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^	15		13	18										2.0	13	-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																<4.0	<4.0	<4.0	<4.0	
Bromobenzene ^{SA}	ug/l	<2.0	62 ^															-	<2.0	<2.0	<2.0	<2.0	
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^															-	<3.0	<3.0	<3.0	<3.0	
Propylbenzene ^{SA}	ug/l	<3.0	660 ^			1.0												2.0	-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^															-	<3.0	<3.0	<3.0	<3.0	
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^															3.0	-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^															-	<3.0	<3.0	<3.0	<3.0	
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^															-	<3.0	<3.0	<3.0	<3.0	
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^					36										-	<3.0	<3.0	<3.0	<3.0	
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^	1.0			2.0											3.0	-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0																3.0	-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	1.0	1.0							2.0		2.0	2.0		3.0	5.0	-	11	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	10	11		16						17	16	17		3.0		-	<3.0	6.0	<3.0	5.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^															-	<3.0	<3.0	<3.0	<3.0	
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)	3.0	2.0		4.0					2.0		2.0	2.0		2.0		-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0															2.0		<2.0	<2.0	<2.0	<2.0	
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)														2.0		<3.0	<3.0	<3.0	<3.0	
Hexachlorobutadiene	ug/l	<3.0	0.30 ^															<3.0	<3.0	<3.0	<3.0	<3.0	
Naphthalene	ug/l	<2.0	70 \$	2.0	2.0		3.0							8.0	8.0		9.0	14	<2.0	<2.0	<2.0	<2.0	
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)															<3.0	<3.0	<3.0	<3.0	<3.0	
Surrogate Recovery Toluene D8	%	<0																	103	143	96	99	
Surrogate Recovery 4-Bromofluorobenzene	%	<0																	103	130	97	96	
Dutch Intervention Limits \$																							
USEPA Region 3 ^																							
NOD - No Organics Detected																							

24 Valley 2: Sub-soil Seepage Main Cell

LOD

Screening
guideline

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VOC MS

Dichlorodifluoromethane	ug/l	<2.0	200 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10											<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^										-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$										<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^										<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^										-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^										-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$										-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$										-	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$										-	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$						3.0				-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0											<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^										-	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$										-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$										-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG										-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$										-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$										-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$										<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$										-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^										-	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^										-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !										-	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$										-	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$										-	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$										-	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^										-	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !										-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^										-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$										-	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^										-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$						2.0				-	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)								3.0		-	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)								4.0		-	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	4.0	<2.0
Bromoform ^{SA}	ug/l	<2.0											-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^										-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^										<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^										-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^										-	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^										-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^										-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^										-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^										-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										-	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^										-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0											-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^										-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0											102	149	94	100	83
Surrogate Recovery 4-Bromofluorobenzene	%	<0											96	129	98	94	89

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

25 Valley 2: Sub-soil Seepage Stormwater Dam	LOD	Screening guideline	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
			Jul-11	Jul-12	Jul-13	Jul-14	Jul-15	Jul-16	Jul-17	Jul-18	Jul-19	Jul-20	Jul-21	Jul-22	Jul-23	Jul-24		
			NOD	NOD	NOD	NOD	NOD	NOD	NOD	NOD								
VOC MS																		
Dichlorodifluoromethane	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Methyl Tertiary Butyl Ether	ug/l	<0.10										<0.10	<0.10	1.1	<0.10	<0.10		
Chloromethane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Vinyl Chloride	ug/l	<0.10										<0.10	<0.10	<0.10	<0.10	<0.10		
Bromomethane	ug/l	<1.0										<1.0	<1.0	<1.0	<1.0	<1.0		
Chloroethane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Trichlorofluoromethane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Dichloromethane (DCM) ^{SA}	ug/l	<5.0										<5.0	<5.0	<5.0	<5.0	<5.0		
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,1-Dichloroethane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
2,2-Dichloropropane	ug/l	<1.0										<1.0	<1.0	<1.0	<1.0	<1.0		
Bromochloromethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0		
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,1-Dichloropropene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0		
1,2-Dichloroethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Benzene	ug/l	<0.50										<0.50	<0.50	<0.50	<0.50	<0.50		
Trichloroethene (TCE) ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,2-Dichloropropane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Dibromomethane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Bromodichloromethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
cis-1-3-Dichloropropene	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Toluene ^{SA}	ug/l	<5.0										<5.0	<5.0	<5.0	<5.0	<5.0		
trans-1-3-Dichloropropene	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,3-Dichloropropane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Dibromochloromethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,2-Dibromoethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Chlorobenzene ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Ethylbenzene ^{SA}	ug/l	<1.0										<1.0	<1.0	<1.0	<1.0	<1.0		
p/m-Xylene ^{SA}	ug/l	<2.0									3.0	<2.0	<2.0	<2.0	<2.0	<2.0		
o-Xylene ^{SA}	ug/l	<1.0									3.0	<1.0	<1.0	<1.0	<1.0	<1.0		
Styrene	ug/l	<2.0									4.0	<2.0	<2.0	<2.0	2.0	<2.0		
Bromoform ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
Isopropylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,1,2,2-Tetrachloroethane	ug/l	<4.0										<4.0	<4.0	<4.0	<4.0	<4.0		
Bromobenzene ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Propylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
2-Chlorotoluene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
4-Chlorotoluene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
tert-Butylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
sec-Butylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
4-Isopropyltoluene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
n-Butylbenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
1,2-Dibromo-3-chloropropane	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,2,4-Trichlorobenzene	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Hexachlorobutadiene	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Naphthalene	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0		
1,2,3-Trichlorobenzene	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0		
Surrogate Recovery Toluene D8	%	<0										102	141	95	98	84		
Surrogate Recovery 4-Bromofluorobenzene	%	<0										102	131	97	85	90		

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX F

GROUNDWATER – INORGANIC WATER QUALITY DATA

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	24-Jun-99	28-Sep-99	11-Jan-00	03-Apr-00	11-Jul-00	26-Sep-00	09-Jan-01	18-Apr-01
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.2	6.2	6.7	7.1	6.3	6.4	6.5	7.3
Electrical conductivity (mS/m)	170	26	21	23	20	20	20	23	24
Chemical Oxygen demand as O2	NG	20	20	20	27	20	<20	21	<20
Total Dissolved Solids	1200	179	146	162	141	138	139	164	167
Alkalinity as CaCO3	NG	76	45	67	55	49	48	56	59
Ammonia as N	1.5	0.16	0.050	0.020	0.050	0.050	0.010	0.020	<0.01
Nitrate as N	11	1.5	2.1	1.8	2.0	1.4	1.6	1.1	0.8
Chloride as Cl	300	30	31	29	28	29	26	28	28
Sulfate as SO4	500	5.9	4.8	8.2	7.7	7.9	6.7	11	10
Boron as B	2.4		0.044		0.042		0.044		0.042
Fluoride as F	1.5		0.33		1.1		0.794		1.23
Phosphate as P	NG		0.19		0.16		0.11		0.045
Sodium as Na	200		31	27	25	26	28	25	26
Potassium as K	NG	2.4	4.0	3.9	4.4	3.3	3.1	3.6	3.3
Calcium as Ca	NG		7.1	10	6.0	8.2	8.3	10	11
Magnesium as Mg	NG		4.4	4.6	3.4	3.6	3.9	7.0	4.7
Arsenic as As	0.010		<0.0020		0.0021		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030		<0.0010		<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050		<0.0030		<0.0030		<0.0030		0.0041
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0		<0.050		<0.050		<0.050		<0.050
Iron as Fe (Dissolved)	2.0	0.020	<0.020	<0.020	<0.020	0.11	<0.020	0.10	<0.020
Iron as Fe (Total)									
Lead as Pb	0.010		0.0057		0.012		0.0043		0.0082
Manganese as Mn (Dissolved)	0.40	0.25	0.020	0.66	0.050	0.24	0.17	0.67	0.68
Manganese as Mn (Total)									
Mercury as Hg	0.0060		0.0014		<0.00050		<0.00050		<0.00050
Percentage Balancing			108.5%	89.3%	84.8%	98.0%	108.0%	102.7%	94.8%

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill	SANS 241	BH4C
Date		15-Aug-01
Infield Analysis		
Temp °C	NG	
pH	>5 or <9.7	
EC [mS/m]	170	
TDS [ppm]	1200	
ORP [mV]	NG	
pH	>5 or <9.7	7.1
Electrical conductivity (mS/m)	170	23
Chemical Oxygen demand as O2	NG	<20
Total Dissolved Solids	1200	158
Alkalinity as CaCO3	NG	54
Ammonia as N	1.5	0.060
Nitrate as N	11	1.7
Chloride as Cl	300	29
Sulfate as SO4	500	8.8
Boron as B	2.4	
Fluoride as F	1.5	
Phosphate as P	NG	
Sodium as Na	200	28
Potassium as K	NG	3.1
Calcium as Ca	NG	10
Magnesium as Mg	NG	4.7
Arsenic as As	0.010	
Barium as Ba	0.70	
Cadmium as Cd	0.0030	
Total Chromium as Cr	0.050	
Hexavalent chromium as Cr	NG	
Copper as Cu	2.0	
Iron as Fe (Dissolved)	2.0	<0.020
Iron as Fe (Total)		
Lead as Pb	0.010	
Manganese as Mn (Dissolved)	0.40	0.38
Manganese as Mn (Total)		
Mercury as Hg	0.0060	
Percentage Balancing		99.5%

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	18-Oct-01	08-Feb-02	11-Apr-02	31-Oct-02	14-Jan-03	15-Apr-03	25-Jun-03	04-Sep-03
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.4	7.2	8.0	6.4	6.3	6.3	6.6	6.7
Electrical conductivity (mS/m)	170	23	30	25	23	20	21	24	23
Chemical Oxygen demand as O2	NG	<20	22	<20	<20	<20	<20	32	<20
Total Dissolved Solids	1200	162	207	173	159	139	146	171	160
Alkalinity as CaCO3	NG	53	54	61	51	42	50	53	53
Ammonia as N	1.5	0.060	0.060	0.020	0.030	0.10	0.030	0.23	0.23
Nitrate as N	11	2.0	1.8	1.3	1.4	1.7	1.7	1.1	1.3
Chloride as Cl	300	28	28	26	27	29	27	28	26
Sulfate as SO4	500	9.0	7.7	9.8	10	4.7	7.7	9.0	8.6
Boron as B	2.4	0.038		0.068	0.044		0.035		0.034
Fluoride as F	1.5	1.1		1.7	1.1		0.69		1.2
Phosphate as P	NG	0.093		0.012	0.13		0.19		0.093
Sodium as Na	200	28	28	28	27	27	28	28	28
Potassium as K	NG	3.3	3.8	3.1	3	3.0	3.2	3.2	3.1
Calcium as Ca	NG	5.1	12	12	10	5.9	7.1	9.8	8.6
Magnesium as Mg	NG	5.0	5.0	5.4	4.7	3.7	4.2	4.6	4.6
Arsenic as As	0.010	<0.0020		<0.0020	<0.0020		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030	<0.0010		<0.0010	<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050	<0.0030		<0.0030	<0.0030		<0.0030		<0.0030
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0	<0.050		<0.050	0.050		<0.050		<0.050
Iron as Fe (Dissolved)	2.0	<0.020		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iron as Fe (Total)									
Lead as Pb	0.010	<0.0040		0.0069	0.0080		0.0074		<0.0040
Manganese as Mn (Dissolved)	0.40	0.29		0.45	0.21	0.020	0.070	0.36	0.16
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050		<0.00050	<0.00050		<0.00050		<0.00050
Percentage Balancing		90.8%	104.5%	100.9%	98.2%	97.9%	94.3%	98.2%	99.1%

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill	SANS 241	BH4C
Date		13-Jan-04

Infield Analysis

Temp °C	NG	
pH	>5 or <9.7	
EC [mS/m]	170	
TDS [ppm]	1200	
ORP [mV]	NG	
pH	>5 or <9.7	6.5
Electrical conductivity (mS/m)	170	22
Chemical Oxygen demand as O2	NG	<20
Total Dissolved Solids	1200	157
Alkalinity as CaCO3	NG	52
Ammonia as N	1.5	0.89
Nitrate as N	11	1.5
Chloride as Cl	300	27
Sulfate as SO4	500	8.9
Boron as B	2.4	
Fluoride as F	1.5	1.4
Phosphate as P	NG	
Sodium as Na	200	28
Potassium as K	NG	3.3
Calcium as Ca	NG	9.8
Magnesium as Mg	NG	4.7
Arsenic as As	0.010	
Barium as Ba	0.70	
Cadmium as Cd	0.0030	
Total Chromium as Cr	0.050	
Hexavalent chromium as Cr	NG	
Copper as Cu	2.0	
Iron as Fe (Dissolved)	2.0	<0.020
Iron as Fe (Total)		
Lead as Pb	0.010	
Manganese as Mn (Dissolved)	0.40	0.14
Manganese as Mn (Total)		
Mercury as Hg	0.0060	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	03-Feb-04	08-Feb-04	20-Sep-04	10-Dec-04	22-Apr-05	21-Jul-05	26-Jan-06	13-Apr-06
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.6	6.4	7.5	6.5	6.5	6.1	6.2	6.4
Electrical conductivity (mS/m)	170	24	22	23	22	21	19	21	18
Chemical Oxygen demand as O2	NG	<20		<20	41	20	<10	80	<10
Total Dissolved Solids	1200	165	25	23			130		
Alkalinity as CaCO3	NG	53	59	47	44		56		
Ammonia as N	1.5	0.79	0.9	0.69	0.71		0.40		
Nitrate as N	11	1.4	1.3	1.8	2.5		<0.20		
Chloride as Cl	300	28	28	28	26		25		
Sulfate as SO4	500	9.6	11	8.3	7.1		<5.0		
Boron as B	2.4	0.054		0.022			0.12		
Fluoride as F	1.5	1.4	1.6	1.1	0.48		2.3		
Phosphate as P	NG	0.072					<0.20		
Sodium as Na	200	26	31	27	25		30		
Potassium as K	NG	3.4	2.9	3.1	3.2		3.5		
Calcium as Ca	NG	9.7	12	8.3	6.9		<2.0		
Magnesium as Mg	NG	4.4	5.2	4.2	3.6		8.0		
Arsenic as As	0.010	<0.0020		<0.0020			<0.0020		
Barium as Ba	0.70						0.18		
Cadmium as Cd	0.0030	<0.0010		<0.0010			<0.010		
Total Chromium as Cr	0.050	<0.0030		<0.0030			0.040		
Hexavalent chromium as Cr	NG						<0.010		
Copper as Cu	2.0	0.070		<0.050			<0.025		
Iron as Fe (Dissolved)	2.0	<0.020	<0.020	<0.020	<0.020		0.12		
Iron as Fe (Total)									
Lead as Pb	0.010	0.0057		10			<0.050		
Manganese as Mn (Dissolved)	0.40	0.23	0.30	0.050	0.010		0.029		
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050		<0.00050			<0.0020		
Percentage Balancing							99.9		

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	10-Jul-06	05-Oct-06	25-Jan-07	12-Apr-07	11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.7	6.3	7.9	6.6	6.5	6.6	6.5	6.9
Electrical conductivity (mS/m)	170	20	22	24	26	22	26	23	23
Chemical Oxygen demand as O2	NG	<10	39	12	<10	20	<10	24	<10
Total Dissolved Solids	1200	186				176			
Alkalinity as CaCO3	NG	40				44			
Ammonia as N	1.5	<0.20				<0.20			
Nitrate as N	11	1.5				2.0			
Chloride as Cl	300	29				31			
Sulfate as SO4	500	5.0				<5.0			
Boron as B	2.4	0.53				0.040			
Fluoride as F	1.5	0.30				0.40			
Phosphate as P	NG	<0.20				0.20			
Sodium as Na	200	32				30			
Potassium as K	NG	4.1				4.3			
Calcium as Ca	NG	5.0				8.0			
Magnesium as Mg	NG	4.0				4.0			
Arsenic as As	0.010	<0.0020				<0.0020			
Barium as Ba	0.70	0.20				0.12			
Cadmium as Cd	0.0030	<0.010				<0.010			
Total Chromium as Cr	0.050	<0.025				<0.025			
Hexavalent chromium as Cr	NG	<0.010				<0.010			
Copper as Cu	2.0	<0.025				<0.025			
Iron as Fe (Dissolved)	2.0	0.31				0.12			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.050				<0.050			
Manganese as Mn (Dissolved)	0.40	0.054				0.031			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0020				0.00060			
Percentage Balancing		94.6				94.6			

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	12-Oct-09	21-Jan-10	10-May-10
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.5	6.4	7.9	7.9	6.9	6.4	7.1	6.5
Electrical conductivity (mS/m)	170	22	23	24	22	26	30	20	28
Chemical Oxygen demand as O2	NG	<10	<10	<10	<10	<10	<3.0	21	40
Total Dissolved Solids	1200	184				224			
Alkalinity as CaCO3	NG	60				48			
Ammonia as N	1.5	<0.20				<0.20			
Nitrate as N	11	3.3				3.5			
Chloride as Cl	300	36				39			
Sulfate as SO4	500	<5.0				7.0			
Boron as B	2.4	0.029				0.071			
Fluoride as F	1.5	0.30				0.30			
Phosphate as P	NG	0.20				<0.20			
Sodium as Na	200	32				39			
Potassium as K	NG	4.5				6.2			
Calcium as Ca	NG	15				10			
Magnesium as Mg	NG	6.0				6.0			
Arsenic as As	0.010	<0.010				0.019			
Barium as Ba	0.70	0.30				0.30			
Cadmium as Cd	0.0030	<0.0050				<0.0050			
Total Chromium as Cr	0.050	<0.025				<0.025			
Hexavalent chromium as Cr	NG	0.010				<0.010			
Copper as Cu	2.0	<0.025				<0.025			
Iron as Fe (Dissolved)	2.0	0.15				0.12			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.020				<0.020			
Manganese as Mn (Dissolved)	0.40	<0.025				0.034			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0010				0.0020			
Percentage Balancing		95.0				92.9			

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.4	8.0	6.6	6.7	6.3	6.6	6.6	6.6
Electrical conductivity (mS/m)	170	27	28	27	30	29	29	26	22
Chemical Oxygen demand as O2	NG	<3.0		<3.0	26	<3.0	<3.0	6.5	8.1
Total Dissolved Solids	1200	132				118			
Alkalinity as CaCO3	NG	56				46			
Ammonia as N	1.5	3.2	1.1			0.029			
Nitrate as N	11	4.4				3.7			
Chloride as Cl	300	40				35			
Sulfate as SO4	500	6.7				3.1			
Boron as B	2.4	0.068				0.044			
Fluoride as F	1.5	<0.183				0.30			
Phosphate as P	NG	0.13				0.12			
Sodium as Na	200	32				31			
Potassium as K	NG	3.8				4.3			
Calcium as Ca	NG	6.7				7.5			
Magnesium as Mg	NG	4.8				6.2			
Arsenic as As	0.010	<0.023				<0.023			
Barium as Ba	0.70	0.28				0.34			
Cadmium as Cd	0.0030	<0.0010				<0.0010			
Total Chromium as Cr	0.050	<0.0020				<0.0020			
Hexavalent chromium as Cr	NG	<0.0080				<0.0080			
Copper as Cu	2.0	0.033				0.0060			
Iron as Fe (Dissolved)	2.0	0.018				0.15			
Iron as Fe (Total)									
Lead as Pb	0.010	0.020				<0.010			
Manganese as Mn (Dissolved)	0.40	0.043				0.0050			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0010				<0.0010			
Percentage Balancing		95.2				97.7			

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
	SANS 241								
Date		19-Jul-2012	#####	#####	#####	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21
Infield Analysis									
Temp °C	NG					25	23	21	25
pH	>5 or <9.7					6.3	6.2	6.1	6.4
EC [mS/m]	170					37	38	39	35
TDS [ppm]	1200					190	190	200	180
ORP [mV]	NG								
pH	>5 or <9.7	6.5	6.5	8.0	6.5	6.2	6.3	6.6	8.3
Electrical conductivity (mS/m)	170	22	28	22	30	48	32	29	31
Chemical Oxygen demand as O2	NG	<3.0	<3.0	<0.082	16	6.9	<6.7	20	40
Total Dissolved Solids	1200	129					245		
Alkalinity as CaCO3	NG	56					87		
Ammonia as N	1.5	0.020					<0.010		
Nitrate as N	11	3.2					3.2		
Chloride as Cl	300	34					41		
Sulfate as SO4	500	3.1					<3.0		
Boron as B	2.4	0.020					<0.030		
Fluoride as F	1.5	0.20					0.14		
Phosphate as P	NG	0.16					0.010		
Sodium as Na	200	35					38		
Potassium as K	NG	4.2					4.6		
Calcium as Ca	NG	9.1					11		
Magnesium as Mg	NG	6.2					9.2		
Arsenic as As	0.010	<0.023					<0.010		
Barium as Ba	0.70	0.22					0.67		
Cadmium as Cd	0.0030	<0.0010					<0.0020		
Total Chromium as Cr	0.050	<0.0020					<0.010		
Hexavalent chromium as Cr	NG	<0.010					<1.0		
Copper as Cu	2.0	<0.0010					0.010		
Iron as Fe (Dissolved)	2.0	<0.0060					<0.10		
Iron as Fe (Total)							1.4		
Lead as Pb	0.010	<0.0010					<0.010		
Manganese as Mn (Dissolved)	0.40	<0.0010					0.040		
Manganese as Mn (Total)							0.18		
Mercury as Hg	0.0060	<0.0010					<0.00050		
Percentage Balancing		95.7							

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23
Infield Analysis									
Temp °C	NG	24	22		23	23	23	23	24
pH	>5 or <9.7	6.1	6.5		6.1	6.15	6.2	6.1	6.8
EC [mS/m]	170	34	36		35	34	37	35	23
TDS [ppm]	1200	170	170		170	170	190	180	120
ORP [mV]	NG								
pH	>5 or <9.7	6.2	6.8	6.1	6.6	6.3	6.5	6.4	6.4
Electrical conductivity (mS/m)	170	25	33	33	35	36	40	38	39
Chemical Oxygen demand as O2	NG	9.6	19	26	21	17	9.5	28	<6.7
Total Dissolved Solids	1200		265				235		
Alkalinity as CaCO3	NG		110				131		
Ammonia as N	1.5		<0.010				<0.010		
Nitrate as N	11		3.4				<0.50		
Chloride as Cl	300		48				36		
Sulfate as SO4	500		17				<3.0		
Boron as B	2.4		0.16				0.060		
Fluoride as F	1.5		0.56				1.1		
Phosphate as P	NG		0.03				<0.10		
Sodium as Na	200		42				47		
Potassium as K	NG		5.0				4.9		
Calcium as Ca	NG		14				17		
Magnesium as Mg	NG		11				11		
Arsenic as As	0.010		<0.010				<0.010		
Barium as Ba	0.70		0.35				0.37		
Cadmium as Cd	0.0030		<0.0020				<0.0020		
Total Chromium as Cr	0.050		<0.010				<0.010		
Hexavalent chromium as Cr	NG		<1.0				<1.0		
Copper as Cu	2.0		<0.010				<0.010		
Iron as Fe (Dissolved)	2.0		<0.10				<0.10		
Iron as Fe (Total)			0.93				1.2		
Lead as Pb	0.010		<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40		0.090				0.91		
Manganese as Mn (Total)			0.26				1.5		
Mercury as Hg	0.0060		<0.00050				0.0060		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill		BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
Date	SANS 241	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24
Infield Analysis								
Temp °C	NG	23	23	23	23	23	23	23
pH	>5 or <9.7	6.3	5.8	6.1	6.6	5.8	5.8	5.8
EC [mS/m]	170	24	45	35	37	35	36	33
TDS [ppm]	1200	110	220	200	190	180	180	170
ORP [mV]	NG							
pH	>5 or <9.7	6.1	7.5	6.1	736	6.3	6.9	7.1
Electrical conductivity (mS/m)	170	37	39	37	37	34	39	39
Chemical Oxygen demand as O2	NG	26	15	<6.7	98	16	14	16
Total Dissolved Solids	1200		320				280	
Alkalinity as CaCO3	NG		158				146	
Ammonia as N	1.5		1.5				<0.010	
Nitrate as N	11		<0.50				0.96	
Chloride as Cl	300		49				43	
Sulfate as SO4	500		<8.3				<8.3	
Boron as B	2.4		0.040				<0.030	
Fluoride as F	1.5		0.6				0.68	
Phosphate as P	NG		<0.010				<0.010	
Sodium as Na	200		50				47	
Potassium as K	NG		4.8				3.8	
Calcium as Ca	NG		16				15	
Magnesium as Mg	NG		13				13	
Arsenic as As	0.010		<0.010				<0.010	
Barium as Ba	0.70		0.04				<0.030	
Cadmium as Cd	0.0030		<0.0020				<0.0020	
Total Chromium as Cr	0.050		<0.010				<0.010	
Hexavalent chromium as Cr	NG		<1.0				<1.0	
Copper as Cu	2.0		<0.010				<0.010	
Iron as Fe (Dissolved)	2.0		<0.10				<0.10	
Iron as Fe (Total)			<0.10				0.54	
Lead as Pb	0.010		<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40		0.02				0.050	
Manganese as Mn (Total)			<0.010				1.0	
Mercury as Hg	0.0060		0.0032					

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 4C Shongweni Landfill	SANS 241	BH4C
Date		21-Jan-25
Infield Analysis		
Temp °C	NG	22
pH	>5 or <9.7	7.1
EC [mS/m]	170	35
TDS [ppm]	1200	170
ORP [mV]	NG	
pH	>5 or <9.7	7.62
Electrical conductivity (mS/m)	170	21
Chemical Oxygen demand as O2	NG	<6.7
Total Dissolved Solids	1200	
Alkalinity as CaCO3	NG	
Ammonia as N	1.5	
Nitrate as N	11	
Chloride as Cl	300	
Sulfate as SO4	500	
Boron as B	2.4	
Fluoride as F	1.5	
Phosphate as P	NG	
Sodium as Na	200	
Potassium as K	NG	
Calcium as Ca	NG	
Magnesium as Mg	NG	
Arsenic as As	0.010	
Barium as Ba	0.70	
Cadmium as Cd	0.0030	
Total Chromium as Cr	0.050	
Hexavalent chromium as Cr	NG	
Copper as Cu	2.0	
Iron as Fe (Dissolved)	2.0	
Iron as Fe (Total)		
Lead as Pb	0.010	
Manganese as Mn (Dissolved)	0.40	
Manganese as Mn (Total)		
Mercury as Hg	0.0060	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241		01-Jul-96	05-Aug-97	23-Dec-97	02-Apr-98	11-Jun-98	15-Sep-98	04-Jan-99	16-Mar-99
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	8.1	7.5	7.2	6.8	6.6	6.7	6.6	6.7
Electrical conductivity (mS/m)	170	28	16	17	18	27	17	17	16
Chemical Oxygen demand as O2	NG	21	65	20	20	140	20	20	20
Total Dissolved Solids	1200	144	113	120	129	190	117	120	115
Alkalinity as CaCO3	NG	89	55	58	64	56	53	70	65
Ammonia as N	1.5	0.040	0.050	0.070	0.080	0.020	0.070	0.36	0.070
Nitrate as N	11	0.40	0.27	<0.050	<0.050	0.28	<0.050	<0.05	0.22
Chloride as Cl	300	26	16	14	17	17	17	16	16
Sulfate as SO4	500	9.4	1.1	1.1	1.0	1.1	0.81	0.74	1.0
Boron as B	2.4	0.039	0.16		<0.020		0.040		0.085
Fluoride as F	1.5		4.3		3.56	0	3.92		4.48
Phosphate as P	NG								0.011
Sodium as Na	200	27	22		24		20		26
Potassium as K	NG	4	1.0	1.0	1.7	1.0	1.0	<1.0	<1.0
Calcium as Ca	NG	20	9.2		11		6.6		8.65
Magnesium as Mg	NG	5.8	2.4		2.8		1.6		2.4
Arsenic as As	0.010	<0.0020	<0.0020		<0.0020		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030	<0.0010	<0.0010		<0.0010		<0.0010		0.026
Total Chromium as Cr	0.050	<0.0030	<0.0030		<0.0030		<0.0030		<0.0030
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0	<0.050			<0.050		<0.050		<0.050
Iron as Fe (Dissolved)	2.0	7.2	19	0.25	7.43	0.28	3.98	0.34	0.11
Iron as Fe (Total)									
Lead as Pb	0.010		0.011		0.0088		<0.0040		0.0079
Manganese as Mn (Dissolved)	0.40	0.44		0.030	0.31	0.27	0.22	0.28	0.080
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050	<0.00050		<0.00050		<0.00050		<0.00050
Percentage Balancing			101.9%		103.9%		87.0%		99.4%

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		24-Jun-99	28-Sep-99	11-Jan-00	03-Apr-00	11-Jul-00	26-Sep-00	09-Jan-01	18-Apr-01
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.7	6.6	6.6	6.4	6.4	6.5	6.5	7.5
Electrical conductivity (mS/m)	170	17	15	15	17	15	16	17	18
Chemical Oxygen demand as O2	NG	26	29	20	20	20	<20	38	25
Total Dissolved Solids	1200		108	107	118	107	112	120	123
Alkalinity as CaCO3	NG	63	44	54	41	38	38	39	40
Ammonia as N	1.5	0.12	0.030	0.050	0.040	0.010	<0.010	0.020	0.020
Nitrate as N	11	0.53	0.72	0.59	3.0	1.9	2.5	2.7	2.1
Chloride as Cl	300	18	16	16	19	19	17	19	18
Sulfate as SO4	500	1.0	2.7	2.0	1.4	1.5	1.2	1.3	1.1
Boron as B	2.4		0.082		0.10		0.025		0.072
Fluoride as F	1.5		3.9		4.4		5.3	4.7	3.7
Phosphate as P	NG		0.0079		0.0305		0.0060		0.015
Sodium as Na	200		23	21	21	24	26	26	24
Potassium as K	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Calcium as Ca	NG		7.7	6.8	6.6	6.0	6.3	6.3	6.2
Magnesium as Mg	NG		2.0	1.8	2.0	1.7	1.9	5.0	2.0
Arsenic as As	0.010		<0.0020		<0.0020		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030		<0.0010		<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050		0.0061		<0.0030		0.0073		<0.0030
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0		<0.050		<0.050		<0.050		<0.050
Iron as Fe (Dissolved)	2.0	0.090	0.050	0.070	0.030	0.020	0.020	<0.020	<0.020
Iron as Fe (Total)									
Lead as Pb	0.010		0.022		0.0071		<0.0040		0.0050
Manganese as Mn (Dissolved)	0.40	0.070	0.14	0.19	0.10	0.080	0.030	0.12	0.060
Manganese as Mn (Total)									
Mercury as Hg	0.0060		<0.00050		<0.00050		<0.00050		<0.00050
Percentage Balancing			107.6%	87.0%	88.1%	113.8%	103.2%	117.7%	91.0%

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6
SANS 241						
Date		15-Aug-01	18-Oct-01	08-Feb-02	11-Apr-02	31-Oct-02
Infield Analysis						
Temp °C	NG					
pH	>5 or <9.7					
EC [mS/m]	170					
TDS [ppm]	1200					
ORP [mV]	NG					
pH	>5 or <9.7	7.0	7.4	7.1	7.7	6.4
Electrical conductivity (mS/m)	170	16	17	16	17	18
Chemical Oxygen demand as O2	NG	<20	<20	26	<20	<20
Total Dissolved Solids	1200	114	116	113	117	127
Alkalinity as CaCO3	NG	36	35	35	39	35
Ammonia as N	1.5	0.050	0.030	0.070	0.040	0.030
Nitrate as N	11	2.9	3.3	3.1	2.5	3.6
Chloride as Cl	300	18	18	17	17	20
Sulfate as SO4	500	1.4	1.6	1.9	2.4	1.4
Boron as B	2.4		0.034		0.031	0.028
Fluoride as F	1.5		3.7	4.5	3.7	3.6
Phosphate as P	NG		0.040		0.034	0.020
Sodium as Na	200	25	27	26	25	25
Potassium as K	NG	<1.0	<1.0	<1.0	<1.0	<1.0
Calcium as Ca	NG	5.9	6.8	7	6.2	6.8
Magnesium as Mg	NG	3.0	2.2	2.2	2.1	2.3
Arsenic as As	0.010		<0.0020		<0.0020	<0.0020
Barium as Ba	0.70					
Cadmium as Cd	0.0030		<0.0010		<0.0010	<0.0010
Total Chromium as Cr	0.050		<0.0030		<0.0030	<0.0030
Hexavalent chromium as Cr	NG					
Copper as Cu	2.0		<0.05		<0.050	<0.050
Iron as Fe (Dissolved)	2.0	0.060	<0.02		<0.020	0.020
Iron as Fe (Total)						
Lead as Pb	0.010		0.0093		<0.0040	0.010
Manganese as Mn (Dissolved)	0.40	0.040	0.01		0.010	0.040
Manganese as Mn (Total)						
Mercury as Hg	0.0060		<0.00050		0.0012	<0.00050
Percentage Balancing		106.8%	103.0%	100.0%	95.2%	95.4%

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241		14-Jan-03	15-Apr-03	25-Jun-03	04-Sep-03	13-Jan-04	02-Mar-04	02-Aug-04	20-Sep-04
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.4	6.9	6.6	6.6	6.5	6.8	6.4	7.3
Electrical conductivity (mS/m)	170	17	17	19	19	17	17	18	16
Chemical Oxygen demand as O2	NG	<20	<20	<20	<20	<20	<20	<20	<20
Total Dissolved Solids	1200	121	121	133	130	118	122	123	114
Alkalinity as CaCO3	NG	34	39	36	42	37	41	42	37
Ammonia as N	1.5	0.15	0.030	0.29	0.010	0.63	<0.010	0.66	0.78
Nitrate as N	11	3.2	3.4	2.7	3.0	2.5	2.3	2.1	1.9
Chloride as Cl	300	17	19	17	18	17	17	16	17
Sulfate as SO4	500	1.6	1.6	1.6	0.77	1.4	1.4	1.6	1.4
Boron as B	2.4		0.037		0.022		0.034		<0.020
Fluoride as F	1.5	4.9	5.7	3.9	3.7	4.2	5.1	3.9	3.7
Phosphate as P	NG		0.029		0.022		0.021		
Sodium as Na	200	26	25	25	27	26	23	25	24
Potassium as K	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0
Calcium as Ca	NG	6.9	6.4	6.8	6.5	6.3	6.2	6.0	5.5
Magnesium as Mg	NG	2.2	2.2	2.3	2.2	2.2	2.1	2.0	1.8
Arsenic as As	0.010		<0.0020		<0.0020		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030		<0.0010		<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050		<0.0030		<0.0030		<0.0030		<0.0030
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0		<0.050		<0.050		<0.050		<0.050
Iron as Fe (Dissolved)	2.0	<0.020	<0.020	<0.020	<0.020	<0.02	<0.020	<0.020	<0.020
Iron as Fe (Total)									
Lead as Pb	0.010		<0.0040		<0.0040		<0.0040		<0.0040
Manganese as Mn (Dissolved)	0.40	0.020	0.020	0.020	0.27	0.030	0.050	0.060	0.040
Manganese as Mn (Total)									
Mercury as Hg	0.0060		<0.00050		<0.00050		<0.00050		<0.00050
Percentage Balancing		99.4%	85.3%	103.1%	96.0%				

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		10-Dec-04	22-Apr-05	21-Jul-05	26-Jan-06	13-Apr-06	10-Jul-06	05-Oct-06	25-Jan-07
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.3	6.8	6.1	6.3	6.3	6.6	6.7	7.9
Electrical conductivity (mS/m)	170	16	16	15	14	16	17	17	18
Chemical Oxygen demand as O2	NG		213	12	60	<10	<10	24	<10
Total Dissolved Solids	1200			184			156		
Alkalinity as CaCO3	NG	37		48			36		
Ammonia as N	1.5	1.3		0.50			<0.20		
Nitrate as N	11	1.4		<0.20			1.9		
Chloride as Cl	300	14		35			16		
Sulfate as SO4	500	2.0		<5.0			5.0		
Boron as B	2.4			0.13			0.42		
Fluoride as F	1.5	5.5		1.9			3.9		
Phosphate as P	NG			<0.20			<0.20		
Sodium as Na	200	26		24			26		
Potassium as K	NG	2.1		<1.0			<1.0		
Calcium as Ca	NG	5.6		<2.0			5.0		
Magnesium as Mg	NG	2.0		12			3.0		
Arsenic as As	0.010			<0.0020			<0.0020		
Barium as Ba	0.70			<0.030			<0.030		
Cadmium as Cd	0.0030			<0.010			<0.010		
Total Chromium as Cr	0.050			0.046			<0.025		
Hexavalent chromium as Cr	NG			<0.010			<0.010		
Copper as Cu	2.0			<0.025			<0.025		
Iron as Fe (Dissolved)	2.0	<0.020		7.0			2.7		
Iron as Fe (Total)									
Lead as Pb	0.010			<0.050			<0.050		
Manganese as Mn (Dissolved)	0.40	0.080		0.047			0.038		
Manganese as Mn (Total)									
Mercury as Hg	0.0060			<0.0020			<0.0020		
Percentage Balancing				97.8			99.0		

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		12-Apr-07	11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08	10-Jul-08	16-Oct-08	07-Jan-09
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.6	6.5	6.2	6.4	6.8	6.7	6.3	7.9
Electrical conductivity (mS/m)	170	17	15	17	17	17	17	17	17
Chemical Oxygen demand as O2	NG	<10	20	<10	16	<10	<10	<10	12
Total Dissolved Solids	1200		164				132		
Alkalinity as CaCO3	NG		36				60		
Ammonia as N	1.5		<0.20				1.4		
Nitrate as N	11		1.0				1.4		
Chloride as Cl	300		13				20		
Sulfate as SO4	500		<5.0				<5.0		
Boron as B	2.4		0.010				<0.025		
Fluoride as F	1.5		4.0				3.8		
Phosphate as P	NG		<0.20				<0.20		
Sodium as Na	200		24				31		
Potassium as K	NG		<1.0				<1.0		
Calcium as Ca	NG		5.0				8.0		
Magnesium as Mg	NG		2.0				3.0		
Arsenic as As	0.010		<0.0020				<0.010		
Barium as Ba	0.70		<0.010				<0.025		
Cadmium as Cd	0.0030		<0.010				<0.0050		
Total Chromium as Cr	0.050		<0.025				<0.025		
Hexavalent chromium as Cr	NG		<0.010				<0.010		
Copper as Cu	2.0		<0.025				<0.025		
Iron as Fe (Dissolved)	2.0		1.8				3.3		
Iron as Fe (Total)									
Lead as Pb	0.010		<0.050				<0.020		
Manganese as Mn (Dissolved)	0.40		0.037				0.065		
Manganese as Mn (Total)									
Mercury as Hg	0.0060		0.00060				<0.0010		
Percentage Balancing			96.8				98.6		

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		09-May-09	11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.9	6.9	6.4	6.5	6.5	6.5	7.9	6.7
Electrical conductivity (mS/m)	170	19	22	22	22	25	25	24	24
Chemical Oxygen demand as O2	NG	<10	<10	<3.0	16	47	<3.0		<3.0
Total Dissolved Solids	1200		176				129		
Alkalinity as CaCO3	NG		40				55		
Ammonia as N	1.5		0.20				2.5	<0.20	
Nitrate as N	11		1.5				1.1		
Chloride as Cl	300		34				49		
Sulfate as SO4	500		5.0				0.31		
Boron as B	2.4		<0.025				0.052		
Fluoride as F	1.5		3.5				2.3		
Phosphate as P	NG		<0.20				<0.025		
Sodium as Na	200		32				30		
Potassium as K	NG		<1.0				0.43		
Calcium as Ca	NG		11				12		
Magnesium as Mg	NG		4.0				3.2		
Arsenic as As	0.010		0.011				<0.023		
Barium as Ba	0.70		<0.025				0.074		
Cadmium as Cd	0.0030		<0.0050				<0.0010		
Total Chromium as Cr	0.050		<0.025				0.0030		
Hexavalent chromium as Cr	NG		<0.010				<0.0080		
Copper as Cu	2.0		<0.025				0.029		
Iron as Fe (Dissolved)	2.0		50				0.027		
Iron as Fe (Total)									
Lead as Pb	0.010		<0.020				0.020		
Manganese as Mn (Dissolved)	0.40		0.16				0.098		
Manganese as Mn (Total)									
Mercury as Hg	0.0060		0.0010				<0.0010		
Percentage Balancing			96.6				98.9		

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241								
Date		11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	6.4	6.4	6.6	6.5	6.4	6.5	6.4
Electrical conductivity (mS/m)	170	28	29	29	27	22	24	32
Chemical Oxygen demand as O2	NG	19	5.4	15	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	1200		118				146	
Alkalinity as CaCO3	NG		47				47	
Ammonia as N	1.5		0.034				0.027	
Nitrate as N	11		1.3				0.87	
Chloride as Cl	300		45				55	
Sulfate as SO4	500		0.39				0.23	
Boron as B	2.4		0.032				<0.010	
Fluoride as F	1.5		2.5				2.8	
Phosphate as P	NG		<0.025				<0.025	
Sodium as Na	200		26				37	
Potassium as K	NG		0.70				0.51	
Calcium as Ca	NG		13				16	
Magnesium as Mg	NG		4.7				5.9	
Arsenic as As	0.010		<0.023				<0.023	
Barium as Ba	0.70		0.025				0.026	
Cadmium as Cd	0.0030		0.0070				<0.0010	
Total Chromium as Cr	0.050		<0.0020				<0.0020	
Hexavalent chromium as Cr	NG		<0.0080				<0.010	
Copper as Cu	2.0		0.0010				<0.0010	
Iron as Fe (Dissolved)	2.0		6.1				<0.0060	
Iron as Fe (Total)								
Lead as Pb	0.010		<0.010				<0.0010	
Manganese as Mn (Dissolved)	0.40		0.053				<0.0010	
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010				<0.0010	
Percentage Balancing			96.3				96.9	

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		16-Jan-2013	24-Apr-2013	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21
Infield Analysis									
Temp °C	NG			29	24	24	27	25	21
pH	>5 or <9.7			5.9	6.0	6.9	5.9	6.1	6.6
EC [mS/m]	170			157	68	61	61	61	56
TDS [ppm]	1200			780	340	300	300	310	280
ORP [mV]	NG								
pH	>5 or <9.7	7.5	6.3	6.1	6.1	6.1	8.3	6.9	6.4
Electrical conductivity (mS/m)	170	34	36	59	53	47	52	45	51
Chemical Oxygen demand as O2	NG	<0.082	<0.082	11	21	38	27	13	<6.7
Total Dissolved Solids	1200				385				360
Alkalinity as CaCO3	NG				74				85
Ammonia as N	1.5				<0.010				<0.010
Nitrate as N	11				<0.50				1.1
Chloride as Cl	300				107				114
Sulfate as SO4	500				21				<3.0
Boron as B	2.4				<0.030				0.28
Fluoride as F	1.5				0.89				2.3
Phosphate as P	NG				<0.010				<0.010
Sodium as Na	200				54				58
Potassium as K	NG				0.66				0.87
Calcium as Ca	NG				31				31
Magnesium as Mg	NG				12				12
Arsenic as As	0.010				<0.010				<0.010
Barium as Ba	0.70				0.24				0.070
Cadmium as Cd	0.0030				<0.0020				<0.0020
Total Chromium as Cr	0.050				0.010				<0.010
Hexavalent chromium as Cr	NG				<1.0				<1.0
Copper as Cu	2.0				<0.010				<0.010
Iron as Fe (Dissolved)	2.0				<0.10				<0.10
Iron as Fe (Total)					152				34
Lead as Pb	0.010				<0.010				<0.010
Manganese as Mn (Dissolved)	0.40				0.17				<0.010
Manganese as Mn (Total)					0.41				0.18
Mercury as Hg	0.0060				<0.00050				<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6	BH6	BH6
SANS 241									
Date		14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23
Infield Analysis									
Temp °C	NG		25	24	24	24	25	24	24
pH	>5 or <9.7		6.3	6.1	6.4	6.2	6.7	6.3	5.6
EC [mS/m]	170		64	77	74	63	60	78	88
TDS [ppm]	1200		320	390	360	320	310	390	440
ORP [mV]	NG								
pH	>5 or <9.7	6.9	6.4	6.1	6.1	6.1	6.2	7.5	7.4
Electrical conductivity (mS/m)	170	53	57	61	63	62	69	71	77
Chemical Oxygen demand as O2	NG	16	19	14	11	40	27	50	27
Total Dissolved Solids	1200				390				570
Alkalinity as CaCO3	NG				81				158
Ammonia as N	1.5				<0.010				1.1
Nitrate as N	11				<0.50				0.52
Chloride as Cl	300				115				200
Sulfate as SO4	500				<3.0				<8.3
Boron as B	2.4				0.060				0.070
Fluoride as F	1.5				2.1				3.1
Phosphate as P	NG				<0.10				<0.010
Sodium as Na	200				68				86
Potassium as K	NG				0.71				1.20
Calcium as Ca	NG				35				58
Magnesium as Mg	NG				13				21
Arsenic as As	0.010				<0.010				<0.010
Barium as Ba	0.70				0.050				0.010
Cadmium as Cd	0.0030				<0.0020				<0.0020
Total Chromium as Cr	0.050				<0.010				<0.010
Hexavalent chromium as Cr	NG				<1.0				<1.0
Copper as Cu	2.0				<0.010				<0.010
Iron as Fe (Dissolved)	2.0				<0.10				<0.10
Iron as Fe (Total)					10				17
Lead as Pb	0.010				<0.010				<0.010
Manganese as Mn (Dissolved)	0.40				0.020				<0.010
Manganese as Mn (Total)					0.13				<0.010
Mercury as Hg	0.0060				<0.00050				<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 6 - Shongweni Landfill		BH6	BH6	BH6	BH6	BH6	BH6
SANS 241		25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Date							
Infield Analysis							
Temp °C	NG	26	26	25	24	22	22
pH	>5 or <9.7	6.2	6.1	5.9	5.7	5.9	5.8
EC [mS/m]	170	117	246	228	79	86	121
TDS [ppm]	1200	580	1230	1110	390	430	610
ORP [mV]	NG						
pH	>5 or <9.7	6.6	7.2	6.8	6.6	7.2	7.0
Electrical conductivity (mS/m)	170	82	92	86	92	103	99
Chemical Oxygen demand as O2	NG	13	24	14	16	9.5	6.7
Total Dissolved Solids	1200				530		
Alkalinity as CaCO3	NG				88		
Ammonia as N	1.5				<0.010		
Nitrate as N	11				0.67		
Chloride as Cl	300				236		
Sulfate as SO4	500				<8.3		
Boron as B	2.4				<0.030		
Fluoride as F	1.5				2.7		
Phosphate as P	NG				<0.010		
Sodium as Na	200				94		
Potassium as K	NG				1.5		
Calcium as Ca	NG				75		
Magnesium as Mg	NG				29		
Arsenic as As	0.010				<0.010		
Barium as Ba	0.70				<0.010		
Cadmium as Cd	0.0030				<0.0020		
Total Chromium as Cr	0.050				<0.010		
Hexavalent chromium as Cr	NG				<1.0		
Copper as Cu	2.0				<0.010		
Iron as Fe (Dissolved)	2.0				<0.10		
Iron as Fe (Total)					10		
Lead as Pb	0.010				<0.010		
Manganese as Mn (Dissolved)	0.40				<0.010		
Manganese as Mn (Total)					0.84		
Mercury as Hg	0.0060						

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		27-Apr-98	11-Jun-98	15-Sep-98	04-Jan-99	16-Mar-99	24-Jun-99	28-Sep-99	11-Jan-00
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	5.8	5.3	5.5	6.0	6.7	7.3	6.5	7.0
Electrical conductivity (mS/m)	170	33	11	24	20	17	17	17	17
Chemical Oxygen demand as O2	NG	31	20	20	21.6	20	20	20	20
Total Dissolved Solids	1200	228	76	166	142	120		117	122
Alkalinity as CaCO3	NG	9.7	<10	11	24	38	36	39	36
Ammonia as N	1.5	0.22	0.03	0.23	0.7	0.07	0.12	0.04	<0.01
Nitrate as N	11	11	6.4	5.8	3.8	0.15	1.01	0.41	1.5
Chloride as Cl	300	59	53	52	34	15	19	15	21
Sulfate as SO4	500	2.68	<0.16	2.9	8	15	12	15	11
Boron as B	2.4	<0.020		0.022		0.060		0.056	
Fluoride as F	1.5	0.102		0.234		3.3		3.4	
Phosphate as P	NG			0.0535		0.0237		0.0314	
Sodium as Na	200	36		22		20		15	16
Potassium as K	NG	8.5	5.7	5.4	5.1	5.9	5.5	5.5	5.8
Calcium as Ca	NG	5.7		2.6		6.3		4.6	4.7
Magnesium as Mg	NG	11		6.0		5.6		5.1	5.1
Arsenic as As	0.010			<0.0020		0.0043		0.0044	
Barium as Ba	0.70								
Cadmium as Cd	0.0030			<0.0010		<0.0010		<0.0010	
Total Chromium as Cr	0.050			<0.0030		0.0033		<0.0030	
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0			<0.05		0.08		<0.05	
Iron as Fe (Dissolved)	2.0	8.1	0.3	0.13	<0.02	0.26	0.09	0.04	<0.02
Iron as Fe (Total)									
Lead as Pb	0.010			<0.0040		0.0047		<0.0040	
Manganese as Mn (Dissolved)	0.40	0.18	0.07	0.09	0.12	0.21	0.12	0.14	0.10
Manganese as Mn (Total)									
Mercury as Hg	0.0060			<0.00050		<0.00050		<0.00050	
Percentage Balancing		109.2%		80.6%		121.5%	9.6%	93.5%	90.9%

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill	SANS 241	BH9
Date		03-Apr-00
Infield Analysis		
Temp °C	NG	
pH	>5 or <9.7	
EC [mS/m]	170	
TDS [ppm]	1200	
ORP [mV]	NG	
pH	>5 or <9.7	7.1
Electrical conductivity (mS/m)	170	17
Chemical Oxygen demand as O2	NG	20
Total Dissolved Solids	1200	118
Alkalinity as CaCO3	NG	42
Ammonia as N	1.5	0.05
Nitrate as N	11	1
Chloride as Cl	300	18
Sulfate as SO4	500	12
Boron as B	2.4	0.032
Fluoride as F	1.5	1.8
Phosphate as P	NG	0.0334
Sodium as Na	200	15
Potassium as K	NG	5.4
Calcium as Ca	NG	4.2
Magnesium as Mg	NG	5
Arsenic as As	0.010	0.0026
Barium as Ba	0.70	
Cadmium as Cd	0.0030	<0.0010
Total Chromium as Cr	0.050	<0.0030
Hexavalent chromium as Cr	NG	
Copper as Cu	2.0	0.06
Iron as Fe (Dissolved)	2.0	0.02
Iron as Fe (Total)		
Lead as Pb	0.010	<0.0040
Manganese as Mn (Dissolved)	0.40	0.10
Manganese as Mn (Total)		
Mercury as Hg	0.0060	<0.00050
Percentage Balancing		83.9%

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		11-Jul-00	26-Sep-00	09-Jan-01	18-Apr-01	15-Aug-01	18-Oct-01	11-Apr-02	02-Aug-02
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.0	7.2	6.8	7.7	7.2	6.9	8.0	7.6
Electrical conductivity (mS/m)	170	16	15	17	20	18	17	17	18
Chemical Oxygen demand as O2	NG	20	20	<20	<20	<20	36	<20	<20
Total Dissolved Solids	1200	111	107	118	140	125	121	120	123
Alkalinity as CaCO3	NG	38	39	37	35	38	34	37	31
Ammonia as N	1.5	0.01	0.03	0.04	0.02	<0.01	0.23	0.06	0.06
Nitrate as N	11	0.63	0.49	0.56	0.67	0.94	0.97	0.72	1.29
Chloride as Cl	300	18	15	16	18	21	17	16	20
Sulfate as SO4	500	14	13	13	11	13	13	14	13
Boron as B	2.4		0.035		0.035		0.063	0.079	
Fluoride as F	1.5		1.9	4.1	1.8		1.9	2.4	1.9
Phosphate as P	NG		0.0112		0.0397		0.0339	0.0048	
Sodium as Na	200	16	16	15	15	17	16	16	17
Potassium as K	NG	5.6	5.9	5.6	5.6	5.6	5.8	5.7	6.2
Calcium as Ca	NG	4.6	4.8	4.8	4.4	6.6	7.7	4.8	4.9
Magnesium as Mg	NG	5.4	5.2	8	5.4	5.7	6	6.2	6.2
Arsenic as As	0.010		0.0028		0.0036		<0.0020	0.0029	
Barium as Ba	0.70								
Cadmium as Cd	0.0030		<0.0010		<0.0010		<0.0010	<0.0010	
Total Chromium as Cr	0.050		<0.0030		<0.0030		<0.0030	<0.0030	
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0		<0.05		<0.05		<0.05	<0.05	
Iron as Fe (Dissolved)	2.0	0.08	0.06	0.06	0.04	<0.02	<0.02	0.02	
Iron as Fe (Total)									
Lead as Pb	0.010		<0.0040		<0.0040		<0.0040	<0.0040	
Manganese as Mn (Dissolved)	0.40	0.12	0.11	0.09	0.16	<0.01	0.17	0.13	
Manganese as Mn (Total)									
Mercury as Hg	0.0060		<0.00050		<0.00050		0.0031	0.0021	
Percentage Balancing		98.1%	104.1%	100.6%	93.0%	100.0%	213.0%	97.0%	101.8%

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		31-Oct-02	14-Jan-03	15-Apr-03	25-Jun-03	04-Sep-03	13-Jan-04	02-Mar-04	02-Aug-04
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.3	7.4	7.4	7.5	7.5	7.0	7.6	6.7
Electrical conductivity (mS/m)	170	20	18	18	18	18	17	18	19
Chemical Oxygen demand as O2	NG	<20	<20	28.7	32.1	<20	<20	<20	102
Total Dissolved Solids	1200	139	127	126	127	127	118	128	131
Alkalinity as CaCO3	NG	37	36	38	38	45	40	41	42
Ammonia as N	1.5	0.19	0.37	0.03	2.15	0.02	>1	1.8	0.54
Nitrate as N	11	0.6	0.47	0.91	0.33	<0.05	0.45	0.48	0.65
Chloride as Cl	300	18	16	20	16	22	15	16	17
Sulfate as SO4	500	13	14	17	17	19	13	13	13
Boron as B	2.4	0.048		0.028		0.029		0.032	
Fluoride as F	1.5	2.5	3.2	3.3	2.6	2.8	2.7	2.6	2.1
Phosphate as P	NG	0.0324		0.0253		0.2310		0.016	
Sodium as Na	200	16	16	17	19	16	16	14	16
Potassium as K	NG	5.9	6.3	6.2	6.6	6.0	6.1	5.9	6.1
Calcium as Ca	NG	4.7	5.0	4.7	5.0	4.8	5.0	4.8	5.0
Magnesium as Mg	NG	6.0	6.0	6.1	6.3	6.1	6.1	5.9	6.1
Arsenic as As	0.010	0.0031		0.0027		0.0030		0.0026	
Barium as Ba	0.70								
Cadmium as Cd	0.0030	<0.0010		<0.0010		<0.0010		<0.0010	
Total Chromium as Cr	0.050	<0.0030		<0.0030		<0.0030		<0.0030	
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0	<0.05		<0.05		<0.05		<0.05	
Iron as Fe (Dissolved)	2.0	0.21	0.22	<0.02	0.05	0.09	0.06	1.5	<0.02
Iron as Fe (Total)									
Lead as Pb	0.010	<0.0040		<0.0040		<0.0040		0.01	
Manganese as Mn (Dissolved)	0.40	0.11	0.06	0.03	0.11	0.13	0.11	0.2	0.14
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050		<0.00050		<0.00050		<0.00050	
Percentage Balancing		92.4%	98.2%	84.5%	110.9%	76.0%			

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241									
Date		20-Sep-04	10-Dec-04	22-Apr-05	21-Jul-05	26-Jan-06	13-Apr-06	10-Jul-06	05-Oct-06
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.9	6.8	7.0	6.6	6.8	6.9	7.2	6.9
Electrical conductivity (mS/m)	170	21	18	17	17	17	18	18	10
Chemical Oxygen demand as O2	NG	<20	<20	<10	<10	64	20	<10	55
Total Dissolved Solids	1200	147			120			186	
Alkalinity as CaCO3	NG	37	39		48			40	
Ammonia as N	1.5	3.1	0.05		0.30			<0.20	
Nitrate as N	11	0.59	0.61		<0.20			1.5	
Chloride as Cl	300	16	16		23			15	
Sulfate as SO4	500	13	13		6.0			11	
Boron as B	2.4	<0.020						0.50	
Fluoride as F	1.5	2.2	3.5		1.5			2.8	
Phosphate as P	NG				<0.20			<0.20	
Sodium as Na	200	15	14		19			17	
Potassium as K	NG	5.9	5.6		5.7			7.1	
Calcium as Ca	NG	4.7	4.7		<2.0			6.0	
Magnesium as Mg	NG	5.8	5.7		12			6.0	
Arsenic as As	0.010	0.0026			<0.0020			0.0060	
Barium as Ba	0.70				0.070			0.064	
Cadmium as Cd	0.0030	<0.0010			<0.010			<0.010	
Total Chromium as Cr	0.050	<0.0030			0.060			<0.025	
Hexavalent chromium as Cr	NG				<0.010			<0.010	
Copper as Cu	2.0	<0.05			<0.025			<0.025	
Iron as Fe (Dissolved)	2.0	<0.02	0.050		0.35			0.65	
Iron as Fe (Total)									
Lead as Pb	0.010	0.01			<0.050			<0.050	
Manganese as Mn (Dissolved)	0.40	0.15	0.15		0.16			0.16	
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050			<0.0020			<0.0020	
Percentage Balancing					96.5			96.8	

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241									
Date		25-Jan-07	12-Apr-07	11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08	10-Jul-08	16-Oct-08
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	8.1	6.9	7.9	6.9	6.9	7.2	6.2	6.9
Electrical conductivity (mS/m)	170	18	18	18	18	18	18	23	16
Chemical Oxygen demand as O2	NG	<10	<10	19	<10	20	<10	<10	<10
Total Dissolved Solids	1200			116				146	
Alkalinity as CaCO3	NG			40				16	
Ammonia as N	1.5			<0.20				<0.2	
Nitrate as N	11			0.60				6.9	
Chloride as Cl	300			18				45	
Sulfate as SO4	500			12				<5.0	
Boron as B	2.4			0.020				<0.025	
Fluoride as F	1.5			2.3				<0.20	
Phosphate as P	NG			<0.20				<0.20	
Sodium as Na	200			16				29	
Potassium as K	NG			5.7				7.3	
Calcium as Ca	NG			6.0				3.0	
Magnesium as Mg	NG			6.0				7.0	
Arsenic as As	0.010			<0.0020				<0.010	
Barium as Ba	0.70			0.057				0.23	
Cadmium as Cd	0.0030			<0.010				<0.0050	
Total Chromium as Cr	0.050			<0.025				<0.025	
Hexavalent chromium as Cr	NG			<0.010				<0.010	
Copper as Cu	2.0			<0.025				<0.025	
Iron as Fe (Dissolved)	2.0			0.97				2.3	
Iron as Fe (Total)									
Lead as Pb	0.010			<0.050				<0.020	
Manganese as Mn (Dissolved)	0.40			0.15				0.13	
Manganese as Mn (Total)									
Mercury as Hg	0.0060			0.00060				<0.0010	
Percentage Balancing				97.4				97.9	

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		07-Jan-09	09-May-09	11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.8	7.9	7.1	7.0	7.5	7.1	7.2	8.0
Electrical conductivity (mS/m)	170	17	17	17	19	17	19	18	17
Chemical Oxygen demand as O2	NG	<10	<10	<10	<3.0	14	13	12	
Total Dissolved Solids	1200			110				97	
Alkalinity as CaCO3	NG			40				59	
Ammonia as N	1.5			<0.20				5.5	0.20
Nitrate as N	11			0.30				0.074	
Chloride as Cl	300			14				18	
Sulfate as SO4	500			14				15	
Boron as B	2.4			<0.025				0.061	
Fluoride as F	1.5			2.6				1.6	
Phosphate as P	NG			<0.20				<0.025	
Sodium as Na	200			18				15	
Potassium as K	NG			7.3				5.2	
Calcium as Ca	NG			6.0				3.8	
Magnesium as Mg	NG			7.0				5.2	
Arsenic as As	0.010			0.014		<0.010		<0.023	
Barium as Ba	0.70			0.068				0.090	
Cadmium as Cd	0.0030			<0.0050				<0.0010	
Total Chromium as Cr	0.050			<0.025				0.0020	
Hexavalent chromium as Cr	NG			<0.010				<0.0080	
Copper as Cu	2.0			<0.025				0.057	
Iron as Fe (Dissolved)	2.0			0.83				0.094	
Iron as Fe (Total)									
Lead as Pb	0.010			<0.020				0.020	
Manganese as Mn (Dissolved)	0.40			0.17				0.17	
Manganese as Mn (Total)									
Mercury as Hg	0.0060			0.0010				<0.0010	
Percentage Balancing				94.2				98.6	

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9
SANS 241					
Date		11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11
Infield Analysis					
Temp °C	NG				
pH	>5 or <9.7				
EC [mS/m]	170				
TDS [ppm]	1200				
ORP [mV]	NG				
pH	>5 or <9.7	7.2	7.0	7.1	7.3
Electrical conductivity (mS/m)	170	18	18	18	18
Chemical Oxygen demand as O2	NG	77	14	<3.0	8.8
Total Dissolved Solids	1200			81	
Alkalinity as CaCO3	NG			40	
Ammonia as N	1.5			0.033	
Nitrate as N	11			0.87	
Chloride as Cl	300			14	
Sulfate as SO4	500			13	
Boron as B	2.4			0.036	
Fluoride as F	1.5			2.0	
Phosphate as P	NG			<0.025	
Sodium as Na	200			11	
Potassium as K	NG			6.7	
Calcium as Ca	NG			5.9	
Magnesium as Mg	NG			6.4	
Arsenic as As	0.010			<0.023	
Barium as Ba	0.70			0.079	
Cadmium as Cd	0.0030			<0.0010	
Total Chromium as Cr	0.050			<0.0020	
Hexavalent chromium as Cr	NG			<0.0080	
Copper as Cu	2.0			0.034	
Iron as Fe (Dissolved)	2.0			0.94	
Iron as Fe (Total)					
Lead as Pb	0.010			<0.010	
Manganese as Mn (Dissolved)	0.40			0.13	
Manganese as Mn (Total)					
Mercury as Hg	0.0060			<0.0010	
Percentage Balancing				99.0	

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241								
Date		30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013	24-Apr-2013	22-Sep-16
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.3	7.2	7.4	7.2	7.7	7.1	7.5
Electrical conductivity (mS/m)	170	17	15	14	18	19	17	17
Chemical Oxygen demand as O2	NG	15	27	<3.0	<3.0	5.1	<0.082	<10
Total Dissolved Solids	1200			88				94
Alkalinity as CaCO3	NG			44				40
Ammonia as N	1.5			0.026				<0.10
Nitrate as N	11			1.9				0.30
Chloride as Cl	300			14				15
Sulfate as SO4	500			10				16
Boron as B	2.4			0.010				0.029
Fluoride as F	1.5			2.4				2.5
Phosphate as P	NG			<0.025				<0.10
Sodium as Na	200			15				13
Potassium as K	NG			6.2				5.7
Calcium as Ca	NG			5.6				5.00
Magnesium as Mg	NG			6.3				6.00
Arsenic as As	0.010			<0.023				<0.010
Barium as Ba	0.70			0.044				0.057
Cadmium as Cd	0.0030			<0.0010				<0.025
Total Chromium as Cr	0.050			<0.0020				<0.025
Hexavalent chromium as Cr	NG			<0.010				<0.010
Copper as Cu	2.0			<0.0010				0.012
Iron as Fe (Dissolved)	2.0			<0.0060				0.902
Iron as Fe (Total)								<0.025
Lead as Pb	0.010			<0.0010				<0.010
Manganese as Mn (Dissolved)	0.40			0.028				0.14
Manganese as Mn (Total)								0.092
Mercury as Hg	0.0060			<0.0010				0.0020
Percentage Balancing				96.5				96

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22
Date									
Infield Analysis									
Temp °C	NG	27	20	22	26	24	16		24
pH	>5 or <9.7	7.2	7.0	7.0	8.0	6.7	6.9		6.8
EC [mS/m]	170	20	290	20	26	20	18		24
TDS [ppm]	1200	100	1450	100	130	100	90		120
ORP [mV]	NG								
pH	>5 or <9.7	6.4	6.6	7.1	8.1	6.8	7.1	6.7	7.1
Electrical conductivity (mS/m)	170	26	17	14	16	12	16	16	17
Chemical Oxygen demand as O2	NG	7.5	13	<6.7	9.4	<6.7	14	<6.7	16
Total Dissolved Solids	1200		120				100		
Alkalinity as CaCO3	NG		36				47		
Ammonia as N	1.5		<0.010				<0.010		
Nitrate as N	11		<0.50				<0.50		
Chloride as Cl	300		14				16		
Sulfate as SO4	500		36				30		
Boron as B	2.4		<0.030				0.19		
Fluoride as F	1.5		2.1				2.4		
Phosphate as P	NG		0.32				0.020		
Sodium as Na	200		16				17		
Potassium as K	NG		6.0				6.0		
Calcium as Ca	NG		5.4				5.4		
Magnesium as Mg	NG		7.5				7.3		
Arsenic as As	0.010		<0.010				<0.010		
Barium as Ba	0.70		0.31				0.11		
Cadmium as Cd	0.0030		<0.0020				<0.0020		
Total Chromium as Cr	0.050		<0.010				<0.010		
Hexavalent chromium as Cr	NG		<1.0				<1.0		
Copper as Cu	2.0		0.020				<0.010		
Iron as Fe (Dissolved)	2.0		<0.10				<0.10		
Iron as Fe (Total)			2.6				1.6		
Lead as Pb	0.010		<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40		<0.010				0.14		
Manganese as Mn (Total)			0.21				0.22		
Mercury as Hg	0.0060		<0.00050				<0.00050		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9	BH9	BH9
SANS 241		04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23
Date								
Infield Analysis								
Temp °C	NG	23	21	25	29	23	22	27
pH	>5 or <9.7	7.2	7.3	6.9	7.4	7.8	6.8	7.0
EC [mS/m]	170	25	25	20	7.0	29	23	25
TDS [ppm]	1200	120	130	100	40	150	120	120
ORP [mV]	NG							
pH	>5 or <9.7	6.9	7.1	6.8	7.0	7.8	7.6	6.9
Electrical conductivity (mS/m)	170	18	18.7	17	18	19	18	18
Chemical Oxygen demand as O2	NG	13	8.0	12	38	8.6	11	<6.7
Total Dissolved Solids	1200		120				130	
Alkalinity as CaCO3	NG		39				48	
Ammonia as N	1.5		<0.010				0.30	
Nitrate as N	11		<0.50				<0.50	
Chloride as Cl	300		17				19	
Sulfate as SO4	500		15				16	
Boron as B	2.4		0.040				0.040	
Fluoride as F	1.5		1.8				2.1	
Phosphate as P	NG		<0.10				<0.010	
Sodium as Na	200		18				18	
Potassium as K	NG		6.9				5.8	
Calcium as Ca	NG		4.7				5.0	
Magnesium as Mg	NG		6.5				6.7	
Arsenic as As	0.010		<0.010				<0.010	
Barium as Ba	0.70		0.080				0.020	
Cadmium as Cd	0.0030		<0.0020				<0.0020	
Total Chromium as Cr	0.050		<0.010				<0.010	
Hexavalent chromium as Cr	NG		<1.0				<1.0	
Copper as Cu	2.0		<0.010				<0.010	
Iron as Fe (Dissolved)	2.0		<0.10				<0.10	
Iron as Fe (Total)			0.80				<0.10	
Lead as Pb	0.010		<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40		<0.010				<0.010	
Manganese as Mn (Total)			0.060				<0.010	
Mercury as Hg	0.0060		<0.00050				<0.00050	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH 9 Shongweni Landfill		BH9	BH9	BH9	BH9	BH9
Date	SANS 241	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis						
Temp °C	NG	25	23	20	20	22
pH	>5 or <9.7	7.2	6.8	6.7	6.8	7.0
EC [mS/m]	170	40	27	26	22	34
TDS [ppm]	1200	200	130	130	110	170
ORP [mV]	NG					
pH	>5 or <9.7	7.4	7.2	6.9	7.0	7.4
Electrical conductivity (mS/m)	170	20	15	18	19	18
Chemical Oxygen demand as O2	NG	<6.7	9.0	15	<6.7	<6.7
Total Dissolved Solids	1200			120		
Alkalinity as CaCO3	NG			40		
Ammonia as N	1.5			<0.010		
Nitrate as N	11			0.65		
Chloride as Cl	300			19		
Sulfate as SO4	500			17		
Boron as B	2.4			<0.030		
Fluoride as F	1.5			1.6		
Phosphate as P	NG			<0.010		
Sodium as Na	200			15		
Potassium as K	NG			6.0		
Calcium as Ca	NG			5.5		
Magnesium as Mg	NG			7.4		
Arsenic as As	0.010			<0.010		
Barium as Ba	0.70			<0.010		
Cadmium as Cd	0.0030			<0.0020		
Total Chromium as Cr	0.050			<0.010		
Hexavalent chromium as Cr	NG			<1.0		
Copper as Cu	2.0			<0.010		
Iron as Fe (Dissolved)	2.0			<0.10		
Iron as Fe (Total)				0.70		
Lead as Pb	0.010			0.010		
Manganese as Mn (Dissolved)	0.40			<0.010		
Manganese as Mn (Total)				0.38		
Mercury as Hg	0.0060					

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11
Date								
Infield Analysis		NG						
Temp °C								
pH		>5 or <9.7						
EC [mS/m]		170						
TDS [ppm]		1200						
ORP [mV]		NG						
pH		>5 or <9.7	6.6	6.1	6.6	6.2	6.5	6.6
Electrical conductivity (mS/m)		170	36	33	80	47	39	34
Chemical Oxygen demand as O2		NG	36	<3.0	31	24	38	<3.0
Total Dissolved Solids		1200	236			206		
Alkalinity as CaCO3		NG	116			121		
Ammonia as N		1.5	<0.20			1.7	0.30	
Nitrate as N		11	1.4			3.2		
Chloride as Cl		300	29			33		
Sulfate as SO4		500	22			23		
Boron as B		2.4	0.11			0.054		
Fluoride as F		1.5	0.60			0.43		
Phosphate as P		NG	<0.20			0.19		
Sodium as Na		200	57			53		
Potassium as K		NG	2.2			0.82		
Calcium as Ca		NG	21			14		
Magnesium as Mg		NG	12			6.5		
Arsenic as As		0.010	0.020			<0.023		
Barium as Ba		0.70	0.14			0.085		
Cadmium as Cd		0.0030	<0.0050			<0.0010		
Total Chromium as Cr		0.050	<0.025			<0.0020		
Hexavalent chromium as Cr		NG	<0.010			<0.0080		
Copper as Cu		2.0	<0.025			0.031		
Iron as Fe (Dissolved)		2.0						
Iron as Fe (Total)			9.8			0.054		
Lead as Pb		0.010	0.024			0.020		
Manganese as Mn (Dissolved)		0.40						
Manganese as Mn (Total)			2.1			0.090		
Mercury as Hg		0.0060	0.0010			<0.0010		
Percentage Balancing			94.8			96.7		

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012
Date							
Infield Analysis	NG						
Temp °C							
pH	>5 or <9.7						
EC [mS/m]	170						
TDS [ppm]	1200						
ORP [mV]	NG						
pH	>5 or <9.7	7.7	6.1	6.3	6.3	6.2	6.6
Electrical conductivity (mS/m)	170	67	77	60	53	62	61
Chemical Oxygen demand as O2	NG	27	25	6.5	5.1	9.4	247
Total Dissolved Solids	1200		428				442
Alkalinity as CaCO3	NG		259				297
Ammonia as N	1.5		0.040				0.022
Nitrate as N	11		6.3				4.6
Chloride as Cl	300		37				35
Sulfate as SO4	500		67				49
Boron as B	2.4		<0.0080				0.010
Fluoride as F	1.5		0.60				0.64
Phosphate as P	NG		0.093				0.058
Sodium as Na	200		111				120
Potassium as K	NG		1.2				1.0
Calcium as Ca	NG		26				31
Magnesium as Mg	NG		25				22
Arsenic as As	0.010		<0.023				<0.023
Barium as Ba	0.70		<0.0010				0.069
Cadmium as Cd	0.0030		<0.0010				<0.0010
Total Chromium as Cr	0.050		<0.0020				<0.0020
Hexavalent chromium as Cr	NG		<0.0080				<0.010
Copper as Cu	2.0		0.0050				<0.0010
Iron as Fe (Dissolved)	2.0						
Iron as Fe (Total)			2.3				<0.0060
Lead as Pb	0.010		<0.010				<0.0010
Manganese as Mn (Dissolved)	0.40						
Manganese as Mn (Total)			0.31				0.70
Mercury as Hg	0.0060		<0.0010				<0.0010
Percentage Balancing			97.5				97.8

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013
Date						
Infield Analysis	NG					
Temp °C						
pH	>5 or <9.7					
EC [mS/m]	170					
TDS [ppm]	1200					
ORP [mV]	NG					
pH	>5 or <9.7	6.4	7.5	6.2	6.2	6.3
Electrical conductivity (mS/m)	170	60	67	58	53	90
Chemical Oxygen demand as O2	NG	<3.0	<0.082	<0.082	34	20
Total Dissolved Solids	1200				311	
Alkalinity as CaCO3	NG				190	
Ammonia as N	1.5				14	
Nitrate as N	11				4.8	
Chloride as Cl	300				40	
Sulfate as SO4	500				30	
Boron as B	2.4				0.0080	
Fluoride as F	1.5				0.30	
Phosphate as P	NG				0.14	
Sodium as Na	200				71	
Potassium as K	NG				1.7	
Calcium as Ca	NG				21	
Magnesium as Mg	NG				15	
Arsenic as As	0.010				<0.0070	
Barium as Ba	0.70				0.028	
Cadmium as Cd	0.0030				<0.0010	
Total Chromium as Cr	0.050				<0.0010	
Hexavalent chromium as Cr	NG				<0.0020	
Copper as Cu	2.0				<0.0010	
Iron as Fe (Dissolved)	2.0					
Iron as Fe (Total)					<0.0030	
Lead as Pb	0.010				<0.0040	
Manganese as Mn (Dissolved)	0.40					
Manganese as Mn (Total)					<0.0010	
Mercury as Hg	0.0060				<0.0010	
Percentage Balancing					96.2	

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15
Date							
Infield Analysis		NG					
Temp °C							
pH		>5 or <9.7					
EC [mS/m]		170					
TDS [ppm]		1200					
ORP [mV]		NG					
pH		>5 or <9.7	6.3	6.1	6.0	6.4	6.2
Electrical conductivity (mS/m)		170	91	61	63	65	66
Chemical Oxygen demand as O2		NG	27	68	54	34	69
Total Dissolved Solids		1200		419			442
Alkalinity as CaCO3		NG		227			230
Ammonia as N		1.5		0.87			0.40
Nitrate as N		11		4.6			6.1
Chloride as Cl		300		39			44
Sulfate as SO4		500		36			47
Boron as B		2.4		0.030			0.026
Fluoride as F		1.5		0.32			0.54
Phosphate as P		NG		0.028			0.12
Sodium as Na		200		87			95
Potassium as K		NG		1.1			1.0
Calcium as Ca		NG		22			24
Magnesium as Mg		NG		17			17
Arsenic as As		0.010		<0.0070			<0.010
Barium as Ba		0.70		0.025			0.014
Cadmium as Cd		0.0030		<0.0010			<0.0020
Total Chromium as Cr		0.050		<0.0010			<0.0030
Hexavalent chromium as Cr		NG		<0.0020			<0.0020
Copper as Cu		2.0		<0.0010			<0.0020
Iron as Fe (Dissolved)		2.0					
Iron as Fe (Total)				<0.0030			<0.0040
Lead as Pb		0.010		<0.0040			<0.0030
Manganese as Mn (Dissolved)		0.40					
Manganese as Mn (Total)				0.17			<0.0020
Mercury as Hg		0.0060		<0.0070			<0.0040
Percentage Balancing			97.3				96.4

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	22-Sep-16	22-Sep-16	11-Oct-16
Date								
Infield Analysis		NG						
Temp °C								
pH		>5 or <9.7						
EC [mS/m]		170						
TDS [ppm]		1200						
ORP [mV]		NG						
pH		>5 or <9.7	6.0	6.0	6.1	6.0	6.1	6.8
Electrical conductivity (mS/m)		170	62	63	48	55	52	47
Chemical Oxygen demand as O2		NG	<5.0	7.4	44	15	22	<10
Total Dissolved Solids		1200			330	312	312	
Alkalinity as CaCO3		NG			178	168	156	
Ammonia as N		1.5			<0.010	<0.010	<0.10	
Nitrate as N		11			7.6	4.7	4.4	
Chloride as Cl		300			38	35	32	
Sulfate as SO4		500			42	44	35	
Boron as B		2.4			0.34	0.32	<0.025	
Fluoride as F		1.5			1.2	1.0	0.90	
Phosphate as P		NG			<0.010	0.080	0.10	
Sodium as Na		200			81	75	65	
Potassium as K		NG			0.97	0.98	0.7	
Calcium as Ca		NG			18	16	16	
Magnesium as Mg		NG			13	12	11	
Arsenic as As		0.010			<0.020	<0.020	<0.010	
Barium as Ba		0.70			0.16	0.16	<0.025	
Cadmium as Cd		0.0030			<0.0030	<0.0030	<0.025	
Total Chromium as Cr		0.050			<0.0070	<0.0070	<0.025	
Hexavalent chromium as Cr		NG			<0.0070	<0.0070	<0.010	
Copper as Cu		2.0			<0.013	<0.013	<0.010	
Iron as Fe (Dissolved)		2.0				<0.10	<0.025	
Iron as Fe (Total)					0.10	<0.10	0.68	
Lead as Pb		0.010			<0.015	<0.015	<0.010	
Manganese as Mn (Dissolved)		0.40				<0.0060	<0.025	
Manganese as Mn (Total)					<0.0060	<0.0060	0.065	
Mercury as Hg		0.0060			<0.027	<0.027	<0.0010	
Percentage Balancing							95.3	

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18
Date								
Infield Analysis	NG							
Temp °C					21	20	20	20
pH	>5 or <9.7				6.8	6.5	6.6	6.2
EC [mS/m]	170				63	97	76	45
TDS [ppm]	1200				314	481	380	224
ORP [mV]	NG						-3.1	44
pH	>5 or <9.7	6.2	6.0	6.0	8.0	5.9	6.1	6.5
Electrical conductivity (mS/m)	170	47	57	68	66	78	47	44
Chemical Oxygen demand as O2	NG	31	<6.7	16	<6.7	89	28	<6.7
Total Dissolved Solids	1200			540				
Alkalinity as CaCO3	NG			264				193
Ammonia as N	1.5			<0.010				<0.010
Nitrate as N	11			7.3				4.0
Chloride as Cl	300			43				34
Sulfate as SO4	500			8.3				40
Boron as B	2.4			0.36				0.56
Fluoride as F	1.5			0.70				0.62
Phosphate as P	NG			0.25				0.27
Sodium as Na	200			112				77
Potassium as K	NG			0.96				1.2
Calcium as Ca	NG			24				17
Magnesium as Mg	NG			17				15
Arsenic as As	0.010			0.020				<0.010
Barium as Ba	0.70			0.31				<0.010
Cadmium as Cd	0.0030			<0.0020				<0.0020
Total Chromium as Cr	0.050			<0.010				<0.010
Hexavalent chromium as Cr	NG			<1.0				<1.0
Copper as Cu	2.0			0.020				<0.010
Iron as Fe (Dissolved)	2.0			3.6				<0.10
Iron as Fe (Total)								20
Lead as Pb	0.010			<0.010				<0.010
Manganese as Mn (Dissolved)	0.40			<0.010				<0.010
Manganese as Mn (Total)								0.76
Mercury as Hg	0.0060			<0.0010				<0.0010
Percentage Balancing								
All values in mg/l, unless otherwise indicated.								

BH09-07S Shongweni Landfill

		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
	SANS 241	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Date								
Infield Analysis	NG							
Temp °C		21	20	21	21	20	22	21
pH	>5 or <9.7	6.1	6.0	5.6	5.9	6.1	5.8	5.8
EC [mS/m]	170	54	54	67	56	65	72	59
TDS [ppm]	1200	269	271	330	280	350	360	300
ORP [mV]	NG	51	86					
pH	>5 or <9.7	5.5	6.06	6.2	6.4	6.3	6.0	6.0
Electrical conductivity (mS/m)	170	70	41	50	53	54	61	48
Chemical Oxygen demand as O2	NG	26	35	<6.7	<6.7	<6.7	24	13
Total Dissolved Solids	1200				290			335
Alkalinity as CaCO3	NG				180			163
Ammonia as N	1.5				<0.010			<0.010
Nitrate as N	11				5.1			4.5
Chloride as Cl	300				41			35
Sulfate as SO4	500				26			46
Boron as B	2.4				0.040			<0.030
Fluoride as F	1.5				0.54			0.28
Phosphate as P	NG				0.23			0.13
Sodium as Na	200				83			72
Potassium as K	NG				1.2			0.66
Calcium as Ca	NG				23			18.8
Magnesium as Mg	NG				15.3			13.6
Arsenic as As	0.010				<0.010			<0.010
Barium as Ba	0.70				0.030			0.21
Cadmium as Cd	0.0030				<0.0020			<0.0020
Total Chromium as Cr	0.050				<0.010			0.010
Hexavalent chromium as Cr	NG				<1.0			<1.0
Copper as Cu	2.0				<0.010			0.010
Iron as Fe (Dissolved)	2.0				1.8			<0.10
Iron as Fe (Total)					5.5			12
Lead as Pb	0.010				<0.010			<0.010
Manganese as Mn (Dissolved)	0.40				0.12			<0.010
Manganese as Mn (Total)					0.38			0.11
Mercury as Hg	0.0060							<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22
Date							
Infield Analysis	NG						
Temp °C		24	22	22	20		20
pH	>5 or <9.7	5.9	6.3	6.1	6.9		6.0
EC [mS/m]	170	56	191	96	69		46
TDS [ppm]	1200	280	960	480	350		230
ORP [mV]	NG						
pH	>5 or <9.7	6.6	8.4	6.4	6.6	6.5	7.2
Electrical conductivity (mS/m)	170	44	186	82	66	59	48
Chemical Oxygen demand as O2	NG	21	92	21	27	<6.7	14
Total Dissolved Solids	1200				475		
Alkalinity as CaCO3	NG				270		
Ammonia as N	1.5				<0.010		
Nitrate as N	11				4.4		
Chloride as Cl	300				43		
Sulfate as SO4	500				53		
Boron as B	2.4				0.33		
Fluoride as F	1.5				0.42		
Phosphate as P	NG				0.12		
Sodium as Na	200				102		
Potassium as K	NG				1.0		
Calcium as Ca	NG				21		
Magnesium as Mg	NG				21		
Arsenic as As	0.010				<0.010		
Barium as Ba	0.70				0.060		
Cadmium as Cd	0.0030				<0.0020		
Total Chromium as Cr	0.050				<0.010		
Hexavalent chromium as Cr	NG				<1.0		
Copper as Cu	2.0				<0.010		
Iron as Fe (Dissolved)	2.0				<0.10		
Iron as Fe (Total)					8.7		
Lead as Pb	0.010				<0.010		
Manganese as Mn (Dissolved)	0.40				<0.010		
Manganese as Mn (Total)					0.22		
Mercury as Hg	0.0060				<0.00050		
Percentage Balancing							
All values in mg/l, unless otherwise indicated.							

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23
Date							
Infield Analysis	NG						
Temp °C		20	20	21	21	20	20
pH	>5 or <9.7	6.0	6.1	6.1	6.4	6.3	6.0
EC [mS/m]	170	45	60	54	39	29	49
TDS [ppm]	1200	200	300	260	190	150	250
ORP [mV]	NG						
pH	>5 or <9.7		6.5	6.3	6.9	7.8	9.9
Electrical conductivity (mS/m)	170	45	48	64	45	55	47
Chemical Oxygen demand as O2	NG		9.9	22	<6.7	44	20
Total Dissolved Solids	1200		290				300
Alkalinity as CaCO3	NG		160				170
Ammonia as N	1.5		<0.010				0.26
Nitrate as N	11		3.4				2.3
Chloride as Cl	300		34				41
Sulfate as SO4	500		23				25
Boron as B	2.4		0.49				<0.030
Fluoride as F	1.5		0.28				0.27
Phosphate as P	NG		<0.10				<0.010
Sodium as Na	200		69				81
Potassium as K	NG		1.2				0.78
Calcium as Ca	NG		16				14
Magnesium as Mg	NG		15				12
Arsenic as As	0.010		<0.010				<0.010
Barium as Ba	0.70		0.010				0.010
Cadmium as Cd	0.0030		<0.0020				<0.0020
Total Chromium as Cr	0.050		<0.010				<0.010
Hexavalent chromium as Cr	NG		<1.0				<1.0
Copper as Cu	2.0		<0.010				<0.010
Iron as Fe (Dissolved)	2.0		<0.10				<0.10
Iron as Fe (Total)			8.6				2.3
Lead as Pb	0.010		<0.010				<0.010
Manganese as Mn (Dissolved)	0.40		<0.010				<0.010
Manganese as Mn (Total)			0.15				<0.010
Mercury as Hg	0.0060		<0.00050				<0.00050
Percentage Balancing							
All values in mg/l, unless otherwise indicated.							

BH09-07S Shongweni Landfill		BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S	BH09-07S
SANS 241		25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Date							
Infield Analysis	NG						
Temp °C		20	21	20	20	20	22
pH	>5 or <9.7	6.0	6.0	5.8	6.0	5.9	6.0
EC [mS/m]	170	51	82	56	44	42	59
TDS [ppm]	1200	260	420	280	230	220	310
ORP [mV]	NG						
pH	>5 or <9.7	6.4	7.3	6.3	7.5	6.5	7.2
Electrical conductivity (mS/m)	170	36	70	43	42	43	38
Chemical Oxygen demand as O2	NG	11	<6.7	14	11	15	<6.7
Total Dissolved Solids	1200				300		
Alkalinity as CaCO3	NG				147		
Ammonia as N	1.5				<0.010		
Nitrate as N	11				4.6		
Chloride as Cl	300				35		
Sulfate as SO4	500				22		
Boron as B	2.4				<0.030		
Fluoride as F	1.5				0.28		
Phosphate as P	NG				<0.010		
Sodium as Na	200				65		
Potassium as K	NG				0.78		
Calcium as Ca	NG				12		
Magnesium as Mg	NG				11		
Arsenic as As	0.010				<0.010		
Barium as Ba	0.70				<0.010		
Cadmium as Cd	0.0030				<0.0020		
Total Chromium as Cr	0.050				<0.010		
Hexavalent chromium as Cr	NG				<1.0		
Copper as Cu	2.0				<0.010		
Iron as Fe (Dissolved)	2.0				<0.10		
Iron as Fe (Total)					4.6		
Lead as Pb	0.010				0.010		
Manganese as Mn (Dissolved)	0.40				<0.010		
Manganese as Mn (Total)					0.61		
Mercury as Hg	0.0060						
Percentage Balancing							
All values in mg/l, unless otherwise indicated.							

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241		01-Jul-96	05-Aug-97	23-Dec-97	02-Apr-98	11-Jun-98	15-Sep-98	04-Jan-99	16-Mar-99
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.7	8.0	7.0	6.5	6.6	6.7	6.6	6.5
Electrical conductivity (mS/m)	170	29	21	21	22	20	22	21	21
Chemical Oxygen demand as O2	NG	28	78	184		64	39	34	47
Total Dissolved Solids	1200	167	150	145	151	143	1372	150	148
Alkalinity as CaCO3	NG	99	82	72	67	64	72	79	75
Ammonia as N	1.5	0.040	0.020	0.080	0.060	0.030	0.11	0.59	0.010
Nitrate as N	11	0.78	0.24	0.13	<0.05	<0.05	0.05	<0.05	0.10
Chloride as Cl	300	22	22	23	27	26	26	25	26
Sulfate as SO4	500	9.8	4.1	3.7	2.0	2.5	1.0	2.8	4.0
Boron as B	2.4	<0.020	0.19		<0.020		0.051		0.53
Fluoride as F	1.5		0.322		0.624		0.499		0.43
Phosphate as P	NG								0.037
Sodium as Na	200	29	28		22		27		39
Potassium as K	NG	3.7	2.0	1.2	1.0	1.1	<1.0	<1.0	1.3
Calcium as Ca	NG	22	15		11.4		7.6		8.4
Magnesium as Mg	NG	5.6	3.7		3.4		2.8		3.9
Arsenic as As	0.010	<0.0020	<0.0020		<0.0020		<0.0020		<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030	<0.0010	<0.0010		<0.0010		<0.0010		<0.0010
Total Chromium as Cr	0.050	<0.0030	<0.0030		<0.0030		0.0027		0.034
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0	<0.050			<0.050		<0.050		<0.05
Iron as Fe (Dissolved)	2.0	6.0	17	0.040	200	3.6	1.13	0.030	0.21
Iron as Fe (Total)									
Lead as Pb	0.010		0.01		0.012		<0.0040		0.0054
Manganese as Mn (Dissolved)	0.40	0.56		<0.010	0.61	0.40	0.37	0.12	0.15
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050	<0.00050		<0.00050		<0.00050		<0.00050
Percentage Balancing			99.1%		86.4%		82.6%		110.7%

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241						
Date		24-Jun-99	28-Sep-99	11-Jan-00	03-Apr-00	11-Jul-00
Infield Analysis						
Temp °C	NG					
pH	>5 or <9.7					
EC [mS/m]	170					
TDS [ppm]	1200					
ORP [mV]	NG					
pH	>5 or <9.7	6.6	6.5	6.7	6.5	6.3
Electrical conductivity (mS/m)	170	22	20	22	24	19
Chemical Oxygen demand as O2	NG	70	50	<20	69	40
Total Dissolved Solids	1200		142	155	165	132
Alkalinity as CaCO3	NG	81	76	75	83	59
Ammonia as N	1.5	0.55	0.030	0.060	0.15	0.050
Nitrate as N	11	<0.050	<0.050	0.35	0.19	0.26
Chloride as Cl	300	27	27	29	31	28
Sulfate as SO4	500	2.4	3.2	3.9	3.0	7.2
Boron as B	2.4		0.18		0.33	
Fluoride as F	1.5		0.48		0.51	
Phosphate as P	NG		0.0059		0.0049	
Sodium as Na	200		26	31	24	28
Potassium as K	NG	<1.0	<1.0	1.0	1.1	1
Calcium as Ca	NG		7.4	8.3	10	6.1
Magnesium as Mg	NG		3.0	3.4	3.7	3.1
Arsenic as As	0.010		<0.0020		<0.0020	
Barium as Ba	0.70					
Cadmium as Cd	0.0030		<0.0010		<0.0010	
Total Chromium as Cr	0.050		<0.0030		0.0072	
Hexavalent chromium as Cr	NG					
Copper as Cu	2.0		<0.050		<0.050	
Iron as Fe (Dissolved)	2.0	0.060	0.030	0.050	0.040	0.34
Iron as Fe (Total)						
Lead as Pb	0.010		0.0053		0.010	
Manganese as Mn (Dissolved)	0.40	0.16	0.29	0.30	0.78	0.3
Manganese as Mn (Total)						
Mercury as Hg	0.0060		<0.00050		<0.00050	
Percentage Balancing			74.8%	85.6%	72.5%	86.7%

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241									
Date		26-Sep-00	09-Jan-01	18-Apr-01	15-Aug-01	18-Oct-01	08-Feb-02	11-Apr-02	31-Oct-02
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.6	6.6	6.7	6.9	7.7	7.1	7.5	6.9
Electrical conductivity (mS/m)	170	20	21	21	21	23	22	23	26
Chemical Oxygen demand as O2	NG	<20	37	<20	<20	23	<20	<20	<20
Total Dissolved Solids	1200	141	146	148	146	162	154	162	183
Alkalinity as CaCO3	NG	71	69	64	69	84	76	68	98
Ammonia as N	1.5	0.060	0.030	<0.010	0.070	0.050	0.040	0.010	0.030
Nitrate as N	11	<0.050	0.32	0.22	<0.050	<0.05	3.2	<0.050	<0.050
Chloride as Cl	300	24	25	25	24	23	18	23	22
Sulfate as SO4	500	1.0	3.1	2.6	<0.16	1.5	1.8	<0.16	2.6
Boron as B	2.4	0.082		0.11		0.038		0.085	0.028
Fluoride as F	1.5	0.37	0.42	0.38		0.87	0.64	0.59	0.75
Phosphate as P	NG	0.0033		0.0081		0.019		0.019	0.0074
Sodium as Na	200	32	26	27	32	32	32	32	33
Potassium as K	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	1.0
Calcium as Ca	NG	7.9	6.2	7.2	8.3	13	11	11	16
Magnesium as Mg	NG	3.2	6.0	3.3	3.7	4.1	4.2	4.5	5.3
Arsenic as As	0.010	<0.0020		<0.0020		<0.0020		<0.0020	<0.0020
Barium as Ba	0.70								
Cadmium as Cd	0.0030	<0.0010		<0.0010		<0.0010		<0.0010	<0.0010
Total Chromium as Cr	0.050	<0.0030		0.0071		<0.0030		<0.0030	0.032
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0	<0.050		<0.050		<0.050		<0.050	<0.050
Iron as Fe (Dissolved)	2.0	<0.020	<0.020	0.15	0.020	<0.020		<0.020	<0.020
Iron as Fe (Total)									
Lead as Pb	0.010	<0.0040		<0.0040		<0.0040		<0.0040	<0.0040
Manganese as Mn (Dissolved)	0.40	0.20	0.41	0.48	0.39	0.22		0.17	0.22
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050		<0.00050		<0.00050		<0.00050	<0.00050
Percentage Balancing		96.2%	89.4%	86.5%	103.9%	99.2%	98.3%	113.1%	

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241					
Date		14-Jan-03	15-Apr-03	25-Jun-03	04-Sep-03	13-Jan-04
Infield Analysis						
Temp °C	NG					
pH	>5 or <9.7					
EC [mS/m]	170					
TDS [ppm]	1200					
ORP [mV]	NG					
pH	>5 or <9.7	6.9	6.7	7.0	7.1	6.7
Electrical conductivity (mS/m)	170	26	27	29	28	23
Chemical Oxygen demand as O2	NG	<20	25	26	<20	21
Total Dissolved Solids	1200	181	191	202	193	164
Alkalinity as CaCO3	NG	96	112	102	116	92
Ammonia as N	1.5	0.13	0.030	0.27	0.070	1.11
Nitrate as N	11	<0.050	<0.050	0.12	<0.050	<0.050
Chloride as Cl	300	21	26	20	22	21
Sulfate as SO4	500	1.2	2.0	2.9	1.7	1.2
Boron as B	2.4		0.030		0.025	
Fluoride as F	1.5	0.72	0.82	0.67	0.66	0.55
Phosphate as P	NG		0.0049		0.0078	
Sodium as Na	200	32	33	32	33	31
Potassium as K	NG	<1.0	1.0	<1.0	<1.0	<1.0
Calcium as Ca	NG	16	17	17	17	13
Magnesium as Mg	NG	4.8	5.4	5.4	5.5	4.8
Arsenic as As	0.010		<0.0020		<0.0020	
Barium as Ba	0.70					
Cadmium as Cd	0.0030		<0.0010		<0.0010	
Total Chromium as Cr	0.050		<0.0030		0.0038	
Hexavalent chromium as Cr	NG					
Copper as Cu	2.0		<0.050		<0.050	
Iron as Fe (Dissolved)	2.0	0.020	<0.020	<0.020	<0.020	<0.020
Iron as Fe (Total)						
Lead as Pb	0.010		<0.0040		<0.0040	
Manganese as Mn (Dissolved)	0.40	0.24	0.20	0.23	0.13	0.24
Manganese as Mn (Total)						
Mercury as Hg	0.0060		<0.00050		<0.00050	
Percentage Balancing		102.3%	89.5%	100.7%	91.1%	

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241									
Date		02-Mar-04	02-Aug-04	20-Sep-04	10-Dec-04	22-Apr-05	21-Jul-05	26-Jan-06	13-Apr-06
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.9	6.6	7.3	6.4	6.6	6.3	6.3	6.6
Electrical conductivity (mS/m)	170	25	31	29	22	22	23	22	28
Chemical Oxygen demand as O2	NG	<20	39	58	<20	<10	<10	76	32
Total Dissolved Solids	1200	174	214	201			210		
Alkalinity as CaCO3	NG	99	111	111	68		76		
Ammonia as N	1.5	<0.010	2.97	2.77	0.50		0.30		
Nitrate as N	11	<0.050	0.050	<0.050	<0.050		<0.20		
Chloride as Cl	300	21	22	21	20		23		
Sulfate as SO4	500	0.54	0.23	2.4	2.6		6.0		
Boron as B	2.4	0.039		<0.020			0.10		
Fluoride as F	1.5	0.62	0.62	0.80	0.57		0.70		
Phosphate as P	NG	<0.0030					<0.20		
Sodium as Na	200	29	31	32	30		31		
Potassium as K	NG	<1.0	1.0	<1.0	<1.0		<1.0		
Calcium as Ca	NG	14	16	23	8.4		<2.0		
Magnesium as Mg	NG	4.4	4.6	5.3	3.5		12		
Arsenic as As	0.010	<0.0020		<0.0020			<0.0020		
Barium as Ba	0.70						<0.030		
Cadmium as Cd	0.0030	<0.0010		<0.0010			<0.010		
Total Chromium as Cr	0.050	0.0057		<0.003			0.053		
Hexavalent chromium as Cr	NG						<0.010		
Copper as Cu	2.0	<0.050		<0.050			<0.025		
Iron as Fe (Dissolved)	2.0	<0.020	<0.020	<0.020	<0.020		24		
Iron as Fe (Total)									
Lead as Pb	0.010	<0.0040		<0.0040			<0.050		
Manganese as Mn (Dissolved)	0.40	0.20	0.34	0.32	0.36		0.45		
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050		<0.0005			<0.0020		
Percentage Balancing							99.6		

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241		10-Jul-06	05-Oct-06	25-Jan-07	12-Apr-07	11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.7	6.6	7.6	6.9	8.3	6.4	6.4	6.6
Electrical conductivity (mS/m)	170	25	25	27	30	26	29	28	29
Chemical Oxygen demand as O2	NG	<10	<10	27	<10	24	<10	12	<10
Total Dissolved Solids	1200	186				198			
Alkalinity as CaCO3	NG	76				80			
Ammonia as N	1.5	<0.20				<0.20			
Nitrate as N	11	1.3				<0.20			
Chloride as Cl	300	22				23			
Sulfate as SO4	500	9.0				14			
Boron as B	2.4	0.42				0.010			
Fluoride as F	1.5	0.80				0.70			
Phosphate as P	NG	<0.20				<0.20			
Sodium as Na	200	33				34			
Potassium as K	NG	<1.0				<1.0			
Calcium as Ca	NG	13				15			
Magnesium as Mg	NG	6.0				4.0			
Arsenic as As	0.010	<0.0020				<0.0020			
Barium as Ba	0.70	<0.030				0.62			
Cadmium as Cd	0.0030	<0.010				<0.010			
Total Chromium as Cr	0.050	<0.025				<0.025			
Hexavalent chromium as Cr	NG	<0.010				<0.010			
Copper as Cu	2.0	<0.025				<0.025			
Iron as Fe (Dissolved)	2.0	21				40			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.050				<0.050			
Manganese as Mn (Dissolved)	0.40	0.43				0.39			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0020				0.00060			
Percentage Balancing		97.7				99.6			

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.0	7.1	6.8	7.0	7.0	8.3	6.7	7.9
Electrical conductivity (mS/m)	170	36	36	33	39	38	36	48	40
Chemical Oxygen demand as O2	NG	<10	<3.0	13569	18	9.1		<3.0	38
Total Dissolved Solids	1200	240				206			
Alkalinity as CaCO3	NG	148				159			
Ammonia as N	1.5	0.20				2.0	0.20		
Nitrate as N	11	<0.20				0.067			
Chloride as Cl	300	27				34			
Sulfate as SO4	500	10				0.44			
Boron as B	2.4	0.16				0.074			
Fluoride as F	1.5	1.2				0.45			
Phosphate as P	NG	<0.20				<0.025			
Sodium as Na	200	58				38			
Potassium as K	NG	4.9				7.8			
Calcium as Ca	NG	25				25			
Magnesium as Mg	NG	7.0				4.8			
Arsenic as As	0.010	0.035				<0.023			
Barium as Ba	0.70	0.045				0.12			
Cadmium as Cd	0.0030	<0.0050				<0.0010			
Total Chromium as Cr	0.050	<0.025				<0.0020			
Hexavalent chromium as Cr	NG	<0.010				<0.0080			
Copper as Cu	2.0	<0.025				0.030			
Iron as Fe (Dissolved)	2.0	55				1.9			
Iron as Fe (Total)									
Lead as Pb	0.010	0.055				0.040			
Manganese as Mn (Dissolved)	0.40	0.70				0.56			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	0.0070	<0.0010			<0.0010			
Percentage Balancing		94.2				95.0			

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	6.5	6.8	7.1	7.0	6.7	7.0	7.7
Electrical conductivity (mS/m)	170	68	41	41	38	48	48	49
Chemical Oxygen demand as O2	NG	21	19	124	<3.0	28	<3.0	20
Total Dissolved Solids	1200	281				325		
Alkalinity as CaCO3	NG	221				267		
Ammonia as N	1.5	0.10				0.25		
Nitrate as N	11	4.7				0.18		
Chloride as Cl	300	39				38		
Sulfate as SO4	500	<0.132				<0.13		
Boron as B	2.4	0.043				0.020		
Fluoride as F	1.5	<0.183				1.7		
Phosphate as P	NG	<0.025				<0.025		
Sodium as Na	200	64				63		
Potassium as K	NG	2.2				2.1		
Calcium as Ca	NG	26				45		
Magnesium as Mg	NG	13				15		
Arsenic as As	0.010	<0.023				<0.023		
Barium as Ba	0.70	0.12				0.053		
Cadmium as Cd	0.0030	0.031				<0.0010		
Total Chromium as Cr	0.050	<0.0020				<0.0020		
Hexavalent chromium as Cr	NG	<0.0080				<0.010		
Copper as Cu	2.0	<0.0010				<0.0010		
Iron as Fe (Dissolved)	2.0	9.6				0.23		
Iron as Fe (Total)								
Lead as Pb	0.010	<0.010				0.0030		
Manganese as Mn (Dissolved)	0.40	0.42				0.25		
Manganese as Mn (Total)								
Mercury as Hg	0.0060	<0.0010				<0.0010		
Percentage Balancing		98.8				98.2		

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.0	7.1	6.6	6.5	6.6	6.5	6.7
Electrical conductivity (mS/m)	170	48	46	72	76	76	70	72
Chemical Oxygen demand as O2	NG	405	16	18	<0.082	29	15	31
Total Dissolved Solids	1200		277			538		
Alkalinity as CaCO3	NG		208			389		
Ammonia as N	1.5		13			2.1		
Nitrate as N	11		0.28			0.39		
Chloride as Cl	300		36			52		
Sulfate as SO4	500		<0.040			1.6		
Boron as B	2.4		0.031			0.046		
Fluoride as F	1.5		1.0			0.98		
Phosphate as P	NG		<0.0080			<0.0080		
Sodium as Na	200		48			79		
Potassium as K	NG		16.5			4.6		
Calcium as Ca	NG		29			62		
Magnesium as Mg	NG		8.3			17		
Arsenic as As	0.010		<0.0070			<0.0070		
Barium as Ba	0.70		0.11			0.133		
Cadmium as Cd	0.0030		<0.0010			<0.0010		
Total Chromium as Cr	0.050		<0.0010			<0.0010		
Hexavalent chromium as Cr	NG		<0.0020			<0.0020		
Copper as Cu	2.0		<0.0010			<0.0010		
Iron as Fe (Dissolved)	2.0		<0.0030			33		
Iron as Fe (Total)								
Lead as Pb	0.010		<0.0040			<0.0040		
Manganese as Mn (Dissolved)	0.40		0.39			0.23		
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010			<0.0070		
Percentage Balancing			97.1			96.8		

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	6.7	6.8	6.7	6.4	6.4	6.4	6.3
Electrical conductivity (mS/m)	170	72	73	70	73	62	71	63
Chemical Oxygen demand as O2	NG	<5.1	31	19	41	62	31	14.5
Total Dissolved Solids	1200		506				420	
Alkalinity as CaCO3	NG		365				320	
Ammonia as N	1.5		0.78				<0.010	
Nitrate as N	11		0.47				<0.50	
Chloride as Cl	300		55				52	
Sulfate as SO4	500		<0.287				<8.3	
Boron as B	2.4		0.033				0.31	
Fluoride as F	1.5		0.66				0.76	
Phosphate as P	NG		<0.0020				<0.010	
Sodium as Na	200		71				66	
Potassium as K	NG		1.9				2.1	
Calcium as Ca	NG		67				63	
Magnesium as Mg	NG		17				18	
Arsenic as As	0.010		<0.010				<0.020	
Barium as Ba	0.70		0.12				0.24	
Cadmium as Cd	0.0030		<0.0020				<0.0030	
Total Chromium as Cr	0.050		<0.0030				<0.0070	
Hexavalent chromium as Cr	NG		<0.0020				<0.0070	
Copper as Cu	2.0		<0.0020				<0.013	
Iron as Fe (Dissolved)	2.0		26				<0.010	
Iron as Fe (Total)								
Lead as Pb	0.010		<0.0030				<0.015	
Manganese as Mn (Dissolved)	0.40		0.16				0.24	
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0040				<0.027	
Percentage Balancing			97.7					

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18
Infield Analysis								
Temp °C	NG				21	21	20	20
pH	>5 or <9.7				6.9	7.2	7.5	6.3
EC [mS/m]	170				69	70	66	65
TDS [ppm]	1200				344	348	331	323
ORP [mV]	NG						-111	-63
pH	>5 or <9.7	6.3	6.3	6.3	6.5	6.2	8.0	6.8
Electrical conductivity (mS/m)	170	55	54	52	69	59	62	58
Chemical Oxygen demand as O2	NG	18.0	<6.7	<6.7	<6.7	89	67	9.6
Total Dissolved Solids	1200			330				280
Alkalinity as CaCO3	NG			278				292
Ammonia as N	1.5			<0.010				<0.010
Nitrate as N	11			<0.50				<0.50
Chloride as Cl	300			48				45
Sulfate as SO4	500			8.3				<8.3
Boron as B	2.4			0.36				0.46
Fluoride as F	1.5			0.63				0.83
Phosphate as P	NG			0.10				0.13
Sodium as Na	200			77				68
Potassium as K	NG			1.3				1.5
Calcium as Ca	NG			48				51
Magnesium as Mg	NG			13				17
Arsenic as As	0.010			0.020				<0.010
Barium as Ba	0.70			0.58				<0.010
Cadmium as Cd	0.0030			<0.0020				<0.0020
Total Chromium as Cr	0.050			<0.010				<0.010
Hexavalent chromium as Cr	NG			<1.0				<1.0
Copper as Cu	2.0			0.020				<0.010
Iron as Fe (Dissolved)	2.0			<0.10				<0.10
Iron as Fe (Total)							16	
Lead as Pb	0.010			<0.010				<0.010
Manganese as Mn (Dissolved)	0.40			0.35				<0.010
Manganese as Mn (Total)								0.28
Mercury as Hg	0.0060			<0.0010				0.0090

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Infield Analysis								
Temp °C	NG	20	20	21	21	20	22	21
pH	>5 or <9.7	6.4	6.2	6.3	6.3	6.2	5.8	6.0
EC [mS/m]	170	46	49	58	59	55	51	55
TDS [ppm]	1200	230	244	290	310	290	250	270
ORP [mV]	NG	-72	-57					
pH	>5 or <9.7	5.6	6.25	6.3	6.5	6.5	6.1	6.2
Electrical conductivity (mS/m)	170	47	38	52	53	52	49	44
Chemical Oxygen demand as O2	NG	27	28	36	13	<6.7	16	24
Total Dissolved Solids	1200				330			330
Alkalinity as CaCO3	NG				222			168
Ammonia as N	1.5				0.010			<0.010
Nitrate as N	11				0.74			0.55
Chloride as Cl	300				45			34
Sulfate as SO4	500				<8.3			32
Boron as B	2.4				<0.030			<0.030
Fluoride as F	1.5				0.83			0.36
Phosphate as P	NG				0.010			<0.010
Sodium as Na	200				67			57
Potassium as K	NG				1.9			0.82
Calcium as Ca	NG				30			23
Magnesium as Mg	NG				14			13.3
Arsenic as As	0.010				<0.010			<0.010
Barium as Ba	0.70				0.040			0.14
Cadmium as Cd	0.0030				<0.0020			<0.0020
Total Chromium as Cr	0.050				<0.010			<0.010
Hexavalent chromium as Cr	NG				<1.0			<1.0
Copper as Cu	2.0				<0.010			0.010
Iron as Fe (Dissolved)	2.0				41			<0.10
Iron as Fe (Total)					54			1.2
Lead as Pb	0.010				0.010			<0.010
Manganese as Mn (Dissolved)	0.40				0.53			0.18
Manganese as Mn (Total)					1.1			0.25
Mercury as Hg	0.0060							<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
SANS 241									
Date		15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22
Infield Analysis									
Temp °C	NG	24	23	22	20		21	21	20
pH	>5 or <9.7	6.1	6.1	6.5	7.8		6.1	6.1	6.3
EC [mS/m]	170	50	43	44	47		47	41	47
TDS [ppm]	1200	250	210	220	230		240	200	240
ORP [mV]	NG								
pH	>5 or <9.7	6.4	7.8	6.2	6.7	6.6	7.1	6.3	6.5
Electrical conductivity (mS/m)	170	38	38	36	42	44	43	43	50
Chemical Oxygen demand as O2	NG	23	21	<6.7	8.3	11	8.5	22	15
Total Dissolved Solids	1200				330				280
Alkalinity as CaCO3	NG				167				171
Ammonia as N	1.5				<0.010				<0.010
Nitrate as N	11				2.2				1.8
Chloride as Cl	300				36				32
Sulfate as SO4	500				28				29
Boron as B	2.4				0.27				0.59
Fluoride as F	1.5				0.73				0.63
Phosphate as P	NG				<0.010				<0.10
Sodium as Na	200				58				75
Potassium as K	NG				1.0				1.0
Calcium as Ca	NG				21				17
Magnesium as Mg	NG				13				13
Arsenic as As	0.010				<0.010				<0.010
Barium as Ba	0.70				0.030				0.010
Cadmium as Cd	0.0030				<0.0020				<0.0020
Total Chromium as Cr	0.050				<0.010				<0.010
Hexavalent chromium as Cr	NG				<1.0				<1.0
Copper as Cu	2.0				<0.010				<0.010
Iron as Fe (Dissolved)	2.0				<0.10				<0.10
Iron as Fe (Total)					50				4.1
Lead as Pb	0.010				<0.010				<0.010
Manganese as Mn (Dissolved)	0.40				<0.010				<0.010
Manganese as Mn (Total)					0.20				0.15
Mercury as Hg	0.0060				<0.00050				<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D	BH09-07D
	SANS 241							
Date		10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24
Infield Analysis								
Temp °C	NG	21	22	21	21	20	21	21
pH	>5 or <9.7	6.2	6.4	6.4	6.0	6.0	5.9	5.8
EC [mS/m]	170	41	38	31	52	53	70	54
TDS [ppm]	1200	210	190	160	260	260	350	270
ORP [mV]	NG							
pH	>5 or <9.7	6.6	6.4	7.1	8.1	6.7	7.4	6.4
Electrical conductivity (mS/m)	170	49	51	51	46	44	58	49
Chemical Oxygen demand as O2	NG	14	<6.7	9.3	31	<6.7	<6.7	11
Total Dissolved Solids	1200				260			
Alkalinity as CaCO3	NG				159			
Ammonia as N	1.5				0.26			
Nitrate as N	11				3.0			
Chloride as Cl	300				38			
Sulfate as SO4	500				35			
Boron as B	2.4				0.030			
Fluoride as F	1.5				0.80			
Phosphate as P	NG				<0.10			
Sodium as Na	200				74			
Potassium as K	NG				0.95			
Calcium as Ca	NG				21			
Magnesium as Mg	NG				13			
Arsenic as As	0.010				<0.010			
Barium as Ba	0.70				0.010			
Cadmium as Cd	0.0030				<0.0020			
Total Chromium as Cr	0.050				<0.010			
Hexavalent chromium as Cr	NG				<1.0			
Copper as Cu	2.0				<0.010			
Iron as Fe (Dissolved)	2.0				<0.10			
Iron as Fe (Total)					69			
Lead as Pb	0.010				<0.010			
Manganese as Mn (Dissolved)	0.40				<0.010			
Manganese as Mn (Total)					<0.010			
Mercury as Hg	0.0060				<0.00050			

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH09-07D Shongweni Landfill		BH09-07D	BH09-07D	BH09-07D
	SANS 241			
Date		16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis				
Temp °C	NG	21	20	22
pH	>5 or <9.7	5.8	6.0	6.2
EC [mS/m]	170	54	44	65
TDS [ppm]	1200	270	220	330
ORP [mV]	NG			
pH	>5 or <9.7	7.5	7.0	7.3
Electrical conductivity (mS/m)	170	48	50	46
Chemical Oxygen demand as O2	NG	33	18	<6.7
Total Dissolved Solids	1200	380		
Alkalinity as CaCO3	NG	175		
Ammonia as N	1.5	<0.010		
Nitrate as N	11	2.5		
Chloride as Cl	300	36		
Sulfate as SO4	500	37		
Boron as B	2.4	<0.030		
Fluoride as F	1.5	0.80		
Phosphate as P	NG	<0.10		
Sodium as Na	200	76		
Potassium as K	NG	1.5		
Calcium as Ca	NG	23		
Magnesium as Mg	NG	16		
Arsenic as As	0.010	<0.010		
Barium as Ba	0.70	<0.010		
Cadmium as Cd	0.0030	<0.0020		
Total Chromium as Cr	0.050	<0.010		
Hexavalent chromium as Cr	NG	<1.0		
Copper as Cu	2.0	<0.010		
Iron as Fe (Dissolved)	2.0	0.11		
Iron as Fe (Total)		84		
Lead as Pb	0.010	<0.010		
Manganese as Mn (Dissolved)	0.40	<0.010		
Manganese as Mn (Total)		0.58		
Mercury as Hg	0.0060			

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241								
Date		01-Jan-97	21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	10-Jul-06	05-Oct-06	25-Jan-07
Infield Analysis			Dry	Dry		Dry	Dry		
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7				7.7			6.8	8.3
Electrical conductivity (mS/m)	170				370			1829	1011
Chemical Oxygen demand as O2	NG				384			3528	1921
Total Dissolved Solids	1200								
Alkalinity as CaCO3	NG								
Ammonia as N	1.5								
Nitrate as N	11								
Chloride as Cl	300								
Sulfate as SO4	500								
Boron as B	2.4								
Fluoride as F	1.5								
Phosphate as P	NG								
Sodium as Na	200								
Potassium as K	NG								
Calcium as Ca	NG								
Magnesium as Mg	NG								
Arsenic as As	0.010								
Barium as Ba	0.70								
Cadmium as Cd	0.0030								
Total Chromium as Cr	0.050								
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0								
Iron as Fe (Dissolved)	2.0								
Iron as Fe (Total)									
Lead as Pb	0.010								
Manganese as Mn (Dissolved)	0.40								
Manganese as Mn (Total)									
Mercury as Hg	0.0060								

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241								
Date		12-Apr-07	11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08	10-Jul-08	16-Oct-08	07-Jan-09
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.1	8.5	6.4	6.5	6.7	6.8	6.7	7.5
Electrical conductivity (mS/m)	170	421	329	301	273	274	278	310	398
Chemical Oxygen demand as O2	NG	105	350	34	405	520	576	229	179
Total Dissolved Solids	1200		2050				1 690		
Alkalinity as CaCO3	NG		552				640		
Ammonia as N	1.5		11				8.0		
Nitrate as N	11		27				0.30		
Chloride as Cl	300		532				520		
Sulfate as SO4	500		256				125		
Boron as B	2.4		1.6				1.3		
Fluoride as F	1.5		9.7				19		
Phosphate as P	NG		<0.20				<0.20		
Sodium as Na	200		589				452		
Potassium as K	NG		25				19.7		
Calcium as Ca	NG		86				99		
Magnesium as Mg	NG		60				56		
Arsenic as As	0.010		<0.0020				<0.010		
Barium as Ba	0.70		0.34				0.627		
Cadmium as Cd	0.0030		<0.010				<0.0050		
Total Chromium as Cr	0.050		0.033				<0.025		
Hexavalent chromium as Cr	NG		<0.010				0.015		
Copper as Cu	2.0		0.040				<0.025		
Iron as Fe (Dissolved)	2.0		21				51		
Iron as Fe (Total)									
Lead as Pb	0.010		0.072				<0.020		
Manganese as Mn (Dissolved)	0.40		5.4				10		
Manganese as Mn (Total)									
Mercury as Hg	0.0060		0.0022				<0.0010		
Percentage Balancing			96.5				98.7		

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241								
Date		09-May-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11
Infield Analysis						Dry	Dry		Dry
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.7	6.8	7.2	6.8			8.0	
Electrical conductivity (mS/m)	170	382	213	175	276			176	
Chemical Oxygen demand as O2	NG	152	500	166	3622			42	
Total Dissolved Solids	1200								
Alkalinity as CaCO3	NG								
Ammonia as N	1.5								
Nitrate as N	11								
Chloride as Cl	300								
Sulfate as SO4	500								
Boron as B	2.4								
Fluoride as F	1.5								
Phosphate as P	NG								
Sodium as Na	200								
Potassium as K	NG								
Calcium as Ca	NG								
Magnesium as Mg	NG								
Arsenic as As	0.010								
Barium as Ba	0.70								
Cadmium as Cd	0.0030								
Total Chromium as Cr	0.050								
Hexavalent chromium as Cr	NG								
Copper as Cu	2.0								
Iron as Fe (Dissolved)	2.0								
Iron as Fe (Total)									
Lead as Pb	0.010								
Manganese as Mn (Dissolved)	0.40								
Manganese as Mn (Total)									
Mercury as Hg	0.0060								

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241							
Date		12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013
Infield Analysis		Dry			Dry			
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	8.2	7.3	7.2		7.2	8.0	
Electrical conductivity (mS/m)	170	1500	385	334		499	881	
Chemical Oxygen demand as O2	NG	3181	260	429		307	1282	
Total Dissolved Solids	1200							
Alkalinity as CaCO3	NG							
Ammonia as N	1.5							
Nitrate as N	11							
Chloride as Cl	300							
Sulfate as SO4	500							
Boron as B	2.4							
Fluoride as F	1.5							
Phosphate as P	NG							
Sodium as Na	200							
Potassium as K	NG							
Calcium as Ca	NG							
Magnesium as Mg	NG							
Arsenic as As	0.010							
Barium as Ba	0.70							
Cadmium as Cd	0.0030							
Total Chromium as Cr	0.050							
Hexavalent chromium as Cr	NG							
Copper as Cu	2.0							
Iron as Fe (Dissolved)	2.0							
Iron as Fe (Total)								
Lead as Pb	0.010							
Manganese as Mn (Dissolved)	0.40							
Manganese as Mn (Total)								
Mercury as Hg	0.0060							

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
Date	SANS 241	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.3	8.1	7.4	7.1		7.4	7.6
Electrical conductivity (mS/m)	170	607	1781	2185	947		1014	1021
Chemical Oxygen demand as O2	NG	564	2063	1678	598		355	3695
Total Dissolved Solids	1200		10342					
Alkalinity as CaCO3	NG		260					
Ammonia as N	1.5		0.17					
Nitrate as N	11		<0.017					
Chloride as Cl	300		5806					
Sulfate as SO4	500		<0.040					
Boron as B	2.4		8.6					
Fluoride as F	1.5		20					
Phosphate as P	NG		0.25					
Sodium as Na	200		3122					
Potassium as K	NG		991					
Calcium as Ca	NG		88					
Magnesium as Mg	NG		158					
Arsenic as As	0.010		<0.0070					
Barium as Ba	0.70		0.38					
Cadmium as Cd	0.0030		<0.0010					
Total Chromium as Cr	0.050		<0.0010					
Hexavalent chromium as Cr	NG		<0.0020					
Copper as Cu	2.0		<0.0010					
Iron as Fe (Dissolved)	2.0		5.9					
Iron as Fe (Total)								
Lead as Pb	0.010		0.0040					
Manganese as Mn (Dissolved)	0.40		<0.0010					
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010					
Percentage Balancing			97.5					

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241						
Date		08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16
Infield Analysis			Dry		Dry		Dry
Temp °C	NG						
pH	>5 or <9.7						
EC [mS/m]	170						
TDS [ppm]	1200						
ORP [mV]	NG						
pH	>5 or <9.7	7.5		6.8		7.3	
Electrical conductivity (mS/m)	170	962		1677		1750	
Chemical Oxygen demand as O2	NG	2889		862		2421	
Total Dissolved Solids	1200						
Alkalinity as CaCO3	NG						
Ammonia as N	1.5						
Nitrate as N	11						
Chloride as Cl	300						
Sulfate as SO4	500						
Boron as B	2.4						
Fluoride as F	1.5						
Phosphate as P	NG						
Sodium as Na	200						
Potassium as K	NG						
Calcium as Ca	NG						
Magnesium as Mg	NG						
Arsenic as As	0.010						
Barium as Ba	0.70						
Cadmium as Cd	0.0030						
Total Chromium as Cr	0.050						
Hexavalent chromium as Cr	NG						
Copper as Cu	2.0						
Iron as Fe (Dissolved)	2.0						
Iron as Fe (Total)							
Lead as Pb	0.010						
Manganese as Mn (Dissolved)	0.40						
Manganese as Mn (Total)							
Mercury as Hg	0.0060						

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241							
Date		22-Sep-16	11-Oct-16	16-Jan-17	24-Mar-17	11-Oct-17	23-Jan-18	18-May-18
Infield Analysis			Dry	Dry	Dry		Dry	Dry
Temp °C	NG					21		
pH	>5 or <9.7					7.2		
EC [mS/m]	170					1837		
TDS [ppm]	1200					9188		
ORP [mV]	NG							
pH	>5 or <9.7	7.2				7.3		
Electrical conductivity (mS/m)	170	1318				1618		
Chemical Oxygen demand as O2	NG	4 143				1208		
Total Dissolved Solids	1200	8 534						
Alkalinity as CaCO3	NG	1 760						
Ammonia as N	1.5	84						
Nitrate as N	11	<0.10						
Chloride as Cl	300	3 716						
Sulfate as SO4	500	363						
Boron as B	2.4	3.8						
Fluoride as F	1.5	17						
Phosphate as P	NG	0.70						
Sodium as Na	200	2 179						
Potassium as K	NG	484						
Calcium as Ca	NG	150						
Magnesium as Mg	NG	116						
Arsenic as As	0.010	<0.010						
Barium as Ba	0.70	1.1						
Cadmium as Cd	0.0030	0.017						
Total Chromium as Cr	0.050	0.11						
Hexavalent chromium as Cr	NG	<0.010						
Copper as Cu	2.0	0.022						
Iron as Fe (Dissolved)	2.0	116						
Iron as Fe (Total)		3.9						
Lead as Pb	0.010	0.18						
Manganese as Mn (Dissolved)	0.40	10						
Manganese as Mn (Total)		1.6						
Mercury as Hg	0.0060	0.0030						
Percentage Balancing		93.9						

All values in mg/l, unless otherwise indicated.

BH05-12S		BH05-12S	BH05-12S	BH05-12S	BH05-12S
	SANS 241				
Date		26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis		Dry	Dry	Dry	Dry
Temp °C	NG				
pH	>5 or <9.7				
EC [mS/m]	170				
TDS [ppm]	1200				
ORP [mV]	NG				
pH	>5 or <9.7				
Electrical conductivity (mS/m)	170				
Chemical Oxygen demand as O2	NG				
Total Dissolved Solids	1200				
Alkalinity as CaCO3	NG				
Ammonia as N	1.5				
Nitrate as N	11				
Chloride as Cl	300				
Sulfate as SO4	500				
Boron as B	2.4				
Fluoride as F	1.5				
Phosphate as P	NG				
Sodium as Na	200				
Potassium as K	NG				
Calcium as Ca	NG				
Magnesium as Mg	NG				
Arsenic as As	0.010				
Barium as Ba	0.70				
Cadmium as Cd	0.0030				
Total Chromium as Cr	0.050				
Hexavalent chromium as Cr	NG				
Copper as Cu	2.0				
Iron as Fe (Dissolved)	2.0				
Iron as Fe (Total)					
Lead as Pb	0.010				
Manganese as Mn (Dissolved)	0.40				
Manganese as Mn (Total)					
Mercury as Hg	0.0060				

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241								
Date		21-Jul-05	07-Oct-05	26-Jan-06	13-Apr-06	10-Jul-06	05-Oct-06	25-Jan-07	12-Apr-07
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	8.6	8.1	8.5	8.1	8.5	8.4	8.9	8.4
Electrical conductivity (mS/m)	170	127	169	162	186	171	171	148	152
Chemical Oxygen demand as O2	NG	<10	371	88	24	26	78	<10	<10
Total Dissolved Solids	1200	786				1068			
Alkalinity as CaCO3	NG	385				652			
Ammonia as N	1.5	0.80				<0.20			
Nitrate as N	11	<0.20				<0.20			
Chloride as Cl	300	107				135			
Sulfate as SO4	500	141				88			
Boron as B	2.4	0.21				0.15			
Fluoride as F	1.5	4.0				5.3			
Phosphate as P	NG	<0.20				<0.20			
Sodium as Na	200	194				340			
Potassium as K	NG	16				9.6			
Calcium as Ca	NG	53				22			
Magnesium as Mg	NG	27				14			
Arsenic as As	0.010	<0.0020				<0.0020			
Barium as Ba	0.70	0.097				0.11			
Cadmium as Cd	0.0030	<0.010				<0.010			
Total Chromium as Cr	0.050	<0.025				<0.025			
Hexavalent chromium as Cr	NG	<0.010				<0.010			
Copper as Cu	2.0	<0.025				<0.025			
Iron as Fe (Dissolved)	2.0	0.72				4.9			
Iron as Fe (Total)									
Lead as Pb	0.010	0.081				0.26			
Manganese as Mn (Dissolved)	0.40	0.17				0.26			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0020				<0.0020			
Percentage Balancing		99.6%				95.4			

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241								
Date		11-Jul-07	12-Oct-07	28-Jan-08	09-Apr-08	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	8.8	7.9	8.2	8.4	8.5	8.2	7.6	8.6
Electrical conductivity (mS/m)	170	143	128	132	126	116	101	115	115
Chemical Oxygen demand as O2	NG	43	36	44	28	16	16	60	91
Total Dissolved Solids	1200	868				696			
Alkalinity as CaCO3	NG	520				404			
Ammonia as N	1.5	<0.20				<0.20			
Nitrate as N	11	<0.20				0.20			
Chloride as Cl	300	124				116			
Sulfate as SO4	500	65				60			
Boron as B	2.4	0.14				0.18			
Fluoride as F	1.5	4.8				4.2			
Phosphate as P	NG	<0.20				<0.20			
Sodium as Na	200	306				211			
Potassium as K	NG	7.2				5.9			
Calcium as Ca	NG	30				34			
Magnesium as Mg	NG	14				19			
Arsenic as As	0.010	<0.0020				<0.010			
Barium as Ba	0.70	0.057				0.105			
Cadmium as Cd	0.0030	<0.010				<0.0050			
Total Chromium as Cr	0.050	<0.025				<0.025			
Hexavalent chromium as Cr	NG	<0.010				<0.010			
Copper as Cu	2.0	<0.025				<0.025			
Iron as Fe (Dissolved)	2.0	1.8				0.43			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.050				<0.020			
Manganese as Mn (Dissolved)	0.40	0.16				0.15			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.00050				0.0010			
Percentage Balancing		98				99.0			

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241								
Date		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	8.3	7.9	8.4	8.0	8.1	8.7	8.1	7.7
Electrical conductivity (mS/m)	170	115	120	85	115	105	102	104	116
Chemical Oxygen demand as O2	NG	28	<3.0	140	43	<3.0		74	8.9
Total Dissolved Solids	1200	652				519			
Alkalinity as CaCO3	NG	420				306			
Ammonia as N	1.5	<0.20				0.037	<0.20		
Nitrate as N	11	1.6				<0.057			
Chloride as Cl	300	109				74			
Sulfate as SO4	500	37				58			
Boron as B	2.4	0.16				0.181			
Fluoride as F	1.5	3.7				0.88			
Phosphate as P	NG	<0.20				<0.025			
Sodium as Na	200	216				141			
Potassium as K	NG	7.3				5.0			
Calcium as Ca	NG	48				37			
Magnesium as Mg	NG	26				22			
Arsenic as As	0.010	0.036				<0.023			
Barium as Ba	0.70	0.11				0.18			
Cadmium as Cd	0.0030	<0.0050				<0.0010			
Total Chromium as Cr	0.050	<0.025				<0.0020			
Hexavalent chromium as Cr	NG	<0.010				<0.0080			
Copper as Cu	2.0	<0.025				0.033			
Iron as Fe (Dissolved)	2.0	2.8				0.029			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.020				0.030			
Manganese as Mn (Dissolved)	0.40	0.90				0.069			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	0.0010				<0.0010			
Percentage Balancing		94.1				95.9			

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241							
Date		12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.8	8.1	8.1	7.9	8.1	7.9	8.5
Electrical conductivity (mS/m)	170	113	111	102	93	95	121	118
Chemical Oxygen demand as O2	NG	14	16	15	14	17	5.5	23
Total Dissolved Solids	1200	581				696		
Alkalinity as CaCO3	NG	335				394		
Ammonia as N	1.5	0.43				0.86		
Nitrate as N	11	0.52				1.4		
Chloride as Cl	300	92				133		
Sulfate as SO4	500	55				49		
Boron as B	2.4	0.17				0.17		
Fluoride as F	1.5	2.9				3.7		
Phosphate as P	NG	0.059				0.059		
Sodium as Na	200	156				185		
Potassium as K	NG	6.2				9.9		
Calcium as Ca	NG	45				50		
Magnesium as Mg	NG	25				28		
Arsenic as As	0.010	<0.023				<0.023		
Barium as Ba	0.70	0.16				0.10		
Cadmium as Cd	0.0030	<0.0010				<0.0010		
Total Chromium as Cr	0.050	<0.0020				<0.0020		
Hexavalent chromium as Cr	NG	<0.0080				<0.010		
Copper as Cu	2.0	0.0070				<0.0010		
Iron as Fe (Dissolved)	2.0	1.6				<0.0060		
Iron as Fe (Total)								
Lead as Pb	0.010	<0.010				<0.0010		
Manganese as Mn (Dissolved)	0.40	0.31				0.0030		
Manganese as Mn (Total)								
Mercury as Hg	0.0060	<0.0010				<0.0010		
Percentage Balancing		95.5				99.4		

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241							
Date		24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	8.0	8.0	8.2	7.9	7.9	7.9	8.1
Electrical conductivity (mS/m)	170	111	108	112	111	112	115	111
Chemical Oxygen demand as O2	NG	0.73	16	152	<0.082	44	19	40
Total Dissolved Solids	1200		658			696		
Alkalinity as CaCO3	NG		353			428		
Ammonia as N	1.5		6.9			0.86		
Nitrate as N	11		0.33			0.44		
Chloride as Cl	300		134			98		
Sulfate as SO4	500		52			54		
Boron as B	2.4		0.15			0.24		
Fluoride as F	1.5		4.1			4.0		
Phosphate as P	NG		0.071			0.025		
Sodium as Na	200		157			167		
Potassium as K	NG		7.5			5.6		
Calcium as Ca	NG		55			50		
Magnesium as Mg	NG		29			25		
Arsenic as As	0.010		<0.0070			<0.0070		
Barium as Ba	0.70		0.13			0.14		
Cadmium as Cd	0.0030		<0.0010			<0.0010		
Total Chromium as Cr	0.050		<0.0010			<0.0010		
Hexavalent chromium as Cr	NG		<0.0020			<0.0020		
Copper as Cu	2.0		<0.0010			<0.0010		
Iron as Fe (Dissolved)	2.0		<0.0030			<0.0030		
Iron as Fe (Total)								
Lead as Pb	0.010		<0.0040			<0.0040		
Manganese as Mn (Dissolved)	0.40		<0.0010			<0.0010		
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010			<0.0070		
Percentage Balancing			98.4			97.1		

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241								
Date		08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.9	8.1	7.0	7.5	6.4	7.5	7.3	7.4
Electrical conductivity (mS/m)	170	117	110	118	122	117	121	115	112
Chemical Oxygen demand as O2	NG	26	30	6.0	31	57	16	24	18.1
Total Dissolved Solids	1200		700				650		
Alkalinity as CaCO3	NG		396				350		
Ammonia as N	1.5		0.57				<0.010		
Nitrate as N	11		0.59				1.3		
Chloride as Cl	300		109				122		
Sulfate as SO4	500		65				88		
Boron as B	2.4		0.18				0.39		
Fluoride as F	1.5		3.5				3.9		
Phosphate as P	NG		0.029				<0.010		
Sodium as Na	200		168				163		
Potassium as K	NG		5.8				5.4		
Calcium as Ca	NG		52				56		
Magnesium as Mg	NG		26				31		
Arsenic as As	0.010		<0.010				<0.020		
Barium as Ba	0.70		0.11				0.24		
Cadmium as Cd	0.0030		<0.0020				<0.0030		
Total Chromium as Cr	0.050		<0.0030				<0.0070		
Hexavalent chromium as Cr	NG		<0.0020				<0.0070		
Copper as Cu	2.0		<0.0020				<0.013		
Iron as Fe (Dissolved)	2.0		<0.0040				<0.010		
Iron as Fe (Total)									
Lead as Pb	0.010		<0.0030				<0.015		
Manganese as Mn (Dissolved)	0.40		<0.0020				<0.0060		
Manganese as Mn (Total)									
Mercury as Hg	0.0060		<0.0040				<0.027		
Percentage Balancing			98.5						

All values in mg/l, unless otherwise indicated.
* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241							
Date		24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18
Infield Analysis								
Temp °C	NG			22	22	21	21	21
pH	>5 or <9.7			8.0	8.0	7.3	7.3	7.3
EC [mS/m]	170			114	119	116	114	91
TDS [ppm]	1200			570	593	582	569	455
ORP [mV]	NG					-219	-136	-102
pH	>5 or <9.7	7.3	6.9	7.4	7.2	7.1	7.6	7.0
Electrical conductivity (mS/m)	170	112	119	120	124	118	124	121
Chemical Oxygen demand as O2	NG	<67	<6.7	18	78	33	10	31
Total Dissolved Solids	1200		670				790	
Alkalinity as CaCO3	NG		367				424	
Ammonia as N	1.5		1.0				<0.010	
Nitrate as N	11		<0.50				1.9	
Chloride as Cl	300		126				119	
Sulfate as SO4	500		8.3				35	
Boron as B	2.4		0.30				0.51	
Fluoride as F	1.5		4.3				4.5	
Phosphate as P	NG		0.12				0.26	
Sodium as Na	200		181				178	
Potassium as K	NG		5.0				6.5	
Calcium as Ca	NG		42				55	
Magnesium as Mg	NG		27				30	
Arsenic as As	0.010		0.020				<0.010	
Barium as Ba	0.70		0.23				<0.010	
Cadmium as Cd	0.0030		<0.0020				<0.0020	
Total Chromium as Cr	0.050		<0.010				<0.010	
Hexavalent chromium as Cr	NG		<1.0				<1.0	
Copper as Cu	2.0		<0.010				<0.010	
Iron as Fe (Dissolved)	2.0		<0.10				<0.10	
Iron as Fe (Total)							3.8	
Lead as Pb	0.010		<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40		0.030				<0.010	
Manganese as Mn (Total)							0.13	
Mercury as Hg	0.0060		<0.0010				<0.0010	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241							
Date		14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20
Infield Analysis								
Temp °C	NG	21	22	21	24	25	20	23
pH	>5 or <9.7	7.4	7.3	7.7	7.4	7.1	7.0	7.2
EC [mS/m]	170	98	129	123	129	133	121	70
TDS [ppm]	1200	488	640	650	670	660	610	1400
ORP [mV]	NG	-130						
pH	>5 or <9.7	7.2	7.1	7.6	7.3	7.3	7.0	7.2
Electrical conductivity (mS/m)	170	116	141	137	130	130	131	127
Chemical Oxygen demand as O2	NG	56	45	15	33	26	24	19
Total Dissolved Solids	1200			720			790	
Alkalinity as CaCO3	NG			359			382	
Ammonia as N	1.5			<0.010			<0.010	
Nitrate as N	11			3.4			3.1	
Chloride as Cl	300			153			134	
Sulfate as SO4	500			70			74	
Boron as B	2.4			0.12			<0.030	
Fluoride as F	1.5			1.3			3.4	
Phosphate as P	NG			0.13			0.03	
Sodium as Na	200			178			164	
Potassium as K	NG			7.8			5.8	
Calcium as Ca	NG			66			62	
Magnesium as Mg	NG			33			34	
Arsenic as As	0.010			<0.010			<0.010	
Barium as Ba	0.70			0.23			0.28	
Cadmium as Cd	0.0030			<0.0020			<0.0020	
Total Chromium as Cr	0.050			0.010			<0.010	
Hexavalent chromium as Cr	NG			<1.0			<1.0	
Copper as Cu	2.0			0.010			<0.010	
Iron as Fe (Dissolved)	2.0			3.7			<0.10	
Iron as Fe (Total)				6.3			3.2	
Lead as Pb	0.010			0.010			<0.010	
Manganese as Mn (Dissolved)	0.40			0.43			<0.010	
Manganese as Mn (Total)				0.45			0.47	
Mercury as Hg	0.0060						<0.00050	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241								
Date		13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22
Infield Analysis									
Temp °C	NG	23	24	21		22	22	21	21
pH	>5 or <9.7	7.1	7.5	8.0		6.7	7.6	7.8	7.8
EC [mS/m]	170	128	134	120		95	125	118	108
TDS [ppm]	1200	640	670	600		470	620	590	540
ORP [mV]	NG								
pH	>5 or <9.7	8.7	7.1	7.3	7.5	7.6	7.3	7.9	7.6
Electrical conductivity (mS/m)	170	125	127	126	122	114	119	132	127
Chemical Oxygen demand as O2	NG	38	51	26	16	14	<6.7	17	21
Total Dissolved Solids	1200			795				790	
Alkalinity as CaCO3	NG			365				360	
Ammonia as N	1.5			<0.010				<0.010	
Nitrate as N	11			1.8				<0.50	
Chloride as Cl	300			153				165	
Sulfate as SO4	500			76				72	
Boron as B	2.4			0.34				0.30	
Fluoride as F	1.5			3.4				3.5	
Phosphate as P	NG			0.04				<0.10	
Sodium as Na	200			168				210	
Potassium as K	NG			5.4				6.5	
Calcium as Ca	NG			8.9				53	
Magnesium as Mg	NG			29				31	
Arsenic as As	0.010			<0.010				<0.010	
Barium as Ba	0.70			0.040				<0.010	
Cadmium as Cd	0.0030			<0.0020				<0.0020	
Total Chromium as Cr	0.050			0.01				<0.010	
Hexavalent chromium as Cr	NG			<1.0				<1.0	
Copper as Cu	2.0			<0.010				<0.010	
Iron as Fe (Dissolved)	2.0			<0.10				<0.10	
Iron as Fe (Total)				2.8				4.9	
Lead as Pb	0.010			<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40			<0.010				<0.010	
Manganese as Mn (Total)				0.47				0.30	
Mercury as Hg	0.0060			<0.00050				<0.00050	

Percentage Balancing

All values in mg/l, unless otherwise indicated.
* mg/kg

BH05-12D		BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D	BH05-12D
	SANS 241							
Date		24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24
Infield Analysis								
Temp °C	NG	24	22	22	23	22	22	20
pH	>5 or <9.7	7.4	7.1	7.2	7.3	7.6	7.1	7.9
EC [mS/m]	170	94	72	170	158	134	146	128
TDS [ppm]	1200	470	360	850	790	670	730	640
ORP [mV]	NG							
pH	>5 or <9.7	7.6	8.1	10	7.4	7.1	7.2	7.6
Electrical conductivity (mS/m)	170	136	146	126	153	169	175	166
Chemical Oxygen demand as O2	NG	<6.7	16	24	35	9.5	24	16
Total Dissolved Solids	1200			880				1150
Alkalinity as CaCO3	NG			186				356
Ammonia as N	1.5			0.26				<0.010
Nitrate as N	11			<0.50				0.76
Chloride as Cl	300			248				274
Sulfate as SO4	500			87				104
Boron as B	2.4			0.040				<0.030
Fluoride as F	1.5			3.7				3.3
Phosphate as P	NG			<0.010				<0.010
Sodium as Na	200			176				208
Potassium as K	NG			7.3				9.7
Calcium as Ca	NG			13				106
Magnesium as Mg	NG			16				58
Arsenic as As	0.010			<0.010				<0.010
Barium as Ba	0.70			0.010				<0.010
Cadmium as Cd	0.0030			<0.0020				<0.0020
Total Chromium as Cr	0.050			<0.010				<0.010
Hexavalent chromium as Cr	NG			<1.0				<1.0
Copper as Cu	2.0			<0.010				<0.010
Iron as Fe (Dissolved)	2.0			<0.10				0.28
Iron as Fe (Total)				<0.10				1.5
Lead as Pb	0.010			<0.010				<0.010
Manganese as Mn (Dissolved)	0.40			<0.010				<0.010
Manganese as Mn (Total)				<0.010				0.61
Mercury as Hg	0.0060			<0.00050				

Percentage Balancing

All values in mg/l, unless otherwise indicated.

* mg/kg

BH05-12D		BH05-12D	BH05-12D
	SANS 241		
Date		22-Oct-24	21-Jan-25
Infield Analysis			
Temp °C	NG	21	22
pH	>5 or <9.7	7.0	7.5
EC [mS/m]	170	133	211
TDS [ppm]	1200	670	1060
ORP [mV]	NG		
pH	>5 or <9.7	8.0	7.2
Electrical conductivity (mS/m)	170	181	173
Chemical Oxygen demand as O2	NG	60	16
Total Dissolved Solids	1200		
Alkalinity as CaCO3	NG		
Ammonia as N	1.5		
Nitrate as N	11		
Chloride as Cl	300		
Sulfate as SO4	500		
Boron as B	2.4		
Fluoride as F	1.5		
Phosphate as P	NG		
Sodium as Na	200		
Potassium as K	NG		
Calcium as Ca	NG		
Magnesium as Mg	NG		
Arsenic as As	0.010		
Barium as Ba	0.70		
Cadmium as Cd	0.0030		
Total Chromium as Cr	0.050		
Hexavalent chromium as Cr	NG		
Copper as Cu	2.0		
Iron as Fe (Dissolved)	2.0		
Iron as Fe (Total)			
Lead as Pb	0.010		
Manganese as Mn (Dissolved)	0.40		
Manganese as Mn (Total)			
Mercury as Hg	0.0060		

Percentage Balancing

All values in mg/l, unless otherwise indicated.
* mg/kg

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
	SANS 241								
Date		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	Dry	Dry	6.9	6.2	6.4	7.9	6.3	7.1
Electrical conductivity (mS/m)	170			60	63	60	55	53	50
Chemical Oxygen demand as O2	NG			279	108	72		<3.0	21
Total Dissolved Solids	1200					332			
Alkalinity as CaCO3	NG					86			
Ammonia as N	1.5					0.76	<0.20		
Nitrate as N	11					1.1			
Chloride as Cl	300					103			
Sulfate as SO4	500					70			
Boron as B	2.4					0.059			
Fluoride as F	1.5					1.0			
Phosphate as P	NG					0.038			
Sodium as Na	200					61			
Potassium as K	NG					1.9			
Calcium as Ca	NG					24			
Magnesium as Mg	NG					20			
Arsenic as As	0.010					<0.023			
Barium as Ba	0.70					0.26			
Cadmium as Cd	0.0030					<0.0010			
Total Chromium as Cr	0.050					0.0020			
Hexavalent chromium as Cr	NG					<0.0080			
Copper as Cu	2.0					0.031			
Iron as Fe (Dissolved)	2.0								
Iron as Fe (Total)						0.025			
Lead as Pb	0.010					0.030			
Manganese as Mn (Dissolved)	0.40								
Manganese as Mn (Total)						0.20			
Mercury as Hg	0.0060					<0.0010			
Percentage Balancing						97.9			

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
	SANS 241							
Date		12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	6.4	7.3	6.3	6.78	6.7	6.6	7.6
Electrical conductivity (mS/m)	170	49	39	48	40	34	34	42
Chemical Oxygen demand as O2	NG	27	21	15	1804	57	5.2	5.8
Total Dissolved Solids	1200	262				223		
Alkalinity as CaCO3	NG	75				103		
Ammonia as N	1.5	0.050				0.015		
Nitrate as N	11	2.9				1.4		
Chloride as Cl	300	69				41		
Sulfate as SO4	500	47				33		
Boron as B	2.4	0.046				0.010		
Fluoride as F	1.5	1.0				1.6		
Phosphate as P	NG	<0.025				0.035		
Sodium as Na	200	70				51		
Potassium as K	NG	2.0				2.7		
Calcium as Ca	NG	14				18		
Magnesium as Mg	NG	13				13		
Arsenic as As	0.010	<0.023				<0.023		
Barium as Ba	0.70	0.14				0.15		
Cadmium as Cd	0.0030	<0.0010				<0.0010		
Total Chromium as Cr	0.050	<0.0020				<0.0020		
Hexavalent chromium as Cr	NG	<0.0080				<0.010		
Copper as Cu	2.0	0.034				<0.0010		
Iron as Fe (Dissolved)	2.0							
Iron as Fe (Total)		<0.0060				<0.0060		
Lead as Pb	0.010	0.020				<0.0010		
Manganese as Mn (Dissolved)	0.40							
Manganese as Mn (Total)		0.060				0.26		
Mercury as Hg	0.0060	<0.0010				<0.0010		
Percentage Balancing		97.4				98.3		

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
	SANS 241							
Date		24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	6.7	6.3	6.6	6.3	8.6	6.3	6.5
Electrical conductivity (mS/m)	170	17	46	47	43	54	28	30
Chemical Oxygen demand as O2	NG	13	30	7.7	<0.082	41	40	37
Total Dissolved Solids	1200		260			269		
Alkalinity as CaCO3	NG		115			115		
Ammonia as N	1.5		0.84			0.556		
Nitrate as N	11		0.50			0.43		
Chloride as Cl	300		52			41		
Sulfate as SO4	500		47			35		
Boron as B	2.4		0.015			0.031		
Fluoride as F	1.5		1.4			1.7		
Phosphate as P	NG		0.042			0.022		
Sodium as Na	200		49			49		
Potassium as K	NG		3.4			2.1		
Calcium as Ca	NG		21			18		
Magnesium as Mg	NG		16			14		
Arsenic as As	0.010		<0.0070			<0.0070		
Barium as Ba	0.70		0.19			0.15		
Cadmium as Cd	0.0030		<0.0010			<0.0010		
Total Chromium as Cr	0.050		<0.0010			<0.0010		
Hexavalent chromium as Cr	NG		<0.0020			<0.0020		
Copper as Cu	2.0		<0.0010			<0.0010		
Iron as Fe (Dissolved)	2.0							
Iron as Fe (Total)			<0.0030			<0.0030		
Lead as Pb	0.010		<0.0040			<0.0040		
Manganese as Mn (Dissolved)	0.40							
Manganese as Mn (Total)			0.38			0.32		
Mercury as Hg	0.0060		<0.0010			<0.0070		
Percentage Balancing			97.1			99.9		

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
SANS 241									
Date		08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	22-Sep-16	22-Sep-16
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	6.4	6.3	5.0	6.1	6.2	6.3	6.2	7.3
Electrical conductivity (mS/m)	170	34	35	41	40	21	39	34	27
Chemical Oxygen demand as O2	NG	<5.1	65	<5.0	7.8	47	16	21	<10
Total Dissolved Solids	1200		246				215	190	148
Alkalinity as CaCO3	NG		106				91	67	48
Ammonia as N	1.5		0.17				<0.010	<0.010	0.20
Nitrate as N	11		0.86				0.74	0.65	0.70
Chloride as Cl	300		40				39	31	29
Sulfate as SO4	500		30				32	54	40
Boron as B	2.4		0.030				0.30	0.66	<0.025
Fluoride as F	1.5		1.5				2.1	1.2	1.2
Phosphate as P	NG		<0.0020				<0.010	<0.010	<0.10
Sodium as Na	200		43				46	37	30
Potassium as K	NG		2.3				3.1	3.1	2.4
Calcium as Ca	NG		16				18	15	8.00
Magnesium as Mg	NG		12				13	11	5.00
Arsenic as As	0.010		<0.010				<0.020	<0.020	<0.010
Barium as Ba	0.70		0.14				0.39	0.81	0.30
Cadmium as Cd	0.0030		<0.0020				<0.0030	<0.0030	<0.025
Total Chromium as Cr	0.050		<0.0030				<0.0070	<0.0070	<0.025
Hexavalent chromium as Cr	NG		<0.0020				<0.0070	<0.0070	<0.010
Copper as Cu	2.0		<0.0020				<0.013	<0.013	<0.010
Iron as Fe (Dissolved)	2.0							<0.10	0.051
Iron as Fe (Total)			<0.0040				<0.010	0.26	17
Lead as Pb	0.010		<0.0030				<0.015	<0.015	0.015
Manganese as Mn (Dissolved)	0.40							0.64	1.0
Manganese as Mn (Total)			0.16				<0.0060	2.0	0.99
Mercury as Hg	0.0060		<0.0040				<0.027	<0.027	<0.0010
Percentage Balancing			95.8						93.8

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
SANS 241									
Date		11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18
Infield Analysis									
Temp °C	NG					21	21	21	14
pH	>5 or <9.7					6.7	6.4	6.6	6.3
EC [mS/m]	170					52	44	46	82
TDS [ppm]	1200					259	219	229	407
ORP [mV]	NG							-21	179
pH	>5 or <9.7	6.3	6.2	6.0	6.2	6.5	6.1	6.1	6.4
Electrical conductivity (mS/m)	170	37	39	37	43	48	69	44	54
Chemical Oxygen demand as O2	NG	5.2	19	7.8	7.5	11	38	32	6.8
Total Dissolved Solids	1200				220				360
Alkalinity as CaCO3	NG				115				91
Ammonia as N	1.5				<0.010				<0.010
Nitrate as N	11				0.51				0.59
Chloride as Cl	300				67				97
Sulfate as SO4	500				8.3				39
Boron as B	2.4				0.46				0.54
Fluoride as F	1.5				2.2				1.4
Phosphate as P	NG				0.11				0.13
Sodium as Na	200				48				65
Potassium as K	NG				1.8				2.5
Calcium as Ca	NG				18				26
Magnesium as Mg	NG				15				23
Arsenic as As	0.010				<0.010				<0.010
Barium as Ba	0.70				0.73				<0.010
Cadmium as Cd	0.0030				<0.0020				<0.0020
Total Chromium as Cr	0.050				<0.010				<0.010
Hexavalent chromium as Cr	NG				<1.0				<1.0
Copper as Cu	2.0				0.010				<0.010
Iron as Fe (Dissolved)	2.0				1.8				<0.10
Iron as Fe (Total)								46	
Lead as Pb	0.010				<0.010				<0.010
Manganese as Mn (Dissolved)	0.40				0.31				<0.010
Manganese as Mn (Total)								0.81	
Mercury as Hg	0.0060				<0.0010			0.010	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
SANS 241		30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20
Date									
Infield Analysis									
Temp °C	NG	20	21	22	21	22	24	22	19
pH	>5 or <9.7	6.3	6.5	6.2	6.2	6.2	6.5	6.3	6.3
EC [mS/m]	170	47	45	49	58	74	121	80	93
TDS [ppm]	1200	232	227	250	310	380	600	400	460
ORP [mV]	NG	9.1	-20						
pH	>5 or <9.7	6.3	6.17	6.6	6.4	6.1	6.5	6.2	6.4
Electrical conductivity (mS/m)	170	60	45	39	52	70	112	67	72
Chemical Oxygen demand as O2	NG	17	21	20	<6.7	9.5	90	16	28
Total Dissolved Solids	1200				300			515	
Alkalinity as CaCO3	NG				75			61	
Ammonia as N	1.5				<0.010			<0.010	
Nitrate as N	11				3.4			4.3	
Chloride as Cl	300				104			116	
Sulfate as SO4	500				26			67	
Boron as B	2.4				0.040			<0.030	
Fluoride as F	1.5				1.6			0.51	
Phosphate as P	NG				0.020			<0.010	
Sodium as Na	200				58			69	
Potassium as K	NG				3.1			2.7	
Calcium as Ca	NG				25			32	
Magnesium as Mg	NG				19			23	
Arsenic as As	0.010				<0.010			<0.010	
Barium as Ba	0.70				0.25			0.38	
Cadmium as Cd	0.0030				<0.0020			<0.0020	
Total Chromium as Cr	0.050				0.010			<0.010	
Hexavalent chromium as Cr	NG				<1.0			<1.0	
Copper as Cu	2.0				<0.010			<0.010	
Iron as Fe (Dissolved)	2.0				7.0			<0.10	
Iron as Fe (Total)					15			41	
Lead as Pb	0.010				<0.010			<0.010	
Manganese as Mn (Dissolved)	0.40				0.49			0.42	
Manganese as Mn (Total)					0.81			2.6	
Mercury as Hg	0.0060							<0.00050	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
Date	SANS 241	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22
Infield Analysis									
Temp °C	NG	22	22	19		21	21	22	22
pH	>5 or <9.7	6.6	6.4	6.8		6.1	6.5	6.4	6.4
EC [mS/m]	170	32	61	76		44	38	58	67
TDS [ppm]	1200	160	310	380		220	190	290	340
ORP [mV]	NG								
pH	>5 or <9.7	8.2	6.5	6.1	6.5	7.0	6.1	6.5	6.7
Electrical conductivity (mS/m)	170	25	43	74	61	45	38	48	61
Chemical Oxygen demand as O2	NG	14	13	<6.7	14	18.6	<6.7	8.1	22
Total Dissolved Solids	1200			495				325	
Alkalinity as CaCO3	NG			58				26	
Ammonia as N	1.5			<0.010				<0.010	
Nitrate as N	11			0.54				<0.50	
Chloride as Cl	300			161				62	
Sulfate as SO4	500			89				81	
Boron as B	2.4			0.21				0.40	
Fluoride as F	1.5			0.97				0.97	
Phosphate as P	NG			0.01				<0.10	
Sodium as Na	200			70				56	
Potassium as K	NG			2.8				3.0	
Calcium as Ca	NG			34				18	
Magnesium as Mg	NG			31				15	
Arsenic as As	0.010			<0.010				<0.010	
Barium as Ba	0.70			0.20				0.020	
Cadmium as Cd	0.0030			<0.0020				<0.0020	
Total Chromium as Cr	0.050			<0.010				<0.010	
Hexavalent chromium as Cr	NG			<1.0				<1.0	
Copper as Cu	2.0			<0.010				<0.010	
Iron as Fe (Dissolved)	2.0			<0.10				<0.10	
Iron as Fe (Total)				17				45	
Lead as Pb	0.010			<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40			<0.010				<0.010	
Manganese as Mn (Total)				0.65				0.37	
Mercury as Hg	0.0060			<0.00050				<0.00050	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S	BH09-13S
	SANS 241							
Date		24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24
Infield Analysis								
Temp °C	NG	24	22	23	21	22	22	21
pH	>5 or <9.7	7.0	6.4	6.2	6.1	6.0	5.8	5.9
EC [mS/m]	170	190	33	45	76	58	75	73
TDS [ppm]	1200	39	170	230	380	290	380	360
ORP [mV]	NG							
pH	>5 or <9.7	6.4	7.5	9.6	6.8	7.4	6.4	7.5
Electrical conductivity (mS/m)	170	35	51	35	53	46	62	64
Chemical Oxygen demand as O2	NG	<6.7	14	21	15	11	12	<6.7
Total Dissolved Solids	1200			200				360
Alkalinity as CaCO3	NG			48				88
Ammonia as N	1.5			0.41				<0.010
Nitrate as N	11			<0.50				0.51
Chloride as Cl	300			52				114
Sulfate as SO4	500			34				53
Boron as B	2.4			<0.030				<0.030
Fluoride as F	1.5			1.4				1.2
Phosphate as P	NG			<0.010				<0.010
Sodium as Na	200			33				71
Potassium as K	NG			1.6				3.0
Calcium as Ca	NG			13				29
Magnesium as Mg	NG			5.1				30
Arsenic as As	0.010			<0.010				<0.010
Barium as Ba	0.70			0.020				<0.010
Cadmium as Cd	0.0030			<0.0020				<0.0020
Total Chromium as Cr	0.050			<0.010				<0.010
Hexavalent chromium as Cr	NG			<1.0				<1.0
Copper as Cu	2.0			0.010				<0.010
Iron as Fe (Dissolved)	2.0			<0.10				<0.10
Iron as Fe (Total)				19				32
Lead as Pb	0.010			<0.010				<0.010
Manganese as Mn (Dissolved)	0.40			<0.010				<0.010
Manganese as Mn (Total)				<0.010				0.80
Mercury as Hg	0.0060			<0.00050				

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13S Shongweni Landfill		BH09-13S	BH09-13S
SANS 241			
Date		22-Oct-24	21-Jan-25
Infield Analysis			
Temp °C	NG	20	22
pH	>5 or <9.7	6.0	6.1
EC [mS/m]	170	47	58
TDS [ppm]	1200	240	290
ORP [mV]	NG		
pH	>5 or <9.7	6.5	7.1
Electrical conductivity (mS/m)	170	49	42
Chemical Oxygen demand as O2	NG	17	<6.7
Total Dissolved Solids	1200		
Alkalinity as CaCO3	NG		
Ammonia as N	1.5		
Nitrate as N	11		
Chloride as Cl	300		
Sulfate as SO4	500		
Boron as B	2.4		
Fluoride as F	1.5		
Phosphate as P	NG		
Sodium as Na	200		
Potassium as K	NG		
Calcium as Ca	NG		
Magnesium as Mg	NG		
Arsenic as As	0.010		
Barium as Ba	0.70		
Cadmium as Cd	0.0030		
Total Chromium as Cr	0.050		
Hexavalent chromium as Cr	NG		
Copper as Cu	2.0		
Iron as Fe (Dissolved)	2.0		
Iron as Fe (Total)			
Lead as Pb	0.010		
Manganese as Mn (Dissolved)	0.40		
Manganese as Mn (Total)			
Mercury as Hg	0.0060		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11
Date									
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.8	6.6	7.5	7.2	6.9	8.4	6.8	8.1
Electrical conductivity (mS/m)	170	60	56	48	64	49	48	54	50
Chemical Oxygen demand as O2	NG	<10	<3.0	147	33	17.7		<3.0	63
Total Dissolved Solids	1200	378				271			
Alkalinity as CaCO3	NG	176				129			
Ammonia as N	1.5	<0.20				3.5	<0.20		
Nitrate as N	11	<0.20				1.8			
Chloride as Cl	300	67				72			
Sulfate as SO4	500	32				30			
Boron as B	2.4	0.13				0.061			
Fluoride as F	1.5	3.6				2.2			
Phosphate as P	NG	<0.20				0.043			
Sodium as Na	200	67				46			
Potassium as K	NG	5.2				2.6			
Calcium as Ca	NG	52				28			
Magnesium as Mg	NG	16				13			
Arsenic as As	0.010	0.016				<0.023			
Barium as Ba	0.70	0.25				0.25			
Cadmium as Cd	0.0030	<0.0050				<0.0010			
Total Chromium as Cr	0.050	<0.025				<0.0020			
Hexavalent chromium as Cr	NG	<0.010				<0.0080			
Copper as Cu	2.0	<0.025				0.031			
Iron as Fe (Dissolved)	2.0	6.7				1.2			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.020				0.010			
Manganese as Mn (Dissolved)	0.40	1.2				0.62			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.0010				<0.0010			
Percentage Balancing		94.7				97.9			

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013
Date								
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.0	7.4	7.4	7.5	7.3	7.2	8.0
Electrical conductivity (mS/m)	170	46	40	45	39	37	50	49
Chemical Oxygen demand as O2	NG	51	322	85	80	17	<3.0	7.5
Total Dissolved Solids	1200	275				259		
Alkalinity as CaCO3	NG	132				142		
Ammonia as N	1.5	0.23				0.064		
Nitrate as N	11	0.50				0.11		
Chloride as Cl	300	67				38		
Sulfate as SO4	500	26				35		
Boron as B	2.4	0.19				0.040		
Fluoride as F	1.5	2.2				2.4		
Phosphate as P	NG	0.032				<0.025		
Sodium as Na	200	56				50		
Potassium as K	NG	4.1				4.2		
Calcium as Ca	NG	29				30		
Magnesium as Mg	NG	14				14		
Arsenic as As	0.010	<0.023				<0.023		
Barium as Ba	0.70	0.64				0.23		
Cadmium as Cd	0.0030	0.0010				<0.0010		
Total Chromium as Cr	0.050	<0.0020				<0.0020		
Hexavalent chromium as Cr	NG	<0.0080				<0.010		
Copper as Cu	2.0	0.043				<0.0010		
Iron as Fe (Dissolved)	2.0	2.7				<0.0060		
Iron as Fe (Total)								
Lead as Pb	0.010	<0.010				<0.0010		
Manganese as Mn (Dissolved)	0.40	2.3				1.1		
Manganese as Mn (Total)								
Mercury as Hg	0.0060	<0.0010				<0.0010		
Percentage Balancing		95.9				98.2		

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
	SANS 241							
Date		24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.0	6.9	7.1	7.0	8.8	6.8	6.9
Electrical conductivity (mS/m)	170	43	49	56	51	71	16	54
Chemical Oxygen demand as O2	NG	146	8.2	49	2.3	60	21	48
Total Dissolved Solids	1200		272			364		
Alkalinity as CaCO3	NG		143			208		
Ammonia as N	1.5		1.1			0.327		
Nitrate as N	11		0.28			0.35		
Chloride as Cl	300		52			53		
Sulfate as SO4	500		29			27		
Boron as B	2.4		0.032			0.072		
Fluoride as F	1.5		3.0			3.5		
Phosphate as P	NG		0.027			0.021		
Sodium as Na	200		44			60		
Potassium as K	NG		4.2			4.0		
Calcium as Ca	NG		38			38		
Magnesium as Mg	NG		14			15		
Arsenic as As	0.010		<0.0070			<0.0070		
Barium as Ba	0.70		0.30			0.24		
Cadmium as Cd	0.0030		<0.0010			<0.0010		
Total Chromium as Cr	0.050		<0.0010			<0.0010		
Hexavalent chromium as Cr	NG		<0.0020			<0.0020		
Copper as Cu	2.0		<0.0010			<0.0010		
Iron as Fe (Dissolved)	2.0		<0.0030			<0.0030		
Iron as Fe (Total)								
Lead as Pb	0.010		<0.0040			<0.0040		
Manganese as Mn (Dissolved)	0.40		1.2			1.1		
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010			<0.0070		
Percentage Balancing			98.9			95.4		

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241									
Date		08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17
Infield Analysis									
Temp °C	NG								
pH	>5 or <9.7								
EC [mS/m]	170								
TDS [ppm]	1200								
ORP [mV]	NG								
pH	>5 or <9.7	7.6	7.3	6.7	6.8	7.0	6.8	6.9	6.9
Electrical conductivity (mS/m)	170	71	71	66	64	59	70	61	60
Chemical Oxygen demand as O2	NG	191	128	7.0	8.7	46	11	12.9	26
Total Dissolved Solids	1200		450				350		
Alkalinity as CaCO3	NG		260				244		
Ammonia as N	1.5		0.23				<0.010		
Nitrate as N	11		0.49				<0.50		
Chloride as Cl	300		61				58		
Sulfate as SO4	500		37				48		
Boron as B	2.4		0.068				0.77		
Fluoride as F	1.5		3.0				3.1		
Phosphate as P	NG		<0.0020				<0.010		
Sodium as Na	200		100				79		
Potassium as K	NG		4.6				4.7		
Calcium as Ca	NG		40				48		
Magnesium as Mg	NG		15				19		
Arsenic as As	0.010		<0.010				<0.020		
Barium as Ba	0.70		0.31				0.62		
Cadmium as Cd	0.0030		<0.0020				<0.0030		
Total Chromium as Cr	0.050		<0.0030				<0.0070		
Hexavalent chromium as Cr	NG		<0.0020				<0.0070		
Copper as Cu	2.0		<0.0020				<0.013		
Iron as Fe (Dissolved)	2.0		<0.0040				0.43		
Iron as Fe (Total)									
Lead as Pb	0.010		<0.0030				<0.015		
Manganese as Mn (Dissolved)	0.40		1.1				0.16		
Manganese as Mn (Total)									
Mercury as Hg	0.0060		<0.0040				<0.027		
Percentage Balancing			99.3						

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19
Date									
Infield Analysis									
Temp °C	NG			21	20	20	21	20	20
pH	>5 or <9.7			6.8	6.9	6.7	6.6	6.6	6.5
EC [mS/m]	170			70	69	74	77	69	74
TDS [ppm]	1200			347	344	369	386	342	368
ORP [mV]	NG					-45	-78	-63	-90
pH	>5 or <9.7	6.6	6.3	7.1	6.9	7.7	6.8	6.5	6.49
Electrical conductivity (mS/m)	170	76	57	64	63	66	77	80	74
Chemical Oxygen demand as O2	NG	6.8	13	<6.7	28	36	<6.7	46	26
Total Dissolved Solids	1200		540						
Alkalinity as CaCO3	NG		201				195		
Ammonia as N	1.5		<0.010				<0.010		
Nitrate as N	11		1.8				<0.50		
Chloride as Cl	300		75				142		
Sulfate as SO4	500		32				40		
Boron as B	2.4		0.83				0.54		
Fluoride as F	1.5		2.1				6.6		
Phosphate as P	NG		0.10				0.13		
Sodium as Na	200		81				79		
Potassium as K	NG		4.6				3.8		
Calcium as Ca	NG		39				55		
Magnesium as Mg	NG		18				27		
Arsenic as As	0.010		<0.010				<0.010		
Barium as Ba	0.70		2.2				0.070		
Cadmium as Cd	0.0030		<0.0020				<0.0020		
Total Chromium as Cr	0.050		<0.010				<0.010		
Hexavalent chromium as Cr	NG		<1.0				<1.0		
Copper as Cu	2.0		0.030				<0.010		
Iron as Fe (Dissolved)	2.0		3.6				<0.10		
Iron as Fe (Total)							47		
Lead as Pb	0.010		<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40		1.8				1.2		
Manganese as Mn (Total)							1.7		
Mercury as Hg	0.0060		<0.0010				<0.0010		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21
Date								
Infield Analysis								
Temp °C	NG	21	21	21	22	22	20	21
pH	>5 or <9.7	6.5	6.5	6.4	6.4	6.9	6.5	6.6
EC [mS/m]	170	88	86	96	99	47	123	74
TDS [ppm]	1200	440	440	510	490	230	620	370
ORP [mV]	NG							
pH	>5 or <9.7	6.5	6.6	6.5	6.5	6.6	6.5	8.0
Electrical conductivity (mS/m)	170	82	80	91	94	37	96	62
Chemical Oxygen demand as O2	NG	20	34	31	21	<6.7	22	35
Total Dissolved Solids	1200		480			235		
Alkalinity as CaCO3	NG		152			76		
Ammonia as N	1.5		<0.010			<0.010		
Nitrate as N	11		<0.50			1.5		
Chloride as Cl	300		145			53		
Sulfate as SO4	500		31			34		
Boron as B	2.4		0.14			<0.030		
Fluoride as F	1.5		145			0.57		
Phosphate as P	NG		0.020			<0.010		
Sodium as Na	200		79			36		
Potassium as K	NG		4.5			3.0		
Calcium as Ca	NG		53			25		
Magnesium as Mg	NG		22			10.8		
Arsenic as As	0.010		<0.010			<0.010		
Barium as Ba	0.70		0.38			0.31		
Cadmium as Cd	0.0030		<0.0020			<0.0020		
Total Chromium as Cr	0.050		0.010			0.010		
Hexavalent chromium as Cr	NG		<1.0			<1.0		
Copper as Cu	2.0		<0.010			<0.010		
Iron as Fe (Dissolved)	2.0		19			<0.10		
Iron as Fe (Total)			19			0.67		
Lead as Pb	0.010		<0.010			<0.010		
Manganese as Mn (Dissolved)	0.40		1.2			<0.010		
Manganese as Mn (Total)			2.2			0.040		
Mercury as Hg	0.0060					<0.00050		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22
Date								
Infield Analysis								
Temp °C	NG	21	20		22	20	20	22
pH	>5 or <9.7	6.5	6.8		6.7	6.8	6.9	6.6
EC [mS/m]	170	89	84		94	100	81	86
TDS [ppm]	1200	450	420		470	500	400	430
ORP [mV]	NG							
pH	>5 or <9.7	7.4	6.9	6.9	7.6	6.7	7.2	6.9
Electrical conductivity (mS/m)	170	70	86	95	92	101	86	89
Chemical Oxygen demand as O2	NG	25	<6.7	21	32	47	15	33
Total Dissolved Solids	1200		540				505	
Alkalinity as CaCO3	NG		180				179	
Ammonia as N	1.5		<0.010				<0.010	
Nitrate as N	11		1.4				<0.50	
Chloride as Cl	300		138				107	
Sulfate as SO4	500		85				53	
Boron as B	2.4		1.0				0.17	
Fluoride as F	1.5		2.6				2.6	
Phosphate as P	NG		<0.010				<0.10	
Sodium as Na	200		84				93	
Potassium as K	NG		5.0				4.3	
Calcium as Ca	NG		65				51	
Magnesium as Mg	NG		23				21	
Arsenic as As	0.010		<0.010				<0.010	
Barium as Ba	0.70		0.45				0.13	
Cadmium as Cd	0.0030		<0.0020				<0.0020	
Total Chromium as Cr	0.050		<0.010				<0.010	
Hexavalent chromium as Cr	NG		<1.0				<1.0	
Copper as Cu	2.0		<0.010				<0.010	
Iron as Fe (Dissolved)	2.0		<0.10				<0.10	
Iron as Fe (Total)			70				21	
Lead as Pb	0.010		<0.010				<0.010	
Manganese as Mn (Dissolved)	0.40		<0.010				<0.010	
Manganese as Mn (Total)			2.1				1.6	
Mercury as Hg	0.0060		<0.00050				0.012	

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M	BH09-13M
SANS 241		24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24
Date								
Infield Analysis								
Temp °C	NG	22	20	20	21	21	20	20
pH	>5 or <9.7	7.4	6.7	6.6	6.5	6.4	6.5	6.4
EC [mS/m]	170	60	51	108	107	74	92	95
TDS [ppm]	1200	300	260	540	530	370	460	480
ORP [mV]	NG							
pH	>5 or <9.7	7.4	7.3	8.1	6.7	7.1	6.9	7.2
Electrical conductivity (mS/m)	170	91	104	98	94	88	95	102
Chemical Oxygen demand as O2	NG	6.9	9.8	42	12	14	12	27
Total Dissolved Solids	1200			760				620
Alkalinity as CaCO3	NG			190				191
Ammonia as N	1.5			0.36				0.36
Nitrate as N	11			<0.50				1.1
Chloride as Cl	300			178				178
Sulfate as SO4	500			76				78
Boron as B	2.4			<0.030				<0.030
Fluoride as F	1.5			2.9				2.6
Phosphate as P	NG			<0.010				<0.010
Sodium as Na	200			101				103
Potassium as K	NG			5.1				5.7
Calcium as Ca	NG			79				86
Magnesium as Mg	NG			31				35
Arsenic as As	0.010			<0.010				<0.010
Barium as Ba	0.70			0.010				0.010
Cadmium as Cd	0.0030			<0.0020				<0.0020
Total Chromium as Cr	0.050			<0.010				<0.010
Hexavalent chromium as Cr	NG			<1.0				<1.0
Copper as Cu	2.0			<0.010				<0.010
Iron as Fe (Dissolved)	2.0			<0.10				<0.10
Iron as Fe (Total)				38				20
Lead as Pb	0.010			<0.010				<0.010
Manganese as Mn (Dissolved)	0.40			<0.010				0.060
Manganese as Mn (Total)				<0.010				2.4
Mercury as Hg	0.0060			<0.00050				

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13M Shongweni Landfill		BH09-13M	BH09-13M
SANS 241			
Date		22-Oct-24	21-Jan-25
Infield Analysis			
Temp °C	NG	21	22
pH	>5 or <9.7	6.5	6.7
EC [mS/m]	170	85	125
TDS [ppm]	1200	430	630
ORP [mV]	NG		
pH	>5 or <9.7	7.4	6.8
Electrical conductivity (mS/m)	170	109	99
Chemical Oxygen demand as O2	NG	25	14
Total Dissolved Solids	1200		
Alkalinity as CaCO3	NG		
Ammonia as N	1.5		
Nitrate as N	11		
Chloride as Cl	300		
Sulfate as SO4	500		
Boron as B	2.4		
Fluoride as F	1.5		
Phosphate as P	NG		
Sodium as Na	200		
Potassium as K	NG		
Calcium as Ca	NG		
Magnesium as Mg	NG		
Arsenic as As	0.010		
Barium as Ba	0.70		
Cadmium as Cd	0.0030		
Total Chromium as Cr	0.050		
Hexavalent chromium as Cr	NG		
Copper as Cu	2.0		
Iron as Fe (Dissolved)	2.0		
Iron as Fe (Total)			
Lead as Pb	0.010		
Manganese as Mn (Dissolved)	0.40		
Manganese as Mn (Total)			
Mercury as Hg	0.0060		
Percentage Balancing			

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
SANS 241		11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11
Date								
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	8.2	8.4	8.5	8.2	8.3	8.9	8.2
Electrical conductivity (mS/m)	170	75	92	74	87	83	82	82
Chemical Oxygen demand as O2	NG	56	<3.0	139	35	<3.0		<3.0
Total Dissolved Solids	1200	526				465		
Alkalinity as CaCO3	NG	300				321		
Ammonia as N	1.5	<0.20				3.9	<0.20	
Nitrate as N	11	<0.20				0.20		
Chloride as Cl	300	49				78		
Sulfate as SO4	500	17				17		
Boron as B	2.4	0.30				0.41		
Fluoride as F	1.5	6.3				4.9		
Phosphate as P	NG	<0.20				<0.025		
Sodium as Na	200	142				160		
Potassium as K	NG	12				6.2		
Calcium as Ca	NG	31				6.9		
Magnesium as Mg	NG	13				4.8		
Arsenic as As	0.010	0.023				<0.023		
Barium as Ba	0.70	0.090				0.15		
Cadmium as Cd	0.0030	<0.0050				<0.0010		
Total Chromium as Cr	0.050	<0.025				<0.0020		
Hexavalent chromium as Cr	NG	<0.010				<0.0080		
Copper as Cu	2.0	<0.025				0.031		
Iron as Fe (Dissolved)	2.0	0.84				0.034		
Iron as Fe (Total)								
Lead as Pb	0.010	0.061				0.020		
Manganese as Mn (Dissolved)	0.40	0.13				0.059		
Manganese as Mn (Total)								
Mercury as Hg	0.0060	<0.0010				<0.0010		
Percentage Balancing		94.0				97.3		

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
	SANS 241							
Date		11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	8.7	7.8	7.4	7.3	7.5	7.8	7.8
Electrical conductivity (mS/m)	170	66	22	41	42	47	43	24
Chemical Oxygen demand as O2	NG	20	13	17	5.8	716	50	16
Total Dissolved Solids	1200		181				320	
Alkalinity as CaCO3	NG		70				173	
Ammonia as N	1.5		0.073				0.016	
Nitrate as N	11		1.9				0.55	
Chloride as Cl	300		40				34	
Sulfate as SO4	500		28				59	
Boron as B	2.4		0.067				0.12	
Fluoride as F	1.5		0.95				4.1	
Phosphate as P	NG		<0.025				<0.025	
Sodium as Na	200		39				74	
Potassium as K	NG		11				3.5	
Calcium as Ca	NG		10				23	
Magnesium as Mg	NG		9.3				17	
Arsenic as As	0.010		<0.023				<0.023	
Barium as Ba	0.70		0.16				0.12	
Cadmium as Cd	0.0030		0.0010				<0.0010	
Total Chromium as Cr	0.050		<0.0020				<0.0020	
Hexavalent chromium as Cr	NG		<0.0080				<0.010	
Copper as Cu	2.0		0.024				<0.0010	
Iron as Fe (Dissolved)	2.0		1.6				<0.0060	
Iron as Fe (Total)								
Lead as Pb	0.010		<0.010				<0.0010	
Manganese as Mn (Dissolved)	0.40		0.141				1.6	
Manganese as Mn (Total)								
Mercury as Hg	0.0060		<0.0010				<0.0010	
Percentage Balancing			96.3				99.9	

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
	SANS 241						
Date		16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14
Infield Analysis							
Temp °C	NG						
pH	>5 or <9.7						
EC [mS/m]	170						
TDS [ppm]	1200						
ORP [mV]	NG						
pH	>5 or <9.7	7.9	7.8	7.7	7.8	7.6	7.6
Electrical conductivity (mS/m)	170	16	18	36	50	28	46
Chemical Oxygen demand as O2	NG	15	<0.082	27	77	1.0	72
Total Dissolved Solids	1200			215			242
Alkalinity as CaCO3	NG			140			169
Ammonia as N	1.5			0.76			13.5
Nitrate as N	11			0.36			0.31
Chloride as Cl	300			19			18
Sulfate as SO4	500			28			12
Boron as B	2.4			0.051			0.074
Fluoride as F	1.5			3.1			2.7
Phosphate as P	NG			0.016			0.96
Sodium as Na	200			41			43
Potassium as K	NG			6.7			8.2
Calcium as Ca	NG			22			14
Magnesium as Mg	NG			10			6.3
Arsenic as As	0.010			<0.0070			<0.0070
Barium as Ba	0.70			0.11			0.071
Cadmium as Cd	0.0030			<0.0010			<0.0010
Total Chromium as Cr	0.050			<0.0010			<0.0010
Hexavalent chromium as Cr	NG			<0.0020			<0.0020
Copper as Cu	2.0			<0.0010			<0.0010
Iron as Fe (Dissolved)	2.0			<0.0030			0.21
Iron as Fe (Total)							
Lead as Pb	0.010			<0.0040			<0.0040
Manganese as Mn (Dissolved)	0.40			0.19			0.77
Manganese as Mn (Total)							
Mercury as Hg	0.0060			<0.0010			<0.0070
Percentage Balancing				97.9			99.0

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
	SANS 241							
Date		07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16
Infield Analysis								
Temp °C	NG							
pH	>5 or <9.7							
EC [mS/m]	170							
TDS [ppm]	1200							
ORP [mV]	NG							
pH	>5 or <9.7	7.5	8.0	6.8	7.5	7.0	7.3	7.4
Electrical conductivity (mS/m)	170	72	70	16	26	74	65	48
Chemical Oxygen demand as O2	NG	38	25	19	31	<5.0	24	44
Total Dissolved Solids	1200				171			
Alkalinity as CaCO3	NG				110			
Ammonia as N	1.5				0.81			
Nitrate as N	11				0.59			
Chloride as Cl	300				15			
Sulfate as SO4	500				10			
Boron as B	2.4				0.071			
Fluoride as F	1.5				2.3			
Phosphate as P	NG				<0.0020			
Sodium as Na	200				36			
Potassium as K	NG				5.0			
Calcium as Ca	NG				11			
Magnesium as Mg	NG				5.4			
Arsenic as As	0.010				<0.010			
Barium as Ba	0.70				0.056			
Cadmium as Cd	0.0030				<0.0020			
Total Chromium as Cr	0.050				<0.0030			
Hexavalent chromium as Cr	NG				<0.0020			
Copper as Cu	2.0				<0.0020			
Iron as Fe (Dissolved)	2.0				<0.0040			
Iron as Fe (Total)								
Lead as Pb	0.010				<0.0030			
Manganese as Mn (Dissolved)	0.40				0.18			
Manganese as Mn (Total)								
Mercury as Hg	0.0060				<0.0040			
Percentage Balancing					95.7			

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
SANS 241		13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18
Date									
Infield Analysis									
Temp °C	NG						20	20	20
pH	>5 or <9.7						7.0	6.8	6.9
EC [mS/m]	170						57	68	65
TDS [ppm]	1200						284	341	325
ORP [mV]	NG								-85
pH	>5 or <9.7	6.9	6.9	7.3	7.2	6.9	7.5	8.2	6.9
Electrical conductivity (mS/m)	170	20	14	19	57	61	43	67	62
Chemical Oxygen demand as O2	NG	26	18.2	18.2	<67	16	16	62	48
Total Dissolved Solids	1200	95				420			
Alkalinity as CaCO3	NG	61				288			
Ammonia as N	1.5	<0.010				<0.010			
Nitrate as N	11	<0.50				<0.50			
Chloride as Cl	300	12				44			
Sulfate as SO4	500	16				8.3			
Boron as B	2.4	0.32				0.59			
Fluoride as F	1.5	1.7				6.6			
Phosphate as P	NG	<0.010				0.11			
Sodium as Na	200	17				129			
Potassium as K	NG	4.6				3.5			
Calcium as Ca	NG	9.9				13			
Magnesium as Mg	NG	6.6				6.9			
Arsenic as As	0.010	<0.020				0.010			
Barium as Ba	0.70	0.24				0.72			
Cadmium as Cd	0.0030	<0.0030				<0.0020			
Total Chromium as Cr	0.050	<0.0070				<0.010			
Hexavalent chromium as Cr	NG	<0.0070				<1.0			
Copper as Cu	2.0	<0.013				0.030			
Iron as Fe (Dissolved)	2.0	<0.010				3.8			
Iron as Fe (Total)									
Lead as Pb	0.010	<0.015				<0.010			
Manganese as Mn (Dissolved)	0.40	<0.0060				<0.010			
Manganese as Mn (Total)									
Mercury as Hg	0.0060	<0.027				<0.0010			

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
SANS 241		18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20
Date									
Infield Analysis									
Temp °C	NG	20	20	20	21	20	20	21	22
pH	>5 or <9.7	7.3	7.2	7.0	7.4	7.1	7.4	7.2	7.1
EC [mS/m]	170	64	54	58	60	7.0	68	34	40
TDS [ppm]	1200	321	272	291	310	30	350	170	200
ORP [mV]	NG	-106	-110	110					
pH	>5 or <9.7	7.7	6.9	7.2	7.1	6.8	7.5	6.5	6.6
Electrical conductivity (mS/m)	170	69	67	61	37	6.0	66	21	24
Chemical Oxygen demand as O2	NG	18	21	39	23	<6.7	20	23	<6.7
Total Dissolved Solids	1200	340				50			130
Alkalinity as CaCO3	NG	299				23			76
Ammonia as N	1.5	<0.010				0.080			<0.010
Nitrate as N	11	1.1				<0.50			2.3
Chloride as Cl	300	46				2.7			20
Sulfate as SO4	500	25				18			20
Boron as B	2.4	0.58				<0.030			<0.030
Fluoride as F	1.5	9.6				<0.10			0.56
Phosphate as P	NG	0.14				0.010			<0.010
Sodium as Na	200	139				13			26
Potassium as K	NG	4.2				1.4			4.8
Calcium as Ca	NG	18				4.1			12.3
Magnesium as Mg	NG	11				2.1			5.9
Arsenic as As	0.010	<0.010				<0.010			<0.010
Barium as Ba	0.70	<0.010				0.040			0.30
Cadmium as Cd	0.0030	<0.0020				<0.0020			<0.0020
Total Chromium as Cr	0.050	<0.010				<0.010			<0.010
Hexavalent chromium as Cr	NG	<1.0				3.9			<1.0
Copper as Cu	2.0	<0.010				<0.010			0.010
Iron as Fe (Dissolved)	2.0	<0.10				2.3			<0.10
Iron as Fe (Total)		4.0				10			5.2
Lead as Pb	0.010	<0.010				<0.010			<0.010
Manganese as Mn (Dissolved)	0.40	<0.10				0.20			0.010
Manganese as Mn (Total)		0.42				0.52			0.40
Mercury as Hg	0.0060	<0.0010							<0.00050

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
SANS 241		15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22
Date								
Infield Analysis								
Temp °C	NG	20	21	21	20		20	20
pH	>5 or <9.7	7.4	7.0	7.0	7.1		7.1	7.2
EC [mS/m]	170	71	11	11	27		8	26
TDS [ppm]	1200	360	50	50	140		40	130
ORP [mV]	NG							
pH	>5 or <9.7	7.2	7.5	6.7	6.9	7.2	6.9	7.1
Electrical conductivity (mS/m)	170	56	12	12	21	63	8.8	27
Chemical Oxygen demand as O2	NG	25	12	8.2	<6.7	15.6	17	18
Total Dissolved Solids	1200				160			
Alkalinity as CaCO3	NG				81			
Ammonia as N	1.5				<0.010			
Nitrate as N	11				1.4			
Chloride as Cl	300				21			
Sulfate as SO4	500				16.2			
Boron as B	2.4				0.39			
Fluoride as F	1.5				1.7			
Phosphate as P	NG				<0.010			
Sodium as Na	200				28			
Potassium as K	NG				3.3			
Calcium as Ca	NG				11			
Magnesium as Mg	NG				5.9			
Arsenic as As	0.010				<0.010			
Barium as Ba	0.70				0.13			
Cadmium as Cd	0.0030				<0.0020			
Total Chromium as Cr	0.050				<0.010			
Hexavalent chromium as Cr	NG				<1.0			
Copper as Cu	2.0				<0.010			
Iron as Fe (Dissolved)	2.0				<0.10			
Iron as Fe (Total)					8.2			
Lead as Pb	0.010				<0.010			
Manganese as Mn (Dissolved)	0.40				<0.010			
Manganese as Mn (Total)					0.38			
Mercury as Hg	0.0060				<0.00050			

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D	BH09-13D
Date	SANS 241	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24
Infield Analysis								
Temp °C	NG	20	20	20	21	21	20	21
pH	>5 or <9.7	7.2	7.3	7.5	7.0	6.5	6.8	6.7
EC [mS/m]	170	16	49	11	10	18	29	20
TDS [ppm]	1200	80	240	50	50	90	140	90
ORP [mV]	NG							
pH	>5 or <9.7	7.2	7.2	7.2	7.8	7.8	6.8	8.0
Electrical conductivity (mS/m)	170	14	52	18	19	20	33	10
Chemical Oxygen demand as O2	NG	14	18	<6.7	9.6	8.0	<6.7	18
Total Dissolved Solids	1200	80				160		
Alkalinity as CaCO3	NG	50				68		
Ammonia as N	1.5	<0.010				0.51		
Nitrate as N	11	<0.50				<0.50		
Chloride as Cl	300	13.2				27		
Sulfate as SO4	500	<3.0				13		
Boron as B	2.4	0.24				<0.030		
Fluoride as F	1.5	0.59				0.95		
Phosphate as P	NG	<0.10				<0.010		
Sodium as Na	200	16				30		
Potassium as K	NG	2.2				2.0		
Calcium as Ca	NG	7.3				13		
Magnesium as Mg	NG	3.5				6.2		
Arsenic as As	0.010	<0.010				<0.010		
Barium as Ba	0.70	0.010				0.020		
Cadmium as Cd	0.0030	<0.0020				<0.0020		
Total Chromium as Cr	0.050	<0.010				<0.010		
Hexavalent chromium as Cr	NG	<1.0				<1.0		
Copper as Cu	2.0	<0.010				<0.010		
Iron as Fe (Dissolved)	2.0	<0.10				<0.10		
Iron as Fe (Total)		27				16		
Lead as Pb	0.010	<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40	<0.010				<0.010		
Manganese as Mn (Total)		0.32				<0.010		
Mercury as Hg	0.0060	<0.00050				<0.00050		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH09-13D Shongweni Landfill		BH09-13D	BH09-13D	BH09-13D	BH09-13D
SANS 241		26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Date					
Infield Analysis					
Temp °C	NG	20	20	20	22
pH	>5 or <9.7	6.6	6.9	6.9	7.4
EC [mS/m]	170	51	71	45	47
TDS [ppm]	1200	260	360	220	230
ORP [mV]	NG				
pH	>5 or <9.7	7.4	7.7	7.5	7.4
Electrical conductivity (mS/m)	170	47	89	48	28
Chemical Oxygen demand as O2	NG	15	10	10	<6.7
Total Dissolved Solids	1200		540		
Alkalinity as CaCO3	NG		272		
Ammonia as N	1.5		0.34		
Nitrate as N	11		<0.50		
Chloride as Cl	300		116		
Sulfate as SO4	500		48		
Boron as B	2.4		<0.030		
Fluoride as F	1.5		2.8		
Phosphate as P	NG		<0.010		
Sodium as Na	200		107		
Potassium as K	NG		6.1		
Calcium as Ca	NG		70		
Magnesium as Mg	NG		31		
Arsenic as As	0.010		<0.010		
Barium as Ba	0.70		0.010		
Cadmium as Cd	0.0030		<0.0020		
Total Chromium as Cr	0.050		<0.010		
Hexavalent chromium as Cr	NG		<1.0		
Copper as Cu	2.0		<0.010		
Iron as Fe (Dissolved)	2.0		<0.10		
Iron as Fe (Total)			20		
Lead as Pb	0.010		<0.010		
Manganese as Mn (Dissolved)	0.40		<0.010		
Manganese as Mn (Total)			2.1		
Mercury as Hg	0.0060				

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH24 14S Shongweni Landfill		BH24 14S	BH24 14S
SANS 241			
Date		22-Oct-24	21-Jan-25
Infield Analysis			
Temp °C	NG	19	24
pH	>5 or <9.7	6.6	6.6
EC [mS/m]	170	61	179
TDS [ppm]	1200	310	920
ORP [mV]	NG		
pH	>5 or <9.7	8.5	7.4
Electrical conductivity (mS/m)	170	57	129
Chemical Oxygen demand as O2	NG	43	64
Total Dissolved Solids	1200		
Alkalinity as CaCO3	NG		
Ammonia as N	1.5		
Nitrate as N	11		
Chloride as Cl	300		
Sulfate as SO4	500		
Boron as B	2.4		
Fluoride as F	1.5		
Phosphate as P	NG		
Sodium as Na	200		
Potassium as K	NG		
Calcium as Ca	NG		
Magnesium as Mg	NG		
Arsenic as As	0.010		
Barium as Ba	0.70		
Cadmium as Cd	0.0030		
Total Chromium as Cr	0.050		
Hexavalent chromium as Cr	NG		
Copper as Cu	2.0		
Iron as Fe (Dissolved)	2.0		
Iron as Fe (Total)			
Lead as Pb	0.010		
Manganese as Mn (Dissolved)	0.40		
Manganese as Mn (Total)			
Mercury as Hg	0.0060		

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH24 14M Shongweni Landfill		BH24 14M	BH24 14M
	SANS 241		
Date		22-Oct-24	21-Jan-25

Infield Analysis

Temp °C	NG	20	23
pH	>5 or <9.7	6.3	6.0
EC [mS/m]	170	70	66
TDS [ppm]	1200	350	350
ORP [mV]	NG		

pH	>5 or <9.7	8.4	7.8
Electrical conductivity (mS/m)	170	79	41
Chemical Oxygen demand as O2	NG	25	<6.7

Total Dissolved Solids	1200
Alkalinity as CaCO3	NG
Ammonia as N	1.5
Nitrate as N	11
Chloride as Cl	300
Sulfate as SO4	500
Boron as B	2.4
Fluoride as F	1.5
Phosphate as P	NG
Sodium as Na	200
Potassium as K	NG
Calcium as Ca	NG
Magnesium as Mg	NG

Arsenic as As	0.010
Barium as Ba	0.70
Cadmium as Cd	0.0030
Total Chromium as Cr	0.050
Hexavalent chromium as Cr	NG
Copper as Cu	2.0
Iron as Fe (Dissolved)	2.0
Iron as Fe (Total)	
Lead as Pb	0.010
Manganese as Mn (Dissolved)	0.40
Manganese as Mn (Total)	
Mercury as Hg	0.0060

Percentage Balancing

All values in mg/l, unless otherwise indicated.

BH24 14D Shongweni Landfill		BH24 14D	BH24 14D
	SANS 241		
Date		22-Oct-24	21-Jan-25

Infield Analysis

Temp °C	NG	20	23
pH	>5 or <9.7	6.1	6.3
EC [mS/m]	170	44	66
TDS [ppm]	1200	220	310
ORP [mV]	NG		

pH	>5 or <9.7	8.7	7.1
Electrical conductivity (mS/m)	170	42	33
Chemical Oxygen demand as O2	NG	<6.7	<6.7

Total Dissolved Solids	1200
Alkalinity as CaCO3	NG
Ammonia as N	1.5
Nitrate as N	11
Chloride as Cl	300
Sulfate as SO4	500
Boron as B	2.4
Fluoride as F	1.5
Phosphate as P	NG
Sodium as Na	200
Potassium as K	NG
Calcium as Ca	NG
Magnesium as Mg	NG

Arsenic as As	0.010
Barium as Ba	0.70
Cadmium as Cd	0.0030
Total Chromium as Cr	0.050
Hexavalent chromium as Cr	NG
Copper as Cu	2.0
Iron as Fe (Dissolved)	2.0
Iron as Fe (Total)	
Lead as Pb	0.010
Manganese as Mn (Dissolved)	0.40
Manganese as Mn (Total)	
Mercury as Hg	0.0060

Percentage Balancing

All values in mg/l, unless otherwise indicated.

ENVIROSERV

**SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025**

Report: JW112/25/B196-25-Rev 0

APPENDIX G

GROUNDWATER – ORGANIC WATER QUALITY DATA

				BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C	BH4C
				Jul-05	Jul-06	Jul-07	Jul-08	Aug-09	Jul-10	Jul-11	Jul-12	Jul-20	Jul-21	Jul-22	Jul-23	Jul-24	
				NOD	NOD												
VOC MS																	
Dichlorodifluoromethane	ug/l	<2.0	200^									<2.0	<2.0	<2.0	<2.0	<2.0	
Methyl Tertiary Butyl Ether	ug/l	<0.10										<0.10	<0.10	<0.10	<0.10	<0.10	
Chloromethane ^{SA}	ug/l	<3.0	190 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
Vinyl Chloride	ug/l	<0.10	5.0 \$									<0.10	<0.10	0.80	1.5	<0.10	
Bromomethane	ug/l	<1.0	7.5 ^									<1.0	<1.0	<1.0	<1.0	<1.0	
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$									<3.0	<3.0	<3.0	<3.0	<3.0	
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$									<5.0	<5.0	<5.0	<5.0	<5.0	
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$									<3.0	<3.0	<3.0	<3.0	<3.0	
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$									<3.0	<3.0	<3.0	<3.0	<3.0	
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$									7.0	17	21	27	22	
2,2-Dichloropropane	ug/l	<1.0										<1.0	<1.0	<1.0	<1.0	<1.0	
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG									<3.0	<3.0	<3.0	<3.0	<3.0	
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
Benzene	ug/l	<0.50	30 \$									<0.50	<0.50	2.1	2.9	2.1	
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$			2.0	2.0	7.0	8.0	8.0		9.0	9.0	3.0	3.0	<3.0	
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !									<2.0	<2.0	<2.0	<2.0	<2.0	
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
Toluene ^{SA}	ug/l	<5.0	1000 \$									<5.0	<5.0	<5.0	<5.0	<5.0	
trans-1-3-Dichloropropene	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0	
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$		1.0		2.0					<3.0	<3.0	<3.0	<3.0	<3.0	
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !									<2.0	<2.0	<2.0	<2.0	<2.0	
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$									<1.0	<1.0	<1.0	<1.0	<1.0	
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)									<2.0	<2.0	<2.0	<2.0	<2.0	
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)									<1.0	<1.0	<1.0	<1.0	<1.0	
Styrene	ug/l	<2.0	300 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
Bromoform ^{SA}	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0	
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^									<4.0	<4.0	<4.0	<4.0	<4.0	
Bromobenzene ^{SA}	ug/l	<2.0	62 ^									<2.0	<2.0	<2.0	<2.0	<2.0	
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
Propylbenzene ^{SA}	ug/l	<3.0	660 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^									<3.0	<3.0	<3.0	<3.0	<3.0	
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
4-Isopropyltoluene ^{SA}	ug/l	<3.0										<3.0	<3.0	<3.0	<3.0	<3.0	
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	<3.0	
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	<3.0	
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)									<3.0	<3.0	<3.0	<3.0	<3.0	
1,2-Dibromo-3-chloropropane	ug/l	<2.0										<2.0	<2.0	<2.0	<2.0	<2.0	
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)									<3.0	<3.0	<3.0	<3.0	<3.0	
Hexachlorobutadiene	ug/l	<3.0	0.30 ^									<3.0	<3.0	<3.0	<3.0	<3.0	
Naphthalene	ug/l	<2.0	70 \$									<2.0	<2.0	<2.0	<2.0	<2.0	
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)									<3.0	<3.0	<3.0	<3.0	<3.0	
Surrogate Recovery Toluene D8	%	<0										96	147	94	99	75	
Surrogate Recovery 4-Bromofluorobenzene	%	<0										101	131	98	93	109	

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

			LOD	Screening guideline	BH6 Jul-05	BH6 Jul-06	BH6 Jul-07	BH6 Jul-08	BH6 Aug-09	BH6 Jul-10	BH6 Jul-11	BH6 Jul-12	BH6 Jul-20	BH6 Jul-21	BH6 Jul-22	BH6 Jul-23	BH6 Jul-24
VOC MS					NOD	NOD	NOD	NOD	NOD	NOD	NOD	NOD					
Dichlorodifluoromethane	ug/l	<2.0	200^										<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10											<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$										<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^										<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$										<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$										<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$										<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0											<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG										<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$										<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !										<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$										<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !										<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$										<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)										<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)										<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^										<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^										<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^										<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^										<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^										<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0											<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0											105	152	95	101	79
Surrogate Recovery 4-Bromofluorobenzene	%	<0											103	133	97	95	104

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

			LOD	Screening guideline	BH9 Jul-05	BH9 Jul-06	BH9 Jul-07	BH9 Jul-08	BH9 Aug-09	BH9 Jul-10	BH9 Jul-11	BH9 Jul-12	BH9 Jul-20	BH9 Jul-21	BH9 Jul-22	BH9 Jul-23	BH9 Jul-24
VOC MS					NOD	NOD	NOD	NOD	NOD	NOD	NOD	NOD					
Dichlorodifluoromethane	ug/l	<2.0	200^										<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10											<0.10	<0.10	2.6	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$										<0.10	<0.10	4.7	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^										<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$										<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$										<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$										<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0											<1.0	<1.0	23	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG										<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$										<0.50	<0.50	4.3	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !										<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$										<5.0	<5.0	12	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$										<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !										<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$										<2.0	<2.0	12	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^										<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$										<1.0	<1.0	8.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)										<2.0	<2.0	35	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)										<1.0	<1.0	4.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	3.0	<2.0
Bromoform ^{SA}	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^										<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^										<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^										<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^										<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^										<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										<3.0	<3.0	4.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0											<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	6.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$										<2.0	<2.0	2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0											98	149	95	100	76
Surrogate Recovery 4-Bromofluorobenzene	%	<0											101	126	98	94	108

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

[illegible]

		LOD	Screening guideline	BHO5-12S Jul-05	BHO5-12S Jul-06 NOD	BHO5-12S Jul-07 NOD	BHO5-12S Jul-08 NOD	BHO5-12S Aug-09 Dry
VOC MS								
Dichlorodifluoromethane	ug/l	<2	200 ^					
Methyl Tertiary Butyl Ether	ug/l	<0.1						
Chloromethane SA	ug/l	<3	190 ^					
Vinyl Chloride	ug/l	<0.1	5.0 \$					
Bromomethane	ug/l	<1	7.5 ^					
Chloroethane SA	ug/l	<3	21 000 ^					
Trichlorofluoromethane SA	ug/l	<3	1100 ^					
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3	10 \$					
Dichloromethane (DCM) SA	ug/l	<5	1000 \$					
trans-1-2-Dichloroethene SA	ug/l	<3	20 \$					
1,1-Dichloroethane SA	ug/l	<3	900 \$					
cis-1-2-Dichloroethene SA	ug/l	<3	20 \$					
2,2-Dichloropropane	ug/l	<1						
Bromochloromethane SA	ug/l	<2	83 ^					
Chloroform SA (Trichloromethane)	ug/l	<2	400 \$					
1,1,1-Trichloroethane SA	ug/l	<2	300 \$					
1,1-Dichloropropene SA	ug/l	<3	NG					
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2	10 \$	3.0				
1,2-Dichloroethane SA	ug/l	<2	400 \$					
Benzene	ug/l	<0.5	30 \$					
Trichloroethene (TCE) SA	ug/l	<3	500 \$					
1,2-Dichloropropane SA	ug/l	<2	0.44 ^					
Dibromomethane SA	ug/l	<3	8.0 ^					
Bromodichloromethane SA	ug/l	<2	60 ^					
cis-1-3-Dichloropropene	ug/l	<2	20 \$					
Toluene SA	ug/l	<5	1000 \$					
trans-1-3-Dichloropropene	ug/l	<2						
1,1,2-Trichloroethane SA	ug/l	<2	130 \$					
Tetrachloroethene (PCE) SA	ug/l	<3	40 \$	7.0				
1,3-Dichloropropane SA	ug/l	<2	370 ^					
Dibromochloromethane SA	ug/l	<2	100 ^					
1,2-Dibromoethane SA	ug/l	<2	0.0075 ^					
Chlorobenzene SA	ug/l	<2	180 \$					
1,1,1,2-Tetrachloroethane SA	ug/l	<2	0.57 ^					
Ethylbenzene SA	ug/l	<1	150 \$					
p/m-Xylene SA	ug/l	<2	70 \$ (sum)					
o-Xylene SA	ug/l	<1	70 \$ (sum)					
Styrene	ug/l	<2	300 \$					
Bromoform SA	ug/l	<2						
Isopropylbenzene SA	ug/l	<3	660 ^					
1,1,2,2-Tetrachloroethane	ug/l	<4	0.076 ^					
Bromobenzene SA	ug/l	<2	62 ^					
1,2,3-Trichloropropane SA	ug/l	<3	88 ^					
Propylbenzene SA	ug/l	<3	660 ^					
2-Chlorotoluene SA	ug/l	<3	240 ^					
1,3,5-Trimethylbenzene SA	ug/l	<3	120 ^					
4-Chlorotoluene SA	ug/l	<3	250 ^					
tert-Butylbenzene SA	ug/l	<3	690 ^					
1,2,4-Trimethylbenzene SA	ug/l	<3	15 ^					
sec-Butylbenzene SA	ug/l	<3	2000 ^					
4-Isopropyltoluene SA	ug/l	<3						
1,3-Dichlorobenzene SA	ug/l	<3	50 \$ (sum)					
1,4-Dichlorobenzene SA	ug/l	<3	50 \$ (sum)					
n-Butylbenzene SA	ug/l	<3	1000 ^					
1,2-Dichlorobenzene SA	ug/l	<3	50 \$ (sum)					
1,2-Dibromo-3-chloropropane	ug/l	<2						
1,2,4-Trichlorobenzene	ug/l	<3	10 \$ (sum)					
Hexachlorobutadiene	ug/l	<3	0.30 ^					
Naphthalene	ug/l	<2	70 \$					
1,2,3-Trichlorobenzene	ug/l	<3	10 \$ (sum)					
Surrogate Recovery Toluene D8	%	<0						
Surrogate Recovery 4-Bromofluorobenzene	%	<0						
Dutch Intervention Limits \$								
USEPA Region 3 ^								
NOD - No Organics Detected								

[illegible]

	LOD	Screening guideline	BHO5-12D Jul-05 NOD	BHO5-12D Jul-06 NOD	BHO5-12D Jul-07 NOD	BHO5-12D Jul-08	BHO5-12D Aug-09
VOC MS							
Dichlorodifluoromethane	ug/l	<2.0	200 ^				
Methyl Tertiary Butyl Ether	ug/l	<0.10					
Chloromethane SA	ug/l	<3.0	190 ^				
Vinyl Chloride	ug/l	<0.10	5.0 \$				
Bromomethane	ug/l	<1.0	7.5 ^				
Chloroethane SA	ug/l	<3.0	21 000 ^				
Trichlorofluoromethane	ug/l	<3.0	1100 ^				
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3.0	10 \$				
Dichloromethane (DCM) SA	ug/l	<5.0	1000 \$				
trans-1-2-Dichloroethene SA	ug/l	<3.0	20 \$				
1,1-Dichloroethane SA	ug/l	<3.0	900 \$				
cis-1-2-Dichloroethene SA	ug/l	<3.0	20 \$				
2,2-Dichloropropane	ug/l	<1.0					
Bromochloromethane SA	ug/l	<2.0	83 ^				
Chloroform SA (Trichloromethane)	ug/l	<2.0	400 \$				
1,1,1-Trichloroethane SA	ug/l	<2.0	300 \$				
1,1-Dichloropropene SA	ug/l	<3.0	NG				
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2.0	10 \$				
1,2-Dichloroethane SA	ug/l	<2.0	400 \$				
Benzene	ug/l	<0.50	30 \$				
Trichloroethene (TCE) SA	ug/l	<3.0	500 \$			1.0	
1,2-Dichloropropane SA	ug/l	<2.0	0.44 ^				
Dibromomethane SA	ug/l	<3.0	8.0 ^				
Bromodichloromethane SA	ug/l	<2.0	60 !				
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$				
Toluene SA	ug/l	<5.0	1000 \$				
trans-1-3-Dichloropropene	ug/l	<2.0					
1,1,2-Trichloroethane SA	ug/l	<2.0	130 \$				
Tetrachloroethene (PCE) SA	ug/l	<3.0	40 \$			4.0	5.0
1,3-Dichloropropane SA	ug/l	<2.0	370 ^				
Dibromochloromethane SA	ug/l	<2.0	100 !				
1,2-Dibromoethane SA	ug/l	<2.0	0.0075 ^				
Chlorobenzene SA	ug/l	<2.0	180 \$				
1,1,1,2-Tetrachloroethane SA	ug/l	<2.0	0.57 ^				
Ethylbenzene SA	ug/l	<1.0	150 \$				
p/m-Xylene SA	ug/l	<2.0	70 \$ (sum)				
o-Xylene SA	ug/l	<1.0	70 \$ (sum)				
Styrene	ug/l	<2.0	300 \$				
Bromoform SA	ug/l	<2.0					
Isopropylbenzene SA	ug/l	<3.0	660 ^				
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^				
Bromobenzene SA	ug/l	<2.0	62 ^				
1,2,3-Trichloropropane SA	ug/l	<3.0	88 ^				
Propylbenzene SA	ug/l	<3.0	660 ^				
2-Chlorotoluene SA	ug/l	<3.0	240 ^				
1,3,5-Trimethylbenzene SA	ug/l	<3.0	120 ^				
4-Chlorotoluene SA	ug/l	<3.0	250 ^				
tert-Butylbenzene SA	ug/l	<3.0	690 ^				
1,2,4-Trimethylbenzene SA	ug/l	<3.0	15 ^				
sec-Butylbenzene SA	ug/l	<3.0	2000 ^				
4-Isopropyltoluene SA	ug/l	<3.0					
1,3-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)				
1,4-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)				
n-Butylbenzene SA	ug/l	<3.0	1000 ^				
1,2-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)				
1,2-Dibromo-3-chloropropane	ug/l	<2.0					
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)				
Hexachlorobutadiene	ug/l	<3.0	0.30 ^				
Naphthalene	ug/l	<2.0	70 \$				
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)				
Surrogate Recovery Toluene D8	%	<0					
Surrogate Recovery 4-Bromofluorobenzene	%	<0					
Dutch Intervention Limits \$							
USEPA Region 3 ^							
NOD - No Organics Detected							

[illegible]

		LOD	Screening guideline	BHO9-13S Aug-09 Dry	BHO9-13S Jul-10 NOD	BHO9-13S Jul-11 NOD	BHO9-13S Jul-12 NOD	BHO9-13S Jul-13 NOD	BHO9-13S Jul-14 NOD	BHO9-13S Jul-16 NOD	BHO9-13S Jul-17	BHO9-13S Jul-18 NOD	BHO9-13S Jul-19	BHO9-13S Jul-20	BHO9-13S Jul-21	BHO9-13S Jul-22	BHO9-13S Jul-23	BHO9-13S Jul-24
VOC MS																		
Dichlorodifluoromethane	ug/l	<2.0	200^											<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10												<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^											<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$											<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^											<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^											<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^											<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$											<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$											<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$											<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$											<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$											<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0												<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^											<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$											<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG											<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$											<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$											<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$											<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$											<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^											<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^											<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !											<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$											<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$											<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0												<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$											<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$											<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^											<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !											<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^											<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^											<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$											<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)										3.0	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)										4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$											<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0												<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^											<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^											<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^											<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^											<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										2.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^											<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^											<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^											<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^											<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										2.0	<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^											<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0												<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^											<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0												<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)								3.0			<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^											<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$								4.0		4.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)											<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0												97	148	95	100	76
Surrogate Recovery 4-Bromofluorobenzene	%	<0												101	129	98	96	106

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

		LOD	Screening guideline	BHO9-13M Aug-09	BHO9-13M Jul-10	BHO9-13M Jul-11	BHO9-13M Jul-12	BHO9-13M Jul-13	BHO9-13M Jul-14	BHO9-13M Jul-15	BHO9-13M Jul-16	BHO9-13M Jul-17	BHO9-13M Jul-18	BHO9-13M Jul-19	BHO9-13M Jul-20	BHO9-13M Jul-21	BHO9-13M Jul-22	BHO9-13M Jul-23	BHO9-13M Jul-24
VOC MS					NOD	NOD	NOD	NOD	NOD	NOD	NOD		NOD						
Dichlorodifluoromethane	ug/l	<2.0	200 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10													<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane SA	ug/l	<3.0	190 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$												<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^												<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane SA	ug/l	<3.0	21 000 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane SA	ug/l	<3.0	1100 ^												<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3.0	10 \$												<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) SA	ug/l	<5.0	1000 \$												<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene SA	ug/l	<3.0	20 \$												<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane SA	ug/l	<3.0	900 \$												<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene SA	ug/l	<3.0	20 \$												<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0													<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane SA	ug/l	<2.0	83 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform SA (Trichloromethane)	ug/l	<2.0	400 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane SA	ug/l	<2.0	300 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene SA	ug/l	<3.0	NG												<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2.0	10 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane SA	ug/l	<2.0	400 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$												<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) SA	ug/l	<3.0	500 \$												<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane SA	ug/l	<2.0	0.44 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane SA	ug/l	<3.0	8.0 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane SA	ug/l	<2.0	60 !												<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Toluene SA	ug/l	<5.0	1000 \$	2.0											<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0													<2.0	<2.0	<2.0	<2.0	<2.0

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

		LOD	Screening guideline	BHO9-13D Aug-09	BHO9-13D Jul-10	BHO9-13D Jul-11	BHO9-13D Jul-12	BHO9-13D Jul-13	BHO9-13D Jul-14	BHO9-13D Jul-15	BHO9-13D Jul-16	BHO9-13D Jul-17	BHO9-13D Jul-18	BHO9-13D Jul-19	BHO9-13D Jul-20	BHO9-13D Jul-21	BHO9-13D Jul-22	BHO9-13D Jul-23	BHO9-13D Jul-24
					NOD	NOD	NOD	NOD	NOD	NOD	NOD		NOD						
VOC MS																			
Dichlorodifluoromethane	ug/l	<2.0	200^												<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10													<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$												<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^												<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^												<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$												<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$												<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$												<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$												<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$												<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0													<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG												<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$												<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$												<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !												<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$	1.0											<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0													<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$												<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !												<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$												<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^												<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$												<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)											3.0	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)											4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$												<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0													<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^												<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^												<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^												<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^												<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^											2.0	<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^												<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^												<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^												<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^												<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^											2.0	<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^												<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0													<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)												<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)												<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^												<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)												<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0													<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)									3.0			<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^										3.0		<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$									4.0		5.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)												<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0													103	148	95	100	73
Surrogate Recovery 4-Bromofluorobenzene	%	<0													101	131	97	95	104

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX H

SURFACE WATER – INORGANIC WATER QUALITY DATA

22-Apr-05 21-Jul-05 07-Oct-05 21-Jan-06 13-Apr-06 04-Jul-06 02-Oct-06 25-Jan-07 10-Apr-07 11-Jul-07 08-Oct-07 20-Jan-08 07-Apr-08 10-Jul-08 16-Oct-08 07-Jan-09 09-May-09 11-Aug-09 12-Oct-09 21-Jan-10 10-May-10 13-Jul-10 21-Oct-10 21-Oct-10 11-Jan-11 11-Apr-11 12-Jul-11 17-Oct-11 30-Jan-12 11-Apr-12 19-Jul-2012 19-Oct-2012 16-Jan-2013 24-Apr-2013 24-Jul-2013 10-Oct-2013 06-Feb-2014 24-Jul-14 07-Nov-2014 26-Jan-15 08-Apr-15 08-Jul-15 12-Oct-15 28-Jan-16

Infield Analysis

Temp °C NG
pH >5 or <9.7
EC [mS/m] 170
TDS [ppm] 1200
ORP [mV] NG

		>5 or <9.7					7.6					7.9					8.1					8.6					8.3					Dry		8.0					7.6					8.2					7.8					8.0					8.6					Dry		8.2					8.3					8.2					8.5					8.2					8.3					8.0					8.4					8.5					8.3					8.4					8.1					8.2					8.3					8.2					8.2					7.9					8.7					7.7					8.1					8.0					8.2					7.4					7.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		Electrical conductivity (mSim)					170					641					2552					1134					246					516					667					1662					422					480							396					795					764					614					643					503					3758							1847					501					1213					1015					730					669					582					988					819					905					811					698					993					552					443					583					773					894					696					1013					321					639					603					598					972					694																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Chemical Oxygen Demand as O2					NG					3360					2560					5760					191					1114					466					1725					400					625							615					2320					1013					785					686					1440					8413							500					3353					2564					654					604					3187					1249					810					786					965					991					2253					696					454					665					955					1298					566					1122					174					429					387					395					593					765																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Total Dissolved Solids					1200										14316																									3580												4798										4296										2515										4559										5657										3591																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Alkalinity as CaCO3					NG					6616																									1440												1852										1593										2379										1580										1582										807																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Ammonia as N					1.5					0.15																									48												100.2										11.2										3.8										1.1										54																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Nitrate as N					11					0.20																									<0.20												<0.057										<0.017										<0.017										0.32																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		Chloride as Cl					300					3900																									620												1457										2095										890										3798										2191										1369																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		Sulfate as SO4					500					10																									115												129										353										<0.040										323										405																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Boron as B					2.4					27																									2.0												6.7										2.3										2.3										2.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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		Arsenic as As					0.010										0.031																									0.010												<0.023										0.090										<0.0070										<0.0070										<0.0070										0.017																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		Barium as Ba					0.70										0.32																									0.45												0.40										0.15										0.24										0.50										0.36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Cadmium as Cd					0.0030										0.025																				<0.0050												<0.0010										0.010										<0.0010										<0.0010										<0.0010																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Total Chromium as Cr					0.050										0.88																									0.057												0.029										<0.0010										<0.0010										<0.0010										<0.0030																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		Hexalent Chromium as Cr					NG					<0.010																									<0.010												<0.0080										<0.0020										<0.0020										<0.0020										<0.0020																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Copper as Cu					2.0										0.14																				<0.025												0.44										0.027										<0.0010										<0.0010										<0.0020																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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All values in mg/l, unless otherwise indicated.

13 Valley 1 Contaminated Stormwater Dam													SANS 241																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

Valley 2 Contaminated Stormwater Dam																	SANS 241													
Date	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18		
Infield Analysis																														
Temp °C	NG																								30	31	19	19	18	
pH	>5 or <9.7																								7.5	8.1	8.0	8.4	8.2	
EC [mS/m]	170																								912	1592	395	364	133	
TDS [ppm]	1200																								4565	7971	1973	1826	663	
ORP [mV]	NG																									-38	72		37	
pH	>5 or <9.7	8.9	8.0	8.1	8.1	8.2	8.1	8.1	8.0	8.1	8.3	8.3	7.9	8.1	8.1	8.2	7.6	7.7	7.9	7.9	7.5	7.4	7.8	7.8	7.6	7.1	7.9	7.5	7.5	
Electrical conductivity (mS/m)	170	77	392	864	2099	898	2108	3012	4650	5800	1091	5350	1977	2984	2789	3191	4255	3114	2677	7306	2518	4645	6788	7612	1067	1716	421	395	155	
Chemical Oxygen Demand as O2	NG	93	1675	3916	10672	3026	7888	9311	23510	21269	1971	15243	6586	10835	9463	11791	13276	15358	13179	23956	6161	11420	17291	19443	714	745	384	190	93	
Total Dissolved Solids	1200			13493			9170		24164			30818				18707				47750				46540				1960		
Alkalinity as CaCO3	NG			3488			1902		<2.48			10479				2123				15898				13700				285		
Ammonia as N	1.5			0.85			0.0070		<0.0050			1362				<0.0040				<0.010				2108				42		
Nitrate as N	11			<0.057			<0.017		<0.017			1.9				0.62				<0.50				3.6				<0.50		
Chloride as Cl	300			5890			4321		13576			11097				9748				20050				19925				1361		
Sulfate as SO4	500			<0.13			<0.040		<0.040			175				<0.287				<8.3				8.3				205		
Boron as B	2.4			5.2			3.3		9.3			8.8				9.3				17				13				0.67		
Fluoride as F	1.5			16			16		22			430				76				16				68				1.9		
Phosphate as P	NG			1.3			2.4		8.1			0.79				12				3.7				3.3				0.080		
Sodium as Na	200			3763			2569		6642			8286				5443				12800				10620				610		
Potassium as K	NG			1494			948		3620			2497				1906				4561				3962				166		
Calcium as Ca	NG			117			105		176			14				66				115				69				69		
Magnesium as Mg	NG			119			70		129			12				92				369				510				60		
Arsenic as As	0.010			<0.023			<0.0070		0.11			0.80				0.33				<0.020				1.2				<0.010		
Barium as Ba	0.70			0.42			0.63		0.26			0.46				0.15				0.42				0.97				<0.010		
Cadmium as Cd	0.0030			<0.0010			<0.0010		<0.0010			<0.0010				<0.0020				0.050				0.040				<0.0020		
Total Chromium as Cr	0.050			0.38			0.14		0.19			0.46				0.21				1.0				0.85				<0.010		
Hexalent Chromium as Cr	NG			0.29			<0.0020		0.013			0.049				-0.002				BDL				<1.0				<1.0		
Copper as Cu	2.0			0.031			0.031		0.025			<0.0010				<0.0020				0.040				0.13				<0.010		
Iron as Fe (Dissolved)	2.0																							2.3				<0.010		
Iron as Fe (Total)				0.41			<0.0030		3.6			1.2				0.86				0.16				1.6				<0.010		
Lead as Pb	0.010			0.084			0.052		0.090			<0.0040				<0.0030				0.050				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40																											3.1		
Manganese as Mn (Total)				1.5			0.67		1.3			1.7				1.8				3.0				4.6				3.3		
Mercury as Hg	0.0060			<0.0010			0.035		<0.0010			<0.0070				<0.0040				<0.027				<0.0010				<0.0010		
Percentage balancing																														
95.8 95.5 97.9 97.6 95.8																														
All values in mg/l, unless otherwise indicated.																														

11 Valley 2 Contaminated Stormwater Dam
Date

SANS 241

14-Jan-1908-Apr-1922-Jul-1916-Oct-1915-Jan-2020-Jul-2015-Oct-2013-Jan-2113-Apr-2127-Jul-2114-Oct-2112-Jan-2204-Apr-2213-Jul-2210-Oct-221124-Jan-231124-Apr-231122-Jul-231125-Oct-231124-Jan-241126-Apr-241116-Jul-241122-Oct-241121-Jan-25

Infield Analysis

Temp °C
pH
EC [mS/m]
TDS [ppm]
ORP [mV]

NG	29	25	17			11	23	32	30	18		29	24			33		15	27	29	21	22		22	22
>5 or <9.7	7.4	7.8	8.2			8.4	8.7	8.5	8.3	7.6		8.0	7.9			7.6		12	8.2	6.8	8.3	8.2		7.2	8.4
170	190	189	1193			181	227	460	820	248		316	330			212		669	237	437	768	1102		119	309
1200	952	940	6190			900	1140	2300	4090	1240		1580	1650			1060		3470	1180	2180	3860	5490		590	1540
NG	-33																								

pH
Electrical conductivity (mS/m)
Chemical Oxygen Demand as O2

>5 or <9.7	-	6.7	8.0	9.1	8.2	6.9	7.1	7.7	8.3	7.3	5.8	7.2	7.6			7.6		12	7.6	7.3	7.5	8.1		7.3	7.6
170	219	187	1452	1446	1140	138	220	500	894	290	332	330	359			399		685	214	758	1172	2214		147	283
NG	82	54	545	933	419	60	40	91	447	27	162	103	124			183		233	106	321	464	981		83	393

Total Dissolved Solids
Alkalinity as CaCO3
Ammonia as N
Nitrate as N
Chloride as Cl
Sulfate as SO4
Boron as B
Fluoride as F
Phosphate as P
Sodium as Na
Potassium as K
Calcium as Ca
Magnesium as Mg

1200			8970			945				1715								4100				14810			
NG			1777			104				250								1930				6924			
1.5			281			<0.010				35								7.2				759			
11			<0.50			4.7				2.7								2.2				<0.50			
300			3737			202				454								496				4805			
500			106			261				442								290				32			
2.4			0.38			<0.030				2.9								<0.030				<0.030			
1.5			0.50			0.55				3.2								2.7				<0.10			
NG			0.34			0.15				2.1								2.3				5.0			
200			2362			138				283								1380				3996			
NG			690			27				99								54				1517			
NG			134			91				88								1.1				118			
NG			99			35				27								<0.030				221			

Arsenic as As
Barium as Ba
Cadmium as Cd
Total Chromium as Cr
Hexalent Chromium as Cr
Copper as Cu
Iron as Fe (Dissolved)
Iron as Fe (Total)
Lead as Pb
Manganese as Mn (Dissolved)
Manganese as Mn (Total)
Mercury as Hg

0.010			<0.010			<0.010				<0.010								<0.010				<0.010			
0.70			0.010			0.15				0.090								0.020				<0.010			
0.0030			<0.0020			<0.0020				<0.0020								<0.0020				<0.0020			
0.050			0.020			<0.010				0.010								0.010				<0.010			
NG			<1.0			<1.0				<1.0								<1.0				<1.0			
2.0			<0.010			0.020				0.010								<0.010				<0.010			
2.0			<0.10			<0.10				<0.10								<0.10				<0.10			
			3.0			0.82				3.1								<0.10				11			
0.010			<0.010			0.010				<0.010								0.020				<0.010			
0.40			0.31			<0.010				6.1								<0.010				<0.010			
			2.6			0.50				6.2								<0.010				1.8			
0.0060						<0.00050				<0.00050								<0.010							

Percentage balancing

All values in mg/l, unless otherwise indicated.

29 Valley 2: Stormwater entering the catchment

SANS 241

		08-Jul-15	12-Oct-15	03-Apr-16	13-Jul-16	22-Sep-16	22-Sep-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21
Infield Analysis								Fill of silt	Fill of silt	Fill of silt	Dry	Dry			Dry	Dry	Dry	Dry						
Temp °C	NG												32						22	27	35	22	23	29
pH	>5 or <9.7												7.2						7.0	7.1	8.7	8.5	8.1	6.9
EC [mS/m]	170												128						112	129	60	122	139	160
TDS [ppm]	1200												640						580	670	300	610	700	800
ORP [mV]	NG																							
pH	>5 or <9.7	3.5	4.8	5.5	6.8	6.4	6.7						7.3						7.74	7.2	7.5	7.2	7.4	7.5
Electrical conductivity (mS/m)	170	156	218	497	79	87	80						193						120	131	71	139	142	161
Chemical Oxygen Demand as O2	NG	96	48	902	50	33	167						57						48	31	19	16	32	46
Total Dissolved Solids	1200	1099			410	560	512												630			1080		
Alkalinity as CaCO3	NG	<2.65			219	149	144												152			162		
Ammonia as N	1.5	7.9			0.77	<0.010	<0.10												1.3			4.0		
Nitrate as N	11	2.2			2.4	<0.50	1.4												2.7			<0.50		
Chloride as Cl	300	82			97	103	116												222			246		
Sulfate as SO4	500	604			38	139	110												131			167		
Boron as B	2.4	0.16			0.22	0.40	0.068												0.68			<0.030		
Fluoride as F	1.5	27			1.8	2.8	2.2												1.2			0.63		
Phosphate as P	NG	8.3			<0.010	<0.010	<0.10												0.040			<0.010		
Sodium as Na	200	88			73	69	57												116			149		
Potassium as K	NG	31			3.7	7.1	4.3												4.9			6.5		
Calcium as Ca	NG	187			39	55	44												47			58		
Magnesium as Mg	NG	21			40	34	30												54			58		
Arsenic as As	0.010	<0.010			<0.020	<0.020	<0.010												<0.010			<0.010		
Barium as Ba	0.70	0.032			0.33	0.69	0.229												0.16			0.19		
Cadmium as Cd	0.0030	<0.0020			<0.0030	<0.0030	<0.025												<0.0020			<0.0020		
Total Chromium as Cr	0.050	<0.0030			0.010	0.020	<0.025												0.030			0.010		
Hexavalent chromium as Cr	NG	<0.0020			<0.0070	0.020	<0.010												<1.0			<1.0		
Copper as Cu	2.0	<0.0020			<0.013	0.030	<0.010												0.010			0.020		
Iron as Fe (Dissolved)	2.0	0.27			<0.010	5.4	2.1												1.4			<0.010		
Iron as Fe (Total)						<0.10	<0.025												6.5			9.0		
Lead as Pb	0.010	<0.0030			<0.015	<0.015	<0.010												<0.010			0.010		
Manganese as Mn (Dissolved)	0.40	4.1			6.8	7.8	7.2												2.3			<0.010		
Manganese as Mn (Total)						7.0	6.1												10			2.0		
Mercury as Hg	0.0060	<0.0040			<0.027	<0.027	0.0050															<0.00050		
Percentage balancing		98.5					94.1																	

All values in mg/l, unless otherwise indicated.

29 Valley 2: Stormwater entering the catchment

SANS 241

		13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis				Not recorded									Full of sand (Not sampled)				
Temp °C	NG	26	15		30	22	20	30	30	29	14	23		21	12	22	22
pH	>5 or <9.7	7.4	7.6		7.6	7.3	7.7	7.3	6.9	8.2	7.2	6.5		8.1	8.2	6.5	8.5
EC [mS/m]	170	133	106		134	100	144	154	99	344	107	166		262	273	64	59
TDS [ppm]	1200	660	530		670	500	720	770	500	6870	540	830		1310	1370	320	240
ORP [mV]	NG																
pH	>5 or <9.7	7.1	7.2	7.2	6.8	7.1	6.9	7.1	7.2	8.2	7.5	7.0		7.4	7.7	7.3	7.6
Electrical conductivity (mS/m)	170	123	113	106	136	103	152	215	168	1534	95	119		310	406	78	34
Chemical Oxygen Demand as O2	NG	41	29	11	20	55	65	41	44	605	32	42		33	138	51	33
Total Dissolved Solids	1200		935				1085				700				3090		
Alkalinity as CaCO3	NG		70				51				263				831		
Ammonia as N	1.5		0.18				<0.010				15				52		
Nitrate as N	11		8.1				7.8				<0.50				<0.50		
Chloride as Cl	300		227				280				145				828		
Sulfate as SO4	500		102				120				23				106		
Boron as B	2.4		0.50				0.30				<0.030				<0.030		
Fluoride as F	1.5		0.86				0.86				1.4				2.3		
Phosphate as P	NG		<0.010				<0.10				<0.010				<0.010		
Sodium as Na	200		137				195				92				658		
Potassium as K	NG		11.7				18.5				5.8				155		
Calcium as Ca	NG		30				34				57				58		
Magnesium as Mg	NG		41				46				39				72		
Arsenic as As	0.010		<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70		0.13				<0.010				0.010				<0.010		
Cadmium as Cd	0.0030		<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050		<0.010				<0.010				<0.010				<0.010		
Hexavalent chromium as Cr	NG		<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0		<0.010				<0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0		<0.10				<0.10				0.13				<0.10		
Iron as Fe (Total)			1.2				3.2				15				4.9		
Lead as Pb	0.010		<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40		0.010				<0.010				<0.010				0.020		
Manganese as Mn (Total)			0.63				1.7				<0.010				3.8		
Mercury as Hg	0.0060		<0.00050				<0.00050				<0.00050						

Percentage balancing

All values in mg/l, unless otherwise indicated.

27 Valley 2: Surface water coming out the base of the silt trap																																
	SANS 241	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	30-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	03-Apr-16	13-Jul-16	11-Oct-16	16-Jan-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	
Flow Rate (Litres / sec)	NG																												0.021	0.018	0.029	0.021
Infield Analysis																																
Temp °C	NG																												20	21	20	19
pH	>5 or <9.7																												6.9	6.9	6.6	7.1
EC [mS/m]	170																												72	81	100	96
TDS [ppm]	1200																												359	405	499	479
ORP [mV]	NG																													18	65	65
pH	>5 or <9.7	8.3	7.4	7.1	7.2	7.9	8.0	7.1	7.3	7.4	7.3	Full of sand	7.5	7.6	Dry	Full of sand	Full of sand	Full of sand	Full of sand	Full of sand	Full of sand	Full of sand	Full of sand	Full of sand	7.2	6.7	7.0	7.6	7.2	6.8	6.9	7.2
Electrical conductivity (mS/m)	170	41	49	40	39	46	53	94	60	48	72		64	67											78	81	74	172	75	91	113	114
Chemical Oxygen Demand as O2	NG	1196	1887	44	45	54	<3.0	37	19	13	120		58	<0.082											22	35	6.9	53	35	40	71	56
Total Dissolved Solids	1200				186				311	232																		520			650	
Alkalinity as CaCO3	NG				50				105	33.5																		210			227	
Ammonia as N	1.5				0.53				0.17	0.12																		2.1			5.5	
Nitrate as N	11				8.7				1.2	4.9																		2.8			2.2	
Chloride as Cl	300				39				57	52																		127			217	
Sulfate as SO4	500				39				71	68																		42			61	
Boron as B	2.4				0.041				0.050	0.062																		0.17			0.16	
Fluoride as F	1.5				1.2				4.9	4.5																		1.3			1.6	
Phosphate as P	NG				0.029				0.035	0.013																		0.10			0.11	
Sodium as Na	200				40				66	49																		81			117	
Potassium as K	NG				2.4				4.4	4.6																		2.9			3.5	
Calcium as Ca	NG				14				28	17																		32			44	
Magnesium as Mg	NG				12				16	11																		31			52	
Arsenic as As	0.010				<0.023				<0.023	<0.0070																		0.020			<0.010	
Barium as Ba	0.70				0.16				0.14	0.067																		0.35			0.060	
Cadmium as Cd	0.0030				<0.0010				<0.0010	<0.0010																		<0.0020			<0.0020	
Total Chromium as Cr	0.050				<0.0020				<0.0020	<0.0010																		0.010			<0.010	
Hexalent Chromium as Cr	NG				<0.0080				<0.010	<0.0020																		<1.0			<1.0	
Copper as Cu	2.0				0.0070				<0.0010	<0.0010																		0.010			<0.010	
Iron as Fe (Dissolved)	2.0				0.78				<0.0060	<0.0030																		<0.10			<0.10	
Iron as Fe (Total)																															0.36	
Lead as Pb	0.010				<0.010				<0.0010	<0.0040																		<0.010			<0.010	
Manganese as Mn (Dissolved)	0.40				0.35				<0.0010	<0.0010																		6.8			9.9	
Manganese as Mn (Total)																															9.9	
Mercury as Hg	0.0060				<0.0010				<0.0010	<0.0010																		<0.0010			<0.0010	
Percentage balancing					97.9				98.7	98.6																						

All values in mg/l, unless otherwise indicated.

27 Valley 2: Surface water coming out the base of the silt trap		SANS 241																								
		30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Flow Rate (Litres / sec)	NG	0.031	0.024	0.100	0.0114	0.0114	0.033	0.020	0.010	0.024	0.027		0.0086	0.0086	0.0117	0.0031	0.0067		Position moved.	Position moved.					0.0038	0.019
Infield Analysis													Not recorded													
Temp °C	NG	20	21	22	20	22	23	21	21	25	22	21				19	22	33	27	14	20	22	21	18	20	22
pH	>5 or <9.7	7.9	8.0	6.9	6.8	6.6	7.0	7.0	7.1	6.8	7.4	7.7				7.1	6.9	7.4	8.5	7.7	6.9	6.5	6.8	7.0	6.9	7.4
EC [mS/m]	170	99	90	120	116	117	126	133	140	120	126	118				109	106	110	117	156	144	103	93	82	67	91
TDS [ppm]	1200	498	448	600	600	610	620	670	700	600	630	590				550	530	550	580	780	720	520	460	410	340	450
ORP [mV]	NG	-37	-14																							
pH	>5 or <9.7	6.7	7.0	7.5	8.4	6.9		6.6	7.5	7.8	6.9	6.7	7.9	7.5	7.1	7.0	7.0	7.1	7.4	9.0	7.4	7.8	7.7	7.6	8.1	7.2
Electrical conductivity (mS/m)	170	107	104	116	120	124		150	123	116	116	122	118	110	105	136	127	174	150	138	122	94	84	82	87	73
Chemical Oxygen Demand as O2	NG	51	50	57	45	41		68	31	24	39	20	37	19	22	62	51	47	28	77	61	71	56	11	32	12
Total Dissolved Solids	1200				660			1160				1010				895				840				570		
Alkalinity as CaCO3	NG				168			137				135				124				75				143		
Ammonia as N	1.5				1.6			0.74				0.98				<0.010				1.2				0.18		
Nitrate as N	11				1.6			5.1				3.6				1.5				7.8				1.7		
Chloride as Cl	300				215			254				221				215				310				122		
Sulfate as SO4	500				129			226				145				148				110				104		
Boron as B	2.4				0.11			<0.030				0.45				0.30				<0.030				<0.030		
Fluoride as F	1.5				0.73			0.70				0.99				0.70				0.98				1.7		
Phosphate as P	NG				<0.010			<0.010				<0.010				<0.010				<0.010				0.070		
Sodium as Na	200				116			149				130				182				203				106		
Potassium as K	NG				6.0			4.9				4.8				9.4				24				4.2		
Calcium as Ca	NG				47			60				44				41				35				35		
Magnesium as Mg	NG				53			69				52				42				42				37		
Arsenic as As	0.010				<0.010			<0.010				<0.010				<0.010				<0.010				<0.010		
Barium as Ba	0.70				0.31			0.17				0.090				<0.010				0.010				<0.010		
Cadmium as Cd	0.0030				<0.0020			<0.0020				<0.0020				<0.0020				<0.0020				<0.0020		
Total Chromium as Cr	0.050				0.010			0.010				0.010				<0.010				<0.010				<0.010		
Hexalent Chromium as Cr	NG				<1.0			<1.0				<1.0				<1.0				<1.0				<1.0		
Copper as Cu	2.0				<0.010			<0.010				<0.010				<0.010				<0.010				<0.010		
Iron as Fe (Dissolved)	2.0				<0.10			<0.10				<0.10				<0.10				<0.10				<0.10		
Iron as Fe (Total)					0.54			0.93				1.1				3.9				2.0				0.66		
Lead as Pb	0.010				<0.010			<0.010				<0.010				<0.010				<0.010				<0.010		
Manganese as Mn (Dissolved)	0.40				6.2			11				5.5				<0.010				<0.010				<0.010		
Manganese as Mn (Total)					8.7			12				6.6				1.9				<0.010				<0.010		
Mercury as Hg	0.0060							<0.00050				<0.00050				<0.00050				<0.00050				3.6		
Percentage balancing																										
All values in mg/l, unless otherwise indicated.																										

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

W 5 - Downstream Shongwen 1		SANS 241																																												
Date		22-Apr-05	21-Jul-05	07-Oct-05	21-Jan-06	13-Apr-06	04-Jul-06	02-Oct-06	25-Jan-07	10-Apr-07	11-Jul-07	08-Oct-07	20-Jan-08	07-Apr-08	10-Jul-08	16-Oct-08	07-Jan-09	09-May-09	11-Aug-09	12-Oct-09	21-Jan-10	10-May-10	13-Jul-10	21-Oct-10	11-Jan-11	11-Apr-11	12-Jul-11	17-Oct-11	30-Jan-12	11-Apr-12	19-Jul-2012	19-Oct-2012	16-Jan-2013	30-Jan-2013	24-Apr-2013	24-Jul-2013	10-Oct-2013	06-Feb-2014	24-Jul-14	07-Nov-2014	26-Jan-15	08-Apr-15	08-Jul-15	12-Oct-15	28-Jan-16	
Infield Analysis																																														
Temp °C	NG																																													
pH	>5 or <9.7																																													
EC [mS/m]	170																																													
TDS [ppm]	1200																																													
ORP [mV]	NG																																													
pH	>5 or <9.7	7.0	7.8	7.3	7.2	7.1	7.5	7.2	8.1	7.4	7.7	7.4	7.3	7.5	7.8	7.4	7.7	7.7	7.4	7.4	7.6	7.6	7.5	7.7	7.7	7.7	7.6	8.0	7.9	7.6	7.9	7.2	7.7	7.5	7.6	7.5	7.6	7.5	8.3	7.6	7.8	7.6	7.4	7.0	6.9	
Electrical conductivity (mS/m)	170	35	71	49	61	37	38	51	35	40	35	45	31	31	28	31	30	39	31	42	26	28	30	42	40	41	42	71	64	45	69	37	42	35	36	29	38	31	47	44	70	69	48	86	29	
Chemical Oxygen Demand as O2	NG	24	<10	94	28	20	28	55	35	<10	51	56	32	<10	21	<10	40	<10	12	<3.0	1394	16	102			51	79	<3.0	9.1	17	89	53	<3.0	24	19	1.3	9.7	46	<0.082	49	13	18	<5.1	17	12	119
Total Dissolved Solids	1200	458					235				216				170				206				143																							
Alkalinity as CaCO3	NG	24					28				24				28				28				22																							
Ammonia as N	1.5	1.2					<0.20				<0.20				<0.20				<0.20				0.24	0.60																						
Nitrate as N	11	0.80					2.9				3.9				2.6				1.9				2.3																							
Chloride as Cl	300	173					85				66				70				206				66																							
Sulfate as SO4	500	32					13				17				10				25				10			</td>																				

SW 5 - Downstream Shongwen 1										SANS 241																															
Date	03-Apr-16	13-Jul-16	11-Oct-16	SW5		09-Mar-17	09-Mar-17	24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	("Sample 5")		22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25	
Infield Analysis																																									
Temp °C	NG									14	25	17	15	15	21	23	8.0		14	27	20	12	21	28	21	11	22		22	13	24	22	23	14	18	24	22	10	19	22	
>5 or <9.7	NG									7.7	8.1	9.1	9.6	8.7	7.7	7.4	389		8.5	7.7	7.7	7.8	6.9	6.8	8.3	9.5	7.8		8.0	8.5	7.2	8.6	7.7	7.7	8.0	7.8	7.5	7.6	7.7		
EC [mS/m]	170									63	43	34	31	26	29	52	62		62	45	50	250	49	49	77	79	40		44	129	43	41	48	57	99	41	62	50	89	78	
TDS [ppm]	170									313	215	168	150	128	147	280	320		320	230	250	250	250	240	380	200		230	660	220	210	240	290	500	200	310	250	450	340		
ORP [mV]	NG									-168		63	27	19	280		320		320	230	250	250	240	380	200		230	660	220	210	240	290	500	200	310	250	450	340			
pH	>5 or <9.7	6.0	6.9	7.5	6.9	7.4	7.3	7.1	6.7	6.6	6.7	7.0	7.1	6.8	7.0	7.2	8.0		7.1	7.3	7.0	6.9	7.3	7.6	7.5	7.2	5.9	7.1	7.4	7.5	7.2	7.2	7.2	7.4	8.4	6.6	7.6	6.7	7.1	7.7	6.6
Electrical conductivity (mS/m)	170	48	45	42	44	70	38	32	34	47	38	30	30	24	27	34	389		39	52	39	35	38	32	25	31	43	28	34	39	38	30	46	35	32	31	50	29	58	54	
Chemical Oxygen Demand as O2	NG	52	27	16	34	12		<67	14	21	<6.7	<6.7	15	16	31	17	60		23	26	9.3	12	29	32	9.1	28	34	10.5	<6.7	<6.7	25	<6.7	27	18	9.7	16	15	<6.7	25	26	
Total Dissolved Solids																																									
250	220				278				280								178		240			245			230					310				240			200				
Alkalinity as CaCO3	NG	25			24				41								NG		32			26				32				26	34			34			20				
Ammonia as N	1.5	<0.010			0.80				1.2				<0.010				<0.11		0.090			<0.010				<0.010				<0.010				0.34			<0.010				
Nitrate as N	11	4.6			4.8				4.0				4.7				18		4.2			4.2				4.1				4.1			4.4			2.9					
Chloride as Cl	300	82			70				74				64				300		96			66				63				75			60			57					
Sulfate as SO4	500	45			42				8.3				24				100		20			41				37				19			23			20					
Boron as B	2.4	0.20			0.42				0.15				0.35				0.44		0.090			<0.030				0.13				0.11			<0.030			<0.030					
Fluoride as F	1.5	1.4			0.90				1.3				0.84				1.4		0.090			0.15				0.65				0.55			<0.10			<0.10					
Phosphate as P	NG	<0.010			<0.10				0.070				<0.010				<0.040		0.010			<0.010				<0.010				<0.010			<0.010			<0.010					
Sodium as Na	200	45			34				40				37				445		53			38				38				45			32			38					
Potassium as K	NG	4.6			4.4				3.5				4.6				24		2.5			4.2				4.1				16			3.5			4.3					
Calcium as Ca	NG	15			15				9.4				17.6				16		9.5			10				9.5				8.6			9.6			9.6					
Magnesium as Mg	NG	15			13				1				13				107		15			15				13				10			10			11					
Arsenic as As																																									
0.010	<0.020				0.027		<0.0030		<0.010				<0.010				<0.040		0.010			<0.010				<0.010				<0.010			<0.010			<0.010					
Barium as Ba	0.70	0.13			0.071		0.076		0.56				<0.010				0.69				0.27				0.070				0.070			<0.010			<0.010						
Cadmium as Cd	0.0030	<0.0030			<0.0020		<0.0040		<0.0020				<0.0020				<0.020		<0.0020			<0.0020				<0.0020				<0.0020			<0.0020			<0.0020					
Total Chromium as Cr	0.060	<0.0070			<0.025		<0.0020		<0.010				<0.010				<0.010		<0.010			<0.010				<0.010				<0.010			<0.010			<0.010					
Hexavalent Chromium as Cr	2.0	<0.010			<0.0070		NG		<1.0				<1.0				NG		<1.0			<1.0				<1.0				<1.0			<1.0			<1.0					
Copper as Cu	2.0	<0.013			<0.010		<0.0030		<0.010				<0.010				<0.020		0.050			<0.010				<0.010				<0.010			<0.010			<0.010					
Iron as Fe (Dissolved)	2.0	<0.010			0.093				0.21				<0.10				<0.020		0.19			<0.10				<0.10				<0.10			<0.10			0.44					
Iron as Fe (Total)	0.010	<0.015			0.89				0.80				<0.10				0.97				5.4				4.2				4.2			<0.10			<0.10						
Lead as Pb	0.010	<0.015			<0.010		<0.0030		<0.010				<0.030				<0.010		<0.010			<0.010				<0.010				<0.010			<0.010			<0.010					
Manganese as Mn (Dissolved)	0.40	<0.025			<0.025				0.020				<0.010				0.080		0.010			<0.010				<0.010				<0.010			<0.010			<0.010					
Manganese as Mn (Total)	0.060	<0.0060			0.029				0.029				0.020				0.050		0.050			<0.010				0.080				0.050			<0.010			<0.010					
Mercury as Hg	0.0060	<0.027			0.0030		<0.00040		<0.0010				<0.0010				<0.0020				<0.0050				<0.0050				<0.0050			<0.0050			<0.0050						
Antimony (Sb)	0.020								<0.0050																																
Beryllium (Be)	NG								<0.0010																																
Cobalt (Co)	NG								<0.0010																																
Molybdenum (Mo)	NG								<0.0020																																
Nickel (Ni)	0.070								<0.0020																																
Selenium (Se)	0.040								<0.0050																																
Tin (Sn)	NG								<0.0050								<0.070																								
Vanadium (V)	NG								<0.0020																																
Zinc (Zn)	5.0								<0.0050								<0.020																								
Percentage balancing																																									
DWAF	98.8																																								
Total Coliform Bacteria / 100 mL	5.0	100 000																																							
Faecal Coliform Bacteria / 100 mL *	0	4 200																																							
E. coli / 100 mL	0	340																																							
Heterotrophic Plate Count / mL *	100	8 000																																							

Date		11-Aug-09		12-Oct-09		21-Jan-10		10-May-10		13-Jul-10		21-Oct-10		11-Jan-11		11-Apr-11		12-Jul-11		17-Oct-11		30-Jan-12		11-Apr-12		19-Jul-2012		19-Oct-2012		16-Jan-2013		30-Jan-2013		24-Apr-2013		24-Jul-2013		10-Oct-2013		06-Feb-2014		24-Jul-14		07-Nov-2014		26-Jan-15		08-Apr-15		08-Jul-15		12-Oct-15		28-Jan-16		03-Apr-16		13-Jul-16		RIVER 3 22-Sep-16 (at SW6)		11-Oct-16		SW6 16-Jan-17		SW06 09-Mar-17		09-Mar-17																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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All values in mg/l, unless otherwise indicated.

SW 6 - Upstream Valley 2 Date		SANS 241																														
		24-Mar-17	13-Jul-17	11-Oct-17	23-Jan-18	18-May-18	18-Jul-18	30-Oct-18	14-Jan-19	08-Apr-19	22-Jul-19	16-Oct-19	15-Jan-20	20-Jul-20	15-Oct-20	13-Jan-21	13-Apr-21	27-Jul-21	14-Oct-21	12-Jan-22	04-Apr-22	13-Jul-22	10-Oct-22	24-Jan-23	24-Apr-23	22-Jul-23	25-Oct-23	24-Jan-24	26-Apr-24	16-Jul-24	22-Oct-24	21-Jan-25
Infield Analysis																																
Temp °C	NG			16	21	16	13	18	21	21	15	21	24	17	19	25	21	16		22	22	16	21	25	21	13	18	22	20	13	18	22
pH	>5 or <9.7		7.2	7.2	7.3	7.1	8.4	8.7	8.6	7.5	7.0	6.6	7.9	8.7	6.9	7.2	7.9	8.0		7.3	8.1	7.7	7.1	7.4	8.0	8.3	7.2	6.9	7.0	8.2	6.5	7.1
EC [mS/m]	170		33	33	27	27	34	30	31	51	33	36	33	34	38	29	32	28		25	28	26	26	23	24	38	35	28	33	42	34	60
TDS [ppm]	1200			167	136	137	168	150	154	300	170	190	170	170	190	150	160	140		130	140	130	130	120	120	190	180	120	180	210	170	230
ORP [mV]	NG					-16	21	-33																								
pH	>5 or <9.7	7.2	6.7	6.9	6.9	6.9	7.1	6.9	7.0	6.7	7.1	7.1	7.1	7.3	7.4	7.5	7.4	6.9	6.2	6.6	6.7	7.0	6.8	6.9	7.1	7.6	6.6	7.7	6.8	7.0	7.9	6.4
Electrical conductivity (mS/m)	170	23	30	31	24	26	30	28	26	25	26	31	29	29	26	21	17	24	25	23	26	25	23	23	26	26	24	19	19	24	33	20
Chemical Oxygen Demand as O2	NG	<67	<6.7	24	7.8	32	<6.7	14	22	<6.7	<6.7	7.7	9.6	<6.7	28	14	<6.7	19	<6.7	24	<6.7		13	<6.7	<6.7	<6.7	<6.7	14	8.9	10	15	34
Total Dissolved Solids		1200		210			320				150			200				170				175				160				140		
Alkalinity as CaCO3	NG		35				12				18			15				14				12			24				11			
Ammonia as N	1.5		2.2				<0.010				<0.010			<0.010				0.11			<0.010			0.66				<0.010				
Nitrate as N	11		3.6				1.9				4.7			5.2				8.4				3.3			6.2				4.7			
Chloride as Cl	300		66				62				60			54				50				40			48				42			
Sulfate as SO4	500		8.3				9.0				23			36				23				16			18				18			
Boron as B	2.4		0.20				0.18				<0.030			<0.030				0.21				0.05			<0.030				<0.030			
Fluoride as F	1.5		0.24				0.35				<0.10			0.19				0.11				0.11			<0.10				<0.10			
Phosphate as P	NG		0.22				0.15				<0.010			<0.010				<0.010				<0.10			<0.010				<0.010			
Sodium as Na	200		30				32				28			30				27				25			30				23			
Potassium as K	NG		3.7				4.8				4.5			4.5				4.0				4.4			4.8				3.1			
Calcium as Ca	NG		4.9				5.7				5.2			5.1				5.2				4.2			5.6				4.2			
Magnesium as Mg	NG		11				15				12.5			14				13				10			13				10			
Arsenic as As		0.010		<0.010			<0.010				<0.010			<0.010				<0.010				<0.010			<0.010				<0.010			
Barium as Ba	0.70		0.74				<0.010				0.090			0.32				0.12				0.070			0.010				0.010			
Cadmium as Cd	0.0030		<0.0020				<0.0020				<0.0020			<0.0020				<0.0020				<0.0020			<0.0020				<0.0020			
Total Chromium as Cr	0.050		<0.010				<0.010				<0.010			<0.010				<0.010				<0.010			<0.010				<0.010			
Hexalent Chromium as Cr	NG		<1.0				<1.0				<1.0			<1.0				<1.0				<1.0			<1.0				<1.0			
Copper as Cu	2.0		<0.010				<0.010				<0.010			<0.010				<0.010				<0.010			<0.010				<0.010			
Dissolved Iron as Fe	2.0		0.54				<0.10				<0.10			<0.10				<0.10				<0.10			<0.10				<0.10			
Total Iron as Fe							0.36				0.34			0.36				0.83				1.2			<0.10				<0.10			
Lead as Pb	0.010		<0.010				<0.010				<0.010			<0.010				<0.010				<0.010			<0.010				<0.010			
Dissolved Manganese as Mn	0.40		0.030				<0.010				<0.010			<0.010				<0.010				<0.010			<0.010				<0.010			
Total Manganese as Mn							0.010				0.070			0.010				0.06				0.63			<0.010				<0.010			
Mercury as Hg	0.0060		<0.0010				<0.0010							<0.00050				<0.00050				<0.00050			<0.00050				0.28			
Antimony (Sb)	0.020																															
Beryllium (Be)	NG																															
Cobalt (Co)	NG																															
Molybdenum (Mo)	NG																															
Nickel (Ni)	0.070																															
Selenium (Se)	0.040																															
Tin (Sn)	NG																															
Vanadium (V)	NG																															
Zinc (Zn)	5.0																															
Percentage balancing																																
DWAf																																
Total Coliform Bacteria / 100 mL	5.0																															
Faecal Coliform Bacteria / 100 mL *	0																															
E. coli / 100 mL	0																															
Heterotrophic Plate Count / mL *	100																															

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX I

SURFACE WATER – ORGANIC WATER QUALITY DATA

13 Valley 1: Contaminated Stormwater Dam			LOD	Screening guideline	13 Jul-05	13 Jul-07	13 Jul-08	13 Aug-09	13 Jul-10	13 Jul-11	13 Jul-12	13 Jan-13	13 Jul-13	13 Jan-14	13 Jul-15	13 Jul-16	13 Jul-17	13 Jul-18	13 Jul-19	13 Jul-20	13 Jul-21	13 Jul-22	13 Jul-23	13 Jul-24	
VOC MS																									
Dichlorodifluoromethane	ug/l	<2.0	200 ^			NOD		Dry	NOD	NOD	NOD	NOD		NOD	NOD					Dry		<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10																				<0.10	<0.10	<0.10	<0.10
Chloromethane SA	ug/l	<3.0	190 ^																			<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$																			<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^																			<1.0	<1.0	<1.0	<1.0
Chloroethane SA	ug/l	<3.0	21 000 ^																			<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane SA	ug/l	<3.0	1100 ^																			<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) SA	ug/l	<3.0	10 \$																			<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) M	ug/l	<5.0	1000 \$																			<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene SA	ug/l	<3.0	20 \$																			<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane SA	ug/l	<3.0	900 \$																			<3.0	<3.0	<3.0	<3.0
cis-1,2-Dichloroethene SA	ug/l	<3.0	20 \$																			<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0																				<1.0	<1.0	<1.0	<1.0
Bromochloromethane SA	ug/l	<2.0	83 ^																			<2.0	<2.0	<2.0	<2.0
Chloroform SA (Trichloromethane)	ug/l	<2.0	400 \$																			<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane SA	ug/l	<2.0	300 \$																			<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene SA	ug/l	<3.0	NG																			<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride SA (Tetrachloromethane)	ug/l	<2.0	10 \$																			<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane SA	ug/l	<2.0	400 \$																			<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$			2.0							1.0			1.0						<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) SA	ug/l	<3.0	500 \$																			<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane SA	ug/l	<2.0	0.44 ^																			<2.0	<2.0	<2.0	<2.0
Dibromomethane SA	ug/l	<3.0	8.0 ^																			<3.0	<3.0	<3.0	<3.0
Bromodichloromethane SA	ug/l	<2.0	60 !																			<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$																			<2.0	<2.0	<2.0	<2.0
Toluene SA	ug/l	<5.0	1000 \$										2.0			1.0	15	1.0				<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0																				<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane SA	ug/l	<2.0	130 \$																			<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) SA	ug/l	<3.0	40 \$																			<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane SA	ug/l	<2.0	370 ^																			<2.0	<2.0	<2.0	<2.0
Dibromochloromethane SA	ug/l	<2.0	100 !																			<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane SA	ug/l	<2.0	0.0075 ^																			<2.0	<2.0	<2.0	<2.0
Chlorobenzene SA	ug/l	<2.0	180 \$			3.0							4.0			4.0						<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane SA	ug/l	<2.0	0.57 ^																			<2.0	<2.0	<2.0	<2.0
Ethylbenzene SA	ug/l	<1.0	150 \$										16			1.0		2.0		3.0		<1.0	<1.0	<1.0	<1.0
p/m-Xylene SA	ug/l	<2.0	70 \$ (sum)										4.0					6.0		4.0		<2.0	<2.0	2.0	<2.0
o-Xylene SA	ug/l	<1.0	70 \$ (sum)			4.0														4.0		<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$										1.0									<2.0	<2.0	<2.0	<2.0
Bromoform SA	ug/l	<2.0																				<2.0	<2.0	<2.0	<2.0
Isopropylbenzene SA	ug/l	<3.0	660 ^																	3.0		<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																			<4.0	<4.0	<4.0	<4.0
Bromobenzene SA	ug/l	<2.0	62 ^																			<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane SA	ug/l	<3.0	98 ^																			<3.0	<3.0	<3.0	<3.0
Propylbenzene SA	ug/l	<3.0	660 ^																			<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene SA	ug/l	<3.0	240 ^																			<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene SA	ug/l	<3.0	120 ^																	3.0		<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene SA	ug/l	<3.0	250 ^																			<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene SA	ug/l	<3.0	690 ^																			<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene SA	ug/l	<3.0	15 ^																	3.0		<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene SA	ug/l	<3.0	2000 ^																			<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene SA	ug/l	<3.0																		3.0		<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)																			<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)													1.0						<3.0	<3.0	<3.0	<3.0
n-Butylbenzene SA	ug/l	<3.0	1000 ^																			<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene SA	ug/l	<3.0	50 \$ (sum)																			<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0																				<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																			<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^																			<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$														2.0		4.0			<2.0	<2.0	<3.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																			<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0																				151	94	101	88
Surrogate Recovery 4-Bromofluorobenzene	%	<0																				131	99	97	95
Dutch Intervention Limits \$																									
USEPA Region 3 ^																									
NOD - No Organics Detected																									

11 Valley 2: Contaminated Stormwater Dam			LOD	Screening guideline	11 Jul-12 NOD	11 Jan-13 NOD	11 Jul-13 NOD	11 Jul-14	11 Jul-15 NOD	11 Jul-16 NOD	11 Jul-17	11 Jul-18	11 Jul-19	11 Jul-20	11 Jul-21	11 Jul-22 Dry	11 Jul-23	11 Jul-24
VOC MS																		
Dichlorodifluoromethane	ug/l	<2.0	200 ^											<2.0	<2.0		<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10												<0.10	<0.10		<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^											-	<3.0		<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$											<0.10	<0.10		<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^											<1.0	<1.0		<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^											-	<3.0		<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^											-	<3.0		<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$											<3.0	<3.0		<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$											-	<5.0		<5.0	<5.0
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$											-	<3.0		<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$											-	<3.0		<3.0	<3.0
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$											-	<3.0		<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0												<1.0	<1.0		<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^											-	<2.0		<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$											-	<2.0		<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$											-	<2.0		<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG											-	<3.0		<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$											-	<2.0		<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$											-	<2.0		<2.0	<2.0
Benzene	ug/l	<0.50	30 \$											<0.50	<0.50		<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$											-	<3.0		<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^											-	<2.0		<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^											-	<3.0		<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 I											-	<2.0		<2.0	<2.0
cis-1,3-Dichloropropene	ug/l	<2.0	20 \$											<2.0	<2.0		<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$					48				26		<2.0	<2.0		<5.0	<5.0
trans-1,3-Dichloropropene	ug/l	<2.0												<2.0	<2.0		<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$											-	<2.0		<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$											-	<3.0		<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^											-	<2.0		<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 I											-	<2.0		<2.0	<2.0
1,2-Dibromomethane ^{SA}	ug/l	<2.0	0.0075 ^											-	<2.0		<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$											-	<2.0		<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^											-	<2.0		<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$								25	2.0		-	<1.0		<1.0	<1.0
p,m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)					22					4.0	-	<2.0		<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)										4.0	-	<1.0		<1.0	<1.0
Styrene	ug/l	<2.0	300 \$											<2.0	<2.0		4.0	<2.0
Bromoform ^{SA}	ug/l	<2.0												-	<2.0		<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^										3.0	-	<3.0		<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0	0.076 ^											<1.0	<1.0		<1.0	<1.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^										-	<2.0	<2.0		<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^											-	<3.0		<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										2.0	-	<3.0		<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^											-	<3.0		<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^										3.0	-	<3.0		<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^											-	<3.0		<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^											-	<3.0		<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										3.0	-	<3.0		<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^											-	<3.0		<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0											3.0	-	<3.0		<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											-	<3.0		<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											-	<3.0		<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^											-	<3.0		<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)											-	<3.0		<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0												<2.0	<2.0		<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)											<3.0	<3.0		<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^											<3.0	<3.0		<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$										4.0	<3.0	<2.0		<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)											<3.0	<3.0		<3.0	<3.0
Surrogate Recovery Toluene D6	%	<0												103	153		99	93
Surrogate Recovery 4-Bromofluorobenzene	%	<0												100	130		93	96
Dutch Intervention Limits \$																		
USEPA Region 3 ^																		
NOD - No Organics Detected																		

		LOD	Screening guideline	27 Jul-11 NOD	27 Jul-12 NOD	27 Jul-13 Full of sand	27 Jul-14 Dry	27 Jul-15 Full of sand	27 Jul-16 Full of sand	27 Jul-17 NOD	27 Jul-18 NOD	27 Jul-19	27 Jul-20	27 Jul-21	27 Jul-22	27 Jul-23	27 Jul-24
VOC MS																	
Dichlorodifluoromethane	ug/l	<2.0	200^										<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10											<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^										-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$										<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^										<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^										-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^										-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$										-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$										-	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$										-	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$										-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0											-	<3.0	<3.0	<3.0	<3.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^										<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$										-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$										-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG										-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$										-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$										-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$										<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$										-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^										-	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^										-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 l										-	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$										-	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$										-	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$										-	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^										-	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 l										-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^										-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$										-	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^										-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$										-	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)									3.0	-	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)										-	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$										<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0											-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^										-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^										<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^										-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^										-	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^										-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^										-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^										-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^										-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^										-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^										-	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^										-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0											-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^										-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)										-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0											<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^										<3.0	<3.0	<3.0	<3.0	<3.0
Napthalene	ug/l	<2.0	70 \$										<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)										<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0										96	145	95	100	85	
Surrogate Recovery 4-Bromofluorobenzene	%	<0										99	128	99	96	92	

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29 Valley 2: Stormwater entering the catchment (plus overflow from 24)

				29 Jul-15 NOD	29 Jul-16 NOD	29 Jul-17 Dry	29 Jul-18 Dry	29 Jul-19	29 Jul-20	29 Jul-21	29 Jul-22	29 Jul-23	29 Jul-24
YOC MS													
Dichlorodifluoromethane	ug/l	<2.0	200 ^						<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10							<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^						-	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$						<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^						<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^						-	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^						-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$						-	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$						-	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$						-	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$						-	<3.0	<3.0	<3.0	<3.0
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$						-	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0							<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^						-	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$						-	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$						-	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG						-	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$						-	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$						-	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$						<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$						-	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^						-	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^						-	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 l						-	<2.0	<2.0	<2.0	<2.0
cis-1,3-Dichloropropene	ug/l	<2.0	20 \$						<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$						-	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug/l	<2.0							<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$						-	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$						-	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^						-	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 l						-	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^						-	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$						-	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^						-	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$						-	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)					3.0	-	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)					4.0	-	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$						<2.0	<2.0	2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0							-	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^						-	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^						<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^						-	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^						-	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^						-	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^						-	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^						-	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^						-	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^						-	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^						-	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^						-	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0							-	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)						-	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)						-	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^						-	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)						-	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0							<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)						<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^						<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$						<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)						<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0							103	141	94	99	92
Surrogate Recovery 4-Bromofluorobenzene	%	<0							100	130	99	91	96

Dutch Intervention Limits \$
USEPA Region 3 ^
NOD - No Organics Detected

[illegible]

		LOD	Screening guideline	SW3 Jul-05 NOD	SW3 Jul-06 NOD	SW3 Jul-07 NOD	SW3 Jul-08 NOD	SW3 Aug-09 NOD	SW3 Jul-10 NOD	SW3 Jul-11 NOD	SW3 Jul-12 NOD	SW3 Jan-13 NOD	SW3 Jul-13 NOD	SW3 Jul-14 NOD	SW3 Jul-15 NOD	SW3 Jul-16 NOD	SW3 Mar-17	SW3 Jul-17	SW3 Jul-18 NOD	SW3 Jul-19	SW3 Jul-20	SW3 Jul-21	SW3 Jul-22	SW3 Jul-23	SW3 Jul-24
VOC MS																									
Dichlorodifluoromethane	ug/l	<2.0	200^																		<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10																			<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$																		<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^																		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane ^{SA}	ug/l	<1.0																			<3.0	<3.0	<3.0	<3.0	<3.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^																		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG																		<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$																		<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 l																		<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 l																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$																		<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)																3.0		<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)																4.0		<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																		<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	680 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^																	2.0	<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0																			<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																3.0		<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0																			98	147	94	98	72
Surrogate Recovery 4-Bromofluorobenzene	%	<0																			101	129	97	94	105
Dutch Intervention Limits \$																									
USEPA Region 3 ^																									
NOD - No Organics Detected																									

		LOD	Screening guideline	SW4 Jul-05 NOD	SW4 Jul-06 NOD	SW4 Jul-07 NOD	SW4 Jul-08 NOD	SW4 Aug-09 NOD	SW4 Jul-10 NOD	SW4 Jul-11 NOD	SW4 Jul-12 NOD	SW4 Jan-13 NOD	SW4 Jul-13 NOD	SW4 Jul-14 NOD	SW4 Jul-15 NOD	SW4 Jul-16 NOD	SW4 Mar-17	SW4 Jul-17 NOD	SW4 Jul-18 NOD	SW4 Jul-19	SW4 Jul-20	SW4 Jul-21	SW4 Jul-22	SW4 Jul-23	SW4 Jul-24
VOC MS																									
Dichlorodifluoromethane	ug/l	<2.0	200^																		<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10																			<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$																		<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^																		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$														0.30				<3.0	<3.0	<3.0	<3.0	<3.0
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0																			<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG																		<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$																		<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !																		<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,3-Dichloropropene	ug/l	<2.0	20 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$																		<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)																	3.0	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)																	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																		<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0																			<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0																			100	152	94	99	73
Surrogate Recovery 4-Bromofluorobenzene	%	<0																			99	129	97	96	106
Dutch Intervention Limits \$																									
USEPA Region 3 ^																									
NOD - No Organics Detected																									

		LOD	Screening guideline	SW5 Jul-05 NOD	SW5 Jul-06 NOD	SW5 Jul-07 NOD	SW5 Jul-08 NOD	SW5 Aug-09 NOD	SW5 Jul-10 NOD	SW5 Jul-11 NOD	SW5 Jul-12 NOD	SW5 Jan-13 NOD	SW5 Jul-13 NOD	SW5 Jul-14 NOD	SW5 Jul-15 NOD	SW5 Jul-16 NOD	SW5 Mar-17	SW5 Jul-17 NOD	SW5 Jul-18 NOD	SW5 Jul-19	SW5 Jul-20	SW5 Jul-21	SW5 Jul-22	SW5 Jul-23	SW5 Jul-24
VOC MS																									
Dichlorodifluoromethane	ug/l	<2.0	200 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10																			<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$																		<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^																		<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$														0.32				<3.0	<3.0	<3.0	<3.0	<3.0
cis-1-2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0																			<1.0	<1.0	<1.0	<1.0	<1.0
Bromochloromethane	ug/l	<2.0	83 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG																		<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$																		<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 l																		<2.0	<2.0	<2.0	<2.0	<2.0
cis-1-3-Dichloropropene	ug/l	<2.0	20 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$																		<5.0	<5.0	<5.0	<5.0	<5.0
trans-1-3-Dichloropropene	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 l																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$																		<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)																	3.0	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)																	4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$																		<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^																		<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^																		<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0																			<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0																			<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^																		<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$																		<3.0	<3.0	<3.0	<3.0	<3.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)																		<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0																			101	152	93	97	90
Surrogate Recovery 4-Bromofluorobenzene	%	<0																			100	127	97	96	94
Dutch Intervention Limits \$																									
USEPA Region 3 ^																									
NOD - No Organics Detected																									

		LOD	Screening guideline	SW6 Aug-09 NOD	SW6 Jul-10 NOD	SW6 Jul-11 NOD	SW6 Jul-12 NOD	SW6 Jan-13 NOD	SW6 Jul-13 NOD	SW6 Jul-14 NOD	SW6 Jul-15 NOD	SW6 Jul-16 NOD	SW6 Mar-17	SW6 Jul-17 NOD	SW6 Jul-18 NOD	SW6 Jul-19	SW6 Jul-20	SW6 Jul-21	SW6 Jul-22	SW6 Jul-23	SW6 Jul-24
VOC MS																					
Dichlorodifluoromethane	ug/l	<2.0	200 ^														<2.0	<2.0	<2.0	<2.0	<2.0
Methyl Tertiary Butyl Ether	ug/l	<0.10															<0.10	<0.10	<0.10	<0.10	<0.10
Chloromethane ^{SA}	ug/l	<3.0	190 ^														<3.0	<3.0	<3.0	<3.0	<3.0
Vinyl Chloride	ug/l	<0.10	5.0 \$														<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	<1.0	7.5 ^														<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane ^{SA}	ug/l	<3.0	21 000 ^														<3.0	<3.0	<3.0	<3.0	<3.0
Trichlorofluoromethane ^{SA}	ug/l	<3.0	1100 ^														<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethene (1,1 DCE) ^{SA}	ug/l	<3.0	10 \$														<3.0	<3.0	<3.0	<3.0	<3.0
Dichloromethane (DCM) ^{SA}	ug/l	<5.0	1000 \$														<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$														<3.0	<3.0	<3.0	<3.0	<3.0
1,1-Dichloroethane ^{SA}	ug/l	<3.0	900 \$										0.55				<3.0	<3.0	<3.0	<3.0	<3.0
cis-1,2-Dichloroethene ^{SA}	ug/l	<3.0	20 \$														<3.0	<3.0	<3.0	<3.0	<3.0
2,2-Dichloropropane	ug/l	<1.0															<3.0	<3.0	<3.0	<3.0	<3.0
Bromochloromethane ^{SA}	ug/l	<2.0	83 ^														<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform ^{SA} (Trichloromethane)	ug/l	<2.0	400 \$														<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1-Trichloroethane ^{SA}	ug/l	<2.0	300 \$														<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloropropene ^{SA}	ug/l	<3.0	NG														<3.0	<3.0	<3.0	<3.0	<3.0
Carbon tetrachloride ^{SA} (Tetrachloromethane)	ug/l	<2.0	10 \$														<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichloroethane ^{SA}	ug/l	<2.0	400 \$														<2.0	<2.0	<2.0	<2.0	<2.0
Benzene	ug/l	<0.50	30 \$														<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene (TCE) ^{SA}	ug/l	<3.0	500 \$														<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichloropropane ^{SA}	ug/l	<2.0	0.44 ^														<2.0	<2.0	<2.0	<2.0	<2.0
Dibromomethane ^{SA}	ug/l	<3.0	8.0 ^														<3.0	<3.0	<3.0	<3.0	<3.0
Bromodichloromethane ^{SA}	ug/l	<2.0	60 !														<2.0	<2.0	<2.0	<2.0	<2.0
cis-1,3-Dichloropropene	ug/l	<2.0	20 \$														<2.0	<2.0	<2.0	<2.0	<2.0
Toluene ^{SA}	ug/l	<5.0	1000 \$														<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-Dichloropropene	ug/l	<2.0															<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichloroethane ^{SA}	ug/l	<2.0	130 \$														<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE) ^{SA}	ug/l	<3.0	40 \$														<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichloropropane ^{SA}	ug/l	<2.0	370 ^														<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane ^{SA}	ug/l	<2.0	100 !														<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dibromoethane ^{SA}	ug/l	<2.0	0.0075 ^														<2.0	<2.0	<2.0	<2.0	<2.0
Chlorobenzene ^{SA}	ug/l	<2.0	180 \$														<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2-Tetrachloroethane ^{SA}	ug/l	<2.0	0.57 ^														<2.0	<2.0	<2.0	<2.0	<2.0
Ethylbenzene ^{SA}	ug/l	<1.0	150 \$														<1.0	<1.0	<1.0	<1.0	<1.0
p/m-Xylene ^{SA}	ug/l	<2.0	70 \$ (sum)													3.0	<2.0	<2.0	<2.0	<2.0	<2.0
o-Xylene ^{SA}	ug/l	<1.0	70 \$ (sum)													4.0	<1.0	<1.0	<1.0	<1.0	<1.0
Styrene	ug/l	<2.0	300 \$														<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform ^{SA}	ug/l	<2.0															<2.0	<2.0	<2.0	<2.0	<2.0
Isopropylbenzene ^{SA}	ug/l	<3.0	660 ^														<3.0	<3.0	<3.0	<3.0	<3.0
1,1,2,2-Tetrachloroethane	ug/l	<4.0	0.076 ^														<4.0	<4.0	<4.0	<4.0	<4.0
Bromobenzene ^{SA}	ug/l	<2.0	62 ^														<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichloropropane ^{SA}	ug/l	<3.0	88 ^														<3.0	<3.0	<3.0	<3.0	<3.0
Propylbenzene ^{SA}	ug/l	<3.0	660 ^														<3.0	<3.0	<3.0	<3.0	<3.0
2-Chlorotoluene ^{SA}	ug/l	<3.0	240 ^														<3.0	<3.0	<3.0	<3.0	<3.0
1,3,5-Trimethylbenzene ^{SA}	ug/l	<3.0	120 ^														<3.0	<3.0	<3.0	<3.0	<3.0
4-Chlorotoluene ^{SA}	ug/l	<3.0	250 ^														<3.0	<3.0	<3.0	<3.0	<3.0
tert-Butylbenzene ^{SA}	ug/l	<3.0	690 ^														<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trimethylbenzene ^{SA}	ug/l	<3.0	15 ^														<3.0	<3.0	<3.0	<3.0	<3.0
sec-Butylbenzene ^{SA}	ug/l	<3.0	2000 ^														<3.0	<3.0	<3.0	<3.0	<3.0
4-Isopropyltoluene ^{SA}	ug/l	<3.0															<3.0	<3.0	<3.0	<3.0	<3.0
1,3-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)														<3.0	<3.0	<3.0	<3.0	<3.0
1,4-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)														<3.0	<3.0	<3.0	<3.0	<3.0
n-Butylbenzene ^{SA}	ug/l	<3.0	1000 ^														<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene ^{SA}	ug/l	<3.0	50 \$ (sum)														<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0															<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)														<3.0	<3.0	<3.0	<3.0	<3.0
Hexachlorobutadiene	ug/l	<3.0	0.30 ^														<3.0	<3.0	<3.0	<3.0	<3.0
Naphthalene	ug/l	<2.0	70 \$														<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/l	<3.0	10 \$ (sum)														<3.0	<3.0	<3.0	<3.0	<3.0
Surrogate Recovery Toluene D8	%	<0															103		95	99	89
Surrogate Recovery 4-Bromofluorobenzene	%	<0															99	131	97	95	95
Dutch Intervention Limits \$																					
USEPA Region 3 ^																					
NOD - No Organics Detected																					

ENVIROSERV

SHONGWENI WASTE MANAGEMENT FACILITY
WATER QUALITY
MONITORING REPORT 2025

Report: JW112/25/B196-25-Rev 0

APPENDIX J

ENVIROSERV – BIOMONITORING REPORT (DECEMBER 2024)

ENVIROSERV
SHONGWENI LANDFILL SITE

**ROUTINE AQUATIC BIOMONITORING OF THE
MGOSHONGWENI RIVER**

FINAL REPORT



GroundTruth
environment & engineering

DECEMBER 2024

GT0168-June 2024

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Consultant Ref Number	GT0168-December 2024
Prepared by	
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EXECUTIVE SUMMARY

EnviroServ Waste Management contracted GroundTruth to undertake the routine, biannual aquatic biomonitoring of the Mgoshongweni River adjacent to the Shongweni Landfill site. The biomonitoring assessed aquatic macroinvertebrates and benthic diatoms to assist in determining the impact of the landfill site on the downstream aquatic ecosystems. The most recent assessment was conducted on the 10th of December 2024.

Large-scale habitat alteration associated with the floods in April and May 2022, and heavy rains in June 2023, have and continue to affect the entire reach of the Mgoshongweni River.

Clearing activities occurring east of the currently active cell, necessitated the relocation of the upstream control site to farther upstream. This was to exclude potential impacts related to the clearing and to maintain its control status. Similarly, we recommend the relocation of the downstream site as contributions from a tributary that developed during 2022/2023 floods, are negatively impacting the current sampling location. The downstream site should, therefore, be relocated to upstream of the confluence with the new tributary for future monitoring events.

Overall, there was a general improvement in biomonitoring results over the June 2024 assessment, apart from the SASS score at the downstream site. The greatest improvement was observed at the upstream site and is related to the increased habitat availability at the new location.

The biological and in-situ (water quality) data from December 2024 indicate that any potential impacts currently related to the operation of the Shongweni Landfill site are not causing degradation of the Mgoshongweni River.

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1. INTRODUCTION

At the request of EnviroServ, GroundTruth undertook an independent aquatic assessment of the Mgoshongweni River, which runs adjacent to the Shongweni Landfill site, to determine if the landfill site is having a negative impact on the surrounding surface water resources and associated aquatic environments downstream. Such an assessment is in line with the requirements of EnviroServ's landfill permit, which stipulates that potential impacts be routinely monitored. The Shongweni Landfill is classified as a Class: H:h waste site, meaning the site can accept hazardous waste.

Biomonitoring is routinely (biannually) undertaken on the Mgoshongweni River at two sites- one upstream and one downstream of the landfill. As of May 2018, a central site was included as an additional site to allow for the differentiation of impacts between the old and new cells of the landfill.

This report documents the findings of the most recent monitoring event, which took place on the 10th of December 2024. The monitoring was undertaken by a Department of Water and Sanitation (DWS) accredited South African Scoring System (v.5) (SASS5) practitioner (Appendix A).

2. METHODS

The ecological condition of the Mgoshongweni River was assessed at three sites, one upstream and another downstream of the landfill site, and a third between the old and new cells. Following field assessments in December 2023 and June 2024, the upstream monitoring site was shifted about 250 m further upstream to minimise potential effects from clearing activities located east of the active cell. The downstream site is located approximately 1 km from the landfill site. The site details are provided in **Table 2-1** and the geospatial context displayed in **Figure 2-1**.

Table 2-1 Co-ordinates (in decimal degrees) of sampling sites assessed as part of biomonitoring of the Mgoshongweni River

Site	South (decimal degrees)	East (decimal degrees)
Site upstream of landfill	29.82201	30.75199
Site central to landfill	29.82955	30.75398
Site downstream of landfill	29.83526	30.75766

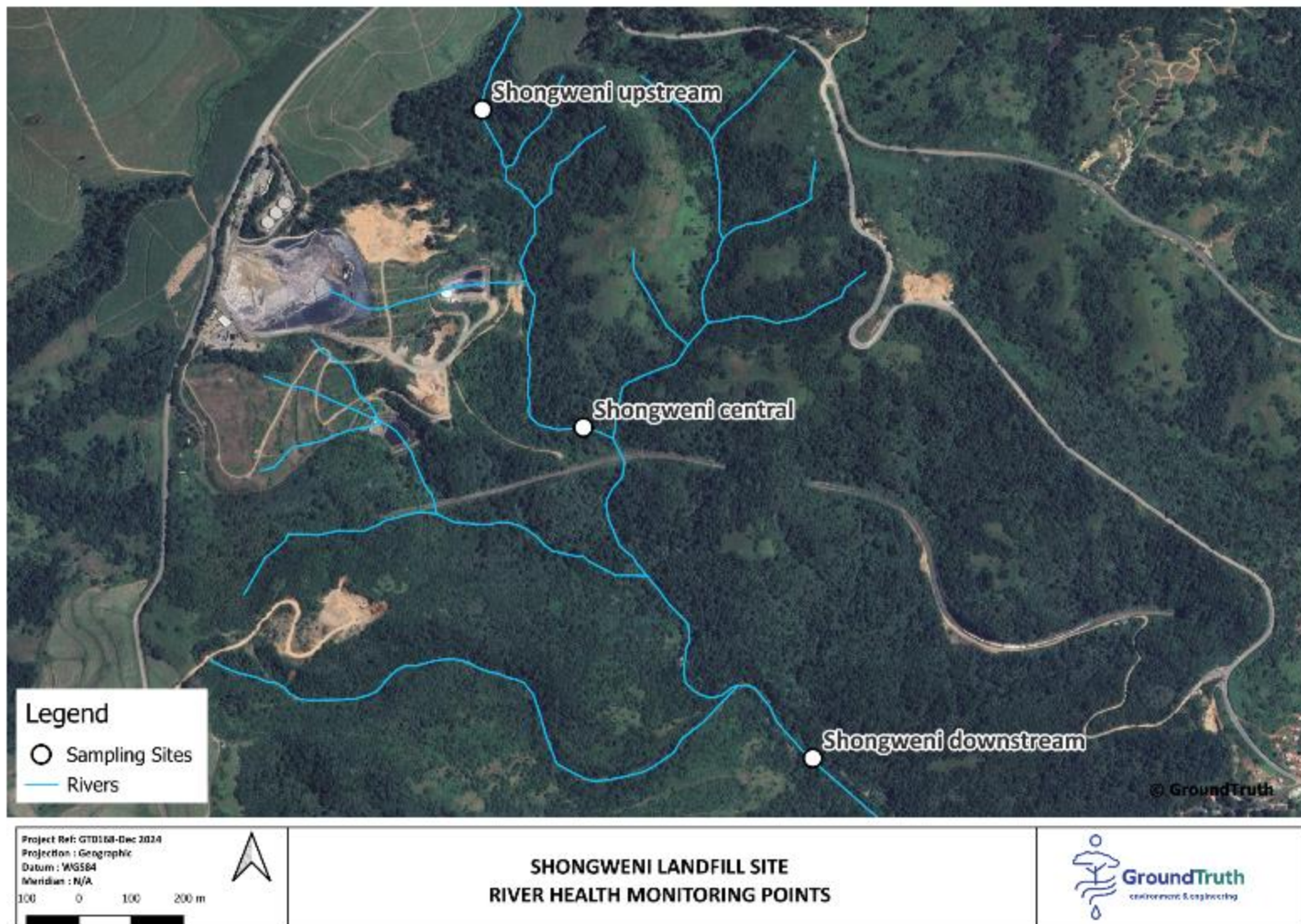


Figure 2-1 Aerial view of the routine biomonitoring sites on the Mgoshongweni River in relation to the EnviroServ Landfill site.

2.1 Assessments

Each site assessment consisted of paired in-situ physico-chemical water quality and biological monitoring (biomonitoring) samples. At each site, in-situ water physico-chemical parameters, namely pH, conductivity, dissolved oxygen, and temperature were measured using a hand-held multi-probe water meter. Additionally, water clarity, which is a surrogate for turbidity, was measured using a water clarity tube.

Biomonitoring uses the occurrence of aquatic taxa with different pollution tolerance ratings to provide an indication of the ecological state or health of the river. Both macroinvertebrates and diatoms were used as bioindicators to assess the condition of the Mgoshongweni River.

The status of the aquatic macroinvertebrates at the monitoring sites was established and quantified using the SASS5 method (Dickens and Graham, 2002), accredited to ISO 17025 standards. The SASS5 method produces two indices, namely a SASS score and Average Score Per Taxon (ASPT) for each site. This was supplemented by measures of habitat availability for aquatic biota generated by the Integrated Habitat Assessment System (IHAS v2) (MacMillan, 1998).

Benthic diatom samples (algae) were collected at each site and analysed to provide further indications of the present water quality status in the river. Due to their lower dependence on availability of aquatic habitats, diatoms can provide additional information with respect to the specific impacts associated with modified water quality (De La Rey et al., 2004). The data from the benthic diatom samples were interpreted according to the Specific Pollution sensitivity Index (SPI, Taylor et al., 2007; Harding and Taylor, 2011) to assess the “health status” of the river at each site in respect to water quality.

Generally, the higher the index (e.g., SASS score, ASPT, or SPI) the better the health, or condition, of a river (**Table 2-2**).

According to the SASS interpretation guidelines (Dallas, 2007), all three sites fall within the North Eastern Coastal Belt Ecoregion. To establish the benchmark against which to compare the current “state” or “river health” of monitored sites, the reference sites for this ecoregion were used, together with data available from the University of the North-West and the South African Diatom Collections. The corresponding SASS, ASPT and SPI scores for each Ecostatus category are presented in

Table 2-2 for comparison with the data collected from each of the sampling sites. A more detailed description of the various river health classes and their ecological and management perspectives is provided in **Table 2-3**.

In addition, the Percentage Pollution Tolerant Valves (% PTV) was determined for each diatom sample as the proportion of valves present that are tolerant of organic pollution, and the percentage deformed cells, as a measure of the inorganic pollution impacts for further indications of water quality changes within the river.

Table 2-2 SASS Score and ASPT used to define river health class boundaries for the North Eastern Coastal Belt (upper) Ecoregion level 1 (derived from Dallas, 2007), and diatom index scores for relevant health classes (derived from Harding and Taylor, 2011).

River health class		Indices		
		SASS	ASPT	SPI
Natural	≥	180	7.3	17
Good	≥	158	6.8	13
Fair	≥	118	6.3	9
Poor	≥	95	5.5	5
Seriously Modified	<	95	5.5	5

Table 2-3 River health classes and their attendant ecological and management perspectives (derived from Graham, 2007)

Category	River health classes	Ecological perspective	Management perspective
A	Natural	No or negligible modification of in-stream and riparian habitats and biota.	Protected rivers; relatively untouched by human hands; no discharges or impoundments allowed.
B	Good	Ecosystems essentially in a good state; biodiversity largely intact.	Some human-related disturbance but mostly of low impact potential.
C	Fair	A few sensitive species may be lost; lower abundances of biological populations may occur.	Zones of competing uses; developmental pressures are a dominant feature.
D	Poor	Habitat diversity and availability have declined; mostly only tolerant species present; species present are often diseased; population dynamics have been disrupted (e.g. biota can no longer breed, or alien species have invaded the ecosystem).	Often characterised by high human densities or extensive resource exploitation. Management intervention is needed to improve river health – e.g. to restore flow patterns, river habitats or water quality.
E	Seriously Modified	Loss of habitat availability and high levels of pollution, resulting in few families being present due to the loss on most intolerant forms.	Often characterised by high human densities, pollution or extensive resource exploitation and modification. Management intervention is needed for improvement to occur.

3. RESULTS

3.1 Water quality

In-situ water physico-chemistry results are summarised in **Table 3-1**. Detailed site assessments (including site photographs) and biomonitoring results are presented in the sections below.

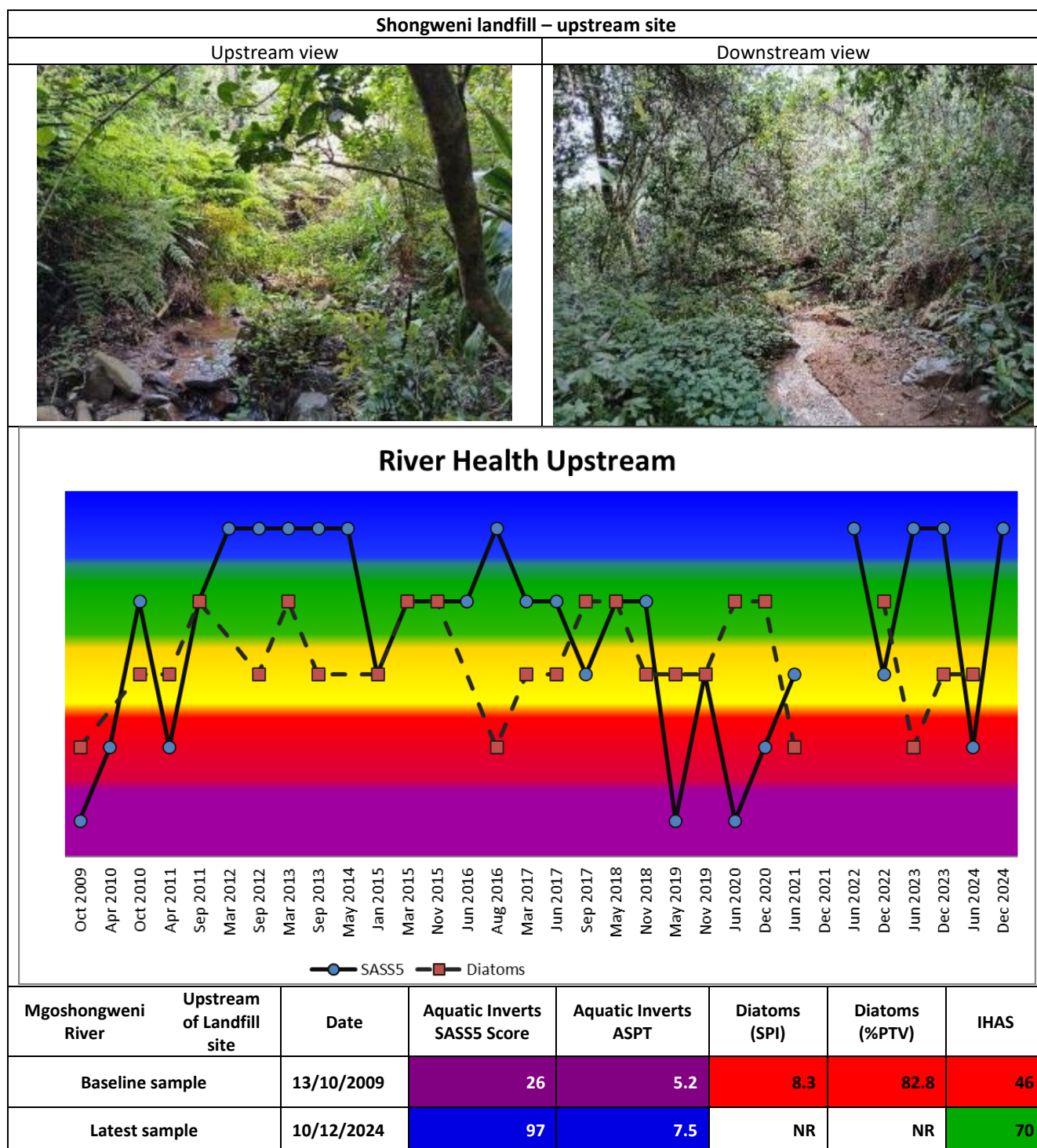
Table 3-1 Summary of the in-situ water physico-chemistry results recorded at up-, central and downstream sites of the EnviroServ Shongweni Landfill site on 10 December 2024

Determinant	Upstream site	Central site	Downstream site
pH (pH units)	6.5	7.4	7.5
Conductivity (mS/m)	23.5	20.7	43.8
Dissolved oxygen (%)	99.2	99.9	93.6
Dissolved oxygen (mg O ₂ /L)	8.94	8.82	8.06
Temperature (°C)	20.4	23.0	23.1
Clarity (cm)	38	18	25

Water quality parameters sampled at the sites upstream, central, and downstream in December 2024, fall within the guideline Target Water Quality Ranges (TWQRs) for aquatic ecosystems (DWAF, 1996).

The pH levels increased from the upstream site to central and downstream sites but remained within half a pH unit of neutral pH. The conductivity decreased between the upstream and central sites but showed a twofold increase at the downstream site, possibly indicating an increase in the concentration of dissolved substances. The increase in conductivity at the downstream site may be associated with contributions from the quarry tributary located upstream. Relocating the downstream sampling site to a position above the tributary would facilitate the isolation of its potential impact. Dissolved oxygen concentrations were higher at the upstream and central sites than at the downstream site. This could be attributed to increased mechanical mixing from small waterfalls at the upstream and central sites, which promotes oxygen exchange. Despite the lower levels at the downstream site, dissolved oxygen concentrations remained within a healthy range, with 93% saturation, indicating good water quality overall. The water clarity declined between the upstream and central sites but improved at the downstream site.

3.2 Summarised river health status of the upstream site



Present health status:

Based on infield observations in December 2023 and June 2024, the clearing activities occurring east of the current active cell were affecting the original upstream site, as such the upstream site was relocated farther upstream by approximately 250 m to maintain the control site status by avoiding any potential impacts from the clearing activities.

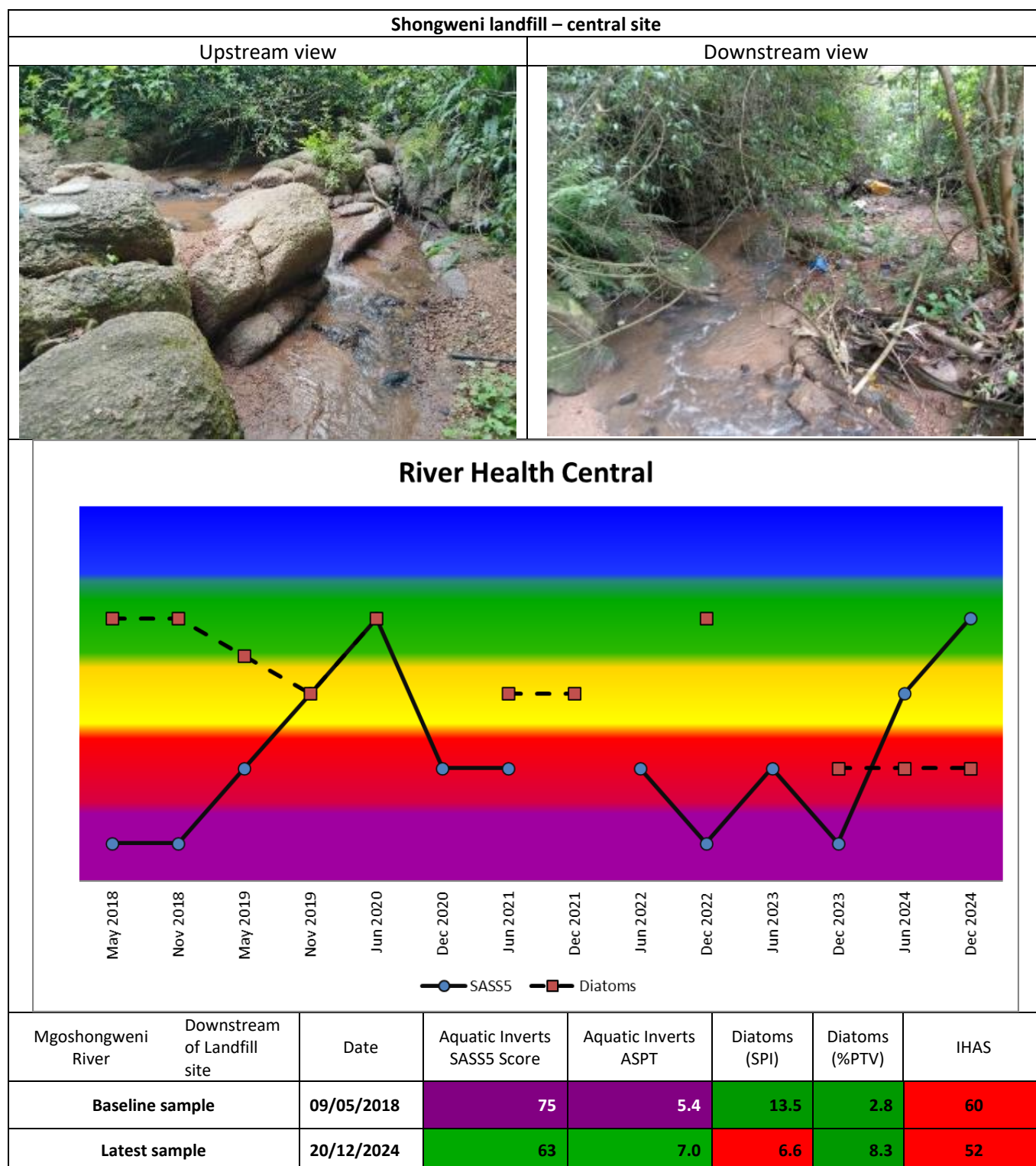
Although the shallow nature of the river at the upstream site made sampling challenging, there was sufficient water to allow sampling of all three SASS5 biotopes (GSM, stones and vegetation); an improvement on the conditions at the previous upstream location. The ASPT was 7.5, which indicated that the site was in a near natural condition.

During the December 2024 sampling event, no diatom cells were present in the sample to generate a score. This was likely due to high suspended sediment load and scouring flows during December, as well as runoff from the sugar cane plantation, which may have elevated turbidity leading to smothering of the diatoms during subsequent low flows.

Impacts and threats:

- Limited habitat availability.
- Potential contamination from upstream agricultural activities.

3.3 Summarised river health status of the central site



Present health status:

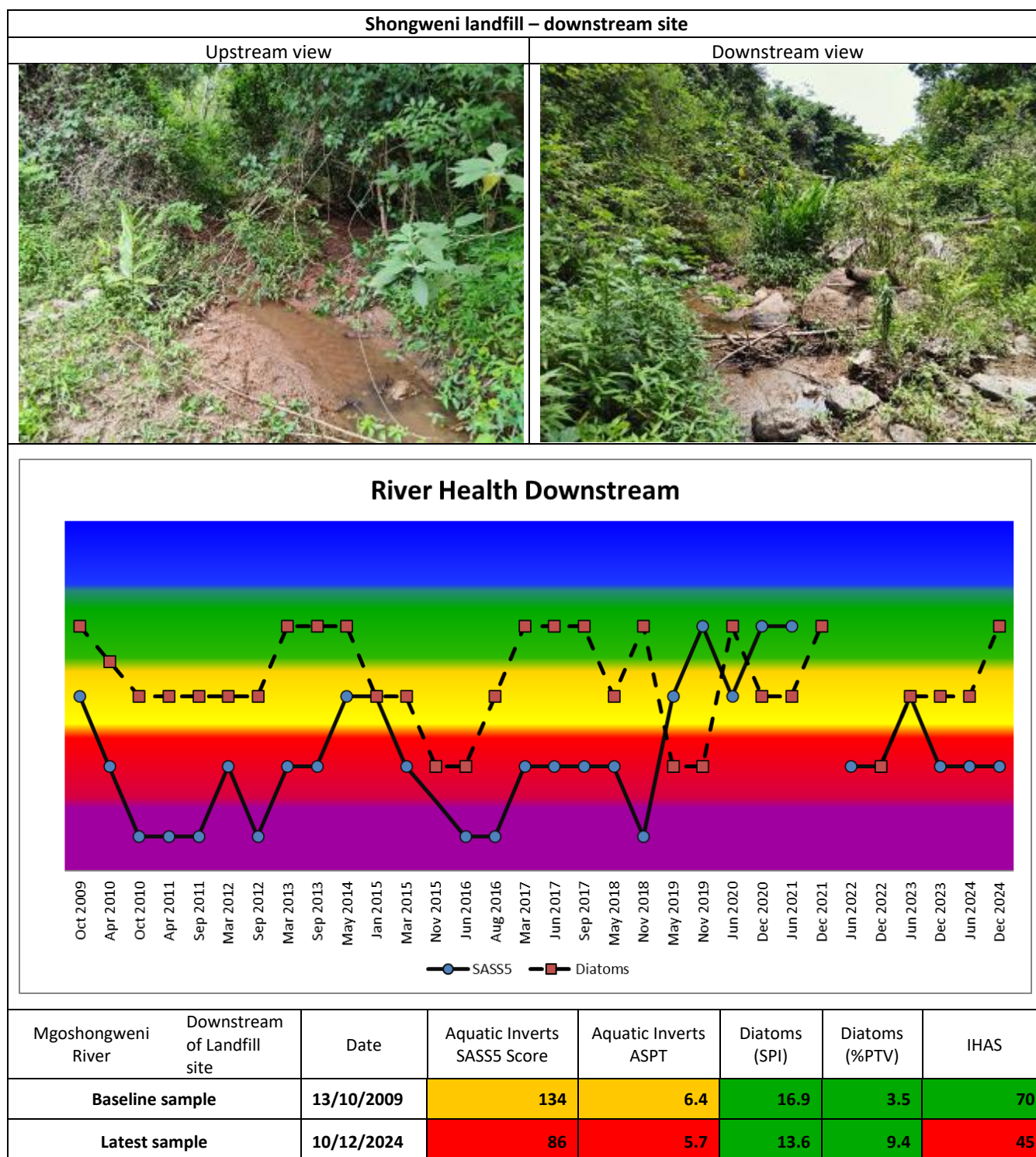
The site is located downstream of the currently active cells of the landfill, but upstream of the confluence with the neighbouring valley, where the previously active cell is located. The diversity and quantity of available habitats at this site were generally poor to moderate.

The SASS results indicated that the site was in a good condition; an improvement over the December 2023 and June 2024 results. This improvement was largely related to the presence of several moderately sensitive taxa. The diatom abundance was low, with only a count of 100 cells, as with the upstream site this is likely related to scouring associated with elevated flows and sediment mobilisation during rainfall events. The SPI suggests that the site has remained in a poor condition. The diatom species composition was dominated by species tolerant to electrolyte rich water and or organic pollution and high nutrients levels.

Impacts and threats:

- Change in habitat availability resulting from flooding events.
- Sedimentation from upstream and the surrounding valley.
- Potential pollution from the landfill site (including solid waste).
- Alien invasive plants in the riparian areas, reducing overall natural diversity and ground cover.

3.4 Summarised river health status of the downstream site



Present health status:

The SASS results indicate that the site was in a poor condition. However, the presence of moderately sensitive SASS taxa, including Lepidostomatidae (bizarre caddisflies) Philopotamidae (finger-net caddisflies) and Perlidae (common stoneflies), suggest that the poor SASS results were primarily due to limited availability of vegetation for sampling rather than water quality issues.

The low SASS results, being related to limited habitat and not water quality, is supported by the diatom results (also a low count of 100 cells), which showed an improvement compared to the June 2024 and central site results. While the diatom community was dominated by *Achnanthes rupestris* (57%), a species with poorly documented environmental tolerance but with some evidence of being associated with elevated electrolytes, higher temperatures and faster flow conditions (typical of warm wet season conditions), the next most abundant species was *Achnanthidium* sp. which does not tolerate very polluted water.

Impacts and threats:

- Change in habitat availability resulting from flooding events.
- Sedimentation from upstream and the surrounding valley.

River health classes are summarised spatially and graphically in **Figure 3-1**.

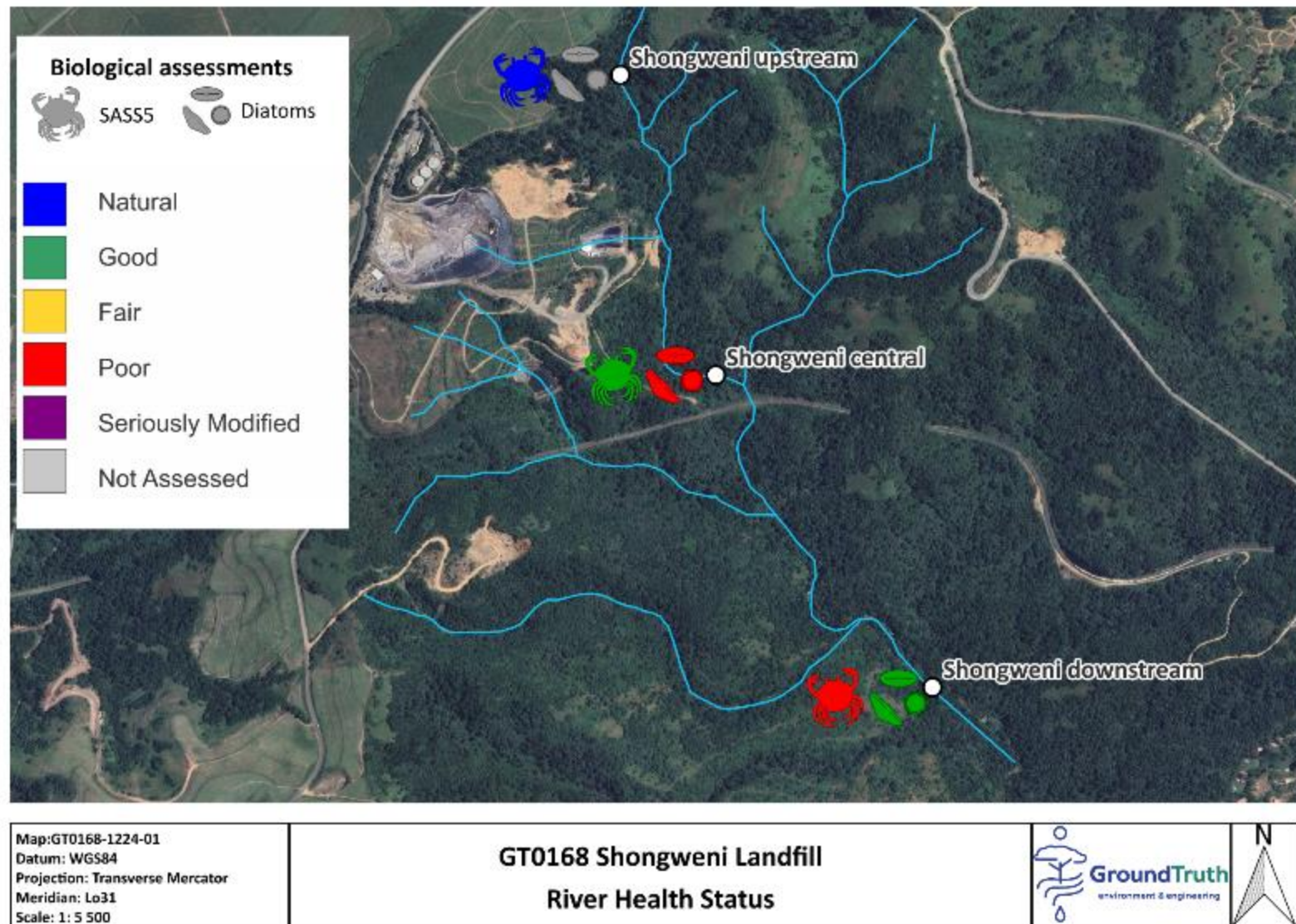


Figure 3-1 Biological monitoring summary of the Mgoshongweni River health in December 2024

4. CONCLUSIONS

Large-scale habitat and river channel modifications along the entire length of the Mgoshongweni River occurred following heavy rains and severe flooding in April and May 2022. Subsequent heavy rains in June 2023 further exacerbated these impacts. The system has not yet fully recovered from these disturbances.

Based on in-field observations conducted in December 2023 and June 2024, the upstream monitoring site was relocated approximately 250 m farther upstream to mitigate potential impacts from clearing activities east of the active cell. This relocation led to a notable improvement in SASS scores. This positive change is largely related to there being a greater diversity of sampling habitat at the new location, underscoring the critical role of habitat quality in river ecosystem assessments. The central site has shown some habitat recovery since the 2022/2023 floods, but downstream habitat recovery has been negligible.

The SASS5 results at both the upstream (poor to near natural) and central (fair to good) sites improved compared to June 2024, related to a greater diversity of habitats available for sampling. According to the SASS results, the downstream site remained in a poor condition largely related to the lack of habitat recovery at the site. Diatoms were limited at all three sites with the upstream site having too few cells to run an analysis and the central and downstream sites only having a 100-cell count. The low diatom counts are likely related to scouring from mobilised sediments during increased flows following rainfall events. The diatom results indicated that the central site remained in a poor condition, with most of the species present exhibiting pollution and electrolyte tolerance. The downstream site showed an improvement in the diatom scores from fair to good, with more sensitive species being present. However, the dominant species at the site still indicated impacts from elevated electrolytes as well as increased flows and temperatures.

The December 2024 data were compared between sites and with June 2024 data, and can be summarised as follows:

- Water quality parameters at the upstream, central, and downstream sites remained within the TWQRs for aquatic ecosystems.
- Electrical conductivity was similar at the upstream and central sites but showed a notable increase at the downstream site between June and December 2024. This increase is likely due to a natural accumulation of dissolved salts from a tributary that joins the Mgoshongweni upstream of the downstream site.
- The pH levels showed less than a 0.5 pH unit shift at all three sites, the upstream site was once again slightly more acidic, but this is likely related to influences from the sugarcane plantations adjacent to the site.
- The biological and *in-situ* water quality results indicate that any potential impacts currently related to the operation of the Shongweni Landfill site are not causing degradation in the Mgoshongweni River.

The lack of habitat improvement at the downstream site and increased electrical conductivity appear to be related to contributions from a newly developed tributary (related to the 2022/2023 floods) and we recommend that the downstream site be moved to upstream of this tributary for future monitoring events.

Sedimentation and runoff emanating from the area under the control of EnviroServ requires continued management and attention. This should ideally be addressed through rehabilitation and revegetation.

While measures have been put in place to mitigate the sedimentation concerns, activities such as clearing of the sediment trap and maintenance of berms, drains, and roads must be undertaken regularly and timeously to prevent unnecessary impacts. The control of alien invasive plants within the riparian areas also needs to be improved upon, and this will require active revegetation to improve the integrity of the riparian zone.

5. REFERENCES

- Dallas HF. 2007. River Health Programme: South African Scoring System (SASS) Data Interpretation Guidelines. The Freshwater Consulting Group/ Freshwater Research Unit., University of Cape Town (UCT), Cape Town, South Africa.
- De La Rey PA, Roux H, Van Rensburg L and Vosloo A. 2004. On the use of diatom-based biological monitoring Part 2: A comparison of the response of SASS 5 and diatom indices to water quality and habitat variation. WRC Report No. TT 282/07. Water Research Commission, Pretoria, South Africa.
- Dickens CWS and Graham PM. 2002. The South African Scoring System (SASS) version 5 Rapid Bioassessment Method for Rivers. *African Journal of Aquatic Sciences*, 27: 1-10.
- DWAF. 1996. Water Quality Management Series, South African Water Quality Guidelines for Freshwater. Second edition, volume 7. Department of Water Affairs and Forestry, Pretoria, South Africa.
- Graham PM. 2007. Final Summary Report: eThekweni Municipality State of Rivers Report. eThekweni Municipality, South Africa.
- GroundTruth. 2023. EnviroServ Shongweni Landfill Site: Routine Aquatic Biomonitoring of the Mgoshongweni River. Final Report. GT168_1223.
- Harding WR and Taylor JC. 2011. The South African diatom index (SADI) - A preliminary index for indicating water quality in rivers and streams in South Africa. Water Research Commission Report No. 1707/1/11. Water Research Commission, Pretoria, South Africa.
- McMillan PH. 1998. An Integrated Habitat Assessment System (IHAS version 2) For the Rapid Biological Assessment of Rivers and Streams. CSIR Report. CSIR, Western Cape, South Africa.
- Taylor JC, Janse van Vuuren MS and Pieterse AJH. 2006. The Application and Testing of Diatom-based Indices in the Vaal and Wilge Rivers, South Africa. *Water SA* Vol. 33:1, 1 January 2007.

6. APPENDICES

APPENDIX 1: SASS Accreditation

