SOIL REPORT

ATOM EARTH PTY LTD | SOIL DOCTORS AUSTRALIA
PO Box 455, Floreat WA 6014

CLIENT :
LOCATION :

DATE : 25/09/2018
CLI ID :
LAND USE : Residential
SAMPLE : Topsoil

TABLE 1

	Ideal	measured	comments
CECe		9.5	CEC value is low to moderate
pH (H_2O)	6.3	5.1	pH is low. Moderately acidic.
EC (mS m)	<0.3	0.75	EC value is slightly high indicating the sample is quite salty.
SOC		2.41	
OM	2 - 10	4.14	Organic matter is within range.
ESP	<3	8.23	Exchangeable sodium is high.

RESULTS

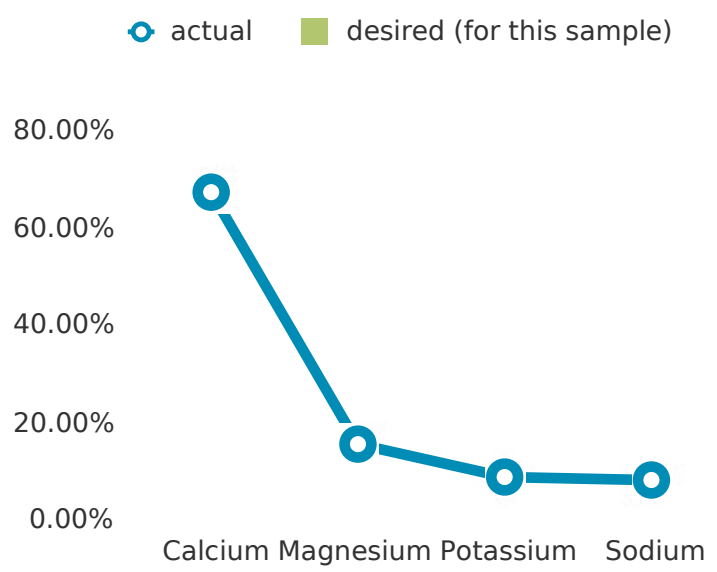
Element (ppm)	Ideal	Plant Available	Total Concentration	Saturated Paste	Status / Toxicity*
Calcium	6 : 1 Ca |Mg	1,281	5,124	240	OK
Magnesium	1:1 Mg|K	181.0	11,036	112	HIGH
Potassium	303-758	328.0	14,262	33	HIGH
Sodium	0.5 - 1.5%	180	180.0	180	HIGH
Phosphorus	30 - 50	49.3	2,900	0.006	LOW
Sulphur	30-50	10.0	50.0	<LOD	LOW
Silicon			79%	36,927	
Manganese	30 -100	249.6	567	56.1	HIGH
Iron	40-200	77.0	25,662	55.5	LOW
Copper	2 - 50	0.0	0.0	0.0	LOW
Zinc	1 - 200	4.1	116.3	2.7	LOW
Molybdenum	0.5-2		40.0	<LOD	LOW
Cobalt	2-50		0.0	0.0	LOW
Selenium	0.6-2		0.0	0.0	LOW
Arsenic	<20		7.4	10.9	**100**
Cadmium	<1		0.0	0.0	**20**
Lead	<35		30.8	29.0	**300**
Mercury	<1		0.0	0.0	**15**
Nickel	1-20	0.0	1.0	0.0	**600**
Chloride	<100		0	0	HIGH
Other metals : Max recommended levels gardens soils					
Titanium			3,849	3,360	SIG
Chromium	<2		15.86	13.15	**100**

Strontium			152.89	46.9	SAFE
Yttrium			27.83	28.92	SAFE
Tin			0	0	**47000**
Antimony			0	0	**31**
Vandium			26.64	0	**550**
Silver			48.63	0	SAFE
Zirconium			198.34	401.74	SAFE

*** LOD – Limit of Detection**

BASE SATURATION

	ideal ranges	desired (for this sample)	actual
Calcium	**65 – 85%**	80%	67.33%
Magnesium	**10 – 20%**	12%	15.60%
Potassium	**2 – 5%**	3.3%	8.84%
Sodium	**< 3%**	1.5%	8.23%
Aluminium		0.5%	
Hydrogen		10%	



SOIL REPORT

ATOM EARTH PTY LTD | SOIL DOCTORS AUSTRALIA
PO Box 455, Floreat WA 6014

CLIENT :
LOCATION :

DATE : 25/09/2018
CLI ID
LAND USE : Residential
SAMPLE : Subsoil

	Ideal	measured	comments
CECe		9.3	CEC value is low to moderate
pH (H_2O)	6.3	5.8	pH value is low
EC (mS m)	<0.3	0.43	EC value is slightly high.
SOC		2.59	
OM	2 - 10	4.46	Organic matter is within range.
ESP	<3	3.51	Exchangeable sodium is slightly high.

RESULTS

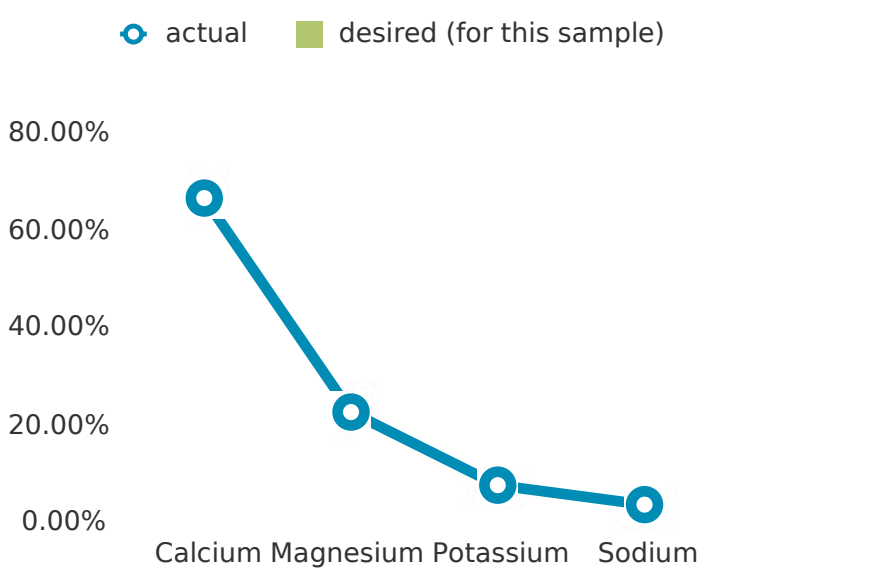
Element (ppm)	Ideal	Plant Available	Total Concentration	Saturated Paste	Status / Toxicity*
Calcium	6 : 1 Ca |Mg	1,234	4,937	290	OK
Magnesium	1:1 Mg|K	255.2	15,558	447	HIGH
Potassium	303-758	271.9	11,821	13	OK
Sodium	0.5 - 1.5%	75	75.0	75.0	HIGH
Aluminium			67,040		
Silicon	<100				
Phosphorus	30 - 50	0.0	0.18	0.005	LOW
Sulphur	30-50	32.0	160.0	<LOD	OK
Manganese	30 -100	51.5	117	<LOD	OK
Iron	40-200	39.9	13,300	24	LOW
Copper	2 - 50	0.0	0.0	0.0	LOW
Zinc	1 - 200	2.8	80.3	1.2	LOW
Molybdenum	0.5-2		3.8	0.0	
Cobalt	2-50		0.0	0.0	
Selenium	0.6-2		0.0	0.0	
Arsenic	<20		13.6	8.7	**100**
Cadmium	<1		0.0	0.0	**20**
Lead	<35		64.1	38.6	**300**
Mercury	<1		0.0	0.0	**15**
Nickel	1-20	0.0	0.0	0.0	**600**
Chloride	<100		0	0	
Other metals : Max recommended levels gardens soils					
Titanium			4,928	3,417	SIG

Element (ppm)	Ideal	Plant Available	Total Concentration	Saturated Paste	Status / Toxicity*
Chromium	<2		23.84	12.5	**100**
Strontium			55.56	32.28	SAFE
Yttrium			29.05	28.45	SAFE
Tin			0	0	**47000**
Antimony			0	0	**31**
Vandium			0	0	**550**
Gold			0	0	
Silver			0	36.7	

*** LOD – Limit of Detection**

CEC

	ideal ranges	desired (for this sample)	actual
Calcium	**65 – 85%**	80%	66.46%
Magnesium	**10 – 20%**	10%	22.52%
Potassium	**2 – 5%**	3.3%	7.51%
Sodium	**< 3%**	1.5%	3.51%
Aluminium		0.5%	
Hydrogen		10%	



WATER REPORT

ATOM EARTH PTY LTD | SOIL DOCTORS AUSTRALIA
PO Box 455, Floreat WA 6014

CLIENT :
LOCATION :

DATE : 18/09/2018
CLI ID :
LAND USE : Residential
SAMPLE : H Sun

RESULTS

Element (ppm)	Rain Water
pH (H_20)	7.1
EC (uS m)	236.0
SAR	
ELEMENT (ppm)	
Calcium	42.0
Magnesium	37.3
Potassium	0.0
Sodium	17.0
Phosphorus	14.0
Sulphur	0.0
Manganese	0.0
Iron	107.0
Copper	0.0
Zinc	0.0
Molybdenum	0.0
Cobalt	0.0
Selenium	0.0
Arsenic	0.0
Cadmium	0.0
Lead	38.7
Mercury	0.0
Nickel	0.0
Chloride	0.0
Other metals : Max recommended levels gardens soils	
Titanium	0.0
Chromium	0.0
Strontium	1.7
Yttrium	36.1

SATURATION

	ppm	mEq/L	% saturation
Calcium	**42.0**	2.1	35.31%
Magnesium	**37.3**	3.1	52.26%
Potassium	**0.0**	0.0	0.00%
Sodium	**17.0**	0.7	12.43%
TOTAL		5.9	

Element (ppm)	Rain Water
Zirconium	110.2
Antimony	0.0
Vandium	0.0
Gold	0.0
Silver	22.0

ANALYSIS

NOTES :

This sample has been tested for total nutrient concentrations, predicted exchangeable levels and saturated paste with irrigation (tap) water. Predicted exchangeable levels are the nutrients that exchange with cations on the soil colloid to become available for plant uptake. Saturated paste is an indication of the nutrients that are immediately available for uptake in the soil solution.

The topsoil sample is moderately acidic and exchangeable sodium is high. The presence of excessive sodium reverses the process of aggregation and causes soil aggregates to disperse into their constituent individual soil particles. The subsoil however, is less acidic and the ESP is not as high.

Calcium (Ca) is a macronutrient essential for all plants. The ability of a soil to supply this element is intimately tied to soil acidity because calcium is the main nonacid cation that reduces aluminum saturation and is a major constituent of most liming materials used to raise soil pH. The calcium status of soils has a major influence on the species composition and productivity.

In order to counteract the effect of excessive sodium on the exchange complex and to reinitiate the process of soil aggregation, calcium needs to be reintroduced into soil solution. The major issues arising from high sodium levels relative to the other exchangeable cations is on the physical properties of soil. In surface soil horizons this imbalance in the ratio of cations results in poor soil structure. This is evidenced by surface soil crusts or the setting of soil into large blocks on drying. As a result seedling germination and plant growth are problematic. Calcium deficiency has a direct impact on root growth.

Calcium carbonate (calcitic lime) is the recommended option (not dolomitic lime) and may be used interchangably with gypsum. Calcium carbonate will help to raise the pH .

The topsoil has high levels of manganese which is common in soil below pH 5.5 and can antagonise the uptake of iron.

Lead levels in the sub soil are high. Whilst topsoil levels are OK, care should be taken growing edible produce if the topsoil is to be removed.

NB: These recommendations been written specifically for the site/and or sites named above for which Atom Earth have been contracted to analyse. This blend may not be suitable for other sites as localised soil conditions may differ. For best performance from any fertiliser blend, soil sampling should be mandatory so as a site specific blend can be applied to avoid fertiliser wastage and environmental contamination. Atom Earth accepts no responsibility for the compatibility of the attached blend.

SOIL TEXTURE

Field Texture Grade	Behaviour of Moist Bolus	Ribbon Length (shearing between thumb and forefinger)	Approximate Clay Content (%)
Sand	Coherence nil to very slight, cannot be moulded; single sand grains adhere to fingers.	Nil	<10% (often <5%)
Loamy Sand	Slight coherence.	approx. 5 mm	5-10%
Clayey Sand	Slight coherence, sticky when wet; many sand grains stick to fingers; clay stains the hands.	5-15 mm	5-10%
Sandy Loam	Bolus just coherent but very sandy to touch; dominant sand grains are of medium size and are easily visible.	15-25 mm	10-20%
Loam	Bolus coherent and rather spongy; smooth feel when manipulated, no obvious sandiness or ?silkiness?; may be greasy to the touch if much organic matter is present.	approx. 25 mm	approx. 25%
Silty Loam	Coherent bolus; very smooth to silky when manipulated.	approx. 25 mm	approx. 25% (with silt)
Sand Clay Loam	Strongly coherent bolus, sandy to touch; medium size sand grains visible in finer matrix.	25-40 mm	>25%
Clay Loam	Coherent plastic bolus, smooth to manipulate.	40-50 mm	20-30%
Clay Loam, Sandy	Coherent plastic bolus; medium size sand grains visible in finer matrix.	40-50 mm	30-35%
Silty Clay Loam	Coherent smooth bolus; plastic and often silky to the touch.	40-50 mm	30-35% (with silt)
Sandy Clay	Plastic bolus; fine to medium sand grains can be seen, felt or heard in clayey matrix.	50-75 mm	35-40%
Light Clay	Plastic bolus; smooth to touch.	50-75 mm (slight resistance to ribbon shear)	35-40%
Light Medium Clay	Plastic bolus; smooth to touch.	approx. 75 mm (mod. resistance to ribbon shear)	40-45%
Medium Clay	Smooth plastic bolus; handles like plasticine; can be moulded into rods without fracture.	>75 mm (mod. resistance to ribbon shear)	45-55%
Heavy Clay	Smooth plastic bolus; handles like stiff plasticine; can be moulded into rods without fracture.	>75 mm (firm resistance to ribbon shear)	>50%

Glossary Terms

Bolus: the ball of soil formed by manipulating the soil by hand.
Coherence: the ball or bolus of soil holds together.
Parent material: weathered and unweathered rock or soil from which soil is formed.
Plasticity: the ball can be deformed and holds its new shape strongly; typical of clays.
Shearing: sliding the thumb across the soil to form a ribbon.
Silkiness: the smooth, soapy or slippery feel of silt.
Sodic: soils with a high level of exchangeable sodium (can lead to poor soil physical conditions).