Appendix G.1.1

Material Balance Calculations

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Material Balance - Phase 1

Construction: Cells H1, IN1, Solidification Plant, Site Infrastructure
Operational: Cells H1 & IN1
Capping & Restoration: Cell H1

Years 2011 to 2016

Construction Item	Description	Quantity	Source
Liner Barrier Clay	Engineered Clay (k < 1 x 10^{-9} m/s)	54,046 m^3	Imported/Site Won [1]
Liner Granular Layer (Haz Cell)	Granular Material (Clause 803 200mm thk)	6,120 m^3	Imported
Liner Barrier Geomembrane	HDPE Geomembrane Liner (2mm thk)	-	Imported
Liner Barrier DAC	DAC (140mm thk)	4,298 m^3	Imported
Liner Protection Layer	Geotextile (Non Woven Polyproplene)	18,000 sq.m	Imported
Liner Seperation Layer	Geotextile (Non Woven Polyproplene)	18,000 sq.m	Imported
Liner Basal Drainage Layer	Granular Stone (16-32mm)	9,000 m^3	Imported
Capping Barrier Clay	Engineered Clay (600mm thk)	16,800 m^3	Imported
Capping Barrier Geomembrane	Flexible VFPE Liner (1.5mm thk)	28,000 sq.m	Imported
Capping Drainage Layer	Drainage Geocomposite (2mm thk)	28,000 sq.m	Imported
Capping Subsoil	Subsoil (850mm thk)	23,800 m^3	Site Won
Capping Topsoil	Topsoil (150mm thk)	4,200 m^3	Imported/Site Won [1]
Sub-base and Hardcore	Granular Fill (Clause 803 and Clause 616 or similar)	38,000 m^3	Imported [2]
Excess spoil	Existing Subsoils & Shales	160,000 m^3	Export [3]

[1]. On site soil to be verified for suitability during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials.
[2]. Potential site sourced hardcore to be verified during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials

[3]. Excess subsoils excavated not required for construction or restoration (material suitability for site re-use to be assessed during construction)

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Material Balance - Phase 2

Construction: Cells H2, NH1, IN2 & IN3
Operational: Cells H2, NH1, IN2 & IN3
Capping & Restoration: Cells H2, IN3

Years 2014 to 2024

Construction Item	Description	Quantity	Source
Liner Barrier Clay	Engineered Clay (k < 1 x 10^{-9} m/s)	92,996 m^3	Imported/Site Won [1]
Liner Barrier Clay NH1 BES	Engineered Clay 1m thk	17,332 m^3	Imported
Liner Granular Layer (Haz Cell)	Granular Material (Clause 803 200mm thk)	6,404 m^3	Imported
Liner Barrier Geomembrane	HDPE Geomembrane Liner (2mm thk)	54,500 sq.m	Imported
Liner Barrier DAC	DAC (140mm thk)	4,483 m^3	Imported
Liner Protection Layer	Geotextile (Non Woven Polyproplene)	84,105 sq.m	Imported
Liner Seperation Layer	Geotextile (Non Woven Polyproplene)	84,105 sq.m	Imported
Liner Basal Drainage Layer	Granular Stone (16-32mm)	20,749 m^3	Imported
Capping Barrier Clay	Engineered Clay (600mm thk)	15,228 m^3	Imported
Capping Barrier Geomembrane	Flexible VFPE Liner (1.5mm thk)	70,247 sq.m	Imported
Capping Drainage Layer	Drainage Geocomposite (2mm thk)	70,247sq.m	Imported
Capping Subsoil	Subsoil (850mm thk)	68,017 m^3	Site Won
Capping Topsoil	Topsoil (150mm thk)	12,003 m^3	Imported/Site Won [1]
Sub-base and Hardcore	Granular Fill (Clause 803 and Clause 616 or similar)	163,000 m^3	Imported [2]
Excess spoil	Existing Subsoils & Shales	214,150 m^3	Export [3]

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[2]. Potential site sourced hardcore to be verified during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials

[3]. Excess subsoils excavated not required for construction or restoration (material suitability for site re-use to be assessed during construction)

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Material Balance - Phase 3

Construction: Cells H3, IN2 & IN3
Operational: Cells H3, NH1, IN1 & IN2
Capping & Restoration: Cells H3 & IN2

Years 2022 to 2034

Construction Item	Description	Quantity	Source
Liner Barrier Clay	Engineered Clay (k < 1 x 10^{-9} m/s)	10,786 m^3	Imported/Site Won [1]
Liner Granular Layer (Haz Cell)	Granular Material (Clause 803 200mm thk)	7,600 m^3	Imported
Liner Barrier Geomembrane	HDPE Geomembrane Liner (2mm thk)	-	Imported
Liner Barrier DAC	DAC (140mm thk)	5,320 m^3	Imported
Liner Protection Layer	Geotextile (Non Woven Polyproplene)	38,000 sq.m	Imported
Liner Seperation Layer	Geotextile (Non Woven Polyproplene)	38,000 sq.m	Imported
Liner Basal Drainage Layer	Granular Stone (16-32mm)	8,629 m^3	Imported
Capping Barrier Clay	Engineered Clay (600mm thk)	19,600 m^3	Imported
Capping Barrier Geomembrane	Flexible VFPE Liner (1.5mm thk)	32,666 sq.m	Imported
Capping Drainage Layer	Drainage Geocomposite (2mm thk)	32,666 sq.m	Imported
Capping Subsoil	Subsoil (850mm thk)	61,046 m^3	Site Won
Capping Topsoil	Topsoil (150mm thk)	10,773 m^3	Imported/Site Won [1]
Sub-base and Hardcore	Granular Fill (Clause 803 and Clause 616 or similar)	72,500 m^3	Imported [2]
Excess spoil	Existing Subsoils & Shales	106,000 m^3	Export [3]

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[1]. On site soil to be verified for suitability during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials.

[2]. Potential site sourced hardcore to be verified during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials

[3]. Excess subsoils excavated not required for construction or restoration (material suitability for site re-use to be assessed during construction)

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Material Balance - Phase 4

Construction: Cells NH2
Operational: Cells NH2 & IN1
Capping & Restoration: Cells NH2 & IN1

Years 2034 to 2036

Construction Item	Description	Quantity	Source
Liner Barrier Clay	Engineered Clay (k < 1 x 10^{-9} m/s)	29,834 m^3	Imported/Site Won [1]
Liner Barrier Clay NH1 BES	Engineered Clay (k < 1 x 10^{-9} m/s)	1,279 m^3	Imported
Liner Granular Layer (Haz Cell)	Granular Material (Clause 803 200mm thk)	-	Imported
Liner Barrier Geomembrane	HDPE Geomembrane Liner (2mm thk)	29,834 sq.m	Imported
Liner Barrier DAC	DAC (140mm thk)	-	Imported
Liner Protection Layer	Geotextile (Non Woven Polyproplene)	29,834 sq.m	Imported
Liner Seperation Layer	Geotextile (Non Woven Polyproplene)	29,834 sq.m	Imported
Liner Basal Drainage Layer	Granular Stone (16-32mm)	1,279 m^3	Imported
Capping Barrier Clay	Engineered Clay (600mm thk)	-	Imported
Capping Barrier Geomembrane	Flexible VFPE Liner (1.5mm thk)	16,753 sq.m	Imported
Capping Drainage Layer	Drainage Geocomposite (2mm thk)	16,753 sq.m	Imported
Capping Subsoil	Subsoil (850mm thk)	43,406 m^3	Site Won
Capping Topsoil	Topsoil (150mm thk)	7,460 m^3	Imported/Site Won [1]
Sub-base and Hardcore	Granular Fill (Clause 803 and Clause 616 or similar)	-	Imported [2]
Excess spoil	Existing Subsoils & Shales	-	Export [3]

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[1]. On site soil to be verified for suitability during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials.

[2]. Potential site sourced hardcore to be verified during construction. The numbers presented in the table represent 'worst case' scenario for importation of materials

[3]. Excess subsoils excavated not required for construction or restoration (material suitability for site re-use to be assessed during construction)

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