



**forestry, fisheries  
& the environment**

Department:  
Forestry, Fisheries and the Environment  
REPUBLIC OF SOUTH AFRICA

**RISK ASSESSMENT IN TERMS OF REGULATION 8 OF THE WASTE  
EXCLUSION REGULATIONS**

	(For official use only)
File Reference Number:	12/9/11
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Risk Assessment for an application for exclusion of waste stream or portion of waste stream in terms of the National Environmental Management: Waste Act, 2008(Act No.59 of 2008), as amended.

**Kindly note that:**

1. This form is current as of 01 April 2021. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
2. The information must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. Spaces are provided in tabular format and will extend automatically when each space is filled with typing.
3. Incomplete forms (including information as required in the application form may be returned to the applicant for revision and the inclusion of additional information.
4. Unless protected by law, all information filled in on this application will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this application on request, during any stage of the application process.

BACKGROUND INFORMATION	
APPLICANT	AECI Plant Health – of which AECI Ltd is the main company.
CONTACT PERSON	Ms Zodwa Mbizeni
NAME	Zodwa
ADDRESS	1st Floor AECI Place 24 The Woodlands Woodlands Drive 2196
E-MAIL ADDRESS	zodwa.mbizeni@aeciworld.com
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WASTE GENERATING FACILITY OR FACILITIES		
PHYSICAL ADDRESS OF FACILITY OR FACILITIES	AECI Plant Health - Modderfontein Industrial Complex, Modderfontein House, Nobel Ave, Modderfontein, 1645	
GPS CO-ORDINATES AT CORNERS OF WASTE GENERATING FACILITY OR FACILITIES	<b>LATITUDE</b>	<b>LONGITUDE</b>
	26°05'28.69"S	28°10'01.50"E
	26°05'29.66"S	28°10'07.58"E
	26°05'32.51"S	28°10'07.02"E
	26°05'31.25"S	28°10'00.89"E
WASTE STREAM OR PORTION OF A WASTE STREAM TO BE EXCLUDED FROM THE DEFINITION OF WASTE	<p>Three portions are to be excluded at the AECI Ltd's AECI Plant Health plant within the Modderfontein Industrial Complex. These three portions include:</p> <ul style="list-style-type: none"> <li>- Thermal Calcium Nitrate Sludge</li> <li>- Thermal Effluent Sludge</li> <li>- Thermal Magnesium Nitrate Sludge</li> </ul>	
BENEFICIAL USE/S	<p>The possible uses of waste:</p> <ul style="list-style-type: none"> <li>- Carrier for organic fertilizer</li> <li>- Filler in brick manufacturing</li> </ul>	

WASTE GENERATING PROCESS	
DETAILED DESCRIPTION OF WASTE GENERATING PROCESS <sup>1</sup>	<p>At AECI Plant Health they produce three types of solutions, namely:</p> <ul style="list-style-type: none"> <li>- Calcium nitrate Solution 50%,</li> <li>- Magnesium Nitrate Solution 35% and</li> <li>- Ammonium Nitrate Solution 21%.</li> </ul> <p>The Calcium Nitrate 50% Solution is produced by mixing water and 60% Nitric acid inside a reactor, they convey calcium carbonate powder via a bucket elevator into the reactor. After the recipe completion they test for specific gravity and add 25% Anhydrous ammonia into the reactor for pH correction. When the product specs are met, they transfer the liquor to a holding</p>

<sup>1</sup> A process flow chart must be attached with this form for the process description

	<p>tank and filter the liquor, removing the solids as waste and the liquid as final product.</p> <p>The Magnesium Nitrate Solution follows the same principle of production, and the raw material differs in that they use magnesium carbonate in place of calcium carbonate.</p> <p>The Ammonium Nitrate Solution is produced two ways: The first being dilution of a concentrated ammonium nitrate solution with weaker ammonium nitrate solution. Once the set specs are met, it is cooled and transferred for storage.</p> <p>The second process involves boiling weak ammonium nitrate liquor into spec of 21%.</p>	
<b>PRODUCTION PROCESS FLOW CHART ATTACHED</b>	<b>YES</b> Annexure D of the main application document.	<b>NO</b>
<b>WASTE CLASSIFICATION</b>	<b>HAZARDOUS</b>	<b>GENERAL</b>
<b>IF HAZARDOUS LIST THE HAZARDS OF THE WASTE</b>	<p>Calcium Nitrate Sludge (See Annexure E of the main application document):</p> <ul style="list-style-type: none"> <li>- Explosive, Corrosive and Oxidising Waste which, in the conditions of a landfill, is explosive, corrosive or oxidizing (according to SANS 10234 or SANS 10228) is prohibited from landfill disposal. The waste has been identified as a potentially strong oxidiser based on the concentration of calcium nitrate. It is plausible that compound/s may differ and, therefore, that this restriction may not apply; however, it has been conservatively recognized.</li> <li>- Potential Hazard Statement codes of Relevance: <ul style="list-style-type: none"> <li>- H272: May intensify fire, oxidiser – Hazardous unless proven otherwise by detailed assessment</li> <li>- H302: Harmful if swallowed – Hazardous unless proven otherwise by detailed toxicological assessment</li> <li>- H315: Causes skin irritation – Hazardous unless proven otherwise by detailed toxicological assessment</li> <li>- H318: Causes serious eye damage – Hazardous unless proven otherwise by detailed toxicological assessment</li> </ul> </li> </ul> <p>Effluent Sludge (See Annexure E of the main application document):</p> <ul style="list-style-type: none"> <li>- Liquid waste Liquid wastes are prohibited from landfill disposal without being stabilised by pre-treatment. This restriction came into effect in August 2019.</li> <li>- Potential Hazard Statement codes of Relevance: <ul style="list-style-type: none"> <li>- H272: May intensify fire, oxidiser – Hazardous unless proven otherwise by detailed assessment.</li> <li>- H302: Harmful if swallowed – Hazardous unless proven otherwise by detailed toxicological assessment.</li> <li>- H315: Causes skin irritation – Hazardous unless proven otherwise by detailed toxicological assessment.</li> </ul> </li> </ul>	

- H318: Causes serious eye damage – Hazardous unless proven otherwise by detailed toxicological assessment.

Magnesium Nitrate Sludge (See Annexure E of the main application document):

- Explosive, Corrosive and Oxidising  
Waste which, in the conditions of a landfill, is explosive, corrosive or oxidizing (according to SANS 10234 or SANS 10228) is prohibited from landfill disposal. The waste has been identified as a potentially strong oxidiser based on the concentration of magnesium nitrate. It is plausible that compound/s may differ and, therefore, that this restriction may not apply; however, it has been conservatively recognised.
- Potential Hazard Statement codes of Relevance:
  - H272: May intensify fire, oxidiser – Hazardous unless proven otherwise by detailed assessment
  - H317: May cause an allergic skin reaction – Hazardous unless proven otherwise by detailed toxicological assessment
  - H318: Causes serious eye damage – Hazardous unless proven otherwise by detailed toxicological assessment
  - H335: May cause respiratory irritation – Hazardous unless proven otherwise by detailed toxicological assessment
  - H350: May cause cancer – Hazardous unless proven otherwise by detailed toxicological assessment
  - H360: May damage fertility or the unborn child - Hazardous unless proven otherwise by detailed toxicological assessment
  - H402: Harmful to aquatic life - Hazardous unless proven otherwise by detailed eco-toxicological assessment
  - H412: Harmful to aquatic life with long lasting effects – Hazardous unless proven otherwise by detailed eco-toxicological assessment

**RISK ASSESSMENT WITHOUT MITIGATION**

PROCESS AREA	ACTIVITY	RISK DESCRIPTION	ENVIRONMENTAL RECEPTORS	ASSESSMENT OF RISK					SIGNIFICANCE
				Impact	Probability	Magnitude	Duration	Scale	
Aluminium Sulphate Plant	Storage of Dangerous Goods - Corrosive products - Sulphuric Acid	Pipeline leaks during filling of storage and from storage to reactor	Soil Surface water/storm water	<b>Ground pollution. Possible storm water pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	2	4	1/2	1/2	16
Aluminium Sulphate Plant	Storage of Dangerous Goods - Low hazard - Aluminium Tri-Hydrate	Spill during transportation, loading or storage.	Environmental pollution (Ambient)	Environmental pollution (Ambient)	2	4	1/2	1/2	16
Aluminium Sulphate Plant	Production and Storage of Dangerous Goods - Corrosive product - Aluminium Sulphate Solution	Spill during transportation, loading or storage.	Soil Surface water/storm water	<b>Ground pollution. Possible storm water pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution,	2	4	1/2	1/2	16

				depending on the volume spilled.					
<b>Aluminium Sulphate Plant</b>	Waste - Aluminium Sulphate Sludge - Corrosive	Spill during transportation, loading or storage.	Soil Surface water/storm water	<b>Ground pollution. Possible storm water pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	2	4	1/2	1/2	16
<b>Aluminium Sulphate Plant</b>	Waste from Aluminium production - Empty bulk bag and pallets - Low Hazard	Contaminated Bulk Bag	Soil Surface water/storm water	<b>Ground pollution. Possible surface water pollution –</b> When empty bags are not properly disposed of, some of the remaining substances may end up in the surface water or in the soil.	1	4	1/2	1/2	8
<b>Aluminium Sulphate Plant</b>	Waste water from washing filter press (effluent) - Low hazard	Waste water	Soil Surface water/storm water Groundwater	<b>Possible storm water and ground pollution</b> should a spill occur, the soil may be contaminated, which could	1	2	1/2	1/2	6

				lead to the effluent ending up in the groundwater or surface water.					
<b>Aluminium Sulphate Plant</b>	Sludge waste from process - Oxidiser - Hazardous	Corrosive sludge	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	2	4	1/2	1/2	16
<b>Aluminium Sulphate Plant</b>	Production and Storage of Dangerous Goods - Corrosive product - Alumium Sulphate Solution - Emission	Emission - COx, NOx and SOx gases	Air	Air pollution through emissions.	3	2	1/2	1/2	18
<b>Ferti Liquid Plant</b>	Offloading of Dangerous Goods - Hazardous - Ammonium Nitrate Solution (88-89.5%)	Spill during off-loading (when received from the tanker) Explosive products	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may	1	2	1/2	1/2	6

				create water pollution, depending on the volume spilled.					
<b>Ferti Liquid Plant</b>	Production of Dangerous Goods - Low Hazard - Ammonium Nitrate Solution (21%)	Spill during production in boiling	Soil	<b>Ground pollution</b> should the spill occur the topsoil may become contaminated.	1	2	1/2	1/2	6
<b>Ferti Liquid Plant</b>	Loading of Dangerous Goods - Low Hazard - Ammonium Nitrate Solution (21%)	Spill during loading	Soil	<b>Ground pollution</b> should the spill occur the topsoil may become contaminated.	1	2	1/2	1/2	6
<b>Ferti Liquid Plant</b>	Production of Dangerous Goods - Low Hazard - Urea Ammonium Nitrate Solution (32%)	Spill during production	Soil	<b>Ground pollution</b> should the spill occur the topsoil may become contaminated.	1	2	1/2	1/2	6
<b>Ferti Liquid Plant</b>	Production of Dangerous Goods - Low Hazard - Urea Ammonium Nitrate Solution (21 and 32%) - Emissions	Emission - COx, NOx and Sox gases	Air	Air pollution through emissions	3	2	1/2	1/2	18
<b>Ferti Liquid Plant</b>	Loading of Dangerous Goods - Low Hazard - Urea Ammonium Nitrate Solution (32%)	Spill during loading	Soil	<b>Ground pollution</b> should the spill occur the topsoil may become contaminated.	1	2	1/2	1/2	6
<b>Calmag Plant</b>	Production of Dangerous Goods - Low Hazard - Calcium Nitrate and Magnesium Nitrate	Spill during loading, off-loading or storage. Low hazard product	Storm water/ surface water	<b>Possible storm water pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to	2	4	1/2	1/2	16



				storm water drains in the area around					
<b>Calmag Plant</b>	Storage of Dangerous Goods - Low Hazard - Calcium and Magnesium Carbonate	Spill during off-loading. Low Hazard	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	3	4	1/2	1/2	24
<b>Calmag Plant</b>	Waste from Calmag production - Empty bulk bag and pallets - Low Hazard	Contaminated Bulk bags	Soil Surface water/storm water	<b>Ground pollution. Possible surface water pollution –</b> When empty bags are not properly disposed of, some of the remaining substances may end up in the surface water or in the soil.	1	4	1/2	1/2	8
<b>Calmag Plant</b>	Waste water from washing plant reactors and filter press (Effluent) - Low hazard	Waste water	Soil Surface water/storm water Groundwater	<b>Possible storm water and ground pollution</b> should a spill occur, the soil may be contaminated, which could lead to the	1	4	1/2	1/2	8

				effluent ending up in the groundwater or surface water.					
<b>Calmag Plant</b>	Sludge waste from process - Oxidiser - Hazardous	Spill during loading into farmers truck - Oxidiser - Hazardous	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	2	4	1/2	1/2	16
<b>Calmag Plant</b>	Production of Dangerous Goods - Low Hazard - Calcium Nitrate and Magnesium Nitrate Emissions	Emission - COx, NOx and SOx gases	Air	Air pollution through emissions.	3	2	1/2	1/2	18
<b>Calmag Plant</b>	Empty Bulk bag and Pallets	Environmental pollution - water and ground	Soil Surface water/storm water	<b>Ground pollution. Possible surface water pollution –</b> When empty bags are not properly disposed off, some of the remaining substances may end up in the surface water or in the soil.	2	4	1/2	1/2	16

Urea Plant	Production of product - Urea Solution43% - Acetic acid - Corrosive and Low Hazard	Spill during production, loading onto and tanker, tank overflow	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	1	4	1/2	1/2	8
Urea Plant	Storage of product - Urea - Pallets Low Hazard	Spill during storage	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	1	4	1/2	1/2	8
Urea Plant	Waste from Urea production - Empty bulk bag and pallets - Low Hazard	Contaminated empty bulk bag and used pallets	Soil Surface water/storm water	<b>Ground pollution. Possible surface water pollution –</b> When empty bags are not	2	4	1/2	1/2	16

				properly disposed off, some of the remaining substances may end up in the surface water or in the soil.					
<b>Urea Plant</b>	Storage of product - Acetic acid - Corrosive and Low Hazard	Spill during storage or transferring from the 210L drum into a 10L drum.	Soil Surface water/storm water	<b>Possible storm water and ground pollution</b> should the spill occur outside in the vicinity of the storm water drains around the plant. Runoff to storm water drains in the area around the plant may create water pollution, depending on the volume spilled.	2	4	1/2	1/2	16

The following factors and criteria must be used to assess the impacts of the activities:

<b>CRITERIA</b>	
<b>Magnitude (Severity)</b>	<b>Duration</b>
10 – Very high	5 – Permanent (longer than 10 years)
8 – High	4 – Long term (5 – 10 years)
6 – Moderate	3 – Medium term (12 months to 5 years)
4 - Low	2 – Short term (< 12 months)
2 - Minor	1 – Immediate
<b>Scale</b>	<b>Probability (Likelihood)</b>
5 – International	5 – Definite
4 – National	4 – Highly probable
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site only	1 – Improbably
0 – None	0 - None

### **Magnitude**

Measures the size of the impact

### **Duration**

Duration refers to the lifetime of the impact i.e. how long it will last

### **Scale**

The scale refers to the extent of the impact

### **Probability**

The probability refers to the chance of the impact to occur. The potential impact could be most likely to occur, unlikely, etc.

### **Assessment of Significance of Impact**

Significance rating of the potential impact illustrates the importance of the impact itself. The size of the area affected by pollution may be extremely high but the significance of this effect is dependent on the concentration or level of pollution in that area. In order to determine the significance of an impact, the following method should be used:

$$\text{Significance (S)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The values of S must then be categorised as follows:

<b>RATING</b>		<b>DESCRIPTION</b>
SP > 60	High significance	An impact which could influence the decision about whether or to proceed with the activities regardless of any possible mitigation
SP 30 - 60	Moderate significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated
SP < 30	Low significance	Impacts with little real effect and which will not have an influence on or require modification of the activities
+	Positive impact	An impact that is likely to result in a positive consequence/effect

I, Quintin Mark Cross (the Applicant) hereby declare that I have read the completed Risk Assessment form and hereby confirm that the information is, to the best of my knowledge, true and correct

Furthermore, I declare that I am fully aware of my responsibilities in terms of the Waste Exclusion Regulations, and that failure to comply with these Regulations may constitute an offence in terms of the National Environmental Management: Waset Act, 2008 (Act 59 of 2008).

\_\_\_\_\_  
Signature of the applicant<sup>2</sup>/ Signature on behalf of the applicant:

\_\_\_\_\_  
Name of Applicant:

\_\_\_\_\_  
Designation

\_\_\_\_\_  
Date:

\_\_\_\_\_  
<sup>2</sup> If the applicant is a juristic person, a signature on behalf of the applicant is required as well as proof of such authority.