

Kentucky Department for Environmental Protection, Division of Waste Management
Response to Comments on Two Proposed Hazardous Waste Permit Modifications

Public Noticed on July 25, 2021

Blue Grass Army Depot, EPA ID: KY8-213-820-105, AI #2805

Comment:

What is the composition of agent [hydrolysate] how will it be disposed?

Division Response:

The reaction of chemical agent with a caustic solution (sodium hydroxide) produces hydrolysate. Hydrolysate is corrosive (pH >12.5) and will carry the corresponding D002 waste code as well as the applicable agent codes (N301 for GB and N302 for VX) and other applicable waste codes per 401 KAR 39:060 Section 3(4). Hydrolysates will be required to meet 99.9999 percent destruction and removal efficiency (DRE) for agent prior to shipment.

The permit requires that GB agent hydrolysate shall not be released from the Munitions Demilitarization Building (MDB) unless it is cleared to less than 52 µg/L GB. VX agent hydrolysate shall not be released from the MDB unless it is cleared to less than 80 µg/L VX.

Approximately 1,800,000 gallons of hydrolysate will be shipped in about 450 tanker truckloads to the Veolia North America facility in Port Arthur, Texas for incineration. The application includes Transportation Risk Assessments, which have been conducted to demonstrate that the shipment of hydrolysate will be protective of human health and the environment.

Here is the hydrolysate composition, from the permit application:

VX Agent Hydrolysate		
Chemical Name	Formula or Abbrev.	wt.%
Sodium methylphosphonate	MPA-NA2	0.81
Water	H2O	75.72
Sodium diisopropylaminoethanethiol	RSNA	10.56
Sodium ethyl methylphosphonate	EMPA-NA	7.89
Sodium Hydroxide	NaOH	3.80
Ethanol	C2H6O	0.26
Dicyclohexylcarbodiimide	DCCDI	0.26
Diisopropylcarbodiimide	DICDI	0.05
Diisopropylamine	DIPA	0.02
1,3-diisopropylurea	DIPU	0.05
Bis(2-diisopropylaminoethyl) disulfide	RSSR	0.23
Nitrogen	N2	0.007
Other Organics	ORGANICS	0.377
Soap	SOAP	0.008

GB Agent Hydrolysate

Chemical Name	Formula or Abbrev.	wt. %
Water	H ₂ O	87.69
Sodium Isopropyl Methylphosphonate	IMPANA	7.63
Sodium Hydroxide	NaOH	1.93
Sodium Fluoride	NaF	1.83
Isopropyl Alcohol	C ₃ H ₈ O	0.32
Other Organics	ORGANICS	0.21
Tributylamine	TBA	0.20
1,3-diisopropylurea	DIPU	0.13
Isopropyl methylphosphonic Acid	IMPA	0.04
Chloroform	CHCl ₃	4.9E-03
Isopropyl Fluoride	C ₃ H ₇ F	2.2E-03
Nitrogen	N ₂	1.1E-03
Oxygen	O ₂	3.1E-10