Hi Volt Ltd

Ballyduff, Thurles, Co. Tipperary

Firewater Retention Risk Assessment

Report Date:

7th May 2021

KD Environmental Ltd.

1 Swiftbrook Glen, Virginia, Co. Cavan

Report No: 2021/25/01

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Appendices

1.0 Introduction

KD Environmental Ltd. was commissioned by Antoinette Russell, Manager with Hi Volt Ltd. to carry out a Fire Water Retention Risk Assessment (FWRRA) for the Hi Volt facility at Ballyduff, Thurles, Co. Tipperary.

Hi Volt have been granted an EPA licence, W0267-01, for activities on site. The following waste activities are permitted on site under W0267-01 in accordance with the Fourth Schedule of the Waste Management Acts 1996 to 2010:

- Class 2. Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological processes).
- Class 3 Recycling or reclamation of metals and metal compounds.
- Class 4 Recycling or reclamation of other inorganic materials.
- Class 13 Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

EPA waste licence W0267-01 requires that;

Condition 3.12: The licensee shall carry out a risk assessment to determine if the activity should have a fire-water retention facility. The licensee shall submit the assessment and a report to the Agency on the findings and recommendations of the assessment within six months of the date of grant of this licence.

Condition: 3.13 In the event that a significant risk exists for the release of Contaminated fire-water, the licensee shall, based on the findings of the risk assessment, prepare and implement, with the agreement of the Agency, a suitable risk management programme. The risk management programme shall be fully implemented within thee months of date of notification by the Agency.

In order to calculate the potential volume of firewater that could be generated from a fire at the Hi Volt facility and to determine if the retention of firewater is necessary in the first instance, a Firewater Risk Assessment was conducted for the Hi Volt facility as per the EPA Guidance on Retention Requirements for Firewater Run-off, issued by the EPA in 2019.

This report has been drafted based on information provided by Hi Volt and EPA guidance. A site assessment made by David Kelly BSc. MSc. of KD Environmental Ltd. on 22nd April 2021. During this site visit, relevant personnel were interviewed, fire abatement equipment on site was verified and the sites emergency response to a fire was reviewed. A full inventory of materials on site was made and a site walkaround was conducted to estimate the total hardstand area of the site and the existing firewater retention facility. The EPA excel based Firewater Risk Assessment tool was utilised to determine firewater run-off risk and the volume of firewater generated by a fire at the Hi Volt facility in Thurles.

2.0 Firewater Retention Qualifying Criteria

There are two qualifying criteria:

1. Environmentally Hazardous Substance Storage Thresholds;

2. Environmental Receptor Criteria for sites whose activities involve potentially polluting substances.

If a site meets either of these criteria, firewater retention is required. If a site does not meet these criteria, then a firewater risk assessment is completed to determine whether firewater retention is required.

2.1 Storage Thresholds

The storage thresholds that require a licensed facility to have a firewater retention facility are detailed in the table below;

Hazard Statement	Hazard Details	Storage Quantity (tonnes)[5]
H400 H410	Very toxic to aquatic life Very toxic to aquatic life with long lasting effects	1
OR		
H401 H411	Toxic to aquatic life Toxic to aquatic life with long lasting effects	10
OR		
H402 H412	Harmful to aquatic life Harmful to Aquatic Life with Long Lasting Effects	100
OR		
H413	May Cause Long Lasting Harmful Effects to Aquatic Life	1,000

An inventory of materials and chemicals stored at the Hi Volt facility in Thurles was conducted including the identification of listed hazards as per MSDS and this inventory is included as Appendix 1 to this report. In summary the quantity of materials containing environmental hazards exceeds the listed quantities in the above table and therefore Hi Volt is required to have an adequate retention facility on site for firewater.

2.2 Environmental Receptors

Stormwater from the Hi Volt yards and waste storage bays is collected and passes through an interceptor before percolation to ground. Stormwater from the roofs of waste storage buildings and the main warehouse flows into a separate stormwater drainage system before discharge to the River Drish which runs adjacent to the Hi Volt facility.

1. Drinking Water Abstraction: There is no drinking water abstraction from the River Drish. The River Drish is small sized river. Abstraction for watering livestock is likely to occur downstream of the Hi Volt facility.

2. Designated bathing waters – not applicable

3. Freshwater pearl mussel rivers –The River Drish is a designated sensitive area under the Urban Waste Water Treatment Regulations (SJ No. 254 of 2001 as amended) (UWWT Regulations) and or a designated Freshwater Pearl Mussel Margaritifera margaritifera site. The first Schedule of the European Communities Environmental Objectives (Fresh water Pearl Mussel) Regulations S.I No. 296 of 2009 (Pearl Mussel Regulations 2009) lists the 27 designated Freshwater Pearl Mussel sites. The River Drish is not designated under this legislation for freshwater pearl mussel. One section of the River Suir is but this is at the lower Suir and a many miles distance downstream.

4. Designated shellfish waters – not applicable

5. Water bodies characterised as High Status under the Water Framework Directive – The River Drish is not designated as sensitive water under the UWWT Regulations. The River Suir is but this is at the Suir estuary and a large distance downstream.

6. Special Areas of Conservation (SAC) and Special Protection Areas (SPA) – The Lower River Suir is a Special Area of Conservation (Site Code 002137). Although the River Drish that receives stormwater from Hi Volt facility has a direct hydrological link to this protected area, the boundary of the SAC is in the lower reaches of the River Suir and approximately 60Km from Hi Volt. Therefore stormwater does not discharge directly to a protected area.

3.0 Firewater Risk Assessment

The EPA excel based tool for the assessment of fire risk for the Hi Volt facility was completed. The significance of a fire at Hi Volt was scored based on the volume of materials stored on site. The quantity of materials containing environmental hazards exceeds the listed quantities in the above table and therefore Hi Volt is required to have an adequate retention facility. The waste oil storage tank can contain up to 60m^3 of waste oil. This oil is transported as an environmentally hazardous material under UN No. 3082 and was therefore determined to carry a H411 risk phrase - Toxic to aquatic life with long lasting effects. The oil in this tank is a mix of oils collected from a number of locations.

3.1 Significance of a Fire

The table below from the EPA fire risk tool has been completed and this has classed a fire at Hi Volt in Thurles as being S3, of High Significance.

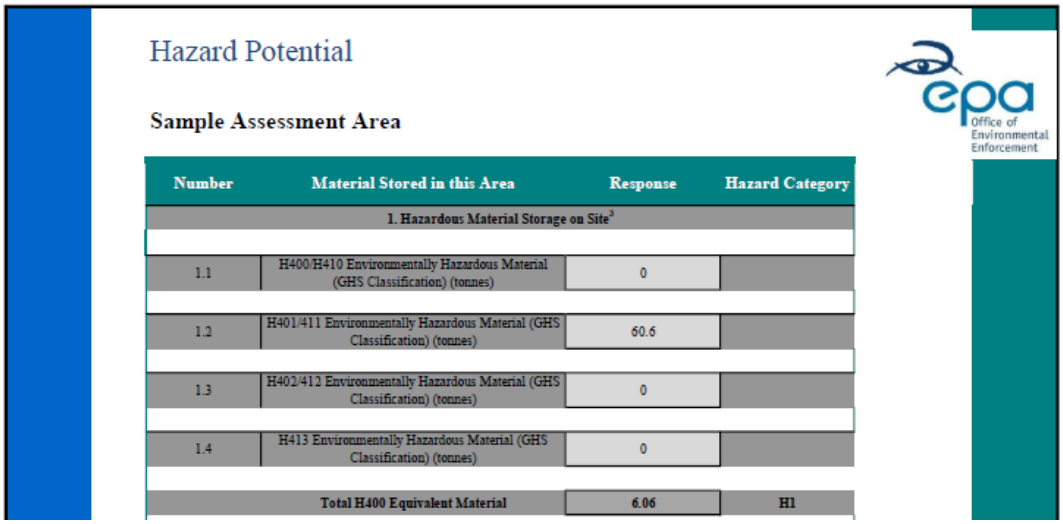
Significance of Fire Event

Sample Assessment Area

Number	Fire Protection Measures in this Area	Response		
	1. Fire Prevention Measures			
1.1	Fire Detection and Alarm Systems (FDAS) - IS 3218:2013	Yes	EN54-2 & EN54-4	
1.2	Automatic Fire Protection	No		
	2. Materials Stored	Tonnes	Substance Name(s)	
	H224 (extremely flammable)	0		Tonnes
	H225 (highly flammable)	0		Tonnes
	H226 (flammable)[1]	0		Tonnes
2.1	Flammable Liquids Storage	0		Tonnes
	H220 (extremely flammable)	0		Tonnes
	H221 (flammable)	0		Tonnes
2.2	Flammable Gas Storage	0		Tonnes
	H228 (flammable)	0		Tonnes
2.3	Flammable Solids Storage	0		Tonnes
	H227 Combustible Liquids	0		Tonnes
	Waste	5		Tonnes
	Packaging (including pallets)	20		Tonnes
	Plastic (if not in packaging above)	0		Tonnes
	Oils/fuels (not classified as flammable)	30		Tonnes
	Process materials (not classified as flammable)	2		Tonnes
	Any other combustible material	200		Tonnes
2.4	Combustible Materials Storage	235		Tonnes
	Percent of S1 Storage	13750%		
	Percent of S2 Storage	817%		
	Percent of S3 Storage	188%		
			2.0	
	Fire Significance		S3 - High Significance	

3.2 Hazard Potential

The Environmental Hazard potentials for a fire at Hi Volt was also determined from the quantities on site of materials that carry an environmental risk. Very small volumes of materials with H400-413 risks are kept on site at Hi Volt. This results in an environmental potential of H_1 as having an Environmental Hazard Potential, as per the EPA worksheet for firewater risk.

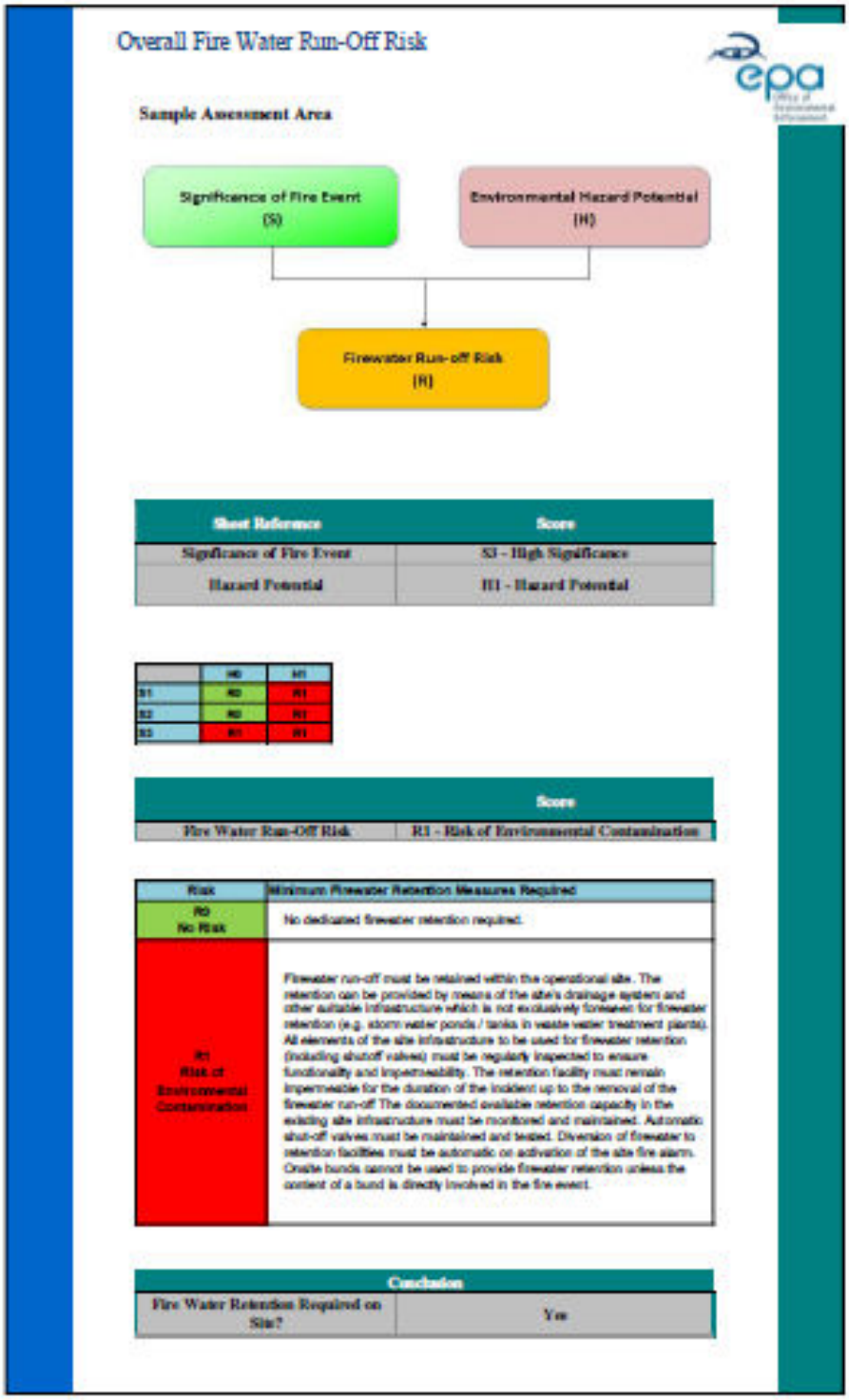


Hazard Potential

Sample Assessment Area

Number	Material Stored in this Area	Response	Hazard Category
	1. Hazardous Material Storage on Site[3]		
1.1	H400/H410 Environmentally Hazardous Material (GHS Classification) (tonnes)	0	
1.2	H401/411 Environmentally Hazardous Material (GHS Classification) (tonnes)	60.6	
1.3	H402/412 Environmentally Hazardous Material (GHS Classification) (tonnes)	0	
1.4	H413 Environmentally Hazardous Material (GHS Classification) (tonnes)	0	
	Total H400 Equivalent Material	6.06	H1

The overall run-off risk for a fire at Hi Volt was then scored using the table below



Overall Fire Water Run-Off Risk

epa

Sample Assessment Area

Significance of Fire Event (S)

Environmental Hazard Potential (H)

Firewater Run-off Risk (R)

Sheet Reference	Score
Significance of Fire Event	S3 - High Significance
Hazard Potential	H1 - Hazard Potential

	H0	H1
S1	R0	R1
S2	R0	R1
S3	R1	R1

	Score
Fire Water Run-Off Risk	R1 - Risk of Environmental Contamination

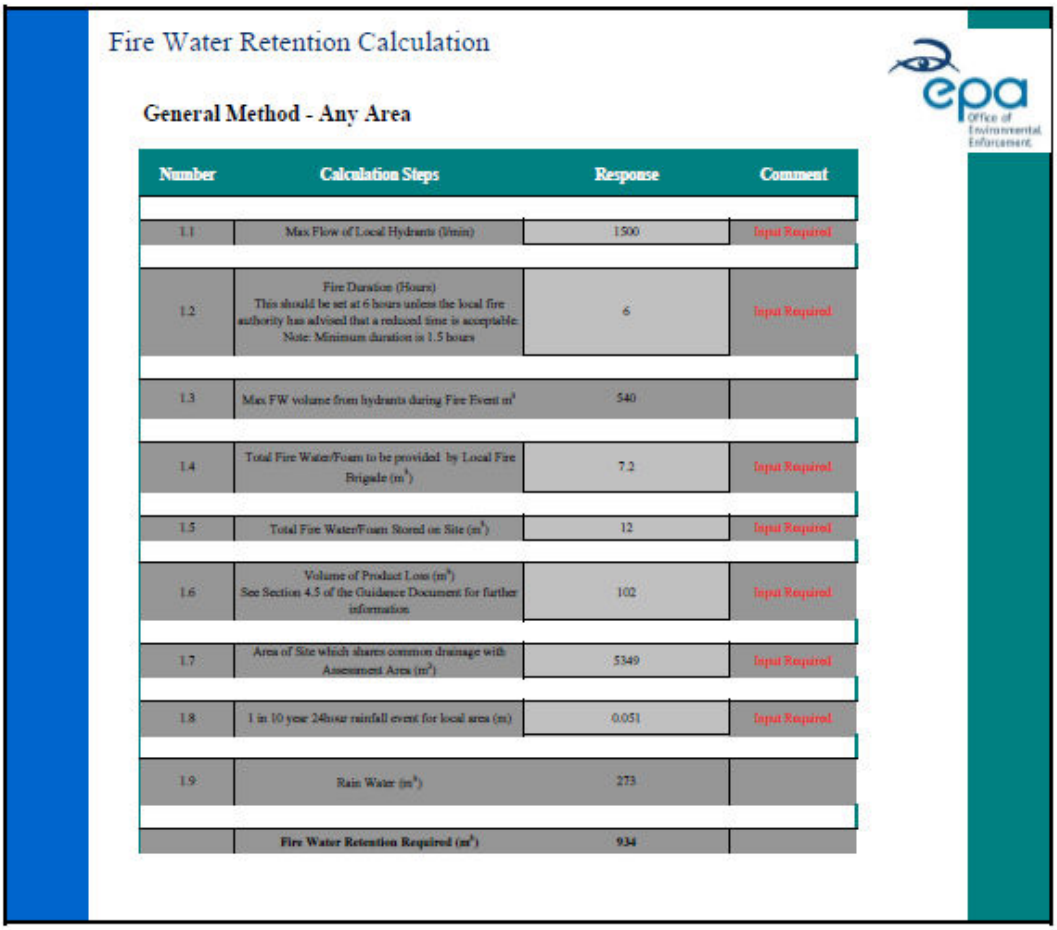
Risk	Minimum Firewater Retention Measures Required
R0 No Risk	No dedicated firewater retention required.
R1 Risk of Environmental Contamination	Firewater run-off must be retained within the operational site. The retention can be provided by means of the site's drainage system and other suitable infrastructure which is not exclusively foreseen for firewater retention (e.g. storm water ponds / tanks in waste water treatment plants). All elements of the site infrastructure to be used for firewater retention (including shut-off valves) must be regularly inspected to ensure functionality and impermeability. The retention facility must remain impermeable for the duration of the incident up to the removal of the firewater run-off. The documented available retention capacity in the existing site infrastructure must be monitored and maintained. Automatic shut-off valves must be maintained and tested. Diversion of firewater to retention facilities must be automatic on activation of the site fire alarm. Onsite bunds cannot be used to provide firewater retention unless the content of a bund is directly involved in the fire event.

Conclusion	
Fire Water Retention Required on Site?	Yes

A fire at the Hi Volt facility in Thurles was scored as R1, and therefore a dedicated firewater retention facility is required.

4.0 Calculation of Firewater Volume

The volume of firewater generated by a fire at Hi Volt in Thurles was calculated using method 3 of the EPA firewater risk assessment tool as presented in the table below:



Fire Water Retention Calculation

General Method - Any Area

Number	Calculation Steps	Response	Comment
1.1	Max Flow of Local Hydrants (l/min)	1500	Input Required
1.2	Fire Duration (Hours) This should be set at 6 hours unless the local fire authority has advised that a reduced time is acceptable. Note: Minimum duration is 1.5 hours	6	Input Required
1.3	Max FW volume from hydrants during Fire Event m^3	540	
1.4	Total Fire Water/Foam to be provided by Local Fire Brigade (m^3)	7.2	Input Required
1.5	Total Fire Water/Foam Stored on Site (m^3)	12	Input Required
1.6	Volume of Product Loss (m^3) See Section 4.5 of the Guidance Document for further information	102	Input Required
1.7	Area of Site which shares common drainage with Assessment Area (m^2)	5349	Input Required
1.8	1 in 10 year 24hour rainfall event for local area (m)	0.051	Input Required
1.9	Rain Water (m^3)	273	
	Fire Water Retention Required (m^3)	**934**	

A 1 in 10 year rainfall event was included in the calculation using Met Eireann data from the weather station at Littleton, Co. Tipperary. There are no fire hydrants on site – it is suggested that the firewater tank at the side of the main warehouse is fitted with a fire hose connection to allow the fire services to conned hoses to this tank.

There are currently no firewater hydrants on site at Hi Volt. For the calculation of total firewater produced, the default of two hydrants on site has been used as per EPA guidance. It is recommended that Hi Volt establish additional firewater supplies on site to the 12m^3 tank that currently exists. As per the table above, a hydrant water delivery rate of 1.5m^3/min over a six hour fire and four fire fighting units attending the fire has been used in calculating firewater volume (as per EPA guidance. The area for collection of rainfall includes all hardstand and waste storage bays.
This was estimated during a site walkaround on 22nd April.
A total firewater volume of 934m^3 was calculated for a fire at the Hi Volt facility in Thurles. This includes all water used to abate a fire, all aqueous materials held on site and all rainfall during a 1 in 10 rainfall event. This is a worst case scenario and the generation of such a large volume of firewater is highly unlikely.

5.0 Site Response to Fire

5.1 Fire Fighting Equipment and Water Supply

There is fire abatement equipment strategically placed throughout the Hi Volt facility in Thurles that may be utilised in tackling small scale fires. All fire extinguishers are covered under a maintenance contract with Everard Fire Safety who performs annually maintenance visits on fire extinguishers. Extinguishers were last inspected and serviced in October 2020.

A summary list of fire abatement equipment on site is provided below;

- Fire extinguishers =16
- Break glass alarm = 2
- Fire hose reels = 0
- Fire suppression units = 1

There are no fire hydrants located on site. However there is a 12m^3 firewater tank located at the side of the main warehouse. It is recommended that a coupling to allow fire services hoses be fitted to this tank. Hi volt should review the firewater supplies on site in consultation with North Tipperary Fire Services. For the purpose of calculating firewater volume the EPA default of two hydrants on site supplying water at 1,500l/min over a six hour fire have been used.

5.2 Staff Fire & Emergency Response Training

There have been no fire drills and emergency evacuation drills performed on site to date. There is an evacuation assembly point at the entrance gate.

Staff received fire awareness training and training in the use of fire extinguishers by Everard Fire in 2018. A designated fire warden should be chosen among staff and trained in site evacuation and drills.

5.3 Fire Station Response

Thurles Fire Station is located 8Km from the Hi Volt facility and the travel time for emergency services is less than 5 minutes. As per EPA guidance a six hour fire attended by four fire fighting units has been used in calculating the firewater volume.

6.0 Design Features

6.1 Materials Storage

There is a high number of chemicals and new oils stored on site and much of this is unbunded. The 'Copper Shed' is a bunded storage and some of the larger oils and chemical storage drums/IBC are stored on chemical storage bunds. The 60m^3 waste oil tank is double skinned.

Under EPA waste licence W0267-01:

3.9.2 All hazardous waste storage areas and all tank, container and drum storage areas shall, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following: (i) 11 0% of the capacity of the largest tank or drum within the bunded area; or (ii) 25% of the total volume of substance that could be stored within the bunded area.

6.9 The integrity and water tightness of all underground pipes, tanks, bunding structures and containers and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated by the licensee within six months of the date of grant of this licence. This testing shall be carried out by the licensee at least once every thee years thereafter and reported to the Agency on each occasion. This testing shall be carried out in accordance with any guidance published by the Agency. The licensee shall maintain a written record of all integrity tests and any maintenance or remedial work arising from them.

Hi Volt need to ensure that all materials stored on site are bunded and that these bunds are integrity inspected. This includes the storage of new oils and chemicals intended for sale and supply.

6.2 Sprinkler System

There is no sprinkler system on site at Hi Volt.

6.3 Alarms and Detection

There are two fire alarm break glass units located in the main warehouse. If break glass units are activated this should set off the alarm. However, there was a fault with the alarm on the day of the site visit. Hi Volt have organised for a service and inspection of the fire alarm by MR Alarms.
Hi Volt communicated that the fire alarm is a local alarm only and is not linked to the security system or externally monitored. In the event of a fire when the site is not manned there is no automatic notification of emergency services that a fire has broke out on site and therefore a large scale fire could develop on site.

6.4 Building Structure

The building materials at the Hi Volt facility are mainly inert and non-combustible such as metal cladding, cement and brick.
Some internal walls and doors are wooden.
The use of non-combustible construction materials greatly reduces the risk of large scale fire forming and the spread of fire.

6.5 Surface Water Drainage

A site map of the drainage system on site is included as Appendix 2 of this report. Stormwater from roofs of the main warehouse is collected separately from rainfall onto yard and waste storage areas. Rainfall from main warehouse roof is discharged directly into the River Drish which runs adjacent to the Hi Volt facility. Rainwater from the yards and waste storage areas is collected and passes through an oil interceptor and into a 46m^3 stormwater retention tank. From this tank the stormwater is discharged onto land via a percolation area.

6.6 Groundwater Protection

There are spill kits available on site to contain and clean-up minor spills and staff have been trained in the use of these spill kits.

6.7 Discharge Shut-off

The 2019 EPA guidance on firewater retention requires that:
"All potential retention methods as outlined above should be automatically activated in the event of a fire, as long as they do not delay the safe evacuation of staff. Reliance on manual intervention to deploy retention is not generally acceptable, except from a safe offsite location."

There is a manual shut-off valve from the stormwater discharge at location SA01.
A person must enter the site to activate this. This does not meet the criteria required by the EPA. An automated shut off system linked to fire alarm activation should be installed at Hi Volt.

7.0 Calculation of Available Firewater Retention

Currently a section of the yard has been designated for firewater retention at Hi Volt. Two concrete storage sheds run adjacent to this yard area. The total area of this section of the yard and the floors of the two adjacent storage sheds is 450m^2. The available capacity of this area to hold firewater is limited by kerbing at a pedestrian gate which is at a height of 0.15cm – see photo 2 below. This area could in theory provide retention for approximately 67m^3 of firewater. The rainfall retention tank on site has a capacity of 46 m^2. In the event of a fire on site, if the manual stormwater shut-off valve is activated, a potential volume of 113 m^3 for firewater is currently available on site. This is dependent on the integrity of the yard, kerbing, walls at the building perimeter and internal shed rear walls. A number of large cracks were noted in the storage shed rear walls during the site visit on 22nd April. If the infrastructure does not have good hydrostatic integrity the firewater will not be retained on site.

Photo 1: Yard area currently designated for Firewater Retention

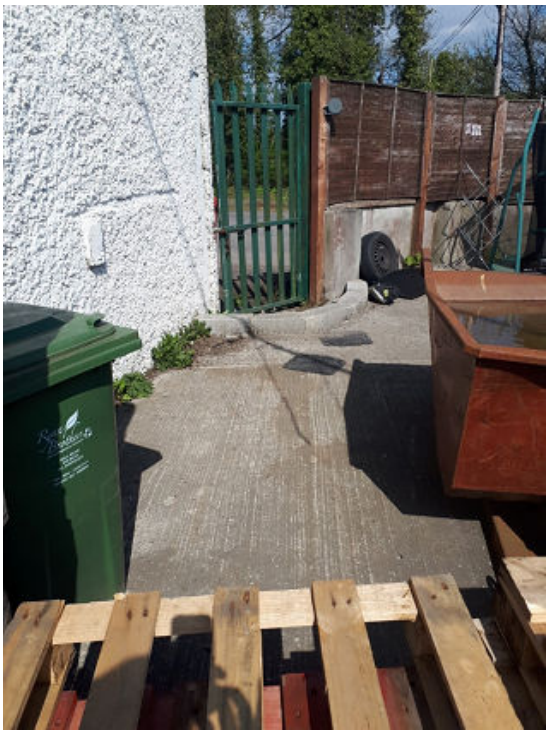


Photo 2: Retention volume is limited by kerbing around pedestrian gate (currently at 0.15m)

Photo 3: The walls of storage shed may not be water-tight. These storage shed walls need to retain firewater under the current firewater retention plan.

Photo 4: A number of large cracks were noted in the shed rear wall as indicated by the red circle

8.0 Conclusions and Recommendations

Using the EPA's firewater risk assessment tool, it has been determined that a firewater retention facility is required for the Hi Volt facility in Thurles due to the large volume of material on site that has an environmental hazard potential – namely the waste oil tank.
A firewater risk assessment has been completed including the calculation of firewater produced. A total firewater volume of 934m^3 was calculated for a fire at the Hi Volt facility. This includes all water used to abate a fire, all aqueous materials held on site and all rainfall during a 1 in 10 year rainfall event.

Currently a section of the yard has been designated for firewater retention at Hi Volt. Two concrete storage sheds run adjacent to this yard area. The total area of this section of the yard and the floors of the two adjacent storage sheds is 450m^2. The available capacity of this area to hold firewater is limited by kerbing at a pedestrian gate which is at a height of 0.15cm – see photo 2 below. This area could in theory provide retention for approximately 67m^3 of firewater. The rainfall retention tank on site has a capacity of 46 m^2. In the event of a fire on site, if the manual stormwater shut-off valve is activated, a potential volume of 113 m^3 for firewater retention is currently available on site. This is insufficient when compared to the volume of firewater calculated using the EPA tool.

The current 113m^3 of firewater retention available is dependent on the integrity of the yard, kerbing, walls at the building perimeter and internal shed rear walls. A number of large cracks were noted in the storage sheds rear walls during the site visit on 22nd April. If the infrastructure does not have good hydrostatic integrity firewater will not be retained on site.

A full inspection of the infrastructure on site should be performed by a chartered engineer with a design to retain at least 934m^3 of firewater constructed on site at Hi Volt in order to comply with the EPA guidelines for firewater retention.
The stormwater shut-off valve should also be automated and linked to the fire alarm so that in the event of a fire at Hi Volt the fire alarm will be activated and the stormwater shout-off valve automatically engaged.

Hi Volt should engage with North Tipperary Fire Services and request a site visit by fire services. This will identify the fire-fighting infrastructure that is required by fire services to effectively and quickly abate a fire. One or more fire hydrants may be required on site as a water source for emergency fire services.

Hi Volt should designate a fire warden on site and conduct recorded fire drills. It is recommended that a fire safety expert be engaged to conduct a fire risk assessment of the buildings, the fire abatement equipment on site and required fire warden training for staff.

David Kelly BSc. MSc.
KD Environmental Ltd.

7th May 2021

Appendix 1

Hi Volt Chemicals and Materials Inventory – April 2021

Tonnes

Risk Materials	H410	H411	H412	Extremely H224	Highly H225	Flammable H226	Combustible H227
Waste Oil (UN3082)		60					
Kerosene		0.6					
Total	**0**	**60.6**	**0**	**0**	**0**	**0**	**0**
Gases							
None							
Total Aqueous				**101.6**			

Packaging	
Pallets	17.98
Plastic wrap/bubble wrap	2
IBC Bags	1
Total	**21**

Other Oils	
New Aztec Oils and Coolants	37
New Aztec greases	1
Hydaulic Mineral Oils in use	1
Total	**39**

Other Chemicals	
Sulphuric Acid	2
Total	**2**

Other Materials	
Waste Metal	40
Cardboard Bales	5
Soild Fuel (Turf)	2
Batteries and Goods for Sale	207
Papers and Files	10
Total	**264**

Appendix 2

Hi Volt Drainage Map


AREA D
AREA A
AREA C
AREA B
AREA E
AREA F
Existing Warehouse
PROPOSED OIL STORAGE INFRASTRUCTURE
(SEE DRAWING WLA-05 FOR DETAILS)
PROPOSED QUARANTINE AREA
PROPOSED TYRE STORAGE AREA
PROPOSED SILT TRAP
OIL/WATER INTERCEPTOR
PROPOSED WEIGH BRIDGE
SITE ENTRANCE