

Nutrien Ag Solutions (Canada) Inc.  
340 Goldenrod Drive, Winnipeg, R3C 2E6 (RM of Rosser)

General Information

To obtain an Environmental Act License (EAL) through Manitoba Sustainable Development, the proposed new Nutrien Ag Solutions (Canada) Inc. (NAS) crop protection storage and distribution site in Winnipeg, MB is required to provide a primary and secondary containment strategy. The site containment strategy includes both primary and secondary containment to protect the environment. Additionally, the site-specific emergency response plan includes industry-specific fire control tactics in the unlikely event of a fire, which has been included for your reference.

Primary Containment

The primary internal containment of the chemical storage warehouse will consist of a concrete floor and high steel angles that are bolted to the floor and sealed to prevent potential leakage. The chemical storage warehouse at this site is 175 feet x 572 feet and it has a 0.417 feet (5-inch) retaining curb. The volume of containment within the building is 41,742 cubic feet or 1,182,002 liters. This volume is to be reduced by 10% due to equipment and pallets making the adjusted volume of containment (A) 1,063,802 liters.

At full capacity there are an estimated maximum of (B) 1,987,887 liters of product stored in this warehouse. See Appendix A for additional information on how this number was determined. (B) – (A) leaves you with (C) 924,085 liters of product that cannot be contained within the primary containment.

In the unlikely event of a fire, the sprinkler system might be activated in the chemical warehouse. Using an estimated flow of 1,500 gallons per minute and considering that there are 3.785 liters in 1 gallon, this adds 5,677.5 liters per minute of water flow to the primary containment. It would take approximately 2 minutes to report a fire event to the local fire department, and in discussions with the local fire department, they have indicated that there is an estimated response time of 10 minutes in the event of a fire. This would allow for 12 minutes of water flow from the sprinkler system, which would introduce (D) 68,130 liters of contaminated water to the primary containment.

This calculation indicates that the total volume that must be contained within the secondary containment is (C) plus (D) 992,215 liters.

Secondary Containment

In addition to the primary containment within the warehouse, the chemical storage warehouse will have secondary containment protection. This secondary containment system is located at the loading dock area at the chemical storage warehouse and is part of the stormwater system. The secondary containment/stormwater system within the loading dock is made up of concrete. The loading dock has a height of 48 inches, and the containment system is will contain any potential releases due to the approximate 3.5% slope and natural gravity flow which directs liquid to trench drains and into sump pits. There are two sump pits, one at each end of the building, which contains two duty-cycle pumps that are controlled by a manual controller.

The secondary containment/stormwater system will always be in the closed position and will require a manual process to open the containment system to release stormwater. This will only be completed after it has been confirmed that no chemical spill has occurred. In the unlikely event of a chemical spill, the spill will be contained within the containment system and a remediation company would then be contacted to clean up the spill.

The secondary containment has an approximate capacity of 1,751,300 liters. This capacity was calculated using only the area that is contained by the face of the dock wall, the two concrete retaining walls, and the top of the concrete pavement. This does not include the additional small volume of the trench drains, the pit, and the piping, as this additional capacity is negligible compared to the volume of the secondary containment.

#### Total Site Containment

The total site containment provides adequate containment with an additional 27% capacity available on site to address any unanticipated scenarios.

The maximum total liters on site = 1,987,887 liters

Sprinkler fire water = 68,130 liters

**Total liters to contain = 2,056,017 liters**

Total primary containment = 1,063,802 liters

Total secondary containment = 1,751,300 liters

**Total site containment = 2,815,102 liters capacity**

#### Fire Control Tactics

Experience from documented industry-specific incidents involving pesticides in structural fires has shown that standard fire-fighting techniques can create additional and more serious problems than posed by the original fire.

A typical industrial occupancy, storing or processing pesticides will have a combination of various formulations which can range from relatively non-toxic, non-flammable products to those which are either extremely toxic, highly flammable, or both. When developing and implementing the emergency response plan for this site, fire control and extinguishments of these products address the worst of these products.

#### Environmental Concerns

Historical evidence has shown that environmental damage, resulting from fires involving pesticides increases in proportion to the volumes of water used to control and extinguish the fire. First and foremost is the fact that the resulting effluent is normally heavy clay soils with diking. Secondly, product of incomplete combustion due to low temperature burns, tend to be substantially more toxic and less stable than the original compounds.

Air quality during a pesticide fire, at or near ground level, will deteriorate dramatically as the combustion temperature is reduced. A combustion temperature of 982 degrees Celsius for example provides complete thermal decomposition of pesticides with resulting emissions of primarily carbon and water. At this

temperature all contaminants are carried into the high atmosphere where dispersion ensures that toxic levels at or near ground level do not occur.

### Life Safety Concerns

Protection of first responders and the public is a concern with fires involving pesticides. As demonstrated above, the management of respirable contaminants at ground level hinges on the temperature of combustion, and the exit temperatures from a structure. When fires have been allowed to burn at high temperatures, the risk has been lowered significantly. If a facility is fully involved or free burning, life safety is greatly enhanced by remaining outside of the structure upwind of smoke and exhaust gases to protect exposures of other buildings while the pesticide structure burns itself out.

These control measures are the standard for all agrichemical warehouses across Canada. The local fire department has been contacted and advised of our fire control tactics as outlined above and will be provided with an opportunity to review and approve the site-specific emergency response plan prior to beginning operations.

## Appendix A – Maximum Inventory Calculations

The NAS chemical storage warehouse will be a 100,100 square foot facility. The operations within this warehouse are broken down as follows:

- 16,640 square feet will be used for loading docks inside the warehouse.
- 2,400 square feet will be office space.
- 5,000 square feet will be tote refurbishing.
- 10,000 square feet will be empty tote storage.
- 15,000 square feet will be used for storage of empty pallets, empty jugs, and cardboard boxes.

When you take the total square footage of 100,100 sq. ft. and subtract the above (49,040 sq. ft.) this leaves 51,060 sq. ft. of storage space for pre-packaged liquid products, or 5,106 pallet positions.

On average, the chemical storage warehouse will store at any given time 60% pre-packaged liquid products (various chemicals, multiple classes) and 40% pre-packaged dry products (Seed, Micronutrients, Granules).

### Liquid product storage pallet configurations:

1,000-liter tote = 1,000 liters

450-liter tote = 450 liters

115-liter drum = 575 liters/pallet

100-liter drum = 500 liters/pallet

2 X 10-liter jugs = 720 liters/pallet

Average = 649 liters/pallet

### Calculating the maximum inventory:

5,106 total pallet positions (3,063 pallets liquid/2,042 pallets dry)

3,063 liquid pallets x 649 liters = 1,987,887 liters in storage