Fertilizer Storage and Handling Guidelines for Greenhouses

MICHIGAN STATE UNIVERSITY | Extension

MAEAP

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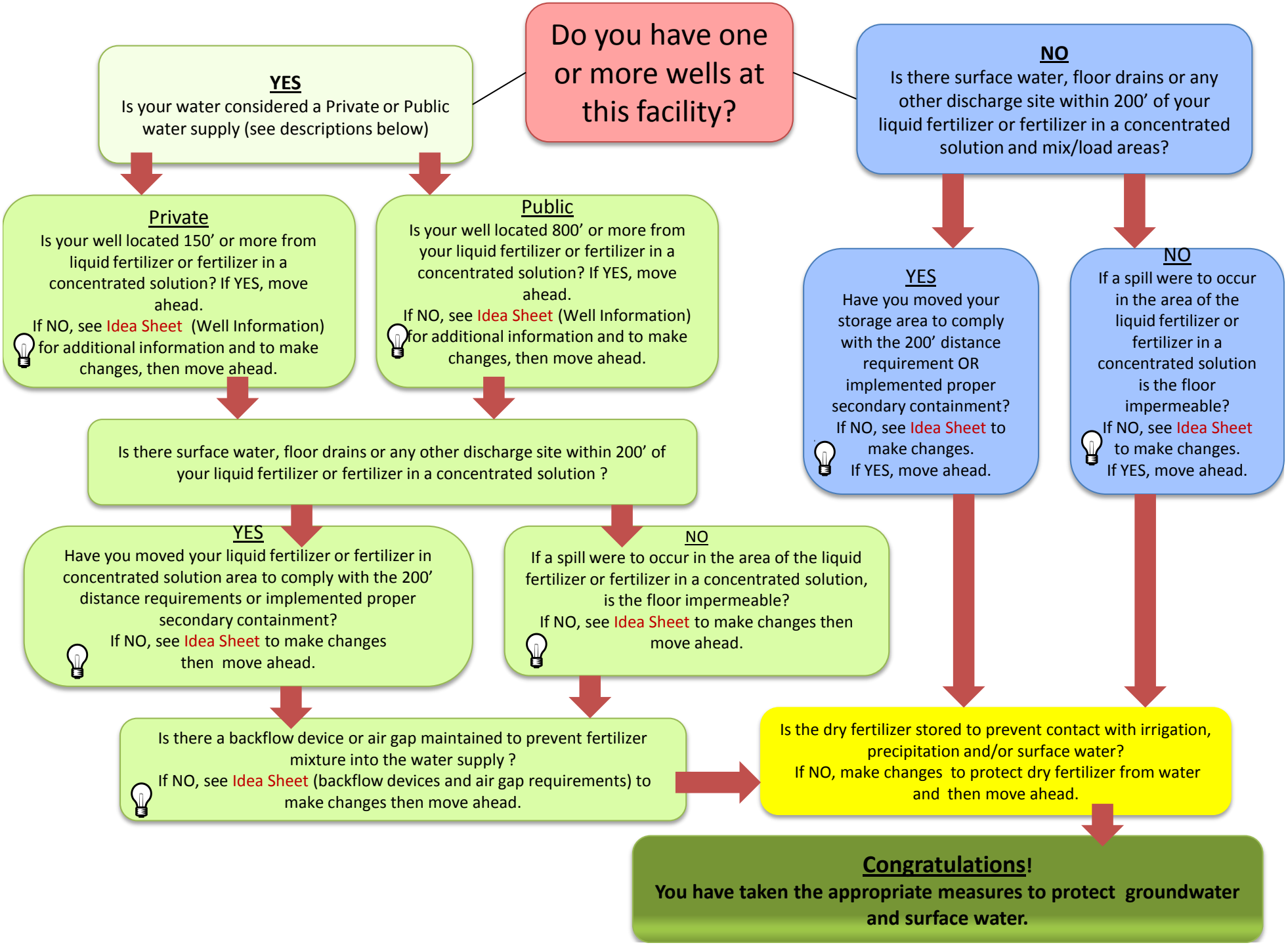

Private: Greenhouse irrigation and family members use only. (No employees or public access)

Public: Greenhouse purposes to persons other than owners and family (greenhouse with employees or that is open to the public).

Idea Sheet

This document is intended to help you with some of the basic methods to prevent contamination of groundwater and surface water as a result of storage and handling of fertilizers at your greenhouse. Follow through the flow sheet and reference this idea sheet, as needed.

Well Information:

A properly designed liquid fertilizer storage or fertilizer in a concentrated solution with appropriate secondary containment can be within 75 feet from **a public and private water supply well and surface water.** Please note, when designing liquid fertilizer storage and fertilizer in a concentrated solution, one should not only consider isolation distance but also groundwater flow direction, geologic confining materials, casing depth, well pumping capacity, and any secondary containment design. Technical assistance should be considered.

Backflow/Air Gap:

Whenever a pump loses power the weight of the water within the fill hose has the potential to create a siphon that can draw the contaminants (fertilizer or other chemical) back into the well or water supply. All water supplies should have a backflow protection device on a well used for filling the sprayer or an 6-inch air gap on the sprayer tank. Fertilizer injection systems should have a backflow device.

Secondary Containment:

There are many different methods for secondary containment. Some are very inexpensive where others are more costly but usually have a higher potential for longevity. An inexpensive portable pad can be used for mixing and loading fertilizers or other chemicals in different locations in the greenhouse. Please note that the area must hold 110% of the volume of the containers in the area plus calculate displacement for the containers holding the fertilizer. See idea sheet for web site to calculate secondary containment dimensions.
Other options for secondary containment are listed below.

- Commercial poly containment pallet/pads are available in several sizes and liquid holding capacity.
- Thick flexible poly vinyl, at least 45 mils. in thickness, attached to dimensional lumber satisfying the volume requirements (constructed like a sandbox).
- Impermeable floor with a containment curb and no floor drains. Must meet the appropriate requirement for the volume of containment. Cement curbing would qualify.

Surface water, floor drains or any other discharge site:

You must inspect locations that have the potential of moving spilled fertilizer into surface water or groundwater.

- Floor drains, that are less than 200' away from pesticide storage, can be temporarily or permanently plugged or hooked to a containment "sump" that can be pumped out. It must meet compliance standards. If the floor drain can not be plugged (either permanently or temporarily), then the liquid fertilizer or fertilizer in solution must have secondary containment.
- If there are NO floor drains, surface water, or other discharge sites within 200', pesticides need to be stored on an impermeable pad (i.e.concrete).

Proper fertilizer security to meet MAEAP verification:

- When fertilizer is not in use, it is stored in a secure area (locked building). Dry fertilizer should be protected from water.
- Fertilizer should never be stored in direct presence of any type of flammable fuel or pesticides.
- Fertilizer tanks should be labeled with lettering larger than 4" in size.
- Keeping an up to date emergency plan is required for MAEAP verification.

Additional Information:

What is Secondary Containment?

It is a second barrier or an outer wall of a double enclosure which will contain any leak or spill from a storage container. Secondary containment helps protect the surface water, groundwater, and soils and reduces worker exposure to regulated substances. This enclosure is usually needed wherever regulated substances are being handled and stored in tanks, totes, drums, small pails, or other containers. Secondary containment systems can be very simple or complex. The containment area may be in a detached shed or building, an open area outdoors, an underground vault, in a separate room, or in a dedicated portion of a larger space. It may include liquid-tight storage cabinets, berms, curbs, sills, sunken floors, special liners, drip pans or buckets, double-walled tanks, or other structures. Containment systems can be purchased as readymade units or custom built on site.

Supply Resources (fertilizer containment, portable mix/loads pads, drain plugs, soft curbs, absorbent pads, first aid kits, etc.):

- New Pig Safety Supply Company: www.newpig.com
- Safety Services Inc.: www.safetyservicesinc.com

Conversion Calculator:

- www.itml.com/conversions.php

***Greenhouse*A*Syst Document*:**

- www.maeap.org/maeap/greenhouse/greenhouseasyst

The www.MAEAP.org website includes additional information and tools to better manage your greenhouse to protect our natural resources.

Financial Incentives:

- Contact: Natural Recourse Conservation Service: http://www.mi.nrcs.usda.gov/

Water Well Information:

- If you need additional information regarding placement of a potential contaminant source in the vicinity of a water well, contact you local County Health Department.

Contacts for additional information and Technical Assistance:

- MSU Extension Greenhouse Environmental Educator Contact: Jeanne Himmelein: himmele1@anr.msu.edu
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