MOSHAWQUIT LAKE DASH OPERATIONS MANUAL

Chapter 1 – General DASH Operations

1. Diver Assisted Suction Harvest or DASH, is a mechanical means of removing aquatic invasive species (AIS). DASH uses a submerged suction nozzle to vacuum up plants which have been removed by the diver. (**Figure 1**)

2. The DASH equipment is mounted on a conventional 24 foot pontoon boat. The boat provides a platform to operate from, transportation to and from the dive sites, and a place to store the plants which have been removed from the lake. (**Figure 2**)

3. The DASH uses an engine driven pump which propels lake water through a venturi nozzle to create suction in the suction line at the suction nozzle. The engine also drives an air compressor to supply the breathing air to the divers. (**Figure 3**)

4. The water and plants which enter the suction nozzle **(Figure 4)** are carried to the surface through the suction line, and deposited in the collection tank. The collection tank **(Figure 5**) contains replaceable mesh bags which capture the plants, but which allow the water to drain into the bottom of the collection tank. The water then drains back into the lake through 3 drains located in the bottom of the tank. The replaceable mesh bags are mounted on a rack at the top of the collection tank. The rack can hold 3 bags so that there is no need to stop harvesting when a bag is full. The topside worker can change bags 'on the fly'.

5. The divers do not use SCUBA for DASH diving. Instead of using SCUBA tanks, the divers receive their breathing air through a hookah system. As mentioned above, the engine driven compressor pressurizes the air to approximately 120 PSI, and fills a stainless steel holding tank (**Figure 6**) on board the DASH boat. The air from that tank is supplied to the diver(s) through two 50 foot air lines. The air line attaches to a harness on the each diver's back, which is connected to a specially modified second stage regulator.

6. The DASH dive sites are located by referring to past aquatic plant surveys which show the location of AIS. Our surveys on Moshawquit Lake use a grid of 322 sampling points to determine where Eurasian water milfoil EWM is located in the lake. (**Figure 7**) The DASH unit has a GPS unit which has the 322 grid points loaded into it. Prior to the start of the dive, the DASH team will be given a grid point or series of grid points for that day's DASH dives. (In some cases, the DASH location may be marked in advance with a buoy.) Once at the dive site, the DASH boat is anchored (using 2 anchors). The area between grid points is about 1 acre, so sometimes the EWM is not directly on a grid point. If the EWM is not immediately visible, the divers may elect to survey the area from the surface by snorkeling around until they locate the EWM. It is better to positively locate the EWM prior to deploying the suction line, and starting the pump/compressor, because it is more challenging to reposition the boat with the hoses in the water.

7. Once at the DASH site, the air and water lines can be deployed to start work.

8. The following personnel are associated with DASH operations (**Figure 8**):

    a. **Topside (Captain)** - With on-water storage of the DASH unit, the Captain will drive the boat with the divers to the specified location on the lake. The Captain will be responsible for filling bags with the plants removed from the lake, and stacking them on the boat during the shift. The bags filled with plants weigh 35-40 lbs. The captain keeps the boat gassed up (gift cards provided). At the end of the each shift the Captain will drop the bags off at the boat landing. If storage is off-water, (i.e. the Toy Box on VV), the Captain would have to pick up the DASH from storage and be

comfortable launching the DASH. A detailed listing of Topside (Captain) procedures & responsibilities are shown in **Chapter 4.**

b. DASH diver – The divers work underwater to remove the plants using the suction nozzle. They do not use SCUBA for DASH diving. Instead of using SCUBA tanks, the divers receive their breathing air through a hookah system. The diver is responsible for identifying the EWM plants, removing them, while minimizing removal of or damage to native plants. When not diving, the DASH diver works with together with the Topside (Captain) to complete topside activities**.** A detailed listing of DASH diver procedures & responsibilities are shown in **Chapter 5.**

c. **Kayaker**- The DASH process can result in the release of EWM fragments that float free of the suction nozzle. It is possible for these fragments to re-root, and grow new EWM plants. The Topside (Captain) has a pool skimmer to capture fragments, but has limited reach. It is desirable to have a kayaker around the work site to collect any floating fragments. A fishing net with a fine mesh net, and a mesh collection bag are used to capture the fragments, which are passed to the topside (Captain).

d. **Disposal person** – Once the plants have been removed and collected in mesh bags, they must be disposed of. The disposal activities consist of retrieving the 4'x8' trailer from Mark Emerick's place and taking it to the boat landing, loading the bags into the trailer and haul it to the Shawano landfill, and returning the trailer to Mark Emerick's house. It is anticipated that there would be one trailer load per day of DASH operations.

e. **Service & Maintenance person** - Does pre- and post-season maintenance (summer-ize and winter-ize) the DASH unit (which is a pontoon boat and outboard engine). Perform the same functions for the DASH pump/engine. This individual should feel comfortable putting a pontoon or boat into storage and getting it ready in spring, and changing the oil on a lawnmower. Any major issues would be assigned to a mechanic or someone qualified.

9. Transportation procedure for the DASH boat is shown in **Chapter 3**

10. Upon completion of the day's activities, the DASH returns to shore to unload the plants, and clean the unit. These activities are shown in **Chapters 6 & 7.**

Chapter 2 – Setting up the DASH for Deployment

Here are the key steps involved in getting the DASH unit ready to work.

1. Obtain Clipboard box (with keys, Data sheets, permit, GPS) to DASH unit from last User.
2. Verify **23 HP Vanguard engine /Compressor/pump** gas tank is full. If not, Use GAS Gift card to Fill DASH with **Regular (87 octane)** gas from Exxon Mobil in Cecil.
3. Verify **35 HP Mercury Outboard** gas tank is full. If not, use Use GAS Gift card to fill tank with **Premium (no ethanol)** gas from Exxon Mobil in Cecil. **Mix two cycle oil with the gas**. **The ratio is 50:1. Use 16 oz. (marked cup in cabinet on DASH)** to 6 gallons gas. If in doubt, call Mark Emerick.
4. Place 50 mesh bags in a white 5 gallon bucket (place this next to the collection tank.)
5. Verify that Diver flag is on board DASH. (Flag may be raised into support if the boat is already on the water.)
6. Verify that diver air lines are on board (stowed in racks)
7. Verify that 2 anchors are on board (stowed at front 2 corners of boat)
8. Verify that 2 electric priming (bilge) pumps are on board (stowed on hooks)
9. Verify that the diver access ladder is on board. (stowed on deck)
10. Verify that sun umbrella is on board. (stowed between console and railing.)
11. Verify that 2 throwable flotation cushions are on board and visible (hanging from front of console).
12. Verify that 4 orange life vests are on board (stowed in black trunk at back of DASH boat).
13. Verify that pool skimmer for collecting EWM fragments is on board (stowed on outside of railing).
14. Place small cooler with 4-6 bottles of bottled water on board.
15. Bring Sunscreen for topside workers
16. Verify diver gear with diver:
    a. Mask & snorkel (if desired)
    b. Fins and or booties
    c. Wetsuit (hood optional)
    d. Weight belt
    e. Mask anti-fogging drops
    f. Spray bottle filled with mouthwash (Listerine or equal) is on board for rinsing regulators.
    g. Regulators are inside a ziploc bag with a rubber band (to keep bugs out.)

17. Use Checklist below to ensure all is ready (**Figure 9**):

Chapter 2 - DASH Pre-Deployment Checklist

- ☐ Clipboard box (with keys, Data sheets, permit, GPS) obtain from last Topside (Captain) DASH (**Figure 9.1)**
- ☐ **23 HP Kohler Compressor/pump/engine** gas tank is full **(Figure 9.2)**
- ☐ **35 HP Mercury Outboard** gas tank is full with **Premium (no ethanol) Mixed with two cycle oil (ratio is 50:1)** If in doubt, call Mark Emerick. (**Figure 9.3**)
- ☐ 50 mesh bags in a white 5 gallon bucket (next to the collection tank.) (**Figure 9.4)**
- ☐ Diver flag is on board DASH. (Flag may be raised into support if the boat is already on the water.) (**Figure 9.5**)
- ☐ Diver air lines ore on board (stowed on racks) (**Figure 9.6)**
- ☐ 2 anchors are on board (stowed at front 2 corners of boat) (**Figure 9.7**)
- ☐ 2 electric priming (bilge) pumps are on board (stowed on hooks) (**Figure 9.8**)
- ☐ Diver access ladder is on board. (stowed on deck)
- ☐ Sun umbrella is on board. (stowed between console and railing.) (**Figure 9.9)**
- ☐ 2 throwable flotation cushions are on board and visible (hanging from front of console). (**Figure 9.10**)
- ☐ 4 orange life vests are on board (stowed in black trunk at back of DASH boat) (**Figure 9.11**)
- ☐ Pool skimmer for collecting EWM fragments is on board (stowed on outside of railing). (**Figure 9.12**)
- ☐ Small cooler with 4-6 bottles of bottled water on board.
- ☐ Diver gear by diver:
    - ☐ Mask & snorkel (if desired)
    - ☐ Fins and or booties
    - ☐ Wetsuit (hood optional)
    - ☐ Weight belt
    - ☐ Mask anti-fogging drops
    - ☐ Spray bottle filled with mouthwash (Listerine or equal) for rinsing regulators.
    - ☐ Regulators are inside a ziploc bag with a rubber band (to keep bugs out.)
    - ☐ Towel(s)
- ☐ Sunscreen for topside workers.

Chapter 3 – Transporting the DASH

Transporting the DASH unit from remote storage to the lake, or off the lake for service or maintenance is very similar to transporting any pontoon boat. The DASH has it's own dedicated trailer, so no special fitting or adjustments are required.

The key things to verify are shown below:

1. Verify that the front of the boat is strapped to the trailer so that it can't shift during loading or transport. There are ratchet straps provided for this purpose, so please make sure they are used. (These are stowed in the black cabinet on the DASH boat.) (**Figure 10**)
2. Verify that the 35 HP outboard motor has been trimmed up to prevent accidental contact with the ground when entering or leaving the boat ramp.
3. If you are removing the boat from the water, verify that the pump suction line has been disconnected from the pump (stowed on deck)
4. Towing vehicle must have a 2" ball, and 2 inch receiver hitch.
5. Use safety chains, to prevent a runaway.
6. Connect the trailer lights.
7. Strap down loose gear on the DASH unit… last year we almost lost the diver flag because it flew off in Tim Ebben's yard.

Chapter 4 – Topside Activities

Topside (Captain) procedures & responsibilities.

1.The Topside (Captain) and the diver work together to deploy the DASH unit. The Topside (Captain) completes the pre-deployment checklist to confirm all equipment is available and ready for use.

2. Confirm today's Dash Dive location with the driver, and turn on the GPS.

3. Starting the outboard Motor- (**Figure 11**) Use the trim adjustment to lower the motor into the water. Pump primer bulb on outboard motor fuel line. Turn ignition to crank motor. Use choke lever to choke motor if it does not start immediately. Allow motor to warm up for 1 to 2 minutes. Use this time to secure any loose gear on board the DASH.

4. Untie the boat and head out to the DASH worksite. This is a good time for the diver to put on their wetsuit, and prepare their gear for the day's dive.

5. Monitor the GPS while driving to the worksite. As you approach the worksite, be ready with both anchors to drop anchor at the grid point location.

6. Once at the grid point, survey the area to look for EWM near the surface. If the Eurasian milfoil is not visible from the surface, it is advisable for the divers to enter the water with snorkels to look for the EWM and confirm its location. Move the boat if necessary to place it adjacent to the EWM, not directly over it, for ease of removal.

7. Drop anchors - Use both anchors (**Figure 12)** tied from one side of the DASH boat in order to maintain stable position. (tip: throw anchors into the wind, so the wind helps hold anchor lines tight)

8. Once anchored at the dive site, begin deployment of the DASH equipment.

9. Raise the red & white diver flag by placing it in the upright tube on the back of the boat. (**Figure 13**)

10. Hang the diver access ladder off the front of the boat **(Figure 14**)

11. Connect the suction strainer to the inlet of the centrifugal pump. Tighten the 2 hand clamps securely. (**Figure 15**)

12. Connect the 3 inch white water pressure line to the Venturi nozzle at the front of the boat. Clamp securely using both clamps. **(Figure 16)**

13. Remove the 4 inch green suction hose from the storage hooks and place it in the water. (Tip: check to see that the buoy tether is set so that the red buoy is 2 feet from the suction nozzle. Starting at the suction nozzle end, remove the red buoy and suction nozzle from the collection tank and place it in the water. Feed the remainder of the suction hose into the water by removing it from each hook around the boat, until the entire suction hose is laying in the water.) (**Figure 17**)

14. Take 3 mesh bags from the white storage bucket next to the collection tank. Install 3 mesh bags into the rack above the collection tank. Place the 6 inch white PVC discharge elbow over one of the mesh bags in the rack. (**Figure 18**)

15. Open the small valve on the bottom of the stainless steel air tank to relieve any pressure in the tank. Once pressure has been relieved, close the valve. (**Figure 19**)

16. **Priming the pressure and suction lines**- Open the fill cap on the top of the inlet strainer to the pump. Remove the 1" brass cap on the main pump. Hang the smaller bilge pump (with the light green ¾ inch hose) over the side of the boat near the pump engine, so that the pump is submerged. Hang the pump from the loop in the electric cord over the pipe rack next to the inlet strainer. Insert the light green water hose from the bilge pump into the fill connection on the top of the inlet strainer. (**Figure 20**)
Place the larger (Tsunami) bilge pump in the water near the collection tank and hang it from the hose hook on the railing next to the collection tank. Insert the clear plastic hose from this bilge pump Into the 6 inch white elbow of the discharge water hose at the top of the collection tank. (**Figure 21**)
Plug both bilge pump's into the Dual cigarette lighter outlet located under the console. (**Figure 22**).
Run both bilge pumps until the suction line and white pressure hose are completely filled with water. (the hoses are full when there are no bubbles visible in either hose. This should take 2-3 minutes)
Remove the green hose from the inlet strainer and promptly replace the fill cap on the inlet strainer, and the main centrifugal pump. Unplug both bilge pump's but leave them in place in case re-priming is necessary.

17. **Starting the 23 hp pump/compressor engine -** Raise the hinged plywood cover on top of the engine compartment. Locate the throttle control on the top left front side of the engine. (**Figure 23**) Slide the throttle to the three-quarter throttle position. Turn the in ignition key to the right to crank the starter. Once the engine has started, release the key and observe the 6 inch white PVC discharge elbow above the collection tank. A large volume of water should begin flowing quickly from this elbow. **If you do not see water flowing from the discharge elbow into the collection tank, turn off the engine by turning the key to the left**.

Do not do not run the engine without water flowing from the discharge hose! The pump must run with water in it, in order to cool the pump shaft seal. Shaft seal damage will occur if there is no water flowing out the discharge elbow.

18**. Re-priming the hoses** - The lack of flow of water indicates that there was still air in the hoses, and re-priming is needed. Repeat the priming process described above, and look carefully for any air bubbles in the hoses.

19. Once water is flowing from the discharge elbow into the collection tank set the throttle to the three-quarter position. The diver can now enter the water and begin work.

20. When the diver is ready to enter the water, complete the DASH data sheet entries for time, location, air temperature, and wind conditions at the start of the dive. (**Figure 24**)

Note: the specific driver procedure/responsibilities will be identified in Chapter 5.

21. Based on weather conditions this is may be a good time to raise the sun umbrella over the collection

tank. (**Figure 25)**

22. Once the diver begins work, the plants will be deposited in the mesh bag and the excess water will continue to drain from the three drains at the bottom of the collection tank. Based on the density of the plants, there may be surges of muck and or silt as the plant roots are extracted with the plant. While it is usually a good idea to allow each bag to fill to completion, in cases where there is excess muck or root material, it may be appropriate to change bags when the bag is only half fall.
Once the bag is nearly full, move the discharge elbow to the next bag position, close the top of the full bag by pulling on the black tie strings and tie it off. (**Figure 26**)

23. Lift the full bag from the collection tank, and place it at the front of the DASH boat to drain. Continue this process until the site is clear, or the boat is full of bags. **Use caution when lifting the bags, full bags can weigh over 40 Lbs when saturated.** It may be necessary to move bags towards the center of the boat, to keep the DASH boat from becoming nose heavy if many bags have been filled. (**Figure 27)**

24. Monitor the diver's location and activity to ensure their safety. Watch for any indications that the divers breathing line is becoming wrapped in the suction line. **If you become concerned, get the divers attention by giving 2-3 light tugs on the airline. This is the signal for the diver to return to the surface.**

25. Watch for fragments of EWM that come to the surface and either alert the kayaker to scoop them up, or capture them using the pool skimmer mounted on the side of the boat. (**Figure 28**)

26. Continue changing bags and stacking full bags of plants in the boat until the end of the shift.

27. Shutdown at shift change or End of Day- Upon completion of the shift, await transfer of new personnel to the DASH boat. At the end of the day, collect and stow the DASH gear in the reverse order of deployment. For example:

a. Shut down the engine compressor/pump once the diver has returned to the boat. **Note: Do not shut it down before the diver is onboard, or you will cut off their air supply.** Remove the 3 inch white pressure hose from the venturi nozzle by loosening the 2 clamps. Allow the white hose to drain into the lake. **(Figure 29**)
b. Next, starting at the front of the boat, lift the 4 inch green suction hose onto the hooks around the railing. Continue hanging the hose on hooks, and wrapping it around the boat. Place the suction nozzle and end of the hose in the collection tank with the buoy. Set the buoy tether so that the buoy is 2 feet from the nozzle.
c. Now lift, and stow the end of the 3 inch white pump hose in the front of the boat.
d. Coil the breathing air lines and regulator and hang them on the racks on the inside of the railing. Rinse the regulator with Listerine, and place it in a Ziploc bag and secure the bag with a rubber band. (**Figure 30**)
e. Collect remaining gear (umbrella, dive flag, diver gear, etc.), and secure it inside the boat.
f. Pull up both anchors being careful to remove any plants or muck from the anchors before stowing them on the boat. Coil the anchor ropes neatly and hang them next to the anchors near the front of the boat.
g. Start the outboard motor and drive the DASH boat to the location where the mesh bags will be unloaded. This will either be the boat landing, or the shoreline where the boat is stored. Unload the bags on shore, and record the number of bags collected on the data sheet for that day's activities on that shift or for the total day. (**Figure 31**)

h. Return the DASH boat to the storage location.
i. Stow all other equipment to the defined as storage locations.
j. Re-stock the white bucket with 50 mesh bags. (**Figure 32**)
k. Refill both gas tanks.

   23 HP Kohler Compressor/pump/engine gas tank. Use GAS Gift card to Fill with **Regular (87 octane) gas from Exxon Mobil in Cecil.**

   35 HP Mercury Outboard gas tank. Use GAS Gift card to fill tank with **Premium (no ethanol) gas from Exxon Mobil in Cecil. Mix two cycle oil (oil is on board DASH) with the gas. The ratio is 50:1. Use 16 oz. (marked cup in cabinet on DASH) to 6 gallons gas.** If in doubt, call Mark Emerick.

28. Collect any Eurasian water milfoil fragments from the boat, and bag them in a mesh bag. Dispose of these fragments with the other mesh bags previously collected.

29. Remove the ignition key for the outboard motor from the console and the key for the pump/ engine, GPS in the clipboard box and remove it from the boat. (**Figure 33**)

Chapter 5 – Diver Activities

Diver procedures & Responsibilities:

1. Upon arrival for the start of your shift, review the pre-deployment checklist to ensure that you have all of the equipment that you need. This is repeated below for reference. Diver gear: (**Figure 34**)

- ☐ Mask (snorkel if desired)
- ☐ Fins and or booties
- ☐ Wetsuit (hood optional)
- ☐ Weight belt
- ☐ Mask anti-fogging drops
- ☐ Spray bottle filled with mouthwash (Listerine or equal) for rinsing regulators.
- ☐ Regulators are inside a Ziploc bag with a rubber band (to keep bugs out.)
- ☐ Towel(s)

2. Assist the Topside (Captain) in preparing the DASH boat for departure, including helping to load, and then securely stow equipment required by the pre-deployment checklist.

3. Use travel time to the site to put on your wetsuit, and gather your gear.

4. Upon reaching the Dash dive site, investigate as necessary to locate the EWM for that day's dive. This may require getting in the water and snorkeling around the area to find the EWM.

5. Work closely with the Topside (Captain) to connect & deploy the pressure and suction hoses, and prime the hoses.

6. Once the pump & air compressor are operating, uncoil the air line on deck, so it will feed easily as you enter the water. Connect the hose to the connecting coupling on the air tank. Test the regulator to ensure that it is supplying adequate breathing air by depressing the purge valve on the regulator.

7. Prepare to dive, by putting on your booties and fins, and your mask (on your forehead). Don't forget to use anti-fogging drops on the mask.

8. Put on the hookah harness with the connection on your back and the regulator passing over your right shoulder. Adjust the straps, and secure them tightly so that the harness doesn't shift during your dive. The purpose of the harness is to prevent any tension on the airline from being transferred to your mouth/jaw while you are breathing from the regulator. (**Figure 35**)

9. The **last piece of equipment that you put on is your weight belt**, so that this may be removed without becoming entangled in the hookah or harness.

10. Enter the water from the diver access ladder on the front of the boat.

11. Verify that you have neutral buoyancy, and that you can float horizontally to minimize placing your feet on the bottom (adjust weights as necessary. (**Figure 36**) Neutral buoyancy is desirable so that you can work without disrupting the plants or silt on the bottom of the lake. Once you are assured that you are close to neutral buoyancy, swim to the buoy connected to the suction line nozzle.

12. Complete a surface dive from the buoy down to the nozzle and hold the nozzle in your right hand and guide it as you swim to the location of the Eurasian water milfoil.

13. The ideal working depth is 2 to 3 feet from the bottom of the lake. This allows the diver to reach out and grab the plant, feed the plant into the suction nozzle, and then pull gently near the roots to fully extract it from the lake bottom. It is important to get as much of the root ball as possible, to prevent re-growth of the plant.

14. The optimum technique for feeding plants into the suction nozzle is to grab the plant 1-2 feet from the bottom, and to guide the middle of the plant into the nozzle, then allowing the nozzle to suck the top of the plant fully into it. Try to feed handfuls about 2 inches in diameter into the 4 inch nozzle. This allows sufficient water flow to maintain suction, but not clog the hose. **Do not fully stuff the suction nozzle, as it is possible to clog it.** (**Figure 37**)

15. If the nozzle becomes clogged, try to dislodge the clog by pulling the clog out of the nozzle. If this doesn't work, return to the surface, and ask the Topside (Captain) to adjust the throttle to full throttle. This increased suction may dislodge the clog. If it does, reduce the throttle back to 75%, and resume work. If, not. Leave the water, and return to the DASH boat.

16. Unclogging the suction hose from the boat – If the suction hose is still clogged, it will be necessary to unclog the hose manually. See below:

a. Diver must leave the water and get back on the DASH boat (remove mask, fins, and hookah harness.)
b. Shut down pump engine.
c. Diver and Topside (Captain) grab 4 inch green suction hose near the venture nozzle, and lift it out of the water, over their heads.
d. Diver and Topside (Captain) continue lifting and 'walk' along the suction hose, using the weight of the water in the hose to force the clog backwards towards the nozzle. By lifting and shaking the hose, it is usually possible to expel the clog back out of the suction nozzle. Once the nozzle is cleared, no plants should be visible within the hose.
e. Collect the clog, and any EWM fragments from the lake, and bag them.
f. Lower the suction hose back into the water.
g. Prime the suction hose (only), restart the pump engine, and resume diving.

17. Visibility - Although the water flowing into the suction nozzle carries away most of the silt, visibility can be reduced when diving in dense EWM beds, or when the lake bottom contains excess silt. Visibility can often be improved simply by waiting 30 seconds for the silt to be drawn away by the waterflow. If, not, simply swim to clear water, and resume work. When in doubt, return to the surface, re-check your location, and move to a new area.

18. Signals from above- There may be weather or other conditions which necessitate communication from the Topside (Captain). The signal for you to surface is 2 tugs on your airline. If you feel those tugs, surface immediately.

Chapter 6 – Disposal Activities

Once the plants have been removed and collected in mesh bags, they must be disposed of. The disposal activities consist of retrieving the 4'x8' trailer from Mark Emerick's place and taking it to the boat landing, loading the bags into the trailer and haul it to the Shawano landfill, and returning the trailer to Mark Emerick's house. It is anticipated that there would be one trailer load per day of DASH operations.

The trailer has a 2" ball, and is equipped with trailer lights.
The trailer should be tarped for the trip, and has a tarp and bungie cords with it.
The Shawano landfill is located at 1099 Rusch Rd. on the east side of Shawano.
It is open from 7 AM – 3 PM Monday through Friday, and 8 AM – Noon on Saturdays.

When dropping weeds at Shawano landfill, simply state that you have "lake weeds", and they will advise you to deposit them in the leaves and yard waste area. There is no charge to deposit them there.
(**Figure 38**)

Chapter 7 – Cleaning the DASH

At the completion of the day's activities, all remaining EWM fragments should be collected and bagged for disposal. In the event that excess muck was collected with the bagged plants and deposited on deck, the deck can be rinsed using the bilge pumps. Stubborn muck can be loosened with a stiff broom.

In the event that the DASH is removed from the water for service, or storage at the end of the season, it should be power washed to fully remove any trapped silt or fragments.

Chapter 8 – Maintenance & Storage

Pre- and post-season maintenance (summer-ize and winter-ize) the DASH unit (which is a pontoon boat and outboard engine) includes pressure washing the entire pontoon, and servicing both engines.

For the 35 HP outboard motor, this involves changing the lower unit gear lubricant, topping off and adding stabilizer to the fuel tanks, fogging the engine cylinders, charging the battery, and cleaning/replacing the spark plugs.

For the 23 HP Vanguard engine/pump this includes changing the engine oil and filter, topping off and adding stabilizer to the fuel tanks, fogging the engine cylinders, charging the battery, and cleaning/replacing the spark plugs.

Prior to placing the DASH unit in storage, it should be covered with waterproof tarps, and internal compartments should be equipped with mothballs or other rodent deterrents.

Transportation to remote storage should follow the transportation guidelines shown in Chapter 3.

Any other major issues would be assigned to a mechanic or someone qualified.