**\_\_\_\_\_\_\_\_\_\_ Lake, \_\_\_\_\_\_\_\_\_\_\_ County (WBIC \_\_\_\_\_\_\_\_)**

**Herbicide Concentration Monitoring Sample Plan (YEAR** \_\_\_\_\_\_**)**

**\_\_\_\_\_\_\_\_\_\_ Lake is \_\_\_\_\_\_\_\_\_\_ acres, has a mean depth of \_\_\_\_\_\_\_\_\_\_ feet, and a maximum depth of \_\_\_\_\_\_\_\_\_\_ feet. The lake is classified as a \_\_\_\_\_\_\_\_\_\_\_\_ lake.**  **(an herbicide formulation containing active ingredient(s) \_\_\_\_\_\_\_\_\_\_) is proposed to be applied to \_\_\_\_\_ acres to control \_\_\_\_\_\_\_ (Figure 1). The proposed application rate is** \_\_\_\_  **within the targeted treatment areas. This would equate to a calculated lakewide concentration of** \_\_\_\_\_  **assuming complete dissipation within the epilimnion.**

**The data collected is intended to provide information on how long and at what concentration the herbicide remains in the water and in contact with plants. This is known as herbicide concentration exposure time (CET) and is a measurement that is used by lake managers to understand the actual amount of herbicide and exposure time observed during operational management activities. This information will be used in conjunction with aquatic plant survey data collected both before and after the herbicide treatment to evaluate the treatment efficacy. The evaluation will help to understand to what extent different plant species are impacted at the actual herbicide CET.**

**Water samples will be collected at the sampling sites and times listed below to monitor herbicide concentration following treatment. A map of the herbicide sample site locations is included (Figure 2) and the coordinates and sampling depths are provided below. Data are in decimal degrees and the datum is WGS84.**

|  |  |  |  |
| --- | --- | --- | --- |
| **\_\_\_\_\_ Lake Herbicide Sample Sites** | | | |
| **Site** | **Latitude** | **Longitude** | **Sample Depth** |
| **A** | **\_\_\_\_\_** | **\_\_\_\_\_** | **Integrated (0-6 ft)** |
| **B** | **\_\_\_\_\_** | **\_\_\_\_\_** | **Integrated (0-6 ft)** |
| **C** | **\_\_\_\_\_** | **\_\_\_\_\_** | **Integrated (0-6 ft)** |
| **D – Deep Hole** | **\_\_\_\_\_** | **\_\_\_\_\_** | **Integrated (0-6 ft)** |

**Samples should be collected at the time intervals listed below**.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **\_\_\_\_\_ Lake Herbicide Sample Intervals** | | | | | | |
| **Interval** | **Site A** | **Site B** | **Site C** | **Site D – Deep Hole** | **Samples/Interval** | **Total Samples** |
| **3 HAT** | **X** | **X** | **X** | **X** | **4** | **4** |
| **9 HAT** | **X** | **X** | **X** | **X** | **4** | **8** |
| **1 DAT** | **X** | **X** | **X** | **X** | **4** | **12** |
| **2 DAT** | **X** | **X** | **X** | **X** | **4** | **16** |
| **4 DAT** | **X** | **X** | **X** | **X** | **4** | **20** |
| **7 DAT** | **X** | **X** | **X** | **X** | **4** | **24** |
| **14 DAT** | **X** | **X** | **X** | **X** | **4** | **28** |
| **21 DAT** | **X** | **X** | **X** | **X** | **4** | **32** |

**HAT denotes hours after treatment.**

**DAT denotes days after treatment.**

**Instructions for sample collection, sample storage, and shipping:**

* Water samples should be collected using an integrated sampling device, which is used to collect a surface water sample from 0 to 6 feet deep. Upon arrival to each sampling site, rinse the integrated sampler and composite water collection bottle three times with lake water before each sample collection.
* Take the water sample from the opposite side of the boat as you rinsed. Slowly lower the integrated sampler vertically so that it is to 6 feet deep (which is typically marked with a line on the integrated sampler). After reaching a depth of 6-foot, slowly pull sampler up vertically. If the sampling location is shallower than 6-feet, lower the sampler into the water column so that it remains at least 1 foot above the lake sediment bottom.
* Empty the contents of the integrated sampler into the composite water collection bottle by pushing the ball valve end against the bar installed across the bottle’s mouth - this pops the ball valve up and releases water from the integrated sampler.
* Gently mix the water in the composite water collection bottle. Then, carefully pour the water into the sample vials provided by the lab.
* If sampling at the deep hole below the thermocline, use a Van Dorn sampler (following the instructions found within [this water chemistry protocol](https://apps.dnr.wi.gov/water/wsSWIMSDocument.ashx?documentSeqNo=282152366) (pg. 5, steps 1-12) to collect a water sample at a discrete depth.
* Depending on the herbicide being analyzed, a small amount of acid may need to be added to each sample vial. The WSLH can analyze for 2,4-D, endothall, copper, and florpyrauxifen-benzyl (FPB); they will provide a sampling kit which will include vials, labels, acid, datasheets, a shipping cooler, and sample handling instructions. The sampling kit provided for florpyrauxifen-benzyl analysis contain empty clear vials as well as amber vials with a pre-measured amount of preservative already within them. The amber vials are the final sample vials.
* Using a permanent marker, write the sampling site, sampling interval, date, and collection time on the sampling label attached to the vial.
* The WSLH will provide datasheets for use when collecting water samples (Figure 3). It is important to use a separate data sheet for each sampling interval that you monitor.
  + On each sampling sheet, the lake name, county, Account Number, DNR User ID, Grant Number, WBIC, and test requested (e.g., herbicide active ingredient) will be prepopulated on the forms by DNR/WSLH.
  + The person taking the sample should fill out the Collector Name and Phone Number, and all information requested in the table on the bottom portion of the sampling sheet.
    - Within each row, write the site name, SWIMS station ID, sample depth, date, time, water temperature, and wind direction and speed.
* Samples should be temporarily stored in a cooler for transport, and then in a refrigerator until shipped.
* Once all sample intervals are completed, the water samples and datasheets should be shipped overnight and with an ice pack to the lab. Samples should not be shipped on loose ice. Samples should not be shipped on a Friday, but rather refrigerated and shipped on the following Monday. Ship the samples to the address on the orange sticker in the sampling kit.

If you have any questions, please call or email one of the contacts listed below.

|  |  |
| --- | --- |
| **Project specifics, logistics and sampling methods** | |
| NAME OF CONSULTING FIRM CONTACT  NAME OF CONSULTING FIRM  Consultant@gmail.com  (XXX) XXX-XXXX | |
| **Wisconsin DNR** | |
| NAME OF APM COORDINATOR  WDNR Regional APM Coordinator  APM.COORDINATOR@WI.GOV  (XXX) XXX-XXXX | |
| **Wisconsin State Lab of Hygiene** | |
| For FPB (ProcellaCORTM):  Erin Mani  Laboratory Manager  [erin.mani@slh.wisc.edu](mailto:erin.mani@slh.wisc.edu)  (608) 224-6269 | For 2,4-D, endothall, & copper:  Brandon Bongard  Chemist  Brandon.Bongard@slh.wisc.edu  (608) 890-1786 |

**Figure 1. \_\_\_\_\_ Lake Treatment Area(s)**

**Figure 2. \_\_\_\_\_ Lake Herbicide Concentration Monitoring Locations**

**Figure 3. Example of a Sample Data Sheet**



**Chain of Custody Statement: The collector,** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, **was trained on appropriate water sample collection methods for herbicide concentration analysis, and samples were collected and processed by the collector following the current Department guidance. Water samples were kept undisturbed in a secure place (i.e., residential fridge) immediately following collection and up until shipment of samples.**

**Collector signature:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Date signed:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_