

## Standard Operating Procedure 3.6.1.1

### PROTOCOL FOR SORTING BEACH SAND

The sample has been collected and is in Ziploc bags/containers. Be sure you have all the bags/containers for each sample location along that station's transect.

#### 1. SIEVE SAMPLE

Sieve the sample using the three sieve sizes, 4.75 mm (no. 4), 2.80 mm (no. 7), and 1.00 mm (no. 18) stacked over the bottom sieve pan. Depending on the size of the sample, this step may need to be done in portions, so the sieves are not clogged with the sand particles. If the screen surface of any of the sieves becomes full, empty the screen into an appropriately labeled container for that size class.

#### 2. TRANSFER SAMPLE

Empty each sieve separately onto a large white sheet of paper. Turn the sieve over and use the bristles of a brush to poke any sand or debris trapped in the sieve onto the paper. Some pieces may be lodged tighter in the sieve. The wooden end of a brush may be used to pop some of these pieces onto the paper, but NEVER use any pointed object that can wedge into the sieve and change its shape.

#### 3. HANDLING THE SIEVED SAMPLE

Using the white paper that the sample is sitting on, place the sample from each sieve into a separate labeled ziplock bag, for storage, or into a separate labeled container, if you are continuing to work with the sample. Most of the sample should pour into the bag or container easily. You may need to make a funnel out of paper to guide the sample into the bag or container. Always transfer the sample with the utmost care to prevent any part of the sample from being lost and always place a clean white sheet of paper on the table under the plastic bag to be able to identify loose pieces, if something should bounce out. When there is a lot of static electricity *Static Guard* may be used when pouring any part of the sample from one bag or container to another.

#### 4. SORTING (DRY)

In an area free from wind, pour out each sample on a large white sheet of paper to sort out debris and plastics. It is best to do this in small amounts at a time for better accuracy. Separate plastic, plant, and "other" (non-sand particles that cannot be identified, but are not plastic) in separate labeled containers. Each container should be labeled with station number, date of collection, location of sample along that station's transect, size class and item type (plastic, plant, "other").

## 5. SORTING (WET)

After the sample is separated by size class and dry sorted, each size class will be “washed”. The “wash” procedure accomplishes three things:

- 1). It loosens any items that may be sticking together in the dry sorted sample.
- 2). It cleans the sample of any dirt, which may muddy the water and inhibit efficient sorting.
- 3). It allows any items less dense than the sand to float or move more freely than the sand when the water is swirled, making them easier to identify and pick out. This is especially true for items that are the same color as the sand.

Begin by pouring small amounts of sand and debris into a container with about 2 to 3 inches of water in it. By initially pouring the sand into the water, the sand and lighter objects will separate and none of the lighter or less dense objects will be trapped by the sand. Due to the dirt in the sand, it may be necessary to wash the sand with water several times. After each “wash”, the overlying water should be gently poured through a screen to collect any floatables. When the overlying water is clear the remaining sand should be sorted for nonfloating plastic, plant, and “other”. To accomplish this, pour 2 to 3 inches of water over the thin layer of sand and gently swirl. The objects less dense than the sand (example: non-floatable dense plastics) will move faster and more freely than the dense sand. REMEMBER, for accuracy in doing the “wash”, do not make the sand very thick on the bottom of the container.

After each size class of sand is completely washed, the sand can be dried and archived in a labeled container or returned to the beach. Archive one sample per station.

For each size class, the floatables and nonfloatables are combined and stored in water in a labeled container with the necessary information (station number, date of collection, location of sample at station, and size class), so later they can be wet sorted into item types (plastic, plant, and “other”).

During the wet sort, all plant material is placed together regardless of size, and all “other” is placed together regardless of size, but each size class of plastic is kept separate. Each item type is stored in a separate sealed container. After the sorting is complete, each of these item types (and size class for plastics) is placed separately on a numbered nitex screen and dried. The number of the nitex screen and the item type and size class are recorded on the lab/data worksheet. If the items on the screens cannot be dried immediately, then they can be stored in a covered and labeled petri dish for later drying.

Dry each plastic size class for 1 hour at 65° C. Dry the plant material and the “other” sample for 24 hours at 65° C, then place plant material and “other” in

a dessicator for 30 min. This allows each sample to cool down and not absorb moisture while it is cooling down.

## 6. FINAL SORT AND WEIGHING

After the items from the “wet sort” are dried, they can be combined with the same items from the “dry sort”.

Again, all plant material is placed together regardless of size and all “other” material is placed together regardless of size. Both these item types are ready for weights. Place data on lab/data sheets.

The same size classes of plastics from the “dry sort” and the “wet sort” are added together. Then each size class is sorted into five type categories:

1. **Fragments:** any broken piece of plastic that is not a pellet, any type of foam, line, nor film.
2. **Pellet:** pre-production nurdle.
3. **Foam:** any type of foam, includes Styrofoam or foam found in cushions, etc.
4. **Line:** any type of line, monofilament, or polyfiber.
5. **Film:** any type of film, may be a variety of thicknesses, but is pliable.

Plastics are not divided by color. Each plastic type for each size class is stored in an individual container appropriately labeled with: date, station, location at station, type of sample (example: plastic), category type (example: line), and size class. All weights should be done at one time. The weights (which may be as low as 0.1 mg) and counts of each plastic type for each size class will be obtained by the staff and placed on the appropriate data sheets.

All samples should be handled as little as possible to reduce the chance of error.

## 7. SAMPLES AND DATA

In the end, the plastic will be separated in vials by 3 sizes (>4.75mm, 2.80-4.749mm, 1.00-2.79mm) and by types (fragment, pellet, foams, line, film). At the most there will be 5 vials for each size class and 17 containers/vials for each station.

Each vial should be checked to be sure all appropriate data is on each label.

The lab/data worksheet should be checked to be sure it is all filled out and the data entered into the computer for analysis.