WATER SAMPLING

PREPARING SAMPLER

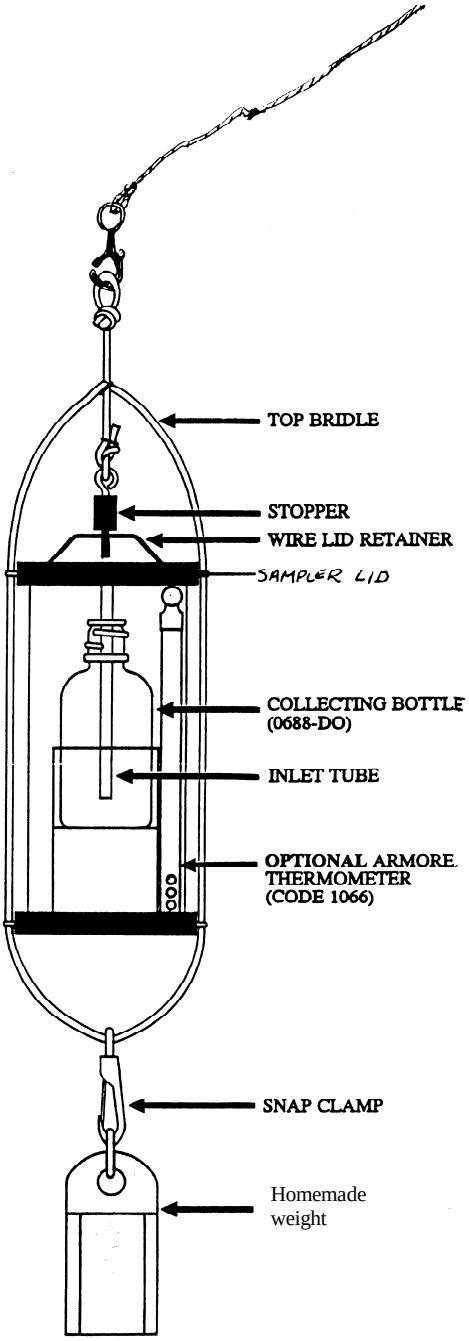
1. Remove the stopper from the gray sampler lid. Lift the wire lid retainer up and away from sampler. Remove the lid with inlet tube attached, sliding it up the rope bridle.

2. Insert the Dissolved Oxygen collection bottle, with the cap removed, into the inner chamber of the sampler.

3. Press the thermometer into the outer chamber and position the scale so it can be read through the clear sampler body.

4. Replace the sampler lid, inserting the inlet tube into the collection bottle. Snap the wire retainer into the grooves on the lid. Press the plastic stopper into the center inlet hole.

5. Attach the weights to the large snap ring at the bottom of the sampler. Clip the nylon line to the loop at the top of the rope bridle with the brass snap clamp.



SAMPLING THE CREEK WATER

6. From about mid-point on the railroad bridge, lower the sampler into the water. Stop when the brass fastener (between the sampler bridle and the calibrated line) is at the water surface. This allows for collecting water samples 1 meter below the creek's surface.

7. Use a quick jerk of the line to remove the sampler's stopper. Water will begin filling the bottle, overflowing and flushing more than 5 times. As air is displaced, bubbles

will be observed rising to the surface. When the water sampler is filled, bubbles will no longer appear. Filling takes about one minute.

8. Using the hand-held-winder, and steady hand motions, retrieve the sampler. Decreasing water pressure prevents the exchange of air and water in the sample.

REMOVING THE SAMPLE

9. Without opening the sample, read the temperature through the clear sampler body. Record the water temperature on the data sheet.

10. Place the sampler on a flat surface.

11. Release the wire lid retainer and remove the plastic lid with the inlet tube attached, sliding it up the rope bridle.

12. Remove the collecting bottle from the inner chamber and carefully set aside for the dissolved oxygen test. Remove the thermometer and place in a location that does not receive direct sunlight, to take the air temperature.

13. Pour the rest of the water from the outer sampler chamber into a Wheaton bottle. This water will be used for the remainder of the testing.

DISSOLVED OXYGEN TEST

FIXING THE SAMPLE

1. Examine the bottle to make sure no air bubbles are trapped inside. (*An air bubble will produce false, high readings. If present another sample must be taken from the creek).*

2. Fix the sample in the field as soon as collected.

3. Add **8 drops of Manganous Sulfate Solution** and
   8 drops of Alkaline Potassium Iodide Azide *(white caps).*

   (*Some of the sample will overflow as chemicals are added, but sufficient amounts of the oxygen-reacting chemicals will fall to the bottom of the bottle. The overflow assures that when the sample bottle is closed, no air will be trapped inside.*) Cap and mix by inverting several times. A precipitate will form. Allow the precipitate to settle the shoulder of the bottle before proceeding. *Impatience may result in an incomplete reaction and produce false low readings.*

4. Add **8 drops of Sulfuric Acid, 1:1** *(red cap)*

   Cap the bottle and gentle shake until the reagent and the precipitate have dissolved. *This may take a few minutes.* A clear- yellow (low DO) to brown orange color (high DO) will develop, depending on the oxygen content of the sample. *Following completion of this step, contact between the water sample and the atmosphere will not affect the test results.*

TEST PROCEDURE

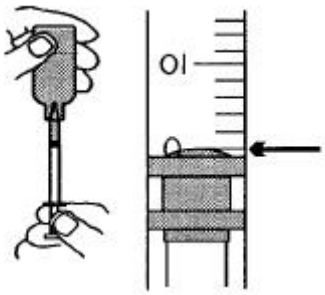
5. Fill the graduated cylinder to the 20 ml line with the fixed water sample.

   (Remember to read the measurement from the bottom of the meniscus.) Transfer titration bottle (*the volume may not match the markings on the vial, the graduated cylinder is the more accurate measure of volume)* and cap.

6. Add **8 drops** of the **Starch Indicator Solution.** Sample should turn blue.

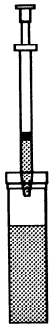
7. Fill the direct reading titrator (*syringe)* with **Sodium Thiosulfate 0.025N.** First, insert the titrator into the plastic fitting of the titrating solution bottle. Invert the bottle and slowly withdraw the plunger until the bottom of the plunger is opposite the zero mark on the scale. *(Small air bubbles may appear in the Titrator barrel. Expel the bubbles by partially filling the barrel and pumping the titration solution back into the inverted reagent container. Repeat this pumping action until the bubbles disappear.)* Turn the bottle right-side-up and remove the titrator.

8. Insert the titrator into the center hole of the water sample titration cap. While gently swirling the bottle, slowly press the plunger until the water sample solution is a faint yellow.



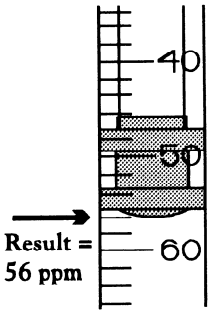
9. Replace the cap and titrator. While gently swirling the bottle, slowly press the plunger to add one drop of titrant at a time. Swirl to mix each drop. Continue until the blue color instantly turns colorless. *Color changes will occur where the drop first contacts the sample, but the drop must be dispersed throughout the sample. The entire solution will turn clear and remain that way for 1-2 minutes when the entire sample is at the end point.*

   If the plunger tip reaches the bottom line of the titrator before endpoint color change, refill the titrator and continue the titration.



10. Read the test results where the plunger tip meets the scale. (If the titrator was refilled, add the first 10 ppm to the last reading to reflect the total amount of reagent dispensed.) Each minor division on the scale equals 0.2 ppm. Record the results as ppm dissolved oxygen.

11. If there is any concern that the DO value is not correct, repeat the test. If the titration was overrun, redo the titration. There is enough reagent for 3 repeats. Another water sample may also be taken and the entire preparation repeated, if necessary.



12. Discard the water sample solution in the waste bucket. Thoroughly rinse the sample bottle with deionized water and discard in waste bucket. Then repeat the test with the second fixed sample. Record both results on the data sheet. Discard results if the endpoint is overrun.

13. After all DO tests are complete, thoroughly rinse the sampler, the titrant bottle, the titrator with dissolved water, putting the waste into the waste bottle for proper disposal.

pH TEST

1. Pour the water sample from the Wheaton bottle into the pH sample jar. Fill to just below the ground glass stripe.

2. Remove the pH (red) meter protective cap. Turn on the switch on the top of the meter.

3. Dip the meter into solution. Stir gently for a few seconds, until the readings stabilize. Record reading.

4. Turn off pH meter. Remove pH meter from sample. Rinse tip with distilled water and cap.

5. Measure the temperature of the water sample with the thermometer and record on the data sheet.

6. Dispose of the sample in the waste container.

CONDUCTIVITY TEST

1. Pour the water sample from the Wheaton bottle into the conductivity sample jar. Fill to just below the ground glass stripe.

2. Remove the conductivity (blue, 4) meter protective cap. Turn on the switch on the top of the meter.

3. Dip the meter into solution. Stir gently for a few seconds, until the readings stabilize. This probe automatically compensates for temperature, so it may take a couple of minutes for the values to stabilize. Record value as micromhos per centimeter.Estimate total dissolved solids by multiplying the conductivity by 0.67.

4. Turn off meter. Remove meter from sample. Rinse tip with distilled water and cap.

5. Dispose of the sample in the waste container.

TURBIDITY TEST

1. Shake the Wheaton bottle sample to ensure a mixed sample.

2. Fill the test tube from the turbidity kit with the water sample to the 5 ml line.

3. Insert the test tube into the Octet Comparator. Match the sharpness or "fuzziness" of the lines behind the sample to the sharpness or "fuzziness" of the lines behind the turbidity standards. *Disregard any color differences between the sample and standard. Match the sample based on turbidity, not color.*
4. Record the reference number of the standard that best matches the sample.

5. Convert the standards to approximate turbidity numbers using the chart listed below.

	Standard #	Turbidity Units (NTU)
Low	1	25
	2	50
Medium	3	75
	4	150
Med-High	5	200
	6	300
High	7	400
	>7	>400

SAN FRANCISQUITO CREEK & LOS TRANCOS CREEK

PIERS LANE & ALPINE ROAD BRIDGES

Testers: (1) _____(2)_____**Date**:_____

(3) _____ (4) _____**Time**:_____

Weather: _____Clear _____Cloudy _____ Rainy_____**Air Temp**._____^{o}C

Creek Water Appearance: (Check all that apply)

San Francisquito Creek		
Scum	Muddy	Clear
Brown	Foamy	Milky
Colored	Other	

Los Trancos Creek		
Scum	Muddy	Clear
Brown	Foamy	Milky
Colored_	Other	

Creek Depth & Flow

San Francisquito Creek	
Depth	**Flow**
<2 ft.	Stagnant
2-5 ft.	Calm
5-10 ft.	Brisk
10 ft.	Raging

Los Trancos Creek	
Depth	**Flow**
<2 ft.	Stagnant
2-5 ft.	Calm
5-10 ft.	Brisk
10 ft.	Raging

Water Sampling

San Francisquito Creek		
Temperature		^{o}C
Diss. Oxygen		ppm
pH		
Conductivity		umhos/cm
x 0.67=TDS		ppm
Turbidity	Std #	
use chart		NTU

Los Trancos Creek		
Temperature		^{o}C
Diss. Oxygen		ppm
pH		
Conductivity		umhos/cm
x 0.67=TDS		ppm
Turbidity	Std #	
use chart		NTU

Comments:_____

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