Appendix E

Dry Weather Analytical and Field Screening Monitoring Program

E.1 Dry Weather Monitoring Sampling Manual

1. Dry Weather Monitoring Field Equipment Checklist

The field equipment listed below is used to conduct dry weather monitoring.

- Clipboard, pens, pencils, Sharpie or other waterproof pens
- MS4 maps, Thomas Guide
- Digital camera
- Field notebook
- Latex gloves
- Protective eyeglasses or goggles
- Rubber boots
- Cooler and ice
- Paper towels
- Tape for securing cooler
- Sample bottles with preservatives
- Polypropylene bucket with rope, or sampling rod to collect samples from larger bodies of water
- Portable field test kits, colorimeters, or spectrophotometer and all reagents for these meters.
- Multi-parameter or individual probes to measure temperature, electrical conductivity, and pH
- Extra batteries for all meters
- Flow measurement equipment (required equipment will depend on method used)
    - Measuring tape for measuring stream width
    - Folding scale for measuring stream depth
    - Current meter or wristwatch
- De-ionized or ultra pure water in squeeze bottles for rinsing, dilutions, etc. (depending on methods used)
- Thermometer for measuring air temperature (optional)
- Waste disposal bottles
- Boat (for sampling lagoon sites)

2. Sampling Procedures and Submission

Field Screening

The field screening part of dry weather monitoring consists of a series of qualitative field observations, flow measurement and field analyses of selected water quality parameters. General site observations (weather conditions, conveyance type, etc.) are recorded on the field datasheet, even if the site is dry. An alternate station will be selected if the station is dry. Field measurements will be taken and recorded on the data sheet where there is flowing or ponded water, provided there has been no rain event during the last 72 hours.

Qualitative Observations

Qualitative observations are intended to provide a general assessment of the site, and include: odor, color, water clarity, the presence of floatable matter, visible deposits/ stains and biological status. A trash assessment will be done at each station and in the neighboring receiving waters and urban runoff to provide information on the spatial extent and nature of the trash. At least one photograph will be taken at each site to record the site visit, identify any vegetation or structural changes, and provide additional evidence if an IC/ID is noted. Photographs also help to locate the site in future visits. New sites will have a photograph taken looking upstream and another taken looking downstream.

Avoid contaminating the sample:

- Wear latex gloves
- Rinse the container with the sample at least twice. Do not rinse pre-cleaned, preserved containers, as the preservative will be lost.

Field Sample Collection

Grab samples are collected by standing downstream and submerging the sample container immediately below the water surface in the upstream direction, disturbing as little of the bottom material as possible. If practical, collect the sample at about 60% of the stream depth (from the surface) in an area of maximum turbulence (except when sampling for volatile organics). Avoid stagnant pools near the edge of flowing streams unless sampling stagnant pools. Enter the channel downstream of the sampling location and move upstream, disturbing as little of the bottom material as possible. For shallow water (less than 6 inches deep), the sample can be collected from the surface of the stream. If the water level is very low, collect the sample using a clean syringe and fill appropriate sample container.

Analytical Laboratory Sample Collection

Use appropriate containers for the analyte being tested, as directed by the lab. Laboratories routinely provide pre-cleaned sample bottles with preservatives already added. Use only analytical or higher grade reagents for preserving samples.

Samples are collected by standing downstream and submerging the sample container immediately below the water surface in the upstream direction, disturbing as little of the bottom material as possible. If practical, collect the sample at about 60% of the stream depth (from the surface) in an area of maximum turbulence (except when sampling for volatile organics). Avoid stagnant pools near the edge of flowing streams unless sampling stagnant pools. Enter the channel downstream of the sampling location and move upstream, disturbing as little of the bottom material as possible. For shallow water (less than 6 inches deep), the sample can be collected from the surface of the stream. If the water level is very low, collect the sample using a clean syringe and fill appropriate sample container. For deeper water, sample mid-depth by leaving the lid on the sample bottle and lowering the bottle to the mid-depth position, then removing the lid and allowing the container to fill.

Store samples in an ice chest at $\leq 4^{\circ}$ C until custody is transferred to the analytical laboratory directly or via contracted courier. Samples collected for laboratory analysis should be

submitted to the laboratory as soon as possible after collection (bacteria samples must be delivered to the laboratory within 6 hours of collection). Complete the following tasks:

- Fill out the chain-of custody form making sure that all sample bottles are correctly labeled
- Carefully pack the sample bottles in the cooler
- Transport the samples to the laboratory
- Complete the chain-of-custody form

Recording Data

Record all qualitative observations and field testing results on the Dry Weather Monitoring Field Datasheet (Appendix F). Estimate the flow rate where applicable by using the Methods of Flow Measurement worksheet (Appendix F). Flow measurements are useful in estimating pollutant mass loading, prioritizing storm drains for future investigations, and helping identify potential illicit discharges upstream. Also note any changes to standard procedures (for whatever reason), and describe any unusual or noteworthy conditions or results in detail on the bottom of the sheet.

Disposal

Dispose of all spent reagents, reacted samples, and rinse solutions in the appropriate waste containers. Upon returning to the office or laboratory, decant these wastes into the sewer system of the office or laboratory unless otherwise instructed by the sewering agency. Be sure to clean all equipment (recheck calibration if any results were questionable), and restock reagents (if necessary).

Automatic Sampling Methods

Automatic sampling methods may be useful during some source identification or enforcement investigations. Investigators should refer to the manufacturer's instructions for operating automatic sampling equipment.

3. Equipment Maintenance

In order to ensure the quality of field results, maintenance of equipment must be given a high priority.

- All equipment must be cleaned and serviced at the end of a field shift.
- All water quality meters must be calibrated in the laboratory or office before field use. Calibration solutions should remain uncontaminated and not be used after their expiration dates.
- Field meters and cameras must be in proper working order. Make sure that batteries have sufficient voltage to power the equipment for the entire field trip. Recharge or replace them as necessary. Keep extra batteries in case they are needed. Probes should be inspected, cleaned and reconditioned regularly.
- Clean and rinse all other sampling equipment after returning from the field. Store clean equipment in storage cases.
- Glassware used in the field (e.g. graduated cylinders for sample dilutions, test kit flasks and/ or beakers) should be cleaned immediately after usage. Rinse three to four times

with deionized water and wipe the outside of the glassware dry with a white paper towel. Rinsewater from test kit cleaning must be poured into the waste container. Dry in an inverted position.

4. Quality Control/ Quality Assurance

Quality control (QC) samples can be in the form of duplicates, spikes, field blanks, method blanks, or synthetic samples. Dry weather monitoring programs can use these various types of QA/ QC samples to assess the accuracy and precision of the field and laboratory analyses performed for their dry weather monitoring programs.

- Duplicate samples may be collected and submitted for at least one in 10 samples to the analytical laboratory to assess the accuracy of the field analyses for nitrate, ammonia, phosphate, electrical conductivity, pH, and turbidity.
- Duplicate samples are used to assess laboratory or field precision. They should be collected in the field in one container and split into two samples for analysis.
- Spiked samples can be prepared in the field or the Copermittee's laboratory/ office. A field sample is spiked with known amounts of analytes and the total volume of this fraction is adjusted to a specific volume (usually 1 liter) using a portion of the original sample as makeup water. *Make sure that the volume of the added spike is small compared to the volume of the sample to which it is added.*
- Field blank samples may be collected at a rate of one per 20 samples for laboratory analysis and field testing. Field blanks are used to monitor contamination originating from the collection, transport or storage of environmental samples. A field blank must be prepared with deionized or ultrapure water (resistivity greater than 17 mega ohms). A trip blank is prepared by filling a sample container in the laboratory/ office and transporting it on a routine monitoring assignment, preserving it in the field (noting the station location), and submitting it with a normal batch of samples.
- Method or equipment blanks are prepared using the same methods used to collect, process, or contain samples before submittal to the laboratory. An example of an equipment blank would be pouring deionized water into a sample container to test the cleanliness of the container.
- Synthetic samples can be prepared using aliquots of commercially prepared standards or from EPA quality assurance ampules. Deionized water should be used as makeup water and analytical grade NaCl should be used to adjust the electrical conductivity of the QA sample into the range of the environmental samples.

5. Health and Safety

Dry weather water sampling may occur when the sampling environment and discharges create hazardous conditions. Use safety precautions at all times when conducting dry weather monitoring.

- Keep a first aid kit and fire extinguisher in the vehicle.
- Watch out for traffic along the access road when sampling or making observations.
- Park vehicle offroad if possible, turn hazard light on, and place orange safety cones out if you are parking near traffic lanes.

- Do NOT remain in open areas or stand under trees if lightning is occurring in the vicinity.
- Watch your step; the ground may be wet and slippery, steep, or unstable. Do not attempt to climb down unsafe slopes.
- Always wear clean latex rubber gloves when sampling.
- Protect eyes and skin against contact with acids and other preservatives.
- Wear appropriate attire (i.e., hat, safety boots, gloves, and long pants).
- Be aware of your environment. Watch for: snakes, tickes, bees, poison oak, and stinging nettles.
- Use common sense when deciding whether to sample during adverse weather conditions. *This program is intended to assess dry weather conditions.* Do not sample during dangerous conditions such as high winds, lightning storms, or flooding conditions that might be unsafe.
- Do not enter channels during periods of high flow. The general rule of thumb is: If the product of the water depth in feet and the velocity in feet per second is greater than 10, or the level is above your waist, don't go in.
- Do not enter confined spaces
- Follow all analytical procedures as prescribed in the equipment manuals. Heed all warnings and precautionary statements.
- Be familiar with Material Safety Data Sheets for all chemicals used in the field and when calibrating instruments. Know the health hazards and emergency medical treatments, and follow proper disposal instructions.

Safety Equipment

The following safety equipment is recommended for use during dry weather sampling:

- First aid kit
- Safety glasses
- Latex gloves
- Rubber boots
- Safety rope

E.2 Dry Weather Monitoring Field Datasheet

San Diego Stormwater Copermittees
Dry Weather Monitoring Field Datasheet

☐ **Routine Investigation** ☐ **IC/ID Follow-Up For** _____

GENERAL SITE DESCRIPTION (NAD 83 decimal degrees to 5th place)

Site ID		**Latitude**	(e.g., 33.41174)	**Watershed**	**Hydrologic Unit**	(e.g., 7.00)
Location		**Longitude**	(e.g., -117.35213)		**Hydrologic Area**	(e.g., 7.10)
Date		**TB Page**			**Hydrologic Subarea** (Optional)	(e.g., 7.11)
Time		**Observer**			**Discharge Area** (Optional)	

Land Use (Primary) (Check one only) ☐ Residential ☐ Commercial ☐ Industrial ☐ Agricultural ☐ Parks ☐ Open

Land Use (Secondary) (Optional, greater than 10%) ☐ Residential ☐ Commercial ☐ Industrial ☐ Agricultural ☐ Parks ☐ Open ☐ None

Conveyance (Check one only) ☐ Manhole ☐ Catch Basin ☐ Outlet ☐ Concrete Channel ☐ Natural Creek ☐ Earthen Channel ☐ Curb/Gutter

ATMOSPHERIC CONDITIONS

Weather ☐ Sunny ☐ Partly Cloudy ☐ Overcast ☐ Fog

Tide ☐ N/A ☐ Low ☐ Incoming ☐ High ☐ Outgoing **Tide Height:**_____ft.

Last Rain ☐ > 72 hours ☐ < 72 hours

Rainfall ☐ None ☐ < 0.1" ☐ > 0.1"

RUNOFF CHARACTERISTICS

Odor	☐ None	☐ Musty	☐ Rotten Eggs	☐ Chemical	☐ Sewage	☐ Other
Color	☐ None	☐ Yellow	☐ Brown	☐ White	☐ Gray	☐ Other
Clarity	☐ Clear		☐ Slightly Cloudy	☐ Opaque		☐ Other
Floatables	☐ None	☐ Trash	☐ Bubbles/Foam	☐ Sheen	☐ Fecal Matter	☐ Other
Deposits	☐ None	☐ Sediment/Gravel	☐ Fine Particulates	☐ Stains	☐ Oily Deposits	☐ Other
Vegetation	☐ None	☐ Limited	☐ Normal	☐ Excessive		☐ Other
Biology	☐ None	☐ Insects ☐ Algae	☐ Fish ☐ Snails	☐ Mussels/ Barnacles	☐ Insect/ Algae	☐ Insect/ Snail ☐ Other

Water Flow ☐ Flowing ☐ Ponded ☐ Dry ☐ Tidal

Does the storm drain flow reach the Receiving Water? ☐ Yes ☐ No ☐ N/A

Evidence of Overland Flow? ☐ Yes ☐ No ☐ Irrigation Runoff ☐ Other: _____

Photo Taken ☐ Yes ☐ No **Photo #** _____

Field Screening Samples Collected? ☐ Yes ☐ No

Water Temp (°C)		NH_3-N (mg/L)		NO_3-N (mg/L)		Ortho-PO_4 (mg/L)	
pH (pH units)		TURB (NTU)		COND (mS/cm)			

Analytical Lab Samples Collected? ☐ **Yes** ☐ **No**

FLOW ESTIMATION WORKSHEETS

Flowing Creek or Box Culvert

Width		ft
Depth		ft
Velocity		ft/sec
Flow		gpm

Filling a Bottle or Known Volume

Volume		mL
Time to Fill		sec
Flow		gpm

Flowing Pipe

Diameter		ft
Depth		ft
Velocity		ft/sec
Flow		gpm

COMMENTS: _____

San Diego Stormwater Copermittees

Land Use Types for Dry Weather Monitoring

(Adopted by the Dry Weather Monitoring Workgroup, April 20, 2004)

1. **Residential**

   Residential (general)
   Single- and multi-family homes, mobile home parks, etc.

   Rural residential (For the County of San Diego and other appropriate Copermittees)
   Single family homes located in rural areas with lot sizes of approximately 1 to 10 acres. Rural residential estates may have small orchards, fields or small storage buildings associated with the residential dwelling unit, etc.

2. **Commercial**

   Offices, schools, shopping centers, auto dealerships, government/civic centers, cemeteries, churches, libraries, post offices, fire/police stations, military use, jails, prisons, border patrol holding stations, dormitories, hotels, motels, resorts, and casinos, etc.

3. **Agricultural**

   Orchards, vineyards, nurseries, greenhouses, flower fields, dairies, livestock, poultry, equine ranches, row crops and grains, pasture, fallow, etc.

4. **Industrial**

   Shipbuilding, airframe, aircraft manufacturing, industrial parks, manufacturing uses such as lumber, furniture, paper, rubber, stone, clay, and glass; auto repair services/recycling centers; warehousing, wholesale trade; mining, sand and gravel extraction, salt evaporation; junkyard, dumps/landfills; auto wrecking/dismantling and recycling centers, etc.

5. **Parks**

   Recreation areas and centers, neighborhood parks, wildlife and nature preserves, golf courses, accessible sandy areas along the coast or major water bodies allowing swimming and picnicking, etc.

6. **Open**

   Vacant and undeveloped lands, etc.

E.3 Trash Assessment Form

Trash Assessment Form

SITE ID: _____ **DATE:** _____

LOCATION: _____ **TIME:** _____

OBSERVER: _____

PREVIOUS TRASH ASSESSMENT RATING (IF APPLICABLE):

ESTIMATED AREA OF ASSESSMENT L x W (FT):

Amount and Extent of Trash	
EVALUATION OF TRASH INCLUDES*: ☐ **MS4** ☐ **RECEIVING WATER** ☐ **BOTH**	
☐ **Optimal**	On first glance, no trash visible. Little or no trash evident when evaluated area is closely examined for litter and debris.
☐ **Suboptimal**	On first glance, little or no trash visible. After close inspection small levels of evident in evaluated area.
☐ **Marginal**	Trash is evident in low to medium levels on first glance. Evaluated area contains litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, or clothing present.
☐ **Submarginal**	Trash distracts the eye on first glance. Evaluated area contains substantial levels of litter and debris . Evidence of site being used frequently by people: many cans, bottles, food wrappers, blankets, or clothing present.
☐ **Poor**	Site is significantly impacted by trash. Evidence of trash accumulation behind a constriction point or evidence of excessive dumping. Evaluated area contains substantial levels of litter and debris .

* In areas where receiving water is accessible and adjacent to dry weather site, trash evaluation must include receiving water.

Site Evaluation for Threat to Human Health and/or Aquatic Health	
☐ **Threat Human Health**	Site poses a threat to human health via swimming, wading, or walking through the area. Trash and debris has the potential to contain chemicals that may bioaccumulate, transmit dangerous bacteria (e.g. medical waste, diapers, human waste), or has the potential for physical harm (sharps, entanglement, nails, etc...). Comments should be added for clarification .
☐ **Threat to Aquatic Health**	Site poses a threat to aquatic health or other wildlife (via contact, ingestion, entanglement, etc...) from the trash and debris present. Trash and debris such as small floatable material that is persistent and can be transported long distances may resemble food and may be ingested. Wire, plastic, fishing line, and other material that has the potential for entanglement. Oil and other visible chemicals or chemical containers falls in this category. Comments should be added for clarification.

- **Complete the following section for Marginal, Submarginal, and Poor Evaluations ONLY**

TYPE OF ASSESSMENT: ☐ RANKING ☐ RAW COUNT (IF REQUIRED)

TYPE	Ranking or Count by Type *	POTENTIAL ROUTE (CHECK UP TO 2)				POTENTIAL SOURCE (CHECK UP TO 2)						
		Dumping	Littering	Upstream	Unable to determine	Household	Construction	Commercial	Industrial	School	Transient	Unable to determine
Automotive												
Biohazard Waste												
Business Related												
Cigarette Butts												
Construction												
Fabric/Clothing												
Food Packaging												
Food Waste												
Household												
Shopping Carts												
Toxic												
Yard Waste												

* Only rank the types of trash PRESENT in evaluated area from 1 through 12 (1 is most prevalent – 12 is least prevalent). DO NOT rank types of trash that are not present in evaluated area.

Comments:_____

E.4 Source Investigation Record

City of Oceanside Clean Water Program

Source Investigation Record

PART A: INITIATION

- ☐ Public/Staff Report — **Summarize:**
- ☐ Dry Weather Monitoring Field Screening Results
- ☐ Dry Weather Monitoring Laboratory Results
- ☐ Receiving Waters Monitoring Results
- ☐ Other: _____

PART B: STARTING LOCATION

PART C: SOURCE TRACKING

Location:_____ **Flow** Yes / No **Observations:** _____

Location:_____ **Flow** Yes / No **Observations:** _____

Location:_____ **Flow** Yes / No **Observations:** _____

Location:_____ **Flow** Yes / No **Observations:** _____

Location:_____ **Flow** Yes / No **Observations:** _____

Location:_____ **Flow** Yes / No **Observations:** _____

Notes:

PART D: SOURCE IDENTIFICATION

- ☐ **Source Unidentifiable**
- ☐ **Follow Up Recommended**

Location for Follow-up: _____

_____

Source:

☐ **Municipal** ☐ **Industrial** ☐ **Commercial** ☐ **Residetntial** ☐ **Other:** _____

Description/Location: _____

_____

☐ **Illegal Discharge** ☐ **Illicit Connection**

Steps Taken to Eliminate Discharge:

☐ **Enforcement Measures:**

DATA SHEET COMPLETED BY (Signature):

City of Oceanside Clean Water Program

Source Investigation - Sampling Analysis Record

LOCATION:

*__Field Screening__ Water Temp (°C)__________ NH_3-N__________ NO_3-N__________ React P-P__________
pH (pH units)__________ TURB__________ EC / TDS__________ DO__________

*__Laboratory Analysis__ Cd (diss)__________ Cu (diss)__________ Pb (diss)__________ Zn (diss)__________
MBAS__________ Hardness__________ O/G__________ Diazinon(µg/L)__________
T. Coliform__________(MPN) Fec. Col_______(MPN) Entero__________(MPN) Chlorpyrifos(µg/L)______

Lab Samples Taken: Yes / No **Bottle ID#'s:** ________ ________ ________ ________
(If Yes, Attach Copy of Chain of Custody Record)

LOCATION:

*__Field Screening__ Water Temp (°C)__________ NH_3-N__________ NO_3-N__________ React P-P__________
pH (pH units)__________ TURB__________ EC / TDS__________ DO__________

*__Laboratory Analysis__ Cd (diss)__________ Cu (diss)__________ Pb (diss)__________ Zn (diss)__________
MBAS__________ Hardness__________ O/G__________ Diazinon(µg/L)__________
T. Coliform__________(MPN) Fec. Col_______(MPN) Entero__________(MPN) Chlorpyrifos(µg/L)______

Lab Samples Taken: Yes / No **Bottle ID#'s:** ________ ________ ________ ________
(If Yes, Attach Copy of Chain of Custody Record)

LOCATION:

*__Field Screening__ Water Temp (°C)__________ NH_3-N__________ NO_3-N__________ React P-P__________
pH (pH units)__________ TURB__________ EC / TDS__________ DO__________

*__Laboratory Analysis__ Cd (diss)__________ Cu (diss)__________ Pb (diss)__________ Zn (diss)__________
MBAS__________ Hardness__________ O/G__________ Diazinon(µg/L)__________
T. Coliform__________(MPN) Fec. Col_______(MPN) Entero__________(MPN) Chlorpyrifos(µg/L)______

Lab Samples Taken: Yes / No **Bottle ID#'s:** ________ ________ ________ ________
(If Yes, Attach Copy of Chain of Custody Record)

LOCATION:

*__Field Screening__ Water Temp (°C)__________ NH_3-N__________ NO_3-N__________ React P-P__________
pH (pH units)__________ TURB__________ EC / TDS__________ DO__________

*__Laboratory Analysis__ Cd (diss)__________ Cu (diss)__________ Pb (diss)__________ Zn (diss)__________
MBAS__________ Hardness__________ O/G__________ Diazinon(µg/L)__________
T. Coliform__________(MPN) Fec. Col_______(MPN) Entero__________(MPN) Chlorpyrifos(µg/L)______

Lab Samples Taken: Yes / No **Bottle ID#'s:** ________ ________ ________ ________
(If Yes, Attach Copy of Chain of Custody Record)

LOCATION:

*__Field Screening__ Water Temp (°C)__________ NH_3-N__________ NO_3-N__________ React P-P__________
pH (pH units)__________ TURB__________ EC / TDS__________ DO__________

*__Laboratory Analysis__ Cd (diss)__________ Cu (diss)__________ Pb (diss)__________ Zn (diss)__________
MBAS__________ Hardness__________ O/G__________ Diazinon(µg/L)__________
T. Coliform__________(MPN) Fec. Col_______(MPN) Entero__________(MPN) Chlorpyrifos(µg/L)______

Lab Samples Taken: Yes / No **Bottle ID#'s:** ________ ________ ________ ________
(If Yes, Attach Copy of Chain of Custody Record)

Table E-1 Field Analytical Methods

TABLE E-1
FIELD ANALYTICAL METHODS

Parameter	Method	Reporting Limit	Range	Accuracy
Specific conductance	Hanna Instruments HI 991301 Portable pH/EC/TDS/Temperature Meter***	0.01 mS/cm	0 – 20 mS/cm	± 2% of functional sensitivity[1]
Temperature	Hanna Instruments HI 991301 Portable pH/EC/TDS/Temperature Meter***	0.1°C	0.0°C – 60.0°C	± 0.5°C
pH	Hanna Instruments HI 991301 Portable pH/EC/TDS/Temperature Meter***	0.01	0.00 – 14.00	± 0.01 pH
Turbidity	Hanna Instruments HI 93703-11 Portable Turbidity Meter***	0.01 NTU	0.01 – 50.00 NTU and 50 – 1000 NTU	± 0.5 NTU or 5% of reading (whichever is greater)
Surfactants	CHEMetrics CHEMets Kit (K-9400) Methylene Blue Active Substances	0.13 mg/L	0.0 mg/L – 3.0 mg/L*	± 0.13 & ± 0.5 mg/L[2]
Nitrate-N	CHEMetrics V-2000 Multi-Analyte LED Photometer – Nitrate 3 Vacu-vials® (K-6933) Cadmium reduction[3]***	2.26 mg/L**	2.26 mg/L –13.6 mg/L**	± 30%
Ammonia-N	CHEMetrics V-2000 Multi-Analyte LED Photometer – Ammonia 3 Vacu-vials® (K-1403) Salicylate***	0.10 mg/L**	0.10 mg/L – 3.00 mg/L**	Varies with measured concetration[4,5]
Ortho-phosphate-P	CHEMetrics V-2000 Multi-Analyte LED Photometer – Phosphate 2 Vacu-vials® (K-8513) Stannous chloride chemistry[6]***	0.25 mg/L**	0.25 mg/L – 2.61 mg/L**	Varies with measured concetration[4,5]

Notes:

[1] Functional sensitivity (FS) represents the lowest limit at which quantitative information is reliable. FS is estimated as the mean concentration for a spiked sample whose coefficient of variance (CV) is 20%. CV is the standard deviation divided by the mean.

[2] ± 0.13 for the range of 0.0 to 1.0 mg/L, ± 0.25 mg/L for the range of 1.0 to 2.0 mg/L and 0.5 mg/L for the range of 2.0 to 3.0 mg/L.

[3] This method determines the concentration of nitrate in mg/L NO_3. To determine the amount of nitrate-nitrogen, the concentration of nitrogen must be adjusted for the presence of oxygen in the NO_3 molecule. Therefore, the result is multiplied by a conversion factor of 0.226, the ratio of the molecular weight of N (14 g/mol) to NO_3 (62 g/mol). The detection limit for nitrate is 10.0 mg/L; however, the detection limit for nitrate-nitrogen is lowered due to the conversion.

[4] Practical Detection Limit (PDL) is defined as the lower limit of the stated test range.

[5] Percent error adjusts as follows: ±30% at PDL, ±20% for 25% of full range, ±10% for 75% of full range, ±10% for 120% of full range. "Full range" is equal to the upper limit of the test kit's range.

[6] This method determines the concentration of orthophosphate in mg/L PO_4. To determine the amount of orthophosphate-P, the concentration of phosphate must be adjusted for the presence of oxygen in the PO_4 molecule. Oxygen is 67.4% of phosphate by mass but is not a plant nutrient in this form. Therefore, the result is multiplied by a conversion factor of 0.326, the ratio of the molecular weight of P (31 g/mol) to PO_4 (95 g/mol). The detection limit for orthophosphate is 0.75 mg/L; however, the detection limit for orthophosphate-P is lowered due to the conversion.

*Extended ranges in chemical analyses can be achieved through dilutions. Accuracies decrease proportionally with further dilutions.

** Readings below the PDL have increased percent error; measurements are reported, but are flagged as being below the PDL.

***Reporting limit, range, and accuracy information taken from Hanna Instruments and CHEMetrics manuals, available online at www.hannainst.com and www.chemetrics.com. Additional information regarding CHEMetrics accuracy was obtained from the manufacturer via email.

Table E-2 Laboratory Analytical Methods

TABLE E-2
LABORATORY ANALYTICAL METHODS

Analyte	Analytical Method	Method Reporting Limit	Maximum Holding Time*
Surfactants (MBAS)	SM 5540 C	0.5 mg/L	48 hours
Oil and grease	EPA 1664	5 mg/L	28 days
Total Hardness	EPA 200.7	10 mg/L	14 days
Cadmium	EPA 6010, 6020, 200.8	5 µg/L	6 months
Copper	EPA 6010, 6020 200.8	5 µg/L	6 months
Lead	EPA 6010, 6020 200.8	5 µg/L	6 months
Zinc	EPA 6010, 6020, 200.8	20 µg/L	6 months
Diazinon	EPA 8141A	0.05 µg/L	7 days
Chlorpyrifos	EPA 8141A	0.05 µg/L	7 days
Total Coliform*	SM 9221 B, E	20 – 1,600,000 MPN/100ml	6 hours
Fecal Coliform*	SM 9221 B, E	20 – 160,000 MPN/100ml	6 hours
Enterococcus*	SM 9230 A, B	20 – 160,000 MPN/100ml	6 hours

Notes:

*Maximum Holding Time values listed here apply to samples collected and preserved in accordance with the QA/QC procedures listed in the Dry Weather Monitoring Sampling Manual.

Table E-3 Action Levels for Field Screening and Laboratory Parameters

TABLE E-3
ACTION LEVELS FOR FIELD SCREENING AND LABORATORY PARAMETERS

Field Screening Analytes	Action Levels[1]	Source/ Notes
pH	<6.5 or >9.0	Basin Plan, with allowance for elevated pH due to excessive photosynthesis. Elevated pH is especially problematic in combination with high ammonia.
Orthophosphate-P (mg/L)	2.0	USEPA Multi-sector General Permit
Nitrate-N (mg/L)	10.0	Basin Plan, and drinking water standards
Ammonia-N (mg/L)	1.0	Based on Workgroup experience. May also consider unionized ammonia fraction.
Turbidity (NTU)[2]	Best Professional Judgment	WQOs relevant to inland surface waters are not available. Base judgment on channel type and bottom, time since last rain, background levels, and most importantly visual observation (e.g. unusual colors and lack of clarity), and unusual odors.
Temperature (°C)	Best Professional Judgment	Base judgment on season, air temperature, channel type, shading, etc.
Conductivity (mS/cm)	Best Professional Judgment	Values > 5 mS/cm may indicate IC/ID however; EC may be highly elevated in some regions due to high-TDS groundwater exfiltration to surface water, mineral dissolution, drought, and seawater intrusion. Normal source ID and discharge elimination work is not effective in these situations. Knowledge of area background conditions is important. Values < 0.75 mS/cm may indicate excessive potable water discharge or flushing.
Laboratory Analytes	**Action Levels**	**Source/ Notes**
Surfactants (MBAS) (mg/L)	1.0	Basin Plan, with allowance based on Workgroup field experience and possible field reagent interferences.
Oil and Grease (mg/L)	15	USEPA Multi-sector General Permit. If petroleum sheen is observed, the sample should be collected from the water surface. Visual observations may justify immediate investigation.
Diazinon (µg/L)	0.5	Response to diazinon and chlorpyrifos levels above 0.5 µg/L should focus on education and outreach to potential dischargers in the target drainage basin. Highly elevated levels should be investigated aggressively as with other potential IC/IDs.
Chlorpyrifos (µg/L)	0.5	
Dissolved Cadmium (µg/L)	California Toxics Rule	Use California Toxics Rule Table, 1-hour criteria to determine appropriate action level for individual samples. Table provides benchmarks based on hardness and dissolved metals concentration. For example, at 300 mg/L hardness the following action levels would apply: Cd – 14 ppb; Cu – 38 ppb; Pb – 209 ppb; and Zn – 297 ppb.
Dissolved Copper (µg/L)	California Toxics Rule	
Dissolved Lead (µg/L)	California Toxics Rule	
Dissolved Zinc (µg/L)	California Toxics Rule	
Total Coliform (MPN/ 100 mL)	50,000	Bacteria levels in many storm drains are likely to exceed public health guidance criteria. Use confidence interval test and best professional judgment to identify conveyances for source ID.
Fecal Coliform (MPN/ 100 mL)	20,000	
Enterococcus (MPN/ 100 mL)	10,000	

Notes

[1]The referenced action levels should not be the sole criteria for initiating a source identification investigation. Dry weather monitoring data should be interpreted using a variety of available information. Factors that should be considered include within-site and between-site sample variability.

°C	degrees Celsius
mS/cm	milliSiemens
mg/L	milligram per liter
IC/ID	illegal connection/illicit discharge
MBAS	methylene blue active substances
MPN/100 mL	most probable number (of colony forming units) per 100 milliliters
NTU	nephelometric turbidity unit
ppb	parts per billion
USEPA	United States Environment Protection Agency
WQO	Water Quality Objectives