

NOVEMBER 2001

Caltrans Storm Water Monitoring & Research Program

2001-2002 Water Quality Data-Reporting Protocols

CTSW-RT-01-057

Prepared for:
California Department of Transportation
Environmental Program

GENERAL INSTRUCTIONS

(11/15/01)

Please read and be familiar with these general instructions. Water quality data can only be accurately and expediently incorporated into the Caltrans Statewide Storm Water Database if these instructions are carefully followed. Adhering to these instructions will facilitate the processing of data and eliminate the need for time-consuming “record-by-record” data validation at year’s end.

- **Get Monitoring Site IDs from Caltrans at the beginning of each monitoring season.**

Caltrans will assign the “Monitoring Site ID”. All Caltrans data reporters are required to contact the Caltrans database manager at the beginning of each sampling season to receive Monitoring Site IDs for each new site they will sample. Note that BMP sites having multiple points of collections (e.g., inlet, within, outlet) will be assigned a unique Monitoring Site ID for each point of collection. Data reporters shall provide the database manager with the names of each site and the Caltrans district in which each site resides.

- **Enter data appropriately.**

To facilitate the accurate entry of water quality data into Excel worksheets by Caltrans data reporters, and the subsequent transfer of this data into the Caltrans Statewide Storm Water Database, each data field described in this data-reporting protocol document possesses the following attributes: Field Name, Field Type, Field Size, Example, Definition, Notes (where applicable), Standard List (where applicable) and Alternate Value (where applicable). These eight data field attributes are defined below.

Field Name	Name of data field as it appears in the Excel data-reporting worksheet.
Field Type	Specifies the type of data, text or numeric that can be stored in a field. Note: text fields can store both text and numbers.
Field Size	Specifies the number of characters that can be stored in a text field or the number of decimal places required of a number entered into a numeric field.
Example	Provides an example of the data type and possible value that is appropriate for a specific data field.
Definition	Provides a definition of the data type and possible value that is appropriate for a specific data field.
Notes	Provides further information that may be helpful in appropriately and accurately populating a specific data field.
Standard List	Provides a list of standard values appropriate for populating a specific data field.
Alternate Value	Specifies if the use of “N/A” (not applicable) or “None” is an appropriate value for a specific data field.

GENERAL INSTRUCTIONS (CONTINUED)

Additionally, the following rules should be abided by when entering water quality data into the Excel data-reporting worksheets provided by Caltrans.

- **Select and enter text values only from the “Standard List”** of values provided for each data field. Standardized values must be entered exactly as specified. Standard lists are included with the description of each data field where appropriate. If a standardized value provided for a particular data field does not accurately describe the data to be entered into that field, please contact the Caltrans database manager to discuss the creation of an additional value for a particular data field.
- **Use “Constituent” names exactly as they appear in the constituent list, and report data in the units specified.** Please refer to Section 4 at the end of these protocols for the list of “Standard Constituent Names”.
- **Enter numeric data values according to the definition provided for the particular numeric data field.** Text must not be entered into numeric data fields. Text-based comments regarding a numeric value should be placed in the “Notes” data field.
- **“Event ID” follows the format YYYY-NN** (“Year monitoring season begins-Number of event at site beginning with 01”). Event IDs for the 2001-2002 Caltrans monitoring season would all begin with “2001”. The first event monitored at any site shall be assigned an Event ID of “2001-01”. Additional events at a particular site shall be numbered consecutively beginning with “2001-02”.
- **Use the correct system for date entries.** Dates must be entered using the Excel “1900 Date System” typical for Windows (the “1900 Date System” is the default date system used by Microsoft Excel installed on Windows machines). The “Macintosh 1904 Date System” should be switched off in Excel preferences (located in the following nested menus: Tools >> Options >> Calculation).
- **Values contained in data fields that link records from one Excel worksheet (or Access table) to another, such as Monitoring Site ID and Event ID, must match exactly** for the correct relationship to exist between records once the data is imported into the Caltrans Statewide Storm Water Database (Version 2.0 built using Microsoft Access 2000). No match can be made between a Monitoring Site ID of “7 -21” (note an extra space between the 7 and the hyphen) found in the Site Descriptions worksheet and a Monitoring Site ID of “7-21” found in the Sample Descriptions worksheet. In general, wherever data field entries are hyphenated, do not include spaces.
- **If any cell in a data field is left blank* (i.e., the data cell is null), a brief note explaining why the data cell was left blank must accompany the particular record.** The brief note shall be placed in the “Notes” data field associated with the particular record containing one or more blank data cells.

*Exception - The following data field can contain null values without an associated note entered in the “Notes” data field of the relevant worksheet or data table:

<u>Worksheet</u>	<u>Data Field</u>
Sample Descriptions	Overall Qualifier

GENERAL INSTRUCTIONS (CONTINUED)

- **The use of “N/A” as a value entered into a text data field is acceptable for some fields** where the data field definition does not apply to the particular data record being entered. For example, the data field “Control Site” (found in the Site Descriptions worksheet) applies only to Caltrans BMP sites for which a control site exists. This data field is “not applicable” to a non-BMP monitoring site with a “Point of Collection” equal to “Discharge”. Data fields where the use of “N/A” is acceptable have this data value option specified in the Alternate Value attribute. “N/A” cannot be entered into a numeric data field. *Additionally, the use of the value “Other” is no longer acceptable for any data field.*
- **Make sure that all required data records for a particular sampling event exist in the Sample Descriptions, Sampling Event Descriptions and Site Descriptions worksheets according to the following rules to maintain referential integrity among all related records:**
 - A Monitoring Site ID value (e.g., 7-21) contained in the Sample Descriptions worksheet must be represented by a single record for the same Monitoring Site ID in the Site Descriptions worksheet.
 - A Monitoring Site ID value (e.g., 7-21) contained in the Site Descriptions worksheet must be represented by at least one record in the Sample Descriptions worksheet.
 - A unique combination of Monitoring Site ID (e.g., 7-21) and Event ID (e.g., 2001-01) contained in the Sample Descriptions worksheet must be represented by a single record for the same unique Monitoring Site ID/Event ID pair in the Sampling Event Descriptions worksheet. Do not forget to create an Event Descriptions record for “non-storm” monitoring events (such as dry weather sampling, groundwater sampling, etc.) even though these events may not include the collection of precipitation and runoff data (Event ID, Site ID, Event Type, Sample Collector and Organization can be populated for these non-storm event records).
 - A unique combination of Monitoring Site ID (e.g., 7-21) and Event ID (e.g., 2001-01) found in the Sample Event Descriptions worksheet must be represented by at least one record in the Sample Descriptions worksheet having the same Monitoring Site ID/Event ID pair.
- **Do not report analytical results for blanks and duplicates. Report only values from environmental samples that have been QA/QC’ed.**
- **Use only Excel worksheets provided by Caltrans for the entry of water quality data.**

All Caltrans “Electronic Data Deliverables” (EDD) must be submitted in the format of the data-reporting worksheets provided by Caltrans. These worksheets are formatted according to the requirements of the data fields contained within them as described in this data-reporting protocols document. The **LDC Checker/ADV software** will export **Sample Descriptions** data in the format specified by this document. Each data reporter must enter **Sampling Event Descriptions** and **Site Descriptions** data in their respective data-reporting worksheets by hand. All data field headings should remain as they were originally entered into the worksheets at the time of their distribution to data reporters. Please confirm that all data entered in the worksheets correspond to the appropriate data field headings.

GENERAL INSTRUCTIONS (CONTINUED)

- **If a sample is analyzed and subsequently deemed not to be representative of the monitoring event from which it was collected (e.g., the sample doesn't meet the requirements for percent storm capture, minimum number of aliquots, etc.), then the data should not be included as part of the data reporter's EDD.**
- **Label all elements of each Electronic Data Deliverable (EDD) clearly**
 - The Excel workbook file containing worksheets storing Sample Descriptions, Sampling Event Descriptions, and Site Descriptions data should be labeled with the name of the data reporter (consultant or university), the title of the Caltrans activity under which the data was collected, and the monitoring season (e.g., 2001-2002 or 01-02) during which the data was collected.

File naming convention for water quality data:

Water quality data file	CDM Dice Study_2001-2002
	UCLA First Flush Study_01-02

- The submittal of supporting data and documents, such as time series data, maps, and photographs, should be labeled with the Caltrans Monitoring Site ID and monitoring season to which they correspond. Times series data collected during storm events at a monitoring site can be submitted as multiple worksheets (one worksheet for each storm event) in a single workbook that represents all times series data collected at that site during an entire monitoring season.

File naming conventions for supporting data:

Time series file	Site 7-21 Time Series_2001-2002.xls
Map file	Site 7-21 Map_2001-2002.pdf
Photograph file	Site 7-21 Photo_2001-2002.jpeg

- When submitting an EDD to the Caltrans database manager, please compile all files (water quality data, including sample, event and site descriptions, time series data, maps and photographs) onto one or more recordable compact discs (CD-R) labeled with the data reporter's name and date of data submittal. Mail CD(s) to the database manager at the address provided below.
- **Please notify Caltrans of any errors or inconsistencies found in this document, or any changes you might recommend.**

Definition of a Precipitation Event

For the purposes of these protocols, a precipitation event shall begin with six consecutive hours during which a sum total of at least 2.54 mm (0.1 inches) of rain falls, and end with six consecutive hours in each of which no rainfall greater than 0.25 mm (0.01 inches) of rain is recorded. The precipitation event so identified shall be truncated so that it both begins and ends in hours with rainfall equal to or greater than 0.25 mm (0.01 inches).

GENERAL INSTRUCTIONS (CONTINUED)

Contact Information

Please refer questions or comments to:

Mike Trouchon
Caltrans Database Manager
Larry Walker Associates
509 4th Street
Davis, CA 95616

(530) 753-6400 x217
michaelt@lwa.com

Masoud Kayhanian
Caltrans/University Storm Water Research Program
7801 Folsom Blvd., Suite 102
Sacramento, CA 95826

(916) 278-8112
mdkayhanian@ucdavis.edu

LIST OF CONTENTS

GENERAL INSTRUCTIONS.....	i
LIST OF CONTENTS.....	v
1. WATER QUALITY SAMPLE DESCRIPTIONS.....	1
1.1 Monitoring Site ID.....	1
1.2 Event ID.....	1
1.3 Sample Start Date.....	1
1.4 Sample Start Time.....	1
1.5 Sample End Date.....	2
1.6 Sample End Time.....	2
1.7 Sample Source.....	2
1.8 Event Representation.....	3
1.9 Sample Type.....	3
1.10 Sample Matrix.....	3
1.11 Constituent Type.....	4
1.12 CAS Number.....	4
1.13 Constituent.....	4
1.14 Fraction.....	5
1.15 Numerical Qualifier.....	5
1.16 Reported Value.....	5
1.17 Overall Qualifier.....	6
1.18 Units.....	6
1.19 Preparation Method.....	7
1.20 Method Reference.....	7
1.21 Method Number.....	7
1.22 Method Detection Limit.....	8
1.23 Reporting Limit.....	8
1.24 Collection Method.....	8
1.25 Field Sample ID.....	8
1.26 Lab Name.....	9
1.27 Lab Sample ID.....	9
1.28 Contract Number.....	9
1.29 Task Order Number.....	9
1.30 Sample Notes.....	10
2. WATER QUALITY SAMPLING EVENT DESCRIPTIONS.....	11
2.1 Event ID.....	11
2.2 Monitoring Site ID.....	11

2.3	Event Type.....	11
2.4	Rain Start Date.....	12
2.5	Rain Start Time.....	12
2.6	Rain End Date.....	12
2.7	Rain End Time.....	12
2.8	Event Rain (mm).....	12
2.9	Max Intensity (mm/hr).....	13
2.10	Antecedent Dry (days).....	13
2.11	Antecedent Event Rain (mm).....	13
2.12	Peak Capture.....	13
2.13	Runoff Start Date.....	14
2.14	Runoff Start Time.....	14
2.15	Runoff End Date.....	14
2.16	Runoff End Time.....	14
2.17	Total Flow Volume (L).....	14
2.18	Peak Flow (L/s).....	14
2.19	Estimated Percent Capture.....	15
2.20	Cumulative Precipitation (mm).....	15
2.21	Sample Collector.....	15
2.22	Organization.....	15
2.23	Event Notes.....	15
3.	WATER QUALITY SITE DESCRIPTIONS.....	16
3.1	Monitoring Site ID.....	16
3.2	Monitoring Year.....	16
3.3	Site Name.....	16
3.4	Site Description.....	16
3.5	Caltrans District.....	16
3.6	Hydrologic Sub-Area.....	17
3.7	County.....	17
3.8	RWQCB.....	17
3.9	Runoff Characterization.....	18
3.10	Surface Type.....	18
3.11	Land Use.....	19
3.12	Catchment Area (ha).....	19
3.13	Impervious Fraction.....	19
3.14	BMP Type.....	20
3.15	Point of Collection.....	21
3.16	Control Site.....	21
3.17	Cut-Fill.....	21
3.18	Roadway Post Mile.....	22
3.19	Latitude.....	22
3.20	Longitude.....	22

3.21	Datum.....	22
3.22	Rain Record Source.....	23
3.23	Receiving Water Type.....	23
3.24	AADT.....	23
3.25	AADT Source.....	23
3.26	Adjacent Lanes.....	24
3.27	Total Lanes.....	24
3.28	Time Series.....	24
3.29	Map.....	24
3.30	Photograph.....	25
3.31	Site Notes.....	25
4.	STANDARD CONSTITUENT NAMES.....	26
4.1	Metals.....	26
4.2	Nutrients.....	26
4.3	Conventionals.....	26
4.4	Major Ions.....	26
4.5	Minerals.....	27
4.6	Microbiological.....	27
4.7	Volatile Organic Compounds (VOCs).....	27
4.8	Semi-Volatile Organic Compounds (SVOCs).....	28
4.9	OC Pesticides.....	29
4.10	OP Pesticides.....	29
4.11	Other Pesticides.....	30
4.12	Miscellaneous Pesticides.....	30
4.13	Polychlorinated Biphenyls (PCBs).....	30
4.14	Hydrocarbons.....	30
4.15	Miscellaneous Constituents.....	30
5.	MEASURING UNITS CONVERSION TABLES.....	31
5.1	Length Conversions.....	31
5.2	Area Conversions.....	31
5.3	Volume/Capacity Conversions.....	32
5.4	Mass Conversions.....	32
5.5	Temperature Conversions.....	32

1. WATER QUALITY SAMPLE DESCRIPTIONS

1.1. Monitoring Site ID

Field Type: Text
Field Size: 8 characters
Example: 7-21
Definition: A unique identification number assigned to the monitoring site by Caltrans.
Notes: The first part of the Monitoring Site ID corresponds to the Caltrans district in which the site is located.

1.2. Event ID

Field Type: Text
Field Size: 8 characters
Example: 2001-01
Definition: A unique, site-specific identification number assigned to a sampling event.
Notes: Event ID follows the format YYYY-NN ("Year monitoring season begins- Number of event at site beginning with 01"). The first event at any site would be assigned an Event ID of "Year-01". Additional events at a particular site shall be numbered consecutively beginning with "Year-02". Even if a site isn't monitored until the latter half of the monitoring season (e.g., Site X is monitored during Feb. - Apr. 2002 - the latter half of the 2001-2002 monitoring season), its Event IDs include the year in which the general Caltrans monitoring season began (e.g., samples collected during the first event at Site X in Feb. 2002 are assigned Event IDs of "2001-01").

1.3. Sample Start Date

Field Type: Date
Field Size: N/A
Example: 11/05/2001
Definition: Date on which composite sampling begins or grab sample is collected. In regard to composite samples, specifically the date on which the sampler was activated and the flow meter began totalizing flow.
Notes: Formatted as mm/dd/yyyy.

1.4. Sample Start Time

Field Type: Time
Field Size: N/A
Example: 15:24
Definition: Time at which composite sampling begins or grab sample is collected. In regard to composite sampling, specifically the time at which the sampler was activated and the flow meter began totalizing flow.
Notes: Formatted for 24-hour clock (hh:mm).

1.5. Sample End Date

Field Type: Date

Field Size: N/A

Example: 11/05/2001

Definition: Date on which composite sampling ends. Specifically, the date on which the last composite sample aliquot was collected.

Notes: Formatted as mm/dd/yyyy.

1.6. Sample End Time

Field Type: Time

Field Size: N/A

Example: 15:24

Definition: Time at which composite sampling ends. Specifically, the time at which the last composite sample aliquot was collected.

Notes: Formatted for 24-hour clock (hh:mm).

1.7. Sample Source

Field Type: Text

Field Size: 12 characters

Example: Storm

Definition: Identifies the source of the water quality sample analyzed.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Storm - Sample from storm water (rainfall) runoff
- Rain - Sample from rainwater collected directly from the atmosphere
- Snowfall - Sample from snowfall collected directly from the atmosphere
- Snow melt - Sample from snow melt runoff
- Receiving - Sample from receiving water
- Base - Sample from dry-weather base flow
- Groundwater - Sample from groundwater
- Non-storm - Sample from non-storm water runoff

1.8. Event Representation

Field Type: Text

Field Size: 12 characters

Example: FF

Definition: Describes the part of the event represented by the sample.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- FF - Event first flush
- Peak - Event peak flow
- Whole - Whole storm
- Discrete - One or more discrete samples collected during an event that cannot be described as representing the first flush, peak or whole storm portion ...of the event. This value will typically, although not exclusively, be used for a "Non-storm" Sample Source.
- X-hr Comp - Used to describe a planned composite sampling event lasting X hours.

1.9. Sample Type

Field Type: Text

Field Size: 2 characters

Example: C

Definition: Describes the way in which sample was collected.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- C - Composite Sample: A sample made up of multiple sub-samples (aliquots) collected over some spatial or temporal scale.
- G - Grab Sample: A single sample that represents conditions at a distinct point in time.

1.10. Sample Matrix

Field Type: Text

Field Size: 10 characters

Example: Water

Definition: Matrix from which sample was analyzed.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Water

Note: Other sample matrices, such as sediment, sludge, soil, solid, etc. are now included in the 2001-2002 Sediment Data-Reporting Protocols document.

1.11. Constituent Type

Field Type: Text

Field Size: 4

Example: CON

Definition: Describes the type or class of constituent analyzed.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- CON - Conventionals
- HC - Hydrocarbons
- ION - Major Ions
- M - Metals
- MIC - Microbial
- MIN - Minerals
- N - Nutrients
- PCB - Polychlorinated Biphenyls (PCBs)
- PEST - Pesticides
- SVOC - Semi-volatile Organic Compounds
- VOC - Volatile Organic Compounds
- MISC - Miscellaneous Constituents (refer to Section 4, "Standard Constituent Names", for list of constituents classified as "Miscellaneous").

1.12. CAS Number

Field Type: Text

Field Size: 15 characters

Example: 7440-50-8

Definition: CAS Number (Chemical Abstracts Service Registry Number) or Caltrans Constituent ID number for constituent.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Refer to Section 4, "Standard Constituent Names", for list of CAS and Caltrans Constituent ID numbers.

1.13. Constituent

Field Type: Text

Field Size: 40 characters

Example: Cu

Definition: Name of constituent as found in the Caltrans Statewide Storm Water Database.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Refer to Section 4 - "Standard Constituent Names".

1.14. Fraction

Field Type: Text

Field Size: 6 characters

Example: Total

Definition: Describes fraction of constituent analyzed.

Notes: Standardized Entry. Enter value from standard list or contact database manager.
THIS DATA FIELD CAN NO LONGER BE LEFT BLANK/NULL.

Standard List

- Total - Total fraction (to be used with metals and total phosphorus only).
- TR - Total recoverable fraction (to be used with metals only).
- Diss - Dissolved fraction (to be used with metals and orthophosphate only).
- N/A - All constituents other than those specified above should receive a value of "N/A" (not applicable) to describe their fraction analyzed.

1.15. Numerical Qualifier

Field Type: Text

Field Size: 1 character

Example: <

Definition: An indication of what the Reported Value for an analyzed sample represents (i.e., a minimum, maximum or "exact" value).

Notes: Standardized Entry. Enter value from standard list or contact database manager. Please refer to Overall Qualifier (see data field 1.17. below) for additional guidance on the appropriate qualification of water quality results.

Standard List

- < - Actual value of analyzed sample is less than reported value. This symbol must be used for all "non-detect" samples.
- = - Value of analyzed sample is as reported.
- > - Actual value of analyzed sample is greater than reported value.

1.16. Reported Value

Field Type: Numeric

Field Size: N/A

Example: 0.25

Definition: Reported laboratory result of analyzed sample.

Notes: Reported Value must equal Reporting Limit if associated Numerical Qualifier is "<".

1.17. Overall Qualifier

Field Type: Text

Field Size: 4 characters

Example: U

Definition: An overall data validation qualifier based on lab results and associated quality assurance/quality control (QAQC) analyses.

Notes: Standardized Entry. Enter value from standard list or contact database manager. The qualifiers and definitions presented below represent a compilation of data qualifiers used by specific EPA programs as noted in: (1) *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 1994); and (2) *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA, 1999).

Standard List

- U - The material was analyzed for, but was not detected above the level of the associated value (the associated value represents a reporting limit that may or may not be elevated due to blank contamination).
- J - The associated value is approximate (i.e., an estimated quantity).
- N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
- NJ - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- UJ - The material was analyzed for, but was not detected. The associated value (i.e., reporting limit) is an estimate and may be inaccurate or imprecise.
- R - The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

1.18. Units

Field Type: Text

Field Size: 12 characters

Example: mg/L

Definition: Describes the unit of measure associated with the Reported Value.

Notes: Standardized Entry. Enter value from standard list or contact database manager. Report sample results in the appropriate unit associated with a particular constituent as specified in "Standard Constituent Names" (see Section 4). Confirm that values for Reported Value, Method Detection Limit, and Reporting Limit are all reported in the same units for individual sample records.

Standard List

- ug/L
- mg/L
- fibers/L - Unit to be used only when reporting analytical results for Asbestos.
- °C
- pH units
- umhos/cm
- MPN/100mL
- NTU

1.19. Preparation Method

Field Type: Text

Field Size: 40 characters

Example: Separatory Funnel

Definition: Describes the preparation a sample underwent prior to analysis. All samples receiving no form of preparation prior to analysis should have this data field value reported as "None".

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Hot Plate
- Microwave
- Purge and Trap
- Methanol Extraction
- Continuous
- Separatory Funnel
- Soxhlet
- Ultrasonic Extraction
- Solid Phase Extraction - for water samples
- Accelerated Solvent Extraction

Alternate Value: - None (see Definition above).

1.20. Method Reference

Field Type: Text

Field Size: 10 characters

Example: EPA

Definition: Provides the reference for the analytical method used to evaluate the sample.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- EPA - US Environmental Protection Agency.
- SM - Standard Methods.
- Field - Constituent evaluated in the field. Note: no Method Numbers are associated with field-measured constituents.
- Caltrans - Caltrans-defined analytical method.

1.21. Method Number

Field Type: Text

Field Size: 10 characters

Example: 625

Definition: Reference number for the analytical method used to evaluate the sample.

Notes: By convention, method numbers that contain a text suffix do not include a space between the number and the text suffix (e.g., 6010A).

1.22. Method Detection Limit

Field Type: Numeric

Field Size: N/A

Example: 0.2

Definition: Method Detection Limit (MDL) - The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from the analysis of a sample in a given matrix containing the analyte.

Notes: Concentrations reported by a laboratory that are between the MDL and Reporting Limit (see data field 1.23. below) are usually flagged by the laboratory as estimated "J", indicating that the constituent is present but its concentration cannot be accurately quantified (see data field 1.17, Overall Qualifier, for further information on data validation qualifiers).

1.23. Reporting Limit

Field Type: Numeric

Field Size: N/A

Example: 1.0

Definition: Reporting Limit (RL) as reported by laboratory. This value is the lowest concentration of a constituent that can be reliably quantified within specified limits of precision and accuracy during routine laboratory operating conditions. Reporting Limit is equivalent to Practical Quantitative Limit (PQL) and Reported Detection Limit (RDL).

Notes: The RL may be elevated above the Caltrans "target" RL due to matrix interference.

1.24. Collection Method

Field Type: Text

Field Size: 6 characters

Example: Auto

Definition: Describes the way in which a sample was collected.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Auto - Sample aliquot collected by automated sampling device.
- Manual - Sample aliquot collected manually.

1.25. Field Sample ID

Field Type: Text

Field Size: 35 characters

Example: 134-0010-281500A

Definition: Field identification number assigned to sample/sample vessel.

Notes: This data field can contain any combination of text and numeric characters.

1.26. Lab Name

Field Type: Text

Field Size: 25 characters

Example: APPL

Definition: Name of laboratory that analyzed sample.

Notes: Standardized Entry. Select value from standard list. The list of analytical laboratories used by the Caltrans Storm Water Management Program will likely change over time, and therefore the Standard List below might not include the name of every laboratory used in any given monitoring year.

Standard List

- APPL - Agriculture & Priority Pollutants Labs
- Aquascience
- Associated Labs
- BSK
- CEL - Calscience Environmental Labs
- Del Mar Analytic
- GeoAnalytical Labs
- North Coast Labs
- Pat-Chem
- Quanterra
- Silliker
- Soil Control Lab
- ToxScan

1.27. Lab Sample ID

Field Type: Text

Field Size: 25 characters

Example: 120085-400A

Definition: Laboratory identification number assigned to sample by analytical laboratory.

Notes: This data field can contain any combination of text and numeric characters.

1.28. Contract Number

Field Type: Text

Field Size: 12 characters

Example: 43A005

Definition: Caltrans contract number under which sample was collected.

Notes: This data field can contain any combination of text and numeric characters.

1.29. Task Order Number

Field Type: Text

Field Size: 6 characters

Example: 11

Definition: Caltrans task order number under which sample was collected.

Notes: This data field can contain any combination of text and numeric characters.

1.30. Sample Notes

Field Type: Text
Field Size: 255 characters
Example: Sample End Time missing due to malfunctioning automated sampler.
Definition: This data field contains any notes or remarks about the sample or various data fields used to describe the sample.
Notes: Data reporter should provide a note for any data field left blank (with the exception of Overall Qualifier). It is not appropriate to provide a note in a particular cell of a data field other than Sample Notes. Considering the example above, it is not appropriate to place the note, "Sample End Time missing due to malfunctioning automated sampler", in the Sample End Time data field. The note must be entered into the Sample Notes data field.

2. WATER QUALITY SAMPLING EVENT DESCRIPTIONS

2.1. Event ID

Field Type: Text

Field Size: 8 characters

Example: 2001-01

Definition: A unique, site-specific identification number assigned to a sampling event.

Notes: Event ID follows the format "Year monitoring season begins-Number of event at site beginning with 01". The first event at any site would be assigned an Event ID of "Year-01". Additional events at a particular site shall be numbered consecutively beginning with "Year-02". Even if a site isn't monitored until the latter half of the monitoring season (e.g., Site X is monitored during Feb. - Apr. 2002 - the latter half of the 2001-2002 monitoring season), its Event IDs include the year in which the general Caltrans monitoring season began (e.g., samples collected during the first event at Site X in Feb. 2002 are assigned Event IDs of "2001-01").

2.2. Monitoring Site ID

Field Type: Text

Field Size: 8 characters

Example: 7-21

Definition: A unique identification number assigned to the monitoring site by Caltrans.

Notes: The first part of the Monitoring Site ID corresponds to the Caltrans district in which the site is located.

2.3. Event Type

Field Type: Text

Field Size: 10 characters

Example: Non-storm

Definition: Describes if sampling event is associated with a storm event or a non-storm event.

Notes: Standardized Entry. Select value from standard list or contact database manager. This data field quickly describes whether an event record includes precipitation and flow data (i.e., event is a storm event) or does not necessarily include such precipitation and flow data (i.e., event is a non-storm event, such as a dry weather or groundwater sampling event; note: flow data could be provided for a dry weather event). Storm event records that are missing various precipitation and flow data due to malfunctioning equipment must be described with Event Type equal to "Storm" and include remarks in their Event Notes data field as to why certain data are missing.

Standard List

- Storm
- Non-storm

2.4. Rain Start Date

Field Type: Date
Field Size: N/A
Example: 11/05/2001
Definition: Date on which precipitation event begins.
Notes: Formatted as mm/dd/yyyy. See “Definition of a Precipitation Event” in the General Instructions section of this document.

2.5. Rain Start Time

Field Type: Time
Field Size: N/A
Example: 15:24
Definition: Time at which precipitation event begins.
Notes: Formatted for 24-hour clock (hh:mm). See “Definition of a Precipitation Event” in the General Instructions section of this document.

2.6. Rain End Date

Field Type: Date
Field Size: N/A
Example: 11/05/2001
Definition: Date on which precipitation event ends.
Notes: Formatted as mm/dd/yyyy. See “Definition of a Precipitation Event” in the General Instructions section of this document.

2.7. Rain End Time

Field Type: Time
Field Size: N/A
Example: 15:24
Definition: Time at which precipitation event ends.
Notes: Formatted for 24-hour clock (hh:mm). See “Definition of a Precipitation Event” in the General Instructions section of this document.

2.8. Event Rain (mm)

Field Type: Numeric
Field Size: Provide number only to two (2) decimal places.
Example: 15.99
Definition: Total rain at site for an event in millimeters (mm).
Notes: The Site Descriptions data field named Rain Record Source identifies the source of the Event Rain data for a particular monitoring site. See “Definition of a Precipitation Event” in the General Instructions section of this document.

2.9. Max Intensity (mm/hr)

Field Type: Numeric
Field Size: Provide number only to two (2) decimal places.
Example: 12.18
Definition: Peak 5-minute intensity of a storm event in millimeters/hour (mm/hr).
Notes: Maximum Intensity is calculated as twelve times (12 x) the maximum rainfall recorded in any 5-minute period.

2.10. Antecedent Dry (days)

Field Type: Numeric
Field Size: Provide number only to one (1) decimal place.
Example: 12.0
Definition: Days since the end of the most recent prior Caltrans-defined precipitation event (whether monitored or not). If datum exists, irrespective of whether the prior event was monitored, data reporter should include Antecedent Dry datum as part of the Event Record for the current event.
Notes: See "Definition of a Precipitation Event" in the General Instructions section of this document.

2.11. Antecedent Event Rain (mm)

Field Type: Numeric
Field Size: Provide number only to two (2) decimal places.
Example: 24.37
Definition: Total rain at site for the most recent antecedent precipitation event in millimeters (mm). The antecedent precipitation event used for this data field should be the same antecedent precipitation event referenced in the Antecedent Dry data field. The quantification of Antecedent Event Rain does not include "inter-event" precipitation.
Notes: Using the examples provided above for Antecedent Dry and Antecedent Event Rain, the antecedent or prior precipitation event for Site X occurred 12.0 days ago, and delivered 24.37 mm of rainfall. The antecedent precipitation event must meet Caltrans' criteria for a precipitation event. See "Definition of a Precipitation Event" in the General Instructions section of this document.

2.12. Peak Capture

Field Type: Text
Field Size: 1 character
Example: Y
Definition: Indication of whether peak flow was captured during sampling event.
Notes: Standardized Entry. Select value from standard list or contact database manager.
Standard List

- Y - Yes, peak flow was captured.
- N - No, peak flow was not captured.

2.13. Runoff Start Date

Field Type: Date
Field Size: N/A
Example: 11/05/2001
Definition: Date on which first runoff begins.
Notes: Formatted as mm/dd/yyyy.

2.14. Runoff Start Time

Field Type: Time
Field Size: N/A
Example: 15:24
Definition: Time at which first runoff begins.
Notes: Formatted for 24-hour clock (hh:mm).

2.15. Runoff End Date

Field Type: Date
Field Size: N/A
Example: 11/05/2001
Definition: Date on which last runoff ceases.
Notes: Formatted as mm/dd/yyyy.

2.16. Runoff End Time

Field Type: Time
Field Size: N/A
Example: 15:24
Definition: Time at which last runoff ceases.
Notes: Formatted for 24-hour clock (hh:mm)

2.17. Total Flow Volume (L)

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 38686
Definition: Total measured flow volume in liters (L) at a monitoring site for an event.

2.18. Peak Flow (L/s)

Field Type: Numeric
Field Size: Provide number only to two (2) decimal places.
Example: 3.40
Definition: Estimated peak flow of runoff in liters per second (L/s) at a monitoring site for an event.

2.19. Estimated Percent Capture

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 99
Definition: Estimated percentage of total event flow volume during which monitoring was performed (i.e., while the sampler was activated and flow-proportioned sample collection was successfully occurring). Report datum only if estimate is based on actual runoff and sample collection data measured by an instrument located at the monitoring site in question.
Notes: Periods of sampler malfunction or failure to collect sample must be excluded from the “captured flow”.

2.20. Cumulative Precipitation (mm)

Field Type: Numeric
Field Size: Provide number only to two (2) decimal places.
Example: 100.761
Definition: Estimated cumulative precipitation in millimeters (mm) at monitoring site since the beginning of the water year (October 1), up to the Rain Start Date/Time for the monitored event. All precipitation that has fallen to date at a site, including “inter-event” precipitation, should be included in the Cumulative Precipitation value reported for that site for a particular event.

2.21. Sample Collector

Field Type: Text
Field Size: 25 characters
Example: Peggie Sampson
Definition: Name of the individual who collected the sample.

2.22. Organization

Field Type: Text
Field Size: 30 characters
Example: Acme Environmental
Definition: Organization to which the sample collector is associated.

2.23. Event Notes

Field Type: Text
Field Size: 255 characters
Example: Runoff End Time missing due to malfunctioning flow meter.
Definition: This data field contains any notes or remarks about the sampling event or various data fields used to describe the sampling event.
Notes: Data reporter should provide a note for any data field left blank. It is not appropriate to provide a note in a particular cell of a data field other than Event Notes. Considering the example above, it is not appropriate to place the note, “Runoff End Time missing due to malfunctioning flow meter”, in the Runoff End Time data field. The note must be entered into the Event Notes data field.

3. WATER QUALITY SITE DESCRIPTIONS

3.1. Monitoring Site ID

Field Type: Text
Field Size: 8 characters
Example: 7-21
Definition: A unique identification number assigned to the monitoring site by Caltrans.
Notes: The first part of the Monitoring Site ID corresponds to the Caltrans district in which the site is located.

3.2. Monitoring Year

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 2001
Definition: Identifies the monitoring season a site is monitored by populating the data field with the year the current monitoring season begins.
Notes: In regard to the 2001-2002 monitoring season, the Monitoring Year value for each site monitored would be "2001" – the year the current monitoring season began. The term Monitoring Year refers to only a single calendar year, while the term Monitoring Season necessarily refers to two calendar years, such as 2001-2002.

3.3. Site Name

Field Type: Text
Field Size: 100 characters
Example: DICE Site 12/23
Definition: Name of monitoring site.
Notes: Site Name is meant to be a shorthand designation for the monitoring site, and the "common name" by which the sampling crew and data reporter refer to the site.

3.4. Site Description

Field Type: Text
Field Size: 255 characters
Example: East of Ocean View Avenue Onramp to EB 210 Fwy; a low-density residential site within foothills.
Definition: Describes monitoring site in some detail, including observations related to site's location and physical characteristics.
Notes: In addition to the above definition, this field can be used to describe changes observed at the site since the prior monitoring season.

3.5. Caltrans District

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 7
Definition: Caltrans district in which monitoring site is located.

3.6. Hydrologic Sub-Area

Field Type: Numeric
Field Size: Provide 5-digit number in the format XXX.XX
Example: 405.32
Definition: State Water Resources Control Board (SWRCB) Hydrologic Unit Sub-Area in which monitoring site is located.
Notes: SWRCB Hydrologic codes are 6-byte strings composed of numbers and a decimal point. The meaning associated with each byte position is shown below.

<u>Byte(s)</u>	<u>Meaning</u>
1	Hydrologic Region
2,3	Hydrologic Unit
4	always a decimal point
5	Hydrologic Area
6	Hydrologic Sub-Area

Hydrologic sub-areas are typically identified in Basin Plans. They may also be found at the Water Quality Standards Inventory Database web site:
<http://www.endeavor.des.ucdavis.edu/wqsid/region.asp>

3.7. County

Field Type: Text
Field Size: 20 characters
Example: Los Angeles
Definition: County in which monitoring site is located.
Notes: It is not necessary to include the word "County" along with the actual name of the county in which the monitoring site is located.

3.8. RWQCB

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 4
Definition: Regional Water Quality Control Board (RWQCB) region in which monitoring site is located.

3.9. Runoff Characterization

Field Type: Text

Field Size: 20 characters

Example: Hwy

Definition: Type of runoff characterized by samples collected from monitoring site.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Hwy - Highway or Freeway
- Maintenance - Maintenance facility
- Parking - Parking lot (e.g., Park & Ride facility)
- Rest Area - Rest area
- Acceleration - Acceleration area
- Deceleration - Deceleration area
- Construction - Construction
- BMP - Site designed for storm water treatment
- Border Check-point - Border Check-point
- Bridge - Bridge
- CVIF - Commercial Vehicle Inspection Facility
- Receiving - Receiving water (described further in "Receiving Water Type")
- Toll Plaza - Toll Plaza
- Watershed - Urban or rural watershed (described further in "Land Use")

3.10. Surface Type

Field Type: Text

Field Size: 25 characters

Example: Pavement

Definition: Describes the predominant surface type associated with a Caltrans facility.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Landscape - Landscaping
- Pavement - Pavement only
- Right-of-Way - Right-of-Way (includes landscape and pavement)
- Construction Site - Graded construction site

3.11. Land Use

Field Type: Text

Field Size: 4 characters

Example: R

Definition: Predominant land use of the tributary catchment area. This field describes the predominant land use of the area from which sampled runoff originates.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- R - Residential
- C - Commercial
- I - Industrial
- A - Agricultural
- F - Forest
- O - Open
- T - Transportation Facility (e.g., bridge, county road, highway, etc.)
- M - Mixed (no predominant land use can be discerned)

3.12. Catchment Area (ha)

Field Type: Numeric

Field Size: Provide number only to two (2) decimal places.

Example: 2.91

Definition: Total surface area in hectares (ha) draining to the point of collection of the storm water runoff sample.

3.13. Impervious Fraction

Field Type: Numeric

Field Size: Provide number only to two (2) decimal places.

Example: 0.67

Definition: Estimated fraction of the catchment area that is effectively impervious.

3.14. BMP Type

Field Type: Text

Field Size: 35 characters

Example: EDB

Definition: Describes the type of BMP represented by the monitoring site. This data field to be populated only for monitoring sites designed to treat storm water runoff. All non-BMP sites should have this data field value reported as "N/A".

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Retention - Retention Pond
- Swale - Biofiltration Swale
- EDB - Extended Detention Basin
- Wet Pond - Wet Detention Pond
- Dry Pond - Extended Dry Detention Pond
- Compost - Compost Media Filter
- Zeolite - Zeolite Media Filter
- SF - Sand Media Filter
- IB - Infiltration Basin
- IT - Infiltration Trench
- TCB - Trapping Catch Basin
- Insert - Drain Inlet Insert
- Strip - Biofiltration Strip
- Strip-Trench - Filtration Strip and Infiltration Trench Treatment Train
- OWS - Oil/Water or Debris Separator
- MCTT - Mult-chambered Treatment Train
- CDS - Continuous Deflector Separator
- DIC - Drain Inlet Cleaning
- Pickup - Litter Pickup (litter studies)
- Sweep - Street Sweeping (litter studies)
- ModifyIn - Modified Inlet (litter studies)
- Grate - Bicycle Grate/LID (litter studies)
- ModGrate - Modified Bicycle Grate (litter studies)
- Baffle Box - Baffle Box (litter studies)
- IBS - Inclined Bar Screen (litter studies)
- LRD - Linear Radial Device (litter studies)

Alternate Value: - N/A (see Definition above).

3.15. Point of Collection

Field Type: Text

Field Size: 12 characters

Example: Discharge

Definition: Describes the point of sample collection at the monitoring site.

Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Discharge - Outfall to receiving water or outlet to conveyance system
- Inlet - Inlet to BMP
- Outlet - Outlet to BMP
- Within - Somewhere within BMP
- Bypass
- Overflow
- Overland - Overland flow
- Receiving - Location(s) in receiving water (stream, lake, etc.)

3.16. Control Site

Field Type: Text

Field Size: 20 characters

Example: 7-156

Definition: The Caltrans Monitoring Site ID for the control or BMP "inlet" site associated with the BMP "outlet" or BMP "within" site in question. All non-BMP sites and BMP "inlet" sites should have this data field value reported as "N/A".

Notes: A small number of BMP sites do not possess a control or reference site. These sites should have this data field populated with the value "No Control for BMP".

Alternate Values: - N/A (see Definition above).
- No Control for BMP (see Notes above).

3.17. Cut-Fill

Field Type: Text

Field Size: 15 characters

Example: Cut

Definition: Identifies the roadway or facility as a cut, fill, grade or hybrid type (e.g., Grade/Fill) site.

Notes: Standardized Entry. Enter value from standard list or contact database manager.

Standard List

- Cut - Sample collected from a cut area.
- Fill - Sample collected from a fill area.
- Grade - Sample collected from a grade area.
- Cut/Fill - Sample collected from a roadway or facility with both cut and fill areas.
- Grade/Cut - Sample collected from a roadway or facility with both grade and cut areas.
- Grade/Fill - Sample collected from a roadway or facility with both grade and fill areas.

3.18. Roadway Post Mile

Field Type: Text

Field Size: 18 characters

Example: I-210-EB-18.45

Definition: A four-part descriptor that describes the roadway type, roadway number, traffic direction, and post mile of the Caltrans highway facility nearest to the monitoring site. If no such Post Mile exists for a site, the data field value should be reported as "N/A".

Notes: The Roadway Post Mile value is a compilation of the following four pieces of information: **Roadway Type-Roadway Number-Traffic Direction-Post Mile**. Standardized entries exist for roadway type and traffic direction. Select values from standard lists or contact database manager.

Standard Lists

Roadway Type

- I - Interstate
- SR - State Route
- CR - County Road

Traffic Direction

- EB - Eastbound
- WB - Westbound
- NB - Northbound
- SB - Southbound

Alternate Value: - N/A (see Definition above).

3.19. Latitude

Field Type: Numeric

Field Size: Provide number to five (5) decimal places.

Example: 34.20969

Definition: Latitude of monitoring site in decimal degrees to five (5) decimal places.

Notes: Data should be collected using a differential GPS instrument with sufficient accuracy to report degrees to five decimal places.

3.20. Longitude

Field Type: Numeric

Field Size: Provide number to five (5) decimal places.

Example: 118.22469

Definition: Longitude of monitoring site in decimal degrees to five (5) decimal places.

Notes: Data should be collected using a differential GPS instrument with sufficient accuracy to report degrees to five decimal places

3.21. Datum

Field Type: Text

Field Size: 20 characters

Example: NAD 83

Definition: Datum by which latitude and longitude reported.

3.22. Rain Record Source

Field Type: Text
Field Size: 50 characters
Example: NOAA
Definition: Source of precipitation record used in precipitation estimates.
Notes: Report "Onsite" if rain gauge is located at the monitoring site, or report the name/location of the nearest rain gauge. Actual precipitation event record (i.e., rainfall data from rain gauge) should be included in a Time Series worksheet for the event (see Time Series data field description in this section).

3.23. Receiving Water Type

Field Type: Text
Field Size: 20 characters
Example: Intermittent
Definition: Type of receiving water sampled or into which storm water runoff is discharged.
Notes: Standardized Entry. Select value from standard list or contact database manager.

Standard List

- Intermittent - Intermittent or seasonal stream or channel
- Wetlands - Seasonal or perennial wetlands
- River - Perennial freshwater river
- Stream - Perennial freshwater stream
- Lake - Freshwater lake or impoundment
- Pond - Freshwater pond
- Bay - Salt or brackish water bay
- Estuary - Salt or brackish water estuary
- Ocean
- Onsite Infiltration - Runoff percolates into soil profile surrounding monitoring site

3.24. AADT

Field Type: Numeric
Field Size: N/A
Example: 120000
Definition: Average annual daily traffic (AADT) flow at or near monitoring site.
Notes: If site is a maintenance yard, parking lot, or rest area, report the estimated number of vehicles entering and leaving the facility each day.

3.25. AADT Source

Field Type: Text
Field Size: 100 characters
Example: <http://www.dot.ca.gov/hg/traffops/saferesr/trafdata/1999all.htm>
Definition: Source or reference for reported AADT value.
Notes: A searchable AADT database is available at the Caltrans Traffic and Vehicle Data Systems Unit web page:

<http://www.dot.ca.gov/hg/traffops/saferesr/trafdata/>

3.26. Adjacent Lanes

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 2
Definition: The number of traffic lanes adjacent to the monitoring site that contribute storm water runoff that is sampled at the monitoring site's point of collection.
Notes: In many cases, the numeric value populating this data field will be a summation of the number of lanes of traffic moving in one direction only next to the monitoring site.

3.27. Total Lanes

Field Type: Numeric
Field Size: Provide number as an integer with zero (0) decimal places.
Example: 4
Definition: The total number of traffic lanes (traffic moving in both directions) neighboring the monitoring site.
Notes: This data field should specify all lanes of traffic near the monitoring site that may impact storm water runoff through the deposition of airborne pollutants.

3.28. Time Series

Field Type: Text
Field Size: 50 characters
Example: Site 7-21 Time Series_2001-2002.xls
Definition: The name of the Excel worksheet in which time series data (flow, precipitation, etc.) collected at a monitoring site is submitted.
Notes: Times series data collected during storm events at a monitoring site can be submitted as multiple worksheets (one worksheet for each storm event) in a single workbook that represents all times series data collected at that site during an entire monitoring season. The Excel workbook file should be labeled with the Caltrans Monitoring Site ID and monitoring season (e.g., 2001-2002 or 01-02) to which it corresponds.

3.29. Map

Field Type: Text
Field Size: 50 characters
Example: Site 7-21 Map_2001-2002.pdf
Definition: The name of the electronic document containing a map that shows the location of the monitoring site.
Notes: The actual electronic document containing a map of the monitoring site should be submitted along with the rest of the data collected for the site, including water quality data, time series data, and one or more photographs. The map should contain the clearly marked location of the monitoring site, latitude and longitude markers, and the watershed contributing flows to the site. The electronic map document should be labeled with the Caltrans Monitoring Site ID and monitoring season (e.g., 2001-2002 or 01-02) to which it corresponds.

3.30. Photograph

- Field Type: Text
Field Size: 50 characters
Example: Site 7-21 Photo_2001-2002.jpeg
Definition: The name of the electronic document containing photograph(s) of the monitoring site.
Notes: The actual electronic document containing photograph(s) of the monitoring site should be submitted along with the rest of the data collected for the site, including water quality data, time series data, and a map. The electronic photograph document should be labeled with the Caltrans Monitoring Site ID and monitoring season (e.g., 2001-2002 or 01-02) to which it corresponds.

3.31. Site Notes

- Field Type: Text
Field Size: 255 characters
Example: No AADT value provided for this site. Site is located along a county road for which no AADT data are available.
Definition: This data field contains any notes or remarks about the monitoring site or various data fields used to describe the monitoring site.
Notes: Data reporter should provide a note for any data field left blank. It is not appropriate to provide a note in a particular cell of a data field other than Site Notes. Considering the example above, it is not appropriate to place the note, "No AADT value provided for this site. Site is located along a county road for which no AADT data are available", in the AADT data field. The note must be entered into the Site Notes data field.

4. STANDARD CONSTITUENT NAMES

4.1. Metals (ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Al	7429-90-5	Fe	7439-89-6
Sb	7440-36-0	Pb	7439-92-1
As	7440-38-2	Hg	7439-97-6
Be	7440-41-7	Mo	7439-98-7
Cd	7440-43-9	Ni	7440-02-0
Cr	7440-47-3	Se	7782-49-2
Cr (III)	16065-83-1	Ag	7440-22-4
Cr (VI)	18540-29-9	Tl	7440-28-0
Co	7440-48-4	V	7440-62-2
Cu	7440-50-8	Zn	7440-66-6

4.2. Nutrients (mg/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
NH3-N	CT-NH3N	Ortho-P	CT-ORTHOP
NO2-N	14797-65-0	P	7723-14-0
NO3-N	14797-55-8	TKN	CT-TKN
Organic Nitrogen	CT-ORGN	Total N	CT-TN

4.3. Conventional (mg/L, typically - unless noted)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Alkalinity as CaCO3	CT-ALKCACO3	Salinity	CT-SALINITY
BOD	CT-BOD	Settleable Solids	CT-SETSOL
COD	CT-COD	Temperature (°C)	CT-TEMP
DO	CT-DO	TDS	CT-TDS
DOC	CT-DOC	TOC	CT-TOC
EC (umhos/cm)	CT-EC	TSS	CT-TSS
Hardness as CaCO3	CT-HARD	Turbidity (NTU)	CT-TURB
pH (pH units)	CT-PH	TVSS	CT-TVSS

4.4. Major Ions (mg/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Ca	7440-70-2	K	7440-09-7
Cl	16887-00-6	Mg	7439-95-4
CO3	CT-CO3	Na	7440-23-5
HCO3	CT-HCO3	SO4	14808-79-8

4.5. Minerals (mg/L, typically)

Constituent	CAS or Caltrans ID #	Constituent	CAS or Caltrans ID #
Asbestos	1332-21-4	Fluoride	CT-FLUORIDE
B	7440-42-8	Mn	7439-96-5
Ba	7440-39-3	Silica	7631-86-9
Chlorine Residual	CT-CLRES		

4.6. Microbiological (various units)

Constituent	CAS or Caltrans ID#	Constituent	CAS or Caltrans ID #
Bacteria (MPN/100 mL or cfu/100 mL)		Protozoa	
E. Coli 0157:H7	CT-ECOLI157	Cryptosporidium	CT-CRYPTO
Enterotoxigenic E. Coli	CT-ECOLIENOX	parvum (oocysts/100L)	
Fecal Coliform	CT-FCOLI	Giardia lamblia	CT-GIARDIA
Fecal Enterococci	CT-FENTERO	(cysts/100L)	
Fecal Streptococci	CT-FSTREP		
Salmonella sp.	CT-SALMONEL	Viruses (TCID₅₀/100 mL)	
Shigella sp.	CT-SHIGELLA	Adenovirus	CT-ADENOVI
Staphylococcus sp.	CT-STAPH	Enterovirus	CT-ENTEROVI
Total Coliform	LDC-0381	Hepatitis A	CT-HEPATITISA
Pseudomonas	CT-AERUG	Rotavirus	CT-ROTAVI
Aeruginosa			

4.7. VOCs (EPA 8260, 601, 602, 603, 1624; ug/L, typically)

Constituent	CAS or Caltrans ID #	Constituent	CAS or Caltrans ID #
1,1,1,2-Tetrachloroethane	630-20-6	4-Bromofluorobenzene	460-00-4
1,1,1-Trichloroethane	71-55-6	4-Chlorotoluene	106-43-4
1,1,2,2-Tetrachloroethane	79-34-5	4-Methyl-2-pentanone (MIBK)	108-10-1
1,1,2-Trichloroethane	79-00-5	Acetone	67-64-1
1,1-Dichloroethane	75-34-3	Acrolein	107-02-8
1,1-Dichloroethylene	75-35-4	Acrylonitrile	107-13-1
1,1-Dichloropropene	563-58-6	Benzene	71-43-2
1,2,3-Trichlorobenzene	87-61-6	Benzyl chloride	100-44-7
1,2,3-Trichloropropane	96-18-4	Bromobenzene	108-86-1
1,2,4-Trimethylbenzene	95-63-6	Bromochloromethane	74-97-5
1,2-Dibromo-3-chloropropane	96-12-8	Bromoform	75-25-2
1,2-Dibromoethane	106-93-4	Carbon disulfide	75-15-0
1,2-Dichlorobenzene	95-50-1	Carbon tetrachloride	56-23-5
1,2-Dichloroethane	107-06-2	Chlorobenzene	108-90-7
1,2-Dichloropropane	78-87-5	Chlorodibromomethane	124-48-1
1,3,5-Trimethylbenzene	108-67-8	Chloroethane	75-00-3
1,3-Dichlorobenzene	541-73-1	Chloroform	67-66-3
1,3-Dichloropropane	142-28-9	cis-1,2-Dichloroethene	156-59-2
1,3-Dichloropropene	542-75-6	cis-1,3-Dichloropropene	10061-01-5
1,4-Dichlorobenzene	106-46-7	cis-1,4-Dichloro-2-butene	1476-11-5
2,2-Dichloropropane	594-20-7	Dibromofluoromethane	1868-53-7
2-Butanone	78-93-3	Dibromomethane	74-95-3
2-Chloroethylvinyl ether	110-75-8	Dichlorobromomethane	75-27-4
2-Chlorotoluene	95-49-8	Dichlorodifluoromethane	75-71-8
2-Hexanone	591-78-6	Ethanol	64-17-5

VOCs - Continued (EPA 8260, 601, 602, 603, 1624; ug/L, typically)

Constituent	CAS or Caltrans ID #	Constituent	CAS or Caltrans ID #
Ethylbenzene	100-41-4	Pyridine	110-86-1
Iodomethane	74-88-4	sec-Butylbenzene	135-98-8
Isopropylbenzene	98-82-8	Styrene	100-42-5
Methanol	67-56-1	tert-Butylbenzene	98-06-6
Methyl bromide	74-83-9	Tetrachloroethylene (PCE)	127-18-4
Methyl Chloride	74-87-3	Tetrahydrofuran	109-99-9
Methylene Chloride	75-09-2	Toluene	108-88-3
Methyl-t-butyl ether (MTBE)	1634-04-4	trans-1,2-Dichloroethene	156-60-5
m-Xylene	108-38-3	trans-1,3-Dichloropropene	10061-02-6
m,p-Xylenes	CT-XYLENES-M-P	trans-1,4-Dichloro-2-butene	110-57-6
n-Butylbenzene	104-51-8	Trichloroethylene (TCE)	79-01-6
n-Propylbenzene	103-65-1	Trichlorofluoromethane	75-69-4
o-Xylene	95-47-6	Vinyl acetate	108-05-4
Pentachloroethane	76-01-7	Vinyl chloride	75-01-4
p-Isopropyltoluene	99-87-6	Xylenes (total)	1330-20-7
p-Xylene	106-42-3		

4.8. SVOCs (EPA 8250/8270, 625; ug/L, typically)

Constituent	CAS or Caltrans ID #	Constituent	CAS or Caltrans ID #
1,2,4-Trichlorobenzene	120-82-1	Aniline	62-53-3
1,2-Diphenylhydrazine	122-66-7	Anthracene	120-12-7
2,4,5-Trichlorophenol	95-95-4	Benzidine	92-87-5
2,4,6-Trichlorophenol	88-06-2	Benzo(a)anthracene	56-55-3
2,4-Dichlorophenol	120-83-2	Benzo(a)pyrene	50-32-8
2,4-Dimethylphenol	105-67-9	Benzo(b)fluoranthene	205-99-2
2,4-Dinitrophenol	51-28-5	Benzo(ghi)perylene	191-24-2
2,4-Dinitrotoluene	121-14-2	Benzo(k)fluoranthene	207-08-9
2,6-Dichlorophenol	87-65-0	Benzoic acid	65-85-0
2,6-Dinitrotoluene	606-20-2	Benzyl alcohol	100-51-6
2-Chloronaphthalene	91-58-7	Bis(2-chloroethoxy)methane	111-91-1
2-Chlorophenol	95-57-8	Bis(2-chloroethyl)ether	111-44-4
2-Methyl-4,6-dinitrophenol	534-52-1	Bis(2-chloroisopropyl)ether	39638-32-9
2-Methylnaphthalene	91-57-6	Bis(2-ethylhexyl)phthalate	117-81-7
2-Methylphenol (o-Cresol)	95-48-7	Butylbenzyl phthalate	85-68-7
2-Nitroaniline	88-74-4	Carbazole	86-74-8
2-Nitrophenol	88-75-5	Chrysene	218-01-9
3,3'-Dichlorobenzidine	91-94-1	Dibenzo(a,h)anthracene	53-70-3
3-Methyl-4-chlorophenol	59-50-7	Dibenzofuran	132-64-9
3-Methylphenol (m-Cresol)	108-39-4	Diethyl phthalate	84-66-2
3-Nitroaniline	99-09-2	Dimethyl phthalate	131-11-3
4-Bromophenyl phenyl ether	101-55-3	Di-n-Butyl phthalate	84-74-2
4-Chloroaniline	106-47-8	Di-n-Octyl phthalate	117-84-0
4-Chlorophenyl phenyl ether	7005-72-3	Endrin ketone	53494-70-5
4-Methylphenol (p-Cresol)	106-44-5	Fluoranthene	206-44-0
4-Nitroaniline	100-01-6	Fluorene	86-73-7
4-Nitrophenol	100-02-7	Hexachlorobenzene	118-74-1
Acenaphthene	83-32-9	Hexachlorobutadiene	87-68-3
Acenaphthylene	208-96-8	Hexachlorocyclopentadiene	77-47-4

SVOCs - Continued (EPA 8250/8270, 625; ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Hexachloroethane	67-72-1	N-Nitrosodiphenylamine	86-30-6
Indeno(1,2,3-cd)pyrene	193-39-5	PAHs	CT-PAH
Isophorone	78-59-1	Pentachlorophenol	87-86-5
Naphthalene	91-20-3	Phenanthrene	85-01-8
Nitrobenzene	98-95-3	Phenol	108-95-2
N-Nitrosodimethylamine	62-75-9	Phenolics	CT-PHENOLICS
N-Nitrosodi-n-Propylamine	621-64-7	Pyrene	129-00-0

4.9. OC Pesticides (EPA 8080/8081; ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
4,4'-DDD	72-54-8	Dieldrin	60-57-1
4,4'-DDE	72-55-9	Endosulfan sulfate	1031-07-8
4,4'-DDT	50-29-3	Endrin	72-20-8
Aldrin	309-00-2	Endrin aldehyde	7421-93-4
alpha-BHC	319-84-6	gamma-BHC	58-89-9
alpha-Chlordane	5103-71-9	gamma-Chlordane	5103-74-2
alpha-Endosulfan	959-98-8	Heptachlor	76-44-8
beta-BHC	319-85-7	Heptachlor expoxide	1024-57-3
beta-Endosulfan	33213-65-9	Methoxychlor	72-43-5
Chlordane	5103-71-9	Mirex	2385-85-5
delta-BHC	319-86-8	Toxaphene	8001-35-2

4.10. OP Pesticides (EPA 8140/8141; ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Azinphos methyl	86-50-0	Merphos	150-50-5
Bolstar (Sulprofos)	35400-43-2	Methidathion	950-37-8
Chlorpyrifos	2921-88-2	Methyl trithion	953-17-3
Coumaphos	56-72-4	Mevinphos	7786-34-7
Def	78-48-8	Naled	300-76-5
Demeton-O	298-03-3	Parathion, ethyl	56-38-2
Demeton-S	126-75-0	Parathion, methyl	298-00-0
Demeton-O and S	CT-DEMETON-O-S	Phorate	298-02-5
Diazinon	333-41-5	Phosalone	2310-17-0
Dichlorvos	62-73-7	Phosmet	732-11-6
Dimethoate	60-51-5	Prometon	1610-18-0
Diphenamid	957-51-7	Prowl	40487-42-1
Disulfoton	298-04-4	Ronnel	299-84-3
Ethion	563-12-2	Simazine	122-34-9
Ethoprop	13194-48-4	Stirophos (Tetrachlorvinphos)	22248-79-9
Fensulfothion	115-90-2	Tokuthion (Prothiofos)	34643-46-4
Fenthion	55-38-9	Trichloronate	327-98-0
Malathion	121-75-5	Trifluralin	1582-09-8

4.11. Other Pesticides (EPA 8150; ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
2,4,5-T	93-76-5	Dicamba	1918-00-9
2,4,5-TP (Silvex)	93-72-1	Dichlorprop	120-36-5
2,4-D	94-75-7	Dinoseb (DNBP)	88-85-7
2,4-DB	94-82-6	MCPA	94-74-6
Dalapon	75-99-0	MCPP	93-65-2

4.12. Miscellaneous Pesticides (ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Alachlor	15972-60-8	Metolachlor	51218-45-2
Atrazine	1912-24-9	Molinate	2212-67-1
Bromacil	314-40-9	Oryzalin	19044-88-3
Cacodylic acid	75-60-5	Oxadiazon	19666-30-9
Chlorsulfuron	64902-72-3	Oxamyl	23135-22-0
Cyanazine	21725-46-2	Oxyfluorfen	42874-03-3
Diquat	85-00-7	Paraquat	4685-14-7
Diuron	330-54-1	Prometryn	7287-19-6
Fluazifop-p-butyl	69806-50-4	Sulfometuron-methyl	74222-97-2
Glyphosate	1071-83-6	Thiobencarb	28249-77-6
Isoxaben	82558-50-7	Trichlopyr	55335-06-3
Mefluidide	53780-34-0		

4.13. Polychlorinated Biphenyls - PCBs (ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Arochlor 1016	12674-11-2	Arochlor 1248	12672-29-6
Arochlor 1221	11104-28-2	Arochlor 1254	11097-61-1
Arochlor 1232	11141-16-5	Arochlor 1260	11096-82-5
Arochlor 1242	53469-21-9	PCBs (total)	CT-TPCB

4.14. Hydrocarbons (mg/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
Oil & Grease	CT-OILGREASE	TPH (Kerosene)	CT-KEROSENE
TEPH	CT-TEPH	TPH (Motor Oil)	CT-MOIL
TPH (Diesel)	68334-30-5	TPH (Stoddard Solvent)	CT-STODSOL
TPH (Gasoline)	8006-61-9	TRPH	CT-TRPH
TPH (Heavy Oil)	CT-HOIL	TVPH	CT-TVPH
TPH (Jet Fuel)	CT-JETFUEL		

4.15. Miscellaneous Constituents (ug/L, typically)

<u>Constituent</u>	<u>CAS or Caltrans ID #</u>	<u>Constituent</u>	<u>CAS or Caltrans ID #</u>
2,3,7,8-Tetrachloro-dibenzo-p-dioxin	1746-01-6	Coprostanol	CT-COPROS
Chlorophyll-a	CT-CHLOROPHYLL	Epicoprostanol	CT-EPICOPROS
Cyanide (mg/L)	57-12-5	Fecal Sterol	CT-FSTEROL

5. MEASURING UNITS CONVERSION TABLES

5.1. Length Conversions

Metric	Converting to >	Imperial
1 millimeter (mm)		0.0394 in
1 centimeter (cm)	10 mm	0.3937 in
1 meter (m)	100 cm	3.2808 ft
1 meter (m)	100 cm	1.0936 yd
1 kilometer (km)	1,000 m	0.6214 mile

Imperial	Converting to >	Metric
1 inch (in)		25.40 mm
1 inch (in)		2.54 cm
1 foot (ft)	12 in	0.3048 m
1 yard (yd)	3 ft	0.9144 m
1 mile	1,760 yd	1.6093 km

5.2. Area Conversions

Metric	Converting to >	Imperial
1 square cm (cm ²)	100 mm ²	0.1550 in ²
1 square m (m ²)	10,000 cm ²	1.1960 yd ²
1 hectare (ha)	10,000 m ²	2.4711 acres
1 square km (km ²)	100 ha	0.3861 mile ²

Imperial	Converting to >	Metric
1 square inch (in ²)		6.4519 cm ²
1 square foot (ft ²)	144 in ²	0.0929 m ²
1 square yard (yd ²)	9 ft ²	0.8361 m ²
1 acre	4840 yd ²	4046.9 m ²
1 acre	4840 yd ²	0.4047 ha
1 square mile (mile ²)	640 acres	2.59 km ²

5.3. Volume/Capacity Conversions

Metric	Converting to >	Imperial
1 cubic cm (cm ³)		0.0610 in ³
1 cubic decimeter (dm ³)	1,000 cm ³	0.0353 ft ³
1 cubic meter (m ³)	1,000 dm ³	1.3080 yd ³
1 liter (L)	1 dm ³	1.76 pt
1 hectoliter (hL)	100 L	21.997 gal

Imperial	Converting to >	Metric
1 cubic inch (in ³)		16.387 cm ³
1 cubic foot (ft ³)	1,728 in ³	0.0283 m ³
1 fluid ounce (fl oz)		28.413 mL
1 pint (pt)	20 fl oz	0.5683 L
1 gallon (gal)	8 pt	4.5461 L

5.4. Mass Conversions

Metric	Converting to >	Imperial
1 milligram (mg)		0.0154 grain
1 gram (g)	1,000 mg	0.0353 oz
1 kilogram (kg)	1,000 g	2.2046 lb
1 metric ton (t)	1,000 kg	2,204.6 lb

Imperial	Converting to >	Metric
1 ounce (oz)	437.5 grain	28.35 g
1 pound (lb)	16 oz	0.4536 kg
1 short ton (US)	2,000 lb	0.907 t

5.5. Temperature Conversions

Converting Degrees Fahrenheit to Degrees Celsius
Degrees Fahrenheit (°F) - 32 x 5/9 = Degrees Celsius (°C)

Converting Degrees Celsius to Degrees Fahrenheit
Degrees Celsius (°C) x 9/5 + 32 = Degrees Fahrenheit (°F)