



**Soils Southwest, Inc.**  
 897 Via Lata, Suite N  
 Colton, CA 92324  
 (909) 370-0474 Fax (909) 370-3156

# LOG OF BORING BMP-2

|  |                             |
|--|-----------------------------|
| <b>Project:</b> Truck Terminal Properties/Bobby Nassir | <b>Job No.:</b> 20016-F/BMP |
| <b>Logged By:</b> John F.                              | <b>Boring Diam.:</b> 8" HSA |
| <b>Date:</b> June 4, 2020                              |                             |

| Standard Penetration (Blows per Ft.) | Sample Type | Water Content in % | Dry Density in PCF | Percent Compaction | Unified Classification System | Graphic | Depth in Feet | Description and Remarks   |
|--------------------------------------|-------------|--------------------|--------------------|--------------------|-------------------------------|---------|---------------|---|
|                                      |             |                    |                    |                    | SM                            |         | 0             | EAST SIDE<br>low weeds and scattered debris   |
|                                      |             |                    |                    |                    |                               |         | 5             | SAND - light gray-brown, silty, fine, dry to damp                                       |
|                                      |             |                    |                    |                    | ML                            |         | 10            | SILT - color change to light gray, soft, powdery, dry with trace white calcium deposits |
|                                      |             |                    |                    |                    |                               |         | 15            | - color change to tan, damp   |
|                                      |             |                    |                    |                    |                               |         | 20            | - End of infiltration test boring @ 13.0 ft.  |
|                                      |             |                    |                    |                    |                               |         | 25            | - no bedrock  |
|                                      |             |                    |                    |                    |                               |         | 30            | - no groundwater  |
|                                      |             |                    |                    |                    |                               |         |               | - 3" PVC Pipe installed with gravel at bottom   |

|   |  |                |
|---|--|----------------|
| <b>Groundwater:</b> n/a<br><b>Approx. Depth of Bedrock:</b> n/a<br><b>Datum:</b> n/a<br><b>Elevation:</b> n/a | <b>Site Location</b><br>Proposed Tractor Trailer Parking Facility<br>114. E. Marham Street<br>Perris, California | <b>Plate #</b> |
|---|--|----------------|



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# LOG OF BORING B-1

**Project:** Truck Terminal Properties/Bobby Nassir

**Job No.:** 20016-F/BMP

**Logged By:** John F.

**Boring Diam.:** 8" HSA

**Date:** June 4, 2020

| Standard Penetration (Blows per Ft.) | Sample Type | Water Content in % | Dry Density in PCF | Percent Compaction | Unified Classification System | Graphic | Depth in Feet | Description and Remarks  |
|--------------------------------------|-------------|--------------------|--------------------|--------------------|-------------------------------|---------|---------------|--|
|                                      |             |                    |                    |                    | SM                            |         |               | DEEP BORING for WQMP-BMP Infiltration Testing weeds<br>SAND - brown, silty, fine, damp |
| 14                                   |             |                    |                    |                    | SM-SC                         |         | 5             | - color change to light gray-brown, silty, clayey, fine, damp                          |
|                                      |             |                    |                    |                    |                               |         | 10            | - color change to grayish tan, dry to damp   |
| 18                                   |             |                    |                    |                    | SM                            |         | 15            | - color change to tan, silty, damp   |
|                                      |             |                    |                    |                    |                               |         | 20            |  |
| 24                                   |             |                    |                    |                    | GP-SP                         |         | 25            | - stiff fine to medium with pebbles  |
|                                      |             |                    |                    |                    |                               |         |               | - gravelly, coarse, pebbles, rock fragments very moist to wet                          |
|                                      |             |                    |                    |                    |                               |         |               | - End of test boring @ 26.0 ft.  |
|                                      |             |                    |                    |                    |                               |         |               | - no bedrock   |
|                                      |             |                    |                    |                    |                               |         |               | - no groundwater   |
|                                      |             |                    |                    |                    |                               |         | 30            |  |

**Groundwater:** n/a  
**Approx. Depth of Bedrock:** n/a  
**Datum:** n/a  
**Elevation:** n/a

**Site Location**

Proposed Tractor Trailer Parking Facility  
 114. E. Marham Street  
 Perris, California

**Plate #**

Standard penetration test





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# LOG OF BORING B-2

|  |                             |
|--|-----------------------------|
| <b>Project:</b> Truck Terminal Properties/Bobby Nassir | <b>Job No.:</b> 20016-F/BMP |
| <b>Logged By:</b> John F.                              | <b>Boring Diam.:</b> 8" HSA |
|  | <b>Date:</b> June 4, 2020   |

| Standard Penetration (Blows per Ft.) | Sample Type | Water Content in % | Dry Density in PCF | Percent Compaction | Unified Classification System | Graphic | Depth in Feet | Description and Remarks   |
|--------------------------------------|-------------|--------------------|--------------------|--------------------|-------------------------------|---------|---------------|---|
|                                      |             |                    |                    |                    | SM                            |         |               | weeds   |
|                                      |             | 20                 | 90.4               | 76                 | VS                            |         |               | SAND - grayish light brown, silty, fine, pebbles, rock fragments, occasional rock, damp<br>- (Max Dry Density = 1115 pcf @ 15%) |
| 11                                   |             |                    |                    |                    |                               |         | 5             | SILT/SAND Mixture- light gray brown, fine, scattered pebble, soft, moist<br>- stiff<br>- color change to tan                    |
| 20                                   |             |                    |                    |                    |                               |         | 10            | - with trace white calcium deposits, damp, very stiff   |
|                                      |             |                    |                    |                    |                               |         | 15            | - End of test boring @ 11.0 ft.<br>- no bedrock<br>- no groundwater   |
|                                      |             |                    |                    |                    |                               |         | 20            |   |
|                                      |             |                    |                    |                    |                               |         | 25            |   |
|                                      |             |                    |                    |                    |                               |         | 30            |   |

|   |  |                |
|---|--|----------------|
| <b>Groundwater:</b> n/a<br><b>Approx. Depth of Bedrock:</b> n/a<br><b>Datum:</b> n/a<br><b>Elevation:</b> n/a | <b>Site Location</b><br>Proposed Tractor Trailer Parking Facility<br>114. E. Marham Street<br>Perris, California | <b>Plate #</b> |
|---|--|----------------|



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# LOG OF BORING B-3

|  |                             |
|--|-----------------------------|
| <b>Project:</b> Truck Terminal Properties/Bobby Nassir | <b>Job No.:</b> 20016-F/BMP |
| <b>Logged By:</b> John F.                              | <b>Boring Diam.:</b> 8" HSA |
|  | <b>Date:</b> June 4, 2020   |

| Standard Penetration (Blows per Ft.) | Sample Type | Water Content in % | Dry Density in PCF | Percent Compaction | Unified Classification System | Graphic | Depth in Feet | Description and Remarks   |
|--------------------------------------|-------------|--------------------|--------------------|--------------------|-------------------------------|---------|---------------|---|
|                                      |             | 21                 | 87.6               | 76.2               | SM                            |         |               | weeds<br>SAND - brown, silty, fine, damp  |
|                                      |             |                    |                    |                    | ML                            |         | 5             | SILT- color change to gray, soft, dry, powdery  |
|                                      |             |                    |                    |                    | VS                            |         |               | SILT/SAND Mixture-color change to light yellow gray, fine scattered pebbles, very moist |
|                                      |             |                    |                    |                    |                               |         | 10            | - End of test boring @ 6.0 ft.<br>- no bedrock<br>- no groundwater                      |
|                                      |             |                    |                    |                    |                               |         | 15            |   |
|                                      |             |                    |                    |                    |                               |         | 20            |   |
|                                      |             |                    |                    |                    |                               |         | 25            |   |
|                                      |             |                    |                    |                    |                               |         | 30            |   |

|   |  |                |
|---|--|----------------|
| <b>Groundwater:</b> n/a<br><b>Approx. Depth of Bedrock:</b> n/a<br><b>Datum:</b> n/a<br><b>Elevation:</b> n/a | <b>Site Location</b><br>Proposed Tractor Trailer Parking Facility<br>114. E. Marham Street<br>Perris, California | <b>Plate #</b> |
|---|--|----------------|



# KEY TO SYMBOLS

Symbol Description

## Strata symbols



Silty sand



Silt



Poorly graded silty  
fine sand



Poorly graded clayey  
silty sand



Poorly graded gravel  
and sand



Variable sand  
and silt mix

## Soil Samplers



Standard penetration test



Bulk/Grab sample



California sampler

## Notes:

1. Exploratory borings were drilled on June 4, 2020 using a 4-inch diameter continuous flight power auger.
2. No free water was encountered at the time of drilling or when re-checked the following day.
3. Boring locations were taped from existing features and elevations extrapolated from the final design schematic plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

### Percolation Test Data Sheet

Project: Truck Terminal Prop. Project No: 20016 Date: 6/11/20

Test Hole No: P-1 Tested By: AKK D

Depth of Test Hole, D<sub>T</sub>: 145" USCS Soil Classification: SM-ML

| Test Hole Dimensions (inches) |           | Length                  | Width |
|-------------------------------|-----------|-------------------------|-------|
| Diameter (if round)=          | <u>8"</u> | Sides (if rectangular)= |       |

Sandy Soil Criteria Test\*

| Trial No. | Start Time  | Stop Time   | Time Interval, (min.) | Initial Depth to Water (in.) | Final Depth to Water (in.) | Change in Water Level (in.) | Greater than or Equal to 6"? (y/n) |
|-----------|-------------|-------------|-----------------------|------------------------------|----------------------------|-----------------------------|------------------------------------|
| 1         | <u>3:21</u> | <u>3:46</u> | <u>25</u>             | <u>108"</u>                  | <u>118"</u>                | <u>10"</u>                  | <u>Y</u>                           |
| 2         | <u>3:48</u> | <u>4:13</u> | <u>25</u>             | <u>108"</u>                  | <u>118"</u>                | <u>10"</u>                  |                                    |

\*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

| Trial No. | Start Time   | Stop Time    | Δt Time Interval (min.) | D <sub>0</sub> Initial Depth to Water (in.) | D <sub>T</sub> Final Depth to Water (in.) | ΔD Change in Water Level (in.) | Percolation Rate (min./in.) |
|-----------|--------------|--------------|-------------------------|---|---|--------------------------------|-----------------------------|
| 1         | <u>8:51</u>  | <u>9:01</u>  | <u>10</u>               | <u>121</u>                                  | <u>125</u>                                | <u>4</u>                       |                             |
| 2         | <u>9:04</u>  | <u>9:14</u>  | <u>10</u>               | <u>121</u>                                  | <u>124 1/2</u>                            | <u>3 1/2</u>                   |                             |
| 3         | <u>9:17</u>  | <u>9:27</u>  | <u>10</u>               | <u>121</u>                                  | <u>124</u>                                | <u>3</u>                       |                             |
| 4         | <u>9:28</u>  | <u>9:38</u>  | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 5         | <u>9:39</u>  | <u>9:49</u>  | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 6         | <u>9:50</u>  | <u>10:00</u> | <u>10</u>               | <u>121</u>                                  | <u>124</u>                                | <u>3</u>                       |                             |
| 7         | <u>10:01</u> | <u>10:11</u> | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 8         | <u>10:12</u> | <u>10:22</u> | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 9         | <u>10:23</u> | <u>10:33</u> | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 10        | <u>10:24</u> | <u>10:44</u> | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 11        | <u>10:46</u> | <u>10:56</u> | <u>10</u>               | <u>121</u>                                  | <u>123 1/2</u>                            | <u>2 1/2</u>                   |                             |
| 12        |              |              |                         |   |   |                                |                             |
| 13        |              |              |                         |   |   |                                |                             |
| 14        |              |              |                         |   |   |                                |                             |
| 15        |              |              |                         |   |   |                                |                             |

COMMENTS:



### Percolation Test Data Sheet

|                                      |                     |                           |           |        |         |
|--------------------------------------|---------------------|---------------------------|-----------|--------|---------|
| Project:                             | TRUCK TERMINAL PARK | Project No:               | 20016-BMP | Date:  | 6-11-20 |
| Test Hole No:                        | P-2                 | Tested By:                | JF        |        |         |
| Depth of Test Hole, D <sub>r</sub> : | 143 in.             | USCS Soil Classification: | ML        |        |         |
| Test Hole Dimensions (inches)        |                     |                           |           | Length | Width   |
| Diameter (if round)=                 | 8 in                | Sides (if rectangular)=   |           |        |         |

**Sandy Soil Criteria Test\***

| Trial No. | Start Time | Stop Time | Time Interval, (min.) | Initial Depth to Water (in.) | Final Depth to Water (in.) | Change in Water Level (in.) | Greater than or Equal to 6"? |
|-----------|------------|-----------|-----------------------|------------------------------|----------------------------|-----------------------------|------------------------------|
| 1         | 3:52       | 4:17      | 25                    | 108                          | 118.5                      | 10.5                        | Y                            |
| 2         | 4:19       | 4:44      | 25                    | 108                          | 117.5                      | 9.5                         | Y                            |

\*If two consecutive measurements show that six inches of water seeps away in less than 25 minutes, the test shall be run for an additional hour with measurements taken every 10 minutes. Other wise, pre-soak (fill) overnight. Obtain at least twelve measurements per hole over at least six hours (approximately 30 minute intervals) with a precision of at least 0.25".

| Trial No. | Start Time | Stop Time | Δt<br>Time Interval (min.) | D <sub>i</sub><br>Initial Depth to Water (in.) | D <sub>f</sub><br>Final Depth to Water (in.) | ΔD<br>Change in Water Level (in.) | Percolation Rate (min./in.) |
|-----------|------------|-----------|----------------------------|--|--|-----------------------------------|-----------------------------|
| 1         | 9:06       | 9:16      | 10                         | 119  | 122.25                                       | 3.25                              |                             |
| 2         | 9:22       | 9:32      | 10                         | 119  | 122.00                                       | 3.00                              |                             |
| 3         | 9:35       | 9:45      | 10                         | 119  | 122.00                                       | 3.00                              |                             |
| 4         | 9:46       | 9:56      | 10                         | 119  | 122.00                                       | 3.00                              |                             |
| 5         | 9:57       | 10:07     | 10                         | 119  | 122.00                                       | 3.00                              |                             |
| 6         | 10:10      | 10:20     | 10                         | 119  | 122.00                                       | 3.00                              |                             |
| 7         | 10:23      | 10:33     | 10                         | 119  | 121.50                                       | 2.50                              |                             |
| 8         | 10:38      | 10:48     | 10                         | 119  | 121.50                                       | 2.50                              |                             |
| 9         | 10:50      | 11:00     | 10                         | 119  | 121.50                                       | 2.50                              |                             |
| 10        | 11:08      | 11:18     | 10                         | 119  | 121.50                                       | 2.50                              |                             |
| 11        |            |           |                            |  |  |                                   |                             |
| 12        |            |           |                            |  |  |                                   |                             |
| 13        |            |           |                            |  |  |                                   |                             |
| 14        |            |           |                            |  |  |                                   |                             |
| 15        |            |           |                            |  |  |                                   |                             |

COMMENTS:

**9.0 APPENDIX B****Laboratory Test Programs**

Laboratory tests were conducted on representative soils for the purpose of classification and for the determination of the physical properties and engineering characteristics. The number and selection of the types of testing for a given study are based on the geotechnical conditions of the site. A summary of the various laboratory tests performed for the project is presented below.

**Moisture Content and Dry Density (D2937):**

Data obtained from these test, performed on undisturbed samples are used to aid in the classification and correlation of the soils and to provide qualitative information regarding soil strength and compressibility.

**Direct Shear (D3080):**

Data obtained from this test performed at increased and field moisture conditions on relatively remolded soil sample is used to evaluate soil shear strengths. Samples contained in brass sampler rings, placed directly on test apparatus are sheared at a constant strain rate of 0.002 inch per minute under saturated conditions and under varying loads appropriate to represent anticipated structural loadings. Shearing deformations are recorded to failure. Peak and/or residual shear strengths are obtained from the measured shearing load versus deflection curve. Test results, plotted on graphical form, are presented on Plate B-1 of this section.

**Consolidation (D2835):**

Drive-tube samples are tested at their field moisture contents and at increased moisture conditions since the soils may become saturated during life-time use of the planned structure.

Data obtained from this test performed on relatively undisturbed and/or remolded samples, were used to evaluate the consolidation characteristics of foundation soils under anticipated foundation loadings. Preparation for this test involved trimming the sample, placing it in one inch high brass ring, and loading it into the test apparatus which contained porous stones to accommodate drainage during testing. Normal axial loads are applied at a load increment ratio, successive loads being generally twice the preceding.

Soil samples are usually under light normal load conditions to accommodate seating of the apparatus. Samples were tested at the field moisture conditions at a predetermined normal load. Potentially moisture sensitive soil typically demonstrated significant volume change with the introduction of free water. The results of the consolidation tests are presented in graphical forms on Appendix B of this report.

**Potential Expansion (ASTM Standard D4829-88)**

Silty and clayey sandy in nature, the site soils are considered 'low to medium' in expansion characteristic. Supplemental testing for soil expansion should be performed following mass grading completion.



**Laboratory Test Results**

A

Table I: In-Situ Moisture-Density (ASTM D2216-80)

| Test Boring No. | Sample Depth, ft. | Dry Density, pcf. | Moisture Content, % |
|-----------------|-------------------|-------------------|---------------------|
| 2               | 3                 | 90.4              | 19.7                |
| 3               | 5                 | 87.6              | 21.1                |

B

Table II: Max. Density/Optimum Moisture Content (ASTM D1557)

| Sample Location @ depth, ft. | Max. Dry Density, pcf | Optimum Moisture (%) |
|------------------------------|-----------------------|----------------------|
| B-2 @ 0-5 ft.                | 115.0                 | 15.0                 |

C.

Table III: Direct Shear (ASTM D3080)

| Test Boring & Sample Depth (ft) | Test Condition  | Cohesion (PSF) | Friction (Degree) |
|---------------------------------|-----------------|----------------|-------------------|
| B-1 @ 0-5                       | Remolded to 95% | 325            | 47                |

D. Table IV: Consolidation (D2435)

| Boring B #             | Depth (ft.) | Consolidation prior to saturation (%) @ 2 kips | Hydro collapse (%) @ 2 kips | Total Consolidation (%@ 8 kips) (saturated) |
|------------------------|-------------|--|-----------------------------|---|
| 2<br>(remolded)<br>95% | 0-5         | 0.6  | 1.4                         | 6.2   |
| 1<br>(undisturbed)     | 3           | 0.2  | 0.7                         | 3.0   |

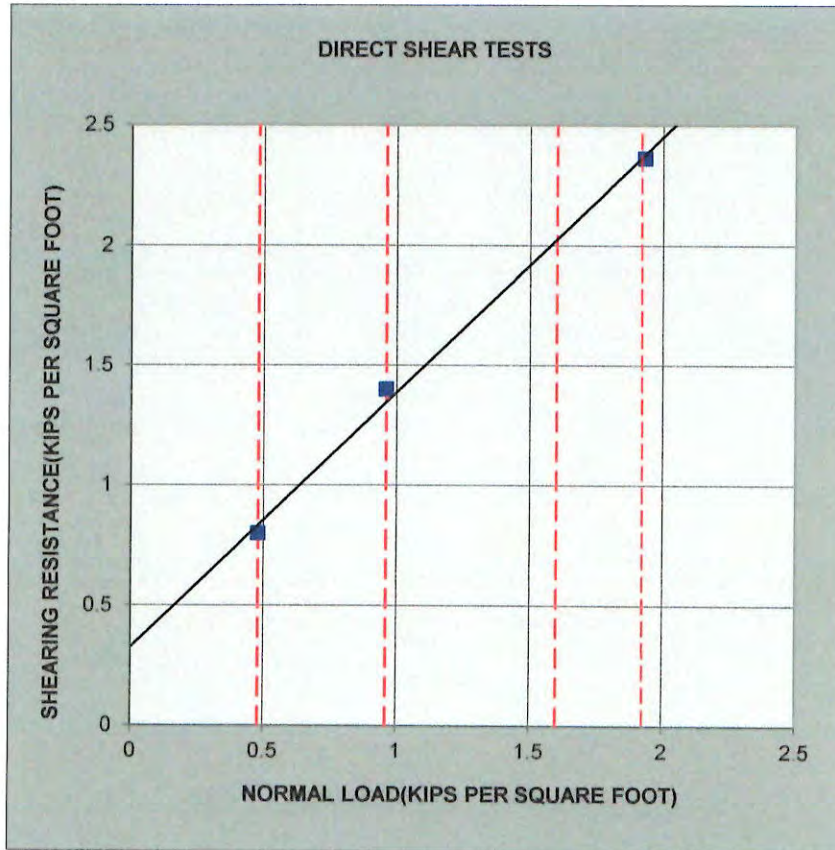
E. Table V: Sand Equivalent

| Sample Location @ depth, ft. | Sand Equivalent Average |
|------------------------------|-------------------------|
| P-1 @ 0-2                    | 15.61                   |

F. Table VI: Soils Expansion Index, EI. (ASTM D4829)

| Sample Location & Soils Type              | Soil Expansion Index, EI | Expansion Potential |
|---|--------------------------|---------------------|
| B-2 @ 0-5'<br>Sand-silty, slightly clayey | 20                       | "low"               |





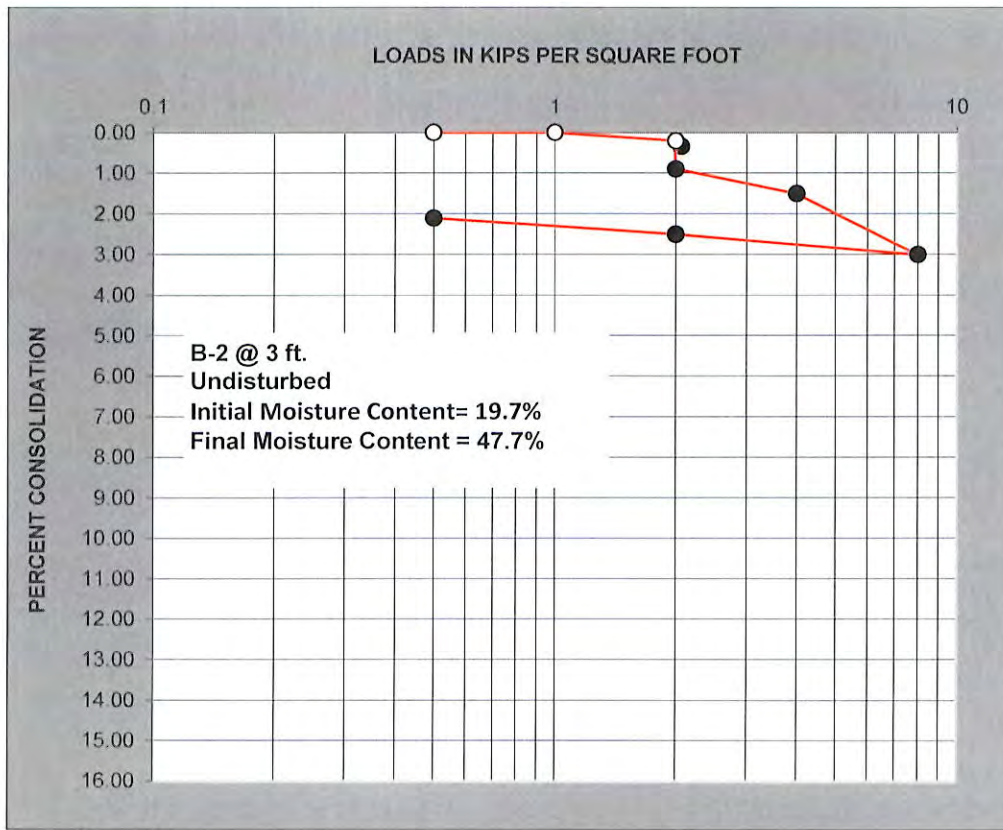
| SYMBOL  | LOCATION | DEPTH (FT) | TEST CONDITION  | COHESION (psf) | FRICTION (degree) |
|---|----------|------------|-----------------|----------------|-------------------|
| ■   | B-2      | 0 to 5     | Remolded to 95% | 325.00         | 46.78             |
| Proposed Tractor Trailer Parking Facility<br>114 E. Markham St.<br>Perris, California |          |            |                 | PROJECT NO.    | 20016-F           |
|   |          |            |                 | PLATE          | B-1               |



**SOILS SOUTHWEST, INC.**  
**Consulting Foundation Engineers**



## CONSOLIDATION TESTS



● WATER PERMITTED TO CONTACT SAMPLE



|             |  |       |       |
|-------------|--|-------|-------|
| PROJECT     | Proposed Tractor Trailer Parking Facility<br>114 E. Markham St. Perris |       |       |
| PROJECT NO. | 20016-F  | PLATE | B-2-1 |

**SOILS SOUTHWEST INC.**  
**Consulting Foundation Engineers**



## SAND EQUIVALENT TEST

Test Date: June 12,2020

Project No.: 20016-F

Job Name: Truck Terminal Properties/Bobby Nassir

Sample Location: P-1 0-2 ft.

Sample by: JF Tested by: A.D.

### LABORATORY DATA

| SAMPLE NO.                         | 1     | 2     | 3     | 4 |
|------------------------------------|-------|-------|-------|---|
| <b>TIME START</b>                  | 10:02 | 10:06 | 10:09 |   |
| <b>TIME SOAK</b><br>(10 min.)      | 10:12 | 10:16 | 10:19 |   |
| <b>TIME AT LEVEL</b><br>15ML       | 10:34 | 10:42 | 10:43 |   |
| <b>TIME of READING</b><br>(20-min) | 10:54 | 11:02 | 11:03 |   |
| <b>FINE, ML</b>                    | 8.0   | 7.3   | 9.2   |   |
| <b>COARSE, ML</b>                  | 1.3   | 1.2   | 1.3   |   |
| <b>SE = 100x</b><br>(coarse/fine)  | 16.25 | 16.44 | 14.13 |   |
| <b>SE Average</b>                  | 15.61 |       |       |   |

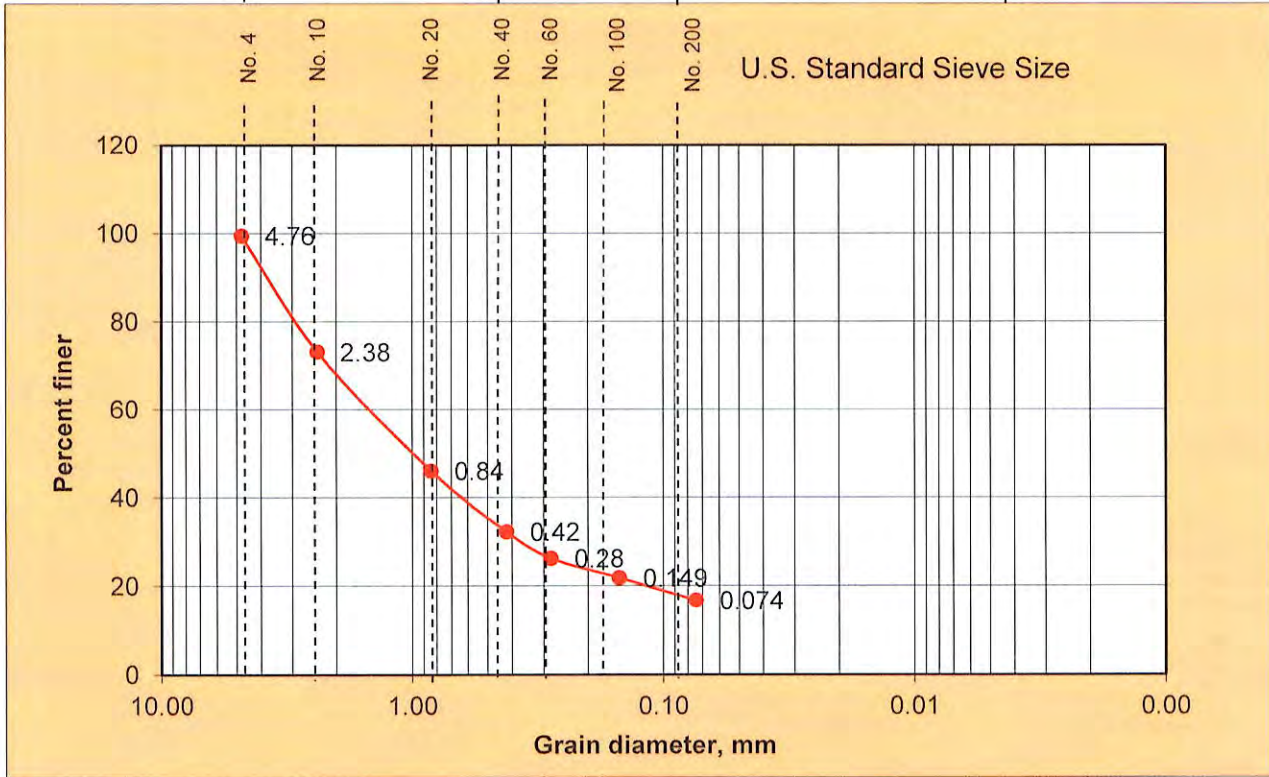
Soil Description: SM-silty fine sands

## GRAIN SIZE DISTRIBUTION ASTM D422

|  |                                    |                     |
|--|------------------------------------|---------------------|
| <b>Project:</b> Truck Terminal Properties  | <b>Job #</b> 20016-F               |                     |
| <b>Location:</b> 114 E. Markham St. Perris | <b>Boring No:</b> <u>P-1@0-0.5</u> | <b>Sample No:</b> 2 |
| <b>Description of Soil:</b> SP-SM          |                                    |                     |
| <b>Date of Sample:</b> 6/11/2020           |                                    |                     |
| <b>Tested By:</b> AD & JF                  | <b>Date of Testing:</b> 6/12/2020  |                     |

| Sieve No. | Sieve Openings in mm | Percent Finer | Grain Size  | % Retained |
|-----------|----------------------|---------------|-------------|------------|
| 4         | 4.76                 | 99.58         | Gravel      | 1          |
| 10        | 2.38                 | 73.26         | Med. to Crs | 67         |
| 20        | 0.84                 | 46.10         | Fines       | 15         |
| 40        | 0.42                 | 32.30         | Silts       | 17         |
| 60        | 0.28                 | 26.30         |             |            |
| 100       | 0.149                | 21.88         |             |            |
| 200       | 0.074                | 16.80         |             |            |

|        |                  |      |      |
|--------|------------------|------|------|
| Gravel | Sand             |      |      |
|        | Coarse to Medium | Fine | Silt |
|        |                  |      | Clay |



**Visual Soil Description :** SP-SM - Slightly silty, fine to medium coarse sand with pebbles scattered rock fragments

**Soil Classification:** SP-SM

**System:** USC

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**Consulting Foundation Engineers**



## **APPENDIX C**

### Supplemental Seismic Design Parameters

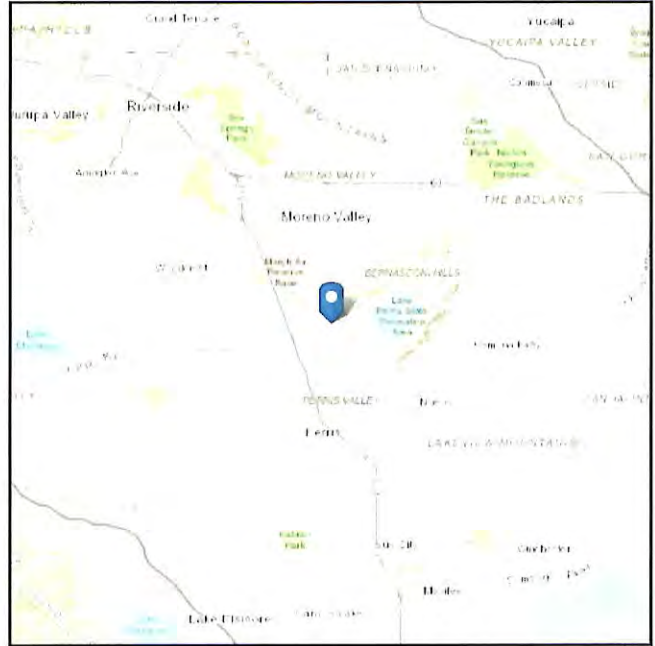
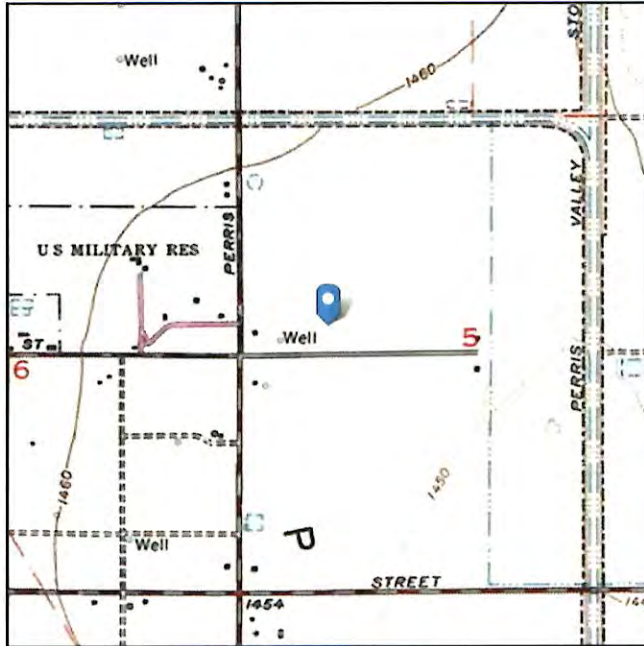


# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** III  
**Soil Class:** D - Stiff Soil

**Elevation:** 1457.54 ft (NAVD 88)  
**Latitude:** 33.852683  
**Longitude:** -117.222862







## Seismic

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**Site Soil Class:** D - Stiff Soil

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_s$ :    | 1.5   | $S_{D1}$ :         | N/A   |
| $S_1$ :    | 0.592 | $T_L$ :            | 8     |
| $F_a$ :    | 1     | PGA :              | 0.524 |
| $F_v$ :    | N/A   | PGA <sub>M</sub> : | 0.577 |
| $S_{MS}$ : | 1.5   | $F_{PGA}$ :        | 1.1   |
| $S_{M1}$ : | N/A   | $I_e$ :            | 1.25  |
| $S_{DS}$ : | 1     | $C_v$ :            | 1.4   |

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Mon Jun 01 2020

**Date Source:** [USGS Seismic Design Maps](#)



# Ground Motion Interpolator

Ground Motion Interpolator (2008)

**Longitude:**

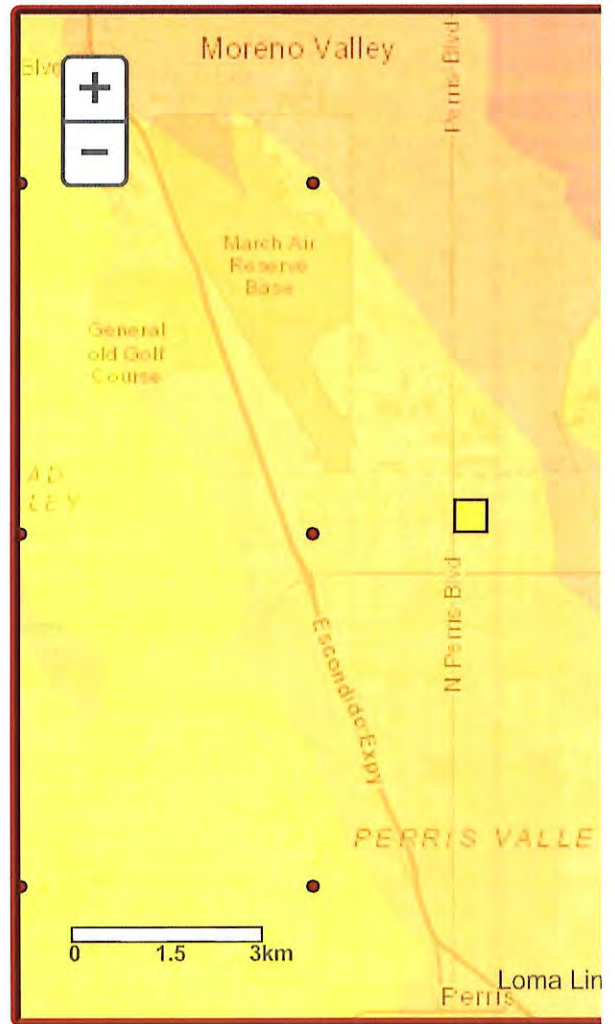
**Latitude:**

**VS30:**  (180-1050 m/sec)

**Return Period:**  
 2% in 50 years     10% in 50 years

**Spectral Acceleration:**  
 PGA     0.2 second SA     1.0 second SA

|  |                |
|--|----------------|
| <b>Inputs:</b>   | <b>Result:</b> |
| -117.222862,<br>33.852683<br>vs30: 270 m/sec<br>10% in 50 years<br>PGA | <b>0.486 g</b> |



[Information and Disclaimer](#)



U.S. Geological Survey - Earthquake Hazards Program

# 2008 National Seismic Hazard Maps - Source Parameters

[New Search](#)

| Distance<br>in Miles | Name  | State | Pref<br>Slip<br>Rate<br>(mm/yr) | Dip<br>(degrees) | Dip<br>Dir | Slip<br>Sense  | Rupture<br>Top<br>(km) | Rupture<br>Bottom<br>(km) | Length<br>(km) |
|----------------------|---|-------|---------------------------------|------------------|------------|----------------|------------------------|---------------------------|----------------|
| 7.04                 | <a href="#">San Jacinto;A+CC+B</a>            | CA    | n/a                             | 90               | V          | strike<br>slip | 0.1                    | 15                        | 152            |
| 7.04                 | <a href="#">San Jacinto;A</a>                 | CA    | 9                               | 90               | V          | strike<br>slip | 0                      | 17                        | 71             |
| 7.04                 | <a href="#">San Jacinto;A+CC+B+SM</a>         | CA    | n/a                             | 90               | V          | strike<br>slip | 0.1                    | 15                        | 178            |
| 7.04                 | <a href="#">San Jacinto;A+C</a>               | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 17                        | 118            |
| 7.04                 | <a href="#">San Jacinto;A+CC</a>              | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 16                        | 118            |
| 7.79                 | <a href="#">San Jacinto;SBV+SJV+A</a>         | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 16                        | 134            |
| 7.79                 | <a href="#">San Jacinto;SBV+SJV+A+C</a>       | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 17                        | 181            |
| 7.79                 | <a href="#">San Jacinto;SBV+SJV+A+CC</a>      | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 16                        | 181            |
| 7.79                 | <a href="#">San Jacinto;SBV+SJV+A+CC+B</a>    | CA    | n/a                             | 90               | V          | strike<br>slip | 0.1                    | 15                        | 215            |
| 7.79                 | <a href="#">San Jacinto;SBV+SJV+A+CC+B+SM</a> | CA    | n/a                             | 90               | V          | strike<br>slip | 0.1                    | 15                        | 241            |
| 7.79                 | <a href="#">San Jacinto;SJV+A</a>             | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 17                        | 89             |
| 7.79                 | <a href="#">San Jacinto;SJV+A+C</a>           | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 17                        | 136            |
| 7.79                 | <a href="#">San Jacinto;SJV+A+CC</a>          | CA    | n/a                             | 90               | V          | strike<br>slip | 0                      | 16                        | 136            |
| 7.79                 | <a href="#">San Jacinto;SJV</a>               | CA    | 18                              | 90               | V          | strike<br>slip | 0                      | 16                        | 43             |
| 7.79                 | <a href="#">San Jacinto;SJV+A+CC+B</a>        | CA    | n/a                             | 90               | V          | strike         | 0.1                    | 15                        | 170            |

U.S. Geological Survey - Earthquake Hazards Program

# 2008 National Seismic Hazard Maps - Source Parameters

## [New Search](#)

| Fault Name                | State             |
|---------------------------|-------------------|
| <b>San Jacinto;A+CC+B</b> | <b>California</b> |
| <b>GEOMETRY</b>           |                   |
| Dip (degrees)             | 90                |
| Dip direction             | V                 |
| Sense of slip             | strike slip       |
| Rupture top (km)          | 0.1               |
| Rupture bottom (km)       | 15                |
| Rake (degrees)            | 180               |
| Length (km)               | 152               |

## MODEL VALUES

|                         |                  |
|-------------------------|------------------|
| Slip Rate               | n/a              |
| Probability of activity | 1                |
|                         | <b>ELLSWORTH</b> |
|                         | <b>HANKS</b>     |
| Minimum magnitude       | 6.5              |
| Maximum magnitude       | 7.56             |
| b-value                 | 0.8              |

| Fault Model | Deformation | Char Rate <sup>1</sup> | GR-a- | Weight |
|-------------|-------------|------------------------|-------|--------|
|-------------|-------------|------------------------|-------|--------|

|                    | Model |                         | value <sup>1</sup> |      |
|--------------------|-------|-------------------------|--------------------|------|
| Moment<br>Balanced | 2.1   | 9.61e-05 / 9.61e-<br>05 | NA / NA            | 0.25 |
| Moment<br>Balanced | 2.2   | 9.61e-05 / 9.61e-<br>05 | NA / NA            | 0.10 |
| Moment<br>Balanced | 2.3   | 9.61e-05 / 9.61e-<br>05 | NA / NA            | 0.15 |

<sup>1</sup> 1<sup>st</sup> Value is based on Ellsworth relation and 2<sup>nd</sup> value is based on Hanks and Bakun relation



## PROFESSIONAL LIMITATIONS

Our investigation was performed using the degree of care and skill ordinarily exercised, under similar circumstances by other reputable Soils Engineers practicing in these general or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The investigations are based on soil samples only, consequently the recommendations provided shall be considered as "preliminary". The samples taken and used for testing and the observations made are believed representative of site conditions; however, soil and geologic conditions can vary significantly between test excavations. If this occurs, the changed conditions must be evaluated by the Project Soils Engineer and designs adjusted as required or alternate design recommended.

The report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are brought to the attention of the project architect and engineers. Appropriate recommendations should be incorporated into structural plans. The necessary steps should be taken to see that out such recommendations in field.

The findings of this report are valid as of this present date. However, changes in the conditions of a property can occur with the passage of time, whether they due to natural process or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur from legislation or broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by change outside of our control. Therefore, this report is subject to review and should be updated after a period of one year.

## RECOMMENDED SERVICES

The review of grading plans and specifications, field observations and testing by a geotechnical representative of this office is integral part of the conclusions and recommendations made in this report. If Soils Southwest, Inc. (SSW) is not retained for these services, the Client agrees to assume SSW's responsibility for any potential claims that may arise during and after construction, or during the life-time use of the structure and its appurtenant.

The recommendations supplied should be considered valid and applicable, provided the following conditions, in minimum, are met:

- i. Pre-grade meeting with contractor, public agency and soils engineer,
- ii. Excavated bottom inspections and verification s by soils engineer prior to backfill placement,
- iii. Continuous observations and testing during site preparation and structural fill soils placement,
- iv. Observation and inspection of footing trenching prior to steel and concrete placement,
- v. Subgrade verifications including plumbing trench backfills prior to concrete slab-on-grade placement,
- vi. On and off-site utility trench backfill testing and verifications,
- vii. Precise-grading plan review, and
- viii. Consultations as required during construction, or upon your request.

# Appendix 4: Historical Site Conditions

*Phase I Environmental Site Assessment or Other Information on Past Site Use*

**Note:**

There is no known Phase I Environmental Site Assessment for this site.



# Appendix 5: LID Infeasibility

*LID Technical Infeasibility Analysis*

**Note:**

LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus a LID Technical Infeasibility Analysis is not needed for this site.

# Appendix 6: BMP Design Details

*BMP Sizing, Design Details and other Supporting Documentation*



**Santa Ana Watershed - BMP Design Volume,  $V_{BMP}$**

(Rev. 10-2011)

Legend:

Required Entries

Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name **Joseph E Bonadiman & Associates, Inc.**

Date **9/10/2020**

Designed by

Case No

Company Project Number/Name

**194696 - Markham Street**

**BMP Identification**

BMP NAME / ID **BMP-1**

*Must match Name/ID used on BMP Design Calculation Sheet*

**Design Rainfall Depth**

85th Percentile, 24-hour Rainfall Depth,  
from the Riverside County SWCT<sup>2</sup> Website (<http://rivco.permitrack.com/>)

$D_{85}$  = **0.64** inches

**Drainage Management Area Tabulation**

*Insert additional rows if needed to accommodate all DMAs draining to the BMP*

| DMA Type/ID | DMA Area (square feet) | Post-Project Surface Type | Effective Imperivous Fraction, $I_f$ | DMA Runoff Factor | DMA Areas x Runoff Factor | Design Storm Depth (in) | Design Capture Volume, $V_{BMP}$ (cubic feet) | Proposed Volume on Plans (cubic feet) |
|-------------|------------------------|---------------------------|--------------------------------------|-------------------|---------------------------|-------------------------|---|---------------------------------------|
| DMA 1-A     | 23,966                 | Ornamental Landscaping    | 0.10                                 | 0.11              | 2647                      |                         |   |                                       |
| DMA 1-B     | 178,713                | Concrete or Asphalt       | 1.00                                 | 0.89              | 159412                    |                         |   |                                       |
| DMA 1-C     | 0                      | Roofs                     | 1.00                                 | 0.89              | 0                         |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             | <b>202679</b>          |                           | <b>Total</b>                         |                   | <b>162059</b>             | <b>0.64</b>             | <b>8643</b>                                   | <b>8,644</b>                          |

Notes:

**Santa Ana Watershed - BMP Design Volume,  $V_{BMP}$**

(Rev. 10-2011)

Legend:

Required Entries

Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name **Joseph E Bonadiman & Associates, Inc.** Date **9/10/2020**  
 Designed by \_\_\_\_\_ Case No \_\_\_\_\_  
 Company Project Number/Name **194696 - Markham Street**

**BMP Identification**

BMP NAME / ID **BMP-2**

*Must match Name/ID used on BMP Design Calculation Sheet*

**Design Rainfall Depth**

85th Percentile, 24-hour Rainfall Depth,  $D_{85} =$  **0.64** inches  
 from the Riverside County SWCT<sup>2</sup> Website (<http://rivco.permitrack.com/>)

**Drainage Management Area Tabulation**

*Insert additional rows if needed to accommodate all DMAs draining to the BMP*

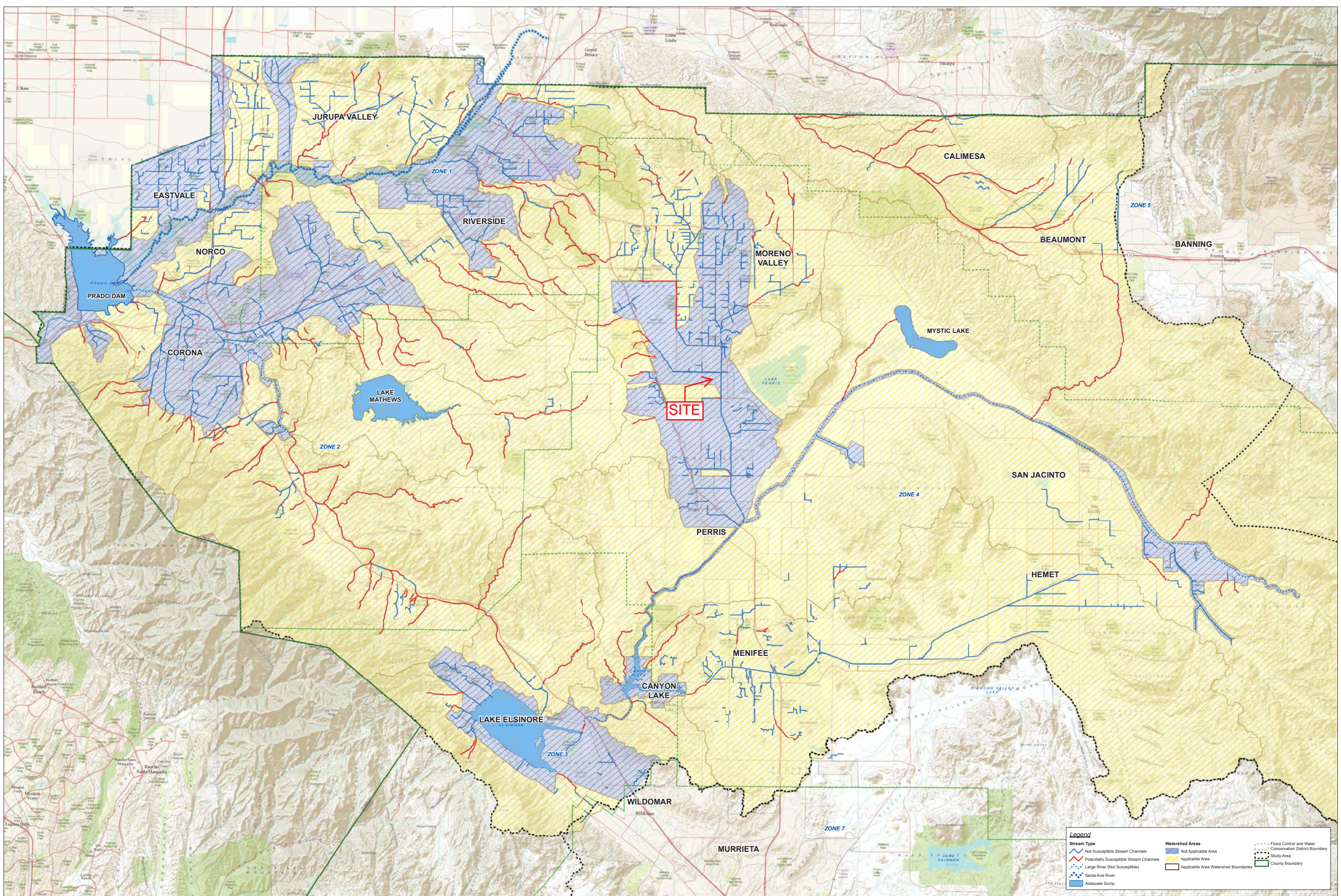
| DMA Type/ID | DMA Area (square feet) | Post-Project Surface Type | Effective Imperivous Fraction, $I_f$ | DMA Runoff Factor | DMA Areas x Runoff Factor | Design Storm Depth (in) | Design Capture Volume, $V_{BMP}$ (cubic feet) | Proposed Volume on Plans (cubic feet) |
|-------------|------------------------|---------------------------|--------------------------------------|-------------------|---------------------------|-------------------------|---|---------------------------------------|
| DMA 2-A     | 25,418                 | Ornamental Landscaping    | 0.10                                 | 0.11              | 2808                      |                         |   |                                       |
| DMA 2-B     | 176,854                | Concrete or Asphalt       | 1.00                                 | 0.89              | 157754                    |                         |   |                                       |
| DMA 2-C     | 470                    | Roofs                     | 1.00                                 | 0.89              | 419                       |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             |                        |                           |                                      |                   |                           |                         |   |                                       |
|             | <b>202742</b>          |                           | <b>Total</b>                         |                   | <b>160981</b>             | <b>0.64</b>             | <b>8586</b>                                   | <b>8,586</b>                          |

Notes:

# Appendix 7: Hydromodification

*Supporting Detail Relating to Hydrologic Conditions of Concern*





**Legend**

|   |                                      |  |
|---|--------------------------------------|--|
| Not Susceptible Stream Channels         | Not Applicable Area                  | Flood Control and Water Conservation District Boundary |
| Potentially Susceptible Stream Channels | Applicable Area                      | Study Area   |
| Large River (Not Susceptible)           | Applicable Area Watershed Boundaries | County Boundary  |
| Santa Ana River                         |                                      |  |
| Adequate Sump                           |                                      |  |



# Appendix 8: Source Control

*Pollutant Sources/Source Control Checklist*

## STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

**How to use this worksheet (also see instructions in Section G of the WQMP Template):**

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1 on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...                                       | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE |   |   |
|--|--|---|---|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Permanent Controls—Show on WQMP Drawings                              | 3<br>Permanent Controls—List in WQMP Table and Narrative  | 4<br>Operational BMPs—Include in WQMP Table and Narrative   |
| <input type="checkbox"/> <b>A. On-site storm drain inlets</b>                          | <input type="checkbox"/> Locations of inlets.                              | <input type="checkbox"/> Mark all inlets with the words “Only Rain Down the Storm Drain” or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify. | <input type="checkbox"/> Maintain and periodically repaint or replace inlet markings.<br><input type="checkbox"/> Provide stormwater pollution prevention information to new site owners, lessees, or operators.<br><input type="checkbox"/> See applicable operational BMPs in Fact Sheet SC-44, “Drainage System Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a><br><input type="checkbox"/> Include the following in lease agreements: “Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains.” |
| <input type="checkbox"/> <b>B. Interior floor drains and elevator shaft sump pumps</b> |  | <input type="checkbox"/> State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.  | <input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.   |
| <input type="checkbox"/> <b>C. Interior parking garages</b>                            |  | <input type="checkbox"/> State that parking garage floor drains will be plumbed to the sanitary sewer.  | <input type="checkbox"/> Inspect and maintain drains to prevent blockages and overflow.   |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...                                     | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE   |   |  |
|--|--|---|--|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Permanent Controls—Show on WQMP Drawings  | 3<br>Permanent Controls—List in WQMP Table and Narrative  | 4<br>Operational BMPs—Include in WQMP Table and Narrative  |
| <input type="checkbox"/> <b>D1.</b> Need for future indoor & structural pest control |  | <input type="checkbox"/> Note building design features that discourage entry of pests.  | <input type="checkbox"/> Provide Integrated Pest Management information to owners, lessees, and operators.   |
| <input type="checkbox"/> <b>D2.</b> Landscape/ Outdoor Pesticide Use                 | <input type="checkbox"/> Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.<br><input type="checkbox"/> Show self-retaining landscape areas, if any.<br><input type="checkbox"/> Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.) | <p>State that final landscape plans will accomplish all of the following.</p> <input type="checkbox"/> Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.<br><input type="checkbox"/> Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.<br><input type="checkbox"/> Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.<br><input type="checkbox"/> Consider using pest-resistant plants, especially adjacent to hardscape.<br><p>To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.</p> | <input type="checkbox"/> Maintain landscaping using minimum or no pesticides.<br><input type="checkbox"/> See applicable operational BMPs in “What you should know for.....Landscape and Gardening” at <a href="http://rcflood.org/stormwater/Error!">http://rcflood.org/stormwater/Error!</a> <small>Hyperlink reference not valid.</small><br><input type="checkbox"/> Provide IPM information to new owners, lessees and operators. |



**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...   | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE   |  |   |
|--|--|--|---|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Permanent Controls—Show on WQMP Drawings  | 3<br>Permanent Controls—List in WQMP Table and Narrative   | 4<br>Operational BMPs—Include in WQMP Table and Narrative   |
| <input type="checkbox"/> <b>E.</b> Pools, spas, ponds, decorative fountains, and other water features. | <input type="checkbox"/> Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)   | If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.  | <input type="checkbox"/> See applicable operational BMPs in “Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain” at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a>   |
| <input type="checkbox"/> <b>F.</b> Food service  | <input type="checkbox"/> For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.<br><br><input type="checkbox"/> On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.   | <input type="checkbox"/> Describe the location and features of the designated cleaning area.<br><br><input type="checkbox"/> Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.                 | <input type="checkbox"/> See the brochure, “The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries” at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a><br><br>Provide this brochure to new site owners, lessees, and operators.   |
| <input type="checkbox"/> <b>G.</b> Refuse areas  | <input type="checkbox"/> Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.<br><br><input type="checkbox"/> If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.<br><br><input type="checkbox"/> Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer. | <input type="checkbox"/> State how site refuse will be handled and provide supporting detail to what is shown on plans.<br><br><input type="checkbox"/> State that signs will be posted on or near dumpsters with the words “Do not dump hazardous materials here” or similar. | <input type="checkbox"/> State how the following will be implemented:<br><br>Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post “no hazardous materials” signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, “Waste Handling and Disposal” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| <b>IF THESE SOURCES WILL BE ON THE PROJECT SITE ...</b>  | <b>... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE</b> |  |   |
|--|---|--|---|
| <b>1<br/>Potential Sources of<br/>Runoff Pollutants</b>  | <b>2<br/>Permanent Controls—Show on<br/>WQMP Drawings</b>                         | <b>3<br/>Permanent Controls—List in WQMP<br/>Table and Narrative</b>   | <b>4<br/>Operational BMPs—Include in WQMP<br/>Table and Narrative</b>   |
| <input type="checkbox"/> <b>H. Industrial processes.</b> | <input type="checkbox"/> Show process area.                                       | <input type="checkbox"/> If industrial processes are to be located on site, state: “All process activities to be performed indoors. No processes to drain to exterior or to storm drain system.” | <input type="checkbox"/> See Fact Sheet SC-10, “Non-Stormwater Discharges” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a><br><br>See the brochure “Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities” at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a> |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...   | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE  |   |   |
|--|---|---|---|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Permanent Controls—Show on WQMP Drawings   | 3<br>Permanent Controls—List in WQMP Table and Narrative  | 4<br>Operational BMPs—Include in WQMP Table and Narrative   |
| <input type="checkbox"/> I. Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.) | <input type="checkbox"/> Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.<br><br><input type="checkbox"/> Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.<br><br><input type="checkbox"/> Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site. | <p>Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.</p> <p>Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:</p> <ul style="list-style-type: none"> <li>▪ Hazardous Waste Generation</li> <li>▪ Hazardous Materials Release Response and Inventory</li> <li>▪ California Accidental Release (CalARP)</li> <li>▪ Aboveground Storage Tank</li> <li>▪ Uniform Fire Code Article 80 Section 103(b) &amp; (c) 1991</li> <li>▪ Underground Storage Tank</li> </ul> <p><a href="http://www.cchealth.org/groups/hazmat/">www.cchealth.org/groups/hazmat/</a></p> | <input type="checkbox"/> See the Fact Sheets SC-31, “Outdoor Liquid Container Storage” and SC-33, “Outdoor Storage of Raw Materials ” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| <b>IF THESE SOURCES WILL BE ON THE PROJECT SITE ...</b>           | <b>... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE</b>   |  |  |
|---|---|--|--|
| <b>1<br/>Potential Sources of Runoff Pollutants</b>               | <b>2<br/>Permanent Controls—Show on WQMP Drawings</b>   | <b>3<br/>Permanent Controls—List in WQMP Table and Narrative</b>   | <b>4<br/>Operational BMPs—Include in WQMP Table and Narrative</b>  |
| <input type="checkbox"/> <b>J. Vehicle and Equipment Cleaning</b> | <input type="checkbox"/> Show on drawings as appropriate: <p>(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.</p> <p>(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).</p> <p>(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.</p> <p>(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.</p> | <input type="checkbox"/> If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced. | <p>Describe operational measures to implement the following (if applicable):</p> <input type="checkbox"/> Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to “Outdoor Cleaning Activities and Professional Mobile Service Providers” for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a> <input type="checkbox"/> Car dealerships and similar may rinse cars with water only. |



**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...                                   | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE  |  |   |
|--|---|--|---|
| 1<br>Potential Sources of Runoff Pollutants  | 2<br>Permanent Controls—Show on WQMP Drawings   | 3<br>Permanent Controls—List in WQMP Table and Narrative   | 4<br>Operational BMPs—Include in WQMP Table and Narrative   |
| <p><input type="checkbox"/> <b>K. Vehicle/Equipment Repair and Maintenance</b></p> | <p><input type="checkbox"/> Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.</p> <p><input type="checkbox"/> Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.</p> <p><input type="checkbox"/> Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.</p> | <p><input type="checkbox"/> State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.</p> <p><input type="checkbox"/> State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency’s requirements.</p> <p><input type="checkbox"/> State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency’s requirements.</p> | <p>In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:</p> <p><input type="checkbox"/> No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.</p> <p><input type="checkbox"/> No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.</p> <p><input type="checkbox"/> No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.</p> <p>Refer to “Automotive Maintenance &amp; Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations”. Brochure can be found at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a></p> <p>Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at <a href="http://rcflood.org/stormwater/">http://rcflood.org/stormwater/</a></p> |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

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|---|---|--|--|
| 1<br>Potential Sources of Runoff Pollutants       | 2<br>Permanent Controls—Show on WQMP Drawings   | 3<br>Permanent Controls—List in WQMP Table and Narrative | 4<br>Operational BMPs—Include in WQMP Table and Narrative  |
| <input type="checkbox"/> L. Fuel Dispensing Areas | <input type="checkbox"/> Fueling areas <sup>6</sup> shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.<br><br><input type="checkbox"/> Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area <sup>1</sup> .] The canopy [or cover] shall not drain onto the fueling area. |  | <input type="checkbox"/> The property owner shall dry sweep the fueling area routinely.<br><input type="checkbox"/> See the Fact Sheet SD-30 , “Fueling Areas” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> |

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<sup>6</sup> The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ... | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE  |  |   |
|--|---|--|---|
| 1<br>Potential Sources of Runoff Pollutants      | 2<br>Permanent Controls—Show on WQMP Drawings   | 3<br>Permanent Controls—List in WQMP Table and Narrative | 4<br>Operational BMPs—Include in WQMP Table and Narrative   |
| <input type="checkbox"/> M. Loading Docks        | <input type="checkbox"/> Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.<br><br><input type="checkbox"/> Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.<br><br><input type="checkbox"/> Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer. |  | <input type="checkbox"/> Move loaded and unloaded items indoors as soon as possible.<br><br><input type="checkbox"/> See Fact Sheet SC-30, “Outdoor Loading and Unloading,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> |

**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| IF THESE SOURCES WILL BE ON THE PROJECT SITE ...  | ... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE |  |  |
|---|--|--|--|
| 1<br>Potential Sources of Runoff Pollutants   | 2<br>Permanent Controls—Show on WQMP Drawings                              | 3<br>Permanent Controls—List in WQMP Table and Narrative   | 4<br>Operational BMPs—Include in WQMP Table and Narrative  |
| <input type="checkbox"/> <b>N. Fire Sprinkler Test Water</b>  |  | <input type="checkbox"/> Provide a means to drain fire sprinkler test water to the sanitary sewer.   | <input type="checkbox"/> See the note in Fact Sheet SC-41, “Building and Grounds Maintenance,” in the CASQA Stormwater Quality Handbooks at <a href="http://www.cabmphandbooks.com">www.cabmphandbooks.com</a> |
| <p><b>O. Miscellaneous Drain or Wash Water or Other Sources</b></p> <input type="checkbox"/> Boiler drain lines<br><input type="checkbox"/> Condensate drain lines<br><input type="checkbox"/> Rooftop equipment<br><input type="checkbox"/> Drainage sumps<br><input type="checkbox"/> Roofing, gutters, and trim.<br><input type="checkbox"/> Other sources |  | <input type="checkbox"/> Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.<br><input type="checkbox"/> Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.<br>Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.<br><input type="checkbox"/> Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.<br><input type="checkbox"/> Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.<br>Include controls for other sources as specified by local reviewer. |  |



**STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST**

| <b>IF THESE SOURCES WILL BE ON THE PROJECT SITE ...</b>                 | <b>... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE</b> |  |  |
|---|---|--|--|
| <b>1<br/>Potential Sources of Runoff Pollutants</b>                     | <b>2<br/>Permanent Controls—Show on WQMP Drawings</b>                             | <b>3<br/>Permanent Controls—List in WQMP Table and Narrative</b> | <b>4<br/>Operational BMPs—Include in WQMP Table and Narrative</b>  |
| <input type="checkbox"/> <b>P.</b> Plazas, sidewalks, and parking lots. |   |  | <input type="checkbox"/> Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain. |

# Appendix 9: O&M

*Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms*

**Note:**

Operations & Maintenance Plan and Documentation of Finance, Maintenance, & Recording Mechanisms to be prepared, signed, and fully-executed as part of the project's Final WQMP.

# Appendix 10: Educational Materials

*BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information*





# A Citizen's Guide to Understanding Stormwater



EPA  
United States Environmental Protection Agency

EPA 833-B-03-002

January 2003

Internet Address (URL) • HTTP://www.epa.gov  
Oil Based Inks on 100% Postconsumer  
Recycled/Recyclable • Printed with Vegetable  
Process Chlorine Free Recycled Paper



## After the Storm

or visit  
[www.epa.gov/nps/stormwater](http://www.epa.gov/nps/stormwater)  
[www.epa.gov/nps](http://www.epa.gov/nps)

For more information contact:



## What is stormwater runoff?

Stormwater runoff occurs when precipitation from rain or snowmelt flows over the ground. Impervious surfaces like driveways, sidewalks, and streets prevent stormwater from naturally soaking into the ground.

## Why is stormwater runoff a problem?

Stormwater can pick up debris, chemicals, dirt, and other pollutants and flow into a storm sewer system or directly to a lake, stream, river, wetland, or coastal water. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and providing drinking water.

## The effects of pollution

Polluted stormwater runoff can have many adverse effects on plants, fish, animals, and people.

- ◆ Sediment can cloud the water and make it difficult or impossible for aquatic plants to grow. Sediment also can destroy aquatic habitats.
- ◆ Excess nutrients can cause algae blooms. When algae die, they sink to the bottom and decompose in a process that removes oxygen from the water. Fish and other aquatic organisms can't exist in water with low dissolved oxygen levels.
- ◆ Bacteria and other pathogens can wash into swimming areas and create health hazards, often making beach closures necessary.
- ◆ Debris—plastic bags, six-pack rings, bottles, and cigarette butts—washed into waterbodies can choke, suffocate, or disable aquatic life like ducks, fish, turtles, and birds.
- ◆ Household hazardous wastes like insecticides, pesticides, paint, solvents, used motor oil, and other auto fluids can poison aquatic life. Land animals and people can become sick or die from eating diseased fish and shellfish or ingesting polluted water.

- ◆ Polluted stormwater often affects drinking water sources. This, in turn, can affect human health and increase drinking water treatment costs.





# Stormwater Pollution Solutions

## Residential

Recycle or properly dispose of household products that contain chemicals, such as insecticides, pesticides, paint, solvents, and used motor oil and other auto fluids. Don't pour them onto the ground or into storm drains.

### Lawn care

Excess fertilizers and pesticides applied to lawns and gardens wash off and pollute streams. In addition, yard clippings and leaves can wash into storm drains and contribute nutrients and organic matter to streams.



- ◆ Don't overwater your lawn. Consider using a soaker hose instead of a sprinkler.
- ◆ Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Use organic mulch or safer pest control methods whenever possible.
- ◆ Compost or mulch yard waste. Don't leave it in the street or sweep it into storm drains or streams.
- ◆ Cover piles of dirt or mulch being used in landscaping projects.

### Septic systems

Leaking and poorly maintained septic systems release nutrients and pathogens (bacteria and viruses) that can be picked up by stormwater and discharged into nearby waterbodies. Pathogens can cause public health problems and environmental concerns.



- ◆ Inspect your system every 3 years and pump your tank as necessary (every 3 to 5 years).
- ◆ Don't dispose of household hazardous waste in sinks or toilets.

### Auto care

Washing your car and degreasing auto parts at home can send detergents and other contaminants through the storm sewer system. Dumping automotive fluids into storm drains has the same result as dumping the materials directly into a waterbody.



- ◆ Use a commercial car wash that treats or recycles its wastewater, or wash your car on your yard so the water infiltrates into the ground.
- ◆ Repair leaks and dispose of used auto fluids and batteries at designated drop-off or recycling locations.

### Pet waste

Pet waste can be a major source of bacteria and excess nutrients in local waters.



- ◆ When walking your pet, remember to pick up the waste and dispose of it properly. Flushing pet waste is the best disposal method. Leaving pet waste on the ground increases public health risks by allowing harmful bacteria and nutrients to wash into the storm drain and eventually into local waterbodies.



Education is essential to changing people's behavior. Signs and markers near storm drains warn residents that pollutants entering the drains will be carried untreated into a local waterbody.

## Residential landscaping

**Permeable Pavement**—Traditional concrete and asphalt don't allow water to soak into the ground. Instead these surfaces rely on storm drains to divert unwanted water. Permeable pavement systems allow rain and snowmelt to soak through, decreasing stormwater runoff.

**Rain Barrels**—You can collect rainwater from rooftops in mosquito-proof containers. The water can be used later on lawn or garden areas.



**Rain Gardens and Grassy Swales**—Specially designed areas planted with native plants can provide natural places for rainwater to collect and soak into the ground. Rain from rooftop areas or paved areas can be diverted into these areas rather than into storm drains.



**Vegetated Filter Strips**—Filter strips are areas of native grass or plants created along roadways or streams. They trap the pollutants stormwater picks up as it flows across driveways and streets.

## Commercial

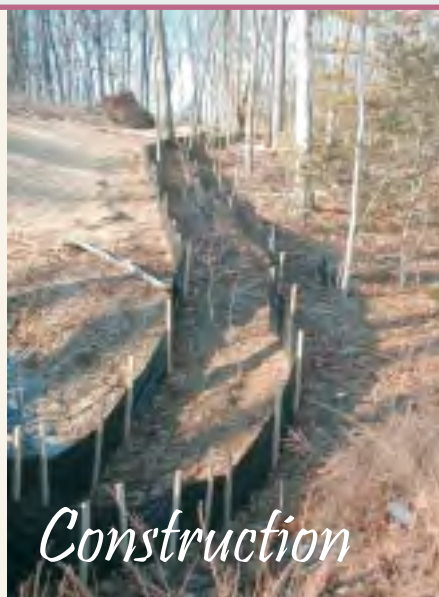
Dirt, oil, and debris that collect in parking lots and paved areas can be washed into the storm sewer system and eventually enter local waterbodies.

- ◆ Sweep up litter and debris from sidewalks, driveways and parking lots, especially around storm drains.
- ◆ Cover grease storage and dumpsters and keep them clean to avoid leaks.
- ◆ Report any chemical spill to the local hazardous waste cleanup team. They'll know the best way to keep spills from harming the environment.

Erosion controls that aren't maintained can cause excessive amounts of sediment and debris to be carried into the stormwater system. Construction vehicles can leak fuel, oil, and other harmful fluids that can be picked up by stormwater and deposited into local waterbodies.

- ◆ Divert stormwater away from disturbed or exposed areas of the construction site.
- ◆ Install silt fences, vehicle mud removal areas, vegetative cover, and other sediment and erosion controls and properly maintain them, especially after rainstorms.
- ◆ Prevent soil erosion by minimizing disturbed areas during construction projects, and seed and mulch bare areas as soon as possible.

## Construction



## Agriculture

Lack of vegetation on streambanks can lead to erosion. Overgrazed pastures can also contribute excessive amounts of sediment to local waterbodies. Excess fertilizers and pesticides can poison aquatic animals and lead to destructive algae blooms. Livestock in streams can contaminate waterways with bacteria, making them unsafe for human contact.

- ◆ Keep livestock away from streambanks and provide them a water source away from waterbodies.
- ◆ Store and apply manure away from waterbodies and in accordance with a nutrient management plan.
- ◆ Vegetate riparian areas along waterways.
- ◆ Rotate animal grazing to prevent soil erosion in fields.
- ◆ Apply fertilizers and pesticides according to label instructions to save money and minimize pollution.

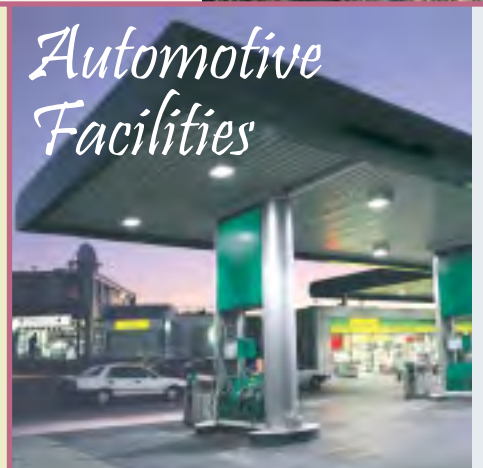


## Forestry

Improperly managed logging operations can result in erosion and sedimentation.

- ◆ Conduct preharvest planning to prevent erosion and lower costs.
- ◆ Use logging methods and equipment that minimize soil disturbance.
- ◆ Plan and design skid trails, yard areas, and truck access roads to minimize stream crossings and avoid disturbing the forest floor.
- ◆ Construct stream crossings so that they minimize erosion and physical changes to streams.
- ◆ Expedite revegetation of cleared areas.

## Automotive Facilities



Uncovered fueling stations allow spills to be washed into storm drains. Cars waiting to be repaired can leak fuel, oil, and other harmful fluids that can be picked up by stormwater.

- ◆ Clean up spills immediately and properly dispose of cleanup materials.
- ◆ Provide cover over fueling stations and design or retrofit facilities for spill containment.
- ◆ Properly maintain fleet vehicles to prevent oil, gas, and other discharges from being washed into local waterbodies.
- ◆ Install and maintain oil/water separators.



# IRRIGATION RUNOFF

## STORMWATER FACT SHEET



**Report Irrigation Runoff or Stormwater Pollution:**  
**800.506.2555**

**RIVERSIDE COUNTY**  
WATERSHED PROTECTION

### OVERWATERING

Overwatering causes irrigation runoff that may contain pollutants such as pesticides, herbicides, fertilizers, pet waste, yard waste, and sediments which can be hazardous to residents and harmful to our environment. Runoff can also serve as a transport mechanism for other pollutants already on the ground or in the curb gutter. Irrigation runoff entering the storm drain system is an illicit discharge.

### BEST PRACTICES

Urban runoff begins when yards and landscaped areas are over-irrigated. Irrigation systems require regular maintenance and visual inspection of the system should be performed to prevent over-spray, leaks, and other problems that result in runoff to storm drains, curbs and gutters.

You can **prevent pollution** by conserving water on your property. Water during cooler times of the day (before 10am and after 6pm).

- Adjust sprinklers to stop overspray and runoff.
- Make needed repairs immediately.
- Use drip irrigation, soaker hoses, or micro-spray systems.
- Use an irrigation timer to pre-set watering times.
- Use a control nozzle or similar mechanism when watering by hand.
- Switch to a water-wise landscape - native plants need less fertilizers, herbicides, pesticides and water.

### PROTECT OUR WATERSHED

Many people think that when water flows into a storm drain it is treated, but the storm drain system and the sanitary sewer system are not connected. Everything that enters storm drains flows untreated directly into our creeks, rivers, lakes, beaches and ultimately the ocean. Storm water often contains pollutants, including chemicals, trash, and automobile fluids, all of which pollute our watershed and harm fish and wildlife.

Whether at home or work, you can help reduce pollution and improve water quality by using the above Best Management Practices (BMP's) as part of your daily clean up and maintenance routine.







**L**andscaping and garden maintenance activities can be major contributors to water pollution. Soils, yard wastes, over-watering and garden chemicals become part of the urban runoff mix that winds its way through streets, gutters and storm drains before entering lakes, rivers, streams, etc. Urban runoff pollution contaminates water and harms aquatic life!

In Riverside County, report illegal discharges into the storm drain, call  
1-800-506-2555  
"Only Rain Down the Storm Drain"

**Important Links:**

Riverside County Household Hazardous Waste Collection Information  
1-800-304-2226 or [www.rivcwm.org](http://www.rivcwm.org)

Riverside County Backyard Composting Program  
1-800-366-SAVE

Integrated Pest Management (IPM) Solutions  
[www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

California Master Gardener Programs  
[www.mastergardeners.org](http://www.mastergardeners.org)  
[www.camastergardeners.ucdavis.edu](http://www.camastergardeners.ucdavis.edu)

California Native Plant Society  
[www.cnps.org](http://www.cnps.org)

The Riverside County "Only Rain Down the Storm Drain" Pollution Prevention Program gratefully acknowledges Orange County's Storm Water Program for their contribution to this brochure.

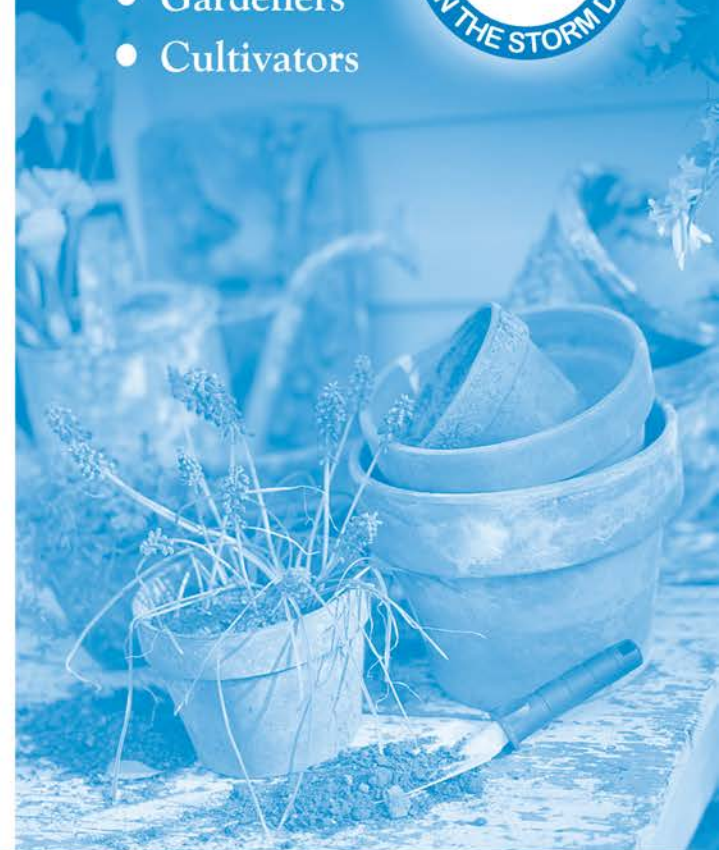


## ...Only Rain Down ...the Storm Drain

*What you should know for...  
Landscape and Gardening*

Best Management tips for:

- Professionals
- Novices
- Landscapers
- Gardeners
- Cultivators





## Riverside County Stormwater Program Members

City of Banning  
(951) 922-3105

City of Beaumont  
(951) 769-8520

City of Calimesa  
(909) 795-9801

City of Canyon Lake  
(951) 244-2955

City of Cathedral City  
(760) 770-0340

City of Coachella  
(760) 398-3502

City of Corona  
(951) 736-2447

City of Desert Hot Springs  
(760) 329-6411

City of Eastvale  
(951) 361-0900

City of Hemet  
(951) 765-2300

City of Indian Wells  
(760) 346-2489

City of Indio  
(760) 391-4000

City of Jurupa Valley  
(951) 332-6464

City of Lake Elsinore  
(951) 674-3124

City of La Quinta  
(760) 777-7000

City of Menifee  
(951) 672-6777

City of Moreno Valley  
(951) 413-3000

City of Murrieta  
(951) 304-2489

City of Norco  
(951) 270-5607

City of Palm Desert  
(760) 346-0611

City of Palm Springs  
(760) 323-8299

City of Perris  
(951) 943-6100

City of Rancho Mirage  
(760) 324-4511

City of Riverside  
(951) 826-5311

City of San Jacinto  
(951) 487-7330

City of Temecula  
(951) 694-6444

City of Wildomar  
(951) 677-7751

Coachella Valley Water District  
(760) 398-2651

County of Riverside  
(951) 955-1000

Riverside County Flood Control District  
(951) 955-1200

# Stormwater Pollution

*What you should know for...*

## Industrial & Commercial Facilities

Best Management Practices (BMPS) for:

- Industrial Facilities
- Commercial Facilities





# YOU can prevent Stormwater Pollution following these practices...

## Industrial and Commercial Facilities

The Riverside County Stormwater Program has identified a number of Best Management Practices (BMPs) for Industrial and Commercial Facilities. These BMPs control and reduce stormwater pollutants from reaching our storm drain system and ultimately our local water bodies. City and County ordinances require businesses to use these BMPs to protect our water quality. Local cities and the County are required to verify implementation of these BMPs by performing regular facility inspections.

### Prohibited Discharges

Discontinue all non-stormwater discharges to the storm drain system. It is *prohibited* to discharge any chemicals, paints, debris, wastes or wastewater into the gutter, street or storm drain.

### Outdoor Storage BMPs

- Install covers and secondary containment areas for all hazardous materials and wastes stored outdoors in accordance with County and/or City standards.
- Keep all temporary waste containers covered, at all times when not in use.
- Sweep outdoor areas instead of using a hose or pressure washer.
- Move all process operations including vehicle/equipment maintenance inside of the building or under a covered and contained area.
- Wash equipment and vehicles in a contained and covered wash bay which is closed-loop or connected to a clarifier sized to local standards and discharged to a sanitary sewer or take them to a commercial car wash.



### Spills and Clean Up BMPs

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep up the area.
- Clean up spills immediately when they occur, using dry clean up methods such as absorbent materials or sweep followed by proper disposal of materials.

- Always have a spill kit available near chemical loading dock doors and vehicle maintenance and fueling areas.
- Follow your Business Emergency Plan, as filed with the local Fire Department.
- Report all prohibited discharges and non-implementation of BMPs to your local Stormwater Coordinator as listed on the back of this pamphlet.
- Report hazardous materials spills to 951-358-5055 or call after hours to 951-782-2973 or, if an emergency, call the Fire Department's Haz Mat Team at 911.



## Plastic Manufacturing Facilities BMPs

AB 258 requires plastic product manufacturers to use BMPs, such as safe storage and clean-up procedures to prevent plastic pellets (nurdles) from entering the waterway. The plastic pellets are released into the environment during transporting, packaging and processing and migrate to waterways through the storm drain system. AB 258 will help protect fish and wildlife from the hazards of plastic pollution.

### Training BMPs

As prescribed by your City and County Stormwater Ordinance(s), train employees in spill procedures and prohibit non-stormwater discharges to the storm drain system. Applicable BMP examples can be found at [www.cabmphandbooks.com](http://www.cabmphandbooks.com).

### Permitting

Stormwater discharges associated with specific categories for industrial facilities are regulated by the State Water Resources Control Board through an Industrial Stormwater General Permit. A copy of this General Permit and application forms are available at: [www.waterboards.ca.gov](http://www.waterboards.ca.gov), select stormwater then the industrial quick link.

To report illegal dumping or for more information on stormwater pollution prevention call: 1-800-506-2555 or e-mail us at: [fcnpcdes@rcflood.org](mailto:fcnpcdes@rcflood.org).

## Helpful telephone numbers and links:

### Riverside County Stormwater Protection Partners

|                            |                |
|----------------------------|----------------|
| Flood Control District     | (951) 955-1200 |
| County of Riverside        | (951) 955-1000 |
| City of Banning            | (951) 922-3105 |
| City of Beaumont           | (951) 769-8520 |
| City of Calimesa           | (909) 795-9801 |
| City of Canyon Lake        | (951) 244-2955 |
| Cathedral City             | (760) 770-0327 |
| City of Coachella          | (760) 398-4978 |
| City of Corona             | (951) 736-2447 |
| City of Desert Hot Springs | (760) 329-6411 |
| City of Eastvale           | (951) 361-0900 |
| City of Hemet              | (951) 765-2300 |
| City of Indian Wells       | (760) 346-2489 |
| City of Indio              | (760) 391-4000 |
| City of Lake Elsinore      | (951) 674-3124 |
| City of La Quinta          | (760) 777-7000 |
| City of Menifee            | (951) 672-6777 |
| City of Moreno Valley      | (951) 413-3000 |
| City of Murrieta           | (951) 304-2489 |
| City of Norco              | (951) 270-5607 |
| City of Palm Desert        | (760) 346-0611 |
| City of Palm Springs       | (760) 323-8299 |
| City of Perris             | (951) 943-6100 |
| City of Rancho Mirage      | (760) 324-4511 |
| City of Riverside          | (951) 361-0900 |
| City of San Jacinto        | (951) 654-7337 |
| City of Temecula           | (951) 694-6444 |
| City of Wildomar           | (951) 677-7751 |

### REPORT ILLEGAL STORM DRAIN DISPOSAL

1-800-506-2555 or e-mail us at  
[fcnpdes@rcflood.org](mailto:fcnpdes@rcflood.org)

- Riverside County Flood Control and Water Conservation District  
[www.rcflood.org](http://www.rcflood.org)

#### Online resources include:

- California Storm Water Quality Association  
[www.casqa.org](http://www.casqa.org)
- State Water Resources Control Board  
[www.waterboards.ca.gov](http://www.waterboards.ca.gov)
- Power Washers of North America  
[www.thepwna.org](http://www.thepwna.org)

# Stormwater Pollution

What you should know for...

## Outdoor Cleaning Activities and Professional Mobile Service Providers



### Storm drain pollution prevention information for:

- Car Washing / Mobile Detailers
- Window and Carpet Cleaners
- Power Washers
- Waterproofers / Street Sweepers
- Equipment cleaners or degreasers and all mobile service providers

Do you know where street flows actually go?

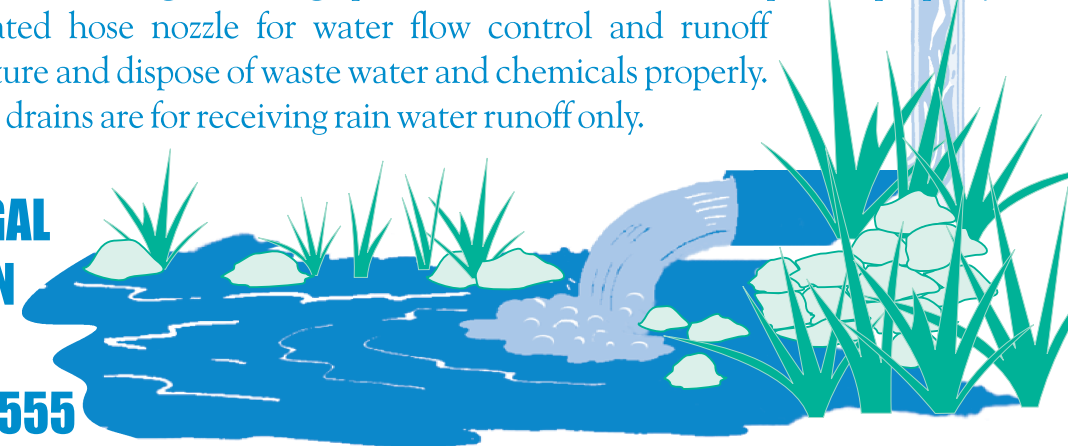
## Storm drains are NOT connected to sanitary sewer systems and treatment plants!



The primary purpose of storm drains is to carry *rain* water away from developed areas to prevent flooding. Pollutants discharged to storm drains are transported directly into rivers, lakes and streams. Soaps, degreasers, automotive fluids, litter and a host of materials are washed off buildings, sidewalks, plazas and parking areas. Vehicles and equipment must be properly managed to prevent the pollution of local waterways.

Unintentional spills by mobile service operators can flow into storm drains and pollute our waterways. **Avoid mishaps.** Always have a **Spill Response Kit** on hand to clean up unintentional spills. Only emergency **Mechanical** repairs should be done in City streets, using drip pans for spills. **Plumbing** should be done on private property. Always store chemicals in a leak-proof container and keep covered when not in use. **Window/Power Washing** waste water shouldn't be released into the streets, but should be disposed of in a sanitary sewer, landscaped area or in the soil. Soiled **Carpet Cleaning** wash water should be filtered before being discharged into the sanitary sewer. Dispose of all filter debris properly. **Car Washing/Detailing** operators should wash cars on private property and use a regulated hose nozzle for water flow control and runoff prevention. Capture and dispose of waste water and chemicals properly. Remember, storm drains are for receiving rain water runoff only.

**REPORT ILLEGAL  
STORM DRAIN  
DISPOSAL  
1-800-506-2555**



# Help Protect Our Waterways!

Use these guidelines for Outdoor Cleaning Activities and Wash Water Disposal

**D**id you know that disposing of pollutants into the street, gutter, storm drain or body of water is **PROHIBITED** by law and can result in stiff penalties?

## Best Management Practices

Waste wash water from Mechanics, Plumbers, Window/Power Washers, Carpet Cleaners, Car Washing and Mobile Detailing activities may contain significant quantities of motor oil, grease, chemicals, dirt, detergents, brake pad dust, litter and other materials.

Best Management Practices, or BMPs as they are known, are guides to prevent pollutants from entering the storm drains. *Each of us* can do our part to keep stormwater clean by using the suggested BMPs below:

## Simple solutions for both light and heavy duty jobs:

**Do...**consider dry cleaning methods first such as a mop, broom, rag or wire brush. Always keep a spill response kit on site.

**Do...**prepare the work area before power cleaning by using sand bags, rubber mats, vacuum booms, containment pads or temporary berms to keep wash water away from the gutters and storm drains.

**Do...**use vacuums or other machines to remove and collect loose debris or litter before applying water.

**Do...**obtain the property owner's permission to dispose of *small amounts* of power washing waste water on to landscaped, gravel or unpaved surfaces.

**Do...**check your local sanitary sewer agency's policies on wash water disposal regulations before disposing of wash water into the sewer. (See list on reverse side)

**Do...**be aware that if discharging to landscape areas, soapy wash water may damage landscaping. Residual wash water may remain on paved surfaces to evaporate. Sweep up solid residuals and dispose of properly. Vacuum booms are another option for capturing and collecting wash water.

**Do...**check to see if local ordinances prevent certain activities.

**Do not let...**wash or waste water from sidewalk, plaza or building cleaning go into a street or storm drain.



Report illegal storm drain disposal  
Call Toll Free  
**1-800-506-2555**

## Using Cleaning Agents

Try using biodegradable/phosphate-free products. They are easier on the environment, but don't confuse them with being toxic free. Soapy water entering the storm drain system can impact the delicate aquatic environment.



When cleaning surfaces with a *high-pressure washer* or *steam cleaner*, additional precautions should be taken to prevent the discharge of pollutants into the storm drain system. These two methods of surface cleaning can loosen additional material that can contaminate local waterways.

## Think Water Conservation

Minimize water use by using high pressure, low volume nozzles. Be sure to check all hoses for leaks. Water is a precious resource, don't let it flow freely and be sure to shut it off in between uses.

## Screening Wash Water

Conduct thorough dry cleanup before washing exterior surfaces, such as buildings and decks **with loose paint**, sidewalks or plaza areas. Keep debris from entering the storm drain after cleaning by first passing the wash water through a "20 mesh" or finer screen to catch the solid materials, then dispose of the mesh in a refuse container. Do not let the remaining wash water enter a street, gutter or storm drain.

## Drain Inlet Protection & Collection of Wash Water

- Prior to any washing, block all storm drains with an impervious barrier such as sandbags or berms, or seal the storm drain with plugs or other appropriate materials.
- Create a containment area with berms and traps or take advantage of a low spot to keep wash water contained.
- Wash vehicles and equipment on grassy or gravel areas so that the wash water can seep into the ground.
- Pump or vacuum up all wash water in the contained area.

## Concrete/Coring/Saw Cutting and Drilling Projects

Protect any down-gradient inlets by using dry activity techniques whenever possible. If water is used, minimize the amount of water used during the coring/drilling or saw cutting process. Place a barrier of sandbags and/or absorbent berms to protect the storm drain inlet or watercourse. Use a shovel or wet vacuum to remove the residue from the pavement. Do not wash residue or particulate matter into a storm drain inlet or watercourse.



# Tips for Landscape & Gardening

This brochure will help you to get the most of your lawn and gardening efforts and keep our waterways clean. Clean waterways provide recreation, establish thriving fish habitats, secure safe sanctuaries for wildlife, and add beauty to our communities. NEVER allow gardening products or waste water to enter the street, gutter or storm drain.

## General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers and pesticides applied to the landscape.
- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.



## Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro-spray systems. Periodically inspect and fix leaks and misdirected sprinklers.

- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.



- Consider recycling your green waste and adding "nature's own fertilizer" to your lawn or garden.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.
- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains or sewers. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting.

- Try natural long-term common sense solutions first. Integrated Pest Management (IPM) can provide landscaping guidance and solutions, such as:

- ◆ **Physical Controls** - Try hand picking, barriers, traps or caulking holes to control weeds and pests.
- ◆ **Biological Controls** - Use predatory insects to control harmful pests.
- ◆ **Chemical Controls** - Check out [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu) before using chemicals. Remember, all chemicals should be used cautiously and in moderation.

- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Waste Collection Center to be recycled.
- *Dumping toxics into the street, gutter or storm drain is illegal!*

[www.bewaterwise.com](http://www.bewaterwise.com) Great water conservation tips and drought tolerant garden designs.

[www.ourwaterourworld.com](http://www.ourwaterourworld.com) Learn how to safely manage home and garden pests.

Additional information can also be found on the back of this brochure.