Outline

• Regional Monitoring Program
  – Data Summary
  – Santa Ana River Reach 4
  – Cucamonga Creek anti-deg target

• MSAR TMDL
  – Wet weather retrospective for MSAR waters
  – Special study of channel bottom releases in MSAR
Sample Locations
Sample Collection

- Increased frequency of sampling at Cucamonga Creek at Hellman (P4-SBC1) and Santa Ana River Reach 4 (P3-SBC1)
- 2019-2020 RMP sampling inventory

<table>
<thead>
<tr>
<th>Priority</th>
<th>Planned/Collected</th>
<th>Dry Weather</th>
<th>Wet Weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority 1</td>
<td>Planned</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Collected</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td>Priority 2</td>
<td>Planned</td>
<td>125</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Collected</td>
<td>125</td>
<td>20</td>
</tr>
<tr>
<td>Priority 3</td>
<td>Planned</td>
<td>80</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Collected</td>
<td>71</td>
<td>0</td>
</tr>
<tr>
<td>Priority 4</td>
<td>Planned</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Collected</td>
<td>19</td>
<td>0</td>
</tr>
</tbody>
</table>
Priority 1 Waters
Priority 1 Sites – Frequent recreational use
Priority 1

- 2,000 mpn/100mL *E. coli* at Lake Perris
- Very high TSS in Lake Perris sample
Priority 1

- 2,400 Enterococci mpn/100mL at Lake Elsinore
- Very low *E. coli* in same sampling event for Lake Elsinore
Priority 3 Waters - Impaired no existing TMDL
### Priority 3 – Impaired no existing TMDL

#### Summary of *E. coli* geomean concentrations (2016-2019)

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site</th>
<th>2016 (MPN/100 mL)</th>
<th>2017 (MPN/100 mL)</th>
<th>2018 (MPN/100 mL)</th>
<th>2019 (MPN/100 mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P3-OC1</td>
<td>Bolsa Chica Channel</td>
<td>51</td>
<td>534</td>
<td>31</td>
<td>46</td>
</tr>
<tr>
<td>P3-OC2</td>
<td>Borrego Creek</td>
<td>Dry</td>
<td>Dry</td>
<td>NA (dry)</td>
<td>NA (dry)</td>
</tr>
<tr>
<td>P3-OC3</td>
<td>Buck Gully Creek</td>
<td>74</td>
<td>89</td>
<td>130</td>
<td>242</td>
</tr>
<tr>
<td>P3-OC5</td>
<td>Los Trancos Creek</td>
<td>457</td>
<td>658</td>
<td>NA (mostly dry)</td>
<td>NA (mostly dry)</td>
</tr>
<tr>
<td>P3-OC6</td>
<td>Morning Canyon Creek</td>
<td>633</td>
<td>212</td>
<td>1414</td>
<td>190</td>
</tr>
<tr>
<td>P3-OC7</td>
<td>Peters Canyon Wash</td>
<td>206</td>
<td>183</td>
<td>562</td>
<td>518</td>
</tr>
<tr>
<td>P3-OC8</td>
<td>San Diego Creek Reach 1</td>
<td>349</td>
<td>116</td>
<td>176</td>
<td>188</td>
</tr>
<tr>
<td>P3-OC9</td>
<td>San Diego Creek Reach 2</td>
<td>208</td>
<td>373</td>
<td>155</td>
<td>18</td>
</tr>
<tr>
<td>P3-OC11</td>
<td>Serrano Creek</td>
<td>121</td>
<td>1080</td>
<td>221</td>
<td>496</td>
</tr>
<tr>
<td>P3-RC1</td>
<td>Goldenstar Creek</td>
<td>242</td>
<td>417</td>
<td>118</td>
<td>360</td>
</tr>
<tr>
<td>P3-SBC1</td>
<td>Santa Ana River Reach 4</td>
<td>48</td>
<td>70</td>
<td>74</td>
<td>39</td>
</tr>
</tbody>
</table>
Priority 3 – Impaired no existing TMDL

- Comparison to Historical Dataset

<table>
<thead>
<tr>
<th>Waterbody</th>
<th>25th and 75th Quartile E. coli Concentration (MPN/100 mL)</th>
<th>Basis for Listing (2002-04)</th>
<th>Regional Monitoring Program (2016-19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolsa Chica Channel</td>
<td>310 – 1750</td>
<td>20 – 168</td>
<td></td>
</tr>
<tr>
<td>Borrego Creek</td>
<td>518 – 3755</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>Buck Gully Creek</td>
<td>100 – 335</td>
<td>30 – 134</td>
<td></td>
</tr>
<tr>
<td>Morning Canyon Creek</td>
<td>100 – 300</td>
<td>240 – 1461</td>
<td></td>
</tr>
<tr>
<td>Peters Canyon Wash</td>
<td>100 – 1100</td>
<td>179 – 428</td>
<td></td>
</tr>
<tr>
<td>San Diego Creek Reach 1</td>
<td>100 – 520</td>
<td>135 – 350</td>
<td></td>
</tr>
<tr>
<td>San Diego Creek Reach 2</td>
<td>100 – 1455</td>
<td>75 – 270</td>
<td></td>
</tr>
<tr>
<td>Serrano Creek</td>
<td>100 – 1460</td>
<td>161 – 1582</td>
<td></td>
</tr>
<tr>
<td>Goldenstar Creek</td>
<td>100 – 200</td>
<td>110 – 515</td>
<td></td>
</tr>
</tbody>
</table>
Santa Ana River Reach 4

- Increased frequency of sampling in 2019 to achieve sufficient dataset for delisting decision
- 28 six week geomeans with one exceedance of geometric mean WQO
- Exceedence related to wet weather

Six week rolling geomean of *E. coli* concentration

![Graph showing E. coli concentration from 6/1/2019 to 11/1/2019.](image)
Priority 3 – Next Steps

- Data collected over five years 2016-2020
- Waterbody specific planning for 2020-21
- Collaboration with entire Task Force on each waterbody
  - Delisting
  - Non-TMDL action plans
  - Source investigation, IDDE, controls through downstream TMDL implementation
  - Continued monitoring
  - TMDL
  - Others
Priority 4 – REC2 Only Update
Santa Ana Delhi Channel

- 2019 – exceedance of 464mpn/100mL Enterococci target (75th percentile)
- Follow-up monitoring triggered
- Results indicating compliance with statistical threshold anti-deg target

<table>
<thead>
<tr>
<th>Sample Requirement</th>
<th>Sample Date</th>
<th>Enterococci Concentration (MPN/100mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Annual Sample</td>
<td>9/23/2019</td>
<td>988</td>
</tr>
<tr>
<td>Required Monthly Follow-up Samples</td>
<td>10/21/2019</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>11/18/2019</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>12/15/2019</td>
<td>185</td>
</tr>
</tbody>
</table>
Cucamonga Creek Reach 1

- Monthly monitoring at Cucamonga Creek at Hellman Ave to develop dataset for new anti-deg target determination
- Statistical analysis to be completed in fall 2020

*E. Coli* concentrations at Hellman Avenue (2016-2019)

\[ n = 54 \]
Priority 2 MSAR TMDL Waters
Prado Park Lake

- *E. coli* concentrations and 6-week rolling geomeans
Prado Park Lake

- Historical *E. coli* concentrations and geomeans
Chino Creek

- *E. coli* concentrations and 6-week rolling geomeans
**Chino Creek**

- Snippet of 2019 dry season showing dry weather flow in Chino Creek at Schaeffer and downstream *E. coli* samples
- MS4 flowrates in Chino Creek follow predictable diurnal pattern with average $\sim 0.4$ cfs
- Increase DWF from other water releases (e.g. recycled water)
Mill-Cucamonga Creek

- *E. coli* concentrations and 6-week rolling geomeans

![Graph showing E. coli concentrations and 6-week rolling geomeans for Mill-Cucamonga Creek. The graph includes data for Warm and Cool Seasons in 2019, with various symbols representing different sampling methods and concentrations.]
Mill-Cucamonga Creek

- Historical *E.coli* concentrations and geomeans

Note: In 2016, compliance site changed from WW-M5 (Chino-Corona Rd) to WW-M6 (Below Mill Creek Wetland)
Reduction in POTW effluent

- For same inflow load measured in 2019 dry season, very different blended concentrations would be expected with 2019 (red) versus 2007 (green) POTW effluent rates.
Santa Ana River

- *E. coli* concentrations and 6-week rolling geomeans
Santa Ana River

- *E. coli* concentrations and 6-week rolling geomeans
Santa Ana River

- *E. coli* load from non-MS4, non-POTW contribute about 300 billion MPN/day, which is enough to consume nearly 100% of the total allowable load for *E. coli* in the Santa Ana River.
Santa Ana River

- Historical *E. coli* concentrations and geomeans
Santa Ana River

- Historical *E. coli* concentrations and geomeans
Wet Weather Retrospective

- One wet event sampled per year – one sample during storm, then ‘post-storm’ samples at 48, 72, 96 hours
- Post-storm samples represent wet weather in cases involving longer duration events
- Runoff records evaluated to parse samples into 1) during wet weather and 2) post-storm baseflow

![Geometric Mean of Samples During versus Post Wet Weather](chart)
Wet Weather Retrospective

- Post-storm samples evaluated to estimate time since return to pre-event flows
- *E. coli* concentration reduced to typical dry weather levels after 12-24 hours in MSAR waters
Next Steps
Santa Ana River at MISSION

- Site in the Synoptic Study – showed that 77 percent of *E. coli* load in Santa Ana River comes from non-human sources upstream of MS4 inflows
- Recommend inclusion of this site in Priority 2 routine sampling to capture record of non-MS4 upstream boundary during dry weather
- RMP to coordinate with a special study to evaluate potential role of *E. coli* releases from naturalized colonies in bottom sediment
Coming Next Reporting Year

• Recommendations for course of action in each Priority 3 waterbody
• Cucamonga Creek anti-degradation target update
• Special study and other scientific analysis to support a TMDL revision tailored for the MSAR waters