MEMORANDUM

DATE: September 18, 2015  
Project No.: 418-02-14-36  
SENT VIA: EMAIL

TO: Jack Bond, City of Modesto

CC: Glenn Prasad, City of Modesto  
Miguel Alvarez, City of Modesto

FROM: Roberto Vera, RCE #83500  
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REVIEWED BY: Gerald Nakano, RCE #29524

SUBJECT: City of Modesto – Water Master Plan  
HPR Placement for Model Calibration & Verification

This memorandum summarizes the supplemental field system pressure data required to assist in the calibration and verification of the City of Modesto’s (City) hydraulic models of the existing contiguous water system and Del Rio outlying service area for the Water Master Plan project. This information is provided for the City to make sure there are not any issues with recommended locations and for the City to share with the Fire Department, so that they are aware of the equipment being installed at the proposed locations. West Yost Associates’ (West Yost) recommended plan for the collection of this field system pressure information, through the use of hydrant pressure recorders (HPR), is summarized below.

HYDRANT PRESSURE RECORDER PLACEMENT

Placement of HPRs at key hydrants within the City’s contiguous water system is required to collect the data necessary to verify pressures for extended period verification of the City’s hydraulic model. West Yost has located 28 hydrants within the City’s contiguous water system and 4 hydrants within the Del Rio outlying service area to monitor system pressures with HPRs. It should be noted that only the outlying service area of Del Rio was selected for the placement of HPRs due to its size and multiple supply wells. Other outlying service areas were not recommended because they are relatively small and placement of HPRs in these areas would not provide any additional benefit to the City.

West Yost is proposing to install the HPRs to collect pressure information for a total of two weeks. Because there are 32 monitoring locations and only 20 HPRs to be provided, this will necessitate installing HPRs for one week (Rotation 1), and then moving some HPRs to new locations for the second week (Rotation 2). Table 1 presents the proposed HPR placement schedule. Figure 1 shows the general location of each HPR by monitoring group. Attachment A includes Table A-1, which provides the street address/location for each proposed HPR. Attachment A also includes detailed
figures that illustrate the specific location of each hydrant selected for HPR placement (see Figures A-1 through A 32).

As shown on Figure 1, rotation cycles were split between the northern (Rotation 1), southern and Del Rio (Rotation 2) service areas. It should be noted that four HPR locations, which will be deployed during the Rotation 1, are planned to remain through Rotation 2. These locations are shown on Figure 1. These four HPR locations are intended to capture boundary information between the northern and the southern portions of the contiguous distribution service area for the entire monitoring period.

<table>
<thead>
<tr>
<th>Cycle as Designated on Figure 1</th>
<th>Number of Hydrants</th>
<th>Number of Monitoring Days</th>
<th>Deployment Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cycle 1</td>
<td>20</td>
<td>7</td>
<td>October 14</td>
</tr>
<tr>
<td>Cycle 2</td>
<td>16(a)</td>
<td>7</td>
<td>October 21</td>
</tr>
</tbody>
</table>

(a) 4 HPRs will be placed in the City’s outlying Del Rio service area. 8 HPRs will be placed in new areas of the contiguous service area. Total includes the 4 HPRs from Rotation 1 that will remain through Rotation 2.

West Yost proposes to perform the initial HPR installation, and to move the HPRs for Rotation 2. Each installation will be performed within a single day. When re-deploying HPRs for the Rotation 2, West Yost will also download data from Rotation 1, before re-installing the HPRs. During the initial installation and between rotations, City staff may want to accompany West Yost staff. The location descriptions and associated detailed location maps of the designated hydrants are presented in Attachment A. Please feel free to contact Bobby Vera at (925) 425-5624 if you have any questions or comments.
ATTACHMENT A
Hydrant Pressure Recorder Location Sheets
**Table A-1. HPR Hydrant Locations**

<table>
<thead>
<tr>
<th>HPR No.</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation 1 – North Modesto</td>
<td></td>
</tr>
<tr>
<td>1*</td>
<td>Garst Road, east of Norseman Drive near Terminal Reservoir</td>
</tr>
<tr>
<td>2*</td>
<td>La Loma Avenue, west of Buena Vista</td>
</tr>
<tr>
<td>3</td>
<td>Road, along west side of Oakdale south of Surrey Avenue</td>
</tr>
<tr>
<td>4</td>
<td>Sumner Road, south of Sylvan Avenue and north of Misty Lane</td>
</tr>
<tr>
<td>5</td>
<td>Floyd Avenue, south east corner of intersection of Oakdale Road and Floyd Avenue</td>
</tr>
<tr>
<td>6*</td>
<td>Oakdale Road, south of Surrey Avenue along west side of Oakdale Road</td>
</tr>
<tr>
<td>7</td>
<td>Coffee Road, south of East Briggsmore Ave and north of East Coolidge Avenue</td>
</tr>
<tr>
<td>8</td>
<td>Coffee Road, south of Mable Avenue and north of Grand Prix Drive</td>
</tr>
<tr>
<td>9</td>
<td>Needam Avenue, between Nellie and College Avenues</td>
</tr>
<tr>
<td>10</td>
<td>Sutter Avenue, south of Western Way</td>
</tr>
<tr>
<td>11*</td>
<td>West Hatch Road, east of South Carpenter Road</td>
</tr>
<tr>
<td>12</td>
<td>Morse Road, near intersection of Morse Road and Lahontan Drive</td>
</tr>
<tr>
<td>13</td>
<td>West Orangeburg Avenue, east of Carver Road along north side of Orangeburg</td>
</tr>
<tr>
<td>14</td>
<td>Marsha Court, west of Nicks Way</td>
</tr>
<tr>
<td>15</td>
<td>Sisk Road, at intersection of Earl Street</td>
</tr>
<tr>
<td>16</td>
<td>Virginia Corridor Easement, east of Semallon Drive and north of Cottonwood Court</td>
</tr>
<tr>
<td>17</td>
<td>Prescott Road, at intersection of Bangs Avenue</td>
</tr>
<tr>
<td>18</td>
<td>Dale Road, along east side of Dale south of Nightingale Drive</td>
</tr>
<tr>
<td>19</td>
<td>Toomes Road, at intersection of Bacon Road</td>
</tr>
<tr>
<td>20</td>
<td>Sungold Drive, south of Sun Down Plane and north of Sun Kist Court</td>
</tr>
<tr>
<td>Rotation 2 – South Modesto and Del Rio</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Yosemite Boulevard, east of Sabbie Street</td>
</tr>
<tr>
<td>22</td>
<td>Ardia Avenue, between Redfield Avenue and Creekwood Drive</td>
</tr>
<tr>
<td>23</td>
<td>Mitchell Road, between Finch Road and South Riverside Drive</td>
</tr>
<tr>
<td>24</td>
<td>North Conejo Avenue, at the intersection of Julian Avenue</td>
</tr>
<tr>
<td>25</td>
<td>Hillside Drive, at the intersection of Tioga Drive</td>
</tr>
<tr>
<td>26</td>
<td>River Road, south east of Herndon Road</td>
</tr>
<tr>
<td>27</td>
<td>Midway Avenue, south of Watson Avenue along east side of Midway</td>
</tr>
<tr>
<td>28</td>
<td>Dallas Street, at the intersection of Butte Avenue</td>
</tr>
<tr>
<td>29</td>
<td>Spy Glass Drive, end of Spy Glass Drive north of Bing Way</td>
</tr>
<tr>
<td>30</td>
<td>Country Club Drive, near St. Johns Road</td>
</tr>
<tr>
<td>31</td>
<td>Hillcrest Drive, south of Riveroaks Drive</td>
</tr>
<tr>
<td>32</td>
<td>River Nine Drive, north east corner of River Nine Block</td>
</tr>
</tbody>
</table>

* Indicates HPRs placed during Rotation 1 that remain through Rotation 2.
Symbology

- **Rotation 1 HPR to Remain Through Rotation 2**
  - Hydrant
  - Valve
  - Existing Pipeline

**Figure A-1**

**HPR 1**

**Rotation 1 - N. Modesto**
Symbology

- Rotation 1 HPR to Remain Through Rotation 2
- Hydrant
- Out of Service Well
- Valve
- Existing Pipeline

Figure A-2
HPR 2
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-3
HPR 3
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-4
HPR 4
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-6
HPR 6
Rotation 1 - N. Modesto

Symbology

- Hydrant
- Valve
- Existing Pipeline

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-7
HPR 7
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-8
HPR 8
Rotation 1 - N. Modesto
City of Modesto
Water Master Plan
HPR Placement Plan

Symbology

- **Rotation 1 HPR**
- **Hydrant**
- **Valve**
- **Existing Pipeline**
Symbology

- Rotation 1 HPR
- Hydrant
- Valve
- Existing Pipeline

Figure A-9
HPR 9
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-10
HPR 10
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan

Symbology
- Rotation 1 HPR
- Hydrant
- Valve
- Existing Pipeline

Scale in Feet

0 125 250

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Symbology

- Rotation 1 HPR to Remain Through Rotation 2
- Valve
- Existing Pipeline

Figure A-11
HPR 11
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
**Symbology**

- **Rotation 1 HPR**
- **Hydrant**
- **Valve**
- **Existing Pipeline**

**Figure A-12**

**HPR 12**

Rotation 1 - N. Modesto

City of Modesto

Water Master Plan

HPR Placement Plan
Figure A-14
HPR 14
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-16
HPR 16
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan

Symbology

- Rotation 1 HPR
- Hydrant
- Valve
- Existing Pipeline
Figure A-18
HPR 18
Rotation 1 - N. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Symbology

- Rotation 2 HPR
- Hydrant
- Valve
- Existing Pipeline

Figure A-21
HPR 21
Rotation 2 - S. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-22
HPR 22
Rotation 2 - S. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-23
HPR 23
Rotation 2 - S. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Symbology

- Rotation 2 HPR
- Hydrant
- Valve
- Existing Pipeline

Figure A-25
HPR 25
Rotation 2 - S. Modesto

City of Modesto
Water Master Plan
HPR Placement Plan
Symbology

- **Rotation 2 HPR**
- Hydrant
- Valve
- Existing Pipeline
Symbology

- Rotation 2 HPR
- Hydrant
- Valve
- Existing Pipeline

Figure A-29
HPR 29
Rotation 2 - Del Rio

City of Modesto
Water Master Plan
HPR Placement Plan
Figure A-32
HPR 32
Rotation 2 - Del Rio

City of Modesto
Water Master Plan
HPR Placement Plan

Symbology

- Rotation 2 HPR
- Hydrant
- Valve
- Existing Pipeline