

## Willow Creek, Little Dry Creek, and Greenwood Gulch OSP Progress Meeting

**ATTENDEES:** Ken MacKenzie - UDFCD  
 Shea Thomas - UDFCD  
 Ward Mahanke - Lone Tree  
 Greg Weeks - Lone Tree  
 Monica Bortolini - SEMSWA  
 Barbara Chongtoua - CH2M HILL  
 Lisa Porta - CH2M HILL  
 Gerald Blackler - CH2M HILL

**Copies** Suzanne Moore - City of Greenwood Village  
 Brad Robenstein - Douglas County  
 Bill Woodcock - South Suburban Parks and Recreation District  
 Cory Hooper - CH2M HILL  
 File

**Location:** SEMSWA Office

**DATE:** May 29, 2008

On May 29, 2008 a project meeting was held for Willow Creek, Little Dry Creek, and Greenwood Gulch Outfall Systems Planning (OSP) Project. This meeting summary documents the key items discussed at the SEMSWA office. Please notify Barbara Chongtoua if your notes differ significantly from these.

### Action Items

**TABLE 1**  
Action Items

Action Item	Item Description	Responsible Party
Ownership and Maintenance of Panorama Park Ponds	Determine if these two ponds are maintained by a public entity and if they meet the eligibility criteria to be maintained by UDFCD – decide if they should be included in the baseline hydrology model	L. Porta / M. Bortolini - COMPLETED
Naming of Tributaries to Willow Creek	Determine if Tributaries to Willow Creek have an official name. If not, CH2M HILL will name them based on the UDFCD stream naming convention	L. Porta / K. MacKenzie
60% Draft Baseline Hydrology Report	Review the report and provide comments to CH2M HILL by Wednesday, June 4th	All sponsors

**TABLE 1**  
Action Items

Action Item	Item Description	Responsible Party
90% Draft Baseline Hydrology Report	Incorporate the comments and finalize the draft report for the sponsor's review	CH2M HILL
Progress Meeting	Schedule next progress meeting	B. Chongtoua

## Meeting Objective

The objectives for the meeting were to accomplish the following:

- ❖ *Distribute the 60% Draft Hydrology Report for FORMAT Review only.*
- ❖ *Confirm the detention facilities for inclusion in the baseline model.*
- ❖ *Get concurrence of the hydrology so that alternatives analysis can start.*

## Hydrology Approach and Modeling

### 1. Basin Delineation

- a. The team reviewed the basin delineation that shall be the basis for the baseline hydrology model. The delineation includes a total of 74 sub basins for the Willow Creek, Little Dry Creek, and Greenwood Gulch watersheds. The basin delineation was agreeable with the team.
- b. Two detention ponds, Panorama Park at Yosemite Street/Dry Creek Road and at Yosemite Street/County Line Road, were discussed as to whether one or both of the detention ponds shall be included in the baseline hydrology model. The Panorama Park Water Quality Pond located approximately at South Yosemite Street and Dry Creek Road will be included in the baseline hydrology model since UDFCD maintenance eligibility is expected. Construction drawings for this pond were obtained from Muller Engineering. The Panorama Park Pond located at South Yosemite Street and County Line Road will not be included in the baseline model, since information deciphering ownership and maintenance responsibility has not yet been made available by Arapahoe County. It will be added in during the alternatives analysis phase.
- c. Seven detention ponds are currently included in the baseline hydrology model which includes the following:

POND LOCATION	SWMM DESIGN POINT	REFERENCE
WILLOW CREEK, S. OF LINCOLN, E. OF YOSEMITE (POND 302)	P1	Rampart Range Sections 15 and 22 Willow Creek Basin Drainage Report for Detention Pond 302 (2003)
COOK CREEK (LONE TREE GOLF COURSE)	P2	Design Report for Lone Tree Central Detention Pond (1981)
REGIONAL POND AT HERITAGE HILLS AND YOSEMITE (WEST POND)	P3	Phase 3 Drainage Study Heritage Hills Filing No. 1 (1995)
SPRING CREEK (AT HIGHLAND'S RANCH)	P4	Final Drainage and Erosion Control Report - Spring Creek Regional Detention Pond and Pipe 3 (1996)
ENGLEWOOD DAM	P5 (ENGLEWOODDAM)	Improvements to Englewood dam (1975)
HOLLY DAM	P6 (HOLLYDAM)	Construction of Holly Dam (1979)
PANORAMA PARK POND (YOSEMITE, SOUTH OF DRY CREEK)	P7	Panorama Park Regional Pond Improvements (2005)

## 2. Baseline Hydrology Report:

- a. The 60% draft hydrology report (Draft Report) was completed and presented to the team at this meeting. Lisa gave an overview of the report, in particular how the models (CUHP and SWMM) were built and discussed the figures in the appendices.
- b. Barb and Lisa presented the preliminary modeling results for the 2008 OSP in comparison to the McCall-Ellingson and Morrill, Inc. (MEM, 1974) report and the Little Dry Creek FHAD (FHAD), which remain the basis for the regulatory flows in the study area. Results from the 2008 OSP are consistently 40% to 50% higher than the MEM, 1974 study and the FHAD. The reason for the differences are summarized below
  - i. Willow Creek Watershed
    1. Regulatory Flows are based on McCall-Ellingson and Morrill, Inc. (MEM, 1974)
    2. 2008 OSP discharges are 40% higher consistently.
    3. 1974 Landuse = 32%

2007 Landuse = 60%

ii. Little Dry Creek Watershed

1. Regulatory Flows are based on MEM, 1974.
2. 2008 OSP discharges are 50 % higher.
3. 1974 Landuse = 32%

2007 Landuse = 50%

iii. Greenwood Gulch Watershed

1. Published Regulatory Flows are based on MEM, 1974 but the Little Dry Creek FHAD is likely to update these flow rates.
2. 2008 OSP discharges are 50 % higher.
3. FHAD Landuse = 32%/75%

2007 Landuse = 48%/95%

- iv. Differences in the version of CUHP used in 1974 compared to the 2008 model as Ken suggested. The 1974 version of CUHP has a much flatter unit hydrograph since the 1974 version pre-dated the data collected by the NURP Program.
  - v. Differences associated with using a 3-hour hyetograph used in the 1974 MEM Study and the FHAD in comparison to the 2-hour hyetograph used in the 2008 OSP.
  - vi. Differences in the level of resolution for the basin delineations. The 2008 OSP has a total of 74 sub-basins in comparison to 20 sub-basins delineated in the MEM 74 Study and the FHAD for the study area.
- c. Design points at pond inflows, as shown below, were compared to recent studies conducted in the watershed, namely the design reports associated with various detention ponds implemented in the last decade. The comparison showed good agreement in the peak inflows for the 100-year storm event and confirms the validity of the 2008 OSP model results.

<b>Location</b>	<b>Design Point</b>	<b>100-Year Peak Flow for 2008 OSP</b>	<b>100-Year Peak Flow from Design Information</b>
<b>Cook Creek (Lone Tree Golf Course)</b>	P2	1453	1325 (Year 1988)
<b>Willow Creek at Yosemite</b>	P3	1466	1331 (Year 1995)
<b>Spring Creek</b>	P4	1210	1195 (Year 1996)

3. Monica Bortolini suggested that the tributaries to Willow Creek should be named on the Draft Report figures to facilitate communication of stream hydrology. Lisa will review old reports to assess if these tributaries were officially named previously. If there are no existing names, the tributaries will be named using the UDFCD stream naming convention as proposed by Ken. The names will be added on the streams for the next report draft.
4. CUHP calibration:
  - a. Ten sub-basins in the study area have an area smaller than 90 acres. It was reported that CUHP significantly underestimates peak flow rates for basins under 90 acres. To overcome this problem, a calibration methodology was developed.
  - b. Gerald presented the calibration methodology, which consisted in using the override option in CUHP to modify the  $C_p$  value, which is directly connected to the  $Q_p$  value.
  - c. The team agreed on the methodology used and the results presented for the 10 sub-basins.

## Project Website

Visit [www.littledrycreekwatershed.org](http://www.littledrycreekwatershed.org) for more background on the project and project meetings.

## Project Schedule and Meetings

<b>Draft Alternatives Evaluation Report</b>	<b>July 14, 2008</b>
<i>Progress Meeting to Review Hydrology</i>	<i>Week of May 29, 2008</i>
<i>Public Meeting</i>	<i>July, 2008</i>
<i>Baseline Hydrology Report (90% Draft)</i>	<i>Week of June 2, 2008</i>
<b>Review of Draft Alternatives Evaluation Report</b>	<b>August 13, 2008</b>
<b>Final Alternative Evaluation Report</b>	<b>September 12, 2008</b>
<b>Team Select Best Alternative</b>	<b>October 28, 2008</b>
<b>Draft Conceptual Preliminary Report</b>	<b>December 29, 2008</b>
<b>Review of Draft Conceptual Preliminary Report</b>	<b>January 28, 2009</b>
<b>Final Conceptual Preliminary Report</b>	<b>February 27, 2009</b>

## Upcoming Activities

- Next Progress Meeting: The next meeting will occur during the week of June 16, 2008. At this meeting CH2M HILL will finalize the hydrologic analysis results and will discuss the alternatives evaluation.