Supplement No 2 – Updated JVWTP Hydraulic Profile

Project:	Supplements to the JVWTP Capacity and Site Optimization Study		
Client:	Jordan Valley Water Conservancy District	**Issue Date:**	January 11, 2016
Purpose:	Provide an updated hydraulic profile for the JVWTP @ 180 mgd using NAVD 88 elevations	**Project No.:**	9635B.00

1.0 INTRODUCTION

1.1 Background

Jordan Valley Water Conservancy District completed the Jordan Valley Water Treatment Plant Capacity and Site Optimization Study in July 2015 (Carollo Engineers). The study included a review of JVWTP hydraulics to determine if the existing plant infrastructure would support expansion to 255 million gallons per day (mgd).

Results of that hydraulic review pointed out a few locations where improvements would need to be made to reduce hydraulic restrictions at 255 mgd, but the review also noted that the 1985 expansion project lowered the maximum operating water surface elevation (WSE) in the 8 million gallon (MG) Finished Water Reservoir (FWR) at 180 mgd by four feet.

1.2 Project Purpose

JVWCD has asked Carollo to confirm hydraulic calculations made as part of the Capacity and Site Optimization Study and prepare a revised hydraulic profile using elevations on the current survey datum.

2.0 HYDRAULIC CALCULATIONS

Carollo analyzed the existing JVWTP hydraulics using our *Hydraulix*® program, and compared it to the 1985 expansion project's hydraulic profile at 180 mgd. The 1985 profile is not included in this report, but can be found on sheet G-5 of the 1985 Jordan Valley Water Purification Plant Expansion drawings.

JVWTP staff measured water surface elevations (WSEs) at various locations throughout the plant to verify model accuracy. Staff measured WSEs on two separate days: Clearwell Outlet Structure and downstream locations on September 11, 2015 @ 150 mgd, and locations upstream of the Clearwell Outlet Structure on September 15, 2015 @ 110 mgd. RBB surveyed these locations on November 20, 2015 and provided survey data for inaccessible locations between the Clearwell Outlet Structure and the 8 MG FWR that were surveyed approximately a year ago for JVWCD's current new FWR project.

The majority of the field measurements were consistent with what the hydraulic model calculated. The main exception was the section of finished water piping between the Inlet, Overflow, and Bypass structure and the 8 MG FWR. Field measurements showed substantially greater headloss than the hydraulic model predicted; the model was adjusted based on the field measurements.

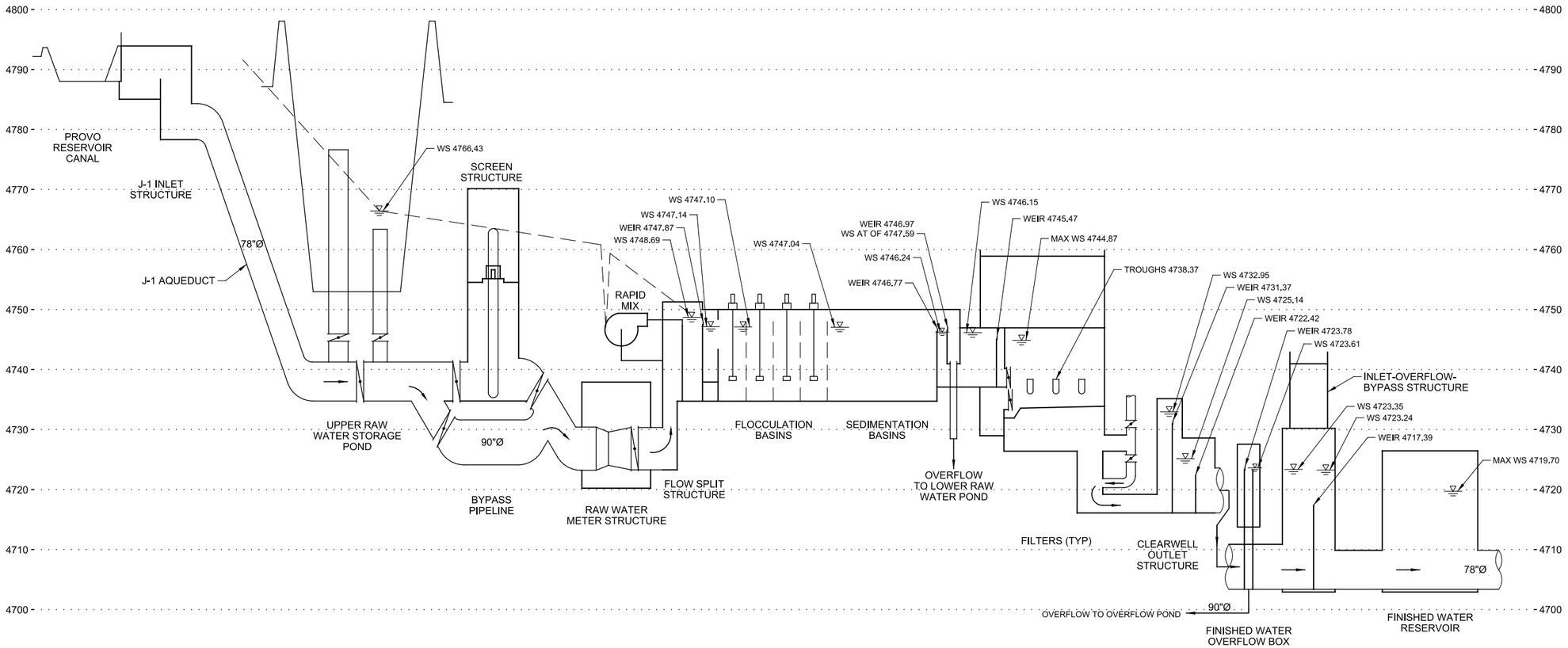
Table 2.1 summarizes the 1985 hydraulic profile elevations based on NGVD 29 datum, and calculated elevations and survey elevations based on NAVD 88 datum. The difference between the two datums, or datum shift, is 3.369 feet.

Figure 2.1 shows the revised hydraulic profile based on the hydraulic model calibrated for this study and NAVD 88 survey elevations.

Table 2.1 Survey and Water Surface Elevations
Updated JVWTP Hydraulic Profile
Jordan Valley Water Conservancy District

		A	B	C	D		
Item Number	**Description**	**1985 Profile Elevation, NGVD 29**	***Shifted NAVD 88 Elevation**	**Calibrated Hydraulic Model, NGVD 29**	**Revised Hydraulic Profile, NAVD 88**	**Difference (D - B)**	**Comments**
1	FWR	4718.00	4721.37	4716.33	4719.70	-1.67	
2	IOB Downstream WSE	4719.10	4722.47	4719.87	4723.24	0.77	
3	IOB Weir Wall	N/A		4714.30	4717.39		
4	IOB Upstream WSE	N/A		4719.98	4723.35		
5	FWOB WSE	4720.11	4723.48	4720.24	4723.61	0.13	
6	FWOB Weir	4720.35	4723.72	4720.35	4723.78	0.06	
7	Clearwell Outlet Weir	4719.00	4722.37	4719.00	4722.42	0.05	
8	Clearwell WSE	4722.00	4725.37	4721.77	4725.14	-0.23	
9	Finished Water Channel Weir	4728.00	4731.37	4728.00	4731.37	0.00	
10	Finished Water Channel WSE	4729.60	4732.97	4729.58	4732.95	-0.02	
11	Troughs	4735.00	4738.37		4738.37	0.00	
12	Max Filter WSE	4741.50	4744.87	4741.50	4744.87	0.00	
13	Filter Inlet Weir	4742.10	4745.47	4742.10	4745.47	0.00	Weir could not be surveyed.
14	Filter Inlet Channel WSE	4742.80	4746.17	4742.78	4746.15	-0.02	
15	Settled Water Channel Overflow Weir	4743.60	4746.97	4743.60	4746.97	0.00	
16	WSE at Overflow	4744.22	4747.59	4744.22	4747.59	0.00	
17	Settled Water Channel WSE	4743.00	4746.37	4742.87	4746.24	-0.13	
18	Sedimentation Basin Effluent Weir	4743.40	4746.77	4743.40	4746.77	0.00	
19	Sedimentation Basin WSE	4743.80	4747.17	4743.67	4747.04	-0.13	
20	Flocculation Basin WSE (Stage 1)	4744.10	4747.47	4743.73	4747.10	-0.37	
	Flocculation Basin Influent Weir	4744.35	4747.72				This weir is shown on the 1985 profile, but does not exist.
21	Pretreatment WSE	N/A		4743.77	4747.14		
22	Pretreatment Flow Split Weir	4745.40	4748.77	4744.50	4747.87	-0.90	1985 profile transposed numbers.
23	Rapid Mix WSE	4746.20	4749.57	4745.32	4748.69	-0.88	

** Datum shift = 1.027 meters, or 3.369 feet.*



HYDRAULIC PROFILE

Figure No. 2.1

JORDAN VALLEY
WATER CONSERVANCY DISTRICT

carollo

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Attachments: none