Widefield
Water and Sanitation District

8495 Fontaine Boulevard, Colorado Springs, Colorado 80925

June 14, 2019

City of Fountain Planning Department
116 South Main St.
Fountain, CO 80817

Re: Letter of Authority

Dear Sir or Madam:

This letter is to accompany City/County permit applications submitted by JDS-Hydro Consultants, Inc. (applicant), on behalf of Widefield Water and Sanitation District (WWSD).

JDS-Hydro Consultants, Inc. has been retained by WWSD to represent our project regarding the proposed improvements of our property located on Willow Springs Road (Schedule #5530003009 and 6255000004) in Fountain, Colorado.

JDS Hydro Consultants, Inc., its consultants, engineers, employees, and sub-contractors have the authority to act on our behalf for this project and should be recognized as our appointed representative.

Sincerely

Robert Bannister, PE
Director of Engineering and Operations

JDS-HYDRO CONSULTANTS, INC.

June 20, 2019

Kristy Martinez
City of Fountain Planning Department
116 South Main Street
Fountain, CO 80817

RE: Widefield Water & Sanitation District Wastewater Treatment Facility (WWTF) Carports – Drainage Letter

The purpose of this drainage letter is to satisfy requirements of the City of Fountain Final Site Development Plan Criteria for a "Letter Type" drainage report including property description, existing/proposed drainage characteristics, hydrologic calculations, sitemap, and drainage plan.

Property Description:

The subject facility is a proposed carport for the District's Operations Center. Please note that while two carports are depicted herein, we are seeking City of Fountain approval for one carport only (Carport #1), which is located within City of Fountain jurisdiction (Carport #2 is located within El Paso County limits). The District's Operations Center is located in the NE ¼ of Section 25, Township 15 South, Range 66 West of the 6th Principle Meridian in El Paso County, specifically 480 Willow Springs Road, Fountain, Colorado 80817.

This parcel is bounded on the east and north by Willow Springs Road, on the west by the WWSD Wastewater Treatment Facility, and on the south by a radio station.

The intention of the applicant is to construct a carport that will serve as additional parking primarily for Operations Center staff vehicles as well as potential WWTF fleet parking during storm events. The single-story structure will be comprised of steel featuring a mansard style roof for added weather protection. The design does not include walls, utilities, concrete slab, or paving. The footprint consists of approximately 3,800 square feet and houses 19 code-compliant parking spaces; please refer to the enclosed design drawings and documentation.

Proposed Carport #1 parcel (Schedule 6525000004) is currently zoned SO (Small Office/Warehouse District) and consists of 2.28 acres, 0.4 of which will be disturbed for erection of the carport. Construction of the carport is anticipated for Fall 2019, with an estimated 3-month duration.

General Existing Drainage Characteristics:

The subject site drainage splits with the majority flowing via sheet-flow to the southwest toward the existing wastewater treatment plant site, and into an existing abandoned wastewater lagoon. This wastewater lagoon is typically empty, and due to the nature of wastewater lagoon treatment facilities, the area is graded such that run-off is completely contained on-site. The reason for this is to contain any potential sewage spills within the Wastewater Treatment Facility site. When empty, the capacity of the abandoned lagoon is approximately 12,000,000 gallons. The area of the basin that contributes stormwater to the abandoned wastewater lagoon is 110,035 square feet (2.53 Acres).

A small portion of the Operations Center building and parking area drains east into Willow Springs Road and its stormwater infrastructure constructed as part of the Highway 16 reconstruction project. The area of the basin that contributes stormwater to Willow Springs Road is 9,057 square feet (0.21 Acres).

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(719) 227-0072 FAX (719) 471-3401

The proposed Carport #1 parcel is located in Zone X, which is outside the 100-year flood plain as shown in the floodplain map in the overall submittal package.

Proposed Drainage Characteristics:

The proposed drainage from this site will generally remain the same as the existing drainage with minimal hydrogeologic impact as a result of the proposed carport. The proposed Carport #1 grading will divert flows east of the carport to the south and into a proposed drainage pan discharging into Willow Springs Road. This includes all runoff from the carport roof. The proposed drainage basins and flow direction is depicted on Sheet C3 of the enclosed design drawings.

The area of the basin that will contribute stormwater to Willow Springs Road is 15,836 square feet (0.36 Acres) and the area of the basin that will contribute stormwater to the onsite abandoned wastewater lagoon is 105,453 square feet (2.42 Acres). The additional hydrologic impact (comparing existing conditions to proposed improvements) on Willow Springs Road is calculated to be *0.023* CFS in a 10-year storm, and 0.*57* CFS in a 100-year storm. The additional hydrologic impact on the abandoned wastewater lagoon is calculated to be *0.71* CFS in a 10-year storm, and *1.26* CFS in a 100-year storm. This is primarily due to the increased impervious area for the carport. Due to the minimal slope of the site and long travel distance, the time of concentration for the drainage basin discharging into the abandoned wastewater lagoon is 61 minutes and 46 minutes for the existing and proposed drainage characteristics, respectively. Therefore, the rainfall intensity is lower due to the longer duration storm event. The existing and developed runoff calculations for each of the proposed basins are enclosed with this letter.

There is no significant impact on the areas downstream of this site. Existing drainage basins and downstream facilities should adequately handle the additional flow from this site.

Respectfully,
JDS-Hydro Consultants, Inc. on behalf of the Widefield Water and Sanitation District

Elizabeth M. Steffens, P.E.
Civil Engineer

Enclosed:
Drainage Calculations

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Basin Discharging into Abandonded Wastewater Lagoon

Rational Method =	Q=ciA		
Hydrologic Soil Group =	C	per EPC Soils Survey	
Soil Classifcation =	59-Nunn Clay Loam		
Existing Area of Basin =	110,035	ft²	
	2.526	acres	
Area of Proposed Basin =	105,453	ft²	
	2.421	acres	

Existing Basin

Overland length	100.000	ft	
Slope	2.500	%	
Ti	56.69	min	Eqn 6-8 - City of Colorado Springs DCM Vol 1
Tt	4.17	min	Eqn 6-9 - City of Colorado Springs DCM Vol 1
Tc	60.85	min	
I_{10} =	1.781	in/hr	
I_{100} =	2.560	in/hr	

Proposed Basin

Overland length	90.000	ft	
Slope	4.000	%	
Ti	41.43	min	Eqn 6-8 - City of Colorado Springs DCM Vol 1
Tt	4.17	min	Eqn 6-9 - City of Colorado Springs DCM Vol 1
Tc	45.60	min	
I_{10} =	2.330	in/hr	
I_{100} =	3.351	in/hr	

Existing Basin Characteristics

C*	5-year	10-year	100-year	Area (ft²)
Undeveloped	0.15	0.25	0.50	93,620
Gravel	0.8	0.80	0.80	11,237
Building Roof	0.75	0.77	0.83	945
Concrete	0.9	0.92	0.96	4,233

C_5 (composite)	= Σ(Ci*Ai)/At =	0.25
C_{10} (composite)	= Σ(Ci*Ai)/At =	0.34
C_{100} (composite)	= Σ(Ci*Ai)/At =	0.55
Q_{10} =	**1.514**	**CFS**
Q_{100} =	**3.565**	**CFS**

Developed Runoff Basin Characteristics

C*	5-year	10-year	100-year	Area (ft²)
Undeveloped	0.15	0.25	0.50	80,250
Gravel	0.8	0.80	0.80	16,185
Building Roof	0.75	0.77	0.83	4,785
Concrete	0.9	0.92	0.96	4,233

C_5 (composite)	= Σ(Ci*Ai)/At =	0.29
C_{10} (composite)	= Σ(Ci*Ai)/At =	0.38
C_{100} (composite)	= Σ(Ci*Ai)/At =	0.58
Q_{10} =	**2.171**	**CFS**
Q_{100} =	**4.700**	**CFS**

* C-values from City of Colorado Springs DCM Volume 1 Table 6-6 (Source UDFCD 2001)

Basin Contributing to Flows in Willow Springs Road

Rational Method =	Q=ciA		
Hydrologic Soil Group =	C	per EPC Soils Survey	
Soil Classifcation =	59-Nunn Clay Loam		
Existing Area of Basin =	9,057	ft²	
	0.208	acres	
Area of Proposed Basin =	15,836	ft²	
	0.364	acres	

Existing Basin

Overland length	50.000	ft	
Slope	0.600	%	
Tc	58.77	min	Eqn 6-8 - City of Colorado Springs DCM Vol 1
I_{10} =	1.718	in/hr	
I_{100} =	2.470	in/hr	

Proposed Basin

Overland length	80.000	ft	
Slope	0.600	%	
Tc	58.06	min	Eqn 6-8 - City of Colorado Springs DCM Vol 1
I_{10} =	1.739	in/hr	
I_{100} =	2.500	in/hr	

Existing Basin Characteristics

C*	5-year	10-year	100-year	Area (ft²)
Undeveloped	0.15	0.25	0.50	6,852
Gravel	0.8	0.80	0.80	763
Building Roof	0.75	0.77	0.83	945
Concrete	0.9	0.92	0.96	497

C_5 (composite)	= Σ(Ci*Ai)/At =	0.31
C_{10} (composite)	= Σ(Ci*Ai)/At =	0.39
C_{100} (composite)	= Σ(Ci*Ai)/At =	0.58
Q_{10} =	**0.138**	**CFS**
Q_{100} =	**0.300**	**CFS**

Developed Runoff Basin Characteristics

C*	5-year	10-year	100-year	Area (ft²)
Undeveloped	0.15	0.25	0.50	13,631
Gravel	0.8	0.80	0.80	763
Building Roof	0.75	0.77	0.83	945
Concrete	0.9	0.92	0.96	497

C_5 (composite)	= Σ(Ci*Ai)/At =	0.42
C_{10} (composite)	= Σ(Ci*Ai)/At =	0.57
C_{100} (composite)	= Σ(Ci*Ai)/At =	0.96
Q_{10} =	**0.363**	**CFS**
Q_{100} =	**0.872**	**CFS**

* C-values from City of Colorado Springs DCM Volume 1 Table 6-6 (Source UDFCD 2001)