



**Planning and Community
Development Department**
2880 International Circle
Colorado Springs, Colorado 80910
Phone: 719.520.6300
Fax: 719.520.6695
Website www.elpasoco.com

**DEVIATION REQUEST
AND DECISION FORM**

Updated: 6/26/2019

PROJECT INFORMATION

Project Name : Latigo Filing 10
 Schedule No.(s) : 4200000352
 Legal Description : SEE ATTACHED – Exhibit C

APPLICANT INFORMATION

Company : WILLIAM GUMAN & ASSOCIATES
 Name : BILL GUMAN
 Owner Consultant Contractor
 Mailing Address : 731 NORTH WEBER STREET, SUITE 10, COLORADO SPRINGS, COLORADO, 80903

 Phone Number : (719) 633-9700
 FAX Number : N/A
 Email Address : BILL@GUMAN.NET

ENGINEER INFORMATION

Company : JR ENGINEERING
 Name : BRYAN LAW Colorado P.E. Number : 25043
 Mailing Address : 5475 TECH CENTER DRIVE, SUITE 235, COLORADO SPRINGS, COLORADO 80919

 Phone Number : 303-267-6254
 FAX Number : N/A
 Email Address : BLAW@JRENGINEERING.COM

OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

, Manager

09/30/22

Signature of owner (or authorized representative)

Date

Engineer's Seal, Signature
And Date of Signature



09/30/22

DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **ECM section 3.3.7 Permanent Storm Water Management Facilities** of the Engineering Criteria Manual (ECM) is requested for the proposed Temporary "Full Infiltration Treatment Control Pond".

Identify the specific ECM standard which a deviation is requested:

Stormwater detention is required typically for developed areas with the goal of releasing accumulated runoff at historic levels per ECM Section 3.3.7. Standard Post Construction Stormwater Detention Facilities are to provide water quality capture volume utilizing 1 of 6 BMP's as described in DCM Volume 2. This deviation request is to design and implement a modified Retention Pond that is proposed to be considered as a temporary full infiltration treatment control pond. Furthermore, this proposed pond will utilize an already existing infiltration/retention pond located at the south west corner of Latigo Boulevard and Eastonville Road. See Exhibit A

State the reason for the requested deviation:

As stated in the Final Drainage Report, prepared by JR Engineering for Filing No 10 (date TBD) under PCD File No SF2137, a Full Spectrum Extended Detention Basin is ultimately proposed to be located just off of Black Squirrel Creek and along Eastonville Road (see attached exhibit). The permanent pond will ultimately provide detention for Filings 10, 11 and 13. The ecological study and permitting for this pond will be extensive due to the fact that the pond outfall will lie within identified wetland and mouse habitat. While this permitting is taking place the owner is requesting to provide an "interim" infiltration pond as discussed above in order to move forward with Filing 10. The "interim" infiltration pond will be removed once the permanent pond is installed as part of Filing 11 development.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

The proposed infiltration pond alternative is intended to be a dry pond and sized to capture and retain the 100 year stormwater runoff volume and infiltrate 99% of the runoff within 120 hours after the end of the 100 year event. Field tests have been conducted by a Geotechnical Consultant utilizing a double ring infiltrometer to determine an infiltration rate. The infiltration rate was determined to be 2.5 inches per hour. The calculated pond volume will be approximately 60 ac-ft which will require the existing pond to be expanded. Further improvements as called out in the updated "Preliminary Geotechnical Investigation and Geologic Hazards Evaluation Latigo Trails Filings 9 and 10" revised March 31, 2022 by CTL Thompson recommends that the top 2 feet of the existing infiltration pond be scarified in order to loosen the compacted soil conditions.

The State Engineers office was also contacted in order to get a read from them on implementing this alternative. Email correspondence is attached as Exhibit B. Several folks were contacted and brought into the conversation. The correspondence is synopsised as follows:

"The two ponds in question lie within a designated basin – Black Squirrel and therefore fall under Colorado Ground Water Commission (Commission) jurisdiction. Our ponds are intended to comply with Rules 5.11.1 and 5.11.3 (see link below). Saying so we would then submit a Notice of Intent (NOI) to the Commission for review and compliance, as normal.

<https://dnrweblink.state.co.us/dwr/ElectronicFile.aspx?docid=3559607&dbid=0>

In addition, as of January 14, 2020, another requirement has been instituted... per Rule 5.11.5, ponds constructed (or modified) after the date of January 14, 2020 must publish a notice in a local newspaper regarding the pond. This is so a holder of vested Water Rights can bring an action before the Commission who will then determine if the intended pond has or will cause material injury to said Rights."

Detailed hydrology/hydraulic analysis will be submitted for review and approval with the Final Drainage Report for Filing 10.

LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- The ECM standard is inapplicable to the particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

The proposed infiltration pond is a common storm water catchment and treatment facility. With proper sizing, as discussed, will provide a safe and efficient treatment facility for the interim condition.

CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

This deviation will achieve the intended result. The infiltration pond will provide the same intended outcome by providing and exceeding the WQCV as required under the ECM.

The deviation will not adversely affect safety or operations.

This deviation will not adversely affect safety or operations. The infiltration pond will be sized for the 100 year capture volume and therefore is not anticipated to pose a safety hazard in this area.

The deviation will not adversely affect maintenance and its associated cost.

Its anticipated that a standard Detention Pond Maintenance Agreement will be executed by the HOA/property owner. The infiltration pond will undergo periodic inspection and maintenance and actions taken if the pond bottom sand material is silting in. Actions could be tilling the surface to total removal and replacement of the top sand layer.

The deviation will not adversely affect aesthetic appearance.

The deviation request will not have an adverse effect on the aesthetic appearance as this is an expansion of an existing facility.

The deviation meets the design intent and purpose of the ECM standards.

The deviation request meets the design intent and purpose of the ECM standards. The proposed infiltration pond will exceed the WQCV as required under the ECM standards.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

Yes, the deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, this project is proposing Water Quality facilities as required by the criteria.

REVIEW AND RECOMMENDATION:

3.3.7

Approved by the ECM Administrator

This request has been determined to have met the criteria for approval. A deviation from Section _____ of the ECM is hereby granted based on the justification provided.

Γ

APPROVED
Engineering Department

11/02/2022 9:13:35 AM

dsdnijkamp

**EPC Planning & Community
Development Department**

L

Denied by the ECM Administrator

This request has been determined not to have met criteria for approval. A deviation from Section _____ of the ECM is hereby denied.

Γ

Γ

L

L

ECM ADMINISTRATOR COMMENTS/CONDITIONS:

1.1. PURPOSE

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

1.2. BACKGROUND

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

1.3. APPLICABLE STATUTES AND REGULATIONS

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

1.4. APPLICABILITY

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

1.5. TECHNICAL GUIDANCE

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

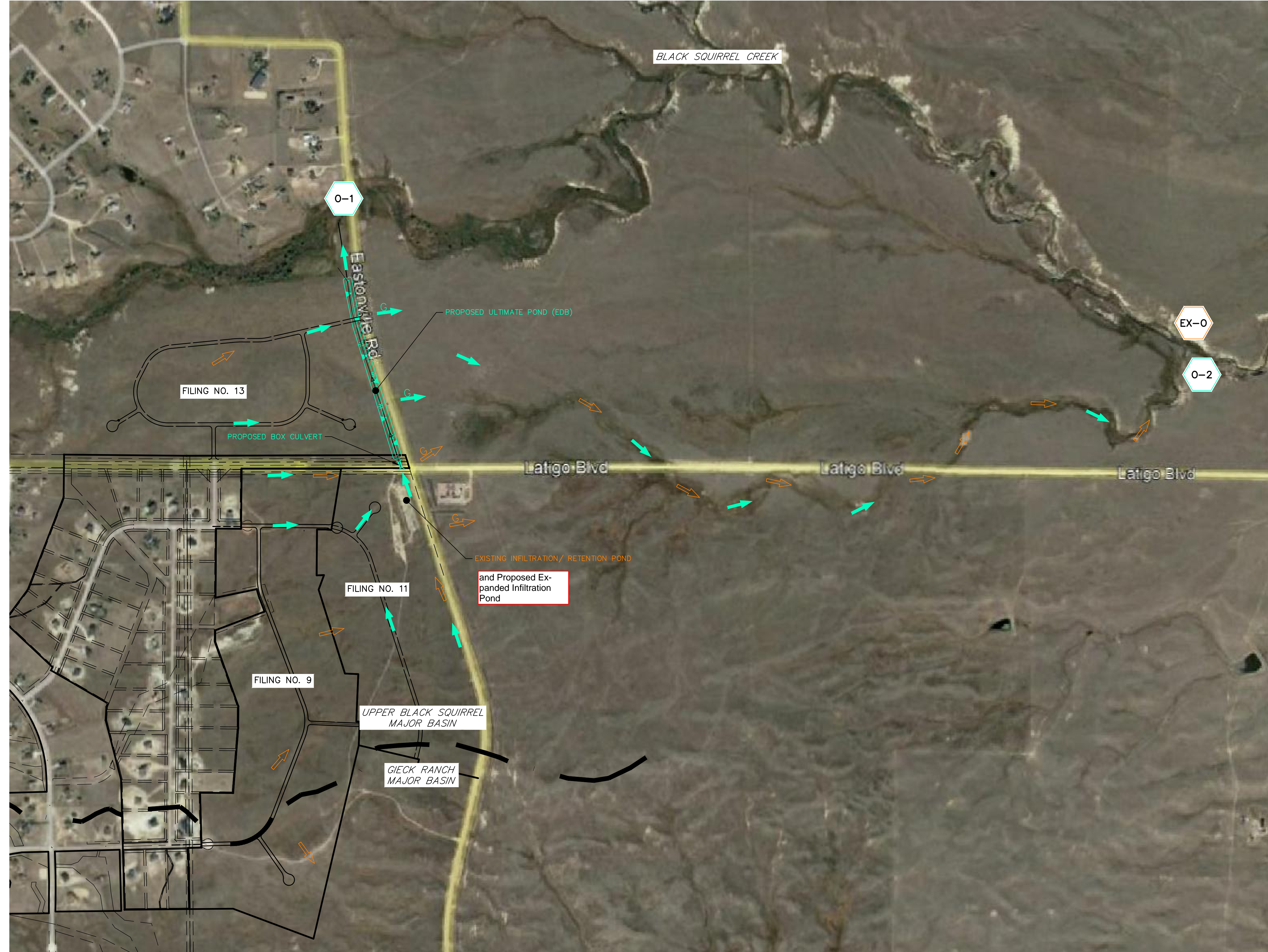
1.6. LIMITS OF APPROVAL

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

1.7. REVIEW FEES

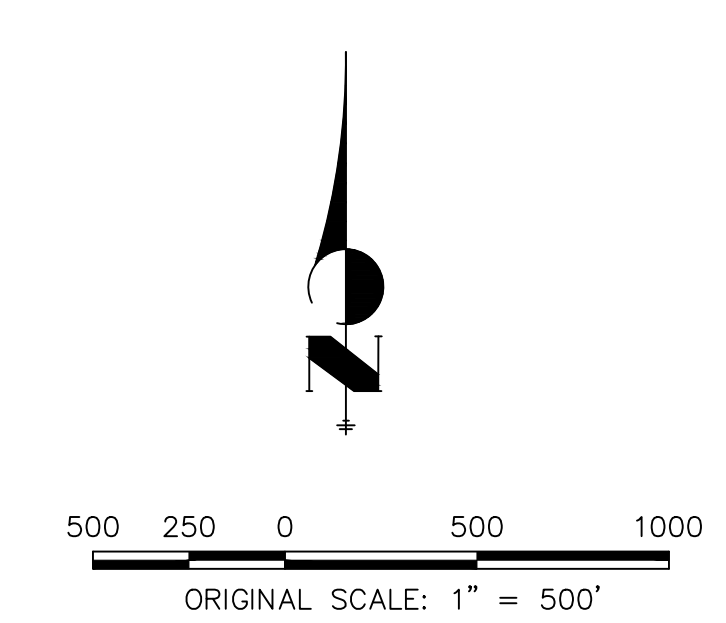
A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.

LATIGO TRAILS BLACK SQUIRREL CREEK OUTFALL



LEGEND	
EXISTING FLOW ARROW	
PROPOSED FLOW ARROW	
EXISTING GROUND WATER FLOW ARROW	
PROPOSED GROUND WATER FLOW ARROW	
EXISTING OUTFALL	
PROPOSED OUTFALL	

EXHIBIT A



BLACK SQUIRREL CREEK OUTFALL
LATIGO TRAILS
JOB NO. 25175.01
03/04/2022
SHEET 1 OF 1



Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

X:\2517501\Drawings\05-25-2021_Updated_Base\Presentations\BSCC_Outfall_Ultimate.dwg, 24/08/2022 3:08:24 PM, CS

Bryan Law

From: Vander Horst, Keith <keith.vanderhorst@state.co.us>
Sent: Friday, March 18, 2022 11:45 AM
To: Bryan Law
Cc: Hollister - DNR, Doug; Mark Perry; Grimes - DNR, Chris
Subject: Re: Latigo Trails Subdivision, El Paso County - Stormwater Management Proposal at this stage

Bryan:
I am afraid not. We have never published one of these notices.

Keith Vander Horst
Chief of Water Supply, Designated Basins



P 303-866-3581 ext. 8266
1313 Sherman St., Room 821, Denver, CO 80203
keith.vanderhorst@state.co.us | water.state.co.us

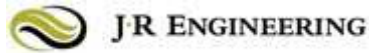
On Fri, Mar 18, 2022 at 10:24 AM Bryan Law <blaw@jrengineering.com> wrote:

Keith,

Thank you for your prompt attention and guidance. Would you or someone have a sample "go by" notice we could use.

Again thank you all for your assistance.

Bryan Law, PE | Client Manager



5475 Tech Center Drive, Ste 235 | Colorado Springs, CO 80909

Phone: 303-740-9393 | Direct: 303-267-6254

Cell: 719-964-6406 | Fax: 303-721-9019

Email: blaw@jrengineering.com

From: Vander Horst, Keith <keith.vanderhorst@state.co.us>

Sent: Friday, March 18, 2022 10:13 AM

To: Bryan Law <blaw@jrengineering.com>

Cc: Hollister - DNR, Doug <doug.hollister@state.co.us>; Mark Perry <Mark.Perry@state.co.us>; Grimes - DNR, Chris <chris.grimes@state.co.us>

Subject: Re: Latigo Trails Subdivision, El Paso County - Stormwater Management Proposal at this stage

Bryan:

Given the information Rule 5.11.5 requires to be published (location, surface area, design volume), the rule applies to any work on a pre-January 15, 2020 facility that changes the location or increases the surface area or volume of stormwater detained. Be advised that in order to reduce workload on staff we are not publishing notice of post-January 14, 2020 facilities, and notice of such facilities should not be submitted to staff of the Ground Water Commission (GWC). To comply with Rule 5.11.5 the developer should itself publish notice of the location and approximate surface area at design volume and a statement confirming that the facility has been designed to comply with Rules 5.11.1 and 5.11.3. You may want to know that staff of the Commission is currently in a process proposing to amend Rule 5.11.5 to have entities self publish such notices. Be advised that when staff of the Commission does publish items in the Upper Black Squirrel Creek designated basin we use the Ranchland News.

Keith Vander Horst
Chief of Water Supply, Designated Basins



P 303-866-3581 ext. 8266
1313 Sherman St., Room 821, Denver, CO 80203
keith.vanderhorst@state.co.us | water.state.co.us

On Thu, Mar 17, 2022 at 3:09 PM Grimes - DNR, Chris <chris.grimes@state.co.us> wrote:

Hi Byran,

The NOIs will need to be sent to the division office and dam safety team regardless of whether or not the structures are located within a designated groundwater basin. No need to duplicate that filing with the Commission if they are in a des. basin.

With regards to your question/comment - *In addition, as of January 14, 2020, another requirement has been instituted... per Rule 5.11.5, ponds constructed (or modified) after the date of January 14, 2020 must publish a notice in a local newspaper regarding the pond. This is so a holder of vested Water Rights can bring an action before the Commission who will then determine if the intended pond has or will cause material injury to said Rights. In a nutshell, is this what needs to happen?* I am not sure... I question whether the rule simply applies to a new "facility" (as a whole), or if any modifications to a facility (including construction of a new pond) that occur after 1/14/2020 require proof be provided to the Commission that the expansions/modifications are in compliance with Rules 5.11.1 and 5.11.3 (and then the Commission publishes those findings). Let's wait for Keith's comment on this so you have clear direction.

Chris Grimes

Ground Water Commission Staff



COLORADO
Division of Water Resources
Department of Natural Resources

P 303.866.3581 x 8253

C 303-263-6181

1313 Sherman Street, Room 818, Denver, CO 80203

chris.grimes@state.co.us / www.water.state.co.us

On Thu, Mar 17, 2022 at 2:35 PM Bryan Law <blaw@jrengineering.com> wrote:

Thank you all for your prompt and thoughtful input. Allow me to synopsise.

The two ponds in question lie within a designated basin – Black Squirrel and therefore fall under CGW jurisdiction.

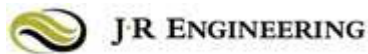
Our ponds are intended to comply with Rules 5.11.1 and 5.11.3. Saying so we would then submit an NOI to CGW for review and compliance, as normal.

In addition, as of January 14, 2020, another requirement has been instituted... per Rule 5.11.5, ponds constructed (or modified) after the date of January 14, 2020 must publish a notice in a local newspaper regarding the pond. This is so a holder of vested Water Rights can bring an action before the Commission who will then determine if the intended pond has or will cause material injury to said Rights.

In a nutshell, Is this what needs to happen?

I appreciate your help. Look forward to your response.

Bryan Law, PE | Client Manager



5475 Tech Center Drive, Ste 235 | Colorado Springs, CO 80909

Phone: 303-740-9393 | Direct: 303-267-6254

Cell: 719-964-6406 | Fax: 303-721-9019

Email: blaw@jrengineering.com

From: Grimes - DNR, Chris <chris.grimes@state.co.us>

Sent: Thursday, March 17, 2022 10:47 AM

To: Hollister - DNR, Doug <doug.hollister@state.co.us>

Cc: Bryan Law <blaw@jrengineering.com>; Mark Perry <Mark.Perry@state.co.us>; Keith Vanderhorst <keith.vanderhorst@state.co.us>

Subject: Re: Latigo Trails Subdivision, El Paso County - Stormwater Management Proposal at this stage

Thanks, Doug.

As Doug mentioned, if any of the structures within a designated groundwater basin capture/impound surface water or expose groundwater, that water falls under the jurisdiction of the Colorado Ground Water Commission ("Commission"). An extension of the Division of Water

Resources, the Commission is a regulatory and adjudicatory body authorized by the General Assembly to administer groundwater resources within the Designated Basins. Commission **Rule 5.11** (see link below) address stormwater detention and infiltration facilities:

<https://dnrweblink.state.co.us/dwr/ElectronicFile.aspx?docid=3559607&dbid=0>

As stated in Rule 5.11.5, new "facilities" constructed after 1/14/20 will require some review by the Commission and documentation meeting criteria as stated Rule 5.11.5 will need to be provided. Sounds like you are proposing some expansions/modifications. It is unclear to me if expansions of the "facility" would require publication by our office (as described in Rule 5.11.5). I don't think so but I have included Keith Vander Horst (Chief of Water Supply for Des. Basins) on this email to confirm for us.

For facilities/structures in operation prior to 1/14/20, I believe the Commission defers to the Division Engineer and the dam safety team on the construction standards.

Division offices, not the Commission, will review the Notice of Intent forms submitted.

Chris Grimes

Ground Water Commission Staff



COLORADO
Division of Water Resources
Department of Natural Resources

P 303.866.3581 x 8253

C 303-263-6181

1313 Sherman Street, Room 818, Denver, CO 80203

chris.grimes@state.co.us / www.water.state.co.us

On Thu, Mar 17, 2022 at 9:14 AM Hollister - DNR, Doug <doug.hollister@state.co.us> wrote:

Mr. Law,

The property in question is located within the Upper Black Squirrel Creek Designated Groundwater Basin and Stormwater Management is Governed by C.R.S 37-92-602. The exclusion for Fountain Creek drainage does not apply because these streams are not located in the Fountain Creek Drainage Basin area. I have included Chris Grimes from the Designated Basin team to the email string as an additional resource for structures in the Designated Basin. If there is an embankment being constructed as part of the stormwater management, then a Notice of Intent is required. Any basins constructed cannot expose groundwater as that is not allowed by statute.

Chris please provide any information that I may have missed.

Doug Hollister

District 10 Water Commissioner
North Regional Team Leader
Districts 10, 14, and 15



COLORADO
Division of Water Resources
Department of Natural Resources

C 719.338.2012

4255 Sinton Rd., Colorado Springs, CO 80907

doug.hollister@state.co.us | dwr.colorado.gov

On Thu, Mar 17, 2022 at 7:53 AM Perry - DNR, Mark <mark.perry@state.co.us> wrote:

Hi Brian, I'm forwarding your email to Doug Hollister, WD 10 Water Commissioner. I think he's the appropriate place to start with your questions.

Thank you Doug. Let me know if you need input from me.

Mark A. Perry, P.E.
Dam Safety Engineer
Colorado Dam Safety



COLORADO
Division of Water Resources
Department of Natural Resources

P 719-542-3368 x2118 | C 719-250-5606
314 E. Abriendo Ave., Suite B, Pueblo CO 81004
mark.perry@state.co.us | <https://dwr.colorado.gov/>

----- Forwarded message -----

From: **Bryan Law** <blaw@jrengineering.com>
Date: Wed, Mar 16, 2022 at 9:30 AM
Subject: Latigo Trails Subdivision, El Paso County - Stormwater Management Proposal at this stage
To: Perry - DNR, Mark <mark.perry@state.co.us>

Good Morning Mark,

I am writing you in hopes of getting a couple of questions answered and if our proposed storm water management scheme will require a formal submittal to the State or not. The project is a continuation of an older subdivision (Latigo Trails) which was done in the late 1990's and early 2000's and then stopped. Leaving an additional 5 Filings to be done. Attached is a high level sketch which shows the location of the existing infiltration/retention pond that has been in existence since the early 2000's. The sketch also shows the proposed course of the future outfall to Black Squirrel Creek (BSC).

The plan today is to start up again with Filing 9 and progress through the rest of the Filings through Filing 13 as shown. Filings 10 and 12 are south and lie outside the BSC Basin.

The existing infiltration/retention pond would continue to be utilized for the development of Filing 9 and be expanded if necessary. Infiltration/retention pond expansion, if necessary, would be a function of the results from the infiltration rates currently being investigated.

Does incorporating the infiltration/retention pond into the proposed storm water management of this project constitute some groundwater/surface water issue that may have to be addressed?

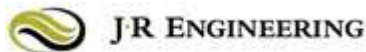
In the future (Filing 11), the infiltration/retention pond would be abandoned and flow would pass under Latigo Boulevard and convey north along Eastonville to a proposed Extended Detention Basin Pond at which point flow would be discharged to BSC. See attached BSC Outfall Ultimate sketch for a more detailed layout. This proposed routing is a diversion from historical patterns. But, given Eastonville Road has been in existence for a long time and has cut off the historical patterns we therefore are requesting that this “diversion” take place. Is this a condition that the State needs to further review?

We have had discussions with El Paso County regarding this proposal. They seem receptive, but, do want the States input at this stage.

Thank you for your attention in this matter and do look forward to your response.

Regards,

Bryan Law, PE | Client Manager



5475 Tech Center Drive, Ste 235 | Colorado Springs, CO 80909

Phone: 303-740-9393 | Direct: 303-267-6254

Cell: 719-964-6406 | Fax: 303-721-9019

Email: blaw@jrengineering.com

Latigo Filing No 10 - Exhibit C

A PARCEL OF LAND LOCATED IN THE WEST HALF OF SECTION 16 AND A PORTION OF THE SOUTHEAST QUARTER OF SECTION 17, TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF EL PASO, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE SOUTH LINE OF SECTION 17, TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE SOUTHEAST CORNER BY A 3-1/4" ALUMINUM CAP STAMPED "LS 24964 2000" FLUSH WITH THE GROUND AND AT THE SOUTHWEST CORNER BY A 2-1/2" ALUMINUM CAP STAMPED "LS 25955 1996" 0.35" BELOW GROUND, BEARING N89°25'55"W.

COMMENCING AT THE SOUTHEAST CORNER OF SECTION 17, TOWNSHIP 12 SOUTH, RANGE 64 WEST OF THE 6TH PRINCIPAL MERIDIAN;

THENCE ON THE EAST LINE OF SAID SECTION 17, N00°24'42"W A DISTANCE OF 1,154.37 FEET, TO THE POINT BEING THE POINT OF BEGINNING;

THENCE S89°27'42"W A DISTANCE OF 1.79 FEET, TO THE SOUTHEASTERLY CORNER OF LOT 8, THE TRAILS FILING NO. 8 RECORDED UNDER RECEPTION NO. 207712541 IN THE RECORDS OF THE EL PASO COUNTY CLERK AND RECORDER;

THENCE ON THE BOUNDARY OF SAID THE TRAILS FILING NO. 8, THE FOLLOWING SIXTEEN (16) COURSES:

1. N01°32'00"W A DISTANCE OF 563.81 FEET;
2. N88°28'20"E A DISTANCE OF 125.09 FEET;
3. N01°31'40"W A DISTANCE OF 60.00 FEET;
4. N01°32'00"W A DISTANCE OF 445.29 FEET;
5. S89°31'51"E A DISTANCE OF 304.75 FEET;
6. N04°24'58"E A DISTANCE OF 601.43 FEET;
7. N00°28'09"E A DISTANCE OF 200.00 FEET;
8. N19°41'13"W A DISTANCE OF 634.23 FEET;
9. N00°28'09"E A DISTANCE OF 102.93 FEET;
10. N69°12'04"E A DISTANCE OF 486.05 FEET;
11. N20°47'56"W A DISTANCE OF 134.68 FEET, TO A POINT OF CURVE;
12. ON THE ARC OF A CURVE TO THE RIGHT, HAVING A RADIUS OF 530.00 FEET, A CENTRAL ANGLE OF 09°05'54" AND AN ARC LENGTH OF 84.16 FEET, TO A POINT OF NON-TANGENT;

13. S78°21'46"W A DISTANCE OF 388.55 FEET;
14. N00°28'09"E A DISTANCE OF 636.09 FEET;
15. S89°32'00"E A DISTANCE OF 230.48 FEET;
16. N00°28'00"E A DISTANCE OF 555.14 FEET, TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF LATIGO BOULEVARD;

THENCE ON SAID SOUTHERLY RIGHT-OF-WAY LINE, N89°48'42"E A DISTANCE OF 917.63 FEET;

THENCE DEPARTING SAID SOUTHERLY RIGHT-OF-WAY LINE, THE FOLLOWING FIFTEEN (15) COURSES:

1. S09°07'03"W A DISTANCE OF 576.97 FEET, TO A POINT OF NON-TANGENT CURVE;
2. ON THE ARC OF A CURVE TO THE LEFT WHOSE CENTER BEARS S09°07'03"W, HAVING A RADIUS OF 420.00 FEET, A CENTRAL ANGLE OF 08°39'03" AND AN ARC LENGTH OF 63.41 FEET, TO A POINT OF TANGENT;
3. N89°32'00"W A DISTANCE OF 68.00 FEET;
4. S00°28'00"W A DISTANCE OF 423.36 FEET;
5. N87°37'41"E A DISTANCE OF 68.09 FEET;
6. S20°16'04"W A DISTANCE OF 143.48 FEET;
7. S17°24'33"E A DISTANCE OF 809.98 FEET;
8. S87°35'59"E A DISTANCE OF 123.23 FEET;
9. S02°24'01"W A DISTANCE OF 437.00 FEET;
10. S87°35'59"E A DISTANCE OF 31.60 FEET;
11. S02°24'01"W A DISTANCE OF 218.11 FEET;
12. S13°09'53"W A DISTANCE OF 853.92 FEET;
13. S13°09'11"W A DISTANCE OF 977.68 FEET;
14. N69°28'15"W A DISTANCE OF 791.84 FEET;
15. S89°27'42"W A DISTANCE OF 398.27 FEET, TO THE POINT OF BEGINNING.

CONTAINING A CALCULATED AREA OF 4,428,810 SQUARE FEET OR 101.6715 ACRES.

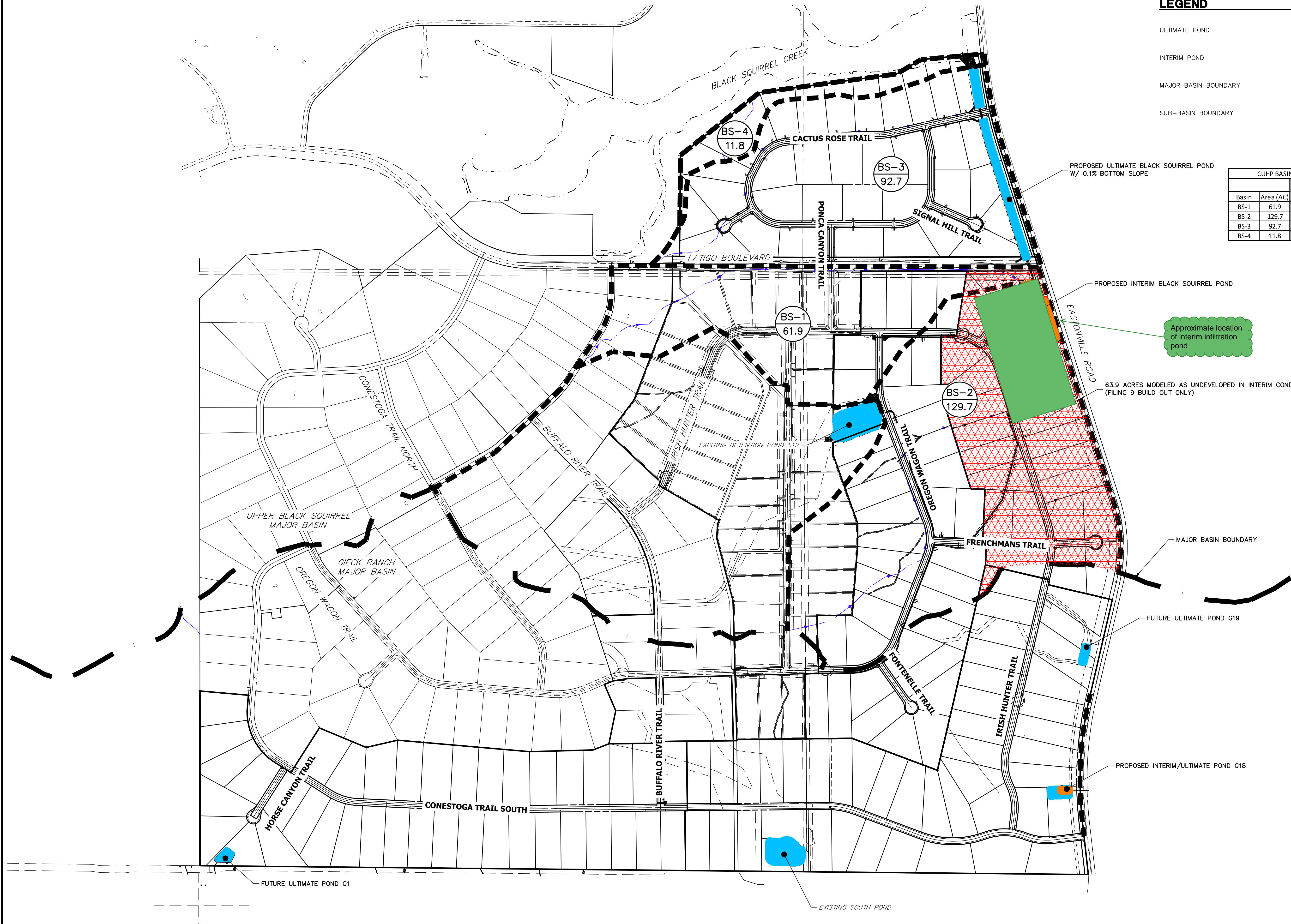
LATIGO TRAILS ULTIMATE CONDITIONS MDDP

CUHP SWMM ULTIMATE/INTERIM CONDITIONS

LEGEND

- ULTIMATE POND 
- INTERIM POND 
- MAJOR BASIN BOUNDARY 
- SUB-BASIN BOUNDARY 

Basin	Area (AC)	% Imp	INTERIM		ULTIMATE		
			Q5(CFS)	Q100(CFS)	% Imp	Q5(CFS)	Q100(CFS)
BS-1	61.9	7.2%	50	85	12.0%	50	86
BS-2	129.7	10.9%	135	230	12.0%	135	230
BS-3	92.7	2.0%	101	173	12.0%	104	178
BS-4	11.8	2.0%	20	34	12.0%	20	35



400 200 0 400 800
ORIGINAL SCALE: 1" = 400'

PROPOSED CUHP/SWMM MAP
LATIGO TRAILS ULTIMATE CONDITION
JOB NO. 25175.01
9/14/2021
SHEET 1 OF 1



Centennial 303-740-9393 • Colorado Springs 719-593-2593
Fort Collins 970-491-9888 • www.jrengineering.com

X:\25175\000\all\25175\01\Drawings\Sheet\Drawings\Proposed_CUHP_SWMM.dwg, Proposed Conditions, 9/14/2021, 12:28:48 PM, CS

CUHP SUBCATCHMENTS

F9_Proposed_100-YR (Interim)

Columns with this color heading are for required user-input
Columns with this color heading are for optional override values
Columns with this color heading are for program-calculated values

								Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters			DCIA
Subcatchment Name	EPA SWMM Target Node	Raingage	Area (mi ²)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Percent Imperviousness	Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)	Level 0, 1, or 2
BS-1	BS1	EPC 24 Hour	0.0967188	0.442486553	0.8477538	0.022	7.18	0.35	0.05	4.5	0.6	0.0018	1
BS-2	BS2	EPC 24 Hour	0.2026563	0.384944318	0.8470165	0.019	10.89	0.35	0.05	4.5	0.6	0.0018	1
BS-3	BS3	EPC 24 Hour	0.1448438	0.265492424	0.7254102	0.017	2	0.35	0.05	4.5	0.6	0.0018	1
BS-4	BS4	EPC 24 Hour	0.0184375	0.057916667	0.1307157	0.02	2	0.35	0.05	4.5	0.6	0.0018	1

Summary of Unit Hydrograph Parameters Used By Program and Calculated Results (Version 2.0.1)

F9_Proposed_100 Year

Catchment Name/ID	User Comment for Catchment	Unit Hydrograph Parameters and Results									Excess Precip.		Storm Hydrograph			
		CT	Cp	W50 (min.)	W50 Before Peak	W75 (min.)	W75 Before Peak	Time to Peak (min.)	Peak (cfs)	Volume (c.f)	Excess (inches)	Excess (c.f.)	Time to Peak (min.)	Peak Flow (cfs)	Total Volume (c.f.)	Runoff per Unit Area (cfs/acre)
BS-1		0.137	0.145	69.1	9.20	36.0	6.50	15.3	42	224,697	4.19	942,160	745.0	85	941,716	1.37
BS-2		0.125	0.183	48.3	8.29	25.1	5.86	13.8	126	470,811	4.20	1,976,148	745.0	230	1,975,200	1.77
BS-3		0.156	0.195	45.1	8.26	23.4	5.84	13.8	96	336,501	4.19	1,408,936	745.0	173	1,407,716	1.87
BS-4		0.156	0.077	23.2	2.88	12.1	2.03	4.8	24	42,834	4.19	179,347	735.0	34	176,108	2.91

Summary of CUHP Input Parameters (Version 2.0.1)

F9_Proposed_100 Year

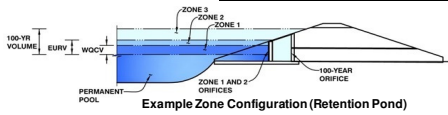
Catchment Name/ID	SWMM Node/ID	Raingage Name/ID	Area (sq.mi.)	Dist. to Centroid (miles)	Length (miles)	Slope (ft./ft.)	Percent Imperv.	Depression Storage		Horton's Infiltration Parameters			DCIA Level and Fractions			Percent Eff. Imperv.
								Pervious (inches)	Imperv. (inches)	Initial Rate (in./hr.)	Final Rate (in.hr.)	Decay Coeff. (1/sec.)	DCIA Level	Dir. Con'ct Imperv. Fraction	Receiv. Perv. Fraction	
BS-1	BS1	EPC 24 HOUR	0.097	0.442	0.848	0.022	7.2	0.35	0.05	4.50	0.00	0.6000	1.00	0.08	0.14	6.98
BS-2	BS2	EPC 24 HOUR	0.203	0.385	0.847	0.019	10.9	0.35	0.05	4.50	0.00	0.6000	1.00	0.12	0.20	10.62
BS-3	BS3	EPC 24 HOUR	0.145	0.265	0.725	0.017	2.0	0.35	0.05	4.50	0.00	0.6000	1.00	0.02	0.04	1.94
BS-4	BS4	EPC 24 HOUR	0.018	0.058	0.131	0.020	2.0	0.35	0.05	4.50	0.00	0.6000	1.00	0.00	0.04	1.94

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: **Latigo Trails-Filing No. 9**

Basin ID: **Black Squirrel Pond - Interim**



Watershed Information

Selected BMP Type =	RP
Watershed Area =	191.96 acres
Watershed Length =	4,870 ft
Watershed Length to Centroid =	2,420 ft
Watershed Slope =	0.015 ft/ft
Watershed Imperviousness =	9.70% percent
Percentage Hydrologic Soil Group A =	0.0% percent
Percentage Hydrologic Soil Group B =	100.0% percent
Percentage Hydrologic Soil Groups C/D =	0.0% percent
Target WQC Drain Time =	12.0 hours
Location for 1-hr Rainfall Depths =	User Input

After providing required inputs above including 1-hour rainfall depths, click "Run CUHP" to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

		Optional User Overrides	
Water Quality Capture Volume (WQCV) =	2.051 acre-feet	2.051	acre-feet
Excess Urban Runoff Volume (EURV) =	2.100 acre-feet	2.100	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	2.521 acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	5.610 acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	8.697 acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	14.217 acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	17.976 acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	23.394 acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3 in.) =	30.969 acre-feet	3.00	inches
Approximate 2-yr Detention Volume =	1.111 acre-feet		
Approximate 5-yr Detention Volume =	1.747 acre-feet		
Approximate 10-yr Detention Volume =	3.676 acre-feet		
Approximate 25-yr Detention Volume =	5.159 acre-feet		
Approximate 50-yr Detention Volume =	5.392 acre-feet		
Approximate 100-yr Detention Volume =	6.982 acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	2.051	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.049	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	4.882	acre-feet
Total Detention Basin Volume =	6.982	acre-feet
Initial Surcharge Volume (ISV) =	N/A	ft ³
Initial Surcharge Depth (ISD) =	N/A	ft
Total Available Detention Depth (H _{total}) =	user	ft
Depth of Trickle Channel (H _{TC}) =	N/A	ft
Slope of Trickle Channel (S _{TC}) =	N/A	ft/ft
Slopes of Main Basin Sides (S _{main}) =	user	H:V
Basin Length-to-Width Ratio (R _{L/W}) =	user	
Initial Surcharge Area (A _{ISV}) =	user	ft ²
Surcharge Volume Length (L _{SV}) =	user	ft
Surcharge Volume Width (W _{SV}) =	user	ft
Depth of Basin Floor (H _{FLOOR}) =	user	ft
Length of Basin Floor (L _{FLOOR}) =	user	ft
Width of Basin Floor (W _{FLOOR}) =	user	ft
Area of Basin Floor (A _{FLOOR}) =	user	ft ²
Volume of Basin Floor (V _{FLOOR}) =	user	ft ³
Depth of Main Basin (H _{MAIN}) =	user	ft
Length of Main Basin (L _{MAIN}) =	user	ft
Width of Main Basin (W _{MAIN}) =	user	ft
Area of Main Basin (A _{MAIN}) =	user	ft ²
Volume of Main Basin (V _{MAIN}) =	user	ft ³
Calculated Total Basin Volume (V _{total}) =	user	acre-feet

Depth Increment = 2.20 ft											
Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft ²)	Optional Override Area (ft ²)	Area (acre)	Volume (ft ³)	Volume (ac-ft)		
Permanent Pool	--	0.00	--	--	--	321,885	7.389				
	--	1.00	--	--	--	333,123	7.647	327,504	7.518		
	--	2.00	--	--	--	344,538	7.910	666,334	15.297		
	--	3.00	--	--	--	356,121	8.175	1,016,664	23.339		
	--	4.00	--	--	--	367,900	8.446	1,378,674	31.650		
	--	5.00	--	--	--	379,847	8.720	1,752,548	40.233		
	--	6.00	--	--	--	391,970	8.998	2,138,456	49.092		
	--	7.00	--	--	--	404,271	9.281	2,536,577	58.232		
	--	8.00	--	--	--	414,868	9.524	2,946,146	67.634		

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

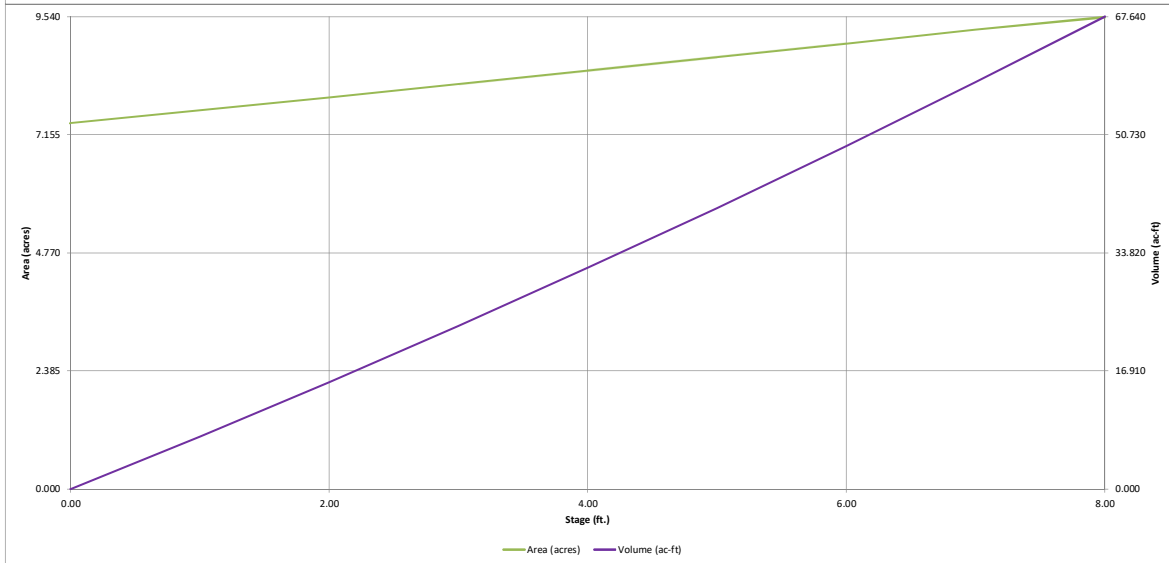
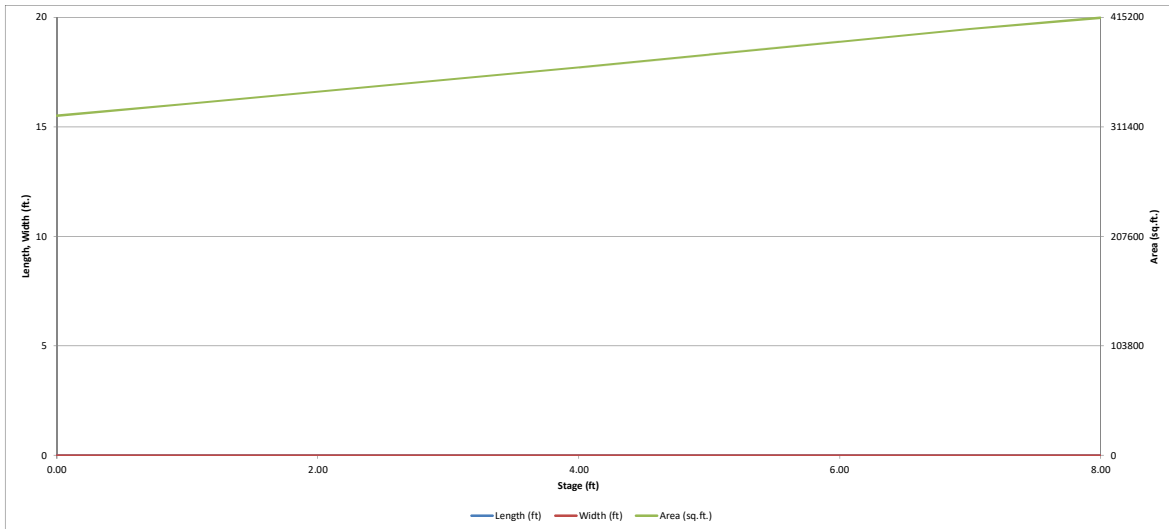


Table - Node BS_F9_InterimPond

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
0	00:30:00	0.00	0.00	0.00
0	01:00:00	0.00	0.00	0.00
0	01:30:00	0.00	7.50	0.02
0	02:00:00	0.00	11.15	0.06
0	02:30:00	0.00	29.96	0.08
0	03:00:00	0.00	4.26	0.09
0	03:30:00	0.00	32.14	0.10
0	04:00:00	0.00	33.54	0.11
0	04:30:00	0.00	5.46	0.12
0	05:00:00	0.00	54.41	0.76
0	05:30:00	0.00	26.78	1.85
0	06:00:00	0.00	53.61	3.74
0	06:30:00	0.05	17476.17	56.24
0	07:00:00	0.30	97792.38	65.98
0	07:30:00	0.55	180392.80	59.13
0	08:00:00	0.74	241996.10	47.56
0	08:30:00	0.88	286784.00	40.11
0	09:00:00	0.99	326342.60	41.09
0	09:30:00	1.12	367125.10	41.58
0	10:00:00	1.24	409966.30	43.54
0	10:30:00	1.38	455558.10	44.76
0	11:00:00	1.53	506277.70	49.80
0	11:30:00	1.72	571826.30	60.73
0	12:00:00	2.03	678488.60	120.90
0	12:30:00	3.23	1099875.00	317.85

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
0	13:00:00	4.49	1561494.00	233.13
0	13:30:00	5.35	1887669.00	168.06
0	14:00:00	5.92	2109537.00	120.99
0	14:30:00	6.31	2262374.00	86.70
0	15:00:00	6.56	2359953.00	59.83
0	15:30:00	6.71	2419215.00	45.81
0	16:00:00	6.80	2458410.00	36.10
0	16:30:00	6.87	2484080.00	30.34
0	17:00:00	6.91	2502236.00	26.85
0	17:30:00	6.95	2514939.00	24.73
0	18:00:00	6.97	2524795.00	23.59
0	18:30:00	6.99	2532067.00	21.70
0	19:00:00	7.00	2536330.00	20.41
0	19:30:00	7.01	2538788.00	19.65
0	20:00:00	7.01	2540231.00	19.25
0	20:30:00	7.01	2540071.00	17.74
0	21:00:00	7.00	2535780.00	15.66
0	21:30:00	6.98	2529819.00	15.03
0	22:00:00	6.96	2521676.00	13.67
0	22:30:00	6.94	2512543.00	13.46
0	23:00:00	6.92	2503135.00	13.36
0	23:30:00	6.89	2493610.00	13.32
1	00:00:00	6.87	2483439.00	11.66
1	00:30:00	6.83	2466898.00	6.99
1	01:00:00	6.77	2443836.00	4.81
1	01:30:00	6.70	2417281.00	2.53

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
1	02:00:00	6.63	2387538.00	1.75
1	02:30:00	6.55	2356709.00	1.31
1	03:00:00	6.47	2325339.00	1.13
1	03:30:00	6.39	2293745.00	1.04
1	04:00:00	6.31	2262038.00	1.00
1	04:30:00	6.23	2230304.00	1.00
1	05:00:00	6.15	2198570.00	1.00
1	05:30:00	6.07	2166836.00	1.00
1	06:00:00	5.99	2135102.00	1.00
1	06:30:00	5.91	2103368.00	1.00
1	07:00:00	5.83	2071634.00	1.00
1	07:30:00	5.75	2039900.00	1.00
1	08:00:00	5.67	2008166.00	1.00
1	08:30:00	5.59	1976432.00	1.00
1	09:00:00	5.50	1944698.00	1.00
1	09:30:00	5.42	1912964.00	1.00
1	10:00:00	5.34	1881230.00	1.00
1	10:30:00	5.26	1849496.00	1.00
1	11:00:00	5.17	1817762.00	1.00
1	11:30:00	5.09	1784708.00	0.00
1	12:00:00	5.00	1751174.00	0.00
1	12:30:00	4.91	1717640.00	0.00
1	13:00:00	4.82	1684106.00	0.00
1	13:30:00	4.73	1650572.00	0.00
1	14:00:00	4.64	1617038.00	0.00
1	14:30:00	4.55	1583504.00	0.00

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
1	15:00:00	4.46	1549970.00	0.00
1	15:30:00	4.37	1516436.00	0.00
1	16:00:00	4.28	1482902.00	0.00
1	16:30:00	4.19	1449368.00	0.00
1	17:00:00	4.10	1415834.00	0.00
1	17:30:00	4.01	1382300.00	0.00
1	18:00:00	3.92	1348766.00	0.00
1	18:30:00	3.83	1315232.00	0.00
1	19:00:00	3.74	1281698.00	0.00
1	19:30:00	3.64	1248164.00	0.00
1	20:00:00	3.55	1214630.00	0.00
1	20:30:00	3.46	1181096.00	0.00
1	21:00:00	3.37	1147562.00	0.00
1	21:30:00	3.27	1114028.00	0.00
1	22:00:00	3.18	1080494.00	0.00
1	22:30:00	3.09	1046960.00	0.00
1	23:00:00	2.99	1013426.00	0.00
1	23:30:00	2.90	979891.90	0.00
2	00:00:00	2.80	946357.90	0.00
2	00:30:00	2.71	912823.90	0.00
2	01:00:00	2.61	879289.90	0.00
2	01:30:00	2.52	845755.90	0.00
2	02:00:00	2.42	812221.90	0.00
2	02:30:00	2.33	778687.90	0.00
2	03:00:00	2.23	745153.90	0.00
2	03:30:00	2.13	711619.90	0.00

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
2	04:00:00	2.04	678085.90	0.00
2	04:30:00	1.94	644551.90	0.00
2	05:00:00	1.84	611017.90	0.00
2	05:30:00	1.74	577483.90	0.00
2	06:00:00	1.64	543949.90	0.00
2	06:30:00	1.55	510415.80	0.00
2	07:00:00	1.45	476881.80	0.00
2	07:30:00	1.35	443347.80	0.00
2	08:00:00	1.25	409813.80	0.00
2	08:30:00	1.15	376279.80	0.00
2	09:00:00	1.05	342745.80	0.00
2	09:30:00	0.95	309211.80	0.00
2	10:00:00	0.85	275677.80	0.00
2	10:30:00	0.74	242143.80	0.00
2	11:00:00	0.64	208609.80	0.00
2	11:30:00	0.54	175075.80	0.00
2	12:00:00	0.44	141541.80	0.00
2	12:30:00	0.34	108007.80	0.00
2	13:00:00	0.23	74473.84	0.00
2	13:30:00	0.13	40939.85	0.00
2	14:00:00	0.02	7405.85	0.00
2	14:30:00	0.00	0.00	0.00
2	15:00:00	0.00	0.00	0.00
2	15:30:00	0.00	0.00	0.00
2	16:00:00	0.00	0.00	0.00
2	16:30:00	0.00	0.00	0.00

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
2	17:00:00	0.00	0.00	0.00
2	17:30:00	0.00	0.00	0.00
2	18:00:00	0.00	0.00	0.00
2	18:30:00	0.00	0.00	0.00
2	19:00:00	0.00	0.00	0.00
2	19:30:00	0.00	0.00	0.00
2	20:00:00	0.00	0.00	0.00
2	20:30:00	0.00	0.00	0.00
2	21:00:00	0.00	0.00	0.00
2	21:30:00	0.00	0.00	0.00
2	22:00:00	0.00	0.00	0.00
2	22:30:00	0.00	0.00	0.00
2	23:00:00	0.00	0.00	0.00
2	23:30:00	0.00	0.00	0.00
3	00:00:00	0.00	0.00	0.00
3	00:30:00	0.00	0.00	0.00
3	01:00:00	0.00	0.00	0.00
3	01:30:00	0.00	0.00	0.00
3	02:00:00	0.00	0.00	0.00
3	02:30:00	0.00	0.00	0.00
3	03:00:00	0.00	0.00	0.00
3	03:30:00	0.00	0.00	0.00
3	04:00:00	0.00	0.00	0.00
3	04:30:00	0.00	0.00	0.00
3	05:00:00	0.00	0.00	0.00
3	05:30:00	0.00	0.00	0.00

Days	Hours	Depth (ft)	Volume (ft3)	Total Inflow (CFS)
3	06:00:00	0.00	0.00	0.00

Outflow Retention Pond Bottom

Latigo Trails F10

$$Q = r_s * A$$

Where: r_s =saturated flow rate (ft/s)

A= area of bottom of pond (sf)

Given:

r_s =2.5 in/hr

A= 321,885 sf

Solution:

r_s = 2.5 (in/hr)= 5.79×10^{-5} (ft/s)

$$Q = (5.79 \times 10^{-5}) * 321,885 = 18.63 \text{ cfs}$$

The saturated rate was used as a constant outflow rate conservatively, as there will be only an hour or two of unsaturated flow.

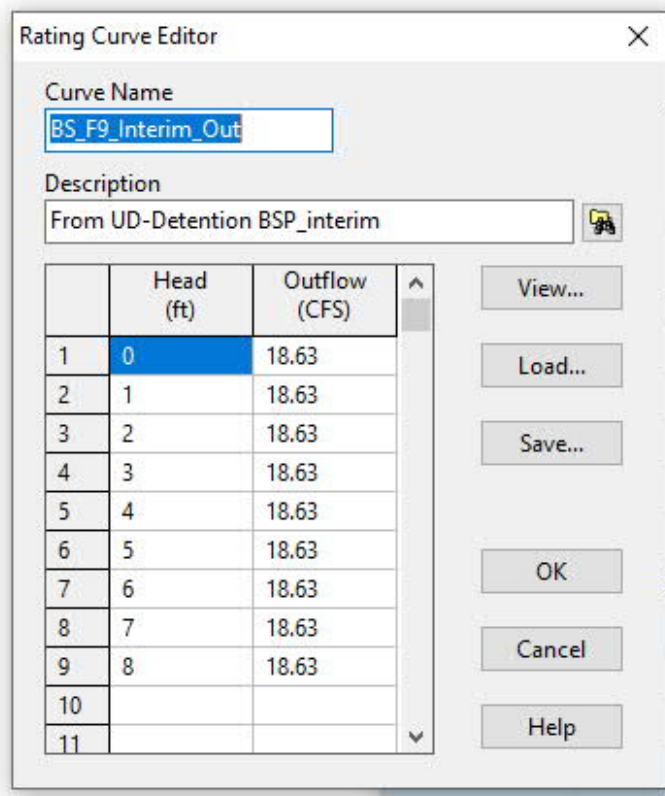


Figure 1. Outflow Rating Curve from SWMM

Storage Volume Summary

Storage Unit	Average Volume 1000 ft3	Average Percent Full	Evap Percent Loss	Exfil Percent Loss	Maximum Volume 1000 ft3
BS_F9_InterimPond	1001.701	34	0	0	2540.524

Storage Volume Summary

Storage Unit	Maximum Percent Full	Day of Maximum Volume	Hour of Maximum Volume	Maximum Outflow CFS
BS_F9_InterimPond	86	0	20:13	18.63

EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.015)

WARNING 04: minimum elevation drop used for Conduit 31
 WARNING 08: elevation drop exceeds length for Conduit 34
 WARNING 10: crest elevation is below downstream invert for regulator Link
 BS_F9_Interim_Out

 Element Count

Number of rain gages 0
 Number of subcatchments ... 0
 Number of nodes 9
 Number of links 8
 Number of pollutants 0
 Number of land uses 0

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
BS1	JUNCTION	7165.00	0.00	0.0	
BS2	JUNCTION	7100.00	0.00	0.0	
3	JUNCTION	7070.00	0.00	0.0	
BS3	JUNCTION	7130.00	0.00	0.0	
BS4	JUNCTION	7120.00	0.00	0.0	
25	JUNCTION	7067.00	0.00	0.0	
S-12	JUNCTION	7100.00	0.00	0.0	Yes
O-A	OUTFALL	7065.00	0.00	0.0	
BS_F9_InterimPond	STORAGE	6069.00	8.00	0.0	

 Link Summary

Name	From Node	To Node	Type	Length
1	BS1	3	CONDUIT	400.0
24.4496 2	BS2	3	CONDUIT	400.0
7.5212 5	BS4	O-A	CONDUIT	400.0
13.8819				

27		BS3	25	CONDUIT	400.0
15.9491	0.0100				
31		S-12	BS2	CONDUIT	400.0
0.0003	0.0100				
33		25	0-A	CONDUIT	400.0
0.5000	0.0100				
34		3	BS_F9_InterimPond	CONDUIT	400.0
250.2500	0.0100				
		BS_F9_Interim_Out	BS_F9_InterimPond 25	OUTLET	

Cross Section Summary

Full Conduit Flow	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels

1	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
2	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
5	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
27	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
31	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
33	DUMMY	0.00	0.00	0.00	0.00	1
0.00						
34	DUMMY	0.00	0.00	0.00	0.00	1
0.00						

NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

Analysis Options

Flow Units CFS
Process Models:
Rainfall/Runoff NO
RDI NO

Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Flow Routing Method KINWAVE
 Starting Date 01/01/2005 00:00:00
 Ending Date 01/04/2005 06:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:30:00
 Routing Time Step 30.00 sec

Control Actions Taken

*****	Volume	Volume
Flow Routing Continuity	acre-feet	10 ⁶ gal
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.000	0.000
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	122.767	40.006
External Outflow	122.776	40.008
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	-0.007	

Highest Flow Instability Indexes

Link 33 (2)
 Link BS_F9_Interim_Out (2)

Routing Time Step Summary

Minimum Time Step	:	30.00 sec
Average Time Step	:	30.00 sec
Maximum Time Step	:	30.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	1.00
Percent Not Converging	:	0.00

Node Depth Summary

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr: min	Reported Max Depth Feet
BS1	JUNCTION	0.00	0.00	7165.00	0 00:00	0.00
BS2	JUNCTION	0.00	0.00	7100.00	0 00:00	0.00
3	JUNCTION	0.00	0.00	7070.00	0 00:00	0.00
BS3	JUNCTION	0.00	0.00	7130.00	0 00:00	0.00
BS4	JUNCTION	0.00	0.00	7120.00	0 00:00	0.00
25	JUNCTION	0.00	0.00	7067.00	0 00:00	0.00
S-12	JUNCTION	0.00	0.00	7100.00	0 00:00	0.00
0-A	OUTFALL	0.00	0.00	7065.00	0 00:00	0.00
BS_F9_InterimPond	STORAGE	2.84	7.01	6076.01	0 20:14	7.01

Node Inflow Summary

Total Inflow Volume Node gal	Flow Balance Error Percent	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr: min	Lateral Inflow Volume 10^6 gal
BS1 7.04	0.000	JUNCTION	84.86	84.86	0 12:25	7.04
BS2 21.1	0.000	JUNCTION	229.73	239.73	0 12:25	14.8
3 28.2	0.000	JUNCTION	0.00	324.60	0 12:25	0
BS3 10.5	0.000	JUNCTION	172.91	172.91	0 12:25	10.5
BS4 1.32	0.000	JUNCTION	34.29	34.29	0 12:15	1.32
25		JUNCTION	0.00	191.54	0 12:25	0

38.7	0.000							
S-12		JUNCTION	55.00	55.00	0	06:40	6.34	
6.34	0.000							
0-A		OUTFALL	0.00	222.12	0	12:20	0	
40	0.000							
BS_F9_InterimPond		STORAGE	0.00	324.60	0	12:25	0	
28.2	-0.010							

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

of Max Occurrence		Maximum	Average	Avg	Evap	Exfil	Maximum	Max	Time
Storage Unit		Outflow	Volume	Pcnt	Pcnt	Pcnt	Volume	Pcnt	
hr: min	CFS	1000 ft3	1000 ft3	Full	Loss	Loss	1000 ft3	Full	days
BS_F9_InterimPond			1001.701	34	0	0	2540.524	86	0
20:13	18.63								

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal
0-A	77.35	24.62	222.12	40.005
System	77.35	24.62	222.12	40.005

Link Flow Summary

Link	Type	Maximum Flow CFS	Time of Max Occurrence days hr: min	Maximum Velocity ft/sec	Max/ Full Flow	Max/ Full Depth
1	DUMMY	84.86	0 12:25			
2	DUMMY	239.73	0 12:25			
5	DUMMY	34.29	0 12:15			
27	DUMMY	172.91	0 12:25			
31	DUMMY	55.00	0 06:40			
33	DUMMY	191.54	0 12:25			
34	DUMMY	324.60	0 12:25			
BS_F9_Interim_Out	DUMMY	18.63	0 06:07			

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Sep 30 08:51:39 2022

Analysis ended on: Fri Sep 30 08:51:39 2022

Total elapsed time: < 1 sec