INNOVATIVE DESIGN. CLASSIC RESULTS.

MASTER DEVELOPMENT DRAINAGE PLAN
FOR
JAYNES PROPERTY

CCES Responses

Prepared for:
CLASSIC COMPANIES
2138 FLYING HORSE CLUB DRIVE
COLORADO SPRINGS CO 80921
(719) 592-9333

Prepared by:
CLASSIC CONSULTING
619 N. CASCADE AVE SUITE 200
COLORADO SPRINGS CO 80903
(719) 785-0790

Job No. 1305.02
PCD File No. SKP-225

MASTER DEVELOPMENT DRAINAGE PLAN FOR JAYNES PROPERTY

ENGINEER'S STATEMENT:

The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the County for drainage reports and said report is in conformity with the applicable master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

_____ _____

Marc A. Whorton Colorado P.E. #37155 Date

OWNER'S/DEVELOPER'S STATEMENT:

I, the owner/developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: CLASSIC COMPANIES

By: _____

Title: _____

Address: 2138 Flying Horse Club Drive

Colorado Springs, CO 80921

EL PASO COUNTY:

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

_____ _____

For County Engineer, / ECM Administrator Date

Conditions:

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MASTER DEVELOPMENT DRAINAGE PLAN FOR JAYNES PROPERTY

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MASTER DEVELOPMENT DRAINAGE PLAN FOR JAYNES PROPERTY

PURPOSE

The intent of the owner/developer is to develop the Jaynes Property. The purpose of this Master Development Drainage Plan, as part of the Jaynes Property Sketch Plan, is to identify major drainage features and facilities and to estimate peak rates of stormwater runoff, from on-site and off-site sources. Also, the purpose is to outline the necessary improvements to safely route developed storm water runoff to adequate outfall facilities. The drainage improvements proposed in this report are preliminary in nature and final drainage reports are required upon any development within the Jaynes Property that detail the 'to be constructed' drainage systems and detention ponds.

GENERAL DESCRIPTION

Jaynes Property is a 142.127-acre site located in a portion of sections 28 and 33, township 12 south, range 65 west of the sixth principal meridian. The site is bounded on the north by Poco Road, to the south and east by Vollmer Road and to the west by existing platted large lot residential subdivisions. The site is within the upper portion of the Sand Creek drainage basin. The proposed uses as shown on the Sketch Plan are as follows: Varying density single family residential, neighborhood commercial, neighborhood park and open space/greenway buffers with a density cap of 450 dwelling units. All roadway access will be from Vollmer Road and the proposed Briargate Parkway extension. No direct roadway access to Poco Road.

The average soil condition reflects Hydrologic Group "B" (Pring coarse sandy loam) as determined by the "Soil Survey of El Paso County Area," prepared by the Soil Conservation Service (see map in Appendix).

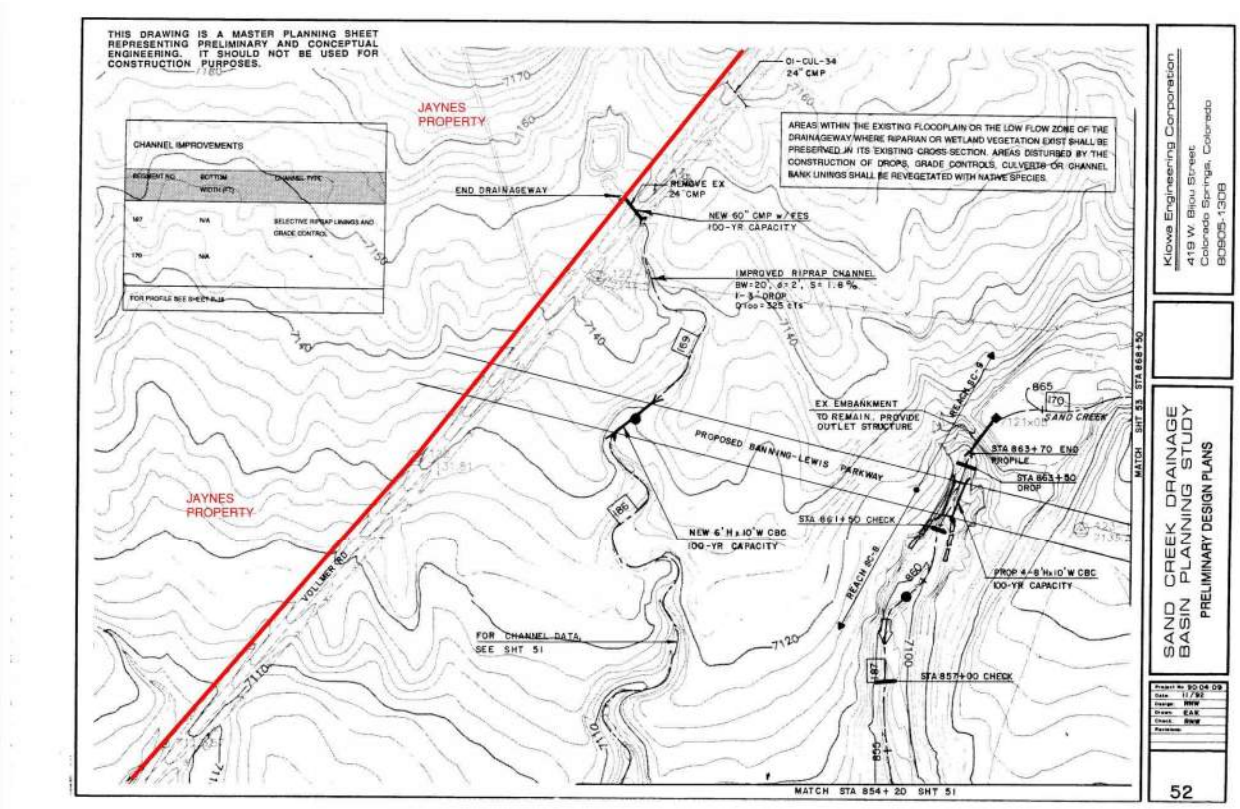
EXISTING DRAINAGE CONDITIONS

The Jaynes property is located in the upper reaches of the Sand Creek Basin. Existing conditions in this basin are largely rolling hills vegetated with native grasses, yucca and sparse pine trees

on the northwestern portion of the site with natural ravines and swales with little to no trees on the south portion of the property. Existing slopes range from 20% to 2% across the site. The entire property generally drains in a southerly direction through numerous natural ravines created from the off-site flows north of Poco Road. This property is not specifically discussed in the Sand Creek DBPS (March 1996), however, improvements along Vollmer Road to handle flows from and through the property are detailed on the following excerpt from the DBPS. The existing culvert crossing Vollmer Road is shown to be replaced with a 60" CMP for 100-yr capacity. This improvement along with the downstream channel improvements within the Sterling Ranch property are currently being constructed as a part of the adjacent Vollmer Road improvements and Homestead North at Sterling Ranch Filing No. 1 development. These plans also include the construction of public storm sewer within Vollmer Road to handle the anticipated developed flows from the urbanization of this stretch of the Vollmer Road corridor.

There are three major off-site basins north of Poco Road represented by EX-3, EX-4A and EX-4B. This nomenclature matches this same area as presented in the Sterling Ranch MDDP. Currently there are multiple corrugated metal culverts within Poco Road allowing these off-site flows from the north to enter the site. However, a recent site investigation reports that these culverts are badly silted in with minimal flow able to be conveyed. They also appear to only be sized for the smaller storm events. As presented on the drainage map, it is recommended that El Paso County visually inspect these facilities and consider up-sizing for larger storm events based on the current basin hydrology or at a minimum clean out the current facilities to allow for better conveyance. However, no evidence of the road overtopping at these crossing locations was found. This off-site property north of Poco Road seems to be all large lot residential with property sizes ranging from 5-acre to 35-acres. As this off-site basin stretches north it starts to get into the Black Forest north of Wildflower Road.

At the northern edge of the property there remains an out parcel with a home accessed from Poco Road that is not a part of this development. This area is also a highpoint in Poco Road and



creates the two major natural ravines running north to south through the Jaynes Property. Near the corner of Poco Road and Vollmer Road there is also another exiting home that also accesses Poco Road. This home is part of the development property and will eventually be abandoned and demolished. There are existing natural ravines on both sides of this existing home site that eventually combine into one and continue to travel in a southerly direction through the site towards an on-site stock pond near Vollmer Road. There are no records or design plans for this stock pond. For this existing condition analysis this pond was removed from the project model. In the central portion of the property exists several structures with gravel driveway access directly to Vollmer Road. These structures will also eventually be abandoned and demolished. The natural ravine along the western portion of the property travels due south all the way to Vollmer Road. A few minor off-site basins (OS-1 and OS-2) from the neighboring large lot residential development to the west also drain onto the property. The entire site drains towards Vollmer Road and into the side road ditch along the west side of

Vollmer. Only a very small portion of the site, represented by Basin EX-D, in the extreme northwest corner of the property sheet flows off-site.

As mentioned earlier, the stretch of Vollmer Road adjacent to the Jaynes property is planned for widening improvements along with the Sterling Ranch development to the east (Homestead North at Sterling Ranch Filing 1). As recommended in the Final Drainage Report for this project and shown on the street and storm improvement plans for Vollmer Road, multiple storm sewer stubs will be provided for the Jaynes property and the off-site properties to the north of Poco Road. Given that these facilities will most likely be approved and constructed prior to the development of the Jaynes property, this report assumes these will be in place as described and shown on the maps. Please also reference the Appendix for the Homestead North drainage maps as reference material.

These ravines and stock pond areas contain some wetlands vegetation. These wetlands were field delineated by CORE Consultants, Inc. and provided on the drainage maps as shown. However, a Jurisdictional Determination (Action No. SPA-2022-00123) was provided by the Corps of Engineers finding that none of these wetland areas contain waters of the U.S. As such, these areas are NOT regulated by the U.S. Army Corps of Engineers under Section 404 of the Federal Clean Water Act. (See Appendix for JD)

The following descriptions represent the existing on and off-site basins and design points affecting this property:

Design Point E1 (Q_5 = 14 cfs, Q_{100} = 82 cfs) consists of the approximated 77.0-acre off-site tributary area from Basin EX-4A. As mentioned earlier, this area is developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards Poco Road and the existing 24" CMP that is silted in. These off-site flows then enter the property within one of the natural ravines and convey the flows to the south tow Added sting stock pond.

Address how development will avoid or mitigate these and other high groundwater areas. Address the need for groundwater monitoring.

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Design Point E2 (Q_5 = 10 cfs, Q_{100} = 58 cfs) consists of the approximated 70.0-acre off-site tributary area from Basin EX-4B. As mentioned earlier, this area is also developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards an off-site stock pond at the northwest corner of Poco Road and Vollmer Road. Verified visually in the field, this facility appears to have an 18" CMP outlet crossing Poco Road to the south. These off-site flows then enter the property within one of the natural ravines and convey the flows to the south towards the existing stock pond.

Design Point E3 (Q_5 = 1 cfs, Q_{100} = 7 cfs) consists of the 3.6-acre tributary area from Basins EX-A and EX-B. This on-site area drains in a southerly direction towards the side road ditch along Vollmer Road and then captured by a Type D CDOT Inlet with a 24" RCP storm outfall. These facilities are detailed in the "Homestead North at Sterling Ranch Filing No. 1" Final Drainage Report and CDs, prepared by JR Engineering, approved Sept. 2022. The location of this facility is represented by Design Point 10 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 0.8 cfs, Q_{100} = 6.0 cfs).** (See Reference Material in Appendix) These improvements will be constructed with that development and the Vollmer Road improvements. The existing 24" CMP culvert near this location will be removed.

Design Point E4 (Q_5 = 25 cfs, Q_{100} = 155 cfs) consists of the 41.4-acre tributary area from on-site Basin EX-C along with the combined off-site flows from Design Points E1 and E2. These combined flows travel in the natural ravine towards the existing stock pond on-site. As mentioned earlier, this facility was removed for this existing drainage model. The total flows then travel towards Vollmer Road where they are then captured by a 6' diameter overflow Manhole with grate and a 48" RCP storm outfall into the planned Vollmer roadway widening improvements. The location of this facility is represented by Design Point 20 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 27.1 cfs, Q_{100} = 190.9 cfs).** (See Reference Material in Appendix)

Added

Sterling Ranch designed

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Again, these improvements will be constructed with the Homestead North development and the Vollmer Road improvements. The existing 24" CMP culvert near this location will be removed.

Design Point E5 (Q_5 = 12 cfs, Q_{100} = 70 cfs) consists of the approximated 44.3-acre off-site tributary area from Basin EX-3. As mentioned earlier, this area is developed as large lot residential (lots ranging from 5-acre to 35-acre) all draining towards Poco Road and the existing 24" CMP that is silted in. These off-site flows then enter the propert Added westerly natural ravine and convey the flows to the south through the property.

(Sterling Ranch designed)

Design Point E6 (Q_5 = 2 cfs, Q_{100} = 13 cfs) consists of the 8.3-acre tributary area from the minor on-site Basin EX-G. These pre-developed flows travel in a southerly direction towards the road side ditch along the west side of Vollmer Road. An existing CDOT Type D inlet captures these flows and routes them under Vollmer Road in a 24" RCP system. The location of the CDOT Type D Inlet facility is represented by Design Point 10 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 4.8 cfs, Q_{100} = 26.3 cfs).** (See Reference Material in Appendix)

Design Point E7 (Q_5 = 1 cfs, Q_{100} = 10 cfs) consists of the 6.5-acre tributary area from the minor on-site Basin EX-H. These pre-developed flows travel in a southerly direction towards the road side ditch along the west side of Vollmer Road. An existing CDOT Type C inlet captures these flows and routes them under Vollmer Road in an 18" RCP system. The location of this CDOT Type C Inlet facility is represented by Design Point 11 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 2.2 cfs, Q_{100} = 12.3 cfs).** (See Reference Material in Appendix)

Design Point E8 (Q_5 = 20 cfs, Q_{100} = 125 cfs) consists of the 72.4-acre tributary area from the on-site Basin EX-E, the off-site basin OS-2 (5.3 ac.) along with the flows from Design Point E5. These combined flows travel in a southerly direction within the on-site natural ravines towards the side road ditch along Vollmer Road and an existing 24" RCP culvert. This facility seems to be silted in

and thus conveys little flow. Rather, the flows continue to be conveyed by the ditch in a southeasterly direction along the north side of Vollmer Road into basin EX-F.

Added

and flows from E8

Design Point E9 (Q_5 = 20 cfs, Q_{100} = 127 cfs) consists of the 8.7-acre tributary area from the on-site Basin EX-F and the off-site basin OS-1 (2.0 ac.). These combined flows travel in a southeasterly direction within the side road ditch along Vollmer Road to the corner of the property. At this location, within the sideroad ditch and ROW for Vollmer Road, an exist. modified 4'x14' CDOT Type D Inlet was constructed along with the Homestead at Sterling Ranch Filing No. 1 Development to capture these off-site flows. This facility has an existing 54" public RCP storm outfall that crosses Vollmer Road and passes through the Homestead at Sterling Ranch Filing No. 1 development and daylights directly into Sand Creek. The location of the CDOT Type D Inlet facility is represented by Design Point 12 within the Homestead at Sterling Ranch Filing No. 1 development **(Q_5 = 18.9 cfs, Q_{100} = 133.7 cfs).** (See Reference Material in Appendix)

Design Point E10 (Q_5 = 0.4 cfs, Q_{100} = 3 cfs) consists of the 1.3-acre tributary area from the on-site Basin EX-D. This minor portion of the property sheet flows off-site into a natural ravine and then into a private stock pond on Lot 3A or Sunrise Meadow Subd. No. 2.

PROPOSED DRAINAGE CONDITIONS

Development within the Jaynes Property is proposed to be urban residential and commercial with associated curb, gutter, sidewalk and paved streets. Overlot grading is anticipated for the majority of the development along with installation of urban services provided through the Sterling Ranch Metropolitan District. Proposed impervious areas will sheet flow across yards and landscape areas to slow runoff and increase time of concentration. This will minimize the effects of impervious areas. At design points where developed flows are greater than in the existing condition, detention facilities will be proposed providing an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume with an outlet control device. Frequent and

infrequent inflows are released at rates approximating undeveloped conditions. This concept provides some mitigation of increased runoff volume by releasing a portion of the increased runoff at a low rate over an extended period of time, up to 72 hours. This means that frequent storms, smaller than the 2 year event, will be reduced to very low flows near or below the sediment carrying threshold value for downstream drainage ways. Also, by incorporating an outlet structure that limits the 100-year runoff to the undeveloped condition rate, the discharge hydrograph for storms between the 2 year and the 100 year event will approximate the hydrograph for the undeveloped conditions and will help effectively mitigate the effects of development. Prior to development within the Jaynes property, final drainage reports and construction plans will be required detailing the requirements and specifics of proposed facilities.

Per the Sand Creek DBPS, this area was planned for both large lot residential and single family residential. There were no recommendations for detention facilities within the area but due to current drainage criteria, detention/stormwater quality facilities are proposed. The following are concept design points for developed conditions with descriptions of anticipated basin areas and conceptual major storm systems:

Design Point D1 (Q_5 = 1 cfs, Q_{100} = 6 cfs) consists of developed flows from Basin B (2.3 Ac.). This on-site area drains in a southerly direction towards the side road ditch along Vollmer Road and then captured by the planned Type D CDOT Inlet with a 24" RCP storm outfall into the Vollmer roadway widening improvements. These improvements required with the construction of Homestead North replace the original culvert crossing of Vollmer Road at this location. The location of this facility is represented by Design Point 10 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 0.8 cfs, Q_{100} = 6.0 cfs).** (See Reference Material in Appendix) Also described in the Homestead North FDR is that these developed flows were accounted for in the design of the off-site Pond C within the Sterling Ranch development. This facility provides detention/stormwater quality and thus, upon development within Basin B, no further detention/stormwater quality will be required.

Design Point D2 (Q_5 = 31 cfs, Q_{100} = 156 cfs) consists of the pre-developed off-site flows from Basins EX-4A and EX-4B and the developed flows from Basin A (33.1 Ac.). The final design for this area will likely involve some overlot grading and removal of the natural ravine through Basin A. The off-site flows from the north are anticipated to be collected in a public storm system defined based on the final site plan for this area. This storm system will also be routed towards Design Point 2 where all these flows combine and are continued to be conveyed downstream towards Design Point ~~3~~. Also described in the Homestead North FDR is that these significant off-site developed flows were accounted for in the design of the off-site Pond C within the Sterling Ranch development. This facility provides detention/stormwater quality and thus, upon development within Basin A, no further detention/stormwater quality will be required. The final design for this area must follow the maximum flow and percent impervious as described in the Homestead North FDR. (See Appendix for applicable reference material)

D3A?

Revised

Design Point D3 (Q_5 = 3 cfs, Q_{100} = 13 cfs) consists of developed flows from Basin C (6.8 Ac.). This area is shown as park area on the Sketch Plan with the intent to leave the natural stock pond and drainageway as passive open space. The west edge of this basin is anticipated to be rear yards of the future planned residential adjacent to the park area. This developed basin will continue to drain in a southerly direction and routed towards Design Point 3.

D3?

Revised

Design Point D3A (Q_5 = 31 cfs, Q_{100} = 157 cfs) represents the total developed flows tributary to the planned 6' diameter overflow Manhole with grate and 48" RCP storm outfall mentioned earlier at this location, represented by Design Point 20 within the Homestead North at Sterling Ranch Filing No. 1 development **(Q_5 = 27.1 cfs, Q_{100} = 190.9 cfs).** (See Reference Material in Appendix) This is the maximum developed flows allowed to be released at this location and treated further downstream in Pond C with the Sterling Ranch Development. The final design for this area must follow this maximum flow and percent impervious as described in the Homestead North FDR. (See Appendix for applicable refer

Added additional language to narrative

Is an outlet structure going to be added or water rights obtained to keep the stock pond? Address ownership and maintenance and embankment analysis to be done.

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EFFECTIVE IMPERVIOUSNESS - POND C

Basin	Acreage	Imp.%
EX-4A	77.0	5%
EX-4B	70.0	5%
A	33.1	27%
B	2.3	30%
C	6.8	16%
Total	**189.2**	**9.6%**

Design Point D4 (Q_5 = 13 cfs, Q_{100} = 29 cfs) consists of developed flows from Basin D (9.3 Ac.). This area will drain in a southeasterly direction and be routed via an on-site storm system alignment determined with final design. These flows are then routed towards the proposed on-site Pond 1 at the south end of the property.

Design Point D5 (Q_5 = 17 cfs, Q_{100} = 31 cfs) consists of developed flows from the Commercial area, Basin E (5.8 Ac.). This area will drain in a southeasterly direction and be routed via an on-site storm system alignment determined with final design. These flows combine with the previously mentioned developed flows from DP D4 and then are routed towards the proposed on-site Pond 1 at the south end of the property.

Design Point D6 (Q_5 = 11 cfs, Q_{100} = 34 cfs) consists of developed flows from Basin F (13.2 Ac.). This on-site area drains in a southerly direction and will be routed via an on-site storm system alignment within Briargate Parkway and then towards the proposed on-site Pond 1 at the south end of the property.

Design Point D7 (Q_5 = 25 cfs, Q_{100} = 108 cfs) consists of the pre-developed off-site flows from Basin EX-3 (44.3 Ac.), approx. 1/2 of OS-2 (5.3 Ac.) and the developed flows from Basin G (26.8 Ac.). The final design for this area will likely involve some overlot grading and removal of the

natural ravine through Basin G. The off-site flows from the north are anticipated to be collected in a public storm system defined based on the final site plan for this area. The total developed flows are then routed via a proposed storm system towards Design Point 7. These flows combine with the previously mentioned developed flows within Briargate Parkway and then routed towards the proposed on-site Pond 1 at the south end of the property.

Design Point D8 (Q_5 = 17 cfs, Q_{100} = 36 cfs) consists of developed flows from Basin I (11.7 Ac.). This area will drain in a southerly direction and be routed via an on-site storm system alignment determined with final design. These flows combine with the previously mentioned developed flows and then routed towards the proposed on-site Pond 1 at the south end of the property.

Design Point D9 (Q_5 = 16 cfs, Q_{100} = 53 cfs) consists of pre-developed flows from approx. 1/2 of Basin OS-2 (5.3 Ac.) and developed flows from Basin J (20.4 Ac.). This area will drain in a southerly direction and be routed via an on-site storm system alignment determined with final design. These flows combine with the previously mentioned developed flows and then routed towards the proposed on-site Pond 1 to the south.

Design Point D10 (Q_5 = 0.7 cfs, Q_{100} = 3 cfs) consists of the 1.3-acre tributary area from the on-site Basin L. This minor portion of the development will consist of the rear yards for the anticipated 1.0 Ac. and 1/2-Ac. lots in this area. This minor area will continue to sheet flow off-site into a natural ravine and into an off-site stock pond on Lot 3A or Sunrise Meadow Subd. No. 2. The final drainage report will determine if any on-site private BMP treatment will be required depending upon lot configuration and house placement.

and EX-3?

EX-3 is already included in the total collected flows at D7. See D7 description.

Design Point D11 (Q_5 = 69 cfs, Q_{100} = 222 cfs) consists of pre-developed flows fro (2.0 Ac.), developed flows from Basin K (6.9 Ac.) which is mainly made up of the pc and the total routed storm flows from on-site. This represents the total developed flows tributary to the proposed on-site Pond 1. (See the following section of this report for Pond 1 details)

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Basin H (Q_5 = 13 cfs, Q_{100} = 24 cfs) consists of the 4.8-acre tributary area from the anticipated Briargate Parkway ROW. This basin will collect the developed flows with proposed Type R curb inlets which then connect directly to the conceptual public storm system within the roadway. This system then routes the developed flows towards Pond 1.

Include statement that Basins Ex-3, EX-4A, EX4-B, EX-D, OS-1 & OS-2 are the same as existing conditions and no changes to flow

Added

DETENTION FACILITIES / STORMWATER QUALITY

Final design of this recommended facility that include planning for water quality management of storm water runoff features will be designed during final design and construction of the proposed improvements. Storm water quality measures will be utilized in order to reduce the amount of sediment, debris and pollutants that are allowed to enter Sand Creek. These features include but are not limited to Full Spectrum Extended Detention Basin Sedimentation Facilities, Sand Filter Basins, and Rain Gardens. Site Planning and design techniques should limit impervious area, minimize directly impervious area, lengthen time of travel and increase infiltration in order to decrease the rate and volume of stormwater runoff. Facilities that require detention will provide an Excess Urban Runoff Volume (EURV) in the lower portion of the facility storage volume that will release the more frequent storms at a slower rate to help minimize the effects of development of the Jaynes Property. These measures will be taken into consideration upon final design of the individual detention facilities as well as the development of the individual land uses within the Jaynes Property.

The proposed Pond 1 is intended to provide detention and stormwater quality for nearly the entire property, including the off-site basin EX-3 north of Poco Road and excluding Basin L (1.3 Ac.) and any area that is tributary and being treated by the off-site Pond C within the Sterling Ranch Development (Basins EX-A, EX-B, A, B and C – Total of 189.20 Ac.). The total anticipated developed flows entering this facility are as follows:

(See Appendix for MHFD-Detention pond design sheets):

identify the outfall for Pond C

Now included in narrative under Design Point D3A description.

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<u>Pond 1</u> (Full Spectrum EDB)

Total Tributary Acreage: 150.5 ac.

Total Site Impervious tributary to Pond 1: 30.1%

1.904 Ac.-ft. WQCV required

2.747 Ac.-ft. EURV required with 4:1 max. slopes

5.367 Ac.-ft. 100-yr. required storage

10.017 Ac.-ft. required total

10.298 Ac.-ft. provided

Total Peak In-flow: Q_5 = 69 cfs, Q_{100} = 222 cfs

Pond Peak Design Release: Q_5 = 14.5 cfs, Q_{100} = 130.3 cfs

Release per Homestead at Sterling Ranch Filing 1 (DP-12): Q_5 = 18.9 cfs, Q_{100} = 133.7 cfs

This proposed detention facility is to be private with maintenance by the Jaynes Homeowners Association with all drainage facilities within the public Right of Way be public with maintenance by El Paso County. As mentioned previously in this report, just outside of the very southwest corner of the property, within the Vollmer Road ROW exists a 4'x14' modified CDOT Type D inlet with a 54" RCP storm outfall. This facility was planned to accept and convey treated developed flows per the "Homestead at Sterling Ranch Filing No. 1" Final Drainage Report and CDs, prepared by M&S Civil Consultants, Inc. approved Nov. 2018. It is anticipated that the proposed Pond 1 storm outfall will connect directly to this facility. These flows are then routed via the existing 54" RCP public storm system directly to Sand Creek.

Added

(per Sterling Ranch design)

Added

maintained by Sterling Ranch metro district?

Additional language added to narrative under D3A description. Additional Pond C info. included in ref. material

Include write up for Pond C: Area and imperviousness from Jaynes portion was assumed in Homestead FDR vs. what is being directed. Is it more or less & higher/lower % impervious? Include a copy of Pond C calculations in Reference material

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EFFECTIVE IMPERVIOUSNESS - POND 1

Basin	Acreage	Imp.%
EX-3	44.3	5%
OS-1	2.0	10%
OS-2	5.3	10%
D	9.3	65%
E	5.8	95%
F	13.2	30%
G	26.8	30%
H	4.8	95%
I	11.7	65%
J	20.4	30%
K	6.9	7%
Total	**150.5**	**30.1%**

DRAINAGE CRITERIA

Hydrologic calculations were performed using the City of Colorado Springs/El Paso County Drainage Criteria Manual, as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014. Individual basin design used for detention/SWQ basin sizing was calculated using the Rational Method. Runoff Coefficients are based on the imperviousness of the particular land use and the hydrologic soil type in accordance with Table 6-6. The average rainfall intensity, by recurrence interval found in the Intensity-Duration-Frequency (IDF) curves in Figure 6-5. Mile High Flood District (MHFD)-Detention spreadsheet Ver. 4.05 used for Preliminary Detention/SWQ design. (See Appendix)

The City of Colorado Springs/El Paso County DCM requires the Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainage ways, and implementing long-term source controls. The

Four Step Process pertains to management of smaller, frequently occurring storm events, as opposed to larger storms for which drainage and flood control infrastructure are sized. Implementation of these four steps helps to achieve storm water permit requirements.

This site adheres to this **Four Step Process** as follows:

1. **Employ Runoff Reduction Practices:** Proposed urban lot impervious areas (roof tops, patios, etc.) will sheet flow across landscaped yards and through open space areas to slow runoff and increase time of concentration prior to being conveyed to the proposed public streets or detention facilities. This will minimize directly connected impervious areas within the project site.

2. **Stabilize Drainageways:** The two major natural drainageways on-site within basins A, G and J will be overlot graded and urbanized with the proposed residential development. Within this development, urban street sections will be constructed along with buried storm systems to handle the developed runoff. After developed flows utilize the runoff reduction practices through the front and rear yards, developed flows will travel via curb and gutter within the public streets and Added ublic storm systems. These collected flows are then routed directly to the proposed extended detention basin (full-spectrum facility).

   Discuss the issues, anticipated problems, possible improvements/ solutions needed to address these drainageways and the conveyances to design points D2, D3 and D7.

3. **Provide Water Quality Capture Volume (WQCV):** Runoff from this development will be treated through capture and slow release of the WQCV and excess urban runoff volume (EURV) in the proposed Full-Spectrum permanent Extended Detention Basin designed per current El Paso County drainage criteria.

4. **Consider need for Industrial and Commercial BMPs**: No industrial uses are proposed within this development. However, a site-specific storm water quality and erosion control

plan and narrative will be submitted along with the grading and erosion control plan. Details such as site-specific sediment and erosion control construction BMP's as well as temporary and permanent BMP's for commercial use will be detailed in this plan and narrative to protect receiving waters. Multiple temporary BMP's are anticipated based on specific phasing of the overall development. BMP's will be constructed and maintained as the development has been graded and erosion control methods employed.

Address emergency overflow conveyances through the site per ECM Update 6.12.0 (may follow existing drainageways?) Identify that a hydraulic analysis of the drainageways (in basins G, C, & A) will be provided at the subdivision stage with the final drainage reports.

FLOODPLAIN STATEMENT

No portion of this site is located within a floodplain as Added to item 2 Stabilize Drainageways above surance Rate Maps (F.I.R.M.) Map Numbers 08041C0533G and 0841C mber 7, 2018 (See Appendix).

DRAINAGE AND BRIDGE FEES

Any applicable fees shall be provided prior to final plat recordation of any development within this site. The following represents the anticipated overall fees for the property:

<u>Sand Creek Drainage Basin</u>

The property has a total area of 142.127-acres and lies entirely within the Sand Creek Drainage Basin boundaries. The following are fees based on the proposed land uses as defined on the Sketch Plan and calculated using the following impervious acreage method approved by El Paso County. The proposed Right-of-way area has been added to the adjacent residential uses:

<u>Fees for Detention Facilities, Open Space buffers & Park</u>

(Per El Paso County Percent Impervious Chart: **7%**)

14.5 Ac. x 7% = **1.02 Impervious Ac.**

Fees for 1.0 Ac. lots

(Per El Paso County Percent Impervious Chart: 20**%)**

12.8 Ac. x 20% = **2.56 Impervious Ac.**

Fees for 1/2 Ac. Avg. lots

(Per El Paso County Percent Impervious Chart: 25**%)**

14.4 Ac. x 25% = **3.6 Impervious Ac.**

Fees for 1/3 Ac. Avg. lots

(Per El Paso County Percent Impervious Chart: 30**%)**

66.5 Ac. x 30% = **19.95 Impervious Ac.**

Fees for 1/8 Ac. Avg. or less lots

(Per El Paso County Percent Impervious Chart: 65%)

29.4 Ac. x 65% = **19.11 Impervious Ac.**

Fees for Commercial Site

(Per El Paso County Percent Impervious Chart: 95**%**)

4.5 Ac. x 95% = **4.28 Impervious Ac.**

Total Impervious Acreage: 50.52 Imp. Ac.

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The following calculations are based on the 2022 Sand Creek drainage/bridge fees:

ESTIMATED FEE TOTALS:

Bridge Fees

$ 8,923.00 x 50.52 Impervious Ac.	=	**$ 450,789.96**

Drainage Fees

$ 21,814.00 x 50.52 Impervious Ac.	=	**$ 1,102,043.28**

Final fee estimates for individual future filings will be handled under separate drainage reports upon submission of individual filing plats.

SUMMARY

The proposed Jaynes property development is within the Upper reach of the Sand Creek Drainage Basin. Recommendations are made within this report concerning necessary improvements that may be required as a result of development of this property. The points of storm water release from the proposed site are required to be at or below the calculated historic flow quantities. This development does not hinder any downstream facility or property to an extent greater than that which currently exists in the 'historic' conditions. All drainage facilities within this report were sized according to the Drainage Criteria Manuals and the full-spectrum storm water quality requirements. Upon development of the individual parcels within the Jaynes property, separate Final Drainage Reports will be required to be submitted and approved by El Paso County that details all storm systems, pond design and fee calculation.

Revised

impact?

PREPARED BY:

Classic Consulting Engineers & Surveyors, LLC

Marc A. Whorton, P.E.
Project Manager

maw/1305.20/130520 MDDP.doc

REFERENCES

1. City of Colorado Springs/County of El Paso Drainage Criteria Manual as revised in November 1991 and October 1994 with County adopted Chapter 6 and Section 3.2.1 of Chapter 13 of the City of Colorado Springs/El Paso County Drainage Criteria Manual as revised in May 2014.

2. "Urban Storm Drainage Criteria Manual Volume 1, 2 & 3" Urban Drainage and Flood Control District, dated January 2016.

3. "Sand Creek Drainage Basin Planning Study," Kiowa Engineering Corporation, dated March 1996.

4. "2018 Sterling Ranch MDDP", M&S Civil Consultants, Inc., June 2018

5. "Final Drainage Report for Retreat at TimberRidge Filing No. 1", Classic Consulting, approved November, 2020.

6. "Final Drainage Report for Homestead North at Sterling Ranch Filing No. 1", JR Engineering, LLC, dated June 2022

7. "Final Drainage Report for Homestead at Sterling Ranch Filing No. 1", M&S Civil Consultants, Inc. dated Nov. 2018

8. "MDDP Amendment for Sterling Ranch", JR Engineering, LLC, dated June 2022

APPENDIX

VICINITY MAP

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Google Maps Jaynes Property Vicinity Map

Imagery ©2022 CNES / Airbus, Maxar Technologies, USDA/FPAC/GEO, Map data ©2022 500 ft

SOILS MAP (S.C.S SURVEY)

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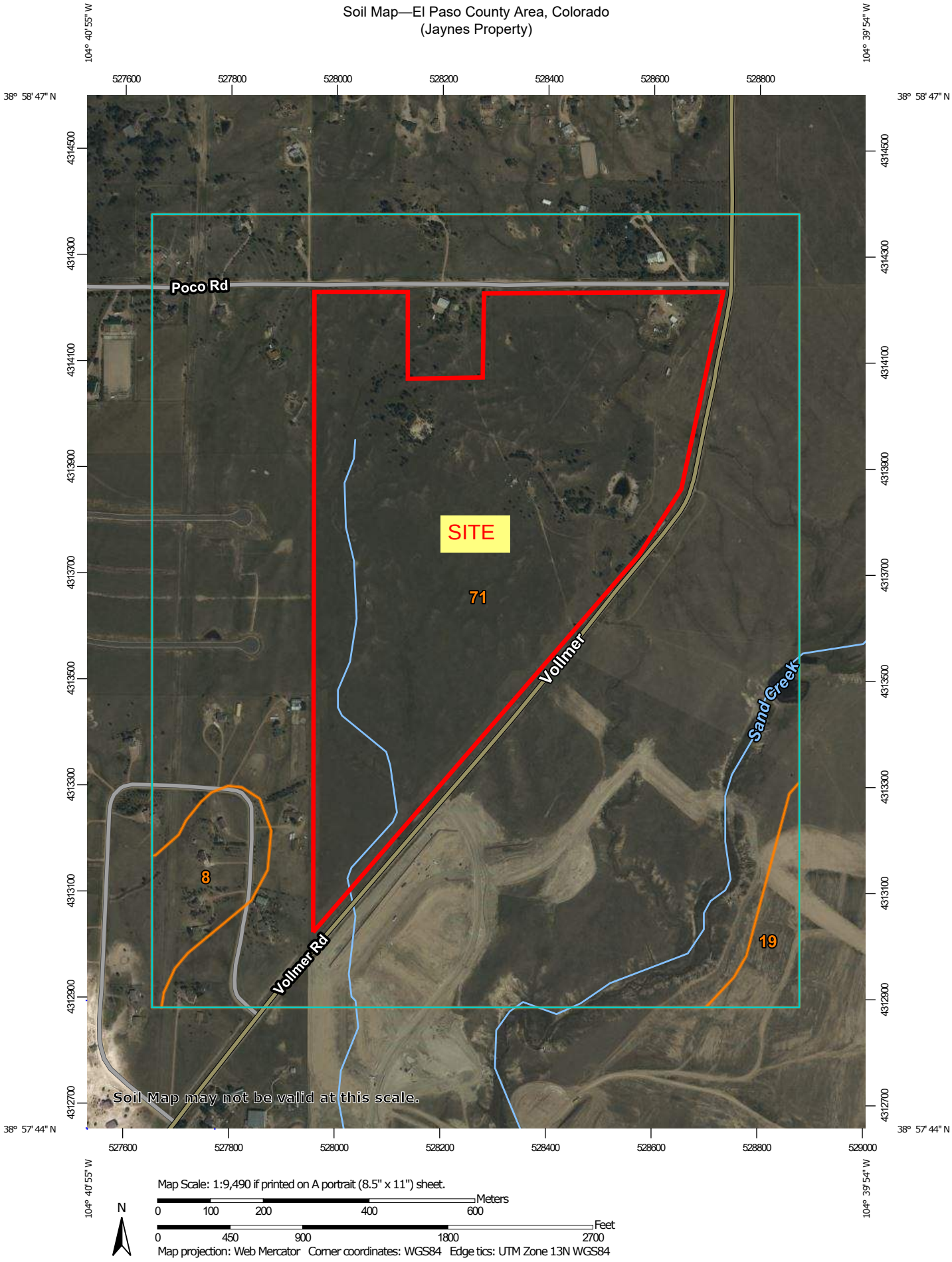
Soil Map—El Paso County Area, Colorado
(Jaynes Property)



Map Scale: 1:9,490 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 450 900 1800 2700

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 19, 2018—May 26, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8	Blakeland loamy sand, 1 to 9 percent slopes	13.2	2.9%
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	7.8	1.7%
71	Pring coarse sandy loam, 3 to 8 percent slopes	433.5	95.4%
Totals for Area of Interest		**454.5**	**100.0%**

El Paso County Area, Colorado

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

F.E.M.A. MAP

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NOTES TO USERS

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The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

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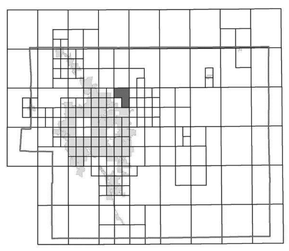
El Paso County Vertical Datum Offset Table

Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



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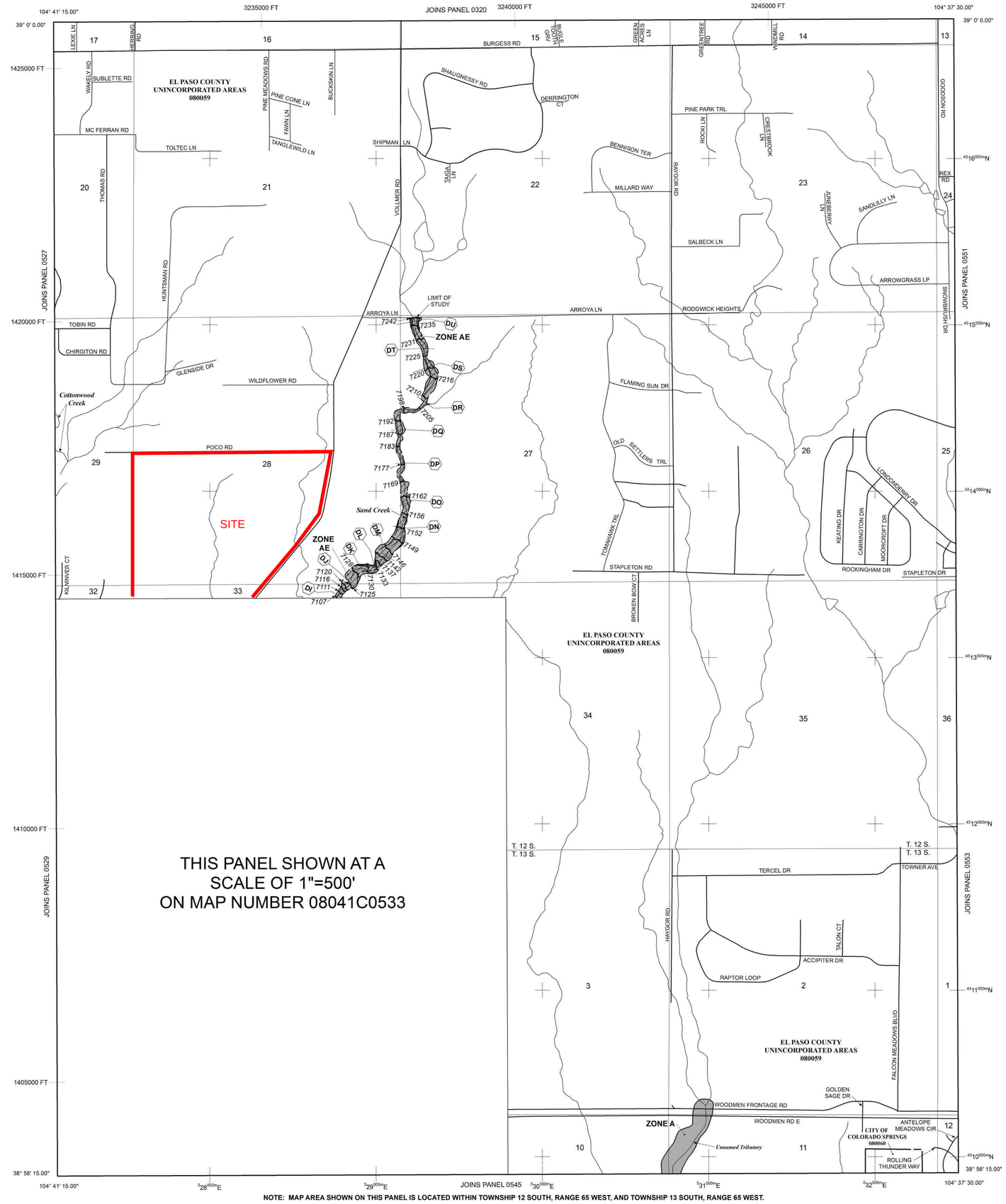

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 12 SOUTH, RANGE 65 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0535G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 535 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0535	G
EL PASO COUNTY	080059	0535	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0535G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

NOTES TO USERS

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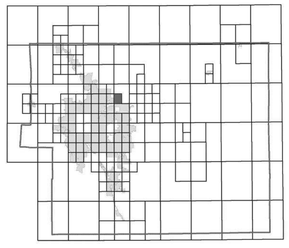

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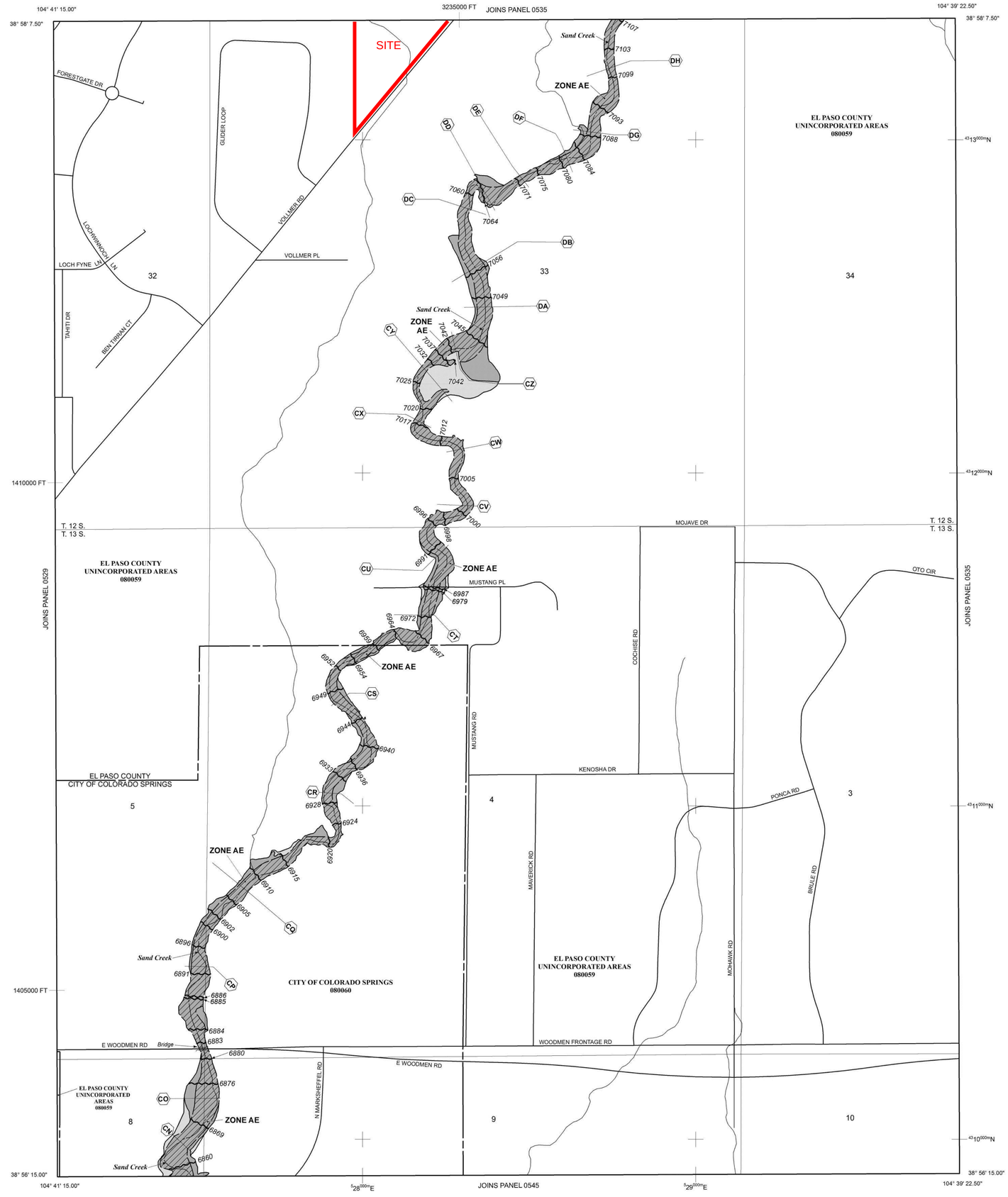

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ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A — A	Cross section line
23 - - - - - 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4275000mN	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0533G

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 533 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0533	G
EL PASO COUNTY	080059	0533	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0533G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency

WETLANDS JURISDICTIONAL DETERMINATION (JD)

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, ALBUQUERQUE DISTRICT
SOUTHERN COLORADO REGULATORY BRANCH
201 WEST 8TH STREET, SUITE 350
PUEBLO, COLORADO 81003

June 30, 2022

Regulatory Division

SUBJECT: Jurisdictional Determination- Action No.SPA-2022-00123

Classic Communities
Attn: Loren Moreland
6385 Corporate Dr., Suite 200
Colorado Springs, Colorado 80919
lorenm@classichomes.com

Dear Mr. Moreland:

This letter responds to your request for a jurisdictional determination (JD) for forty (40) wetlands and one man-made pond associated with the *Classic Communities-Jayne's Parcel*, residential development. The approximately 141-acre project site is located near Sand Creek, centered at latitude 38.976682°, longitude -104.668357°, Colorado Springs, El Paso County, Colorado. We have assigned Action No. SPA-2022-00123 to your request. Please reference this number in all future correspondence concerning the site.

Based on the information provided, we concur with your aquatic resource delineation for the site, as depicted on the enclosed drawing labeled, *SPA-2022-00123, Figure 1*, prepared by Core Consultants, Inc. (enclosure 1). We have determined that the site does not contain waters of the United States that are subject to regulation under Section 404 of the Clean Water Act. The approximately 9.66-acres of aquatic resources identified as *Wetlands WT-A1* through *WT-A40* and one man-made pond, on the above drawing are intrastate isolated aquatic resources with no apparent interstate or foreign commerce connection. As such, these aquatic resources are not regulated by the U.S. Army Corps of Engineers. This disclaimer of jurisdiction is only for Section 404 of the Federal Clean Water Act.

We are enclosing a copy of the *Approved Jurisdictional Determination Form* for your site (enclosure 2). A copy of this JD is also available at http://www.spa.usace.army.mil/reg/JD. This approved JD is valid for five years unless new information warrants revision of the determination before the expiration date.

You may accept or appeal this approved JD or provide new information in accordance with the attached Notification of Administration Appeal Options and Process and Request for Appeal (NAAOP-RFA) (enclosure 3). If you elect to appeal this approved JD, you must complete Section II of the form and return it to the Army Engineer Division, South Pacific, CESPD-PDS-O, Attn: Tom Cavanaugh, Administrative

Appeal Review Officer, P.O. Box 36023, 450 Golden Gate Ave, San Francisco, CA 94102 within 60 days of the date of this notice. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety and waive all rights to appeal the approved JD.

If you have any questions, please contact Senior Project Manager Kyle Zibung by email at kyle.d.zibung@usace.army.mil, or telephone at (651) 290-5877. For program information or to complete our Customer Survey, visit our website at https://www.spa.usace.army.mil/Missions/Regulatory-Program-and-Permits/.

Sincerely,

for Kara Hellige
Chief, Southern Colorado Branch

Enclosures

cc:
Natalie Graves, Core Consultants, Inc. (ngraves@liveyourcore.com)

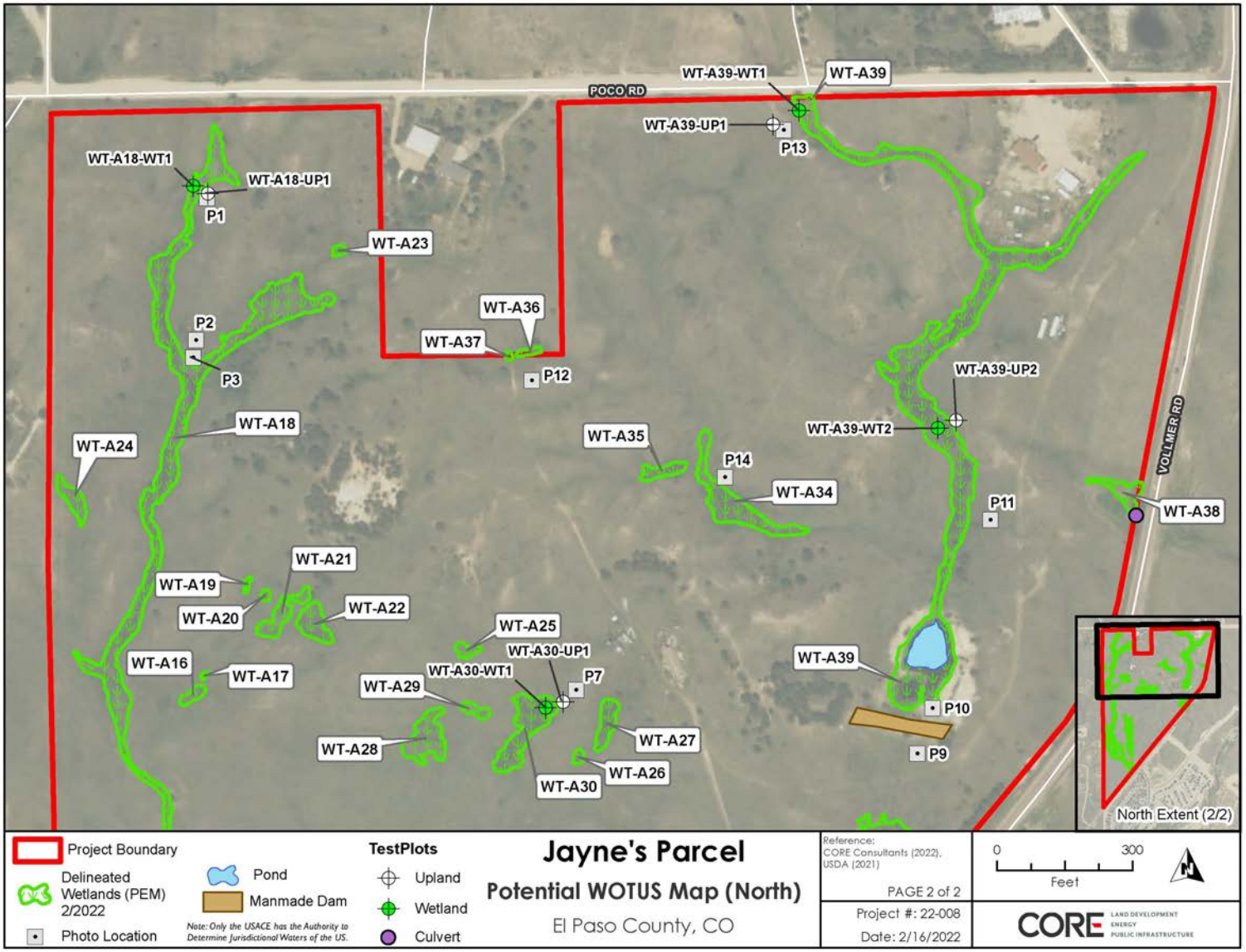


Figure 4.4 Potential WOTUS Location Map (North)

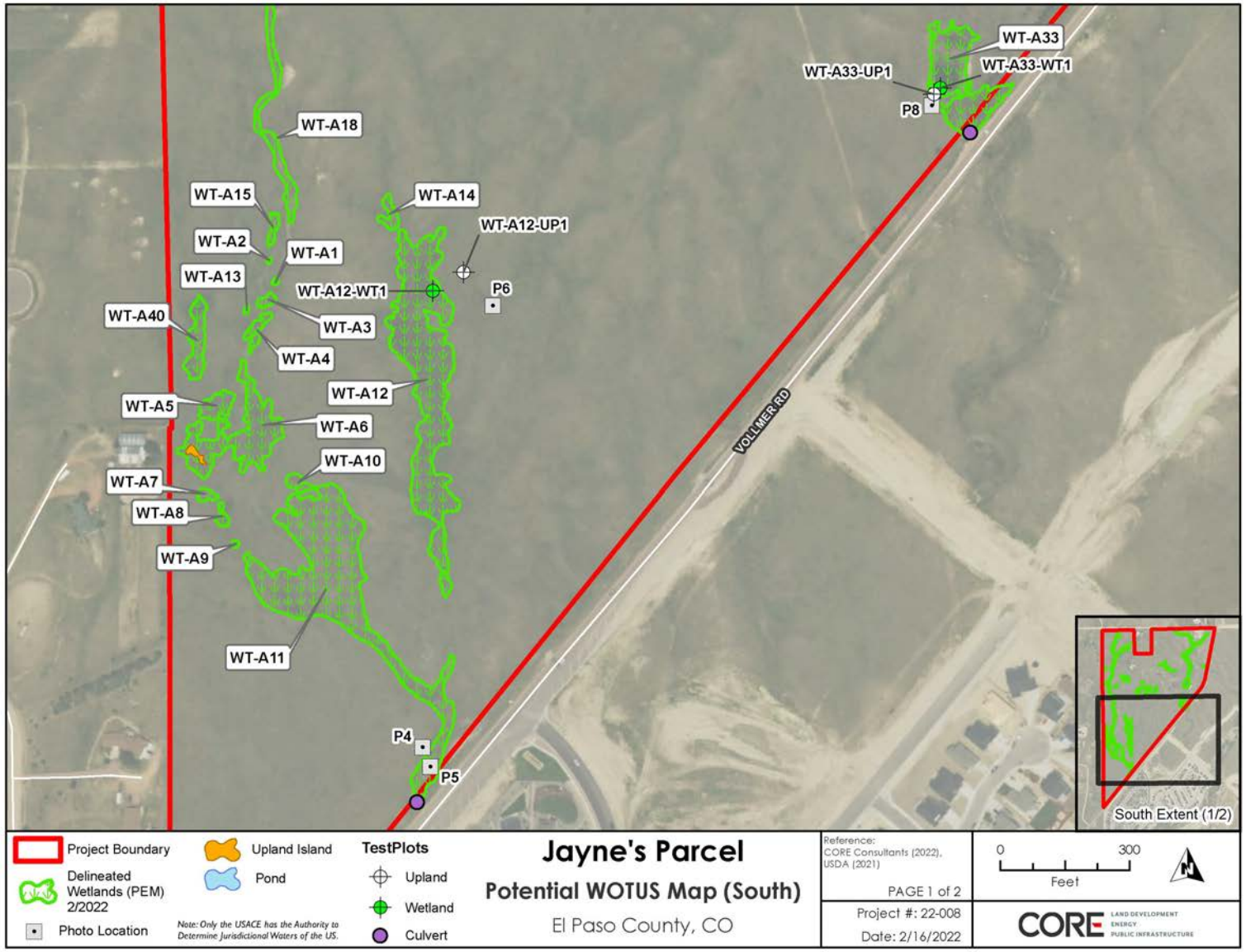


Figure 4.4 Potential WOTUS Location Map (South)

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): June 30, 2022

B. ST PAUL, MN DISTRICT OFFICE, FILE NAME, AND NUMBER: SPA-2022-00123, Classic Communities-Jayne's Parcel AJD

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Colorado County/parish/borough: El Paso City: Colorado Springs

Center coordinates of site (lat/long in degree decimal format): Lat. 38.976682° **N**, Long. -104.668357° **W**.

Universal Transverse Mercator: 13

Name of nearest waterbody: Sand Creek

Name of watershed or Hydrologic Unit Code (HUC): 11020003-Fountain

- ☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- ☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

- ☒ Office (Desk) Determination. Date: June 2, 2022
- ☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There are no "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There are no"*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

1. **Waters of the U.S.:** N/A

2. **Non-regulated waters/wetlands (check if applicable):**[1]

☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **The review area for this determination is comprised of 40 individual Wetlands (identified as WT A1 through WT-A40) totaling 9.51 acres and one man-made pond totaling 0.15 acre located on the approximately 141-acre tract. Based on a review of the National Hydrography Dataset (NHD) the nearest mapped potential relatively permanant water (RPW) is Sand Creek located approximately 1,500 feet southeast of the review area. The National Wetland Inventory (NWI) and NHD shows mapped wetland drainages with two mapped ephemeral streams in the eastern and western portion of the review area, however, the February 2022 Core Consultants, Inc., wetland delineation report (Core Report) did not find any defined bed/banks nor ordinary high water mark indicators within these two mapped features. The Core Report determined the mapping layers to be inaccurate and best characterized both features as multiple depressional wetlands seperated by upland swales. The upland swales sever a surface connection between the wetlands, pond, and Sand Creek. The Core Report notes that a culvert is present under Vollmer Road in the eastern portion of the review area near WT-A38, however, the outlet channel is comprised of a meandering upland swale with no observed surface connection to Sand Creek. Much of the land south of the JD review area has been previously graded for residential development resulting in altered surface hydrology patterns. Due to their small size and/or disturbed characteristics, Wetlands WT-A1 through WT-A40 and the man-made pond provide limited habitat functions to surrounding areas and exhibit tenuous ecological connections to nearby surface waters. Based on this information, the Corps has determined that Wetlands WT-A1 through WT-A40 and the man-made pond are isolated features with no surface or shallow subsurface hydrologic connection or ecological connection to a RPW or TNW. Wetlands WT-A1 through WT-A40 and the man-made pond do not border, neighbor, nor are contiguous with another water of the U.S. Wetlands WT-A1 through WT-A40 and the man-made pond are not seperated from other WOTUS by man-made dikes, barriers, or berms. Wetlands WT-A1 through WT-A40 and the man-made pond do not support a link to interstate or foreign commerce; they are not known to be used by interstate or foreign travelers for recreation or**

[1] Supporting documentation is presented in Section III.F.

other purposes; They do not produce fish or shellfish that could be taken and sold in interstate or foreign commerce; and they are not known to be used for industrial purposes by industries in interstate commerce. Therefore, the Corps has determined that Wetlands WT-A1 through WT-A40 and the man-made pond are isolated and therfore not regulated by the Corps under Section 404 of the CWA.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs: N/A

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY): N/A

C. SIGNIFICANT NEXUS DETERMINATION: N/A

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY): N/A

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): N/A

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- ☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- ☒ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
  - ☒ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- ☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- ☐ Other (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- ☒ Lakes/ponds: 0.15 acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☒ Wetlands: 9.51 acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- ☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- ☐ Lakes/ponds: acres.
- ☐ Other non-wetland waters: acres. List type of aquatic resource: .
- ☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: February 2022 Core Consultants, Inc. Wetland Delineation Report
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☒ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps:
- ☐ Corps navigable waters' study:
- ☒ U.S. Geological Survey Hydrologic Atlas:
  - ☒ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24K Falcon NW
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: El Paso County Soil Survey
- ☒ National wetlands inventory map(s). Cite name: USFWS National Wetland Inventory
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date):2020, 2018, 2017, 2015, 2013, 2010 2008, 2006, 2005, 2000, 1994
or ☐ Other (Name & Date):

☐ Previous determination(s). File no. and date of response letter:

☐ Applicable/supporting case law:

☐ Applicable/supporting scientific literature:

☐ Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Classic Communities c/o Loren Moreland	File No.: SPA-2022-00123	Date: June 30, 2022
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
→	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

Kyle Zibung
U.S. Army Corps of Engineers
201 West 8th Street, Suite 350
Pueblo, Colorado 81003
Phone: 651-290-5877
Email: kyle.d.zibung@usace.army.mil

If you only have questions regarding the appeal process you may also contact:

Thomas J. Cavanaugh
Administrative Appeal Review Officer
U.S. Army Corps of Engineers
South Pacific Division
P.O. Box 36023, 450 Golden Gate Ave
San Francisco, California 94103-1399
Phone: 415-503-6574, FAX 415-503-6646)
Email: Thomas.J.Cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

HYDROLOGIC / STORMWATER QUALITY CALCULATIONS

CLASSIC SM
CONSULTING
ENGINEERS & SURVEYORS

JOB NAME: *JAYNES PROPERTY MDDP*
JOB NUMBER: *1305.02*
DATE: *11/23/22*
CALCULATED BY: *MAW*

FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

		DEVELOPED AREA/IMPERVIOUS AREA				LANDSCAPE/UNDEVELOPED AREAS				WEIGHTED			WEIGHTED CA			IMPERVIOUSNESS
BASIN	TOTAL AREA (AC)	AREA (AC)	C(2)	C(5)	C(100)	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	**CA(2)**	**CA(5)**	**CA(100)**	%
EX-A	0.78	0.00	0.03	0.09	0.36	0.78	0.03	0.09	0.36	0.03	0.09	0.36	**0.02**	**0.07**	**0.28**	2%
EX-B	2.80	0.00	0.03	0.09	0.36	2.80	0.03	0.09	0.36	0.03	0.09	0.36	**0.08**	**0.25**	**1.01**	2%
EX-C	41.40	0.00	0.03	0.09	0.36	41.40	0.03	0.09	0.36	0.03	0.09	0.36	**1.24**	**3.73**	**14.90**	2%
EX-D	1.30	0.00	0.03	0.09	0.36	1.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.04**	**0.12**	**0.47**	2%
EX-E	72.40	0.00	0.03	0.09	0.36	72.40	0.03	0.09	0.36	0.03	0.09	0.36	**2.17**	**6.52**	**26.06**	2%
EX-F	8.70	0.00	0.03	0.09	0.36	8.70	0.03	0.09	0.36	0.03	0.09	0.36	**0.26**	**0.78**	**3.13**	2%
EX-G	8.30	0.00	0.03	0.09	0.36	8.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.25**	**0.75**	**2.99**	2%
EX-H	6.50	0.00	0.03	0.09	0.36	6.50	0.03	0.09	0.36	0.03	0.09	0.36	**0.20**	**0.59**	**2.34**	2%
OS-1	2.00	2.00	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.12**	**0.26**	**0.80**	10%
OS-2	5.30	5.30	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.32**	**0.69**	**2.12**	10%
EX-3	44.30	44.30	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.77**	**4.65**	**16.61**	5%
EX-4A	77.00	77.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**3.08**	**8.09**	**28.88**	5%
EX-4B	70.00	70.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**2.80**	**7.35**	**26.25**	5%
A	33.10	33.10	0.17	0.24	0.47	0.00	0.02	0.08	0.35	0.17	0.24	0.47	**5.46**	**7.78**	**15.39**	27%
B	2.30	1.30	0.18	0.25	0.47	1.00	0.05	0.12	0.39	0.12	0.19	0.44	**0.28**	**0.45**	**1.00**	30%
C	6.80	1.10	0.41	0.45	0.59	5.70	0.05	0.12	0.39	0.11	0.17	0.42	**0.74**	**1.18**	**2.87**	16%
D	9.30	9.30	0.41	0.45	0.59	0.00	0.02	0.08	0.35	0.41	0.45	0.59	**3.81**	**4.19**	**5.49**	65%
E	5.80	5.80	0.79	0.81	0.88	0.00	0.02	0.08	0.35	0.79	0.81	0.88	**4.58**	**4.70**	**5.10**	95%
F	13.20	13.20	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**2.38**	**3.30**	**6.20**	30%
G	26.80	26.80	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**4.82**	**6.70**	**12.60**	30%
H	4.80	4.80	0.79	0.81	0.88	0.00	0.02	0.08	0.35	0.79	0.81	0.88	**3.79**	**3.89**	**4.22**	95%
I	11.70	11.70	0.41	0.45	0.59	0.00	0.02	0.08	0.35	0.41	0.45	0.59	**4.80**	**5.27**	**6.90**	65%
J	20.40	20.40	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**3.67**	**5.10**	**9.59**	30%
K	6.90	6.90	0.05	0.12	0.39	0.00	0.02	0.08	0.35	0.05	0.12	0.39	**0.35**	**0.83**	**2.69**	7%
L	1.30	0.65	0.12	0.20	0.44	0.65	0.03	0.09	0.36	0.08	0.15	0.40	**0.10**	**0.19**	**0.52**	11%
Total to Off-site Pond C (Tributary Basins: EX-4A, EX-4B, A, B, C)	189.20															**9.6%**
Total to on-site Pond 1 (Tributary Basins: EX-3, OS-1, OS-2, D thru K)	150.50															**30.1%**

JOB NAME:	*JAYNES PROPERTY MDDP*
JOB NUMBER:	*1305.02*
DATE:	*11/23/22*
CALC'D BY:	*MAW*

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$

Tc=L/V

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L}{180} + 10$$

*For buried riprap, select C_v value based on type of vegetative cover.

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED CA(2)	CA(5)	CA(100)	OVERLAND C(5)	Length (ft)	Height (ft)	Tc (min)	STREET / CHANNEL FLOW Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-A	0.02	0.07	0.28	0.09	240	9	18.3					18.3	2.58	3.23	5.41	0.1	**0.2**	**2**
EX-B	0.08	0.25	1.01	0.09	300	24	15.9	120	2.0%	1.0	2.0	17.9	2.60	3.25	5.46	0.2	**0.8**	**6**
EX-C	1.24	3.73	14.90	0.09	300	18	17.5	1300	2.9%	1.7	12.7	30.2	1.98	2.47	4.15	2	**9**	**62**
EX-D	0.04	0.12	0.47	0.09	225	10	16.7					16.7	2.68	3.36	5.64	0.1	**0.4**	**3**
EX-E	2.17	6.52	26.06	0.09	280	20	15.9	3400	2.5%	1.6	35.8	51.8	1.34	1.66	2.79	3	**11**	**73**
EX-F	0.26	0.78	3.13	0.09	300	12	20.0	560	2.0%	1.4	6.6	26.6	2.13	2.66	4.47	1	**2**	**14**
EX-G	0.25	0.75	2.99	0.09	300	10	21.2	420	2.0%	1.4	4.9	26.2	2.15	2.69	4.51	1	**2**	**13**
EX-H	0.20	0.59	2.34	0.09	300	10	21.2	800	2.0%	1.4	9.4	30.7	1.96	2.45	4.11	0.4	**1.4**	**10**
OS-1	0.12	0.26	0.80	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.8**	**4**
OS-2	0.32	0.69	2.12	0.08	300	12	20.2					20.2	2.46	3.08	5.16	1	**2**	**11**
EX-3	1.77	4.65	16.61	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	4	**12**	**70**
EX-4A	3.08	8.09	28.88	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	4	**14**	**82**
EX-4B	2.80	7.35	26.25	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	3	**10**	**58**

JOB NAME: *JAYNES PROPERTY MDDP*
JOB NUMBER: *1305.02*
DATE: *11/23/22*
CALC'D BY: *MAW*

Return Period	1-Hour Depth
2	1.19
5	1.50
10	1.75
25	2.00
50	2.25
100	2.52

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L}}{S^{0.33}}$$

$$V = C_v S_w^{0.5}$$

Tc=L/V

Table 6-7. Conveyance Coefficient, C_v

Type of Land Surface	C_v
Heavy meadow	2.5
Tillage/field	5
Riprap (not buried)*	6.5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$t_c = \frac{L}{180} + 10$$

*For buried riprap, select C_v value based on type of vegetative cover.

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED CA(2)	WEIGHTED CA(5)	WEIGHTED CA(100)	OVERLAND C(5)	OVERLAND Length (ft)	OVERLAND Height (ft)	OVERLAND Tc (min)	STREET / CHANNEL FLOW Length (ft)	STREET / CHANNEL FLOW Slope (%)	STREET / CHANNEL FLOW Velocity (fps)	STREET / CHANNEL FLOW Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	INTENSITY I(5) (in/hr)	INTENSITY I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	TOTAL FLOWS Q(5) (cfs)	TOTAL FLOWS Q(100) (cfs)
A	5.46	7.78	15.39	0.08	100	2	14.7	1000	2.0%	2.8	5.9	20.5	2.44	3.05	5.12	13	**24**	**79**
B	0.28	0.45	1.00	0.12	100	2	14.1	500	2.0%	2.8	2.9	17.0	2.66	3.33	5.59	1	**1**	**6**
C	0.74	1.18	2.87	0.12	300	14	18.4	500	2.0%	1.4	5.9	24.3	2.24	2.80	4.69	2	**3**	**13**
D	3.81	4.19	5.49	0.08	100	2	14.7	800	2.0%	2.8	4.7	19.4	2.51	3.14	5.27	10	**13**	**29**
E	4.58	4.70	5.10	0.08	50	1	10.4	550	1.5%	2.4	3.7	14.1	2.89	3.61	6.07	13	**17**	**31**
F	2.38	3.30	6.20	0.08	100	2	14.7	600	2.0%	2.8	3.5	18.2	2.58	3.23	5.43	6	**11**	**34**
G	4.82	6.70	12.60	0.08	100	2	14.7	1500	2.0%	2.8	8.8	23.5	2.28	2.85	4.78	11	**19**	**60**
H	3.79	3.89	4.22	0.08	30	0.6	8.0	1150	1.5%	2.4	7.8	15.8	2.75	3.44	5.77	10	**13**	**24**
I	4.80	5.27	6.90	0.08	100	2	14.7	700	1.5%	2.4	4.8	19.4	2.51	3.13	5.26	12	**17**	**36**
J	3.67	5.10	9.59	0.08	100	2	14.7	1000	1.5%	2.4	6.8	21.5	2.39	2.98	5.01	9	**15**	**48**
K	0.35	0.83	2.69	0.08	100	2	14.7	350	1.0%	1.0	5.8	20.5	2.44	3.05	5.13	1	**3**	**14**
L	0.10	0.19	0.52	0.09	100	5	10.7	150	4.0%	2.0	1.3	12.0	3.08	3.86	6.48	0.3	**0.7**	**3**

JOB NAME: *JAYNES PROPERTY MDDP*
JOB NUMBER: *1305.02*
DATE: *11/23/22*
CALCULATED BY: *MAW*

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Inlet Size
					I(5)	I(100)	Q(5)	Q(100)	
E1	EX-4A	8.09	28.88	50.5	1.70	2.85	14	82	EX. 24" CMP CULVERT
E2	EX-4B	7.35	26.25	64.9	1.32	2.22	10	58	EX. STOCK OFF-SITE POND
E3	EX-A, EX-B	0.32	1.29	18.3	3.23	5.41	1	7	TYPE D CDOT INLET W/ 24" RCP
E4	EX-4A, EX-4B, EX-C	19.16	70.03	64.9	1.32	2.22	25	155	PLANNED 48" RCP W/ MH AND GRATE
E5	EX-3	4.65	16.61	29.1	2.53	4.24	12	70	EX. 24" CMP CULVERT
E6	EX-G	0.75	2.99	26.2	2.69	4.51	2	13	TYPE D CDOT INLET W/ 24" RCP
E7	EX-H	0.59	2.34	30.7	2.45	4.11	1	10	TYPE C CDOT INLET W/ 18" RCP
E8	EX-3, EX-E, OS-2	11.86	44.80	51.8	1.66	2.79	20	125	EX. 24" CMP CULVERT
E9	DP-E8, EX-F, OS-1	12.90	48.73	55.8	1.55	2.60	20	127	MODIFIED 4'X14' TYPE D CDOT INLET W/ 54" RCP
E10	EX-D	0.12	0.47	16.7	3.36	5.64	0.4	3	SHEET FLOW TO NATURAL RAVINE

JOB NAME: *JAYNES PROPERTY MDDP*
JOB NUMBER: *1305.02*
DATE: *11/23/22*
CALCULATED BY: *MAW*

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity		Flow		Inlet Size
					I(5)	I(100)	Q(5)	Q(100)	
D1	B	0.45	1.00	17.0	3.33	5.59	1	6	TYPE D CDOT INLET W/ 24" RCP
D2	EX-4A, EX-4B, A	23.21	70.52	64.9	1.32	2.22	31	156	FUTURE PUBLIC STORM SYSTEM
D3	Basin C	1.18	2.87	24.3	2.80	4.69	3	13	PLANNED 48" RCP W/ MH AND GRATE
D3A	D2, Basin C	24.39	73.39	66.9	1.28	2.14	31	157	EXIST. 48" PUBLIC STORM OUTFALL
D4	D	4.19	5.49	19.4	3.14	5.27	13	29	FUTURE PUBLIC STORM SYSTEM
D5	E	4.70	5.10	14.1	3.61	6.07	17	31	FUTURE PUBLIC STORM SYSTEM
D6	F	3.30	6.20	18.2	3.23	5.43	11	34	FUTURE PUBLIC STORM SYSTEM
D7	EX-3, G, 1/2 OS-2	11.70	30.27	37.9	2.13	3.57	25	108	FUTURE PUBLIC STORM SYSTEM
D8	I	5.27	6.90	19.4	3.13	5.26	17	36	FUTURE PUBLIC STORM SYSTEM
D9	J, 1/2 OS-2	5.44	10.65	21.5	2.98	5.01	16	53	FUTURE PUBLIC STORM SYSTEM
D10	L	0.19	0.52	12.0	3.86	6.48	0.7	3	NATURAL RAVINE
D11	**TOTAL INFLOW POND 1 (DP-4 thru DP-9, incl. K and OS-1)**	**35.68**	**68.11**	**42.9**	**1.94**	**3.26**	**69**	**222**	**FULL-SPECTRUM POND 1 FACILITY**

EFFECTIVE IMPERVIOUSNESS - POND C

Basin	Acreage	Imp.%
EX-4A	77.0	5%
EX-4B	70.0	5%
A	33.1	27%
B	2.3	30%
C	6.8	16%
Total	**189.2**	**9.6%**

EFFECTIVE IMPERVIOUSNESS - POND 1

Basin	Acreage	Imp.%
EX-3	44.3	5%
OS-1	2.0	10%
OS-2	5.3	10%
D	9.3	65%
E	5.8	95%
F	13.2	30%
G	26.8	30%
H	4.8	95%
I	11.7	65%
J	20.4	30%
K	6.9	7%
Total	**150.5**	**30.1%**

Design Procedure Form: Extended Detention Basin (EDB)

UD-BMP (Version 3.07, March 2018)

Designer:	**Marc A. Whorton, P.E.**
Company:	**Classic Consulting**
Date:	**November 22, 2022**
Project:	**Jaynes Property - MDDP**
Location:	**Pond 1**

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a	I_a = 30.1 %
B) Tributary Area's Imperviousness Ratio ($i = I_a / 100$)	i = 0.301
C) Contributing Watershed Area	Area = 150.500 ac
D) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = 0.42 in
E) Design Concept (Select EURV when also designing for flood control)	Choose One: ○ Water Quality Capture Volume (WQCV) ◉ Excess Urban Runoff Volume (EURV)
F) Design Volume (WQCV) Based on 40-hour Drain Time ($V_{DESIGN} = (1.0 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i) / 12 * Area$)	V_{DESIGN}= ac-ft
G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume ($V_{WQCV\ OTHER} = (d_6*(V_{DESIGN}/0.43))$	$V_{DESIGN\ OTHER}$= 1.859 ac-ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{DESIGN\ USER}$= ac-ft
I) NRCS Hydrologic Soil Groups of Tributary Watershed	
i) Percentage of Watershed consisting of Type A Soils	HSG_A = 0 %
ii) Percentage of Watershed consisting of Type B Soils	HSG_B = 100 %
iii) Percentage of Watershed consisting of Type C/D Soils	$HSG_{C/D}$ = 0 %
J) Excess Urban Runoff Volume (EURV) Design Volume For HSG A: $EURV_A = 1.68 * i^{1.28}$ For HSG B: $EURV_B = 1.36 * i^{1.08}$ For HSG C/D: $EURV_{C/D} = 1.20 * i^{1.08}$	$EURV_{DESIGN}$ = 4.664 ac-f t
K) User Input of Excess Urban Runoff Volume (EURV) Design Volume (Only if a different EURV Design Volume is desired)	$EURV_{DESIGN\ USER}$= ac-f t
2. Basin Shape: Length to Width Ratio (A basin length to width ratio of at least 2:1 will improve TSS reduction.)	L : W = 2.0 : 1
3. Basin Side Slopes	
A) Basin Maximum Side Slopes (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Z = 4.00 ft / ft
4. Inlet	
A) Describe means of providing energy dissipation at concentrated inflow locations:	Concrete Forebay
5. Forebay	
A) Minimum Forebay Volume (V_{FMIN} = 3% of the WQCV)	V_{FMIN} = 0.056 ac-ft
B) Actual Forebay Volume	V_F = 0.056 ac-ft
C) Forebay Depth (D_F = 30 inch maximum)	D_F = 30.0 in
D) Forebay Discharge	
i) Undetained 100-year Peak Discharge	Q_{100} = 224.00 cfs
ii) Forebay Discharge Design Flow ($Q_F = 0.02 * Q_{100}$)	Q_F = 4.48 cfs
E) Forebay Discharge Design	Choose One: ○ Berm With Pipe ◉ Wall with Rect. Notch ○ Wall with V-Notch Weir
F) Discharge Pipe Size (minimum 8-inches)	Calculated D_P = in
G) Rectangular Notch Width	Calculated W_N = 10.1 in

Design Procedure Form: Extended Detention Basin (EDB)

Designer:	**Marc A. Whorton, P.E.**
Company:	**Classic Consulting**
Date:	**November 22, 2022**
Project:	**Jaynes Property - MDDP**
Location:	**Pond 1**

6. Trickle Channel	
A) Type of Trickle Channel	Choose One: (●) Concrete ( ) Soft Bottom
F) Slope of Trickle Channel	S = 0.0070 ft / ft
7. Micropool and Outlet Structure	
A) Depth of Micropool (2.5-feet minimum)	D_M = 2.5 ft
B) Surface Area of Micropool (10 ft^2 minimum)	A_M = 170 sq ft
C) Outlet Type	Choose One: (●) Orifice Plate ( ) Other (Describe):
D) Smallest Dimension of Orifice Opening Based on Hydrograph Routing (Use UD-Detention)	$D_{orifice}$ = 2.99 inches
E) Total Outlet Area	A_{ot} = 46.57 square inches
8. Initial Surcharge Volume	
A) Depth of Initial Surcharge Volume (Minimum recommended depth is 4 inches)	D_{IS} = 6 in
B) Minimum Initial Surcharge Volume (Minimum volume of 0.3% of the WQCV)	V_{IS} = 243 cu ft
C) Initial Surcharge Provided Above Micropool	V_s= 85.0 cu ft
9. Trash Rack	
A) Water Quality Screen Open Area: $A_t = A_{ot} * 38.5*(e^{-0.095D})$	A_t = 1,350 square inches
B) Type of Screen (If specifying an alternative to the materials recommended in the USDCM, indicate "other" and enter the ratio of the total open are to the total screen are for the material specified.)	*Aluminum Amico-Klemp SR Series with Cross Rods 2" O.C.*
Other (Y/N): N	
C) Ratio of Total Open Area to Total Area (only for type 'Other')	User Ratio =
D) Total Water Quality Screen Area (based on screen type)	A_{total} = 1901 sq. in.
E) Depth of Design Volume (EURV or WQCV) (Based on design concept chosen under 1E)	H= 5.5 feet
F) Height of Water Quality Screen (H_{TR})	H_{TR}= 94 inches
G) Width of Water Quality Screen Opening ($W_{opening}$) (Minimum of 12 inches is recommended)	$W_{opening}$ = 20.2 inches

Design Procedure Form: Extended Detention Basin (EDB)

Designer: Marc A. Whorton, P.E.
Company: Classic Consulting
Date: November 22, 2022
Project: Jaynes Property - MDDP
Location: Pond 1

10. Overflow Embankment	
A) Describe embankment protection for 100-year and greater overtopping:	Buried Rip-Rap
B) Slope of Overflow Embankment (Horizontal distance per unit vertical, 4:1 or flatter preferred)	Ze = 4.00 ft / ft
11. Vegetation	Choose One: ○ Irrigated ◉ Not Irrigated
12. Access	
A) Describe Sediment Removal Procedures	Per Maintenance Manual

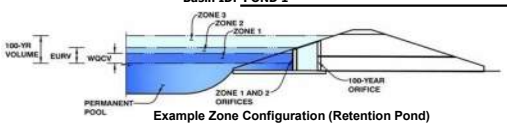
Notes:

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)

Project: **JAYNES PROPERTY - MDDP**

Basin ID: **POND 1**



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	**EDB**	
Watershed Area =	150.50	acres
Watershed Length =	4,400	ft
Watershed Length to Centroid =	2,200	ft
Watershed Slope =	0.020	ft/ft
Watershed Imperviousness =	30.10%	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 WQCV Drain Time =	40.0	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.

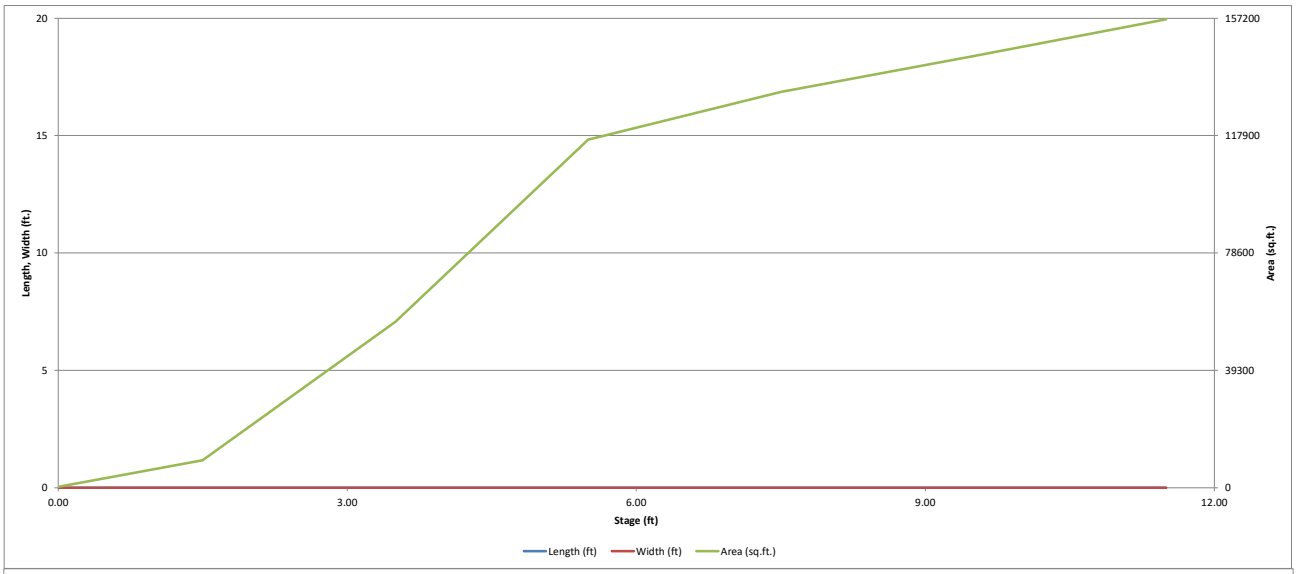
			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	1.904	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	4.650	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	4.726	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	7.661	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	10.364	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	14.440	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	17.523	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	21.638	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.48 in.) =	34.043	acre-feet	3.48	inches
Approximate 2-yr Detention Volume =	3.328	acre-feet		
Approximate 5-yr Detention Volume =	4.761	acre-feet		
Approximate 10-yr Detention Volume =	6.939	acre-feet		
Approximate 25-yr Detention Volume =	8.044	acre-feet		
Approximate 50-yr Detention Volume =	8.475	acre-feet		
Approximate 100-yr Detention Volume =	10.017	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	1.904	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.747	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	5.367	acre-feet
Total Detention Basin Volume =	10.017	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	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_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	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 = 1.00 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)
Top of Micropool	--	0.00	--	--	--	300	0.007		
7096	--	1.50	--	--	--	9,226	0.212	7,144	0.164
7098	--	3.50	--	--	--	55,588	1.276	71,958	1.652
7100	--	5.50	--	--	--	116,539	2.675	244,085	5.603
7102	--	7.50	--	--	--	132,547	3.043	493,171	11.322
7104	--	9.50	--	--	--	144,509	3.317	770,227	17.682
7106	--	11.50	--	--	--	156,874	3.601	1,071,610	24.601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15
10
5
0
Length, Width (ft.)
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117900
78600
39300
0
Area (sq.ft.)
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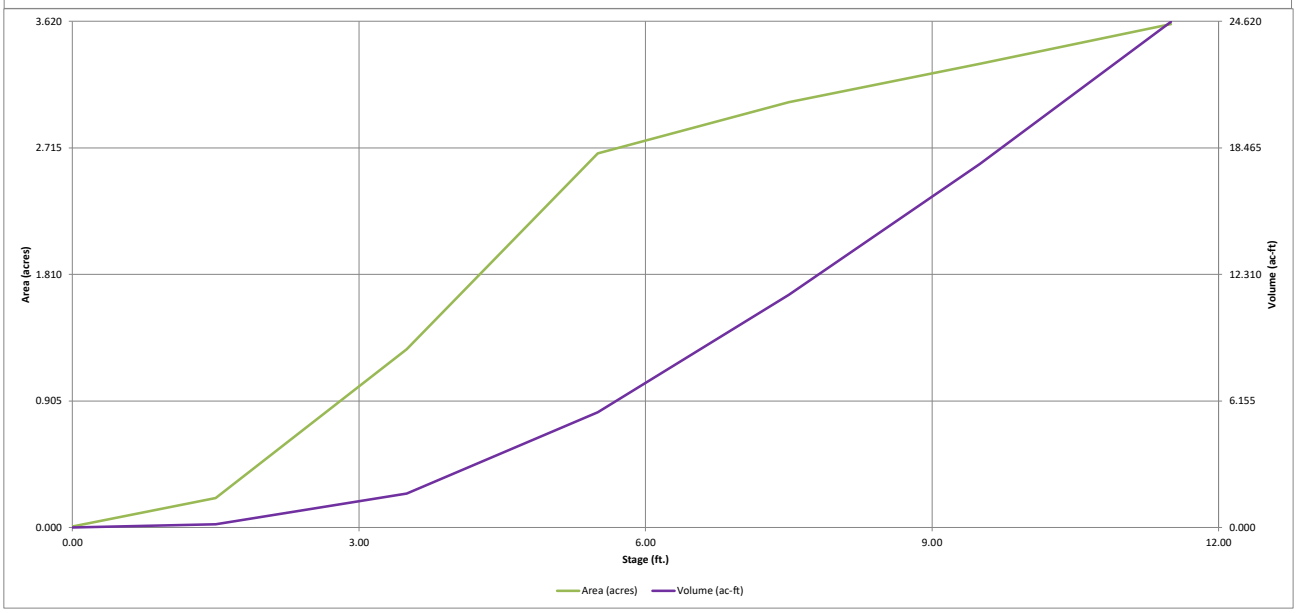
3.00
6.00
9.00
12.00
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)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2.715
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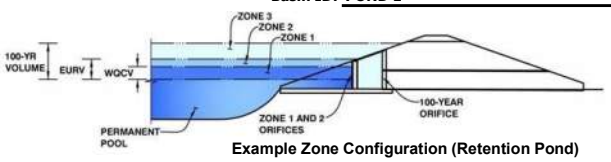
0.000
Area (acres)
24.620
18.465
12.310
6.155
0.000
Volume (ac-ft)
0.00
3.00
6.00
9.00
12.00
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Project: **JAYNES PROPERTY - MDDP**

Basin ID: **POND 1**



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	3.69	1.904	Orifice Plate
Zone 2 (EURV)	5.13	2.747	Orifice Plate
Zone 3 (100-year)	7.07	5.367	Weir&Pipe (Restrict)
Total (all zones)		10.017	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	5.50	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	22.00	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	sq. inches	Elliptical Slot Area =	N/A	ft^2

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.80	3.60	5.40				
Orifice Area (sq. inches)	7.00	7.57	16.00	16.00				

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	5.50	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	15.00	N/A	feet
Overflow Weir Grate Slope =	0.00	N/A	H:V
Horiz. Length of Weir Sides =	6.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	5.50	N/A	feet
Overflow Weir Slope Length =	6.00	N/A	feet
Grate Open Area / 100-yr Orifice Area =	6.51	N/A	
Overflow Grate Open Area w/o Debris =	62.64	N/A	ft^2
Overflow Grate Open Area w/ Debris =	31.32	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	2.50	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	42.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	42.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	9.62	N/A	ft^2
Outlet Orifice Centroid =	1.75	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	3.14	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	8.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	100.00	feet
Spillway End Slopes =	3.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	0.94	feet
Stage at Top of Freeboard =	10.44	feet
Basin Area at Top of Freeboard =	3.45	acres
Basin Volume at Top of Freeboard =	20.86	acre-ft

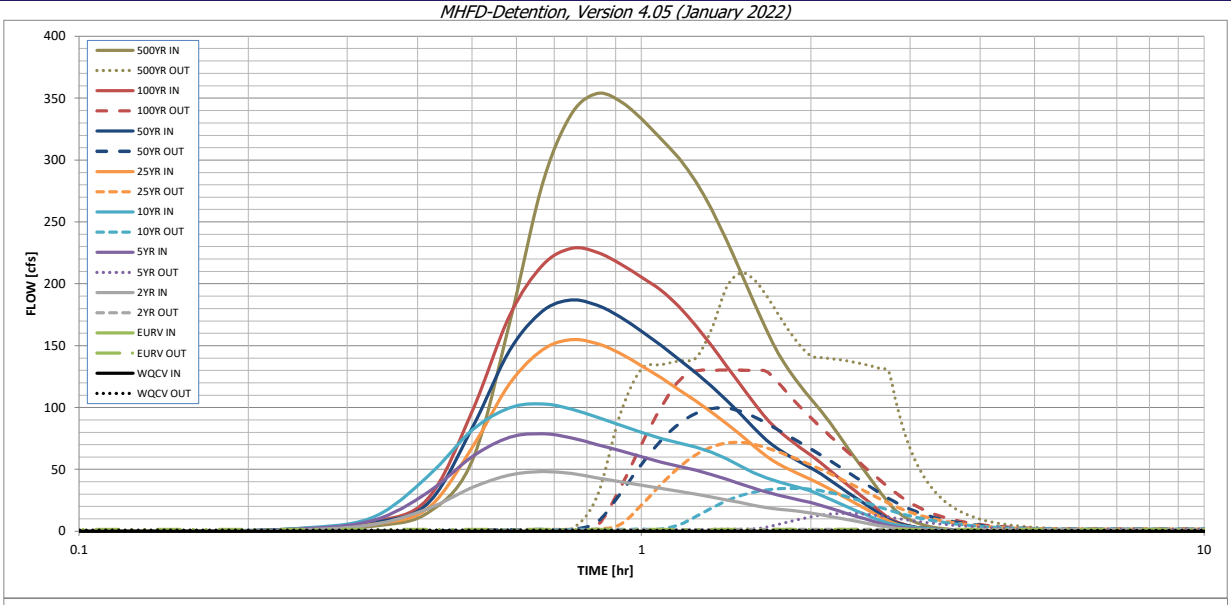
Routed Hydrograph Results

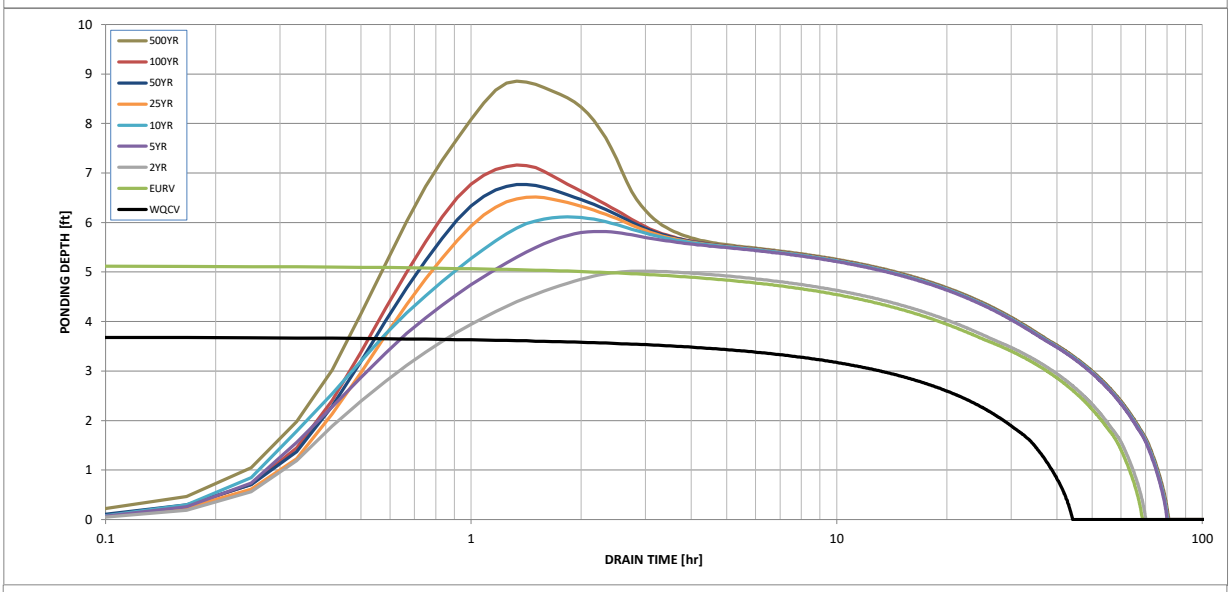
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

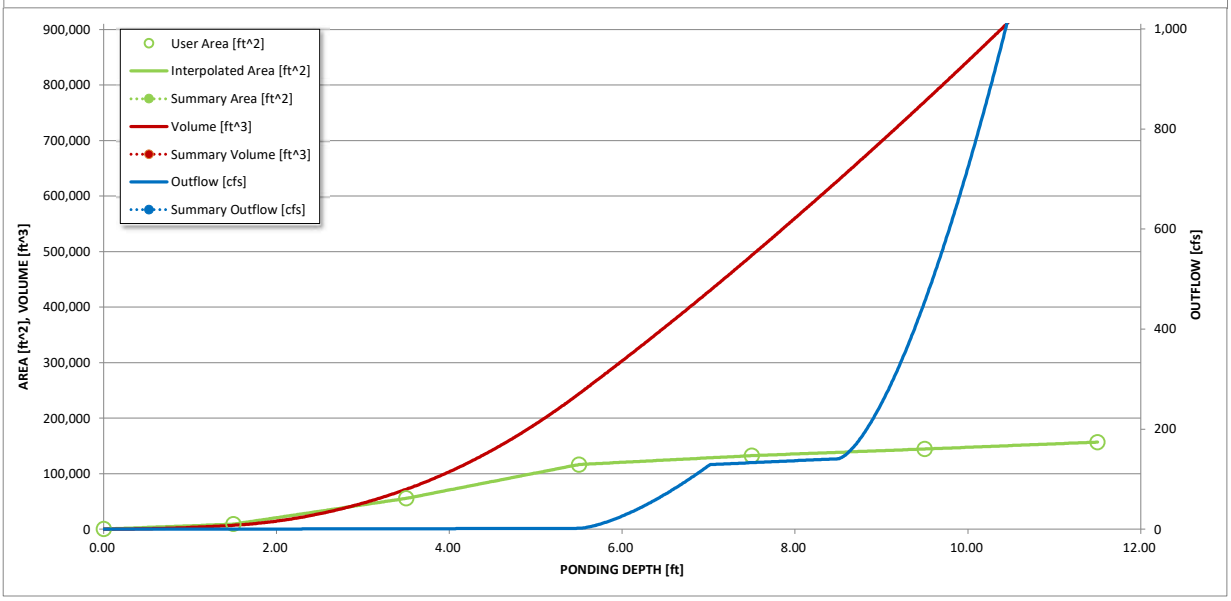
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.48
CUHP Runoff Volume (acre-ft) =	1.904	4.650	4.726	7.661	10.364	14.440	17.523	21.638	34.043
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	4.726	7.661	10.364	14.440	17.523	21.638	34.043
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	12.7	35.9	55.4	100.6	126.4	162.7	264.0
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A		18.9				133.7	
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.13	0.37	0.67	0.84	0.89	1.75
Peak Inflow Q (cfs) =	N/A	N/A	48.3	78.9	102.9	154.8	186.9	228.6	353.8
Peak Outflow Q (cfs) =	1.0	1.7	1.6	14.5	34.7	71.8	99.5	130.3	208.6
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.8	0.6	0.7	0.8	1.0	0.8
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.2	0.5	1.1	1.5	2.0	2.2
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	60	62	68	66	63	60	58	51
Time to Drain 99% of Inflow Volume (hours) =	**42**	65	66	75	74	72	71	69	65
Maximum Ponding Depth (ft) =	3.69	5.13	5.02	5.82	6.11	6.52	6.77	7.16	8.86
Area at Maximum Ponding Depth (acres) =	1.41	2.42	2.33	2.73	2.79	2.86	2.91	2.98	3.23
Maximum Volume Stored (acre-ft) =	1.907	4.661	4.376	6.469	7.270	8.399	9.120	10.298	15.555

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.01	0.70
	0:15:00	0.00	0.00	1.18	1.97	2.47	1.67	2.23	2.07	4.14
	0:20:00	0.00	0.00	5.31	8.66	11.42	5.79	6.96	7.67	14.79
	0:25:00	0.00	0.00	18.09	31.16	44.09	18.40	22.31	26.01	56.63
	0:30:00	0.00	0.00	35.29	60.25	81.76	67.45	83.22	96.77	168.78
	0:35:00	0.00	0.00	45.52	75.92	99.80	119.53	146.29	174.57	280.67
	0:40:00	0.00	0.00	48.27	78.88	102.95	146.65	177.81	214.82	336.82
	0:45:00	0.00	0.00	46.70	75.54	98.86	154.85	186.93	228.61	353.76
	0:50:00	0.00	0.00	43.26	70.20	92.20	151.77	182.68	225.60	347.62
	0:55:00	0.00	0.00	40.01	65.09	85.77	143.81	173.28	216.13	333.32
	1:00:00	0.00	0.00	37.19	60.24	79.91	133.77	161.55	205.36	316.97
	1:05:00	0.00	0.00	34.72	55.97	75.00	124.01	150.12	194.82	301.42
	1:10:00	0.00	0.00	32.39	52.58	71.30	114.29	138.82	181.41	282.33
	1:15:00	0.00	0.00	30.03	49.37	68.02	105.13	128.05	165.92	260.02
	1:20:00	0.00	0.00	27.71	45.82	63.89	96.11	117.15	149.85	235.53
	1:25:00	0.00	0.00	25.41	42.06	58.57	87.01	105.95	133.66	209.88
	1:30:00	0.00	0.00	23.15	38.33	52.84	77.97	94.83	118.47	185.59
	1:35:00	0.00	0.00	21.02	34.82	47.35	69.01	83.81	104.08	162.92
	1:40:00	0.00	0.00	19.20	31.72	43.22	60.67	73.67	91.18	143.81
	1:45:00	0.00	0.00	17.90	29.18	40.19	54.60	66.52	81.81	129.47
	1:50:00	0.00	0.00	16.95	27.03	37.62	49.79	60.75	74.25	117.58
	1:55:00	0.00	0.00	15.92	25.06	35.14	45.72	55.80	67.60	107.04
	2:00:00	0.00	0.00	14.77	23.17	32.48	42.00	51.26	61.57	97.42
	2:05:00	0.00	0.00	13.43	21.00	29.31	38.07	46.41	55.34	87.31
	2:10:00	0.00	0.00	11.96	18.63	25.88	33.84	41.16	48.91	76.79
	2:15:00	0.00	0.00	10.53	16.30	22.54	29.69	36.03	42.77	66.75
	2:20:00	0.00	0.00	9.18	14.08	19.37	25.73	31.14	37.00	57.26
	2:25:00	0.00	0.00	7.91	11.97	16.41	21.93	26.45	31.42	48.16
	2:30:00	0.00	0.00	6.69	9.96	13.62	18.27	21.95	25.99	39.37
	2:35:00	0.00	0.00	5.51	8.03	10.98	14.72	17.59	20.69	30.86
	2:40:00	0.00	0.00	4.39	6.22	8.54	11.31	13.42	15.58	22.97
	2:45:00	0.00	0.00	3.35	4.64	6.56	8.17	9.61	10.93	16.63
	2:50:00	0.00	0.00	2.54	3.60	5.26	5.88	7.05	7.93	12.42
	2:55:00	0.00	0.00	2.00	2.95	4.33	4.39	5.34	5.89	9.37
	3:00:00	0.00	0.00	1.64	2.44	3.57	3.36	4.12	4.36	7.04
	3:05:00	0.00	0.00	1.37	2.02	2.94	2.59	3.18	3.22	5.25
	3:10:00	0.00	0.00	1.15	1.66	2.42	2.02	2.49	2.37	3.90
	3:15:00	0.00	0.00	0.96	1.36	1.97	1.60	1.96	1.74	2.90
	3:20:00	0.00	0.00	0.79	1.11	1.59	1.26	1.54	1.30	2.20
	3:25:00	0.00	0.00	0.65	0.89	1.26	1.00	1.22	1.04	1.74
	3:30:00	0.00	0.00	0.54	0.70	0.98	0.79	0.96	0.83	1.37
	3:35:00	0.00	0.00	0.44	0.55	0.76	0.62	0.75	0.67	1.09
	3:40:00	0.00	0.00	0.34	0.42	0.59	0.48	0.58	0.52	0.84
	3:45:00	0.00	0.00	0.26	0.31	0.44	0.36	0.44	0.39	0.62
	3:50:00	0.00	0.00	0.19	0.22	0.32	0.26	0.32	0.28	0.44
	3:55:00	0.00	0.00	0.14	0.15	0.21	0.18	0.21	0.19	0.28
	4:00:00	0.00	0.00	0.09	0.10	0.13	0.11	0.13	0.11	0.16
	4:05:00	0.00	0.00	0.05	0.06	0.07	0.06	0.07	0.06	0.08
	4:10:00	0.00	0.00	0.03	0.03	0.03	0.03	0.03	0.02	0.02
	4:15:00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.
The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

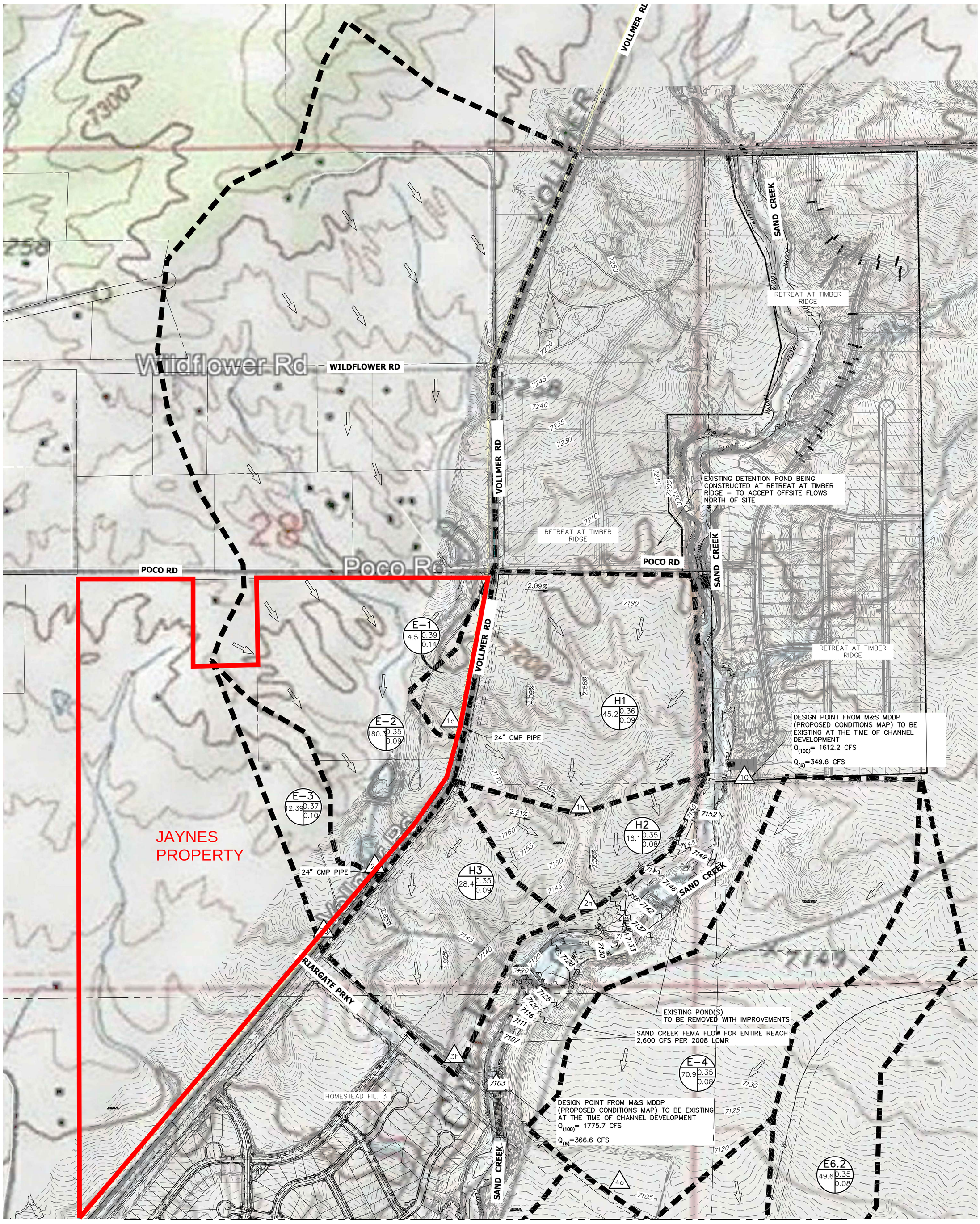
Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

REFERENCE MATERIAL

EXISTING DRAINAGE MAP
HOMESTEAD NORTH



SEE SHEET 2

BASIN SUMMARY TABLE

Tributary Sub-basin	Area (acres)	Percent Impervious	C_5	C_{100}	t_c (min)	Q_5 (cfs)	Q_{100} (cfs)
E-1	4.50	9%	0.14	0.39	48.7	1.1	5.2
E-2	180.30	3%	0.09	0.35	47.4	28.1	192.9
E-3	12.39	4%	0.10	0.37	46.9	2.2	13.7
E-4	70.90	2%	0.08	0.35	49.0	9.9	72.7
E-5	18.80	2%	0.08	0.35	34.9	3.4	24.9
E6.1	124.90	2%	0.08	0.35	48.1	17.7	130.0
E6.2	49.61	2%	0.08	0.35	44.2	7.5	55.4
H1	45.20	3%	0.09	0.36	34.7	8.9	61.0
H2	16.10	2%	0.08	0.35	25.1	3.5	26.0
H3	28.40	3%	0.09	0.35	31.3	5.9	40.8

DESIGN POINT

DP	Q5 Total	Q100 Total
1h	8.0	52.4
2h	10.2	69.0
3h	32.5	223.2
1o	1.1	5.2
2o	28.1	192.9
3o	2.2	13.7
4o	9.9	72.7
5o	12.5	92.0
6.2o	7.5	55.4
6.1o	36.9	270.9

LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C –100 YR
D: C–5 YR

DESIGN POINT

EXISTING FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING

6100

N

300 150 0 300 600

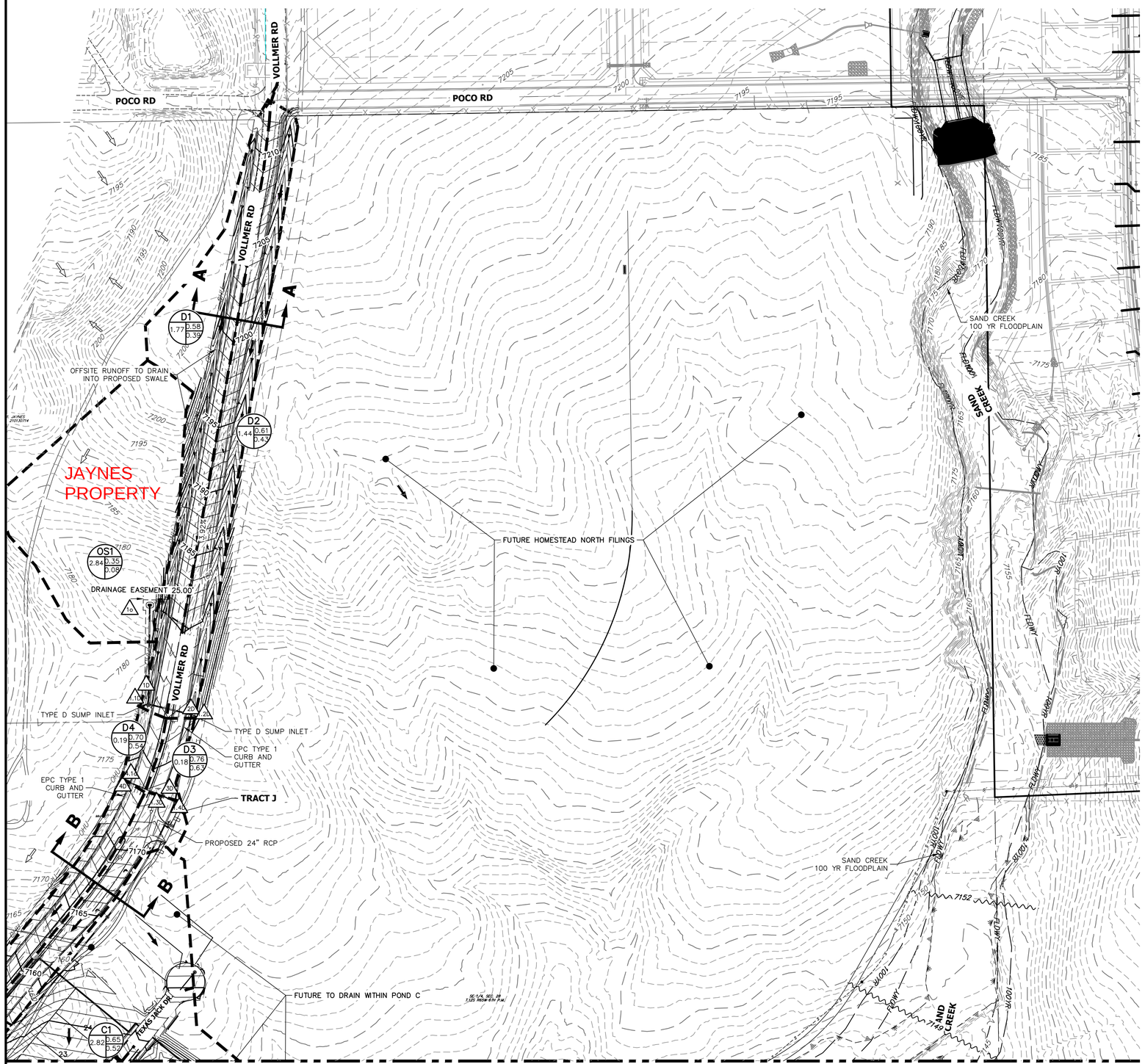
ORIGINAL SCALE: 1" = 300'

EX DRAINAGE MAP
HOMESTEAD NORTH
JOB NO. 25188.00
1–4–2022
SHEET 1 OF 2

J·R ENGINEERING
A Westrian Company

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

DRAINAGE MAP



LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C –100 YR
D: C–5 YR

DESIGN POINT

PROPOSED FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

STORM SEWER PROPOSED

PROPOSED R.O.W

PROPOSED PROPERTY LINES

PROPOSED SIDEWALK

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING 6100

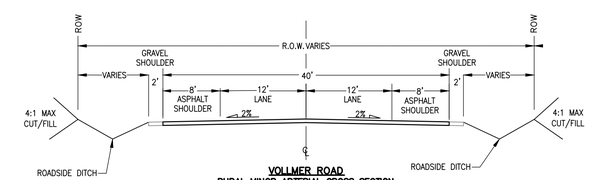
PROPOSED 6100

BASIN SUMMARY TABLE

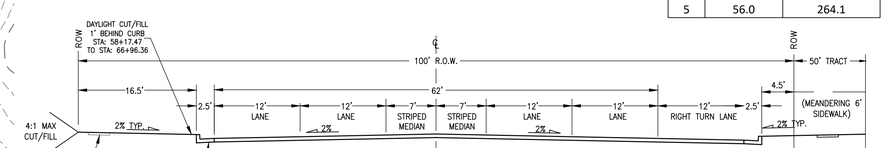
Tributary Sub-basin	Area (acres)	Percent Impervious	C5	C100	tc (min)	Q5 (cfs)	Q100 (cfs)
C1	2.82	69%	0.52	0.65	13.1	5.4	11.4
C2.1	0.20	91%	0.82	0.90	5.0	0.8	1.6
C2.2	4.69	73%	0.56	0.68	12.8	9.9	20.3
C2.3	0.83	67%	0.54	0.68	10.1	1.9	3.9
C3.1	0.35	73%	0.68	0.79	5.0	1.2	2.4
C3.2	1.46	71%	0.56	0.68	8.4	3.6	7.4
C4.1	6.34	65%	0.49	0.63	12.0	12.1	25.9
C4.2	3.59	57%	0.44	0.58	12.9	5.9	13.1
C5	0.16	81%	0.74	0.84	6.4	0.6	1.0
C6	2.59	20%	0.21	0.43	6.8	2.5	8.8
D1	1.77	40%	0.40	0.60	16.5	2.4	6.0
D2	1.44	56%	0.55	0.78	15.0	2.8	6.6
D3	0.18	68%	0.63	0.76	5.4	0.6	1.2
D4	0.19	57%	0.54	0.70	6.3	0.5	1.1
D5	0.91	77%	0.71	0.82	6.0	3.1	6.1
D6	0.83	69%	0.64	0.77	6.4	2.5	5.2
D7	0.75	79%	0.72	0.82	5.0	2.8	5.3
D8	0.72	69%	0.64	0.74	5.0	2.4	4.6
OS1	2.84	2%	0.08	0.35	14.5	0.8	6.0
OS2	179.61	2%	0.08	0.35	47.4	27.1	190.9
OS3	11.98	2%	0.08	0.35	47.6	1.7	12.6

DESIGN POINT SUMMARY TABLE

DP	Q5 Total	Q100 Total
1c	5.4	11.4
2.3c	7.1	14.9
2.3i	7.0	11.5
2.1c	0.8	1.6
2.1i	0.8	1.5
2.2C	9.8	20.1
4.2c	5.9	13.1
4.2i	5.9	10.5
4C	18.8	41.8
3.1	4.7	11.6
3.1c	1.2	2.4
3.1i	1.2	1.9
3.2	7.9	12.9
3.3	9.1	17.6
3.4	26.0	54.9
3.2c	3.6	7.8
5C	4.1	8.7
6C	2.5	8.8
3.5	30.7	65.0
o1	0.8	6.0
1d	2.4	6.0
1.1d	3.2	11.7
2d	2.8	6.6
1.2d	5.8	18.0
3d	0.6	1.2
4d	0.5	1.1
4.1d	0.5	1.1
1.3d	1.0	2.2
1.4d	6.6	19.6
2o	27.1	190.9
6d	2.1	4.3
6.1d	28.1	192.5
1.5d	29.2	195.0
5d	3.1	6.1
1.6d	32.7	205.4
1.7d	36.1	221.0
3o	1.7	12.6
8d	2.5	14.3
2.1d	2.5	13.2
7d	2.4	5.3
2.2d	3.5	16.0
1.7d	36.1	221.0
5	56.0	264.1



VOLLMER ROAD
RURAL MINOR ARTERIAL CROSS SECTION
SECTION AA – SCALE: NTS



VOLLMER ROAD
URBAN MINOR ARTERIAL CROSS SECTION
SECTION BB – SCALE: NTS

100 50 0 100 200
ORIGINAL SCALE: 1" = 100'

DRAINAGE MAP
HOMESTEAD NORTH – FILLING ONE
JOB NO. 25188.00
6/13/22
SHEET 1 OF 2

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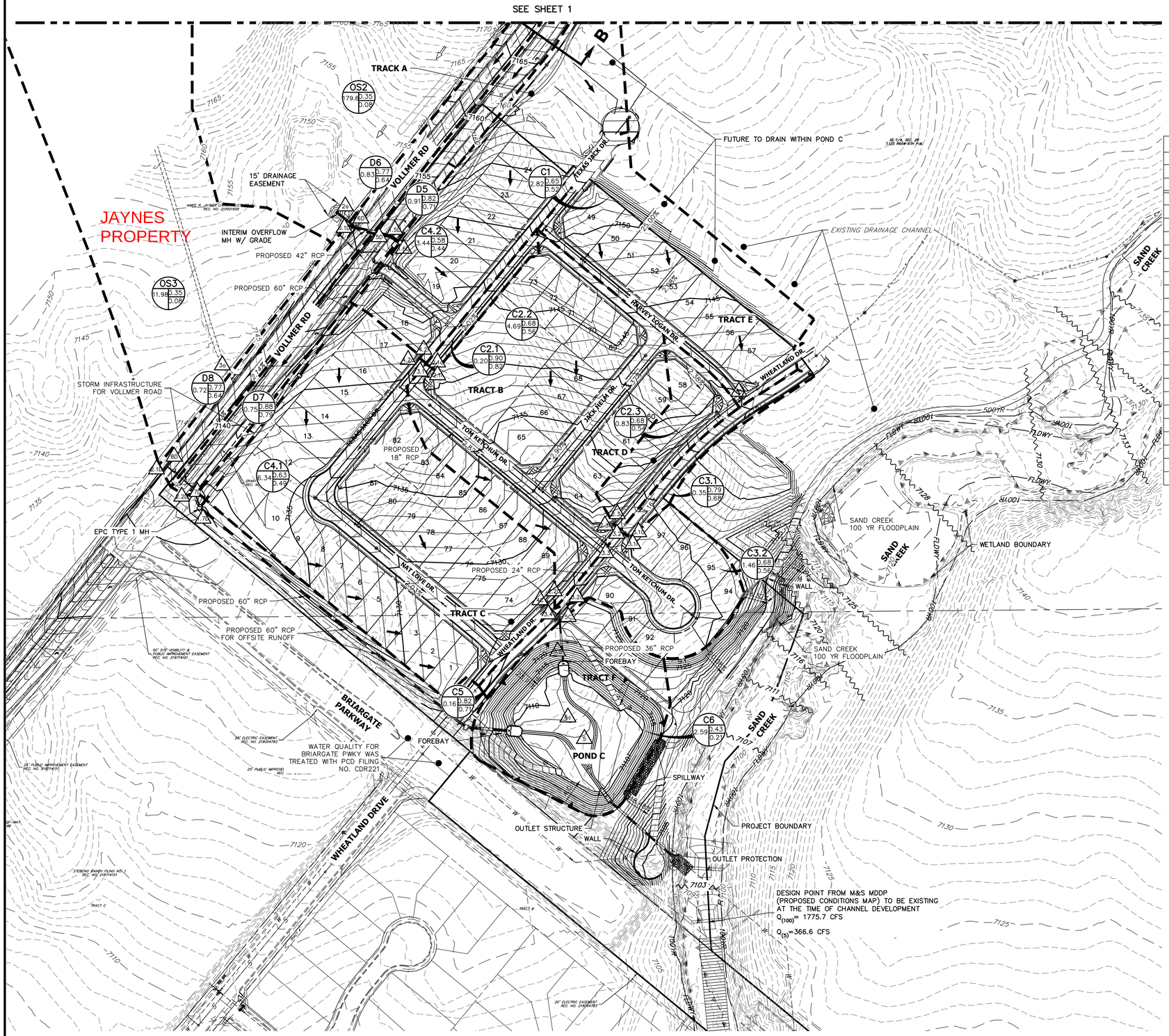
DRAINAGE MAP



LEGEND

BASIN ID
A: BASIN LABEL
B: AREA
C: C –100 YR
D: C–5 YR

DESIGN POINT

PROPOSED FLOW DIRECTION

BASIN DRAINAGE AREA

EXISTING STORM SEWER

STORM SEWER PROPOSED

PROPOSED R.O.W

PROPOSED PROPERTY LINES

PROPOSED SIDEWALK

EXISTING PROPERTY LINE

ROW EXISTING

FL EXISTING

SIDEWALK EXISTING

DRAINAGE ACCESS & MAINTENANCE EASEMENT

EXISTING 6100

PROPOSED 6100

BASIN SUMMARY TABLE

Tributary Sub-basin	Area (acres)	Percent Impervious	C5	C100	tc (min)	Q5 (cfs)	Q100 (cfs)
C1	2.82	69%	0.52	0.65	13.1	5.4	11.4
C2.1	0.20	91%	0.82	0.90	5.0	0.8	1.6
C2.2	4.69	73%	0.56	0.68	12.8	9.9	20.3
C2.3	0.83	67%	0.54	0.68	10.1	1.9	3.9
C3.1	0.35	73%	0.68	0.79	5.0	1.2	2.4
C3.2	1.46	71%	0.56	0.68	8.4	3.6	7.4
C4.1	6.34	65%	0.49	0.63	12.0	12.1	25.9
C4.2	3.59	57%	0.44	0.58	12.9	5.9	13.1
C5	0.16	81%	0.74	0.84	6.4	0.6	1.0
C6	2.59	20%	0.21	0.43	6.8	2.5	8.8
D1	1.77	40%	0.40	0.60	16.5	2.4	6.0
D2	1.44	56%	0.55	0.78	15.0	2.8	6.6
D3	0.18	68%	0.63	0.76	5.4	0.6	1.2
D4	0.19	57%	0.54	0.70	6.3	0.5	1.1
D5	0.91	77%	0.71	0.82	6.0	3.1	6.1
D6	0.83	69%	0.64	0.77	6.4	2.5	5.2
D7	0.75	79%	0.72	0.82	5.0	2.8	5.3
D8	0.72	69%	0.64	0.74	5.0	2.4	4.6
OS1	2.84	2%	0.08	0.35	14.5	0.8	6.0
OS2	179.61	2%	0.08	0.35	47.4	27.1	190.9
OS3	11.98	2%	0.08	0.35	47.6	1.7	12.6

Design Point	Inlet Size
Inlet DP 2.3C	15' Type R
Inlet DP 2.1C	5' Type R
Inlet DP 4.2C	15' Type R
Inlet DP 3.1C	5' Type R
Inlet DP 4C	15' Type R
Inlet DP 5C	15' Type R
Inlet DP 3D	5' Type R
Inlet DP 4D	5' Type R
Inlet DP 5D	10' Type R
Inlet DP 6D	10' Type R
Inlet DP 7D	10' Type R
Inlet DP 8D	20' Type R
Inlet DP 1D	Type D Inlet
Inlet DP 2D	Type D Inlet

DESIGN POINT SUMMARY TABLE

DP	Q5 Total	Q100 Total
1c	5.4	11.4
2.3c	7.1	14.9
2.3i	7.0	11.5
2.1c	0.8	1.6
2.1i	0.8	1.5
2.2C	9.8	20.1
4.2c	5.9	13.1
4.2i	5.9	10.5
4C	18.8	41.8
3.1	4.7	11.6
3.1c	1.2	2.4
3.1i	1.2	1.9
3.2	7.9	12.9
3.3	9.1	17.6
3.4	26.0	54.9
3.2c	3.6	7.8
5C	4.1	8.7
6C	2.5	8.8
3.5	30.7	65.0
o1	0.8	6.0
1d	2.4	6.0
1.1d	3.2	11.7
2d	2.8	6.6
1.2d	5.8	18.0
3d	0.6	1.2
4d	0.5	1.1
4.1d	0.5	1.1
1.3d	1.0	2.2
1.4d	6.6	19.6
2o	27.1	190.9
6d	2.1	4.3
6.1d	28.1	192.5
1.5d	29.2	195.0
5d	3.1	6.1
1.6d	32.7	205.4
1.7d	36.1	221.0
3o	1.7	12.6
8d	2.5	14.3
2.1d	2.5	13.2
7d	2.4	5.3
2.2d	3.5	16.0
1.7d	36.1	221.0
5	56.0	264.1

100 50 0 100 200
ORIGINAL SCALE: 1" = 100'

DRAINAGE MAP
HOMESTEAD NORTH FILLING NO. 1
JOB NO. 25188.00
6/13/22
SHEET 2 OF 2

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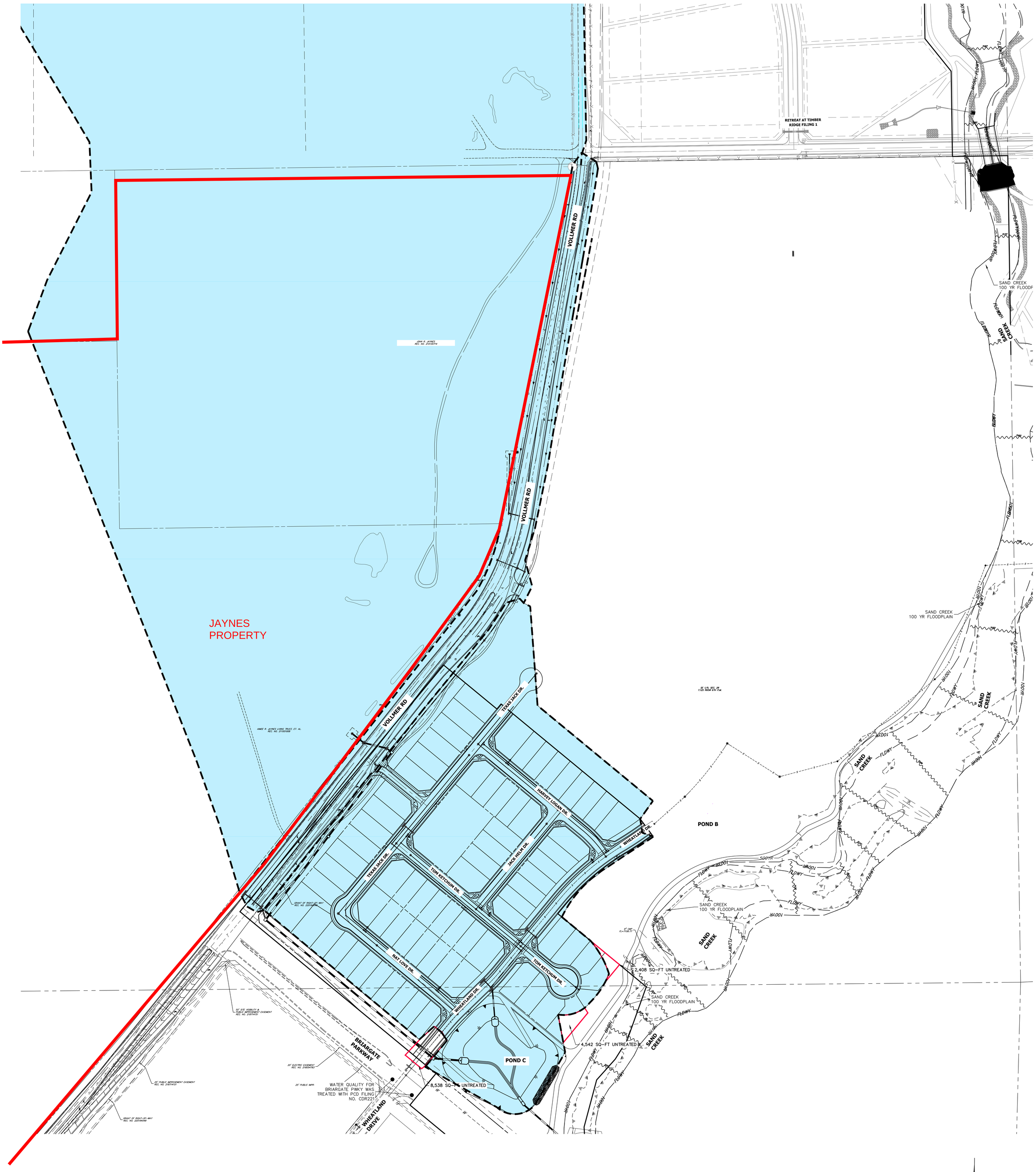
WATER QUALITY CAPTURE PLAN

HOMESTEAD NORTH



NOTE:

1. **A SEPARATE PLAN FOR STERLING RANCH ROAD AND BRIARGATE PKWY WILL BE PROVIDED IN A THE SEPARATE FDR REQUIRED FOR CONSTRUCTION OF THESE ROADWAYS.**
2. **A TOTAL OF 15,488 SQ-FT ON SITE IS LEFT UNTREATED.**
3. **POND C TREATS THE IMPROVEMENTS TO VOLLMER ROAD AND THE OFFSITE TRIBUTARY AREA**

POND C 224.3 ACRES, 10.3% IMPERVIOUS

100 50 0 100 200

ORIGINAL SCALE: 1" = 100'

WQ – POND C
HOMESTEAD NORTH – FILING ONE
JOB NO. 25188.00
06–13–2022
SHEET 1 OF 1

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COMPOSITE % IMPERVIOUS & COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

Subdivision: Homestead North Fil. 1
Location: El Paso County

Project Name: Homestead North-Filing 1
Project No.: 25188.00
Calculated By: ARJ
Checked By:
Date: 6/15/22

Basin ID	Total Area (ac)	Streets/Paved (100% Impervious)				Residential (45%-65% Impervious)				Lawns (2% Impervious)				Basins Total Weighted C Values		Basins Total Weighted % Imp.
		C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	Area (ac)	Weighted % Imp.	C_5	C_{100}	
C1	2.82	0.90	0.96	0.49	17.2%	0.45	0.59	2.25	51.7%	0.08	0.35	0.09	0.1%	0.52	0.65	69.0%
C2.1	0.20	0.90	0.96	0.18	90.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.02	0.2%	0.82	0.90	90.7%
C2.2	4.69	0.90	0.96	1.26	26.9%	0.45	0.59	3.33	46.1%	0.08	0.35	0.10	0.0%	0.56	0.68	73.0%
C2.3	0.83	0.90	0.96	0.28	34.1%	0.45	0.59	0.41	32.4%	0.08	0.35	0.13	0.3%	0.54	0.68	66.9%
C3.1	0.35	0.90	0.96	0.25	72.8%	0.45	0.59	0.00	0.0%	0.08	0.35	0.09	0.5%	0.68	0.79	73.3%
C3.2	1.66	0.90	0.96	0.42	25.1%	0.45	0.59	0.96	37.7%	0.08	0.35	0.28	0.3%	0.50	0.64	63.2%
C4.1	6.34	0.90	0.96	1.04	16.4%	0.45	0.59	4.76	48.8%	0.08	0.35	0.55	0.2%	0.49	0.63	65.5%
C4.2	3.59	0.90	0.96	0.59	16.4%	0.45	0.59	2.20	39.8%	0.08	0.35	0.65	0.4%	0.44	0.58	56.6%
C5	0.16	0.90	0.96	0.13	80.9%	0.45	0.59	0.00	0.0%	0.08	0.35	0.03	0.4%	0.74	0.84	81.3%
C6	2.59	0.90	0.96	0.27	10.6%	0.45	0.59	0.32	8.1%	0.08	0.35	1.89	1.5%	0.21	0.43	20.2%
36" Pipe w/ Forebay	23.23															61.3%
D1	1.77	0.90	0.96	0.69	38.8%	0.45	0.59	0.00	0.0%	0.08	0.35	1.14	1.3%	0.40	0.60	40.1%
D2	1.44	0.90	0.96	0.79	54.9%	0.45	0.59	0.00	0.0%	0.08	0.35	1.02	1.4%	0.55	0.78	56.4%
D3	0.18	0.90	0.96	0.12	67.0%	0.45	0.59	0.00	0.0%	0.08	0.35	0.06	0.7%	0.63	0.76	67.6%
D4	0.19	0.90	0.96	0.11	56.6%	0.45	0.59	0.00	0.0%	0.08	0.35	0.08	0.9%	0.54	0.70	57.5%
D5	0.91	0.90	0.96	0.70	76.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.21	0.5%	0.71	0.82	77.0%
D6	0.83	0.90	0.96	0.57	68.4%	0.45	0.59	0.00	0.0%	0.08	0.35	0.26	0.6%	0.64	0.77	69.0%
D7	0.75	0.90	0.96	0.59	78.5%	0.45	0.59	0.00	0.0%	0.08	0.35	0.14	0.4%	0.72	0.82	78.9%
D8	0.72	0.90	0.96	0.49	68.8%	0.45	0.59	0.00	0.0%	0.08	0.35	0.17	0.5%	0.64	0.74	69.3%
OffSite Basins																
OS1	2.84	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.08	0.35	2.85	2.0%	0.08	0.35	2.0%
OS2	179.61	0.90	0.96	0.91	0.5%	0.45	0.59	0.00	0.0%	0.08	0.35	178.71	2.0%	0.08	0.35	2.5%
OS3	11.98	0.90	0.96	0.00	0.0%	0.45	0.59	0.00	0.0%	0.08	0.35	11.99	2.0%	0.08	0.35	2.0%
60" Pipe w/ Forebay	201.22															4.4%
Pond C	224.4															10.3%

This is all undeveloped. Provide Pond C calculations with total developed imperviousness as well.

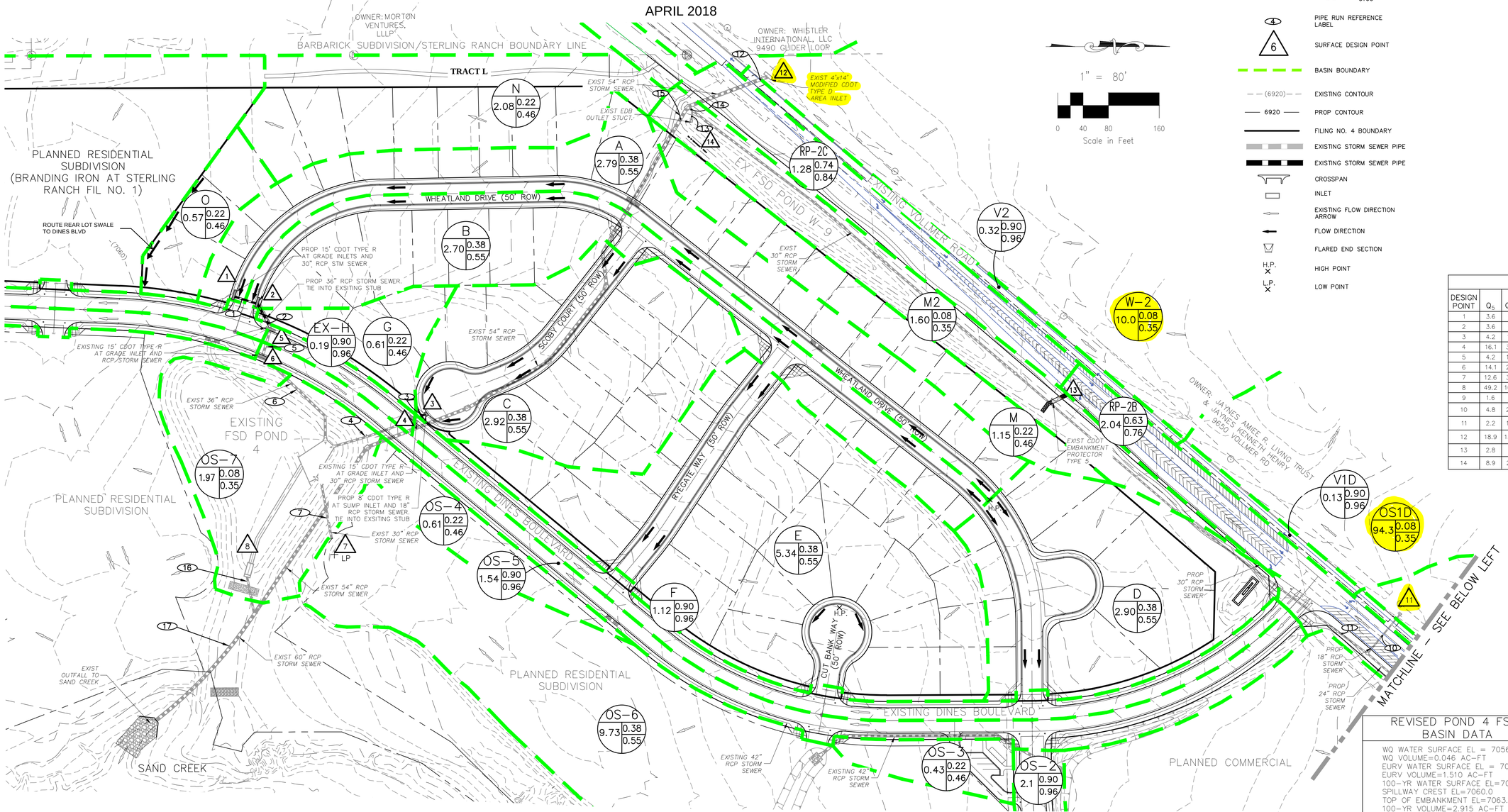
Added additional language and comparison chart to narrative

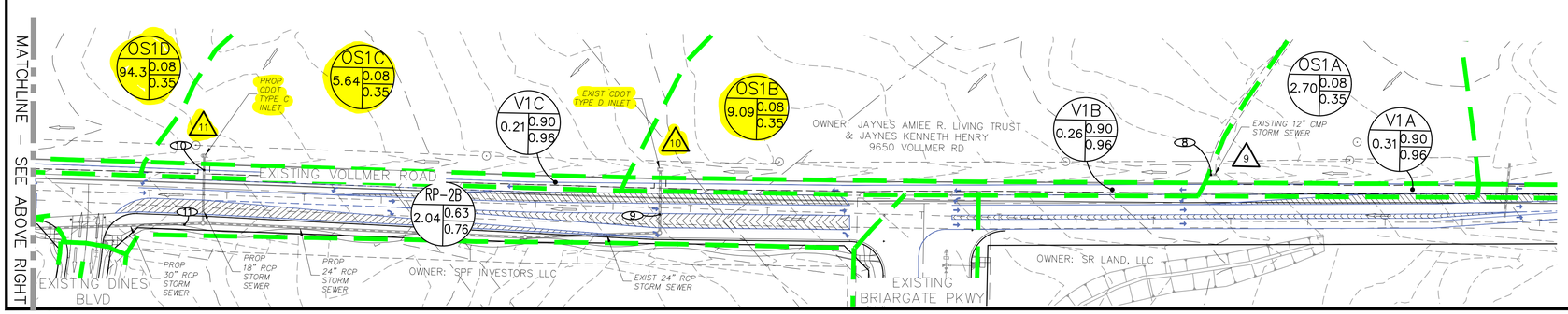
HOMESTEAD AT STERLING RANCH FILING NO. 1

COUNTY OF EL PASO, STATE OF COLORADO

FINAL DRAINAGE MAP

APRIL 2018





LEGEND

- BASIN DESIGNATION: Z, 25, .25, .35, C5, C100, ACRES
- PIPE RUN REFERENCE LABEL
- SURFACE DESIGN POINT
- BASIN BOUNDARY
- (6920) EXISTING CONTOUR
- 6920 PROP CONTOUR
- FILING NO. 4 BOUNDARY
- EXISTING STORM SEWER PIPE
- EXISTING STORM SEWER PIPE
- CROSSPAN
- INLET
- EXISTING FLOW DIRECTION ARROW
- FLOW DIRECTION
- FLARED END SECTION
- H.P. HIGH POINT
- L.P. LOW POINT

1" = 80'

0 40 80 160

Scale in Feet

BASIN SUMMARY			
BASIN	AREA (ACRES)	Q_5	Q_{100}
OS2	2.10	8.9	15.9
OS3	0.43	0.4	1.3
OS4	0.61	0.5	1.9
OS5	1.54	5.6	10.0
OS6	9.73	12.5	30.4
OS7	1.97	0.7	5.3
A	2.79	3.6	8.7
B	2.70	3.6	8.6
C	2.92	4.2	10.1
D	2.90	4.3	10.4
E	5.34	8.2	19.9
F	1.12	4.3	7.7
G	0.61	0.5	1.9
EX-H	0.19	0.9	1.6
M	1.15	1.0	3.6
M2	1.60	0.4	3.2
N	2.08	1.6	5.7
O	0.57	0.5	1.8
W-2	10.00	2.7	19.7
OS1 HISTORIC	111.70	18.9	136.8
SUB-BASIN OS1A	2.70	0.7	5.3
SUB-BASIN OS1B	9.09	2.4	17.8
SUB-BASIN OS1C	5.64	1.5	11.1
SUB-BASIN OS1D	94.3	16.3	119.5
V1A	0.31	1.4	2.6
V1B	0.26	1.2	2.2
V1C	0.21	1.0	1.7
V1D	0.13	0.6	1.1
V2	0.32	1.5	2.7
RP-2B	2.04	4.9	9.9
RP-2C	1.28	4.3	8.2

DESIGN POINT SUMMARY				
DESIGN POINT	Q_5	Q_{100}	BASIN	STRUCTURE
1	3.6	8.7	A	15' AT-GRADE INLET
2	3.6	8.6	B	15' AT-GRADE INLET
3	4.2	10.1	C	8' SUMP INLET
4	16.1	36.7	D, E, F	15' AT-GRADE INLET
5	4.2	19.7	G, EX-H, FLOWBY DP4	EX 15' AT-GRADE INLET
6	14.1	26.7	OS2, OS3, OS4, OS5	EX 15' AT-GRADE INLET
7	12.6	30.5	OS6	EX 18' RCP
8	49.2	105.3	OS7, PR4, PR6, PR7	EX FDS POND 4
9	1.6	7.0	OS1A, V1A	EX 12" CMP CULVERT
10	4.8	26.3	OS1B, V1B, DP6	EX 2.9'x5.7' CDOT TYPE D INLET
11	2.2	12.3	OS1C, V1C,	EX 2.9'x2.9' CDOT TYPE C INLET
12	18.9	133.7	OS1D, V1D, W-2, V2	EX 4'x14' MOD CDOT TYPE D INLET
13	2.8	5.6	RP-2B	EX CDOT EMBANKMENT PROTECTOR TYPE 5
14	8.9	21.2	M, M2, RP2C, DP13	EX FSD POND W-9

STORM SEWER SUMMARY				
PIPE RUN	Q_5	Q_{100}	PIPE SIZE	CONTRIBUTING PIPES/DP'S
1	3.6	8.7	30" RCP	DP1
2	7.1	17.2	36" RCP	DP2, PR1
3	4.2	10.1	18" RCP	DP3
4	16.8	29.4	30" RCP	DP4, PR3
5	10.8	30.0	36" RCP	DP5, PR2
6	21.0	44.6	36" RCP	DP6, PR5
7	12.6	30.5	24" RCP	DP7
8	1.6	7.0	12" CMP	DP9
9	4.8	26.3	24" RCP	DP10
10	2.2	12.3	18" RCP	DP11
11	7.0	38.6	30" RCP	PR5, PR6
12	18.9	133.7	54" RCP	DP12
13	0.6	8.7	18" RCP	OUTFLOW EDB POND W-9
14	7.6	47.2	30" RCP	PR7, PR9
15	23.8	164.1	54" RCP	PR8, PR10
16	2.7	36.2	30" RCP	OUTFLOW EDB POND 4
17	26.5	200.3	60" RCP	PR11, PR12

REVISED POND 4 FSD BASIN DATA	REVISED POND W-9 FSD BASIN DATA
WQ WATER SURFACE EL = 7056.39	WQ WATER SURFACE EL = 7086.59
WQ VOLUME=0.046 AC-FT	WQ VOLUME=0.092 AC-FT
EURV WATER SURFACE EL = 7058.46	EURV WATER SURFACE EL = 7087.99
EURV VOLUME=1.510 AC-FT	EURV VOLUME=0.390 AC-FT
100-YR WATER SURFACE EL=7059.98	100-YR WATER SURFACE EL=7088.84
SPILLWAY CREST EL=7060.0	SPILLWAY CREST EL=7088.84
TOP OF EMBANKMENT EL=7063.0	TOP OF EMBANKMENT EL=7090.5
100-YR VOLUME=2.915 AC-FT	100-YR VOLUME=0.638 AC-FT
100-YR INFLOW = 105.3 CFS	100-YR INFLOW = 21.2 CFS
100-YR RELEASE = 36.8 CFS	100-YR RELEASE = 8.7 CFS

1" = 80'

0 40 80 160

Scale in Feet

OFF-SITE DRAINGE MAP

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20 BOULDER CRESCENT, SUITE 110
COLORADO SPRINGS, CO 80903
PHONE: 719.955.5485

HOMESTEAD AT STERLING RANCH FIL NO. 1

FINAL DRAINAGE MAP

PROJECT NO. 09-005	SCALE: HORIZONTAL: 1"=80' VERTICAL: N/A	DATE: 4/12/2018	
DESIGNED BY: CMN DRAWN BY: CMN CHECKED BY: VAS		SHEET 1 OF 1	FDM01

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DRAINAGE MAPS

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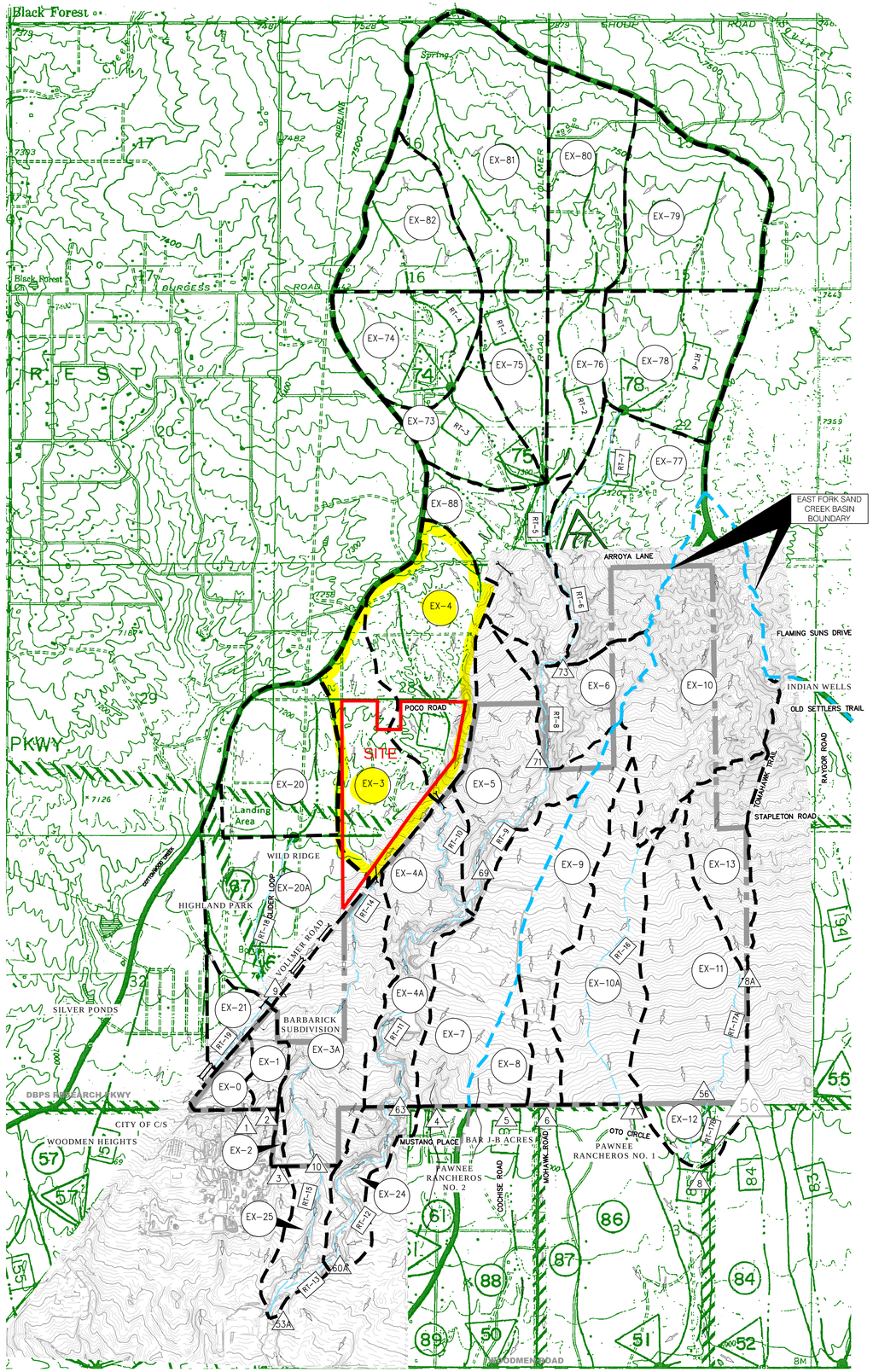

0 600 1200 2400
Scale in Feet

LEGEND

BASIN ID – SC3–77

DESIGN POINT – 87

REACH IDENTIFIER – RT–17A

BASIN BOUNDARY –

EAST FORK SAND CREEK BASIN BOUNDARY –

FLOW DIRECTION –

BASIN SUMMARY

BASIN	CN	AREA (ACRES)	AREA (SQ MI)	Q_2 (CFS)	Q_5 (CFS)	Q_{10} (CFS)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)
EX–0	62	23.8	0.037	5.0	8.2	13.0	19.6	25.7	32.2
EX–1	62	25.7	0.040	4.8	7.9	12.4	18.7	24.5	30.9
EX–2	62	5.5	0.009	1.1	1.8	2.8	4.3	5.6	7.1
EX–3	62	136.8	0.214	22.0	36.4	57.6	86.9	114.0	143.1
EX–3A	61	188.1	0.294	28.3	47.4	75.7	115.1	152.2	192.6
EX–4	62	192.0	0.300	30.1	49.9	79.1	119.5	157.0	197.3
EX–4A	62	151.5	0.237	24.7	40.8	64.4	97.0	127.2	160.1
EX–5	62	153.9	0.240	24.2	40.0	63.4	95.9	125.9	158.2
EX–6	62	90.2	0.141	15.3	25.5	40.1	60.7	79.9	100.5
EX–7	56	165.0	0.258	11.6	21.5	37.5	60.9	83.1	107.4
EX–8	45	42.0	0.066	0.5	1.7	4.5	9.4	14.5	20.5
EX–9	54	131.9	0.206	12.2	23.9	43.1	70.9	97.0	125.2
EX–10	60	270.7	0.423	32.7	56.0	91.1	140.1	185.9	236.1
EX–10A	41	179.3	0.280	0.6	2.2	7.3	17.4	29.1	43.1
EX–11	43	209.3	0.327	18.0	29.8	47.7	73.4	98.3	126.1
EX–12	51	39.5	0.062	2.2	5.1	10.1	17.7	25.1	33.3
EX–13	55	89.3	0.139	7.7	15.2	27.1	44.2	60.5	78.4
EX–20	62	143.4	0.224	25.4	42.1	66.7	100.7	132.3	166.2
EX–20A	64	179.7	0.281	32.2	51.9	80.5	119.8	155.9	194.6
EX–21	65	33.3	0.052	8.6	13.5	20.7	30.5	39.4	49.0
EX–24	59	63.1	0.099	9.5	16.6	27.5	42.9	57.4	73.0
EX–25	43	54.4	0.085	0.3	1.5	4.8	10.7	17.2	25.1
EX–73	63	90.0	0.141	16.4	26.4	41.3	62.1	81.3	102.0
EX–74	63	119.7	0.187	22.3	36.5	57.3	85.9	112.3	140.7
EX–75	63	79.3	0.124	13.1	21.5	33.7	50.5	66.1	82.8
EX–76	63	86.4	0.135	14.2	23.1	36.4	54.6	71.4	89.6
EX–77	62	230.6	0.360	34.7	56.9	90.6	137.5	180.9	227.7
EX–78	63	155.6	0.243	28.1	45.3	70.6	106.2	139.1	174.5
EX–79	63	189.0	0.295	34.9	57.0	89.5	134.3	175.6	220.1
EX–80	63	147.7	0.231	27.3	44.3	69.6	104.5	136.8	171.4
EX–81	62	262.9	0.411	42.6	70.2	111.0	167.4	219.6	275.7
EX–82	62	117.8	0.184	20.0	33.2	52.8	80.0	105.1	132.3
EX–88	62	139.2	0.217	22.2	36.7	58.0	87.6	115.0	144.4

DESIGN POINT SUMMARY (PEAK FLOW)

DESIGN POINT	AREA (SQ MI)	Q_2 (CFS)	Q_5 (CFS)	Q_{10} (CFS)	Q_{25} (CFS)	Q_{50} (CFS)	Q_{100} (CFS)	LOCATION
DP–74	0.371	39.3	65.3	104.8	158.9	209.1	262.8	
DP–75	1.413	141.2	235.1	376.6	566.6	750.9	950.5	
DP–78	0.538	59.7	98.4	154.0	232.6	306.2	385.3	
DP–73	2.528	225.9	380.7	618.0	957.0	1260.4	1582.3	
DP–71	2.669	229.3	388.9	629.7	978.8	1277.3	1637.9	STERLING RANCH NORTHERN BNDRY
DP–69	3.209	253.0	434.8	707.7	1100.0	1453.3	1870.4	
DP–63	3.446	251.4	430.7	713.1	1113.2	1496.2	1911.5	STERLING RANCH SOUTHERN BNDRY
DP–10	0.508	36.5	56.0	106.4	162.9	220.6	287.2	COLORADO SPRINGS/EL PASO BNDRY
DP–9A	0.557	55.3	94.3	150.3	227.7	299.5	380.5	VOLLMER/TAHITI DRIVE
DP–9	0.505	52.8	88.8	142.1	214.2	281.0	351.4	VOLLMER/LOCHWINNOCH LN
DP–8A	0.139	7.7	15.2	27.1	44.2	60.5	78.4	D/S STERLING RANCH EASTERN BNDRY
DP–8	0.528	24.2	45.1	77.8	124.4	169.5	220.9	D/S STERLING RANCH SOUTHERN BNDRY
DP–7	0.703	32.4	57.1	97.3	156.1	213.8	277.9	STERLING RANCH SOUTHERN BNDRY
DP–6	0.206	12.2	23.9	43.1	70.9	97.0	125.2	STERLING RANCH SOUTHERN BNDRY
DP–5	0.066	0.5	1.7	4.5	9.4	14.5	20.5	STERLING RANCH SOUTHERN BNDRY
DP–4	0.258	11.6	21.5	37.5	60.9	83.1	107.4	STERLING RANCH SOUTHERN BNDRY
DP–3	0.009	1.1	1.8	2.8	4.3	5.6	7.1	STERLING RANCH SOUTHERN BNDRY
DP–2	0.040	4.8	7.9	12.4	18.7	24.5	30.9	STERLING RANCH SOUTHERN BNDRY
DP–1	0.037	5.0	8.2	13.0	19.6	25.7	32.2	STERLING RANCH SOUTHERN BNDRY
DP–60A	3.545	247.7	430.2	707.1	1113.0	1496.6	1913.5	FUTURE MARKSHEFFEL X–ING
DP–56	0.466	23.2	42.5	71.9	115.6	157.4	202.9	STERLING RANCH SOUTHERN BNDRY
DP–53A	4.138	262.1	454.0	763.2	1196.5	1609.8	2061.5	SAND CREEK AND POND 3

DESIGN POINT SUMMARY (VOLUME)

DESIGN POINT	AREA (SQ MI)	V_2 (AC–FT)	V_5 (AC–FT)	V_{10} (AC–FT)	V_{25} (AC–FT)	V_{50} (AC–FT)	V_{100} (AC–FT)	LOCATION
DP–74	0.371	5.9	9.0	13.6	19.8	25.5	31.6	
DP–75	1.413	22.7	34.5	51.7	75.4	97.1	120.5	
DP–78	0.538	8.9	13.5	20.1	29.3	37.7	46.7	
DP–73	2.528	40.4	61.5	92.1	134.3	173.1	214.9	
DP–71	2.669	42.5	64.9	97.1	141.6	182.5	226.6	STERLING RANCH NORTHERN BNDRY
DP–69	3.209	50.7	77.4	116.1	169.4	218.6	271.4	
DP–63	3.446	54.1	82.5	123.8	180.8	233.3	289.9	STERLING RANCH SOUTHERN BNDRY
DP–10	0.508	7.6	11.7	17.6	25.8	33.4	41.6	COLORADO SPRINGS/EL PASO BNDRY
DP–9A	0.557	9.3	14.1	21.1	30.7	39.4	48.8	VOLLMER/TAHITI DRIVE
DP–9	0.505	8.4	12.7	19.0	27.6	35.5	44.0	VOLLMER/LOCHWINNOCH LN
DP–8A	0.139	1.3	2.1	3.4	5.2	7.0	8.9	D/S STERLING RANCH EASTERN BNDRY
DP–8	0.528	4.4	7.0	11.1	16.8	22.3	28.4	D/S STERLING RANCH SOUTHERN BNDRY
DP–7	0.703	6.1	10.0	15.9	24.3	32.4	41.3	STERLING RANCH SOUTHERN BNDRY
DP–6	0.206	2.4	4.0	6.3	9.6	12.7	16.0	STERLING RANCH SOUTHERN BNDRY
DP–5	0.066	0.2	0.4	0.8	1.4	1.9	2.6	STERLING RANCH SOUTHERN BNDRY
DP–4	0.258	2.6	4.2	6.7	10.2	13.5	17.2	STERLING RANCH SOUTHERN BNDRY
DP–3	0.009	0.1	0.2	0.3	0.5	0.6	0.8	STERLING RANCH SOUTHERN BNDRY
DP–2	0.040	0.6	0.9	1.4	2.1	2.7	3.4	STERLING RANCH SOUTHERN BNDRY
DP–1	0.037	0.6	0.9	1.3	1.9	2.5	3.1	STERLING RANCH SOUTHERN BNDRY
DP–60A	3.545	55.3	84.4	126.4	184.8	238.5	296.6	FUTURE MARKSHEFFEL X–ING
DP–56	0.466	4.0	6.3	9.9	14.9	19.8	25.1	SAND CREEK AND POND 3
DP–53A	4.138	63.0	96.4	144.7	211.8	273.9	340.9	SAND CREEK AND POND 3

OFF-SITE
DRAINAGE MAP

EFSC DBPS DESIGN POINT SUMMARY (PEAK FLOW)

DBPS DESIGN POINT	AREA (SQ MI)	Q_{10} (CFS)	Q_{100} (CFS)
DP–50	0.32	47.0	195.7
DP–51 (BASIN 86)	0.33	17.7	74.1
DP–52	1.67	80.5	456.5
DP–56	0.79	63.6	265.0

Values reported from SCDBPS
(DP 50, 51, 52 Not analyzed as a part of this study)
DBPS Reach 85(Basin91)=Q10=28.8cfs Q100=115.2cfs

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2018 STERLING RANCH MDDP

EXISTING HYDROLOGIC CONDITIONS MAP

PROJECT NO. 09–002 | FILE: \dwg\Eng Exhibits\2018–MDDP–ExistCondWSWkMap.dwg

DESIGNED BY: DLM
DRAWN BY: DLM
CHECKED BY: VAS

SCALE
HORIZ: NTS
VERT: NTS

DATE: 08–22–18

DM1

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FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

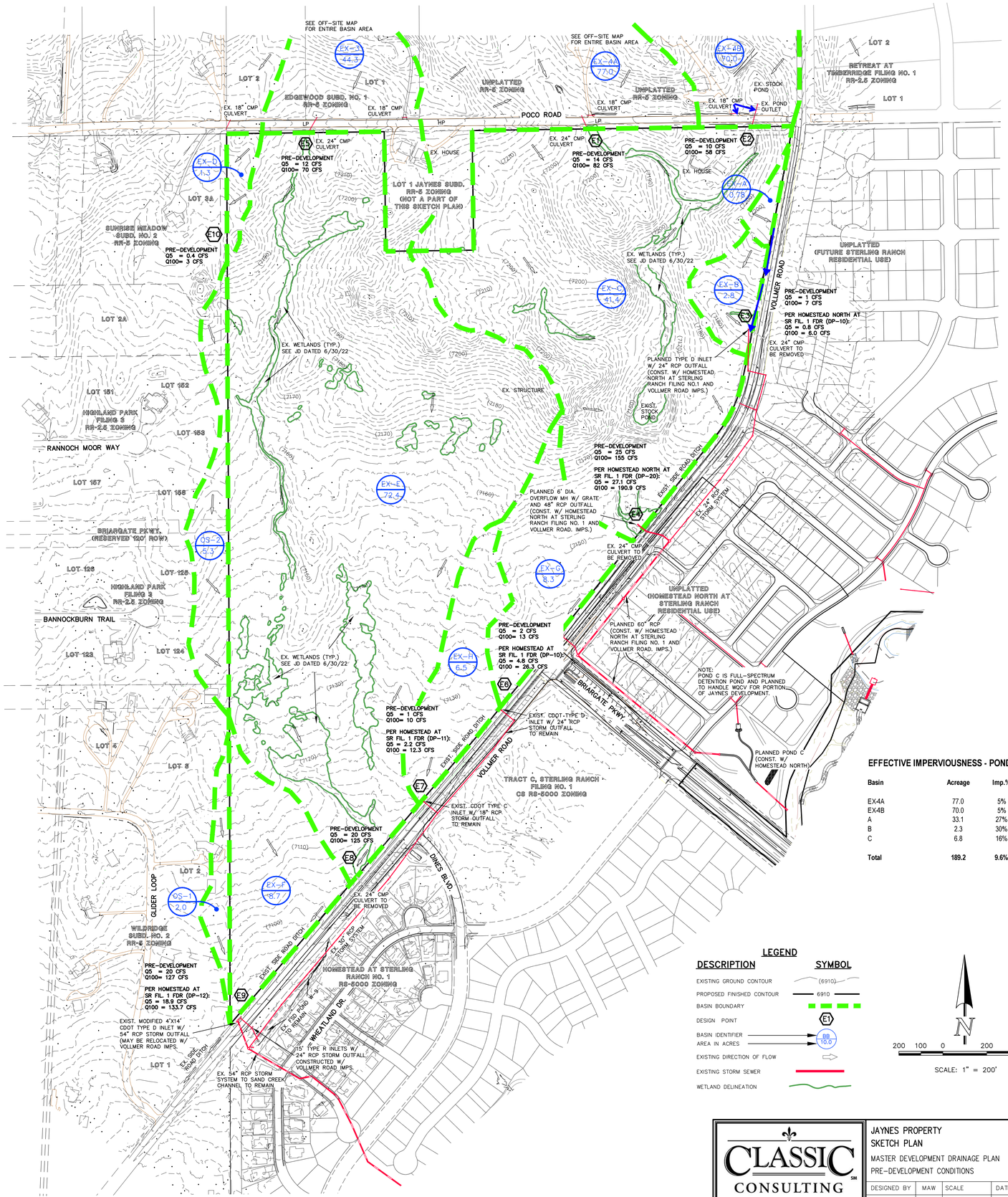
BASIN	TOTAL AREA (AC)	DEVELOPED AREA/IMPERVIOUS AREA				LANDSCAPE/UNDEVELOPED AREAS				WEIGHTED			WEIGHTED CA			IMPERVIOUSNESS
		AREA (AC)	C(2)	C(5)	C(100)	AREA (AC)	C(2)	C(5)	C(100)	C(2)	C(5)	C(100)	CA(2)	CA(5)	CA(100)	%
EX-A	0.78	0.00	0.03	0.09	0.36	0.78	0.03	0.09	0.36	0.03	0.09	0.36	**0.02**	**0.07**	**0.28**	2%
EX-B	2.80	0.00	0.03	0.09	0.36	2.80	0.03	0.09	0.36	0.03	0.09	0.36	**0.08**	**0.25**	**1.01**	2%
EX-C	41.40	0.00	0.03	0.09	0.36	41.40	0.03	0.09	0.36	0.03	0.09	0.36	**1.24**	**3.73**	**14.90**	2%
EX-D	1.30	0.00	0.03	0.09	0.36	1.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.04**	**0.12**	**0.47**	2%
EX-E	72.40	0.00	0.03	0.09	0.36	72.40	0.03	0.09	0.36	0.03	0.09	0.36	**2.17**	**6.52**	**26.06**	2%
EX-F	8.70	0.00	0.03	0.09	0.36	8.70	0.03	0.09	0.36	0.03	0.09	0.36	**0.26**	**0.78**	**3.13**	2%
EX-G	8.30	0.00	0.03	0.09	0.36	8.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.25**	**0.75**	**2.99**	2%
EX-H	6.50	0.00	0.03	0.09	0.36	6.50	0.03	0.09	0.36	0.03	0.09	0.36	**0.20**	**0.59**	**2.34**	2%
OS-1	2.00	2.00	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.12**	**0.26**	**0.80**	10%
OS-2	5.30	5.30	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.32**	**0.69**	**2.12**	10%
EX-3	44.30	44.30	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.77**	**4.65**	**16.61**	5%
EX-4A	77.00	77.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**3.08**	**8.09**	**28.88**	5%
EX-4B	70.00	70.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**2.80**	**7.35**	**26.25**	5%

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED			OVERLAND				STREET / CHANNEL FLOW				Tc	INTENSITY			TOTAL FLOWS		
	CA(2)	CA(5)	CA(100)	C(5)	Length (ft)	Height (ft)	Tc (min)	Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	TOTAL (min)	I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-A	0.02	0.07	0.28	0.09	240	9	16.3					16.3	2.58	3.23	5.41	0.1	**0.2**	**2**
EX-B	0.08	0.25	1.01	0.09	300	24	15.9	120	2.0%	1.0	2.0	17.9	2.60	3.25	5.46	0.2	**0.8**	**6**
EX-C	1.24	3.73	14.90	0.09	300	18	17.5	1300	2.9%	1.7	12.7	30.2	1.98	2.47	4.15	2	**9**	**62**
EX-D	0.04	0.12	0.47	0.09	225	10	16.7					16.7	2.68	3.36	5.64	0.1	**0.4**	**3**
EX-E	2.17	6.52	26.06	0.09	280	20	15.9	3400	2.5%	1.6	35.8	51.8	1.34	1.66	2.79	3	**11**	**73**
EX-F	0.26	0.78	3.13	0.09	300	12	20.0	560	2.0%	1.4	6.6	26.6	2.13	2.66	4.47	1	**2**	**14**
EX-G	0.25	0.75	2.99	0.09	300	10	21.2	420	2.0%	1.4	4.9	26.2	2.15	2.69	4.51	1	**2**	**13**
EX-H	0.20	0.59	2.34	0.09	300	10	21.2	800	2.0%	1.4	9.4	30.7	1.96	2.45	4.11	0.4	**1.4**	**10**
OS-1	0.12	0.26	0.80	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.8**	**4**
OS-2	0.32	0.69	2.12	0.08	300	12	20.2					20.2	2.46	3.08	5.16	1	**2**	**11**
EX-3	1.77	4.65	16.61	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	4	**12**	**70**
EX-4A	3.08	8.09	28.88	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	4	**14**	**82**
EX-4B	2.80	7.35	26.25	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	3	**10**	**58**

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	Intensity I(100)	Flow Q(5)	Flow Q(100)	Inlet Size
E1	EX-4A	8.09	28.88	50.5	1.70	2.85	14	82	EX. 24" CMP CULVERT
E2	EX-4B	7.35	26.25	64.9	1.32	2.22	10	58	EX. STOCK OFF-SITE POND
E3	EX-A, EX-B	0.32	1.29	18.3	3.23	5.41	1	7	TYPE D CDOT INLET W/ 24" RCP
E4	EX-4A, EX-4B, EX-C	19.16	70.03	64.9	1.32	2.22	25	155	PLANNED 48" RCP W MH AND GRATE
E5	EX-3	4.65	16.61	29.1	2.53	4.24	12	70	EX. 24" CMP CULVERT
E6	EX-G	0.75	2.99	26.2	2.69	4.51	2	13	TYPE D CDOT INLET W 24" RCP
E7	EX-H	0.59	2.34	30.7	2.45	4.11	1	10	TYPE C CDOT INLET W 18" RCP
E8	EX-3, EX-E, OS-2	11.86	44.80	51.8	1.66	2.79	20	125	EX. 24" CMP CULVERT
E9	DP-E8, EX-F, OS-1	12.90	48.73	55.8	1.55	2.60	20	127	MODIFIED 4'X14' TYPE D CDOT INLET W 54" RCP
E10	EX-D	0.12	0.47	16.7	3.36	5.64	0.4	3	SHEET FLOW TO NATURAL RAVINE



EFFECTIVE IMPERVIOUSNESS - POND C

Basin	Acreage	Imp.%
EX-4A	77.0	5%
EX-4B	70.0	5%
A	33.1	27%
B	2.3	30%
C	6.8	16%
Total	**189.2**	**9.6%**

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	(6910)
PROPOSED FINISHED CONTOUR	6910
BASIN BOUNDARY	
DESIGN POINT	E1
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
EXISTING DIRECTION OF FLOW	
EXISTING STORM SEWER	
WETLAND DELINEATION	

N

200 100 0 200 400

SCALE: 1" = 200'

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799 (Fax)

JAYNES PROPERTY
SKETCH PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
PRE-DEVELOPMENT CONDITIONS

DESIGNED BY	MAW	SCALE		DATE	7-15-22
DRAWN BY	MAW	(H) 1"= 200'		SHEET 1	OF 3
CHECKED BY		(V) 1"= N/A		JOB NO.	1305.20

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FINAL DRAINAGE REPORT ~ BASIN RUNOFF COEFFICIENT SUMMARY

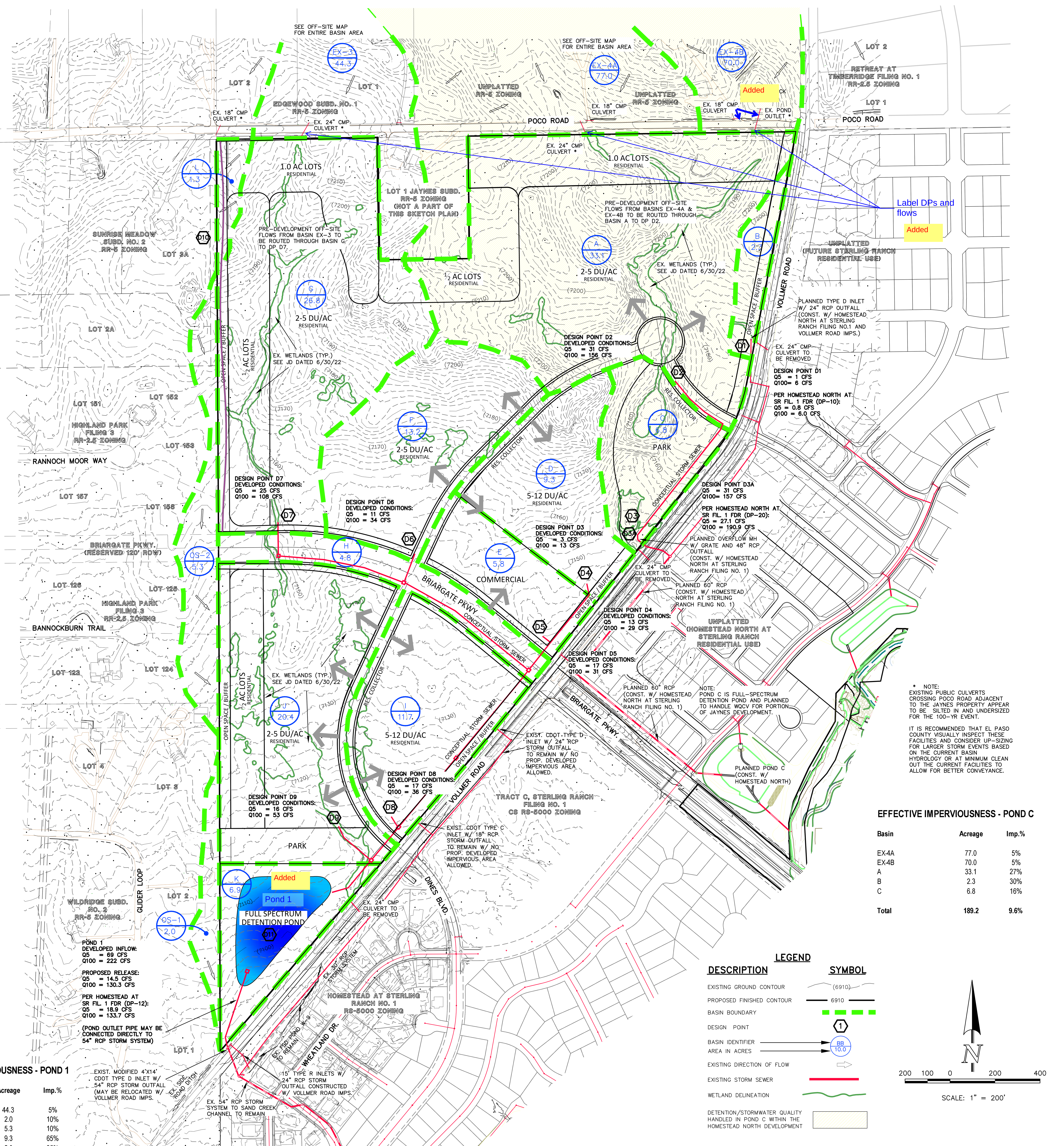
BASIN	TOTAL AREA (AC)	DEVELOPED AREA/IMPERVIOUS AREA AREA (AC)	C(2)	C(5)	C(100)	LANDSCAPE/UNDEVELOPED AREAS AREA (AC)	C(2)	C(5)	C(100)	WEIGHTED C(2)	C(5)	C(100)	WEIGHTED CA CA(2)	CA(5)	CA(100)	IMPERVIOUSNESS %
EX-A	0.78	0.00	0.03	0.09	0.36	0.78	0.03	0.09	0.36	0.03	0.09	0.36	**0.02**	**0.07**	**0.28**	2%
EX-B	2.80	0.00	0.03	0.09	0.36	2.80	0.03	0.09	0.36	0.03	0.09	0.36	**0.08**	**0.25**	**1.01**	2%
EX-C	41.40	0.00	0.03	0.09	0.36	41.40	0.03	0.09	0.36	0.03	0.09	0.36	**1.24**	**3.73**	**14.90**	2%
EX-D	1.30	0.00	0.03	0.09	0.36	1.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.04**	**0.12**	**0.47**	2%
EX-E	72.40	0.00	0.03	0.09	0.36	72.40	0.03	0.09	0.36	0.03	0.09	0.36	**2.17**	**6.52**	**26.06**	2%
EX-F	8.70	0.00	0.03	0.09	0.36	8.70	0.03	0.09	0.36	0.03	0.09	0.36	**0.26**	**0.78**	**3.13**	2%
EX-G	8.30	0.00	0.03	0.09	0.36	8.30	0.03	0.09	0.36	0.03	0.09	0.36	**0.25**	**0.75**	**2.99**	2%
EX-H	6.50	0.00	0.03	0.09	0.36	6.50	0.03	0.09	0.36	0.03	0.09	0.36	**0.20**	**0.59**	**2.34**	2%
OS-1	2.00	2.00	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.12**	**0.26**	**0.80**	10%
OS-2	5.30	5.30	0.06	0.13	0.40	0.00	0.02	0.08	0.35	0.06	0.13	0.40	**0.32**	**0.69**	**2.12**	10%
EX-3	44.30	44.30	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**1.77**	**4.65**	**16.61**	5%
EX-4A	77.00	77.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**3.08**	**8.09**	**28.88**	5%
EX-4B	70.00	70.00	0.04	0.11	0.38	0.00	0.02	0.08	0.35	0.04	0.11	0.38	**2.80**	**7.35**	**26.25**	5%
A	33.10	33.10	0.17	0.24	0.47	0.00	0.02	0.08	0.35	0.17	0.24	0.47	**5.46**	**7.78**	**15.39**	27%
B	2.30	1.30	0.18	0.25	0.47	1.00	0.05	0.12	0.39	0.12	0.19	0.44	**0.28**	**0.45**	**1.00**	30%
C	6.80	1.10	0.41	0.45	0.59	5.70	0.05	0.12	0.39	0.11	0.17	0.42	**0.74**	**1.18**	**2.87**	16%
D	9.30	9.30	0.41	0.45	0.59	0.00	0.02	0.08	0.35	0.41	0.45	0.59	**3.81**	**4.19**	**5.49**	65%
E	5.80	5.80	0.79	0.81	0.88	0.00	0.02	0.08	0.35	0.79	0.81	0.88	**4.58**	**4.70**	**5.10**	95%
F	13.20	13.20	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**2.38**	**3.30**	**6.20**	30%
G	26.80	26.80	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**4.82**	**6.70**	**12.60**	30%
H	4.80	4.80	0.79	0.81	0.88	0.00	0.02	0.08	0.35	0.79	0.81	0.88	**3.79**	**3.89**	**4.22**	95%
I	11.70	11.70	0.41	0.45	0.59	0.00	0.02	0.08	0.35	0.41	0.45	0.59	**4.80**	**5.27**	**6.90**	65%
J	20.40	20.40	0.18	0.25	0.47	0.00	0.02	0.08	0.35	0.18	0.25	0.47	**3.67**	**5.10**	**9.59**	30%
K	6.90	6.90	0.05	0.12	0.39	0.00	0.02	0.08	0.35	0.05	0.12	0.39	**0.35**	**0.83**	**2.69**	7%
L	1.30	0.65	0.12	0.20	0.44	0.65	0.03	0.09	0.36	0.08	0.15	0.40	**0.10**	**0.19**	**0.52**	11%
Total to Off-site Pond C (Tributary Basins: EX-4A, EX-4B, A, B, C)	189.20															**9.6%**
Total to on-site Pond 1 (Tributary Basins: EX-3, OS-1, OS-2, D thru K)	150.50															**30.1%**

FINAL DRAINAGE REPORT ~ BASIN RUNOFF SUMMARY

BASIN	WEIGHTED CA(2)	CA(5)	CA(100)	OVERLAND C(5)	Length (ft)	Height (ft)	Tc (min)	STREET / CHANNEL FLOW Length (ft)	Slope (%)	Velocity (fps)	Tc (min)	Tc TOTAL (min)	INTENSITY I(2) (in/hr)	I(5) (in/hr)	I(100) (in/hr)	TOTAL FLOWS Q(2) (cfs)	Q(5) (cfs)	Q(100) (cfs)
EX-A	0.02	0.07	0.28	0.09	240	9	18.3					18.3	2.58	3.23	5.41	0.1	**0.2**	**2**
EX-B	0.08	0.25	1.01	0.09	300	24	15.9	120	2.0%	1.0	2.0	17.9	2.60	3.25	5.46	0.2	**0.8**	**6**
EX-C	1.24	3.73	14.90	0.09	300	18	17.5	1300	2.9%	1.7	12.7	30.2	1.98	2.47	4.15	2	**9**	**62**
EX-D	0.04	0.12	0.47	0.09	225	10	16.7					16.7	2.68	3.36	5.64	0.1	**0.4**	**3**
EX-E	2.17	6.52	26.06	0.09	280	20	15.9	3400	2.5%	1.6	35.8	51.8	1.34	1.66	2.79	3	**11**	**73**
EX-F	0.26	0.78	3.13	0.09	300	12	20.0	560	2.0%	1.4	6.6	26.6	2.13	2.66	4.47	1	**2**	**14**
EX-G	0.25	0.75	2.99	0.09	300	10	21.2	420	2.0%	1.4	4.9	26.2	2.15	2.69	4.51	1	**2**	**13**
EX-H	0.20	0.59	2.34	0.09	300	10	21.2	800	2.0%	1.4	9.4	30.7	1.96	2.45	4.11	0.4	**1.4**	**10**
OS-1	0.12	0.26	0.80	0.08	300	10	21.4					21.4	2.39	2.99	5.01	0.3	**0.8**	**4**
OS-2	0.32	0.69	2.12	0.08	300	12	20.2					20.2	2.46	3.08	5.16	1	**2**	**11**
EX-3	1.77	4.65	16.61	0.08	300	10	21.4	650	2.0%	1.4	7.7	29.1	2.02	2.53	4.24	4	**12**	**70**
EX-4A	3.08	8.09	28.88	0.08	300	9	22.2	2400	2.0%	1.4	28.3	50.5	1.37	1.70	2.85	4	**14**	**82**
EX-4B	2.80	7.35	26.25	0.08	300	10	21.4	3500	1.8%	1.3	43.5	64.9	1.07	1.32	2.22	3	**10**	**58**
A	5.46	7.78	15.39	0.08	100	2	14.7	1000	2.0%	2.8	5.9	20.5	2.44	3.05	5.12	13	**24**	**79**
B	0.28	0.45	1.00	0.12	100	2	14.1	500	2.0%	2.8	2.9	17.0	2.66	3.33	5.59	1	**1**	**6**
C	0.74	1.18	2.87	0.12	300	14	18.4	500	2.0%	1.4	5.9	24.3	2.24	2.80	4.69	2	**3**	**13**
D	3.81	4.19	5.49	0.08	100	2	14.7	800	2.0%	2.8	4.7	19.4	2.51	3.14	5.27	10	**13**	**29**
E	4.58	4.70	5.10	0.08	50	1	10.4	550	1.5%	2.4	3.7	14.1	2.89	3.61	6.07	13	**17**	**31**
F	2.38	3.30	6.20	0.08	100	2	14.7	600	2.0%	2.8	3.5	18.2	2.58	3.23	5.43	6	**11**	**34**
G	4.82	6.70	12.60	0.08	100	2	14.7	1500	2.0%	2.8	8.8	23.5	2.28	2.85	4.78	11	**19**	**60**
H	3.79	3.89	4.22	0.08	30	0.6	8.0	1150	1.5%	2.4	7.8	15.8	2.75	3.44	5.77	10	**13**	**24**
I	4.80	5.27	6.90	0.08	100	2	14.7	700	1.5%	2.4	4.8	19.4	2.51	3.13	5.26	12	**17**	**36**
J	3.67	5.10	9.59	0.08	100	2	14.7	1000	1.5%	2.4	6.8	21.5	2.39	2.98	5.01	9	**15**	**48**
K	0.35	0.83	2.69	0.08	100	2	14.7	350	1.0%	1.0	5.8	20.5	2.44	3.05	5.13	1	**3**	**14**
L	0.10	0.19	0.52	0.09	100	5	10.7	150	4.0%	2.0	1.3	12.0	3.08	3.86	6.48	0.3	**0.7**	**3**

FINAL DRAINAGE REPORT ~ SURFACE ROUTING SUMMARY

Design Point(s)	Contributing Basins	Equivalent CA(5)	Equivalent CA(100)	Maximum Tc	Intensity I(5)	I(100)	Flow Q(5)	Q(100)	Inlet Size
E1	EX-4A	8.09	28.88	50.5	1.70	2.85	14	82	EX. 24" CMP CULVERT
E2	EX-4B	7.35	26.25	64.9	1.32	2.22	10	58	EX. STOCK OFF-SITE POND
E3	EX-A, EX-B	0.32	1.29	18.3	3.23	5.41	1	7	TYPE D CDOT INLET W/ 24" RCP
E4	EX-4A, EX-4B, EX-C	19.16	70.03	64.9	1.32	2.22	25	155	PLANNED 48" RCP W/ MH AND GRATE
E5	EX-3	4.65	16.61	29.1	2.53	4.24	12	70	EX. 24" CMP CULVERT
E6	EX-G	0.75	2.99	26.2	2.69	4.51	2	13	TYPE D CDOT INLET W/ 24" RCP
E7	EX-H	0.59	2.34	30.7	2.45	4.11	1	10	TYPE C CDOT INLET W/ 18" RCP
E8	EX-3, EX-E, OS-2	11.86	44.80	51.8	1.66	2.79	20	125	EX. 24" CMP CULVERT
E9	DP-E8, EX-F, OS-1	12.90	48.73	55.8	1.55	2.60	20	127	MODIFIED 4'X14' TYPE D CDOT INLET W/ 54" RCP
E10	EX-D	0.12	0.47	16.7	3.36	5.64	0.4	3	SHEET FLOW TO NATURAL RAVINE
D1	B	0.45	1.00	17.0	3.33	5.59	1	6	TYPE D CDOT INLET W/ 24" RCP
D2	EX-4A, EX-4B, A	23.21	70.52	64.9	1.32	2.22	31	156	FUTURE PUBLIC STORM SYSTEM
D3	Basin C	1.18	2.87	24.3	2.80	4.69	3	13	PLANNED 48" RCP W/ MH AND GRATE
D3A	D2, Basin C	24.39	73.39	66.9	1.28	2.14	31	157	EXIST. 48" PUBLIC STORM OUTFALL
D4	D	4.19	5.49	19.4	3.14	5.27	13	29	FUTURE PUBLIC STORM SYSTEM
D5	E	4.70	5.10	14.1	3.61	6.07	17	31	FUTURE PUBLIC STORM SYSTEM
D6	F	3.30	6.20	18.2	3.23	5.43	11	34	FUTURE PUBLIC STORM SYSTEM
D7	EX-3, G, 1/2 OS-2	11.70	30.27	37.9	2.13	3.57	25	108	FUTURE PUBLIC STORM SYSTEM
D8	I	5.27	6.90	19.4	3.13	5.26	17	36	FUTURE PUBLIC STORM SYSTEM
D9	J, 1/2 OS-2	5.44	10.65	21.5	2.98	5.01	16	53	FUTURE PUBLIC STORM SYSTEM
D10	L	0.19	0.52	12.0	3.86	6.48	0.7	3	NATURAL RAVINE
D11	**TOTAL INFLOW POND 1 (DP-4 thru DP-9, incl. K and OS-1)**	**35.68**	**68.11**	**42.9**	**1.94**	**3.26**	**69**	**222**	**FULL-SPECTRUM POND 1 FACILITY**



* NOTE:
EXISTING PUBLIC CULVERTS CROSSING POCO ROAD ADJACENT TO THE JAYNES PROPERTY APPEAR TO BE SILTED IN AND UNDERSIZED FOR THE 100-YR EVENT.

IT IS RECOMMENDED THAT EL PASO COUNTY VISUALLY INSPECT THESE FACILITIES AND CONSIDER UP-SIZING FOR LARGER STORM EVENTS BASED ON THE CURRENT BASIN HYDROLOGY OR AT MINIMUM CLEAN OUT THE CURRENT FACILITIES TO ALLOW FOR BETTER CONVEYANCE.

EFFECTIVE IMPERVIOUSNESS - POND C

Basin	Acreage	Imp.%
EX-4A	77.0	5%
EX-4B	70.0	5%
A	33.1	27%
B	2.3	30%
C	6.8	16%
Total	**189.2**	**9.6%**

EFFECTIVE IMPERVIOUSNESS - POND 1

Basin	Acreage	Imp.%
EX-3	44.3	5%
OS-1	2.0	10%
OS-2	5.3	10%
D	9.3	65%
E	5.8	95%
F	13.2	30%
G	26.8	30%
H	4.8	95%
I	11.7	65%
J	20.4	30%
K	6.9	7%
Total	**150.5**	**30.1%**

LEGEND

DESCRIPTION	SYMBOL
EXISTING GROUND CONTOUR	(6910)
PROPOSED FINISHED CONTOUR	6910
BASIN BOUNDARY	
DESIGN POINT	1
BASIN IDENTIFIER / AREA IN ACRES	BB 10.0
EXISTING DIRECTION OF FLOW	
EXISTING STORM SEWER	
WETLAND DELINEATION	
DETENTION/STORMWATER QUALITY HANDLED IN POND C WITHIN THE HOMESTEAD NORTH DEVELOPMENT	

N

200 100 0 200 400

SCALE: 1" = 200'

CLASSIC CONSULTING

619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799 (Fax)

JAYNES PROPERTY
SKETCH PLAN
MASTER DEVELOPMENT DRAINAGE PLAN
DEVELOPED CONDITIONS

DESIGNED BY	MAW	SCALE	DATE 7-15-22
DRAWN BY	MAW	(H) 1"= 200'	SHEET 2 OF 3
CHECKED BY		(V) 1"= N/A	JOB NO. 1305.20

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