Livingston City Commission Agenda

September 19, 2023
5:30 PM
City – County Complex, Community Room
https://us02web.zoom.us/j/83690208904?pwd=c3Y1ay9Rc3puWis2MG5IaDd4dlNRQT09

Meeting ID: 836 9020 8904
Passcode: 399814

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1. Call to Order

2. Roll Call

3. Public Comment

Individuals are reminded that public comments should be limited to item over which the City Commission has supervision, control jurisdiction, or advisory power (MCA 2-3-202)

4. Consent Items

A. APPROVAL OF MINUTES FROM SEPTEMBER 5, 2023, REGULAR CITY COMMISSION MEETING PG.4

B. CLAIMS PAID 8/31/23 - 9/12/23 PG.13

C. AGREEMENT 20034 WITH PARK COUNTY FOR WASTEWATER TESTING. PG24

D. AGREEMENT 20035 REGARDING THE PARK COUNTY BEHAVIORAL HEALTH AND CRISIS RESPONSE COALITION PG.29

E. AMENDMENT NO. 1 TO AGREEMENT 20024 WITH AFSCME PG.35

5. Proclamations

A. A PROCLAMATION OF THE CITY COMMISSION OF THE CITY OF LIVINGSTON DECLARING SEPTEMBER 19TH AS INFORMATION TECHNOLOGY PROFESSIONALS DAY IN LIVINGSTON. PG.38

6. Scheduled Public Comment

7. Public Hearings

Individuals are reminded that testimony at a public hearing should be relevant, material, and not repetitious. (MCA 7-1-4131 and Livingston City Code Section 2-21)

A. CONSIDERATION OF COMMUNITY DEVELOPMENT BLOCK GRANT PROJECTS FOR 2023

8. Ordinances

A. ORDINANCE 3045: AN ORDINANCE OF THE CITY OF LIVINGSTON MONTANA REMOVING FEES FROM THE MUNICIPAL CODE PG.40

9. Resolutions

10. Action Items

A. MOUNTAIN VIEW SUBDIVISION PRELIMINARY PLAT **PG.58**

11. City Manager Comment

12. City Commission Comments

13. Adjournment

Calendar of Events

Supplemental Material

Notice

- Public Comment: The public can speak about an item on the agenda during discussion of that item by coming up to the table or podium, signing-in, and then waiting to be recognized by the Chairman. Individuals are reminded that public comments should be limited to items over which the City Commission has supervision, control, jurisdiction, or advisory power (MCA 2-3-202).

- Meeting Recording: An audio and/or video recording of the meeting, or any portion thereof, may be purchased by contacting the City Administration. The City does not warrant the audio and/or video recording as to content, quality, or clarity.

- Special Accommodation: If you need special accommodations to attend or participate in our meeting, please contact the Fire Department at least 24 hours in advance of the specific meeting you are planning on attending.

File Attachments for Item:

A. APPROVAL OF MINUTES FROM SEPTEMBER 5, 2023, REGULAR CITY COMMISSION MEETING

Livingston City Commission Minutes

September 05, 2023
5:30 PM
City – County Complex, Community Room

https://us02web.zoom.us/j/89631800639?pwd=WDFQSlg4b3dTM0ZVdDI0WVhsbmFFUT09

Meeting ID: 896 3180 0639
Passcode: 938156

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1. Call to Order

Chair Nootz called the meeting to order at 5:33pm

2. Roll Call

City Commission in attendance at start of meeting: Chair Nootz, Vice-Chair Kahle, Commissioner Friedman, Commissioner Schwarz

Staff in attendance: City Manager Grant Gager, City Clerk Emily Hutchinson, Planning Director Jennifer Severson, Finance Director Paige Fetterhoff, Asst. Chief Wayne Hard

3. Public Comment

Individuals are reminded that public comments should be limited to item over which the City Commission has supervision, control jurisdiction, or advisory power (MCA 2-3-202)

Public Comment was offered by:

- Patricia Grabow gave a heartfelt thank you for the Warren McGee statue.
- Beverly McGee Madsen & Laura McGee jointly shared their excitement about the statue of their Uncle Warren. They gave a big thank you to everyone for putting this together and they are happy this statue will be here for their family to see for many years to come.

4. Consent Items

A. CLAIMS PAID 8/10/23 - 8/30/23 **PG.4**

B. APPROVAL OF MINUTES FROM AUGUST 15, 2023, REGULAR CITY COMMISSION MEETING **PG.21**

C. APPROVAL OF MINUTES FROM AUGUST 28, 2023, SPECIAL CITY COMMISSION MEETING **PG.31**

D. BROOKSTONE PAYBACK AGREEMENT **PG.34**

E. CONSIDERATION OF AGREEMENT 20033 WITH LIVINGSTON DEPOT FOUNDATION AND PARK COUNTY COMMUNITY FOUNDATION **PG.36**

Chair Nootz asked Commissioners if there were any consent items that should be pulled for discussion. Vice Chair Kahle asked to pull consent item E for a small adjustment.

Motion to approve consent items A – D was made by Commissioner Schwarz and seconded by Vice Chair Kahle. The motion passed unanimously by the four members present.

Vice Chair Kahle motioned to approve consent item E with an adjustment to the language on PG 39 of the agenda at the ii adding “or legal” and seconded by Commissioner Schwarz.

Chair Nootz asked the City Manager if the City had anything to add. Nothing was added, but thanks was given to the Depot and Community Foundation.

The motion passed unanimously by the four members present.

5. Proclamations

6. Scheduled Public Comment

A. DEPT. OF COMMERCE COMMUNITY TECHNICAL ASSISTANCE - CONSULTANT INTRODUCTION TO ZONING CODE EVALUATION PROJECT

Chair Nootz called on the City Manager to introduce the item. The City Manager shared that the State Department of Commerce has included Livingston in its community technical assistance program. This means the City has a group of professionals who will help us start the zoning code overhaul. This team does this first step of comparing the Livingston Municipal Code zoning section with the growth policy to identify areas of conflict or point out areas of concerns.

Cody Marxer introduced herself as a planner with Great Western Engineering based out of Helena. She reiterated that they will be comparing the zoning code to the growth policy and they are looking for inconsistencies and things of that nature. They have already begun the review and we can expect to see an engagement plan with ways to amend and bring things into compliance. She did clarify nothing would be mandated, but all suggestion based and guidance for moving forward.

Chair Nootz asked the City Manager how this process works. The City Manager clarified the procurement process for the larger zoning overhaul. The document that Cody and her team put together will inform the work of that consultant. With the outcome being a text amendment, it will go through Zoning Commission then to City Commission.

7. Public Hearings

Individuals are reminded that testimony at a public hearing should be relevant, material, and not repetitious. (MCA 7-1-4131 and Livingston City Code Section 2-21)

8. Ordinances

A. ORDINANCE 3042: AND ORDINANCE OF THE CITY OF LIVINGSTON, MONTANA, AMENDING CHAPTER 26, ARTICLE V, SECTIONS 26.90 AND 26.91 OF THE LIVINGSTON MUNICIPAL CODE ENTITLED STREET MAINTENANCE AND STREET LIGHTING DISTRICTS PG.41

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this is the second reading of this ordinance and it’s to change to the way the street and street lighting maintenance district costs are assessed. The proposal is to move to an assessment method based on valuation. There are several different methods allowed under state code such as parcel size,

street frontage, trip generation, equal apportionment and the method we are recommending which is based on taxable value of a parcel.

Vice Chair Kahle moved to approve the ordinance and Commissioner Friedman seconded the motion. The item was approved unanimously by the four commissioners present.

B. ORDINANCE 3043, AN ORDINANCE OF THE CITY OF LIVINGSTON, MONTANA, AMENDING CHAPTER 30 OF THE LIVINGSTON MUNICIPAL CODE ENTITLED ZONING BY ADDING NEW SECTION 30.47 ENTITLED PLANNED UNIT DEVELOPMENTS AND PROVIDING A REPEALER, SAVINGS, SEVERABILITY AND EFFECTIVE DATE. PG.50

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this a continuation from the last meeting when the PUD Ordinance was presented. There was a request from the City Commission to staff to gain some feedback on the ordinance. The City Manager and Planning Director spoke with several different groups and would like bring what they heard to the City Commission for a discussion. The intent is to gain City Commission feedback and bring a revised ordinance to them at a later date.

Planning Director Jennifer Severson shared that they did gain some additional feedback that was suggest from the August 1st meeting. Suggested revisions included decreased from 1 acre to .5 acre, allow PUD in all zoning districts, remove commercial use requirement, make commercial use a public benefit, increase max density bonus to 50% from 25%, and allow cash-in-lieu for increased open space benefit. The City Manager reminded City Commissioners that the goal is to refine the ordinance based on the 6 updates. Chair Nootz suggested to go through the items individually.

Public Comment was offered by:

- Tom Blurock is a board member of Friends of Park County and is really interested in making this PUD ordinance work. He felt it would be a big deal for a developer to deed restrict their property to do this. He is really happy to see the direction this is going.
- Dan Downing is frustrated by this idea and has concerns with density and affordability.
- Martha Downing shared that the proposed changes may change her experience with the home she purchased.
- Ken Cochrane, President of Friends of Park County, and shares that Friends of Park County approves and likes this PUD Ordinance. He offers to points of view being clear and objective definitions, standards and criteria in land use regulation, and would like commission to consider adding the provision of voluntary conservation easements in the ETJ as a public benefit.

Chair Nootz started off with decrease minimum PUD size to one half acre from 1 acre. Commissioner Schwarz and Commissioner Friedman liked this sizing. Vice Chair Kahle asked the City Manager and Planning Director if this feasible at one half acre. The City Manager clarified that the map the Planning Director had show's that yes, and there is benefit for half acre and no concern from staff capacity. Chair Nootz asked if this if this PUD process would also apply to land owners or developers that have properties to redevelop as well. City Manager confirmed yes, it applies. Vice Chair Kahle and Chair Nootz also agreed they like the half acre option.

Next is allowing PUD's in all zoning districts. Commissioner Schwarz asked how this works in R1. Planning Director Severson clarified that they are including zones outside of residential and last meeting it was not inclusive of all zones. The City Manager clarified that R1 was originally included in the August 1st meeting, but it was discussed then that it would not be suitable for environmental reasons and Commission thought PUD's should not be included in R1. To clarify zoning would not

include R1, but open it to everything else. Chair Nootz does not think it's acceptable to put PUD Ordinance in all zoning districts because there are some places that don't allow housing. Chair Nootz brought up Ag Land and Industrial Land that was discussed in growth policy that people don't want housing in those areas, so she feels PUDs should not be allowed in those districts. Mixed Use and Neighborhood Commercial zones were discussed as PUD candidate districts. It was determined that Neighborhood Commercial does not allow housing so this would not allow PUD's.

Remove commercial use requirement was started off by Vice Chair Kahle feels this is redundant, but it makes sense for public benefit. Chair Nootz clarified they like this idea of not making this a requirement just a commercial use a public benefit.

Require 80% minimum AMI for rentals and 120% AMI for owner units to obtain incentives, that's up from a minimum of 60% AMI with rentals and owner units not delineated. Vice Chair Kahle asked Planning Director Severson about her speaking with developers and housing experts and wanted to clarify both of those groups thought 60% was too low. Planning Director Severson said with the cost to build in Livingston that it's unlikely a developer could make 60% work. The City Manager clarified items related to deed restrictions and income verification. Chair Nootz reiterated the intent is for high quality housing and safe housing for all members of the community. Ultimately Chair Nootz is comfortable moving up this AMI. Chair Nootz would like more information and definition around renters vs. owners in this PUD.

Increase max density bonus to 50% from 25% was started by Chair Nootz. She understands that developers want this density bonus, but feels 25% is very generous and is not in favor of this increase. Commissioner Schwarz and Vice Chair Kahle agrees not to agree not to raise this density bonus to 50% and just keep it at 25%.

Cash-in-lieu for increased open space benefit was started with Chair Nootz who feels this contradicts one of the original proposed benefits. The City Manager clarified this was a suggestion based on a smaller subdivision and discussed some example numbers that calculate open space options. The staff would maintain the process for the cash-in-lieu of option such as a dollar amount per square foot for the in-lieu fee. Currently it's not a well-used or well-known program that could be used.

City Manager stated staff will take in the feedback and bring it back before the Commission with updates.

7:01pm Commissioner Schwarz for a 10 minute break seconded by Vice Chair Kahle. Unanimously approved.

(Starts at Video Mark 1:29:45)

C. ORDINANCE 3044: AN ORDINANCE OF THE CITY COMMISSION OF THE CITY OF LIVINGTON, MONTANA, AMENDING CHAPTER 28, SECTION X-A OF THE LIVINGSTON MUNICIPAL CODE ENTITLED SUBDIVISION REGULATION BY ELIMINATING THE FEE SCHEDULE AND PROVIDING THAT THE FEES WILL BE SET BY SEPARATE RESOLUTION OF THE CITY COMMISSION. PG.78

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this is the second reading and this ordinance is in preparation for a City-wide Fee Resolution. The City is going through all City Code removing all reference to fees and they started with chapter 28.

Vice Chair Kahle moved to approve the ordinance and Commissioner Friedman seconded the motion

The item was approved unanimously by the four commissioners present.

9. Resolutions

A. RESOLUTION 5107: LEVYING 100% OF THE COST FOR STREET MAINTENANCE AND IMPROVMENTS DISTRICT NO. 1 FOR FY 2023-2024 PG.84

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this is the second reading of this resolution. The average residential property assessment will decrease in FY 24 from $275 to $255.

Commissioner Schwarz moved to approve the resolution and Vice Chair Kahle seconded the motion.

Chair Nootz asked where can people reach out and ask about this item and the City Manager clarified they could call City Hall and speak to the Finance Office or him directly.

The item was approved unanimously by the four Commissioners present.

B. RESOLUTION 5108: **ESTIMATING THE COST OF MAINTAINING LIGHTS AND SUPPLYING ELECTRICAL CURRENT TO SPECIAL IMPROVEMENT LIGHTING DISTRICT NO. 20 FOR FY 2023-2024 PG.89**

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this is the second reading of this resolution which sets the assessment amount for the light maintenance district. The change includes 33% decrease so the average residential property will be assessed $19.30 down from $31.09.

Vice Chair Kahle moved to approve the resolution and Commissioner Friedman seconded the motion.

The item was approved unanimously by the four Commissioners present.

C. RESOLUTION 5109: MODIFYING SPECIAL IMPROVEMENT LIGHTING DISTRICT NO. 20 BY REPLACING STREET LIGHTS AND OTHER APPURTENANCES FOR FY 2023-2024 PG.94

Chair Nootz called on the City Manager to introduce the item. The City Manager stated this resolution is to set the final assessment amount for the appurtenances in the light maintenance district. The amount for residential property will decrease in FY24.

Commissioner Schwarz moved to approve the resolution and Vice Chair Kahle seconded the motion.

Public Comment was offered by:

- Patricia Grabow is happy to see these changes in the lighting district and is happy it's going down.

The item was approved unanimously by the four Commissioners present.

10. Action Items

A. UPDATE ON COMMUNITY WELLNESS CENTER PROJECT PG.99

The City Manager wanted to update the City Commissioners and let them know staff is working with 4 Ranges Community Recreation Foundation on possibly replacing some of the aging recreation infrastructure. It was discussed that there was talk of creating a special district that would extend into the County and unfortunately the County Commission did not feel comfortable asking the public to vote on this special district. Staff is still working with the Foundation on a path forward in a way that accomplishes the goals identified in the community needs assessment, but is also affordable for the tax payers of City residents. The goals being that the Wellness Center is affordable and sustainable is very important to maintaining our budget moving forward. It was further clarified the City is looking at the feasibility of a city only district to fund operations of the Wellness Center.

Public Comment was offered by:

- Patricia Grabow discussed a grant option to create a trail from Public Works to the Star Division and MRL agreed to a bike path. She thinks this grant would help reduce cost for Wellness Center.

Commissioner Schwarz expressed concern that this project will fall through and expressed disappointment in the County Commission for not letting the public vote on this. Vice Chair Kahle thanked the City Manager for working on this and trying to figure out a plan that works best for the community. Chair Nootz thanked the City Manager and stated the original intent of this project was to serve City and County and the design was based on both participating. Chair Nootz shared some community concerns she's still hearing about the City pool and understanding its aging, and also City residents carrying all the weight for the project. Chair Nootz thanked the City Manager for taking on this project and find a way to try and make it work. Commissioner Friedman expressed the importance of having a Wellness Center in the community and that we follow through on the project. Chair Nootz clarified that they are not done trying to help with this Wellness Center even with funding concern and the City Manager agreed.

B. DISCUSSION REGARDING ADVISORY BOARDS PG.102

The City Manager has observed that the public engagement is very low and staff reviewed past meetings findings little to no public attendance or engagement. The average public attendance is less than 1 per meeting. The advisory boards have been brought to his attention to update and make more functional for the City.

Chair Nootz reminded that this has been a topic of discussion since they interviewed the current City Manager. After learning the history of some of the boards Chair Nootz offered that a primary issue is how the boards were initially set-up to be advisory to the Commission. However, they were actually give responsibilities that are more executive in nature. Chair Nootz also indicated she felt

we should update the advisory boards to be in line with today's City government. Chair Nootz would like to clarify the goals for the advisory boards and the roles of people on the boards.

Vice Chair Kahle stated peoples time is valuable and for the folks on these boards utilizing that time more effectively for everyone would be a good idea.

Commissioner Friedman asked if the boards are working within the City. He feels they are important if we can figure out a system where they fit for effectively. Frequency of meetings, consistency, input of good ideas, efficient and effective participation, clarify goals and roles are the key topics brought up by the Commission.

The City Manager agreed that frequency of meetings is a good issue to sort through giving on example with Park & Trail and Tree Board could benefit from a seasonal meeting. Chair Nootz questioned executive branch board vs. legislative boards and needed clarity on the difference. The City Manager stated if large changes are going to be made then some updates to Livingston Municipal Code will have to happen. Chair Nootz brought up board training and possibly making that part of our board process. It was discussed with a legislative update we could possibly combine the Planning and Zoning Board.

The City Manager stated boards will continue to meet as needed as staff and commission sort through the process of updating the boards.

C. CLOSED SESSION PURSUANT TO MONTANA CODE ANNOTATED 2-3-203(4)(A)

Chair Nootz motioned to enter into closed session seconded by Vice Chair Kahle.

The motion was approved unanimously by the four Commissioners present.

(Starts at Video Mark 2:32:26)

11. City Manager Comment

The City Manager thanked everyone in the room and is excited for September Community events and welcoming the kids back to school.

12. City Commission Comments

Vice Chair Kahle thanks fellow Commissioners and the City Manager. Chair Nootz thanked Vice Chair Kahle for stepping in while she was out. Chair Nootz thanked the Water Department for fixing a broken water main. Chair Nootz expressed gratitude to the City and the Water Department for their hard work.

13. Adjournment

8:48pm Commissioner Friedman motioned to adjourn the meeting seconded by Vice Chair Kahle. Unanimously approved.

Calendar of Events

Supplemental Material

Notice

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File Attachments for Item:

B. CLAIMS PAID 8/31/23 - 9/12/23

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
A DIVISION OF IDSC HOLDINGS LLC							
10005	A DIVISION OF IDSC HOLDINGS	ARV/58307051	PLIERS	08/08/2023	110.07	110.07	09/12/2023
	Total A DIVISION OF IDSC HOLDINGS LLC:				110.07	110.07	
AAA CLEANING, LLC							
3727	AAA CLEANING, LLC	2023.8.31	Bennett St cleaning	08/31/2023	156.25	156.25	09/12/2023
3727	AAA CLEANING, LLC	2023.8.31	Bennett St cleaning	08/31/2023	156.25	156.25	09/12/2023
3727	AAA CLEANING, LLC	2023.8.31	Bennett St cleaning	08/31/2023	156.25	156.25	09/12/2023
3727	AAA CLEANING, LLC	2023.8.31	Bennett St cleaning	08/31/2023	156.25	156.25	09/12/2023
3727	AAA CLEANING, LLC	2023.8.31	220 E PARK CLEANING	08/31/2023	2,000.00	2,000.00	09/12/2023
	Total AAA CLEANING, LLC:				2,625.00	2,625.00	
ACE ROOFING, LLC							
2768	ACE ROOFING, LLC	22-1069-1	WINTER ROOF REPAIR	08/21/2023	2,648.54	2,648.54	09/01/2023
2768	ACE ROOFING, LLC	22-1069-2	SPRING INSPECTION	08/24/2023	650.00	650.00	09/01/2023
	Total ACE ROOFING, LLC:				3,298.54	3,298.54	
ALL SERVICE TIRE & ALIGNMENT							
22	ALL SERVICE TIRE & ALIGNME	66501	Oil Change	07/19/2023	83.00	83.00	09/01/2023
22	ALL SERVICE TIRE & ALIGNME	66839	Tire Repair	08/31/2023	20.00	20.00	09/12/2023
22	ALL SERVICE TIRE & ALIGNME	66863	Mount & Balance	09/06/2023	80.00	80.00	09/12/2023
	Total ALL SERVICE TIRE & ALIGNMENT:				183.00	183.00	
ALPINE ELECTRONICS RADIO SHACK							
402	ALPINE ELECTRONICS RADIO	10294894	KEYBOARD, MOUSE	08/24/2023	79.98	79.98	09/01/2023
402	ALPINE ELECTRONICS RADIO	10295202	DUST REMOVER	09/01/2023	23.97	23.97	09/12/2023
402	ALPINE ELECTRONICS RADIO	10295308	Office Supplies	09/05/2023	18.14	18.14	09/12/2023
	Total ALPINE ELECTRONICS RADIO SHACK:				122.09	122.09	
ALSCO							
10005	ALSCO	LBIL1855322	MATS	05/24/2023	133.23	133.23	09/12/2023
10005	ALSCO	LBIL1862929	MATS	06/21/2023	129.35	129.35	09/12/2023
10005	ALSCO	LBIL1870478	MATS	07/19/2023	131.29	131.29	09/12/2023
10005	ALSCO	LBIL1878022	MATS	08/16/2023	133.20	133.20	09/12/2023
10005	ALSCO	LBIL1880865	330 BENNETT	08/25/2023	15.14	15.14	09/01/2023
10005	ALSCO	LBIL1880865	330 BENNETT	08/25/2023	15.14	15.14	09/01/2023
10005	ALSCO	LBIL1880865	330 BENNETT	08/25/2023	15.15	15.15	09/01/2023
10005	ALSCO	LBIL1880865	330 BENNETT	08/25/2023	15.15	15.15	09/01/2023
10005	ALSCO	LBIL1881075	MATS 220 E PARK	08/28/2023	100.86	100.86	09/12/2023
	Total ALSCO:				688.51	688.51	
BALCO UNIFORM COMPANY, INC.							
3371	BALCO UNIFORM COMPANY, IN	75869	Uniform	08/29/2023	293.90	293.90	09/12/2023
3371	BALCO UNIFORM COMPANY, IN	76252	Uniform	08/25/2023	235.10	235.10	09/12/2023
	Total BALCO UNIFORM COMPANY, INC.:				529.00	529.00	
BETTER DAYS CLEANING							
10004	BETTER DAYS CLEANING	1236	cleaning	09/10/2023	875.00	875.00	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total BETTER DAYS CLEANING:				875.00	875.00	
BOUND TREE MEDICAL, LLC							
2662	BOUND TREE MEDICAL, LLC	85056196	Patient Supplies	08/14/2023	101.61	101.61	09/01/2023
2662	BOUND TREE MEDICAL, LLC	85067919	Patient Supplies	08/24/2023	359.99	359.99	09/01/2023
	Total BOUND TREE MEDICAL, LLC:				461.60	461.60	
BRIDGER ANALYTICAL LAB							
3820	BRIDGER ANALYTICAL LAB	2308161	ANALYSIS	08/18/2023	228.00	228.00	09/01/2023
	Total BRIDGER ANALYTICAL LAB:				228.00	228.00	
BRIDGER PRECAST LLC							
10005	BRIDGER PRECAST LLC	0001401-IN	RING/COVER	09/01/2023	3,996.00	3,996.00	09/12/2023
	Total BRIDGER PRECAST LLC:				3,996.00	3,996.00	
BRUCE E. BECKER, P.C.							
10000	BRUCE E. BECKER, P.C.	2023.8.31	Contracted service	09/01/2023	4,000.00	4,000.00	09/12/2023
10000	BRUCE E. BECKER, P.C.	2023.9.12	REIMB-SUPPLIES	09/12/2023	28.57	28.57	09/12/2023
	Total BRUCE E. BECKER, P.C.:				4,028.57	4,028.57	
BRUCO, INC.							
782	BRUCO, INC.	419154	ReECOATING SERVICE	08/22/2023	4,628.00	4,628.00	09/01/2023
	Total BRUCO, INC.:				4,628.00	4,628.00	
CANON FINANCIAL SERVICES, INC							
1747	CANON FINANCIAL SERVICES, I	31079181	Printer	08/12/2023	29.31	29.31	09/01/2023
1747	CANON FINANCIAL SERVICES, I	31079182	Printer	08/12/2023	29.75	29.75	09/01/2023
	Total CANON FINANCIAL SERVICES, INC:				59.06	59.06	
CASELLE							
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	2,895.16	2,895.16	09/12/2023
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	95.10	95.10	09/12/2023
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	95.10	95.10	09/12/2023
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	183.51	183.51	09/12/2023
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	183.51	183.51	09/12/2023
3763	CASELLE	127416	APPLICATION SOFTWARE	09/01/2023	278.62	278.62	09/12/2023
	Total CASELLE:				3,731.00	3,731.00	
CENTURYLINK							
162	CENTURYLINK	2023.8.16	4062220137441b	08/16/2023	85.69	85.69	09/01/2023
	Total CENTURYLINK:				85.69	85.69	
CITY OF LIVINGSTON							
3364	CITY OF LIVINGSTON	2023.7.20	REIMB-PETTY CASH	07/20/2023	80.00	80.00	09/12/2023
3364	CITY OF LIVINGSTON	2023.8.11	REFUND RENTAL-BLACK	08/11/2023	35.00	35.00	09/12/2023
3364	CITY OF LIVINGSTON	2023.8.26	REIMB-PETTY CASH	08/26/2023	94.90	94.90	09/12/2023
3364	CITY OF LIVINGSTON	60218944	REFUND RENTAL-SILVESTRI	08/30/2023	35.00	35.00	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total CITY OF LIVINGSTON:				244.90	244.90	
CIVICPLUS							
10000	CIVICPLUS	264127	CIVICREC ANNUAL RENEWAL	08/01/2023	4,524.88	4,524.88	09/01/2023
10000	CIVICPLUS	270351	MERCHANT FEES	07/31/2023	370.37	370.37	09/01/2023
10000	CIVICPLUS	270351	MERCHANT FEES	07/31/2023	1,054.30	1,054.30	09/01/2023
	Total CIVICPLUS:				5,949.55	5,949.55	
COLJ CONFERENCE REGISTRATION							
2660	COLJ CONFERENCE REGISTRA	2023.9.8	FALL judge conf.	09/08/2023	300.00	300.00	09/12/2023
	Total COLJ CONFERENCE REGISTRATION:				300.00	300.00	
COMDATA							
2671	COMDATA	20392457	CG72P	09/01/2023	369.24	369.24	09/12/2023
2671	COMDATA	20392457	CG72R	09/01/2023	473.21	473.21	09/12/2023
2671	COMDATA	20392457	CG73C	09/01/2023	751.09	751.09	09/12/2023
2671	COMDATA	20392457	CG73H	09/01/2023	159.65	159.65	09/12/2023
2671	COMDATA	20392457	CG73L	09/01/2023	563.72	563.72	09/12/2023
2671	COMDATA	20392457	CG73S	09/01/2023	1,328.52	1,328.52	09/12/2023
2671	COMDATA	20392457	CG74G	09/01/2023	690.37	690.37	09/12/2023
2671	COMDATA	20392457	CG74G	09/01/2023	120.00	120.00	09/12/2023
2671	COMDATA	20392466	CG72S	09/01/2023	2,475.06	2,475.06	09/12/2023
2671	COMDATA	20392467	EMS	09/01/2023	2,985.37	2,985.37	09/12/2023
2671	COMDATA	20392467	FIRE	09/01/2023	515.03	515.03	09/12/2023
2671	COMDATA	EB986/203894	BZR70	04/01/2023	207.64	207.64	09/12/2023
2671	COMDATA	EB986/203900	BZR70	05/01/2023	204.75	204.75	09/12/2023
2671	COMDATA	XW660/203900	FIRE	05/01/2023	472.99	472.99	09/12/2023
2671	COMDATA	XW660/203900	EMS	05/01/2023	3,269.13	3,269.13	09/12/2023
	Total COMDATA:				14,585.77	14,585.77	
COREY O'NEILL							
10001	COREY O'NEILL	2023.8.28	REIMB-TAPE	08/28/2023	20.97	20.97	09/12/2023
	Total COREY O'NEILL:				20.97	20.97	
D&R COFFEE SERVICE INC							
10002	D&R COFFEE SERVICE INC	170030	RENTAL FEE	08/28/2023	50.00	50.00	09/01/2023
	Total D&R COFFEE SERVICE INC:				50.00	50.00	
DANA SAFETY SUPPLY, INC.							
3234	DANA SAFETY SUPPLY, INC.	865208	GRAPHICS	08/17/2023	478.00	478.00	09/01/2023
3234	DANA SAFETY SUPPLY, INC.	866846	EMS MEDIC 4	08/28/2023	675.00	675.00	09/12/2023
	Total DANA SAFETY SUPPLY, INC.:				1,153.00	1,153.00	
DEPARTMENT OF REVENUE							
122	DEPARTMENT OF REVENUE	2023_06WMC	REGIONAL SEWER EXT APP #5	08/15/2023	2,357.21	2,357.21	09/05/2023
	Total DEPARTMENT OF REVENUE:				2,357.21	2,357.21	
DORSEY & WHITNEY LLP							
10005	DORSEY & WHITNEY LLP	3905002	LEGAL SERVICES	08/24/2023	5,500.00	5,500.00	09/01/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total DORSEY & WHITNEY LLP:				5,500.00	5,500.00	
EAGLE FENCE, LLC							
542	EAGLE FENCE, LLC	1966	MILES PARK FENCE	08/31/2023	6,982.00	6,982.00	09/12/2023
	Total EAGLE FENCE, LLC:				6,982.00	6,982.00	
EXEC U CARE SERVICES, INC.							
3298	EXEC U CARE SERVICES, INC.	3547	Janitorial Services	08/30/2023	250.00	250.00	09/12/2023
3298	EXEC U CARE SERVICES, INC.	3547	Janitorial Services	08/30/2023	2,291.89	2,291.89	09/12/2023
	Total EXEC U CARE SERVICES, INC.:				2,541.89	2,541.89	
FARSTAD OIL							
3353	FARSTAD OIL	165299	Diesel 800G	08/17/2023	3,104.80	3,104.80	09/01/2023
	Total FARSTAD OIL:				3,104.80	3,104.80	
FERGUSON WATERWORKS #1701							
2386	FERGUSON WATERWORKS #17	0782683-2	Meters	06/05/2023	4,590.00	4,590.00	09/12/2023
2386	FERGUSON WATERWORKS #17	0841670	Meters	08/24/2023	5,022.00	5,022.00	09/12/2023
2386	FERGUSON WATERWORKS #17	0861894	Meters	08/30/2023	2,883.68	2,883.68	09/12/2023
	Total FERGUSON WATERWORKS #1701:				12,495.68	12,495.68	
FISHER SAND AND GRAVEL							
2904	FISHER SAND AND GRAVEL	3682	ROAD MIX	08/12/2023	660.94	660.94	09/01/2023
	Total FISHER SAND AND GRAVEL:				660.94	660.94	
FORZA FORENSICS LLC							
10005	FORZA FORENSICS LLC	1701	TRAINING-BRUMMEL	05/15/2023	770.00	770.00	09/01/2023
	Total FORZA FORENSICS LLC:				770.00	770.00	
FRONTLINE AG SOLUTIONS, LLC							
2516	FRONTLINE AG SOLUTIONS, LL	1061350	RING	08/08/2023	34.38	34.38	09/01/2023
2516	FRONTLINE AG SOLUTIONS, LL	1072885	ARM	09/01/2023	186.08	186.08	09/12/2023
	Total FRONTLINE AG SOLUTIONS, LLC:				220.46	220.46	
GENERAL DISTRIBUTING COMPANY							
1845	GENERAL DISTRIBUTING COM	0001283626	CYLINDER RENTAL	08/31/2023	35.46	35.46	09/12/2023
1845	GENERAL DISTRIBUTING COM	0001285371	Patient Supplies	08/31/2023	113.55	113.55	09/12/2023
	Total GENERAL DISTRIBUTING COMPANY:				149.01	149.01	
GUY'S GLASS, INC.							
529	GUY'S GLASS, INC.	16209-D	BRONZE CLADDING	08/09/2023	660.00	660.00	09/12/2023
	Total GUY'S GLASS, INC.:				660.00	660.00	
HANSER'S AUTOMOTIVE & WRECKER							
1687	HANSER'S AUTOMOTIVE & WR	LIV4688	Tow SUBARU	08/28/2023	100.00	100.00	09/12/2023
1687	HANSER'S AUTOMOTIVE & WR	LIV4736	Tow-MOTORCYCLE	09/11/2023	100.00	100.00	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total HANSER'S AUTOMOTIVE & WRECKER:				200.00	200.00	
HIGH COUNTRY WILDLIFE CONTROL							
10002	HIGH COUNTRY WILDLIFE CON	8222	PEST CONTROL AUG	08/22/2023	210.00	210.00	09/01/2023
	Total HIGH COUNTRY WILDLIFE CONTROL:				210.00	210.00	
HORIZON AUTO PARTS							
1920	HORIZON AUTO PARTS	978656	WIPER BLADES	08/30/2023	69.77	69.77	09/12/2023
	Total HORIZON AUTO PARTS:				69.77	69.77	
INSTY-PRINTS							
250	INSTY-PRINTS	16117	Business cards-BRIANNA	07/18/2023	49.95	49.95	09/01/2023
250	INSTY-PRINTS	16230	PROTOCOL BOOKS	07/26/2023	434.66	434.66	09/01/2023
250	INSTY-PRINTS	16585	NAME PLATES	09/01/2023	137.68	137.68	09/12/2023
	Total INSTY-PRINTS:				622.29	622.29	
J & H OFFICE EQUIPMENT							
1783	J & H OFFICE EQUIPMENT	34752405	AGREEMENT 015-1486424	08/28/2023	270.73	270.73	09/12/2023
	Total J & H OFFICE EQUIPMENT:				270.73	270.73	
JON M HESSE PC							
10005	JON M HESSE PC	45599	PROFESSIONAL SERVICES	08/31/2023	9,244.39	9,244.39	09/12/2023
	Total JON M HESSE PC:				9,244.39	9,244.39	
JORDAN BRUMMEL							
10002	JORDAN BRUMMEL	2023.8.25	REIMB-TRAVEL	08/25/2023	152.50	152.50	09/12/2023
10002	JORDAN BRUMMEL	2023.9.7	reimb-TRAINING	09/07/2023	17.00	17.00	09/12/2023
	Total JORDAN BRUMMEL:				169.50	169.50	
KELLEY CONNECT							
10001	KELLEY CONNECT	IN1412927	JH16535	09/05/2023	92.51	92.51	09/12/2023
	Total KELLEY CONNECT:				92.51	92.51	
KEN'S EQUIPMENT REPAIR, INC							
1390	KEN'S EQUIPMENT REPAIR, IN	61034	BAR FUSE	07/06/2023	20.00	20.00	09/01/2023
	Total KEN'S EQUIPMENT REPAIR, INC:				20.00	20.00	
KENYON NOBLE							
776	KENYON NOBLE	1045497	MEASURING WHEEL	07/26/2023	64.99	64.99	09/12/2023
776	KENYON NOBLE	1051580	MARKING PAINT	07/28/2023	88.10	88.10	09/12/2023
776	KENYON NOBLE	1084116	DUCT TAPE	08/14/2023	155.31	155.31	09/12/2023
776	KENYON NOBLE	1084711	PADDLE SWITCH	08/14/2023	109.99	109.99	09/12/2023
776	KENYON NOBLE	1084880	Fasteners	08/14/2023	33.99	33.99	09/12/2023
776	KENYON NOBLE	1090285	BELLED PIPE	08/16/2023	73.94	73.94	09/12/2023
776	KENYON NOBLE	1090534	BUFFALO DRIVER	08/16/2023	20.99	20.99	09/12/2023
776	KENYON NOBLE	1090534	GARDENHOE	08/16/2023	187.42	187.42	09/12/2023
776	KENYON NOBLE	1091816	ANCHOR PINS	08/17/2023	33.98	33.98	09/12/2023
776	KENYON NOBLE	1091984	Chainsaw bar	08/17/2023	269.99	269.99	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
776	KENYON NOBLE	1103959	Flexible coupling	08/23/2023	66.95-	66.95-	09/12/2023
	Total KENYON NOBLE:				971.75	971.75	
LEHRKIND'S COCA-COLA							
2830	LEHRKIND'S COCA-COLA	2072538	Water	08/23/2023	126.00	126.00	09/01/2023
2830	LEHRKIND'S COCA-COLA	2072539	Water	08/23/2023	46.00	46.00	09/01/2023
	Total LEHRKIND'S COCA-COLA:				172.00	172.00	
LIVINGSTON ACE HARDWARE - #122005							
26	LIVINGSTON ACE HARDWARE -	C96308	ROLLER	07/26/2023	94.96	94.96	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C96365	Fastners	07/26/2023	43.10	43.10	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C97061	SprAY PAINT	07/27/2023	55.92	55.92	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C97151	FLAG MARKER	07/27/2023	13.99	13.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C98767	Fastners	07/30/2023	24.59	24.59	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99231	TOILET VALVE	07/31/2023	16.99	16.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99326	WATERWISE TOILET VALVE	07/31/2023	7.00-	7.00-	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99452	WEDGE HANDLE	07/31/2023	6.99	6.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99538	CAPS	07/31/2023	7.99	7.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99552	RIVET	07/31/2023	7.18	7.18	09/12/2023
26	LIVINGSTON ACE HARDWARE -	C99868	EAR PLUGS	08/01/2023	27.98	27.98	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D00533	LINE PRO	08/02/2023	23.99	23.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D00593	BATTERIES	08/02/2023	11.99	11.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D01192	BaTTERIES	08/03/2023	28.98	28.98	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D01482	TUBE SEALANT	08/04/2023	17.99	17.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D01610	CLAMP GROUND	08/04/2023	29.71	29.71	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D03570	STIHL	08/07/2023	34.99	34.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D03643	CONNECTOR	08/07/2023	31.97	31.97	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D03698	HOSE MEANDER	06/07/2023	53.01	53.01	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D04671	POWER STRIP	08/09/2023	66.31	66.31	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D05189	CoOLER	08/10/2023	89.99	89.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D05543	GLOVES	08/11/2023	25.97	25.97	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D07789	DEFLECTOR	08/15/2023	90.59	90.59	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D08312	PIPE GALV	08/16/2023	19.99	19.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D08317	CONTRACTOR BAGS	08/16/2023	21.98	21.98	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D08840	SpOOL INSERT	08/17/2023	62.94	62.94	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D09163	BUG STOP	08/18/2023	80.62	80.62	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D10773	COUPLE	08/21/2023	23.56	23.56	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D10904	Fastners	08/21/2023	17.45	17.45	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D11943	C CLAMP	08/23/2023	50.96	50.96	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D12187	PLUG	08/24/2023	5.99	5.99	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D12212	TUBE POLY	08/24/2023	4.74	4.74	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D12245	CLEANING SUPPLIES	08/24/2023	84.91	84.91	09/12/2023
26	LIVINGSTON ACE HARDWARE -	D12841	NOZZLE	08/25/2023	56.96	56.96	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X97269	PRESSURE GAUGE	07/26/2023	119.12	119.12	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X97889	SPRNKLER POPUP	08/06/2023	56.31	56.31	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X98291	FAUCET	08/14/2023	23.98	23.98	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X98387	TAPE	08/15/2023	121.92	121.92	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X98471	KEY BLANK	08/17/2023	2.59	2.59	09/12/2023
26	LIVINGSTON ACE HARDWARE -	X98482	SPRINKLER	08/17/2023	82.94	82.94	09/12/2023
	Total LIVINGSTON ACE HARDWARE - #122005:				1,635.14	1,635.14	
LIVINGSTON BUSINESS IMPROVEMENT							
3370	LIVINGSTON BUSINESS IMPRO	2023.6	2ND HALF FY 23	09/11/2023	22,868.37	22,868.37	09/11/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total LIVINGSTON BUSINESS IMPROVEMENT:				22,868.37	22,868.37	
MEYER ELECTRIC AND GROUNDS REPAIR, LLC							
3812	MEYER ELECTRIC AND GROUN	1133	POOL PUMP	08/15/2023	383.83	383.83	09/01/2023
	Total MEYER ELECTRIC AND GROUNDS REPAIR, LLC:				383.83	383.83	
MISC							
99999	MISC	2021.8.1	OVERPAYMENT tk2022-0301	08/23/2023	50.00	50.00	09/12/2023
99999	MISC	2023.9	PLUMBING PARTS	09/08/2023	96.18	96.18	09/12/2023
99999	MISC	TK2015-0245	Bond Release	01/12/2016	785.00	785.00	09/11/2023
	Total MISC:				931.18	931.18	
MONTANA CORRECTIONAL ENTERPRISES							
1180	MONTANA CORRECTIONAL EN	4213975	CABINET	08/26/2023	826.00	826.00	09/12/2023
	Total MONTANA CORRECTIONAL ENTERPRISES:				826.00	826.00	
MONTANA DOG COMPANY							
10005	MONTANA DOG COMPANY	000005-R-0004	KINETIC POWER	08/31/2023	624.00	624.00	09/12/2023
	Total MONTANA DOG COMPANY:				624.00	624.00	
MONTANA STATE - FIRE SERVICES TRAINING							
2631	MONTANA STATE - FIRE SERVI	34-191	FireFIGHTER CERT-ENGLE	06/08/2023	95.00	95.00	09/01/2023
	Total MONTANA STATE - FIRE SERVICES TRAINING:				95.00	95.00	
MOUNTAIN FRESH CLEANING							
10005	MOUNTAIN FRESH CLEANING	0000035	CLEANING SERVICES	09/01/2023	2,030.00	2,030.00	09/12/2023
	Total MOUNTAIN FRESH CLEANING:				2,030.00	2,030.00	
MOUNTAIN MOBILE AUTO GLASS							
2106	MOUNTAIN MOBILE AUTO GLAS	20402	Medic 2 Windshield	08/21/2023	935.00	935.00	09/01/2023
	Total MOUNTAIN MOBILE AUTO GLASS:				935.00	935.00	
MUNICIPAL EMERGENCY SERVICES							
2604	MUNICIPAL EMERGENCY SERV	IN1929323	OPS PPE	09/01/2023	1,014.89	1,014.89	09/12/2023
	Total MUNICIPAL EMERGENCY SERVICES:				1,014.89	1,014.89	
MURDOCH'S RANCH & HOME SUPPLY							
3688	MURDOCH'S RANCH & HOME S	370208022312	EMBLEM	08/02/2023	70.19	70.19	09/12/2023
3688	MURDOCH'S RANCH & HOME S	370308092358	STEEL WOOL	08/09/2023	87.95	87.95	09/12/2023
3688	MURDOCH'S RANCH & HOME S	370408152304	STREAM NOZZLE	08/15/2023	130.96	130.96	09/12/2023
3688	MURDOCH'S RANCH & HOME S	370508082391	ELECTRODE	08/08/2023	238.73	238.73	09/12/2023
3688	MURDOCH'S RANCH & HOME S	370508152399	TOOLS	08/15/2023	269.93	269.93	09/12/2023
3688	MURDOCH'S RANCH & HOME S	370608072311	AIR HOSE	08/07/2023	65.24	65.24	09/12/2023
	Total MURDOCH'S RANCH & HOME SUPPLY:				863.00	863.00	
NORMONT EQUIPMENT							
12	NORMONT EQUIPMENT	30356	Asphalt Emulsion	08/24/2023	3,854.00	3,854.00	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total NORMONT EQUIPMENT:				3,854.00	3,854.00	
POWDER COATING OF MONTANA							
10005	POWDER COATING OF MONTA	1140	WHEELS	08/07/2023	300.00	300.00	09/01/2023
	Total POWDER COATING OF MONTANA:				300.00	300.00	
REDSTONE LEASING							
3842	REDSTONE LEASING	2023.10	Lease 60 of 60	09/01/2023	203.07	203.07	09/12/2023
	Total REDSTONE LEASING:				203.07	203.07	
RICK'S REFRIGERATION, INC.							
3023	RICK'S REFRIGERATION, INC.	23987	BELT	07/25/2023	104.87	104.87	09/01/2023
	Total RICK'S REFRIGERATION, INC.:				104.87	104.87	
RIVERSIDE HARDWARE LLC							
3659	RIVERSIDE HARDWARE LLC	201553	GREASE GUN KIT	08/04/2023	260.00	260.00	09/12/2023
3659	RIVERSIDE HARDWARE LLC	202044	CLEANER	08/09/2023	10.99	10.99	09/12/2023
3659	RIVERSIDE HARDWARE LLC	203006	TAPE	08/21/2023	57.58	57.58	09/12/2023
3659	RIVERSIDE HARDWARE LLC	203034	FASTENERS	08/21/2023	22.80	22.80	09/12/2023
3659	RIVERSIDE HARDWARE LLC	203045	DRILL BIT	08/21/2023	5.99	5.99	09/12/2023
	Total RIVERSIDE HARDWARE LLC:				357.36	357.36	
SAFETRAC							
3143	SAFETRAC	40814	CDL Services	09/01/2023	517.00	517.00	09/12/2023
	Total SAFETRAC:				517.00	517.00	
SISTER CITIES INTERNATIONAL							
515	SISTER CITIES INTERNATIONA	7931990	MEMBERSHIP DUES	12/07/2022	310.00	310.00	09/01/2023
	Total SISTER CITIES INTERNATIONAL:				310.00	310.00	
SLEEPING GIANT ANIMAL CLINIC							
3645	SLEEPING GIANT ANIMAL CLINI	58615	BRIGGS	08/03/2023	447.00	447.00	09/12/2023
	Total SLEEPING GIANT ANIMAL CLINIC:				447.00	447.00	
SPECIAL LUBE							
1814	SPECIAL LUBE	224-280-12681	Oil Change	08/24/2023	60.20	60.20	09/01/2023
1814	SPECIAL LUBE	224-280-12685	Oil Change	08/23/2023	60.20	60.20	09/01/2023
1814	SPECIAL LUBE	224-280-12811	Oil Change	08/29/2023	59.59	59.59	09/12/2023
	Total SPECIAL LUBE:				179.99	179.99	
TARR, MARGARET							
3586	TARR, MARGARET	2023.9.6	REIMB-FLAG FOOTBALL APP	09/06/2023	170.50	170.50	09/12/2023
	Total TARR, MARGARET:				170.50	170.50	
THOMSON REUTERS - WEST							
2823	THOMSON REUTERS - WEST	848888155	Information Char	09/01/2023	353.65	353.65	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total THOMSON REUTERS - WEST:				353.65	353.65	
TOWN & COUNTRY FOODS - LIVINGSTON							
2595	TOWN & COUNTRY FOODS - LI	105.23	BATTERIES	08/28/2023	12.49	12.49	09/12/2023
2595	TOWN & COUNTRY FOODS - LI	33	Water	06/09/2023	9.12	9.12	09/12/2023
	Total TOWN & COUNTRY FOODS - LIVINGSTON:				21.61	21.61	
TRAF-O-TERIA SYSTEM							
666	TRAF-O-TERIA SYSTEM	18225	Parking tickets	08/15/2023	403.29	403.29	09/01/2023
	Total TRAF-O-TERIA SYSTEM:				403.29	403.29	
TRANSUNION RISK & ALTERNATIVE							
3376	TRANSUNION RISK & ALTERNA	380349-20230	Investigative Research	09/01/2023	75.00	75.00	09/12/2023
	Total TRANSUNION RISK & ALTERNATIVE:				75.00	75.00	
ULINE							
3564	ULINE	166408612	MED SUPPLIES	07/25/2023	2,486.54	2,486.54	09/01/2023
	Total ULINE:				2,486.54	2,486.54	
UPS STORE #2420, THE							
292	UPS STORE #2420, THE	2023.8.8	Shipment	08/08/2023	12.52	12.52	09/01/2023
	Total UPS STORE #2420, THE:				12.52	12.52	
WESTERN DRUG							
1396	WESTERN DRUG	433961	Patient Supplies	09/02/2023	16.38	16.38	09/12/2023
	Total WESTERN DRUG:				16.38	16.38	
WESTERN EMULSIONS, INC.							
2963	WESTERN EMULSIONS, INC.	10-546822	HFMS-2	08/09/2023	25,419.05	25,419.05	09/01/2023
	Total WESTERN EMULSIONS, INC.:				25,419.05	25,419.05	
WESTERN MUNICIPAL CONSTRUCTION, INC.							
10000	WESTERN MUNICIPAL CONSTR	6	REGIONAL SEWER EXT	08/23/2023	198,531.00	198,531.00	09/12/2023
10000	WESTERN MUNICIPAL CONSTR	6	1% GROSS RECEIPTS TAX	08/23/2023	1,985.31-	1,985.31-	09/12/2023
	Total WESTERN MUNICIPAL CONSTRUCTION, INC.:				196,545.69	196,545.69	
WHISTLER TOWING, LLC							
3237	WHISTLER TOWING, LLC	1336	TOW	08/11/2023	80.00	80.00	09/01/2023
3237	WHISTLER TOWING, LLC	1503	ROTATION	08/21/2023	337.50	337.50	09/01/2023
3237	WHISTLER TOWING, LLC	1737	TOW GMC	09/07/2023	337.50	337.50	09/12/2023
3237	WHISTLER TOWING, LLC	1738	TOW TOYOTA	09/07/2023	337.50	337.50	09/12/2023
3237	WHISTLER TOWING, LLC	7724	EMS REPAIRS	07/25/2023	715.80	715.80	09/01/2023
3237	WHISTLER TOWING, LLC	8963	ACO MAINT	08/29/2023	1,667.68	1,667.68	09/12/2023
	Total WHISTLER TOWING, LLC:				3,475.98	3,475.98	
WILCOXSON'S							
47	WILCOXSON'S	932808	Ice Cream - Pool	08/04/2023	41.25	41.25	09/12/2023

Vendor	Vendor Name	Invoice Number	Description	Invoice Date	Net Invoice Amount	Amount Paid	Date Paid
	Total WILCOXSON'S:				41.25	41.25	
WISPWEST.NET							
2087	WISPWEST.NET	828711	Internet-CIVIC CENTER	09/01/2023	63.51	63.51	09/12/2023
2087	WISPWEST.NET	828711	Internet SOCCER	09/01/2023	85.19	85.19	09/12/2023
	Total WISPWEST.NET:				148.70	148.70	
YELLOWSTONE NEWS GROUP							
10005	YELLOWSTONE NEWS GROUP	400202	PUBLIC NOTICE	08/14/2023	72.00	72.00	09/12/2023
10005	YELLOWSTONE NEWS GROUP	400245	PUBLIC NOTICE	08/16/2023	48.00	48.00	09/12/2023
10005	YELLOWSTONE NEWS GROUP	408959	PUBLIC NOTICE	08/12/2023	39.00	39.00	09/12/2023
10005	YELLOWSTONE NEWS GROUP	414062	PUBLIC NOTICE	08/23/2023	52.00	52.00	09/01/2023
	Total YELLOWSTONE NEWS GROUP:				211.00	211.00	
	Grand Totals:				363,299.11	363,299.11	

Dated: _____

Mayor: _____

City Council: _____

_____

_____

_____

_____

_____

City Recorder: _____

File Attachments for Item:

C. AGREEMENT 20034 WITH PARK COUNTY FOR WASTEWATER TESTING.

City Manager
Grant Gager

220 E Park Street
(406) 823-6000 phone

citymanager@livingstonmontana.org
www.livingstonmontana.org

City of Livingston

Incorporated 1889

Date: 9/19/2023
To: Chair Nootz and City Commissioners
From: Grant Gager, City Manager

Staff Report for Consideration of Agreement 20034

Recommendation and Summary

Staff is seeking Commission approval of Agreement 20034 with Park County to help implement a wastewater testing program by adopting the following motion:

"I move to approve Agreement 20034 and authorize the City Manager to sign the agreement."

The reasons for the request for guidance are as follows:

- The City has previously tested City wastewater for the presence of certain items.
- The City and County are hopeful that routinely testing City wastewater will provide insight into certain aspects of community health.

Introduction and History

The City of Livingston has periodically tested its wastewater to understand the prevalence of certain items in the system including viruses and narcotics. Doing so is an industry accepted practice of understanding various aspects of community health.

Analysis

The Park County Health Department has inquired with the City about implementing a routing wastewater monitoring program in the City of Livingston. In order to do so, the County has agreed to fund the cost of sample collection and testing and the attached Agreement memorializes the terms of that agreement which include weekly drawing of samples at a rate of $75 per sample paid to the City for collection and submission costs.

Fiscal Impact

The Agreement provides that the County will provide the City a reimbursement to offset the costs of the program.

Strategic Alignment

Understanding elements that may be present in the City's wastewater will enable the development of effective public policy.

Attachments

- Attachment A: Agreement 20034

MEMORANDUM OF UNDERSTANDING REGARDING WASTEWATER TESTING

Park County, Montana, a political subdivision of the State of Montana with its principal office located at 414 East Callender Street, Livingston, Montana ("Park County") and the City of Livingston, Montana, a political subdivision of the State of Montana with its principal office located at 220 East Park Street, Livingston, Montana ("City of Livingston") hereby enter into this Memorandum of Understanding ("MOU"):

Recitals.

A. **Whereas**, Park County wishes to test wastewater from the Livingston Wastewater Treatment Plant;

B. **Whereas**, the City of Livingston owns and operates the Livingston Wastewater Treatment Plant;

C. **Whereas**, employees of the City of Livingston will be drawing the samples and shipping them to Archer Biologicals LLC;

D. **Whereas**, Park County will pay the City of Livingston for the costs associated with these activities;

E. **Whereas**, the parties desire to enter into this MOU in order to memorialize the agreement between the parties regarding wastewater testing.

NOW, THEREFORE, in consideration of the foregoing recitals and the terms and conditions set forth herein, the parties agree as follows:

1. The City of Livingston shall draw and ship wastewater samples to Archer Biologicals LLC, or another vendor that is deemed suitable by both parties;
2. The City of Livingston shall draw and ship the samples weekly;
3. Park County will be responsible for paying the City of Livingston for

the service of drawing and shipping the samples;

4. Park County will pay the City of Livingston a sum of $75.00 per sample for time, materials and preparation for shipping weekly. The Park County Health Department will provide shipping containers, and will pay the cost of shipping to the lab;
5. Park County will pay the City of Livingston within thirty (30) days of submission of an invoice;
6. This MOU may at any time be terminated with three (3) months written notice to either party;
7. No amendment, modification or waiver of any condition, provision or term of this MOU shall be valid or of any effect unless made in writing, signed by the party or parties to be bound and specifying with particularity the nature and extent of such amendment, modification or waiver;
8. This MOU and the obligations hereunder cannot be assigned without prior permission of either party.

Dated this_____day of _____, 2023.

CITY OF LIVINGSTON

BY:_____

GRANT GAGER
CITY MANAGER

PARK COUNTY COMMISSION

_____
BILL BERG

_____
CLINT TINSLEY

_____
MIKE STORY

ATTEST:

_____
MARITZA REDDINGTON
CLERK & RECORDER

APPROVED AS TO FORM

_____
KRISTIN BJELLA HOW
DEPUTY PARK COUNTY ATTORNEY

File Attachments for Item:

D. AGREEMENT 20035 REGARDING THE PARK COUNTY BEHAVIORAL HEALTH AND CRISIS RESPONSE COALITION

City Manager
Grant Gager

220 E Park Street
(406) 823-6000 phone

citymanager@livingstonmontana.org
www.livingstonmontana.org

Incorporated 1889

Date: 9/19/2023
To: Chair Nootz and City Commissioners
From: Grant Gager, City Manager

Staff Report for Consideration of Agreement 20035

Recommendation and Summary
Staff is seeking Commission approval of Agreement 20035 with various partners to help guide the work of the Park County Behavioral Health and Crisis Response Coalition by adopting the following motion:

"I move to approve Agreement 20035 and authorize the City Manager to sign the agreement."

The reasons for the request for guidance are as follows:

- The City has worked with several community partners since January to help implement programs that respond to mental health crises in the community.
- The group has discussed a charter to guide the efforts.

Introduction and History
The City of Livingston has recently worked with community partners to implement several programs designed to respond to mental health crises in the community. The coalition is facilitated by a coordinator from Livingston Healthcare funded by a Montana Department of Public Health and Human Services. The Coalition's programs to date include the Community Paramedic program as well as two Community Crisis Specialists. Both programs provide support for community members that frequently utilize certain emergency medical resources.

Analysis
The Coalition charter will provide a framework for the group to move forward in a more formal manner.

Fiscal Impact
There is no fiscal impact to the charter as it conforms to existing practice.

Strategic Alignment
The charter will enable efforts consistent with Growth Policy strategy 7.2.4.2. which states that the City should "Collaborate with mental health providers […] to assess any unmet needs of Livingston's residents.

Attachments

- Attachment A: Agreement 20035

Park County Behavioral Health and Crisis Response Coalition
Project Charter
January 2023-June 2024

Project Summary:

Driven by statistically high rates of behavioral health concerns, community partners in Park County are committed to building a more robust behavioral health crisis system that seeks to decriminalize or offer intervention outside of the criminal court for mental health and substance use issues. The aim of the Coalition is to build pathways to proper, behavioral health care that links individuals to community based behavioral health supports for follow up post-crisis. The Park County Behavioral Health and Crisis Response Coalition will focus on developing a robust, community based behavioral health system that diverts individuals from the Montana State Hospital, jail or the emergency department and instead assesses, de-escalates, and stabilizes individuals in the community whenever possible, and in the least restrictive and most supportive environment possible.

To ensure efficiency with Coalition members time and efforts and to ensure members are working towards project goals within their own scope of work, separate workgroups will be established as needed. Each work group will be made up of 2-5 Coalition members, to focus specifically on the project scope outlined below. Each workgroup will develop its own charter and send it to the Coalition for approval.

Park County Behavioral Health and Crisis Response Coalition Members:

Joe Sexton	Crisis Coalition Coordinator	Livingston HealthCare
Shannan Piccolo	Director of Health Dept	Park County MT
Kristen Galbraith	Director of Grants & Special Projects	Park County, MT
Jay O'Neill	Captain	Park County MT, Detention Center
Wayne Hard	Assistant Police Chief	City of Livingston
Dale Johnson	Chief of Police	City of Livingston
Tad Dykstra	Sergeant	Park County Sheriff's Office
Stacy Kohler	Chief Nursing Officer	Livingston HealthCare
Julie Anderson	MSW	Private Practice
Kendra Lassiter	County Attorney	Park County, MT
Lesa Maher	Chief Juvenile Probation Officer	State of Montana
Bill Berg	Commissioner	Park County, MT
Kelly Miller	Program Director	The Phoenix
Rebecca Ruhd	Program Advocate	ASPEN

Janella Johnson	LCSW	L'esprit
Raymond Wright	Emergency Dept. Medical Director	Livingston HealthCare
Coleen Strickland		Park County
Todd Wester	Principal, SGMS Middle School	Livingston School District
Katelyn Lavender	Victim Witness Coordinator	Park County
Jeanette Tecca	PSS MCRT	Park County
Dan Lashinski	LPD Officer	City of Livingston
Josh Chabalowski	Fire Chief	City of Livingston
Grant Gager	Manager	City of Livingston
Brad Bichler	Sheriff	Park County
Greg Coleman	Disaster and Emergency Services Director	Park County
Lander Cooney	CEO	Community Health Partners
Linda Cantin	Justice of the Peace	Park County
Amy Titgemeier	MSW Licensure Candidate	LFRC
Hannah Wologo	Community Health Coordinator/LiveWell49	Livingston HealthCare

Governance Structure:

- The Crisis Response Coalition is made up of community leaders who have a direct impact in the crisis response system in Park County and who are in the position to make decisions within their organizations.
- The Crisis Response Coalition is facilitated and managed by a Coalition Response Coordinator. This position is contracted by Park County, the recipient of the Crisis Diversion grant through DPHHS and is the coordinator for the work of the Coalition.
- The Crisis Response Coalition Coordinator is responsible for facilitating the work of the Coalition, coordinating the work to meet the goals of the project scope, and ensuring the work moves forward.
- The Crisis Response Coalition will meet no less than quarterly, either in person or virtually. Workgroups will also meet as needed.
- The Crisis Response Coalition makes decisions via consensus.

.

Project Objectives:

The Crisis Response Coalition has five main objectives:

1) Strengthen the crisis system infrastructure in Park County by ensuring leadership for the Crisis Coalition from a Crisis Coalition Coordinator
2) Increase access to training on behavioral health crisis in Park County
3) Increase the capacity of Park County providers to track behavioral health crisis services, through data collection and sharing and identifying upstream root causes.
4) Continue to work towards developing a community support system to respond more effectively to community based behavioral health crises, using mental health paraprofessionals and the pending Medicaid reimbursement model for Mobile Crisis Response. The new Medicaid option will require that crisis response teams include one qualified clinical mental health professional who can provide an assessment within their authorized scope of practice under state law and other community support providing continuity of care.
5) Increase access to behavioral health services in the detention center.

Project Scope:

Workgroup 1: Coordination of Crisis Response Efforts and Sustainability

- The responsibility of this workgroup is to ensure the Coalition is making headway with community outreach, communications, and sustained funding for crisis response efforts in Park County are ongoing.

Workgroup 2: Crisis Response Training and Evaluation

- The responsibility of this workgroup is to evaluate and assess current training options for Crisis Intervention and implement training schedule for all individuals and organizations identified for training.

Workgroup 3: Data Collection and Data Sharing

- The responsibility of this workgroup is to make recommendations for methods of collecting data as well as recommendations for data sharing.
- Collectively find issues and/or opportunities for collecting data and decide next steps to take.
- Develop Data Sharing Agreements by October 31, 2023

Workgroup 4: Enhanced Crisis Response System

- The responsibility of this workgroup is to focus on developing a robust, community based behavioral health crisis response system that diverts individuals from the Montana State Hospital, jail or the emergency department and instead assesses, de-escalates, and stabilizes individuals in the community whenever possible and in the least restrictive and most supportive environment possible.

Workgroup 5: Behavioral Health Services in the Jail

- The responsibility of this workgroup is to plan for the treatment and services needed to address the inmates' mental health needs.

Partner organization signatures:

Park County Commission

_____

City of Livingston Manager

DocuSigned by:
Grant Gager, City Manager, Livingston, Montana
86B86F6E5004484...

Livingston HealthCare

DocuSigned by:
Bruce Whitfield
9252EE07736E48C...

Community Health Partners

_____

File Attachments for Item:

E. AMENDMENT NO. 1 TO AGREEMENT 20024 WITH AFSCME

City Manager
Grant Gager

220 E Park Street
(406) 823-6000 phone

citymanager@livingstonmontana.org
www.livingstonmontana.org

Incorporated 1889

Date: 9/19/2023
To: Chair Nootz and City Commissioners
From: Grant Gager, City Manager

Staff Report for Amendment to Agreement 20024 with American Federal of State, County and Municipal Employees Local 2711A

Recommendation and Summary
The City Manager is recommending approval of an amendment to Agreement 20024 with the American Federal of State, County and Municipal Employees Local 2711A by adoption of the following motion:

"I move to approve Amendment No. 1 to Agreement 20024 with the American Federal of State, County and Municipal Employees Local 2711A and authorize the City Manager to execute the agreement."

The reasons for the recommendation are as follows:

- The Agreement was previously accepted by the Commission on July 18, 2023, as part of implementing the budget.
- The Certification Pay Schedule was inadvertently omitted from the original agreement.

Introduction and History
At its meeting on July 18, 2023, the City Commission approved updated Memoranda of Understandings for all collectively bargained labor groups in the City. At that time, the supplemental exhibit for outlining the supplemental pay for certain certifications in the group represented by the American Federal of State, County and Municipal Employees Local 2711A was inadvertently omitted from approval.

Analysis
The certifications included in the attachment are consistent with current practice.

Fiscal Impact
Funding for the certification pay is included in the City Manager's FY 2024 Recommended Budget.

Attachments

- Attachment A: Amended Certification Pay Schedule

Addendum A

AFSCME 2711-A

Fiscal Years 2024, 2025, 2026

Certification Title	Per Month Cert Pay	CBA Limits
CDL	150	All Dept
CDL - Class A	200	Water/Street
Water License	300	Water
WRF 1C	400	WRF
Boiler Operator	75	Parks
CPO	75	Parks
Pesticide	100	Parks
Pesticide - working under Applicator	50	Parks (May-Sept)
Arborist	200	Parks
Flagger	25	All Dept
BPA Tester (see backflow)		Should Be Backflow
Heavy Equipment 1	No Cert	Included in Job Expectations/training
Heavy Equipment 2	200	Water / Street
Heavy Equipment 3	300	Water / Street
Rigging	25	Water / Street
OSHA Safety	25	All Dept
Competent Trench	75	Street/Parks/Water
Confined Space	75	WRF / Water
Backflow Operator (BPA)	75	Water / WRF
Wastewater Collection	100	Sewer / WRF
Welder	150	WRF / Streets

File Attachments for Item:

A. A PROCLAMATION OF THE CITY COMMISSION OF THE CITY OF LIVINGSTON DECLARING SEPTEMBER 19TH AS INFORMATION TECHNOLOGY PROFESSIONALS DAY IN LIVINGSTON.

Proclamation

of the Livingston City Commission

Declaring September 19, 2023, as National I.T. Professionals Day in the City of Livingston

****

WHEREAS, National Information Technology Professionals Day is celebrated on the third Tuesday of every September in recognition and appreciation of IT Professionals who take care of the critical technology infrastructure that is relied on to power our digital experience; and

WHEREAS, IT Professionals play a critical role in managing and maintaining the essential system and applications that allow the City to serve its residents with excellent services; and

WHEREAS, The City of Livingston IT services include cyber-security preparedness, telecommunications, geographic information systems, network infrastructure, server and desktop virtualization, application and systems development, and 24/7 on-call support for Public Safety and other mission-critical applications; and

WHEREAS, Two IT Professionals across our organization currently provide these services to our residents and our employees, and every day these IT Professionals are called upon to overcome a myriad of new challenges in a rapidly changing environment; and

WHEREAS, The City of Livingston has been improved by the results of dedicated efforts by our IT Professionals as they have increased efficiency, protected City assets and improved the safety of our residents and employees.

NOW, THEREFORE, BE IT RESOLVED on behalf of the Livingston City Commission, I, Melissa Nootz, chair, do hereby declare September 19, 2023, to be:

INFORMATION TECHNOLOGY PROFESSIONALS DAY IN LIVINGSTON, MONTANA

Signed this ___ day of Sept, 2023.

_____

MELISSA NOOTZ, Chair
Livingston City Commission

_____

EMILY HUTCHINSON
City Clerk

File Attachments for Item:

A. ORDINANCE 3045: AN ORDINANCE OF THE CITY OF LIVINGSTON MONTANA REMOVING FEES FROM THE MUNICIPAL CODE

City Manager
Grant Gager

220 E Park Street
(406) 823-6000 phone

citymanager@livingtonmontana.com
www.livingstonmontana.org

Incorporated 1889

Date: 9/13/2023
To: Chair Nootz and City Commissioners
From: Paige Fetterhoff

Staff Report for Ordinance 3045 Amending Sections of Municipal Code Containing Fees

Recommendation and Summary
Staff is recommending the Commission approve Ordinance 3045 to remove fees from Livingston Municipal Code by adopting the following motion:

"I move to approve Ordinance Number 3045 and authorize the Chair to sign Ordinance Number 3045."

The reasons for the recommendation are as follows:

- Fees can be set by the City Commission by resolution and need not be set by ordinance.
- Fees should be changed from time to time to reflect the cost of providing certain services.

Introduction and History
The City of Livingston desires to provide a fee schedule that includes all fees charged by the City of Livingston for services. Many fees have not been update in over a decade and no longer cover the cost of providing services. In an effort to be able to easily update fees, Livingston Municipal Code needs to be amended to remove all fees and add language for fees to be set by resolution.

Analysis
Staff identified 27 sections of code that contained fees. In each section, the fee has been removed and replace with language allowing fees to be set by the City Commission by resolution. Staff is currently in the process of identifying and updating all fees across multiple departments.

Fiscal Impact
There is no fiscal impact related to the removal of fee amounts from Municipal Code.

Strategic Alignment
Ensuring adequate recovery of costs will enable sustainable City operations.

Attachments

- Attachment A: Ordinance 3045

ORDINANCE NO. 3045

AN ORDINANCE OF THE CITY COMMISSION OF THE CITY OF LIVINGSTON, MONTANA, AMENDING THE LIVINGSTON MUNICIPAL CODE, TO REMOVE ANY PERMIT AND FEE AMOUNTS AND REPLACE THEM WITH LANGUAGE TO SET AMOUNTS VIA RESOLUTION.

* * * * *

Preamble.

The purpose of this Ordinance is to update and remove sections of the Livingston Municipal Code where fee and permit amounts are set by ordinance and change the language so that all fee and permits amounts are set by resolution.

* * * * *

WHEREAS, the Livingston Municipal Codes set certain fees with in the code; and

WHEREAS, the City Commissions has adopted the practice of removing fees from the Code of Ordinances in order that fees charged by the City can be adopted through the resolution process; and

NOW, THEREFORE, BE IT ORDAINED by the City Commission of the City of Livingston, Montana, as follows:

SECTION 1

That Livingston Municipal Code by amended as follows with deletions struck through and additions redlined as follows:

Sec. 3-14. License fees.

The annual license fees shall be set by the City Commission by separate resolution. ~~as follows:~~

~~A. For an all beverage license $406.25~~

~~B. For an all beverage license for fraternal organizations 170.00~~

~~C. For beer retailer license (either on or off premises only lease) 195.00~~

~~D. For special beer license upon daily basis 60.00~~
~~and fifteen dollars ($15.00) per day additional for any event lasting for more than two (2) days.~~

~~E. For beer for any unit for a nationally chartered veterans organization 85.00~~

~~F. For table wine for on or off premises consumption 195.00~~

~~G. For additional expenses for the transfer of any license 110.00~~

~~H. For transfer of any license 110.00~~

A prorated license fee shall be charged for the portion of any year for which application is made. No refund of any fees shall be given upon the discontinuance of the business for any reason or upon sale of the business.

The license fees as provided in this section are in addition to other City licensing fees and any other fees required for the sale of liquor.

(Ord. 1823, 11/20/95)

Sec. 4-22. Dog and cat tags securely fastened, exception.

A. Upon payment of the license fee under this Section the City shall issue to the owner a license certificate in the form of a receipt and a metallic tag for each dog and cat so licensed. The tag shall have stamped thereon the year for which it was issued and the number appearing on the certificate. Every owner of a dog shall provide each dog with a collar and shall securely attach to such collar the license tag and the vaccination tag.

Every owner of a cat shall provide proof of licensure thereof, however the cat shall not be required to wear a collar with an attached license.

B. No license provided for in this Section is transferable, and no license tag shall be fastened to any dog or cat other than the one for which it was issued. Any person who knowingly fastens a license tag or a vaccination tag to any dog or cat other than the one for which such tag was issued or who willfully permits such dog to wear any license tag or vaccination tag issued for another dog, is guilty of a civil offense. The Animal Control Officer shall impound every dog or cat found bearing a license tag or vaccination tag not issued for that dog or cat, and shall dispose of such dog or cat as provided by Section 4-44.

C. In case a license tag is lost or destroyed, the owner of the dog or cat shall apply to the City for a duplicate tag and City shall issue a duplicate tag upon presentation of the receipt showing payment for the license for the current year ~~and upon payment of two dollars ($2.00) for the duplicate tag~~. The cost of the duplicate tag shall be based on the cost of the tag to the City.

D. In case a vaccination tag is lost or destroyed, the owner of the dog or cat shall apply to the veterinarian who vaccinated the dog or cat for a duplicate tag, and such veterinarian shall issue a duplicate tag upon presentation of the receipt showing payment for the vaccination and upon payment of such charge as the veterinarian may require.

(Ord. 1984, 4/2/07; Ord. No. 2043 , § 1, 12/4/12)

Sec. 4-71. Registration.

Any dog found by the Court to be vicious and dangerous pursuant to a hearing under Section 4-73 shall be registered with City of Livingston within ten (10) days of the effective date of the finding. The vicious and dangerous dog registration fee shall be ~~Seventy-Five Dollars ($75.00) per year~~set by the City Commission by separate resolution, plus the actual costs incurred by the City in making the warning sign.

(Ord. 1984, 4/2/07)

Sec. 5-12. Industrial Revenue Bonds.

(a) The City shall impose a fee upon any applicant for industrial revenue bonds which shall be set by the City Commission by separate resolution.~~according to the following schedule:~~

~~1. An application fee of one hundred dollars ($100.00).~~

~~2. A minimum additional fee of one thousand dollars ($1,000.00).~~

~~3. A fee of one dollar ($1.00) for each one thousand dollars ($1,000.00) of face amount of bonds proposed to be issued above three hundred thousand dollars ($300,000).~~

(b) The application fee shall be due upon first application and appearance before the Council. The minimum additional fee and other fees shall be non-refundable and shall be imposed and due the day following the adoption of a resolution authorizing the project, whichever occurs later. If the Council does not authorize a project after public hearing no fee other than the application fee shall be charged.

(c) The purpose of the fees is to defray expenses, direct and indirect, to the City in the review and consideration of such projects and such fees shall go to the general fund of the City.

(Ord. 1453, 12/3/79; Ord. 1620, 3/20/89)

Sec. 6-190.1. Special improvement district waivers.

A. Any applicant for a building permit and owner of the real property of such location, where any or all of certain public improvements have not been made of either curbs, gutter, sidewalks, storm drains, or street paving, shall be required to waive their right to protest the creation of any future special improvement district or districts for improvements, including curb, gutter, sidewalk, storm drainage, and paving that may

become assessable under a duly passed resolution to create a special improvement district or districts under applicable Montana statutes.

B. The waiver described in subsection A of this Section shall be recorded at the Park County, Montana, office of Clerk and Recorder. The waiver shall state that the waiver shall run with the land and shall be binding upon subsequent owners of the real property.

C. A fee, to be set by the City Commission by separate resolution, ~~of Fifteen Dollars ($15.00)~~ shall be charged to the applicant for costs associated with processing and recording the waiver.

(Ord. 1983, 2/20/07)

Sec. 9-26. Same—lien for charges: moving charges; payment of charges by owner.

The City shall have a lien upon each impounded vehicle or trailer for the amount of the cost of removing and impounding such vehicle or trailer, plus such reasonable amount as may be charged by the depository storing such vehicle or trailer, plus an administrative charge of twenty-five dollars ($25.00). In the event such vehicle or trailer is moved by the police or street department with its own equipment, the charge for moving it shall be fifteen dollars ($15.00). In the event such vehicle or trailer is stored at police headquarters, the storage charge shall be two dollars and fifty cents ($2.50) per day. All such charges are declared to be reasonable and proper charges to cover the cost of hauling to the depository or police headquarters and storage therein. No impounded vehicle or trailer shall be released to any claimant without the payment of the charges provided in this section, unless the Chief of Police is reasonably satisfied that such vehicle or trailer was improperly impounded.

(Code 1958, 28-74; Ord. 1256, 9/14/73; Ord. 1701, 1/21/92; Ord. 1747, 6/21/93)

Sec. 11-70. Storage and transportation of liquefied petroleum gases—Establishment of limits.

The storage and dispensing of flammable or combustible liquids in outside aboveground tanks and bulk storage of liquefied petroleum gases is to be permitted as follows:

1. There shall be no new facilities installed for the storage of flammable or combustible liquids in outside aboveground tanks or bulk storage of liquefied petroleum gases, except as follows:

2. Only upon special permit issued by the City of Livingston when, in the sole discretion of the Fire Chief, such installation is not detrimental to the general welfare, health and safety of the residents of the City of Livingston and then only if such aboveground storage tanks or bulk storage facilities meet the following requirements:

    a. Facilities of the type must be permitted by the Fire Code in effect in the City of Livingston at the time of the application for special permit;

    b. The facility must be installed in accordance with any and all applicable requirements set forth and described in the Fire Code in effect in the City of Livingston at the time of the application for special permit;

    c. The aboveground and/or bulk storage tank or tanks must be listed and labeled in accordance with any and all applicable requirements set forth and described in the Fire Code in effect in the City of Livingston at the time of the application for special permit;

    d. The aboveground storage tank must only be used for the storage and dispensing of combustible liquids or liquefied petroleum gases;

    e. Any public or private entity installing the facility must comply with all other applicable state, federal, and local laws, statutes, rules, regulations, and ordinances;

    f. Under no circumstances will an aboveground or bulk storage tank or tanks be allowed in any area zoned residential, central business district or neighborhood commercial; and

g. All aboveground and/or bulk storage tank or tanks must be installed to include any and all safety devices and precautions the Fire Chief reasonably believes are necessary to protect the general welfare, health and safety of the residents of the City of Livingston, which may include, but are not limited to, leak detection or fire suppression measures.

3. Application and Application Fee. Any public or private entity desiring to install an aboveground or bulk storage tank or tanks must submit an application to the Fire Chief with an application fee, set by the City Commission by separate resolution ~~in the amount of Two Hundred Fifty Dollars ($250.00),~~ which fee shall be used to defray the costs of site inspection and approval.

(Ord. 1307, 10/6/75; Ord. 1487, 7/6/81; Ord. 1849, 3/17/97; Ord. No. 2061 , § 1, 12/15/15; Ord. No. 3038 , 9/6/22)

Sec. 12-93. Notice to destroy.

The Recording Secretary shall give notice to destroy weeds within the City limits by publishing notice to the public at least once each week for two (2) consecutive weeks in a newspaper distributed within the City. The last publication shall not be less than seven (7) days prior to April 30th. (For the calendar year 1990 these notices shall be published following the second reading of this chapter.) Such notice shall at a minimum advise the public as follows:

A. That all owners of real property or agents having control thereof are responsible for destroying all weeds in prohibited areas by extermination, removal or cutting not later than April 30th of each year and to keep the area free of weeds through November 30th of that year.

B. Failure to remove the offending weeds may cause the City to remove the weeds and charge the cost thereof against the real property together with an administrative cost equal to twenty-five (25) percent of the removal cost and a penalty, to be set by the City Commission by separate resolution, ~~of twenty-five dollars ($25.00)~~ for each time the City provides the removal.

(Ord. 1660, 6/4/90)

Sec. 12-94. Failure to comply.

Upon first failure, neglect or refusal to maintain the prohibited areas free from weeds during the prescribed period, the City shall give notice to the noncomplying owner, agent or occupant thereof. Such notice shall provide as a minimum:

A. That the noncomplying owner, or agent thereof, is allowed seven (7) days from the date of the first notice of noncompliance to exterminate or remove;

B. That upon failure to comply the City may by its own work forces or by contract cause the weeds to be exterminated, removed or cut and the cost thereof shall be assessed against the noncomplying real property together with an additional administrative cost equal to twenty-five (25) percent of the cost of removal and a penalty to be set by the City Commission by a separate resolution ~~twenty-five dollar ($25.00)~~ penalty;

C. If the owner, or agent of the property continues to neglect to maintain the prohibited areas free from weeds, the City may at its sole discretion exterminate, remove or cut the weeds again as needed without additional notice of any kind. Charges as in subsection (2), including penalty, will be assessed for each time the City removes the weeds;

D. That the assessed amount together with costs and penalties shall constitute a lien on the noncomplying real property and will be taxed as a special assessment against the real property. The City has the option of sending a monthly billing statement to the owner, agent or occupant of said premises which is due and payable upon receipt. Should this statement remain unpaid, within sixty (60) days all costs will be levied and assessed against the real property.

(Ord. 1660, 6/4/90)

Sec. 13-16. License—bond required—conditions.

A. All plumbers working in the public right-of-way shall file with Clerk a minimum bond in the sum of five thousand dollars ($5,000.00), which bond shall be approved by the governing body, conditioned that the licensee shall properly refill any and all trench or trenches made or dug by him in all thoroughfares of the City, and shall keep and maintain the same in a safe and passable condition, and level and even with the street surface for a period of two (2) years from and after the time the same has been refilled.

B. Anyone other than a plumber, must purchase a street opening permit from the City, the cost of which shall be set by the City Commisison by separate resolution, ~~for five dollars ($5.00)~~ and furnish proof of bonding as set forth in subsection A of this Section.

(Ord. 1658, 5/8/90)

Sec. 13-19.1. Water system development fee.

A. Except for City owned buildings and facilities, a water system development fee shall be charged and shall be paid according to the size of the water service line utilized as set by the City Commission by separate resolution. ~~follows:~~

~~Meter Size~~	~~System Development Fee~~
~~⅝~~	~~$750.00~~
~~¾~~	~~750.00~~
~~1~~	~~1,327.00~~
~~1 ¼~~	~~2,077.00~~
~~1 ½~~	~~3,000.00~~
~~2~~	~~5,325.00~~
~~3~~	~~12,000.00~~
~~4~~	~~21,300.00~~
~~6~~	~~24,000.00~~
~~8~~	~~88,275.00~~

B. The water system development fee shall apply only to new service lines. The fee shall not apply to service lines already installed but not metered or to equivalent (but not larger) replacement lines that are replaced within one hundred twenty (120) days of termination of use of a service line.

C. The water system development fee shall be in addition to all other permit and tapping fees and shall have no impact upon the current practice of charging customers for additional expenses the City incurs in making a new connection into the City's water main. This practice of charging the new customer for these incidental expenses of materials and human-power shall continue.

D. The water system development fee shall be paid at the same time as, or before obtaining a building permit. All moneys collected through this water system development fee shall be deposited directly into the capital improvements subaccount of the Livingston Water Utility Enterprise Fund Account. The account shall only be used for capital improvements of the City's water system. The account shall not be used for replacement nor maintenance of existing lines and/or facilities.

(Ord. 1704, 5/4/92; Ord. 1787, 10/17/94; Ord. 1829, 6/3/96: Ord. 1931 § 1 (part), 11/17/03; Ord. No. 3005 , § 2, 4/20/21)

Sec. 13-25. Private water supply—permit—inspection—fee.

A. Every person who owns or occupies premises which are furnished water from the municipal water system, and who has or intends to construct a private water supply system on the premises, must apply to the City Building Inspector for a yearly permit to have such private water supply system.

B. There shall be an annual fee, to by set by separate resolution by the City Commission, ~~of ten dollars ($10.00)~~ for such permit which shall be initially granted only after an inspection of the private water supply system by the Building Inspector.

C. The Building Inspector is authorized to inspect such private water supply system thereafter as often as they deems necessary, but not less than annually.

(Ord. 1658, 5/8/90)

Sec. 13-38. Water service—discontinuance.

Should the consumer desire to discontinue the use of water temporarily, or should the premises become vacant, the City, when notified to do so in writing, will shut off the water at the curb.

A. Termination of Service by Customer. Customer shall give Utility at least twenty-four (24) hours' notice, Saturdays, Sundays and holidays excluded, to terminate service, unless a longer notice of termination is provided for in the Livingston Water Department Consumer Contract.

B. Discontinuance and Refusal of Service by Utility. Utility may refuse to serve or discontinue service to any customer or prospective customer including any other member of the same household or firm as follows:

1. Without Notice:

   a. In the event of any condition determined by the Utility to be hazardous,

   b. In the event of customer use of equipment in such a manner as to adversely affect the Utility's equipment or the Utility's service to others,

   c. In the event of any unauthorized use or diversion of service or when any evidence of tampering with meter or interference with the proper functioning thereof is found,

   d. Upon receipt of orders from government authority to discontinue service;

2. Upon Not Less than Twenty-Four (24) Hours:

   a. For violation of and/or noncompliance with any applicable Federal, State, Municipal or other local laws, regulations, and codes,

   b. For failure of the customer to fulfill their contractual obligations for service,

   c. For failure of the customer to permit Utility reasonable access to equipment owned by the Utility;

3. Upon Ten (10) Days' Written Notice:

   a. Waste of water is prohibited, and customers must keep their fixtures and service pipes in good order at their own expense, and all waterways closed when not in use. Leaky fixtures must be repaired at once without waiting for notice from the Utility, and if not repaired after ten (10) days' written notice is given, the water may be shut off,

   b. For nonpayment of unified Utility service bill, including billing for water, sewer and garbage service and for nonpayment of any portion of Utility bill following reasonable attempts by Utility to effect collection of settlement. Reasonable attempts shall include:

1. Mailing of routine monthly Utility bill,

2. When the account is not paid within thirty (30) days of date of mailing, a "friendly reminder" will be mailed,

3. When the account is not paid within ten (10) days of date of delivering of the "friendly reminder," a "final notice" will be delivered. This may be left at the residence if the owner is not at home. This "final notice" will be delivered by the Code Enforcement Officer and a fee set by the City Commission by separate resolution ~~the cost of five dollars ($5.00)~~ will be added to the bill.

4. The "final bill" will contain the statement:

   Water service will be disconnected at 10:00 a.m. on the third work day following date of delivery. You may appeal this bill by appealing in writing and delivery to Public Works Director at City offices at 414 E. Callender Street, Livingston, MT. The City Manager may appoint either the Utility Superintendent or Public Works Director to hold a hearing on the appeal.

5. Five (5) days after written notification of the City Hearings Officer of decision, the water may be turned off if satisfactory payment has not been made per the Hearing Officer decision.

(Ord. 1658, 5/8/90; unnumbered Ord., 5/21/90)

Sec. 13-42. Water service—violation—penalty.

For violation of any of rules set out in Sections 13-30 through 13-44 or for nonpayment of water usage, the City has the right to turn off the water without further notice, and after it has been turned off from any service pipe on account of nonpayment or violation of the rules, the same shall not be turned on again until back payment and the cost to turn the water off and on are paid. The charge for this service shall be set by separate resolution of the City Commission. ~~Thirty-Five Dollars ($35.00) during normal working hours and Sixty Dollars ($60.00) for any other time.~~

(Ord. 1658, 5/8/90)

Sec. 13-55. Contract for service.

The rules and regulations of the City set out in Secs. 13-30 through 13-70 are made a part of the contract with every individual, firm, corporation, who takes water, and every such individual, firm, or corporation agrees, in making application for water and sewer, to be bound thereby. The customer service contract shall be as per the following format:

CITY OF LIVINGSTON

WATER AND SEWER CONSUMER CONTRACT	DATE
NEW OWNER	TAP NO.
PREVIOUS OWNER	DISTRICT_____CLASS
PROPERTY ADDRESS	EFFECTIVE DATE
	METER
(City) (State) (Zip)	(Book/Page)
MAIL TO NAME	
MAIL TO ADDRESS	
	CLERK
(City) (State) (Zip)	

SELLER: CITY OF LIVINGSTON, MONTANA

In consideration of these premises, the City agrees to sell and deliver water and sewer services to Consumer at the above address and Consumer agrees to pay for all water, sewer and garbage services delivered to said address at the rate in force. Metered rate payments for water under this Agreement shall be due and payable on or before the 10th day after statement rendered for water delivered during the previous month.

If Consumer is in default under this Agreement, the City may immediately discontinue water deliveries hereunder until such default shall be corrected; including payment as stipulated, to cover the cost of turning water off and on.

In addition to the foregoing and all other remedies available, it is agreed all sums that shall be due and unpaid under this contract shall be and are hereby made pursuant to Section 71-3-102 , M.C.A., a charge or lien against the real property to which the water has been delivered.

Consumer agrees to abide by all City water, sewer and garbage ordinances in Chapter 13 of the Code of Ordinances and rules and regulations of the City governing use of the water and sewer service delivered. All such rules and regulations applicable as they shall from time to time may be amended shall be deemed a part of this contract.

Water services shall be considered on and available unless the City turns the water off at the curb box.

Consumer understands and agrees that the City of Livingston is not responsible for maintenance and repair of the curb box and service line from the main into the improvements on the property. Consumer further agrees that the curb box must be available to the City at all times. Consumer is responsible for costs involved with maintaining service line from main line to curb box.

Consumer grants the City's agent or other authorized persons access at reasonable hours to any premises where water is used for the purpose of making inspection or investigations.

The Consumer agrees to the above stated regulations and notes:

a. Utility bills are delinquent 30 days after mailing.

b. Disconnected services will not be reconnected for 24 hours from disconnection. The cost of this service shall be set by the City Commission by separate resolution.~~This service will cost thirty-five dollars during normal work hours and sixty dollars at other times for reconnection.~~

c. Consumer assumes all risks of freezing of service pipes and meter from the service box into said property and will pay all costs incident to the immediate thawing and repairing service.

d. Consumer agrees to not allow leaks to remain inside property ahead of the installed meter.

e. City personnel may shut off the water service to said premises for failure to comply with the rules and regulations.

Delay by the City in enforcing its remedies hereunder shall never be deemed a waiver of such default or the remedies herein provided; and an actual waiver of one default hereunder shall be deemed a waiver of any other default whether prior or subsequent.

Delinquent utility bills shall accrue interest at the rate of ten percent (10%) per annum. Water, sewer and garbage services are billed as a part of the monthly bill for a unified utility service billing. Water service will be terminated if the entire unified billing is not paid.

This Agreement shall inure to the benefit of and be binding upon the Consumer, has successors or assigns.

IN WITNESS WHEREOF, the parties do hereby execute these presents.

CITY OF LIVINGSTON
WATER DEPARTMENT

CONSUMER

BY:_____
(Date)

_____
(Date)

(Ord. 1658, 5/8/90; unnumbered Ord., 5/21/90)

Sec. 13-57. Water bill—charges.

If water service is turned off (other than emergency) at the request of the owner, and turned on again, the charge for this service shall be set by the City Commission by separate resolution. ~~twenty dollars ($20.00)~~ during normal working hours and ~~forty dollars ($40.00)~~ for any other time.

(Ord. 1658, 5/8/90)

Sec. 13-82. Fire protection.

A. Private Fire Lines. A private fire line will be charged an annual fee for capability to supply meter and maintain line to the curb stop. This fee shall be set by the City Commission by separate resolution.

~~Line Size~~	~~Annual Rate~~
~~2-inch line~~	~~$ 37.50~~
~~3-inch line~~	~~$ 56.20~~
~~4-inch line~~	~~$ 87.50~~
~~6-inch line~~	~~$156.20~~
~~8-inch line~~	~~$212.50~~
~~12-inch line~~	~~$437.50~~

B. Public Fire Hydrant Charges. The annual charge per hydrant in a private line shall be based on the number of hydrants in service at the beginning of the fiscal year and shall be set by the City Commission by separate resolution. ~~fifty dollars ($50.00) per hydrant.~~

(Ord. 1658, 5/8/90)

Sec. 13-83. Miscellaneous water rates.

A. Standpipe Water Sales. The rate for standpipe water sales shall be set by the City Commission by separate resolution. ~~twenty-five cents ($.25) per one hundred fifty gallons or major portion thereof with a minimum charge of one dollar ($1.00) per tank load.~~

B. Swimming Pool—Municipal. The rate for a municipal swimming pool shall be the commercial metered rate.

C. Park Irrigation. The rate for park irrigation shall be the metered rate.

D. All Schools. The rate for schools shall be the metered rate.

(Ord. 1658, 5/8/90)

Sec. 13-97. Reimbursement calculations.

Reimbursement under this section shall be determined by the City using the following criteria:

A. The total potential users of the constructed water main extension shall be estimated on the basis of the most probable development of lots adjacent to this water main extension, the capacity of the installation, and the capacity of City water mains.

B. The standard method, not to exclude other methods or factors, of estimating the number of total potential users shall be that one potential user will be allowed per fifty (50) feet of lot frontage. The total potential use by the applicant shall be similarly determined and included in the total of potential users.

C. The cost for a water service tap from the water main extension shall be found by dividing the total cost of the water main installation by the total potential users of the water main extension.

D. No person shall be reimbursed a greater amount than the total cost of the water main installation less that person's total potential use multiplied by the cost per water service tap.

E. Commercial property, industrial property, multifamily property and other property of a similar nature will have reimbursement calculated by a method considering customary usage and deemed appropriate by the City.

F. For purposes of administering this section, each party, including the party extending the water main, shall be charged a fee set by the City Commission by separate resolution ~~of fifteen dollars ($15.00)~~ for each water service tap.

G. Adjacent property for purposes of calculation shall only be property living immediately adjacent to the main except for extensions into a planned subdivision wherein the line is owned by the owner within the subdivision.

H. The City may hire an engineer to make the reimbursement calculation described in this section in which event the engineering fees shall be added to the reimbursement fee to be paid by the party paying the reimbursement.

(Ord. 1658, 5/8/90; Ord. 1781, 9/6/94)

Sec. 14-13.2. Sewer main extensions.

A. An application must be submitted to the office of the Public Works Director and approved before a City sewer trunk line or a City sewer main may be extended. The application for connection shall be submitted by the City Manager to the City Commission with the City Manager's review, recommendations and suggested connection fee. A connection to the City's sewer by a person or business whose premises are located outside the City shall require a Waiver of Protest of Annexation and a request for withdrawal from the Rural Fire District and the City Manager to make a recommendation to the City Commission to approve extension. In addition, any person or business located outside of the City and currently receiving utility services from the City shall be required to consent to annexation in order to receive continued services. Approval, disapproval, or amendment by the City Commission shall constitute final action upon the application.

City sewer mains are normally eight (8) inches or larger in diameter. Sewer trunk lines carry the largest quantity of sewage in the City's system, and taps shall be held to an absolute minimum. City sewer mains serve as collection systems for neighborhoods and are tapped for service lines. The sewer main line will be extended to the far side of the property as designated by the City.

B. The application for connection shall set forth the location of the proposed line and connection. The capacity of the line and type of pipe shall be set forth. Any engineering studies shall be enumerated and the Public Works Director may request, if they desire, a copy of such study. The Public Works Director may also request that the method and plan of construction be set forth in more detail by way of maps and diagrams. Applicant must submit appropriate plans approved by the Department of Health and Environmental Science.

C. To be entitled to reimbursement for connections by other applicants to a sewer main installed under the provisions of this Section, the applicant must submit an itemized and substantiated summary of the total cost of the sewer main installations. Documentation may include a copy of bills for the project. Applicant may submit suggested reimbursement fees.

D. Before any person may install a service connection from a sewer main, and if within ten (10) years from the original date of an extension, the applicant shall be required to make a payment on a proportionate basis in accordance with this Section. The payment as set forth herein shall be paid to the City for direct reimbursement to the original applicant, and the payment must be made before the new applicant connection permit may be granted. The City's charge for connection to the City's sewer system must also be paid.

E. Reimbursement under this Section shall be determined initially by the Public Works Director using the following criteria:

1. The total potential users of the sewer main extension shall be estimated on the basis of the most probable development of lots adjacent to the sewer main extension, the capacity of the installation, and the capacity of City sewer mains.

   Commercial property, industrial property, multi-family property and other property of a similar nature will have reimbursement calculated by a method deemed appropriate by the City considering projected usage and local effect upon the system.

2. The standard method, not to exclude other methods or factors, of estimating the number of total potential users shall be that one potential user will be allotted per fifty (50) feet of lot frontage. The total potential use by the applicant shall be similarly determined and included in the total of potential users.

3. The cost for a sewer service tap from the sewer main extension shall be found by dividing the total cost of the sewer main installation by the total potential users of the sewer main extension.

4. No person shall be reimbursed a greater amount than the total cost of the sewer main installation less that person's total potential use multiplied by the cost per sewer service tap.

5. Review of the reimbursement determination may be made by the City Commission as outlined in subsection (A) of this Section.

F. For purposes of administering this Section, each person, including the person extending the sewer main, shall be charged an additional fee set by the City Commission by separate resolution. ~~of Fifteen Dollars ($15.00).~~

(Ord. 1329, 7/19/76; Ord. 1639, 12/89; Ord. 1802, 1/17/95; Ord. 1804, 1/17/95; Ord. 1868, 2/2/98: Ord. 1925 § 1, 4/21/03; Ord. No. 3005 , § 2, 4/20/21)

Sec. 14-13.3. Wastewater system development fee.

A. Except for city owned buildings and facilities, a wastewater (sewerage) utility development fee shall be charged and shall be paid according to the size of the water service line installed for the development set by the City Commission by separate resolution. ~~as follows:~~

~~Meter Size~~	~~System Development Fee~~
~~⅝″~~	~~$875.00~~
~~¾″~~	~~875.00~~
~~1″~~	~~1,550.00~~
~~1 ¼″~~	~~2,425.00~~
~~1 ½″~~	~~3,500.00~~
~~2″~~	~~6,210.00~~
~~3″~~	~~14,000.00~~
~~4″~~	~~24,850.00~~
~~6″~~	~~28,000.00~~
~~8″~~	~~102,987.00~~

B. This new wastewater system development fee shall have no impact upon the current practice of charging customers for additional expenses the City incurs in making a new connection into the City's wastewater collection system main. This practice of charging the new customer for these incidental expenses of materials and manpower shall continue.

C. The wastewater development fee must be paid before obtaining a building permit and/or before the water is turned on. All moneys collected through this wastewater system development fee shall be deposited directly into the Livingston Sewer Enterprise Fund's Capital Improvement Account. The account shall only be used for

capital improvements of the City's wastewater system. The account shall not be used for replacement nor maintenance of existing lines and/or facilities.

(Ord. 1705, 5/4/92; Ord. 1788, 10/17/94; Ord. 1833, 6/17/96)

Sec. 14-82. Private sewage disposal.

1. Where a public sanitary or combined sewer is not available under the provisions of Division 2, Sec. 4, the building sewer shall be connected to a private sewage disposal system complying with the provisions of this division.

2. Before commencement of construction of a private sewage disposal system the owner shall first obtain a written permit signed by the Public Works Director. The application for such permit shall be made on a form furnished by the City, which the applicant shall supplement by any plans, specifications, and other information as are deemed necessary by the Public Works Director. A permit and inspection fee shall be set by the City Commission by separate resolution ~~of fifteen (15) dollars~~ shall be paid to the City of Livingston at the time the application is filed.

3. A permit for a private sewage disposal system shall not become effective until the installation is completed to the satisfaction of the Public Works Director. They shall be allowed to inspect the work at any stage of construction and, in any event, the applicant for the permit shall notify the Public Works Director when the work is ready for final inspection, and before any underground portions are covered. The inspection shall be made within forty-eight (48) hours of the receipt of notice by the Public Works Director.

4. The type, capacities, location, and layout of a private sewage disposal system shall comply with all recommendations of the Department of Public Health of the State of Montana. No permit shall be issued for any private sewage disposal system employing subsurface soil absorption facilities where the area of the lot is less than square feet. No septic tank or cesspool shall be permitted to discharge to any natural outlet.

5. At such time as a public sewer becomes available to a property served by a private sewage disposal system, as provided in Division 3, Sec. 4, a direct connection shall be made to the public sewer in compliance with this chapter, and any septic tanks, cesspools, and similar private sewage disposal facilities shall be abandoned and filled with suitable material.

6. The owner shall operate and maintain the private sewage disposal facilities in a sanitary manner at all times, at no expense to the City.

7. No statement contained in this Division shall be construed to interfere with any additional requirements that may be imposed by the health officer.

8. When a public sewer becomes available, the building sewer shall be connected to said sewer within sixty (60) days and the private sewage disposal system shall be cleaned of sludge and filled with clean bank-run gravel or dirt.

Sec. 14-83. Building sewers and connections.

1. No unauthorized person shall uncover, make any connections with or opening into, use, alter, or disturb any public sewer or appurtenance thereof without first obtaining a written permit from the Public Works Director.

2. There shall be two (2) classes of building sewer permits: (a) for residential and commercial service, and (b) for service to establishments producing industrial wastes. In either case, the owner or their agent shall make application on a special form furnished by the City. The permit application shall be supplemented by any plans, specifications, or other information considered pertinent in the judgment of the Public Works Director. A permit and inspection fee shall be set by the City Commission by separate resolution ~~of fifteen dollars ($15.00) for a residential or commercial building sewer permit and twenty-five dollars ($25.00) for an industrial building sewer permit shall be paid to the City at the time the application is filed.~~

   ~~An additional charge for connection to the City's sewer system shall be one hundred fifty dollars ($150.00) for single-family and commercial connections. Multiple units using a single tap shall be charged an additional fifty dollars ($50.00) per unit. Industrial connections charges shall be one hundred fifty dollars ($150.00) plus fifty dollars ($50.00) for each multiple of an average residential use. The fees must accompany the original application.~~ In addition, the user shall be charged for any City time and material in making the connection to City lines.

(Ord. 1640, 12/89)

3. All applications for industrial waste permits shall be approved by the City Council after review and recommendation by the Council Health and Sanitation Committee.

4. All costs and expenses incident to the installation and connection of the building sewer shall be borne by the owner. The owner shall indemnify the City from any loss or damage that may directly or indirectly be occasioned by the installation of the building sewer. The building owner shall maintain at the building owner's sole expense the building sewer or service line from the City main to the building.

(Ord. 1786, 9/19/94)

5. A separate and independent building sewer shall be provided for every building; except where one building stands at the rear of another on an interior lot and no private sewer is available or can be constructed to the rear building through an adjoining alley, court, yard, or driveway, the building sewer from the front building may be extended to the rear building and the whole considered as one building sewer.

6. Old building sewers may be used in connection with new buildings only when they are found, on examination and test by the City, to meet all requirements of the ordinance codified in this Chapter.

7. The size, slope, alignment, materials of construction of all sanitary sewers, including building sewers, and the methods to be used in excavating, placing of the pipe, jointing, testing, and backfilling the trench, shall all conform to the requirements of the building and plumbing code or other applicable rules and regulations of the City. In the absence of code provisions or in amplification thereof, the materials and procedures set forth in appropriate specifications of the A.S.T.M. and W.P.C.F. Manual of Practice No. 9 shall apply.

8. Whenever possible, the building sewer shall be brought to the building at an elevation below the basement floor. In all buildings in which any building drain is too low to permit gravity flow to the public sewer, sanitary sewage carried by such building drain shall be lifted by an approved means and discharged to the building sewer.

9. No person shall make connection of roof downspouts, exterior foundation drains, areaway drains, or other sources of surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer.

10. The connection of the building sewer to the public sewer shall conform to the requirements of the building and plumbing code or other applicable rules and regulations of the City, or the procedures set forth in appropriate specifications of A.S.T.M. and the W.P.C.F. Manual of Practice No. 9. All such connections shall be made gas-tight and watertight. Any deviation from the prescribed procedures and materials must be approved by the Public Works Director before installation.

11. The applicant for the building sewer permit shall notify the Public Works Director when the building sewer is ready for inspection and connection to the public sewer. The connection shall be made under the supervision of the Public Works Director or their representative.

12. All excavations for building sewer installation shall be adequately guarded with barricades and lights so as to protect the public from hazard. Streets, sidewalks, parkways, and other public property disturbed in the course of the work shall be restored in a manner satisfactory to the City.

(Ord. 1375, 10/4/77)

Sec. 26-40. Snow removal vehicles—permit requirements.

A. Any person operating motorized equipment or vehicles for snow removal for hire shall be required to have a City permit.

B. All permit holders and all Federal, State or local governmental entities and school districts shall comply with the City Ordinances and with requirements for removal and deposit of snow as set forth in regulations set forth in writing by the City Public Works Superintendent.

C. Each permit shall cost an amount to be set by the City Commission by separate resolution ~~Fifteen Dollars ($15.00) per year~~ and shall be purchased by January 31st of each year without proration.

(Ord. 1940 § 1 (part), 3/15/04)

Sec. 26-107. Driveway construction—permit and supervision.

Before any person builds or constructs a driveway from private property and where concrete curbing must be removed to any City street, a written permit shall be obtained from the City to permit a curb cut and driveway construction. The City Building Department must approve all plans and specifications for the construction of the driveway. A permit fee shall be set by the City Commission by separate resolution.~~of One Hundred Dollars ($100.00) shall be charged for each curb cut in a two (2) hour parking zone. In all other areas, the permit fee shall be Thirty Dollars ($30.00).~~ The Building Department may supervise the construction of the curb cut and driveway to see that specifications are met.

(Ord. 1940 § 1 (part), 3/15/04)

Sec. 29-18. Fees.

A processing fee shall be set by the City Commission by separate resolution and ~~of fifty dollars ($50.00)~~ shall be submitted with each permit application.

(Ord. No. 2033, § I, 8/16/11)

Sec. 30.84. Investigation fee.

Whenever work for which a variance is required has commenced without first obtaining a variance, an investigation fee, in addition to the variance filing fee, shall be charged. The investigation fee shall be set by the City Commission by separate resolution ~~Fifty Dollars ($50.00)~~. The fee must be paid prior to submission of a variance application. The payment of such investigation fee shall not exempt any person from compliance with all other provisions of this article, nor from any penalty prescribed by law.

SECTION 2

Statutory Interpretation and Repealer:

Any and all resolutions, ordinances and sections of the Livingston Municipal Code and parts thereof in conflict herewith are hereby repealed.

SECTION 3

Severability:

If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect the other provisions of this ordinance which may be given effect without the invalid provision or application and, to this end, the provisions of this ordinance are declared to be severable.

SECTION 4

Savings Provision:

This ordinance does not affect the rights or duties that matured, penalties and assessments that were incurred or proceedings that began before the effective dates of this ordinance.

SECTION 5

Effective date:

This ordinance will become effective 30 days after the second and final adoption.

* * * * *

PASSED by the City Commission of the City of Livingston, Montana, on first reading at a regular session thereof held on the 19th day of September, 2023.

MELISSA NOOTZ, CHAIR

ATTEST:

EMILY HUTCHINSON
City Clerk

* * * * *

PASSED, ADOPTED AND APPROVED, by the City Commission of the City of Livingston, Montana, on second reading at a regular session thereof held on the 3rd day of October, 2023.

MELISSA NOOTZ, CHAIR

ATTEST:

EMILY HUTCHINSON
City Clerk

APPROVED AS TO FORM:

JON HESSE
City Attorney

PUBLIC NOTICE

NOTICE, is hereby given the Livingston City Commission will conduct a public hearing on Tuesday, October 3rd at 5:30 p.m. after the second reading of **ORDINANCE NO. 3045: AN ORDINANCE OF THE CITY COMMISSION OF THE CITY OF LIVINGSTON, MONTANA, AMENDING THE LIVINGSTON MUNICIPAL CODE, TO REMOVE ANY PERMIT AND FEE AMOUNTS AND REPLACE THEM WITH LANGUAGE TO SET AMOUNTS VIA RESOLUTION.** This public hearing will be conducted in the Community Room of the City/County Complex at 414 E. Callendar Street, Livingston, MT. For additional information contact Paige Fetterhoff at (406) 823-6003.

Please publish twice on:

September 23rd and September 30th

File Attachments for Item:

A. MOUNTAIN VIEW SUBDIVISION PRELIMINARY PLAT

City Manager
Grant Gager

220 E Park Street
(406) 823-6000 phone

citymanager@livingstonmontana.org
www.livingstonmontana.org

City of Livingston

Incorporated 1889

Date: September 19, 2023
To: Chair Nootz and City Commissioners
From: Jennifer Severson, Planning Director

Staff Report for Mountain View Major Subdivision

Proposal Summary

Livingston West, LLC, owner of the property described as Parcel 1A of Certificate of Survey No. 2748RB (see Development Plan in Figure 1 below), located on the west end of Livingston near the Highway 10 West on-ramp at Interstate 90, is proposing to divide the subject property into 24 lots. The property surrounds the Printing for Less and FedEx facilities.

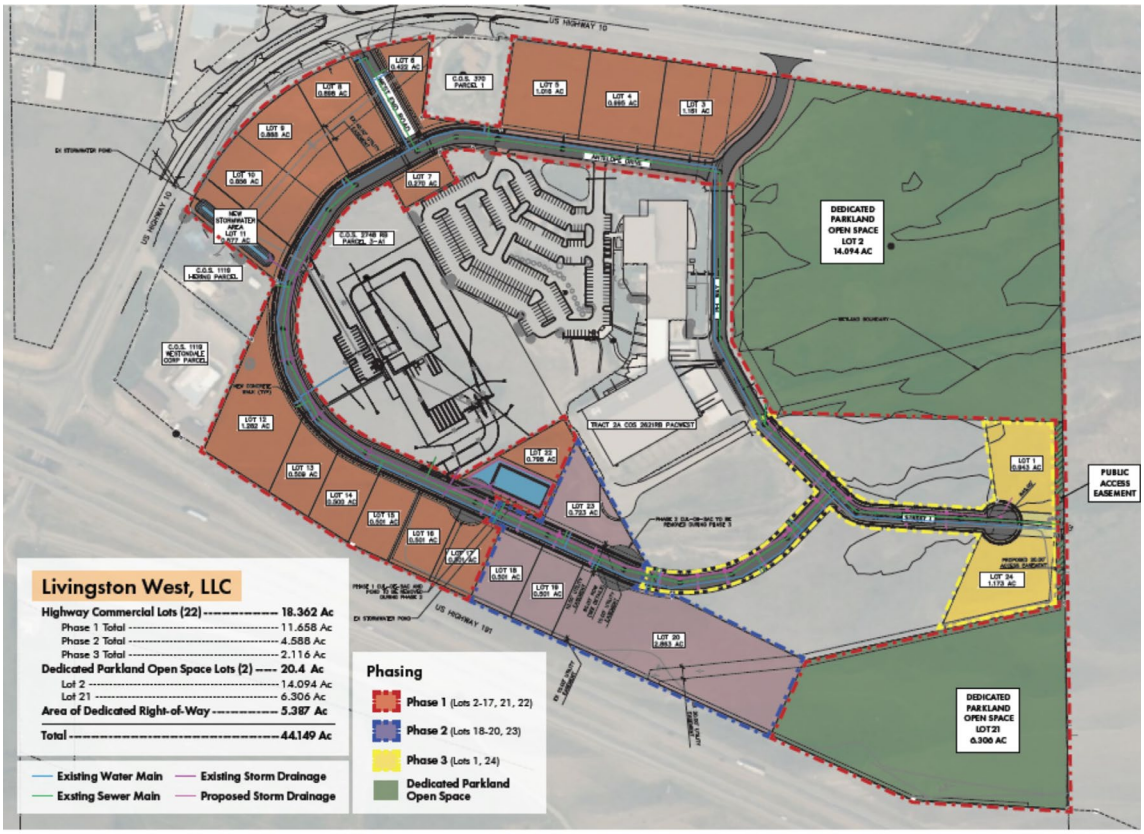

Figure 1. Development Plan

Background

The subject property was annexed by the City of Livingston in 2004 and is zoned Highway Commercial. As defined in the Livingston Municipal Code Art II, Sec 30.30, the Highway Commercial zoning district is intended to provide areas for residential structures, commercial and service enterprises which serve the needs of the tourist, traveler, recreationalist or the general traveling public. Areas designated as Highway Commercial should be located in the vicinity of freeway interchanges, intersections on limited access highways, or adjacent to primary and secondary highways. The subject property is also located in an area designated as Community Commercial on the Future Land Use Map included in the 2021 Growth Policy (see Figure 2 below). Community Commercial land use designation accommodates medium to large scale wholesale, retail, lodging, offices, and service establishments typically located along major corridors that can function independent of adjoining development and/or require individual access to public rights-of-way.

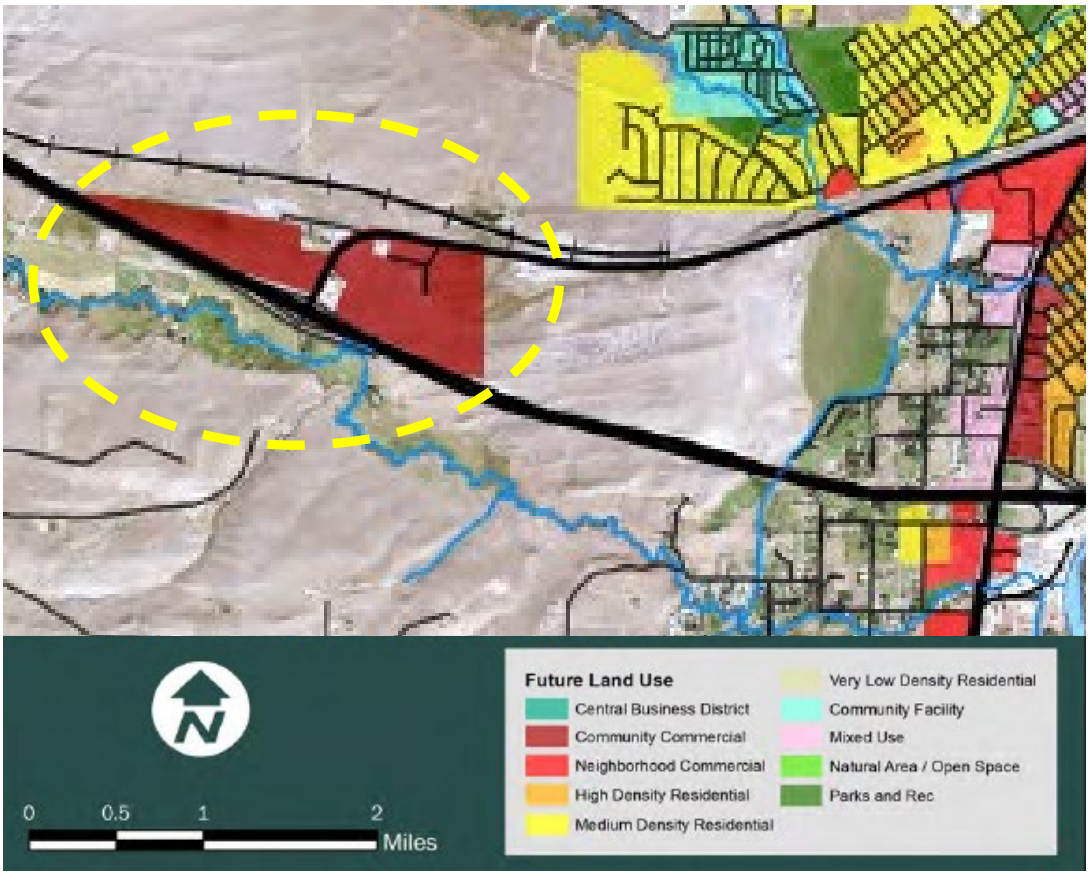

Figure 2. Future Land Use Map

Referral Agency Responses

Livingston Public Works- comments were provided about the following: additional costs to the City associated with the proposed subdivision; street improvements and temporary safety measures between phase development; erosion control; water and sewer connection requirements for each subdivided lot; ownership and maintenance responsibilities for new public facilities; and staff review of stormwater and street plans for phases 2 and 3. Recommendations were made for: a new sewer main near Kenyon Noble as recommended

in the Wastewater Preliminary Engineering Report; POA covenant revisions; a water and sewer easement across Lot 12 for future services to an adjacent parcel.

Livingston Fire and Rescue- no concerns; approve of the new line extensions for many of the hydrants shown on the plans.

Northwestern Energy- comments confirmed their ability to provide electric and natural gas services to the proposed subdivision and requested the applicant initiate contact to plan utility design and locates before finalizing lot development.

Montana State Historic Preservation Office (SHPO)- comments confirmed the absence of previously recorded cultural resource sites within the designated area and, provided there is no disturbance to structures over 50 years of age, there is a low likelihood cultural resources will be impacted by the proposed subdivision and a cultural resource inventory is unwarranted at this time.

MT Fish, Wildlife and Parks- comments confirmed that the area proposed for subdivision is used by some big game and non-game species. This agency recommended several revisions to the developer covenants to mitigate potential adverse impacts to wildlife from future development in the subdivision.

US Postal Service- comments recommending a Cluster Box Unit Mailbox (CBU) for the proposed development that is ADA compliant and bolted to the cement, preferably located on a sidewalk.

Windrider Transit- comments confirmed the proposed subdivision is not currently serviced by this agency and there are no plans to do so in the future without additional funding from the developer.

No Concerns- Livingston Building and Police Departments

No Responses to Developer Inquiry Received-; MT Department of Transportation; Park Electric Cooperative; and Lumen.

Public Comments- Friends of Park County; Jean Sandberg; Thomas McNamee- none of these commenters support the proposed subdivision. Freshwater Partners supports plans to keep the site wetlands intact and functioning, and stated concerns about routing utilities through the wetlands, the scope of the wetland study in the application, and future legal liability once the City maintains ownership of the wetlands.

FINDINGS OF FACT

The Montana Code Annotated (MCA) Section 76-3-608 requires the decision by a governing body to approve, conditionally approve or deny a proposed subdivision to be based on the specific, documentable, and clearly defined impact on the following primary criteria.

(Staff Responses in *italics*)

A. Effect on Agriculture

Agriculture is defined as the production of food, feed, and fiber commodities, livestock and poultry, bees, fruits and vegetables, and sod, ornamental, nursery, and horticultural crops that are raised, grown, or produced for commercial purposes.

1) Would the subdivision remove agricultural or timberlands with significant existing or potential production capacity?
No. Staff has not identified existing agricultural or timberland resources on this site.

2) Would the subdivision remove from production agricultural lands that are critical to the area's agricultural operations?
No. Staff has not identified any current or previous agricultural production on the subject property.

3) Would the subdivision create significant conflict with nearby agricultural operations (e.g. creating problems for moving livestock, operating farm machinery, maintaining water supplies, controlling weeds, applying pesticides or would the subdivision generate nuisance complaints due to nearby agricultural operations)?
Staff has not identified or been notified of any intensive agricultural activities in the immediate area.

B. <u>Effect on Agricultural Water User Facilities</u>

Agricultural water user facilities are defined as any part of an irrigation system used to produce an agricultural product on property used for agricultural purposes.

1) Would the subdivision create a significant conflict with agricultural water user facilities (e.g. creating problems for operating and maintaining irrigation systems or creating nuisance complaints due to safety concerns, noise, etc.)?
No. Staff has not identified any agricultural water user facilities on the subject property and no conflict is anticipated.

C. <u>Effect on Local Services</u>

Local services are defined as all services provided by any local government unit having jurisdiction over the subdivision as well as those commonly provided by private entities to similar properties in the vicinity.

1) What additional or expanded public services and facilities would be demanded to serve this subdivision?
The following additional or expanded public services and utilities would be necessary to serve the proposed subdivision: water, sanitary sewer, garbage collection, streets and sidewalks, street lights, stormwater facilities, police, fire, and emergency medical services (EMS).

   a) What additional costs would result for services such as streets, law enforcement, parks and recreation, fire protection, water, sewer and solid waste, schools and busing (including additional personnel, equipment, construction and maintenance costs)?
   The cost of fire and police services will increase proportionally to population growth in the City; however, the amount attributed to this development is integrated into the City's current Impact Fee Schedule, which was updated in 2021. New and expanded public infrastructure associated with the proposed subdivision will be constructed and paid for by private parties. Ownership and maintenance of public infrastructure dedicated to the City will be the responsibility of the City. As stated in the Public Works referral dated

July 19, 2023 (attached), the developer covenants must be updated to indicate developer responsibility for sidewalk construction costs.

Until the proposed subdivision lots are developed, it is unknown whether the proposed subdivision will have residential development. Similarly, it is unknown whether future housing would include residents with school age children requiring busing for school.

b) Who would bear these costs?
Taxes on new construction will be paid into the City's General Fund and Impact Fees will be charged at the time building permit(s) are issued for new development on the subdivided lots. The applicant is required to improve PFL Way from the fire hydrant at the end of the existing pavement past Antelope Drive, and must bear the cost of constructing these improvements. Once construction is complete, the City will assume responsibility for maintenance of water and sewer infrastructure, streets, streetlights, and sidewalks.

As noted in the Public Works referral, the City will absorb additional costs associated with the Starlo Booster Station for pumping water and providing fire flows to new development in the proposed subdivision.

The applicant has proposed to dedicate stormwater facilities and open space associated with the new subdivision; however, the Public Works Director has requested- and staff recommends- that the Property Owners Association (POA) maintain ownership and maintenance responsibilities for stormwater facilities. The Public Works Director and staff also recommend the applicant be required to deed restrict the subdivision open space/ parklands for public use but have the POA assume ownership and maintenance responsibilities.

Garbage Service will be paid by user fees incurred by the individual lot owners when contracting for service.

c) Can the service providers meet the additional costs given legal and other constraints?
Yes. The City's impact fees are designed to off-set the increase in capital expenditures for public services and will be paid as each subdivided lot is developed. Increased tax revenue generated by new development on the lots will also be directed into the City's General Fund.

2) Would the subdivision allow existing services, through expanded use, to operate more efficiently or make the installation or improvement of services feasible?
The adjacent FedEx facility recently extended water and sewer mains to the edge of Hwy 10 that could accommodate future service to additional annexed property across the Highway as well as the proposed subdivision lots as they are developed.

As stated in the Public Works referral letter, the sewer main near Kenyon Noble is a high-risk area with clay tile and capacity issues for future flows. A 15-inch main replacement is recommended in the Wastewater Collection Preliminary Engineering Report (PER).

3) What are the present tax revenues received from the unsubdivided land by the County, City and Schools?
The 2022 tax bills for the subject property totaled $17,614.

4) What would be the approximate revenues received by each above taxing authority when the subdivision is improved and built upon?
It is impossible to estimate future tax revenue on developed lots without knowing the types and scale of that development. However, the applicant has estimated that annual tax revenues to the City of Livingston could be as much as $200,000 at full build out of the subdivision. This estimate was calculated using the State of Montana tax rate of 1.35% and the City of Livingston mill rate of 0.58606 as applied to the acreage and estimated taxable value of potential development for each lot. Furthermore, based on that estimate of the City's potential tax revenue, the additional potential tax revenues for the County and School District could be upwards of $300,000.

5) Would new taxes generated from the subdivision cover additional public costs?
Because the subject property is zoned Highway Commercial, with the potential for both higher density residential development as well as commercial uses, staff anticipates it is likely that the property tax revenue generated by new development will cover additional public costs. Impact fees will apply to new development in the subdivision and the developed lots must also pay into the City's street and light maintenance districts.

6) Would any special improvement districts be created which would obligate the City fiscally or administratively?
No. Staff does not anticipate the creation of a special improvement district for the area within the subdivision. However, staff is recommending a waiver of protest requirement for an SID for the subdivided lots. This waiver will apply to a future project to create pedestrian/bicycle connectivity from this subdivision to the City's existing trail system to the east.

D. <u>Effect on the Natural Environment</u>
The natural environment is defined as the physical conditions that exist within a given area.

1) How would the subdivision affect surface and groundwater, soils, slopes, vegetation, historical or archaeological features, and visual features within the subdivision or on adjacent lands?

a) Would any stream banks be altered, streams rechanneled or any surface water contaminated from run-off carrying sedimentation or other pollutants?
No streams exist within the area proposed for subdivision. Erosion Control installed in accordance with the MT Stormwater Pollution Prevention Plan (SWPPP) will help prevent sediment migration during runoff.

b) Would groundwater supplies likely be contaminated or depleted as a result of the subdivision?
Future development on the proposed subdivision lots will supplied by City water mains and is not anticipated to affect groundwater quantity. A Geotechnical Report was prepared by Terracon in May 2021 on the adjacent FedEx property (see pages 83-153 in the application materials PDF) that confirmed groundwater depth is between 6 and 15 feet below pre-development site grades. Although the report does not include the area proposed for subdivision, it is likely similar conditions may exist as on the adjacent FedEx site. The report recommends that individual contractors should be made aware of the possibility of encountering groundwater during construction.

c) Would construction of streets or building sites result in excessive cuts and fills on steep slopes or cause erosion on unstable soils?
No. The Stormwater Management Plan was designed to comply with the City's Public Works and MT DEQ standards. As stated above, erosion control must be installed as required per the MT Stormwater Pollution Prevention Plan (SWPPP).

d) Would significant vegetation be removed causing soil erosion or bank instability?
No. As noted above, Erosion Control is required per the SWPPP and proper construction techniques, per the City's Public Works Design Standards, are expected to mitigate potential erosion and soil migration caused by runoff.

e) Would significant historical or archaeological features be damaged or destroyed by the subdivision?
Based on the attached letter from the Montana State Historic Preservation Office dated June 8, 2023, although there have been a few previously conducted cultural resource inventories in the area, there have been no previously recorded cultural resource sites in the area. Therefore, staff does not anticipate any significant historical or archaeological features will be impacted by the proposed subdivision.

f) Would the subdivision be subject to natural hazards such as flooding, rock, snow or land slides, high winds, severe wildfires or difficulties such as shallow bedrock, high water table, unstable or expansive soils, or excessive slopes?
None of the listed hazards have been identified within the area proposed for subdivision and staff does not anticipate the proposed subdivision will be subject to these hazards. Building permits are required for structures built during future development, ensuring all buildings conform to the International Building Code.

E. <u>Effect on Wildlife and Wildlife Habitat</u>

Wildlife and Wildlife Habitat are defined as living things that are neither human nor domesticated and the physical surroundings required for their existence.

1) How would the subdivision affect critical wildlife areas such as big game wintering range, migration routes, nesting areas, wetlands or other important habitat?
The proposed subdivision contains wetland areas, as shown on the preliminary plat, that will be protected during and after construction of the subdivision. A Wetland Delineation Study was conducted in September 2019 by Sundog Ecological, Inc. (Appendix E in the application materials) for the eastern half of the proposed subdivision that delineates the wetland and surface water areas that exist on the eastern half of the subject property. Effects on the quality and quantity of wetland and surface water will be mitigated by designing around these areas to the greatest extent possible and as required by local, State, and Federal regulations and adherence to the SWPPP.

The proposed subdivision has not been previously formally identified as big game wintering range or migration routes. The applicant has solicited comments from Montana Fish Wildlife and Parks, but none have been received at this time; however, the Wetland Delineation Study confirmed that no critical habitats for federally listed Threatened and Endangered Species exist in the area delineated as wetlands on the subject property.

The application states the Mountain View Subdivision will comply with Park County Weed Control District requirements. Following preliminary plat approval, a weed management plan application and 3-year monitoring contract will be submitted to the district and a

noxious weed management plan will be developed with the Park County Weed Control Board to prevent invasive weeds from adversely affecting native vegetation.

2) How would pets or human activity affect wildlife?
Although the potential for human/ wildlife interaction may exist if future development includes residential uses, staff anticipates potential conflicts would likely be minimal and limited to the open space areas. The applicant has included a suggestion for pets to be leashed while in these areas.

F. Effect on Public Health and Safety

Public Health and Safety is defined as a condition of well-being wherein risk of injury to the community at large is minimized.

1) Would the subdivision be subject to hazardous conditions due to high voltage lines, airports, highways, railroads, high-pressure gas lines, or adjacent industrial uses?
No new access points to Highway 10 are proposed and nearby active rail lines are located more than 300 feet away and across the highway from the proposed subdivision.

2) What existing uses may be subject to complaints from residents of the subdivision?
There are no existing uses on the subject property as it is currently vacant.

3) What public health or safety hazards, such as dangerous traffic or fire conditions, would be created by the subdivision?
An all-weather access road between Antelope Drive and PFL Way must be constructed as part of Phase 1 improvements to provide maintenance and emergency access until future phases and streets are constructed to complete the internal road network. The Public Works director has requested the applicant provide dead end barricades at the cul de sacs for each phase of development to prevent the public from accessing the all-weather road.

A Traffic Study was prepared by Sanderson Stewart in May 2023 (Application Materials Appendix D) to determine impacts of the proposed subdivision on the surrounding transportation network. Because the exact nature of future development on subdivided lots is unknown, the study looked at various types of uses that may be expected to determine trip generation estimates. The study notes that at full buildout, the subdivision is projected to generate a total of 9,991 gross average weekday trips with 866 trips generated during the AM peak hour and 754 trips generated during the PM peak hour. Based on the analysis in the traffic study, it is anticipated the high volume of trips added to the network by the proposed Mountain View Subdivision are projected to trigger the warrants for turn lanes into the site access intersections from Highway 10; however, the final decision to install any turn lanes shall be made by MDT after evaluation of impacts to other aspects of the intersections or adjacent intersections.

Planning Board Public Hearings

The Planning Board held a public hearing on August 16, 2023. No Board members expressed concerns about potential subdivision impacts on Agriculture or Agricultural Water User Facilities.

A motion was made to conditionally approve the subdivision but the motion did not pass and the public hearing was continued at a special August 30, 2023, meeting of the Planning Board.

During the August 30 meeting two Board members who were not present at the August 19 meeting were in attendance.

Board members expressed concerns during both meetings about how the proposed subdivision would affect the following:

Effect on Local Services- the proposed development would likely increase traffic along Highway 10, traffic coming off Interstate 90 at Exit 330 to the west, and traffic at the intersection of Park Street and Highway 10 to the east. Impact Fees to fund a future water main/ loop to tie into the subdivision would likely be inadequate to fully fund this infrastructure and the City would ultimately be responsible for meeting the funding shortfall. Concerns were also discussed about the additional reliance on emergency services A condition was recommended for a waiver of protest for a SID for future water and sewer capacity improvements necessitated by future development within the subdivision.

Effect on the Natural Environment- runoff from the proposed development would adversely impact existing wetlands located at the northeast corner of the subdivision and 'Egeland Creek' [NOTE: there is no surface water feature named Egeland Creek in the City's GIS database; staff believes the area discussed as Egeland Creek may be the area designated in the State's mapping database as PEMC (Seasonally Flooded Wetlands), which extend east from the wetlands in the northeast corner of the site.]

Effect on Wildlife and Wildlife Habitat- the potential for fencing in subdivision to harm wildlife was discussed as well as concerns that improperly stored solid waste could attract bears. Conditions were recommended to mitigate potential conflicts between future subdivision development and wildlife, including leashed dogs in open space, animal-proof trash storage, and "wildlife friendly" fencing.

Effect on Public Health and Safety- traffic concerns above were reiterated, especially during potential emergency evacuation of City residents, such as during a train derailment, or when I-90 between Exit 330 and 333 is closed during high winds. Proximity to wildland-urban interface and I-90 may exacerbate wildfire potential. Traffic congestion and potential accidents caused by high speed limit on Highway 10. Suggestion made to request MDT conduct a speed study along Hwy 10 to mitigate concerns.

Additional discussion points not related to specific Findings of Fact included how sprawl and infill are defined; the proposed subdivision is on land previously annexed by the City which suggests development was anticipated; how the application addressed the Growth Policy; and that there is a need for the types of potential development allowed in the Highway Commercial zoning district as suggested in the application.

A motion was made and seconded to approve the Mountain View Subdivision with the conditions as proposed by staff and the additional following conditions: waiver of protest of a SID for future water and sewer capacity improvements; bear-proof trash storage; wildlife friendly fencing; dedication of land within the subdivision for City gateway signage; and leashing of dogs in public open space. The motion passed by a vote of 5-4.

Recommendation

As stated in MCA Section 76-3-608.1, a governing body may not deny approval of a proposed subdivision based solely on the subdivision's impacts on educational services or based solely on parcels within the subdivision having been designated as wildland-urban

interface parcels. The governing body shall issue written findings of fact that weigh the criteria A-F discussed above.

Based upon the Findings of Fact as evaluated above, the Planning Board recommends the City Commission **conditionally approve** the Mountain View Subdivision with the following conditions:

1. The subdivider must sign a waiver of protest of SID for all lots in this subdivision. This waiver will apply to a future project to create pedestrian/bicycle connectivity from this subdivision to the City's existing trail system.

2. The subdivider must sign a waiver of protest for a SID for future water and sewer infrastructure improvements to expand capacity as necessitated by future development in the subdivision.

3. All infrastructure must comply with the City of Livingston Public Works Design Standards and Specifications.

4. Street lights will be required within this development. Type and spacing will be per existing City specifications.

5. All outdoor lighting in this development must be night-sky friendly and must be approved by the City prior to installation.

6. The developer Declaration of Covenants submitted with the Final Plat must include the following requirements:
    a. All trash must be stored in bear-proof containers or else be stored inside until the day it's scheduled for pick up.
    b. All fencing within the subdivision must be designed to be "wildlife friendly" as per recommendations by MT FWP.
    c. Dogs must be leashed at all times in the areas identified as Open Space on the plat.
    d. Minimum lot densities for residential and commercial development must not be more restrictive than City zoning regulations.
    e. The developer is responsible for sidewalk construction costs.

7. The developer will allot an area within the subdivision, outside MDT right-of-way, for future Gateway Signage installation such as a "Welcome to Livingston" sign.

8. Storm water design will meet all applicable DEQ standards. The Property Owners Association (POA) must maintain ownership and maintenance responsibilities for stormwater facilities once constructed.

9. The applicant is required to deed restrict the subdivision open space/ parklands for public use and the POA must assume ownership and maintenance responsibilities.

10. Erosion Control must be installed in accordance with the MT Stormwater Pollution Prevention Plan (SWPPP).

11. Development must comply with Park County Weed Control District requirements.

12. The subdivider will be responsible for all required street signing to include traffic control signs as well as street name signs. All signs will be built and installed according to City specifications. Painting of curbs at fire hydrants will also be required.

13. The applicant is required to improve PFL Way from the fire hydrant at the end of the existing pavement past Antelope Drive, and must bear the cost of constructing these improvements.

14. The applicant must install provide dead end barricades at the cul de sacs for each phase of development to prevent the public from accessing the all-weather road.

15. An all-weather access road between Antelope Drive and PFL Way must be constructed as part of Phase 1 improvements to provide maintenance and emergency access until future phases and streets are constructed to complete the internal road network.

16. Building permits are required for structures built during future development, ensuring all buildings conform to the International Building Code.

17. A Montana licensed engineer, or his supervised representative, will be required to be on site during utility construction.

18. If a utility reimbursement plan is requested by the developer, it must be submitted to, and approved by, the City prior to beginning construction.

19. Any improvement agreement(s) for deferred infrastructure construction need to be reviewed and approved by the City prior to the beginning of construction.

Jennifer Severson

Subject: FW: Mountain View Subdivision Resubmittal Comments

From: Shannon Holmes <sholmes@livingstonmontana.org>
Sent: Wednesday, July 19, 2023 12:08 PM
To: Jennifer Severson <jseverson@livingstonmontana.org>; Martha ORourke <morourke@livingstonmontana.org>
Subject: RE: Mountain View Subdivision Resubmittal Comments

Jennifer,
Here are my comments.

Please let me know if you have any questions.

1. Starlo Booster Station does have additional costs for pumping water and providing fire flows to this development.
2. The sewer main near Kenyon Noble is a high risk area with clay tile and capacity issues for future flows. A 15-inch main replacement is recommended in the Wastewater Collection PER.
3. All weather access road in Antelope Drive to PFL Way needs to be constructed in Phase 1.
4. Please provide dead end barricades at cul de sacs for each phase.
5. Erosion Control needs to be placed per the SWPPP
6. Improve PFL Way from end of pavement Fire hydrant past Antelope Drive.
7. No return letters from FWP, MDT, Windrider and Park electric and USPS
8. Covenants- City takes care of Streets. POA takes care of dedicated open space, retention ponds
9. Covenants should address sidewalk construction.

Thanks!

Shannon Holmes
Public Works Director
(406) 222--5667

From: Shannon Holmes <sholmes@livingstonmontana.org>
Sent: Wednesday, July 19, 2023 8:06:58 AM
To: Jennifer Severson <jseverson@livingstonmontana.org>; Martha ORourke <morourke@livingstonmontana.org>
Subject: RE: Mountain View Subdivision Resubmittal Comments

Good morning,

Yes, each lot needs water and sewer service stubs now as part of the subdivision. I will provide any comments that I have later this morning.

Thanks!

Shannon Holmes
Public Works Director
(406) 222--5667

From: Jennifer Severson <jseverson@livingstonmontana.org>
Sent: Tuesday, July 18, 2023 3:39 PM
To: Martha ORourke <morourke@livingstonmontana.org>
Cc: Shannon Holmes <sholmes@livingstonmontana.org>
Subject: RE: Mountain View Subdivision Resubmittal Comments

Thanks Martha- re: #3 below- Can you make the decision now whether or not you would allow each developer to do their own water/ sewer services? It just sounds a bit ambiguous as it is…unless this is a standard Public Works comment/ condition language for subs?

Also, is the below all comments from public works on the subdivision? I.E. Shannon, are you planning to also submit comments or does Martha's response cover it?

Thank you!

Jennifer Severson – Planning Director
City of Livingston
(406) 222-4903

From: Martha ORourke <morourke@livingstonmontana.org>
Sent: Tuesday, July 18, 2023 3:31 PM
To: Jennifer Severson <jseverson@livingstonmontana.org>
Cc: Shannon Holmes <sholmes@livingstonmontana.org>
Subject: Mountain View Subdivision Resubmittal Comments

Good afternoon Jennifer,

This application looks good. I don't have too many comments except:

- We should consider asking for an easement to be shown across lot 12 for future water and sewer service connection to the Westondale Corp parcel;
- Public Works will need to review stormwater and street plan and profiles for phases 2 and 3 of this subdivision;
- All new lots will need water and sewer services, unless we will allow each lot developer to do their own due to unknown proposed future development and unknown water and sewer service size needs.

Thank you,

LIVINGSTON Montana
GO BEYOND YELLOWSTONE

Jennifer Severson

Subject: FW: Mountain View Subdivision (June 2023 Application)

From: Josh Chabalowski <firechief@livingstonmontana.org>
Sent: Tuesday, July 18, 2023 3:56 PM
To: Jennifer Severson <jseverson@livingstonmontana.org>
Subject: RE: Mountain View Subdivision (June 2023 Application)

No comments at this time. Looks good to me since they have the new line extensions in place with lots of hydrants. Makes me happy.

Josh

From: Jennifer Severson
Sent: Wednesday, June 28, 2023 2:50 PM
To: Shannon Holmes <sholmes@livingstonmontana.org>; Jim Woodhull <jwoodhull@livingstonmontana.org>; 'firechief@livingstonmontana.org' <firechief@livingstonmontana.org>; Dale Johnson <djohnson@livingstonmontana.org>; Martha ORourke <morourke@livingstonmontana.org>
Subject: Mountain View Subdivision (June 2023 Application)

Hi folks,

I just shared a dropbox link with you that includes the latest Mountain View Subdivision application- file is too large to email. For easy reference, I'll also share the link here: https://www.dropbox.com/s/yc7ex33f0d0fql1/Mountain%20View%20Subdivision%20-%20Preliminary%20Plat%20Submittal%20-%20June%2021%202023.pdf?dl=0

The City has 15 working days to review the application materials for sufficiency- i.e. have they provided all the information you need to fully evaluate the proposed subdivision? I'll be responsible for notifying the applicant if we need additional information so that I can track all information submitted by the application for the planning review of the subdivision. If you need additional information from the applicant, please let me know **NO LATER THAN 2 pm on Wed. July 19** so I'll have time to compile requests for additional info and forward all requests for info to the applicant? I'm including a follow up notification in this email for July 18 at noon as a reminder.

Let me know if anyone has questions. This submittal is pretty close to what they submitted last time so I doubt the application will be missing much (if anything).

Thx,
Jen

Jennifer Severson, AICP – Planning Director
City of Livingston
220 E. Park St.
Livingston, MT 59047
(406) 222-4903
jseverson@livingstonmontana.org

From: Dale Johnson
To: Jennifer Severson
Subject: RE: Mountain View Subdivision (June 2023 Application)
Date: Wednesday, July 5, 2023 1:09:32 PM
Attachments: image002.png

From everything I looked at, I didn't see any issues from my department.

Dale

From: Jennifer Severson <jseverson@livingstonmontana.org>
Sent: Wednesday, June 28, 2023 2:50 PM
To: Shannon Holmes <sholmes@livingstonmontana.org>; Jim Woodhull <jwoodhull@livingstonmontana.org>; Josh Chabalowski <firechief@livingstonmontana.org>; Dale Johnson <djohnson@livingstonmontana.org>; Martha ORourke <morourke@livingstonmontana.org>
Subject: Mountain View Subdivision (June 2023 Application)

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The City has 15 working days to review the application materials for sufficiency- i.e. have they provided all the information you need to fully evaluate the proposed subdivision? I'll be responsible for notifying the applicant if we need additional information so that I can track all information submitted by the application for the planning review of the subdivision. If you need additional information from the applicant, please let me know **NO LATER THAN 2 pm on Wed. July 19** so I'll have time to compile requests for additional info and forward all requests for info to the applicant? I'm including a follow up notification in this email for July 18 at noon as a reminder.

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Thx,
Jen

Jennifer Severson, AICP – Planning Director
City of Livingston
220 E. Park St.
Livingston, MT 59047
(406) 222-4903

From: Jim Woodhull
To: Jennifer Severson
Subject: Mountain View Subdivision
Date: Tuesday, July 18, 2023 1:11:35 PM

The Building Department has not concerns or conditions to recommend.

NorthWestern Energy
Delivering a Bright Future

sent via email June 7, 2023

Chris Naumann
Sanderson Stewart – Senior Planner
106 E Babcock St. – Suite L1
Bozeman, MT 59718

Dear Chris,

Northwestern Energy is willing and able to provide electric and natural gas services to the proposed Mountain View Subdivision in Livingston, MT near the West Interchange and 100 PFL Way. The area in question consists of portions of T2S, R9E, S22.

These services will be provided in accordance with applicable Montana Public Services rules and regulations and the current Northwestern Energy tariff schedule. NWE has both underground and overhead electric, as well as gas distribution in and around the project area.

Northwestern Energy shall determine the locations of all transformers, underground lines and equipment for proper installation and maintenance. These facilities shall be located on front lot lines in the utility easement right-of-way unless otherwise approved by both parties.

As the project gets closer to approved plat and a finalized development plan, please reach out to NWE directly in order to start the utility planning, design and sizing process for your development. Please feel free to contact me if you have any questions or require any additional information.

Sincerely,

Matt Fettig

Matt Fettig
Livingston District Manager
matthew.fettig@northwestern.com
224 S. B St.
Livingston, MT 59047
406-582-4606

Sumner Anacker

From: Murdo, Damon <dmurdo@mt.gov>
Sent: Thursday, June 8, 2023 2:59 PM
To: Sumner Anacker
Subject: RE: Mountain View Subdivision Preliminary Plat - Request for Comment (SHPO)
Attachments: Reports.pdf; 2023060806.pdf

June 8, 2023

Sumner Anacker
Sanderson Stewart
106 East Babcock St, Suite L
Bozeman MT 59715

MONTANA
HISTORICAL SOCIETY
State Historic
Preservation Office

RE: MOUNTAIN VIEW SUBDIVISION, LIVINGSTON. SHPO Project #: 2023060806

Dear Sumner:

I have conducted a cultural resource file search for the above-cited project located in Section 22, T2S R9E. According to our records there have been no previously recorded sites within the designated search locale. However, there have been a few previously conducted cultural resource inventories done in the area. I've attached a list of these reports. If you would like any further information regarding these reports, you may contact me at the number listed below.

It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are within the Area of Potential Effect, and are over fifty years old, we would recommend that they be recorded, and a determination of their eligibility be made prior to any disturbance taking place.

As long as there will be no disturbance or alteration to structures over fifty years of age, we feel that there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials are inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated.

If you have any further questions or comments, you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. I have attached an invoice for the file search. Thank you for consulting with us.

Sincerely,

Damon Murdo
Cultural Records Manager
State Historic Preservation Office

File: LOCAL/SUBDIVISIONS/2023

Township:2 S Range:9 E Section: 22

GREISER T. WEBER, ET AL.

11/1/2000 RESULTS OF A CULTURAL RESOURCES INVENTORY FOR THE TOUCH AMERICA/AT & T FIBER OPTIC CABLE ROUTE BETWEEN BILLINGS AND LOOKOUT PASS IN MONTANA

CRABS Document Number: ZZ 6 23275 Agency Document Number:

Township:2 S Range:9 E Section: 22

LAHREN LARRY A.

1/16/2004 CULTURAL RESOURCE EVALUATIONS OF THE PROPOSED PRINTING FOR LESS FACILITY IN PARK COUNTY MONTANA

CRABS Document Number: PA 6 27162 Agency Document Number:

MT Fish, Wildlife & Parks
Region 3 Headquarters
1400 S 19th Avenue
Bozeman, MT 59718

June 30, 2023

Sanderson Stewart Community Design
106 East Babcock Street Suite L1
Bozeman, MT 59715

RE: Mountain View Subdivision

Dear Sumner Anacker,

Montana Fish, Wildlife & Parks (FWP) appreciates the opportunity to comment on the Mountain View Subdivision. The area is used by big game, especially pronghorn, and a variety of nongame species. Black bears and mountain lions are also known to use the area occasionally. To help lessen the impact of this development to local wildlife populations, we offer the following general comments for consideration during construction and development of neighborhood covenants:

1. Block up open space to be most effective for wildlife, including working with adjacent and subsequent phase developments to provide safe wildlife passage corridors.
2. Minimize construction of new roads where possible.
3. If fences are necessary, use wildlife-friendly construction. FWP provides fencing recommendations at https://fwp.mt.gov/conservation/wildlife-management/wildlife-migration/private-lands/fence-modification
4. Include requirements for bear-resistant garbage facilities. In addition to garbage, other items can attract bears, including pet food, gardens and fruit trees, birdseed (which should be discouraged from April 1st through November), barbecue grills, and compost piles (unless limited to grass, leaves, and garden clippings). To maximize human safety, these additional items should be addressed in a subdivision's covenants.
5. Property owners should be aware that feed or supplements (such as salt blocks), are attractants and are against state law (MCA 87-6-216) for public safety and wildlife health.
6. Pets should be controlled and not be allowed to roam. Under current state law it is illegal for dogs to chase hoofed game animals and the owner may be cited for their dogs' behavior (MCA 87-3-404).
7. Landowners should understand that wildlife, particularly deer and elk, will feed on green lawns, gardens, flowers, and ornamental shrubs and trees. Landowners should consider landscaping with native vegetation that is less likely to suffer feeding damage, and/or incorporate protection for new landscaping.

For further questions or concerns, please reach out to the following FWP personnel.

Michael Yarnall, Wildlife Biologist (406-224-1162, michael.yarnall@mt.gov)
Jen Smitham, Region 3 Public Comment Coordinator (406-495-3262, jsmitham@mt.gov)

Thank you again for the opportunity to comment.

Sincerely,

Marina Yoshioka
Region 3 Supervisor

Sumner Anacker

From: Staples, Thomas - Livingston, MT <Thomas.Staples@usps.gov>
Sent: Tuesday, August 1, 2023 9:07 AM
To: Sumner Anacker
Subject: RE: [EXTERNAL] Mountain View Subdivision Preliminary Plat - Request for Comment (USPS)

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Summer,

The only comment I have is that you would have a CBU cluster for the proposed lots that is ADA compliant and bolted into the cement. Preferably, it would be a on a sidewalk.

Tom Staples
United States Postal Service | Postmaster - Livingston, MT
105 N 2nd St FL 1 | Livingston, MT 59407
406 222 3479 | Thomas.Staples@usps.gov

From: Sumner Anacker <sanacker@sandersonstewart.com>
Sent: Tuesday, August 1, 2023 8:46 AM
To: 59047 Livingston, MT <59047LivingstonMT@usps.gov>
Subject: [EXTERNAL] Mountain View Subdivision Preliminary Plat - Request for Comment (USPS)

To Whom It May Concern,

I am reaching out requesting your comments for the proposed highway commercial subdivision, Mountain View Subdivision, in the City of Livingston, Montana. The project would create 22 highway commercial lots with two (2) dedicated parkland open space lots and public right-of-way totaling 44.149 acres. The project is located south and east of Highway 10 and north of Interstate 90. See the attached letter with additional project information and a proposed subdivision vicinity map.

If you are not the appropriate person to review and respond, please forward accordingly.
I respectfully request any comments be delivered to me by email no later than August 14, 2023. We originally sent this letter back in June but found out Daniel is no longer the correct point of contact.

Thank you for your help with this matter.

Best,
Sumner Anacker

Sumner Anacker PE
Project Engineer
she/her

t: 406-922-4314

SANDERSON STEWART
a sanderson bellecci company

Sumner Anacker

From: Sheryl Raddas <SRaddas@parkcounty.org>
Sent: Tuesday, August 1, 2023 9:32 AM
To: Sumner Anacker
Cc: Kristen Galbraith
Subject: RE: Mountain View Subdivision Preliminary Plat - Request for Comment (Windrider)

At this time our Transit system does not service this area, nor do we plan to expand in this area without additional funding. We rely on 54% of our funding annually from State and Federal grants and have Community Partners that make up the remaining 46% of our budget. If there is an annual commitment (approximately $2,00-$5,000) from this subdivision then we could look at adding a bus stop in this area.

If this is something that would be of interest, please reach out to me so that we can plan to add this stop. We update our Fixed Route schedule annually in July and the new schedules run Sept.1st – August 31st.

If you have any further questions, please let me know.

Thanks,
Sheryl

PARK COUNTY MONTANA

SHERYL RADDAS, *Windrider Coordinator*

PARK COUNTY TRANSIT DEPARTMENT
o: 406.922.5683 c: 509.945.7449
e: sraddas@parkcounty.org
www.parkcounty.org

From: Sumner Anacker <sanacker@sandersonstewart.com>
Sent: Tuesday, August 1, 2023 8:43 AM
To: Sheryl Raddas <SRaddas@parkcounty.org>
Subject: RE: Mountain View Subdivision Preliminary Plat - Request for Comment (Windrider)

Hi Sheryl,

I wanted to follow up and see if you had an opportunity to provide comment on the proposed subdivision in Livingston, Montana.

Thank you for your help and looking forward to hearing from you soon.

Sumner

Sumner Anacker PE
Project Engineer
she/her

t: 406-922-4314

SANDERSON STEWART
a sanderson bellecci company

From: Sumner Anacker <sanacker@sandersonstewart.com>
Sent: Wednesday, June 7, 2023 8:56 AM
To: sraddas@parkcounty.org
Subject: Mountain View Subdivision Preliminary Plat - Request for Comment (Windrider)

Hi Sheryl,

I am reaching out requesting your comments for the proposed highway commercial subdivision, Mountain View Subdivision, in the City of Livingston, Montana. The project would create 22 highway commercial lots with two (2) dedicated parkland open space lots and public right-of-way totaling 44.149 acres. The project is located south and east of Highway 10 and north of Interstate 90. See the attached letter with additional project information and a proposed subdivision vicinity map.

If you are not the appropriate person to review and respond, please forward accordingly.
I respectfully request any comments be delivered to me by email no later than June 16, 2023.

Thank you for your help with this matter.

Best,
Sumner Anacker

Sumner Anacker PE
Project Engineer
she/her

t: 406-922-4314

SANDERSON STEWART
Planning and Designing Enduring Communities Across the West

MONTANA FRESHWATER PARTNERS

8.30.23

Dear Planning Board and City Commissioners,

My name is Jeannette Blank. I am providing comment on the proposed development on the west end of town, next to the PFL/FedEx buildings. I am a project manager with Montana Freshwater Partners, a local non-profit that focuses on wetland and stream conservation and restoration in Park County and throughout the state. I have 20+ years of experience with wetland mapping, permitting and mitigation, and would like to share a few comments that I think will be important for the Planning Board and City Commission to consider about the proposed intent to donate the wetland portion of this property to the City. The intent to donate the wetland area is not a bad idea, and I support keeping the wetland intact and functioning – this is important for our local watershed. However, the City should go into this 'donation' with eyes open and understand how regulations and associated costs could factor into future landuse decisions for this wetland area.

1) Below is a screenshot of the wetland and stream map available on the Montana Natural Heritage Program's map viewer (https://mtnhp.org/MapViewer). The wetland/stream map on this website is based on a national dataset and is a great way to see the potential wetland areas on a property and see how an area of interest may connect to other larger or regulated waterbodies. The wetland/stream boundaries from this national dataset always need to be ground-truthed with a wetland delineation that is performed by a qualified wetland scientist. From this map, we can see that there is potential that the large wetland area on the proposed property may have a continuous connection to Fleshman Creek. Fleshman Creek, in turn has a connection to the Yellowstone River, and the Yellowstone River is a Water of the U.S. – and because of the series of connection to the Yellowstone, this makes Fleshman Creek a regulated water body, and *potentially* the wetland on the proposed property a regulated wetland under the Clean Water Act. This is important for the City to understand before accepting this area as a donation for a couple of reasons:

a) If in the future, the City wanted to do any improvements to the site (i.e. add public trails or benches) that would result in filling the wetland, dredging or draining the wetland, any amount of impact will at a minimum require Army Corps notification, possibly permits, and of course, the City's time to get approval from the Army Corps of Engineers. If the impacts exceed the 0.1-acre threshold for mitigation, the City would also have to pay to have those impact mitigated by purchasing credits from an established mitigation bank. Paying for mitigation is expensive and typically runs in the $60K-100K+ per acre of wetland impact.

b) I would strongly suggest routing any and all utilities for the subdivision (including maintenance ROWs) outside of the wetland boundary and City property and consider what the cost of installing and maintaining those utilities will be for Livingston tax payers. Those costs will be more expensive if any utilities and ROW bisect any wetlands. If the wetlands are regulated, there will be additional costs for permitting, notifications, rehabilitation and potentially mitigation associated with the installation and future maintenance of those utilities. Even if the wetlands are not regulated by the Army Corps, there will be additional engineering, equipment, and access costs associated with working in the wetland area.

c) also pay attention to how surface/stormwater runoff from the proposed development could impact this wetland site, and ensure there is an agreement in place with the developer that this development will not degrade the City's wetland property – I would also suggestion including legal conditions to ensure that there will always be an entity associated with the development that can be pursued for legal recourse if the development at some point in the future impacts the City's wetland area.

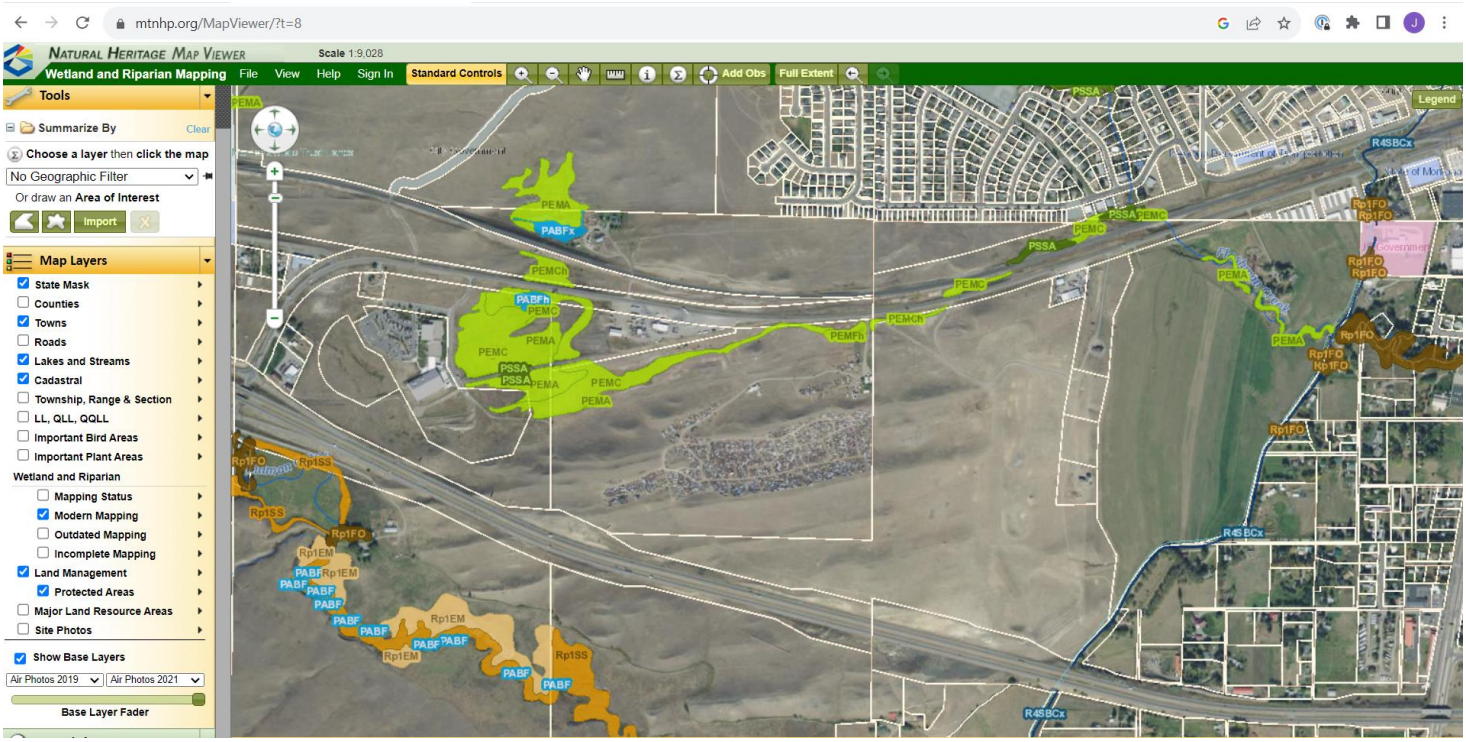
d) another aspect to pay attention to is the groundwater conditions in the wetland and the proposed development. Is there potential for the groundwater table to rise and impact basements or foundations of the proposed development. If the developer entity 'dissolves' in the future as they have a tendency to do, and the groundwater table impacts the buildings in the development – the property owners may pursue a lawsuit against the developer, but if that developer entity is no longer in existence, then the City, as the owner of the wetland, could be a target – whether that is legally defensible or not, it will cost the City time and money to deal with - so please ensure this developer is reputable and will not leave the City with any potential liability issues in the future.

2) When reviewing the wetland delineation that was provided by the developer, be sure the delineation was conducted by a qualified wetland scientist (most likely it was), and ask what extent the wetland was delineated (mapped) – was it just the wetland area present on the proposed property, or did it confirm the wetland connection to Fleshman Creek? When looking at the connection to Fleshman creek, does the channel/swale

that connects the large wetland area to Fleshman Creek have a discernable bed/bank and ordinary high water mark? If so, then this would be considered a stream channel, which may trigger some other regulations to consider. This information will be needed to understand if the donated wetland area has a connection to Fleshman Creek. Also please pay attention to when the delineation was completed (what year? What month?) and whether our area was experiencing or coming out of drought conditions. Wetlands are very dynamic and will expand and contract depending on what the water year is doing. The City will want to understand what the wetland boundary is during 'normal' or typical conditions and will also want to understand what this site looks like under really wet conditions (make sure utilities/ROWs are outside of the extents during really wet conditions). You can get an idea of this by looking at aerial photos from different years on GoogleEarth.

These are all factors/issues that are unique to developing around and owning a wetland that I have seen trip up landowners in the past, and we would like to pass along to the City so that you can make a fully informed decision on this development and this potential donation.

Thank you,
Jeannette Blank
Montana Freshwater Partners
PO Box 338, Livingston MT 59047
406-223-5955



Screenshot of the proposed development parcel and surrounding parcels taken from the Montana Natural Heritage Map Viewer. Potential wetland areas are mapped in green, open water areas in light blue, stream channels in dark blue lines, and riparian communities in brown/orange shades.

FRIENDS *of* PARK COUNTY

Promoting thoughtfully planned development in order to protect and enhance Park County's vibrant communities, sustainable working lands, and healthy natural resources.

Testimony on Mountain View Subdivision Preliminary Plat Re-Application Livingston Planning Board

Transmitted August 15, 2023

Summary

The Planning Board should recommend denial of the application because the legal and factual bases for the City Commission's 2022 denial of the prior application remain substantially unchanged. Those bases were and remain[1]:

1. **Montana Code Annotated 76-1-605: Consistency with Growth Policy provisions.**

The proposed subdivision would be inconsistent with:

- Objective 2.1,1. Community gateways that celebrate its character.
- Objective 6.2.3. Making a good first impression on visitors.
- Objective 3.1 Prioritize infill over expansion.
- Goal 3.4 Evaluate proposed developments against Smart Growth principles.
- Objective 4.3.3 Preserve the night skies and natural scenic views.
- Objective 6.1.1 Support existing local business.

2. **Montana Code Annotated 76-3-608(3)(a): Primary subdivision review criteria:**

- Adverse impact on local services.
- Wildfire and high wind hazards.
- Adverse impacts on wildlife.
- Potential surface water contamination.

To recommend approval, the Planning Board would have to repudiate its prior decision and the findings of fact and conclusions of law set out in the City's November 2022 decision.

[1] Friends of Park County is not taking a position on the parkland dedication issue which was another basis for denial.

Table of Contents

The City and the applicant concur that Montana's subdivision statutes require the Planning Board to consider the proposed subdivision's consistency with the 2021 Growth Policy.

Montana Code Annotated 76-1-605 describes the use of an adopted growth policy.

> *(1) Subject to subsection (2), after adoption of a growth policy, the governing body within the area covered by the growth policy pursuant to 76-1-601 must be guided by and give consideration to the general policy and pattern of development set out in the growth policy in the:*
>
> *(a) authorization, construction, alteration, or abandonment of public ways, public places, public structures, or public utilities;*
>
> *(b) authorization, acceptance, or construction of water mains, sewers, connections, facilities, or utilities;*

The City's subdivision ordinance provides:

> *III-B-4 Planning Board Hearing, Consideration and Evidence*
>
> *c Consideration-Evidence*
>
> *In making its decision to approve, conditionally approve, or deny a proposed subdivision, the governing body may consider, without limitation, the following, as applicable:*
>
> *(i) an officially adopted growth policy;*

Under the previously cited Montana statutes and the City's subdivision ordinance the Growth Policy is not only "applicable" it is directly relevant and essential to making a sound decision.

The City's November 3, 2022, findings of fact and conclusions of law found that the proposed subdivision did not comport with six objectives, two goals and one strategy in the Growth Policy, reproduced and discussed below, (in the same order as in the City's decision.)

The City's decision and in the narrative submitted as part of the re-application show that the City and the applicant concur that Growth Policy applies to this decision.

The applicant has failed to address all but one of the City's determinations of inconsistency with Growth Policy Goals, Objectives and Strategies.

In its November 3, 2022, letter to the applicant (Appendix A) the City presented the findings of fact and conclusions of law, that were the basis for denial of the subdivision application under MCA 76-1-605.

In the re-application narrative, the applicant describes how its project may conform to various *other* goals and objectives in the Growth Policy. The City's 2022 decision never discussed or disputed whether the application complied with those other provisions; the question is whether it does comply with the ones cited by the City.

With one exception (discussed in the next section), the applicant does not even attempt to demonstrate the consistency of the subdivision with provisions the City identified as conflicting with the preliminary plat.

Objective 2.1.1 Establish community gateways to indicate entrances to Livingston and celebrate its community character.

The re-application does not address this objective, (nor does the Staff Report.) This alone is grounds for denial.)

Objective 6.2.3 Make a good first impression to [sic] visitors.

The re-application does not address this objective, (nor does the Staff Report.) This alone is grounds for denial.)

Strategy 3.1.1.4: Promote any growth that maintains the compact, historic development patterns found in the historic city center.

The re-application does not address this Strategy, (nor does the Staff Report.) This alone is grounds for denial.

Objective 3.4: Encourage the responsible [growth] of Livingston by evaluating proposed developments against the ten principles of Smart Growth (listed on next page.]

The re-application does not address this Objective or the ten Smart Growth principles, (nor does the Staff Report.) This alone is grounds for denial.

Objective 4.3.3: Preserve the night skies as well as the natural scenic views.

The re-application proposes a covenant that will require "shielded downlight exterior lighting only in conformance with the City of Livingston's Night Sky Protection Act." (Exhibit H) but does not address the preservation of "natural scenic views," (nor does the Staff Report.) This alone is grounds for denial.

Objective 6.1.1: Support existing local business.

The re-application does not address this Objective, (nor does the Staff Report.) This alone is grounds for denial.

The application does not comply Growth Policy Goal 3.1: "Prioritize infill over expansion by taking advantage of existing and planned infrastructure, such as transportation, energy, water, and sewer facilities."

The City found that the subdivision did not comport with this Goal 3.1: "Prioritize infill over expansion by taking advantage of existing and planned infrastructure, such as transportation, energy, water, and sewer facilities"

The applicant responds that the proposed subdivision "represents the continuation of infill of this property...." Application Narrative page 6 (scrolling page 19.)

However, the City's policy clearly refers to prioritize infill across the City not on a single property separated by more than a mile from the rest of the City's developed area and infrastructure. The applicant's statement misinterprets the Goal and is thus not relevant.

Because there has been no change in state law, no major and responsive revision to the subdivision proposal (with one minor exception) and no new relevant facts submitted, the City's prior findings of fact and conclusions of law under Montana Code Annotated 76-3-608 (3)(a) oblige the Planning Board to recommend denial.

MCA 76-3-608(3)(a) states:

> *(3) A subdivision proposal must undergo review for the following primary criteria:*
>
> *(a) except when the governing body has established an exemption pursuant to subsection (6) or except as provided in **76-3-509**, **76-3-609**(2) or (4), or **76-3-616**, the specific, documentable, and clearly defined impact on agriculture, agricultural water user facilities, local services, the natural environment, wildlife, wildlife habitat, and public health and safety, excluding any consideration of whether the proposed subdivision will result in a loss of agricultural soils;*

Next, we review the City's findings of noncompliance under this statute and address whether and how the applicant has addressed those deficiencies.

Impact on local services:

The City found that:

"the subdivision will create an increase in infrastructure a significant distance from the majority of the land developed in the city limits which significantly increases the costs to maintain it," referencing specific details about water, sewer and transportation infrastructure enhancements.

The subdivision improvements proposed in the re-application are in the same location, no closer to the city than they were when first proposed, and there is no indication that the City's financial situation is much improved and no new facts are provided about those costs or an explanation of why the prior factual assertion is now in error.

The City found:

> *We know that new development pays for itself when it comes to long-term maintenance and upkeep of new services. The City of Livingston is currently not able to maintain our historic and current infrastructure. Our sewer lines are being infiltrated by groundwater and we have water lines to residences that are failing. By adding additional water and sewer lines so far outside the city center we will be adding additional burden to current city residents.*
>
> *This is why our Growth Policy prioritizes infill as a way to mitigate those costs to the City and its current residents."*

November 2022 Decision page 2.

The applicant asserts (and the staff agrees) that the new taxes will indeed cover project costs but there are no facts just speculative assertions. Nor do the applicant (or the staff) address the question of an overall shortfall in funding maintenance and upkeep of new services.

Natural Environment:

The City's November 2022 Decision (page 2) found that once the subdivision lots were built out it could contaminate surface waters with runoff:

> *There are wetlands in the subdivision so it's likely surface water contamination from run-off at maximum build out could contaminate surface waters especially given that highway commercial zoning is very permissive with a variety of potential contamination vectors at full build out,*

City Decision page 2.

The June 2023 revised subdivision application's incorporates the 2022 wetland delineation (scrolling pages 249 and 265) and site drainage report for the original application, which confirms rather than contradicts the City's conclusion about surface water contamination:

> Proposed Watershed A is hydrologically split into two sections, Proposed Watershed A1 and A2. Runoff from Proposed Watershed A2 will match existing drainage patterns. Runoff from Proposed Watershed A1 will flow into Antelope Drive east towards the intersection with PFL Way. Runoff will flow in the gutter of PFL Way until the end of the curb where runoff is diverted into the existing wetland to the east. No new inlets and pipes are proposed for Proposed Watershed A.

> Runoff from Proposed Watershed B is split into three separate basins as Shown on Exhibit B in Appendix A. Proposed Watershed B1 is the area west of the new Street B, Proposed Watershed B2 is the area east of the new Street B and Proposed Watershed B3 is the area that drains into the proposed retention area to matching the existing retention area.

Mountainview Subdivision Preliminary Plat Application June 23, 2023 scrolling page 58. See also reference to surface waters in Sundog Ecological Inc. hydrology report page 5, scroll page 244.

Effect on Wildlife & Habitat:

In finding that the subdivision does not address effects on wildlife, the City decision states: "There is a recommendation to connect open spaces for safe wildlife corridors. The subdivision doesn't connect the open spaces."

The revised application design still shows the two dedicated open spaces as two separated lots, shown bat right:

Figure 2. Site Layout
Mountain View Subdivision TIS

The decision notes (page 2) "Montana Wildlife & Parks has stated that the area is used by big game especially pronghorn as well as black bear, mountain lions and non-game species. The Applicant has not addressed these issues fully or offered any mitigation strategies like providing safe wildlife passage corridors, wildlife friendly fencing and bear proof garbage cans,"

The applicant has proposed a covenant requiring bear-proof garbage containers (Exhibit H) but otherwise has not addressed these concerns.

Public Health & Safety:

The City's November 2022 Decision (page 2) found that the steep grassy slopes near I-90 were a "known fire hazard" during the dry seasons and that the proposed subdivision is in "a very high wind area."

Friends of Park County did not find documentation in the re-application of how the applicant addressed and mitigated these public health and safety risks.

A new traffic analysis was submitted with the re-application. It is not clear whether or how this considered additional traffic volumes when I-90 is re-routed through the city, and what analysis or mitigation addressed the City's concerns about the hazards presented by the proximity to I-90 and the main line railroad.

Friends of Park County submits its September 21, 2022 testimony on the original application as part of the record of this proceeding.

As part of its testimony on the re-application, Friends of Park County resubmits its September 21, 2022, testimony to the Planning Board on the original application, at Appendix B.

Conclusion: The Planning Board should recommend denial of the re-application. No additional time or review should be allowed to amend the application.

For the reasons presents the Planning Board should recommend that the City Commission deny the re-application.

The applicant has had nine months to address the legal and factual reasons for denial of the original application and so the Planning Board should not grant it additional time to amend, supplement or revise the re-application.

Respectfully submitted,

Ken Cochrane, President
Friends of Park County

From: Jean Sandberg
To: Jennifer Severson
Subject: Andrew Fields proposed development
Date: Monday, August 14, 2023 4:57:24 PM

Dear Ms. Severson,

A few years ago when Printing for Less asked for a variance in order to build housing for its employees it somehow opened the door for Mr. Fields subdivision Livingston West? which supposedly will be a 400 + sub division. Of course at the time it was touted as affordable housing. I don't think Printing for Less built any housing. At that time he was proposing the commercialization of the area now in question, I believed the idea was nixed. At any rate I personally don't want Livingston to become East Bozeman. Mr. Field says how wonderful a grand gas station and convenience store at the junction will be bringing people into Livingston. People who are planning on coming into Livingston will come anyway and people who are going someplace else will just get gas and a snack and go where they were going. They won't need to go into Livingston.. Some people working in Bozeman have to bypass Belgrade and go To Three Forks to find affordable housing. Commercialization of that area will not only cause a traffic mess, but will hurt businesses in Livingston.
The uncontrolled vacation rentals is what has made affordable housing for the working force have nowhere to live. It has had that effect in Gardiner and Jackson Hole. When your economy is based on the tourist business you have to have affordable housing and Andrew Fields subdivision is not that. Workforce housing there would not be ideal!

Thank you for listening.
Sincerely,
Jean Sandberg
220 South Yellowstone St.

From: Thomas McNamee
To: Jennifer Severson; Planning
Subject: proposed Mountain View subdivision
Date: Wednesday, August 16, 2023 3:38:03 PM

Dear Jennifer Severson:

I will not be able to attend the Planning Board meeting on August 16, 2023, but I know that there is to be a hearing regarding a proposal for a Mountain View Subdivision. I have read the developer's proposal, and I would like to submit the following as my comment:

Nothing about this proposal is in harmony with the vision for Livingston's future as it is eloquently described in the city's Growth Policy. The future of Livingston should be pedestrian-oriented and compact. It should look like what Livingston looks like now. The proposal for this subdivision attempts to say that the development would accord with the Growth Policy, but it really doesn't.

The proposal describes the development as "infill." It is nothing of the kind. Real infill would be development within the footprint of the city. And "a future bus route" is the transportation solution? How about bicycles, walking, short distance driving, and our splendid, existing Windrider service? All in town.

What, realistically, would this development cost the taxpayers of Livingston and Park County? For police, fire, ambulance, snowplowing, schoolbus?

Let me quote from the developer's proposal:

> Once dedicated to the City, maintenance requirements would fall upon the City of Livingston. Public infrastructure will include streets, street lighting, sidewalks, water mains, sewer mains, stormwater mains and ponds.
>
> Law enforcement and fire protection services have been provided to the area of the proposed subdivision by the City of Livingston since it was annexed nearly 20 years ago. Therefore, no additional costs or personnel should be required to continue these services.
>
> It is unknown at this time whether the proposed subdivision will have any residential development. It is also unknown whether any future housing would include residents with school age children requiring busing for school.

So you add all these people and there would be no additional costs in law enforcement

and fire protection? How do you figure that? And it's "unknown whether future development would include school age children requiring busing for school"? These are lies.

There's no possible way this thing wouldn't end up raising our taxes.

And the so-called park? Half of it is wetland. The developer is quoted in the Livingston Enterprise as follows: "You could do a boardwalk (to avoid water), but it isn't really needed."

Again, to quote from the developer's own proposal:

> Construction of the facility will generate a substantial volume of new traffic demand for area streets and intersections. Through the planned development, it is estimated that approximately 4,035 new external vehicle trips could be generated daily upon full buildout of the subdivision. This would result in approximately 2,000 new vehicle trips per day on US 10 just west of the West Park Street intersection.

That doesn't count the "highway commercial," whatever that turns out to be. Certainly it would include a new gas station, convenience store, etc. We already have that at Exit 333.

This proposal simply serves the developer—it does the people of Livingston no good whatever.

The plans for the Mountain View Subdivision are the very definition of suburban sprawl —exactly what the citizens of Livingston don't want their town to look like. This is not outer Bozeman, this is not Four Corners.

What this proposal in fact amounts to is a long-distance suburb of Bozeman.

Yes, Livingston's population will grow. But it can grow within its existing footprint. Studies have shown that to be true. We don't have to sprawl out into the countryside.

This subdivision should never be built.

Thank you for this opportunity to comment.

Tom McNamee
216 S. 5th St.
Livingston MT 59047

SANDERSON STEWART

LETTER OF TRANSMITTAL

To:	Jennifer Severson	**Date:**	June 21, 2023
	Planning Director	**Project No:**	18005.05
	City of Livingston	**Project:**	Mountain View Subdivision
		Reference:	**Preliminary Plat Application**

☐ By Mail ☐ Next Day Air ☒ Delivered By Hand ☐ To Pick Up

Attachments:

☐ SID Pre-Creation Exhibits	☐ Contract Documents	☐ Prints
☐ Plans/Specifications	☐ Change Order	☒ Plat Submittal
☐ Shop Drawings	☐ Estimate	☐ Other

MESSAGES:

The following materials are for the Mountain View Major Subdivision Preliminary Plat application:

1. Application Binder
2. Civil Sheets
3. Preliminary Plat
4. Flash Drive with digital copies of all plans and documents

Signed: Sumner Anacker

Sumner Anacker, PE
Project Engineer

MOUNTAIN VIEW MAJOR SUBDIVISION
PRELIMINARY PLAT APPLICATION

Project No. 18005.05

Livingston West LLC
Box 500
Emigrant, MT 59027

Placemaking

Infrastructure Engineering

Surveying + Mapping

Community Planning

Landscape Architecture

Branding + Visualization

June 21, 2023

SANDERSON STEWART

ENDURING COMMUNITY DESIGN

MOUNTAIN VIEW
MAJOR SUBDIVISION
PRELIMINARY PLAT APPLICATION
TABLE OF CONTENTS

PLANS & PLAT

Civil Engineering Plans

- C1.1 Cover
- C1.2 Legend
- C2.1 Exiting Conditions
- C3.1 Overall Site Plan
- C4.1 Utility Plan
- C5.1 Stormwater & Drainage Plan
- C6.1 Details

Preliminary Plat

- Sheet 1 of 2 Cover & Certificates
- Sheet 2 of 2 Lot Layout

APPENDICES

A. Preliminary Stormwater Report
B. Preliminary Sewer & Water Design Report
C. Subdivision Improvements
D. Mountain View Subdivision Traffic Impact Study
E. Wetland Delineation Report
F. Public Agency Review
G. Private Service Providers Review
H. Covenants, Conditions, and Restrictions Summary

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 21, 2023

Jennifer Severson
Planning Director
City of Livingston
220 E. Park Street
Livingston, MT 59047

Reference: Mountain View Subdivision
Preliminary Plat Submittal
Project No. 18005.05

Jennifer:

On behalf of Andrew Field and Livingston West LLC, attached is a Preliminary Plat application for the Mountain View Subdivision. The proposed subdivision includes 24 lots, including two open space lots, and public right-of-way for subdivision streets and utilities.

We are submitting one printed copy and digital copy of the preliminary plat application for your review. The following documentation is included in the application:

1. Cover Letter
2. Completed Preliminary Plat Application
3. Checklist of Submittal Materials
4. Application Review Fee
5. Application Narrative
6. Vicinity Map
7. Overall Development Plan
8. Active Transportation Plan
9. Preliminary Civil Plan Set
10. Preliminary Plat
11. Stormwater Overview
12. Water & Sewer Overview
13. Subdivision Improvements
14. Traffic Trip Generation Analysis
15. Summary of Probable Impacts
16. Wetlands Report
17. Public Agency Review
18. Private Service Providers Review
19. Covenants, Conditions & Restrictions Summary

Please let me know if you have any questions or need additional information, please feel free to contact me at (406) 922-4311 or cnaumann@sandersonstewart.com.

Sincerely,

Chris Naumann
Associate | Senior Planner
Sanderson Stewart
106 East Babcock Street Suite L1
Bozeman MT 59715
cnaumann@sandersonstewart.com
406-922-4311 (d)
406-570-5758 (m)

City of Livingston
Department of Planning
220 E. Park St.
Livingston, MT 59047
(406)222-4903
planning@livingstonmontana.org

City of Livingston Subdivision Preliminary Plat Instructions

Subdivision review is required to divide any parcel of land within the City of Livingston that does not meet the criteria for a subdivision exemption as listed in 76-3-2 MCA. Subdivisions require a three-step application process prior to final approval:

- Pre-Application
- Preliminary Plat Application
- Final Plat Application

Preliminary Plats require a public hearing before the Planning Board for a recommendation to the City Commission, and are approved or denied by the City Commission. All subdivision applications are evaluated by the Planning Board and City Commission based upon the following criteria listed in Section III.B.6 of the Subdivision Regulations for major subdivisions or Section IV.B.6 for minor subdivisions:

- Provides easements for the location and installation of any planned utilities.
- Provides legal and physical access to each parcel within the subdivision and the notation of that access on the applicable plat and any instrument transferring the parcel.
- Assures that all required public improvements will be installed before final plat approval, or that their installation after final plat approval will be guaranteed.
- Complies with the requirements of 76-3-504 MCA, regarding the disclosure and disposition of water rights.
- Complies with the Subdivision Regulations.
- Complies with the applicable Zoning Regulations.
- Complies with the Montana Subdivision and Platting Act.

The Preliminary Application shall be submitted to the Planning Department. The Planning Department may forward the application to local, state, and federal agencies as necessary to ensure a comprehensive review of the project. **It is required that you submit and receive an approved Subdivision Pre-Application prior to submitting a Preliminary Plat Application.**

Submittal Requirements (listed in Section III.B.1 of the Subdivision Regulations for major subdivisions or Section IV.B.1 for minor subdivisions):

☑ Two (2) copies of the Completed Application Form.
☑ Three (3) copies of the Preliminary Plat, which:

- Contains the required information for preliminary plats..
- Conforms to the Design and Improvement Standards in Section VI of the Subdivision Regulations.
- Conforms to the requirements of the Zoning Regulation.

- Conforms to the requirements of the Public Works Design Standards and Specifications Policy.

☑ A summary of probable impacts of the Subdivision.

☑ Proof that the subdivider has submitted for review copies of the subdivision application and environmental assessment, if applicable, to the public utilities and agencies of local, state, and federal government identified during the pre-application meeting or subsequently identified as having a substantial interest in the proposed subdivision.

☑ Additional relevant and reasonable information as identified by the Development Review Committee during the pre-application meeting:

☑ The Preliminary Plat Application Review Fee.

All documents other than the preliminary plat shall be submitted on either 8 ½" x 11" or 11" x 17" paper. Additionally, digital copies of the submittal in PDF file format are required.

City of Livingston
Department of Planning
220 E. Park St.
Livingston, MT 59047
(406)222-4903
planning@livingstonmontana.org

City of Livingston Subdivision Preliminary Plat Application

1. **Property Owner Name:** Livingston West, LLC (c/o Andrew Field)

2. **Location of Property**

General Location: Northeast of the intersection of I-90 and Highway 10

Address: TBD Antelope Drive and TBD PFL Way

Subdivision: N/A Lot: N/A Block: N/A

Zoning District: HC

3. **Contact Information**

Property Owner

Home Address: Andrew Field PO Box 500
Emigrant, MT 59027

Phone Number: 406-223-7077

Email Address: asfield@gmail.com

Primary Contact/ Applicant

Name: Sumner Anacker, PE Sanderson Stewart

Address: 106 E Babcock Street, Suite L1
Bozeman, MT 59715

Phone Number: 406-922-4314

Email Address: sanacker@sandersonstewart.com

Secondary Contact

Name: Richard Smith

Address:

Phone Number:

Email Address: resmith@rj-development.net

4. Project Information

Type of Subdivision: ☒ Major ☐ Subsequent Minor ☐ Minor

Proposed Subdivision Name: Mountain View Subdivision

Brief Description of Project: Subdivision of Tract 1-A of COS 2748RB into 24 lots (including dedicated parkland open space) with street, storm, water, and sanitary sewer improvements

Proposed Use(s): Highway Commercial

Number of Lots: 24 Number of Phases: 3

I hereby certify that the information included in this application is true and accurate.

Applicant's Signature

6/21/23

Date

APPENDIX B

LIST OF SUBMITTAL MATERIAL
(Based on City of Livingston Subdivision Regulations)

PRELIMINARY PLAT

The following materials shall be submitted with all applications for Preliminary Plat approval:

	Attached (Check)
1. Three (3) copies of the preliminary plat in 24" x 36" format.	✓
2. Eight (8) copies of the preliminary plat in 11" x 17" format.	✓
3. The required review fee.	✓
4. A vicinity sketch showing conditions on adjacent land including:	
a. Approximate locations, size and depth of existing or proposed sanitary and storm sewers, water mains, fire hydrants, gas, electric, telephone lines and streetlights.	✓
b. Ownership of lands immediately adjacent the subdivision and all public and private streets leading to the subdivision.	✓
c. Locations of buildings, structures, power lines and other improvements and nearby land uses.	✓
d. The existing zoning of the subdivision and of adjacent lands within 500 feet.	✓
5. A complete grading and drainage plan designed to handle runoff from a 10 year, 6 hour storm and containing the following:	
a. Location and details, accurately dimensioned, of all existing and proposed drainage structures to include courses, elevations, grades and cross sections of streets, bridges, ditches, culverts, retention areas and other drainage improvement.	✓

a. Ground contours with intervals of 2 feet where the average slope is under 10% and 5 feet where average slope is 10% or greater. ✓
b. Information describing the ultimate destinations of storm water from the subdivision and the effect of the runoff on down-slope drainage structures. ✓
c. Describe construction procedures, slope protection and reseeding methods to minimize erosion. ✓

6. A list of the proposed subdivision improvements shall be submitted and shall include the following items:
   a. Provide design specifications for all streets and alleys. Include information on all drainage structures, street signs, sidewalks, and street lights. ✓
   b. Indicate the solid waste collection and disposal facilities proposed for the subdivision. ✓
   c. Show fire hydrant locations and spacing. ✓
   d. Describe all utilities to be installed and which entities will be providing the services. ✓
   e. Indicate parkland to be dedicated or amount of cash-in-lieu of land to be donated, if applicable. ✓
   f. Indicate how mail delivery will be handled within the subdivision. ✓

7. Overall Development Plan: When a tract of land is to be subdivided in phases, the subdivider must provide an overall development plan indicating the intent for the entire development. The preliminary plat submission and other supplements must include the entire development and be in compliance with the procedures and standards contained in the Livingston Subdivision Regulations. Plat review will be based on the overall development. ✓

(iii) Unless the subdivision will be served by a community sewer or water system, each lot in the cluster must be a minimum of one acre in size.

(iv) Multiple adjacent tracts of record may be aggregated to create a single parcel for the purpose of creating a cluster development.

b. Park dedication requirements are waived for clustered subdivisions created under this section.

X. ADMINISTRATIVE PROVISIONS

X-A. Fee Schedule

To cover costs of reviewing plans, advertising, holding public hearings, and other activities associated with the review of a subdivision proposal, the subdivider shall pay a non-refundable fee at the time of application for preliminary plat approval. The fees, payable to the City, are as follows:

Minor Subdivisions

Preliminary Plat	$600.00 plus $20 per lot
Final Plat/Summary review	$400.00
Subsequent Minor	$800.00 plus $40 per lot

Major Subdivisions

Preliminary Plat	$800.00 plus $40 per lot
Final Plat	$400.00 plus $20 per lot

Subdivision by Rent or Lease and Condominiums

Preliminary Review (five or fewer units)	$600.00 plus $20 per unit
Final Review	$400.00
Preliminary Review (over five units)	$800.00 plus $20 per unit
Final Review	$400.00 plus $20 per unit

$800
+
$40/lot *24 lots
$1,760.00

X-B. Variances

X-B-1. Variances Authorized

The governing body may grant variances from Section VI, Design and Improvement Standards, of these regulations when, due to the characteristics of land proposed for subdivision, strict compliance with these standards would result in undue hardship and

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 21, 2023
Project No. 18005.05

MOUNTAIN VIEW
MAJOR SUBDIVISION
PRELIMINARY PLAT APPLICATION
APPLICATION NARRATIVE

INTRODUCTION

On behalf of Livingston West, LLC, Sanderson Stewart is submitting this Preliminary Plat Application for the proposed Mountain View Subdivision. This highway commercial subdivision is within the City of Livingston. The project would create 24 lots including dedicated parkland open space and public right-of-way totaling 43.879 acres. These new lots are currently served by the City of Livingston water and sanitary sewer systems.

The subdivision will be accessed from Highway 10 via PFL Way, Antelope Drive, and West End Road. It is generally located on Section 22 of Township 02 South Range 09 East. See Exhibit A: Vicinity Map.

SITE LOCATION

The proposed Mountain View Subdivision is located on 43.879 acres of land to the east of the interchange of Interstate 90 and Highway 10. More specifically, the project is located on Parcel 1-A of COS 2748RB, situated in the NW ¼ of Section 22, Township 02 South, and Range 09 East in the City of Livingston, Park County, Montana. See Exhibit A: Vicinity Map.

EXISTING CONDITIONS

Structures

There are no existing structures within Parcel 1-A of COS 2748RB.

Public Infrastructure

Mountain View Subdivision includes the existing paved roadway on Antelope Drive and PFL Way.

There is a completed 10-inch public sewer main which follows the roadways along its entire length, continuing to the southeast where the sewer main leaves the subdivision. There is a 12-inch public water main that follows the existing roadways. A 12-inch public water main is also now complete, paid for with private funds, and follows the new roadway within the subdivision with the associated water services, valves, and hydrants. Storm drainage is generally collected in the roadway gutters and conveyed through storm drainage infrastructure to a temporary on-site detention pond located on Antelope Drive. All existing public infrastructure is shown on the Civil Engineering Plans and the Preliminary Plat.

Private Utilities

There is an existing overhead power line with a 30' wide easement at the southern corner of the subdivision. In addition, there are several underground utility lines with 10' easements running through multiple lots of the subdivision. All existing private utility easements are shown on the Civil Engineering Plans and the Preliminary Plat.

Private Utility Easement

There are two existing 20' underground electric easements shown on the existing Certificates of Survey with "exact location undetermined". One is on Tract 3-A1 of COS 2748RB per Recorded Document No. 426785 and the other is on Tract 2-A of COS 2621RB per Recorded Document Nos. 333214 and 406962. Neither of these easements are part of this subdivision.

There is an existing 40' utility easement bisecting Lots 6, 8-11 for overhead power and communication lines on Tract 1-A of COS 2748RB per Recorded Document No. 87649.

There is an existing 30' utility easement for overhead power and communication lines running along Lots 20, 21, and 24 on Tract 1-A of COS 2748RB per Recorded Document No. 335670.

There is one existing 60' public access and utility easement shown on Tract 1-A of COS 2748RB and proposed Mountain View Subdivision Lot 3 per Roll 219, Page 1501 and Roll 223, Page 56 as originally located on COS 1941. It is the intent of the applicant to verify this easement is no longer in use and vacate the easement prior to Final Plat.

Topography

The land is primarily characterized by rolling hills and grassland, with a large wetland area located in the northeast quadrant of the subdivision and steeper hill areas located in the southeast corner of the subdivision.

ZONING & LAND USE

Highway Commercial

All the land in the proposed subdivision is currently zoned as Highway Commercial within the City of Livingston city limits. Therefore, all the proposed subdivision lots are subject to the Highway Commercial zoning designation. Highway Commercial is defined by the City of Livingston as:

> "a district intended to provide areas for residential structures, commercial and service enterprises which serve the needs of the tourist, traveler, recreationalist or the general traveling public. Areas designated as Highway Commercial should be located in the vicinity of freeway interchanges, intersections on limited access highways, or adjacent to primary and secondary highways."

Future development within Mountain View subdivision will be required to meet the Highway Commercial zoning requirements. Zoning designations can be seen on Exhibit B: Overall Development Plan.

OVERALL DEVELOPMENT PLAN

General Description

All future lot developments will be subject to the Property Owners Association design review process, be held to the Highway Commercial zoning requirements, and submitted to the City for formal site plan review and approval.

Current Ownership

Livingston West, LLC owns the land comprising the proposed Mountain View Subdivision is as shown on the attached Exhibit B.

Lot Layout

Mountain View Subdivision will be subdivided into 24 lots that will range from 0.27 acres to 14.1 acres. Two of the lots, totaling approximately 20.4 acres, will be designated as open space parkland and dedicated to the City of Livingston. The remaining lots will range from 0.270 acres to 1.230 acres.

Final Plat Phasing

The subdivision will be final platted in three phases. The first final plat phase will consist of lots 2-17, 21, and 22. Phase two will consist of lots18-20 and 23. Phase three will consist of lots 1 and 24. The lot layout and phasing can be seen in Exhibit B: Overall Development Plan and the Preliminary Plat.

Dedicated Open Space Parkland

Lots 2 and 21, totaling approximately 20.4 acres, will be designated as open space parkland, which equates to 47% of the entire subdivision. Lot 2 is in the northeast corner of the subdivision and includes a substantial amount of wetland area. Lot 21 is in the southeastern corner of subdivision and primarily consists of hilly grassland. The proposed dedicated open space parkland lots can be seen in Exhibit B: Overall Development Plan and on the Preliminary Plat.

GRADING & DRAINAGE PLAN

General Description

The roadway extensions will generally follow the existing drainage patterns and slope towards the southeast to the existing wetlands. Roadways will be sloped to drain to the associated gutters and conveyed through storm drainage infrastructure toward the proposed detention pond. The proposed lots will drain towards the new streets and will be conveyed along swales following the proposed roadways. These swales will convey the runoff towards the proposed detention pond. As development occurs on the lots, the swales will be filled as the property owners will be required to mitigate runoff within their site. With Phase 3, a new detention basin will be constructed to store and convey the pre-development peak flows. The proposed grading and drainage are shown on the Civil Engineering Plans. For more drainage information see Appendix A: Preliminary Stormwater Report.

PROPOSED SUBDIVISION IMPROVEMENTS

General Improvements

The proposed general improvements of the Mountain View Subdivision, most of which have already been completed, include streets, street signage, boulevards, sidewalks, and street lighting. All these improvements will be designed to meet the requirements established in the City of Livingston Public Works Design Standards and Specifications Policy including the corresponding Modifications to Montana Public Works Standards. As such all sidewalks will be ADA compliant and all street lighting will meet the requirements of the Night Sky Protection Act. All the proposed subdivision improvements are listed in Appendix C: Subdivision Improvements.

Streets

The proposed street improvements for the Mountain View Subdivision includes a 1,100 LF extension of Antelope Drive, a 740 LF extension of PFL Way, and an additional 320 LF roadway (Street 1) to provide access to the remaining lots within the subdivision. The proposed street improvements are shown on the Civil Engineering Plans and the Preliminary Plat.

Potential Alley Access

Due to the proposed small lot layout of this highway commercial subdivision and applicant's not knowing the precise usage of each lot, the applicability of alleyways cannot be determined at this time. If multiple lots were used for a single development a common drive and/or alleyways could possibly be incorporated into the site plan design.

Streets and Roads Improvements
"VI-A-8.b. Alleys, designed in accordance with Table 1, shall be provided in all residential subdivisions. Alleys will also be the preferred method for providing utility and garbage pick-up access in non-residential subdivisions."

While alleys are preferred in non-residential subdivisions, they are likely not feasible due to the narrow lot configuration. In lieu of alleys, utility easements have been proposed along the front of each lot adjacent to the existing and proposed streets. Adequate garbage collection access

will be proposed as part of the future site planning process as each lot prepares for development.

Stormwater

A preliminary drainage report summarizing the design of the future stormwater system associated with the Mountain View Major Subdivision is provided in Appendix A: Preliminary Stormwater Report. The report presents a summary of calculations performed to quantify the necessary storm drainage improvements. The storm drain system has been and will continue to be designed to meet the requirements in The City of Livingston Design Standards and Specification Policy (DSSP) of February 2021.

There will be one (1) stormwater detention pond in the southeast portion of the subdivision to treat runoff from the street network. There will be one (1) stormwater detention pond located on Lot 11 near Highway 10 to treat existing predevelopment storm flows from Jesson property to the west northwest. The proposed stormwater facility easements are shown on the Civil Engineering Plans and the Preliminary Plat. For more stormwater information see Appendix A: Preliminary Stormwater Report.

Sewer & Water

A preliminary report summarizing the design of the existing sanitary sewer and water main installations associated with the Mountain View Major Subdivision is provided in Appendix B: Preliminary Sewer & Water Report. The project will utilize existing sanitary sewer and water, as well as provide water service stubs and sanitary stubs to serve future developments within a portion of the subdivision. The provided report summarizes the water and sewer main design and capacity calculations for the water and sewer services to the theoretical future development.

Parkland Dedication

The proposed Mountain View subdivision includes over 20 acres of open space to be dedicated to the City of Livingston as parkland. The proposed parkland is characterized by rolling grassland and a large wetland area that merit being preserved and made available for public use and enjoyment.

Dedicated parkland is included in the proposed subdivision as Lots 2 and 21. The proposed dedication equates to parkland per Ordinance No. 2069 Sec. VI-A-16.b. - "Standards for Parkland Dedication – provides for the preservation of a physical amenity such a as a meadow, stand of trees, significant wildlife habitat or a wildlife corridor, a scenic hillside with slopes less than 25%, a stream or significant water body, an area of riparian resource."

As such, the proposed open space parkland dedication meets the requirements established in MCA 76-3-621.

GROWTH POLICY ALIGNMENT

The proposed development aligns with many elements of the Growth Policy.

Population & Community Character

Land Use
Goal 3.1: Prioritize infill over expansion by taking advantage of existing and planned infrastructure, such as transportation, energy, water, and sewer facilities.

The proposed Mountain View Subdivision represents the continuation of infill of this property that was annexed into the City of Livingston over 15 years ago. This subdivision will take advantage of the existing water, sewer, and transportation infrastructure that is sized to accommodate this anticipated growth.

Natural Resources
Goal 4.3: Protect and manage natural resources, open spaces, and wildlife.

The proposed Mountain View preliminary plat proposes to formally dedicate over 20 acres of open space parkland, over half of which contains important wetland habitat for a variety of flora and fauna.

Housing
Goal 5.1: Provide housing options to meet the needs of all residents.

Mountain View subdivision will provide the opportunity for housing development should the subsequent owners choose to develop that type of use.

Economy
Goal 6.1: Strengthen and diversify Livingston's economy by supporting industries and initiatives that increase employment opportunities and personal income.

The Highway Commercial zoning will allow Mountain View subdivision to be developed with a variety of businesses that will not only create a diversity of new jobs but also service Livingston's tourism economy.

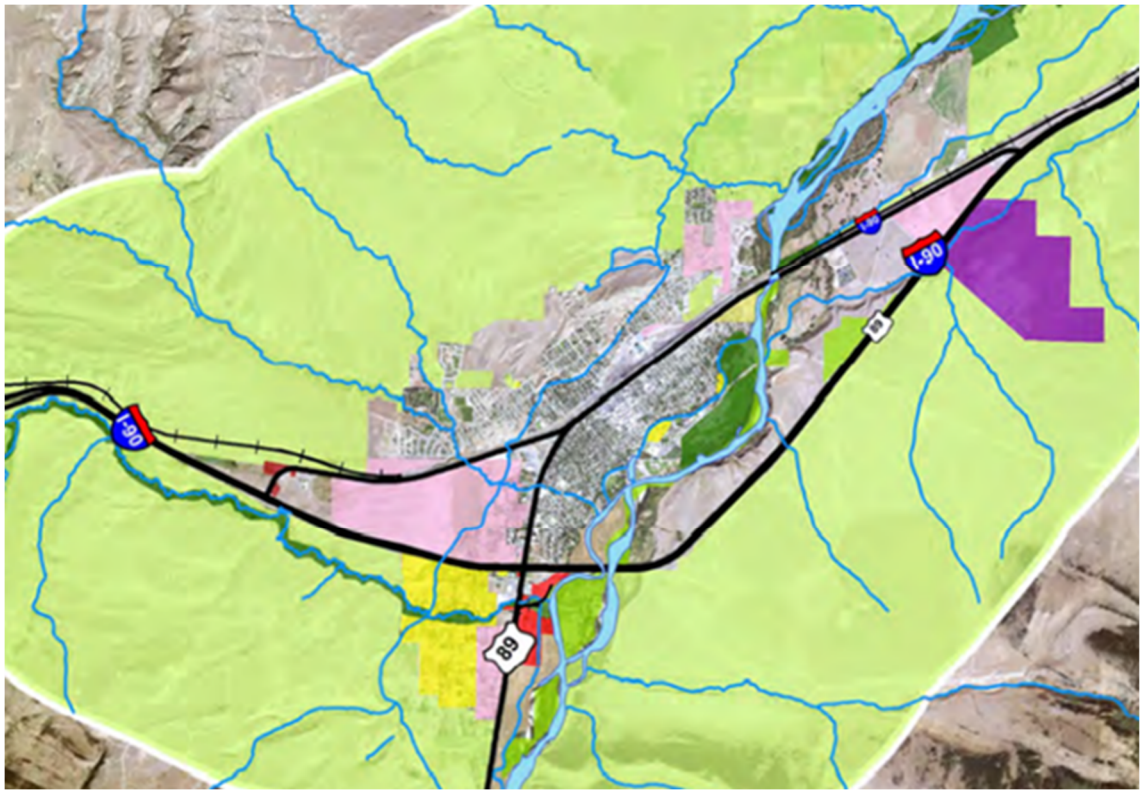
Local Services

Transportation
Goal 8.2: Create a complete and well-maintained transportation network within the City.

The Mountain View preliminary plat application identifies opportunities to enhance the City's multimodal active transportation network with potential bus route service, internal sidewalks and trails, and a shared use path connection leading east.

Public Facilities
Goal 9.1: Develop infrastructure to enhance community services and improve public safety for Livingston residents.

The impact fees paid by future development of the proposed subdivision lots will provide revenues to fund offsite community infrastructure improvements.
The 2021 City of Livingston Growth Policy prescribes a future land use of "Mixed Use" for the undeveloped properties between the proposed subdivision and Highway 89. This designation indicates that continued development in the area is planned and supported.



2021 Livingston Growth Policy | Appendix A: Extra-Territorial Jurisdiction Plan | Exhibit 2.9

DRC ADDITIONAL INFORMATION

Active Transportation
At the request of the City of Livingston staff, active transportation and transit locations are conceptually proposed in the Mountain View Subdivision plan. A future bus route is anticipated to circumnavigate the subdivision along Antelope Drive and PFL Way to serve the public transportation needs of PFL, FedEx, and any future development within the subdivision. There could be multiple bus stops along the route on Antelope Drive and one bus shelter on PFL Way. Conceptually, a shared use path designed for cyclists and pedestrians will be located along Highway 10 and will extend into Mountain View Subdivision along PFL Way. Sidewalks will

border all new streets in the subdivision to complete the pedestrian network. A natural surface trail could be extend into Lot 2 to access the wetlands and open space. These multimodal facilities can be seen in Exhibit C: Active Transportation Plan.

Traffic Trip Generation

At the request of the City of Livingston staff, a preliminary traffic trip generation analysis was produced for the proposed Mountain View subdivision. The analysis concluded:

> *"The preceding analysis has shown that construction of the facility will generate a modest volume of new traffic demand for area streets and intersections. . . Future (2027) scenario capacity results are projected to be similar to existing conditions (2022 results)" With that, the West Park Street/US 10 intersection observes the biggest difference in projected 95th percentile vehicle queuing. Under current conditions, the AM peak hour projected 95th percentile queuing is up to 7 vehicles and the PM peak hour projected queuing is up to 13 vehicles. At full buildout (2027) conditions, the AM peak projected 95th percentile queuing is up to 9 vehicles and the PM peak hour projected queuing is up to 19 vehicles.*

The complete analysis is included in Appendix D: Traffic Trip Generation Analysis

Covenants, Conditions, and Restrictions

Although not required to be submitted until Final Plat, the applicant has provided a summary of the draft Covenants, Conditions, and Restrictions (CC&R), at the request of City of Livingston staff. In addition to standard CC&R provisions, those for the proposed subdivision include wildlife-friendly fencing, wildlife-proof trash storage, and an Owners Association Design Review Committee.

A summary of the Mountain View Subdivision Covenants, Conditions, and Restrictions are included in Appendix H.

PUBLIC AGENCY REVIEW

At request of City of Livingston staff, formal letters were sent to three public agencies to solicit their review and comments on the proposed Mountain View Subdivision. The three public agencies included Montana Department of Transportation, Montana Fish, Wildlife, and Parks, and the State Historic Preservation Officer. These letters and any received comments are included as Appendix F: Public Agency Review.

PRIVATE SERVICE PROVIDER REVIEW

Letters were sent to five private service providers to solicit their review and comments on the proposed Mountain View Subdivision on request of City of Livingston staff. The five service providers included NorthWestern Energy, Park Electric Cooperative, CenturyLink, Windrider

public bus Service provider, and the United States Postal Service. These letters and any received comments are included as Appendix G: Private Service Provider Review.

SUMMARY OF PROBABLE IMPACTS & MITIGATION

As required by the City of Livingston Subdivision Regulations Section III B-6 this application includes a summary of probable impact. The impacts addressed include Agriculture, Ag Water, Local Services, Natural Environment, Wildlife & Habitat, and Public Health & Human Safety.

1. IMPACTS ON AGRICULTURE

A. Would the subdivision remove agricultural or timberlands with significant existing or potential production capacity?

No. There are no current agricultural or timberland resources on this site.

B. Would the subdivision remove from production agricultural lands that are critical to the area's agricultural operations?

No. There is no agricultural production on this site now or in the past. There are no agricultural water user facilities on this site.

C. Would the subdivision create significant conflict with nearby agricultural operations (e.g. creating problems for moving livestock, operating farm machinery, maintaining water supplies, controlling weeds, applying pesticides or would the subdivision generate nuisance complaints due to nearby agricultural operations)?

No. The proposed subdivision would not create conflicts with nearby agricultural operations.

2. IMPACT ON AGRICULTURAL WATER USER FACILITIES

A. Would the subdivision create a significant conflict with agricultural water user facilities (e.g. creating problems for operating and maintaining irrigation systems or creating nuisance complaints due to safety concerns, noise, etc.)?

No. The subdivision would not create conflicts with agricultural water user facilities.

3. IMPACT ON LOCAL SERVICES

A. What additional or expanded public services and facilities would be demanded to serve this subdivision?

i. What additional costs would result for services such as streets, law enforcement, parks and recreation, fire protection, water, sewer and solid waste, schools and busing (including additional personnel, equipment, construction, and maintenance costs)?

All the public infrastructure associated with the proposed subdivision has or will be constructed and paid for by private parties. Once dedicated to the City, maintenance requirements would fall upon the City of Livingston. Public infrastructure will include streets, street lighting, sidewalks, water mains, sewer mains, stormwater mains and ponds.
See Appendix C: Subdivision Improvements for more detailed information.

Law enforcement and fire protection services have been provided to the area of the proposed subdivision by the City of Livingston since it was annexed nearly 20 years ago. Therefore, no additional costs or personnel should be required to continue these services.

The proposed open space parkland to be dedicated would need to be managed by the City. As established in Ordinance No. 2069, open space parklands "shall be managed to remain in a near natural state when it has been dedicated for preservation or conservation purposes." As such, the maintenance costs should be nominal.

Solid waste services are paid for by user 'tipping' fees that would be incurred by the property owners contracting for service.

It is unknown at this time whether the proposed subdivision will have any residential development. It is also unknown whether any future housing would include residents with school age children requiring busing for school.

ii. Who would bear these costs?

See responses above.

iii. Can the service providers meet the additional costs given legal and other constraints?

Yes. The additional public service maintenance costs will be covered by the impact fees paid by each developed site and the new additional tax revenue generated by

future development.

B. Would the subdivision allow existing services, through expanded use, to operate more efficiently or make the installation or improvement of services feasible?

Yes. The new sewer and water mains are designed to accommodate future development to the northwest and to be tied into the City's long term expansion plans to connect to the City's large tank reservoir to the north upon future construction of the West End Loop.

C. What are the present tax revenues received from the unsubdivided land by the County, City and Schools?

The current tax bills for the subject property is $17,613.62 for the 2022 calendar year per the Park County Treasurer.

D. What would be the approximate revenues received by each above taxing authority when the subdivision is improved and built upon?

At full build out of the proposed subdivision, the estimated annual tax revenues to the City of Livingston would be nearly $200,000. This estimate was calculated using the State of Montana tax rate of 1.35% and the City of Livingston mill rate of 0.58606 as applied to the acreage and estimated taxable value of potential development for each lot.

E. Would new taxes generated from the subdivision cover additional public costs?

Yes.

i. Would any special improvement districts be created which would obligate the City fiscally or administratively?

No. There is currently a TIF District on this property that is scheduled to expire in 2024.

F. Other Impacts on Local Services—Water Rights

Regarding the disclosure and disposition of water rights as required by 76-3-504, the current property and property owners, thus subdividers, do not own any surface water rights.

4. IMPACT ON NATURAL ENVIRONMENT

A. How would the subdivision affect surface and groundwater, soils, slopes, vegetation, historical or archaeological features, and visual features within the subdivision or on adjacent lands?

i. **Would any streambanks be altered, streams rechanneled or any surface water contaminated from run-off carrying sedimentation or other pollutants?**

No. There are no streams on the proposed subdivision. Road drainage in the subdivision will be controlled by paved streets with concrete curb and gutter. Storm runoff will be collected by the gutters and transported to stormwater inlets. From the inlets, the stormwater will be conveyed to onsite stormwater detention ponds. Erosion of the road will be prevented due to the impervious paved surface. Erosion of the nonpaved right-of-way areas impacted during construction will be mitigated through reseeding affected areas after construction is complete. All phases of construction (public infrastructure and private development) will require DEQ Stormwater Pollution Prevention Plans to be approved and administered.

ii. Would groundwater supplies likely be contaminated or depleted as a result of the subdivision?

No. Groundwater supplies would not be depleted as the proposed lots will be connected to City of Livingston water mains. Contamination of groundwater is not expected with the uses allowed by Highway Commercial zoning and applicable City and DEQ water quality regulations.

iii. Would construction of streets or building sites result in excessive cuts and fills on steep slopes or cause erosion on unstable soils?

No. Grading in areas that will be affected during construction will be done as to not adversely affect adjacent lands with stormwater runoff from the subdivision. The stormwater management plan for the subdivision has been designed in accordance with the standards of the City of Livingston and the Montana Department of Environmental Quality Design Circular DEQ-8.

iv. Would significant vegetation be removed causing soil erosion or bank instability?

No. The soils located within the proposed subdivision are lean clay with sand and clayey sand. Historically, the area receives between 14 and 16 inches of rain per year. The effect on native dryland vegetation will be limited to the developed areas. Revegetation of affected areas will be done as development occurs.

v. Would significant historical or archaeological features be damaged or destroyed by the subdivision?

No. The State Historical Preservation Office previously reviewed the proposed subdivision and concluded:

> "Based on previous survey within the project area we feel that there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time."

The full response from the State Historical Preservation Office and a cultural assessment from 2004 prior to the construction of the Printing for Less building are provided in Appendix F: Public Agency Review.

vi. Would the subdivision be subject to natural hazards such as flooding, rock, snow or land slides, high winds, severe wildfires or difficulties such as shallow bedrock, high water table, unstable or expansive soils, or excessive slopes?

No.

The subdivision is not located within a floodplain. The nearest floodplain designation is along Billman Creek south of Interstate 90 and poses no hazard to the proposed subdivision.

The subject area does not have a history of rock, snow, or landslides.

All the structures built in the subdivision will conform to building standards which will prevent hazards caused by high winds that frequently occur in the area.

Wildfire in the area is not a high risk due to the lack of natural fuel and the availability of fire protection added by the development of the subdivision including the paved road that will serve as a fire break and the completed installation of numerous fire hydrants.

The geotechnical work performed in May 2021 by Terracon Consultants, Inc. for the FedEx project constructed by Ruedebusch Development & Construction identified soil depths ranging between 8 and 21 feet and water depths ranging from 6 to 15 feet below existing site grades.

The soils present are typical of the area and predominantly lean clay with sand. This soil type is not characterized as unstable or expansive in nature.

Although moderately sloping in some areas, the topography of the site is not conducive to snow or rockslides. There are no excessive slopes on the property that may be a potential hazard.

vii. Other Natural Environment Impacts—Weed Management Plan

Mountain View subdivision will comply with Park County Weed Control District requirements. Following preliminary plat approval, a weed management plan application and 3-year monitoring contract will be submitted to the district and a noxious weed management plan will be developed with the Park County Weed Control Board. The subdivision will abide by the Montana County Weed Act (Title 7, Chapter 22, Sections 7-22-2101 through 7-22-2153).

5. IMPACTS ON WILDLIFE AND HABITAT

A. How would the subdivision affect critical wildlife areas such as big game wintering range, migration routes, nesting areas, wetlands or other important habitat?

The proposed subdivision contains wetland areas, as shown on the preliminary plat, that will be protected during and after construction of the subdivision. A wetland study was conducted by Sundog Ecological, Inc. and is contained in Appendix E: Wetland Delineation Report. This study delineates the wetland and surface water areas that exist on the development. Effects on the quality and quantity of wetland and surface water will be mitigated by designing around these areas to the greatest extent possible and as required by local, State, and Federal regulations.

The proposed subdivision has not been previously formally identified as big game wintering range or migration routes. The applicant has solicited comments from Montana Fish Wildlife and Parks, but none have been received at this time. See Appendix F: Public Agency Review for agency request for review documentation.

B. How would pets or human activity affect wildlife?

Pets and their owners will have access to the subdivision's private property, public sidewalks, any future trails, and the proposed dedicated open space parkland. It is suggested that pets be kept on leashes while in these areas. Wildlife will continue to be allowed access to proposed open spaces totaling approximately 20 acres.

6. IMPACTS ON PUBLIC HEALTH AND SAFETY

A. Would the subdivision be subject to hazardous conditions due to high voltage lines, airports, highways, railroads, high-pressure gas lines, or adjacent industrial uses?

No. The proposed Mountain View Subdivision Lots 12 – 21 are adjacent to the Montana Department of Transportation (MDT) Right of Way for Interstate 90. The proposed subdivision Lots 2 – 11 are adjacent to MDT Right of Way for State Highway 10. The proposed subdivision Lots 2 – 5 are approximately 500 feet from the Montana Rail Link railroad tracks to the north of Highway 10.

Despite the proximity of the proposed subdivision to the infrastructure referenced above, and because all the applicable setbacks are in place, the proposed Mountain View Subdivision would not be subject to hazardous conditions due to the adjacent infrastructure.

Some of the proposed subdivision lots will be adjacent to the Printing for Less facility and the FedEx Ground facility. These light industrial uses do not pose any hazardous conditions and have been constructed and will operate in accordance with the City of Livingston regulations that mitigate any hazards including noise.

B. What existing uses may be subject to complaints from residents of the subdivision?

In theory any of the existing uses, public and private, may be subject to complaints from tenants or users of the proposed subdivision. The uses of potential concern, such as the highways and railroad, predate any development in the area and the characteristics of these uses are generally recognized and accepted. The CC&Rs will include a notice to possible purchasers of adjacent activities.

C. What public health or safety hazards, such as dangerous traffic or fire conditions, would be created by the subdivision?

The Mountain View Subdivision will not create any public health or safety hazards.

SANDERSON STEWART

EXHIBIT A
Mountain View Subdivision
Vicinity Map

Montana Department of Transportation
Benjamin & Brittney Hampson
Barry & Heather Payne
Robert & Kristie Payne
Wendale Properties LLC
Joseph Vanblaricom
Mark & Helen Egeland
W END RD
US HIGHWAY 10 W
Margie W Jesson Trustee
Margie W Jesson Trustee
ANTELOPE DR
PEL WAY
Pac West Diversified LP & Yolo Partners LLC
Livingston West LLC
Chana Montana Real Estate Holdings LLC
INTERSTATE 90 W
I 90 ON RAMP
I 90 OFF RAMP
2022 Livingston LLC (FedEx Ground Facility)
Alvin & Aleta Hering
Windy City Properties LLC
Zane & Jessica Leonard
Philip Jesson
I 90 OFF RAMP
I 90 ON RAMP
INTERSTATE 90 E
Michael Adams
Alvah & Marlie Askin
Marie Voyich

Subdivision Properties
Existing and New Water Mains
Existing and New Sewer Mains
Existing Stormwater Drainage
Proposed Stormwater Drainage
Existing Power Lines
Parcels
Fire Hydrants
Zoning: Highway Commercial
Existing Buildings
Livingston City Limits

NORTH

0 250 500 1,000 Feet

SANDERSON STEWART

EXHIBIT B
Mountain View Subdivision
Overall Development Plan

US HIGHWAY 10

LOT 6 0.422 AC

C.O.S. 370 PARCEL 1

LOT 5 1.016 AC

LOT 4 0.995 AC

LOT 3 1.161 AC

LOT 8 0.898 AC

WEST END ROAD

EX 40.00' UTILITY EASEMENT

LOT 9 0.868 AC

EX STORMWATER POND

ANTELOPE DRIVE

LOT 10 0.856 AC

LOT 7 0.270 AC

US HIGHWAY 10

NEW STORMWATER AREA LOT 11 0.577 AC

C.O.S. 2748 RB PARCEL 3-A1

DEDICATED PARKLAND OPEN SPACE LOT 2 14.094 AC

C.O.S. 1119 HERING PARCEL

PATH WAY

WETLAND BOUNDARY

C.O.S. 1119 WESTONDALE CORP PARCEL

NEW CONCRETE WALK (TYP)

LOT 12 1.282 AC

TRACT 2A COS 2621RB PACWEST

LOT 22 0.798 AC

LOT 1 0.943 AC

R45.00'

PUBLIC ACCESS EASEMENT

LOT 13 0.509 AC

LOT 14 0.500 AC

LOT 15 0.501 AC

LOT 16 0.501 AC

LOT 17 0.501 AC

LOT 23 0.723 AC

PHASE 2 CUL-DE-SAC TO BE REMOVED DURING PHASE 3

STREET 1

PROPOSED 20.00' ACCESS EASEMENT

LOT 24 1.173 AC

LOT 18 0.501 AC

LOT 19 0.501 AC

10.00' UTILITY EASEMENT

60.00' ROW (SEE DETAILS)

10.00' UTILITY EASEMENT

PHASE 1 CUL-DE-SAC AND POND TO BE REMOVED DURING PHASE 2

EX STORMWATER POND

US HIGHWAY 191

LOT 20 2.863 AC

EX 10.00' UTILITY EASEMENT

30.00' UTILITY EASEMENT

DEDICATED PARKLAND OPEN SPACE LOT 21 6.306 AC

Livingston West, LLC

Highway Commercial Lots (22)	**18.362 Ac**
Phase 1 Total	11.658 Ac
Phase 2 Total	4.588 Ac
Phase 3 Total	2.116 Ac
Dedicated Parkland Open Space Lots (2)	**20.4 Ac**
Lot 2	14.094 Ac
Lot 21	6.306 Ac
Area of Dedicated Right-of-Way	**5.387 Ac**
Total	**44.149 Ac**

- Existing Water Main
- Exsting Sewer Main
- Existing Storm Drainage
- Proposed Storm Drainage

Phasing

- **Phase 1** (Lots 2-17, 21, 22)
- **Phase 2** (Lots 18-20, 23)
- **Phase 3** (Lots 1, 24)
- Dedicated Parkland Open Space

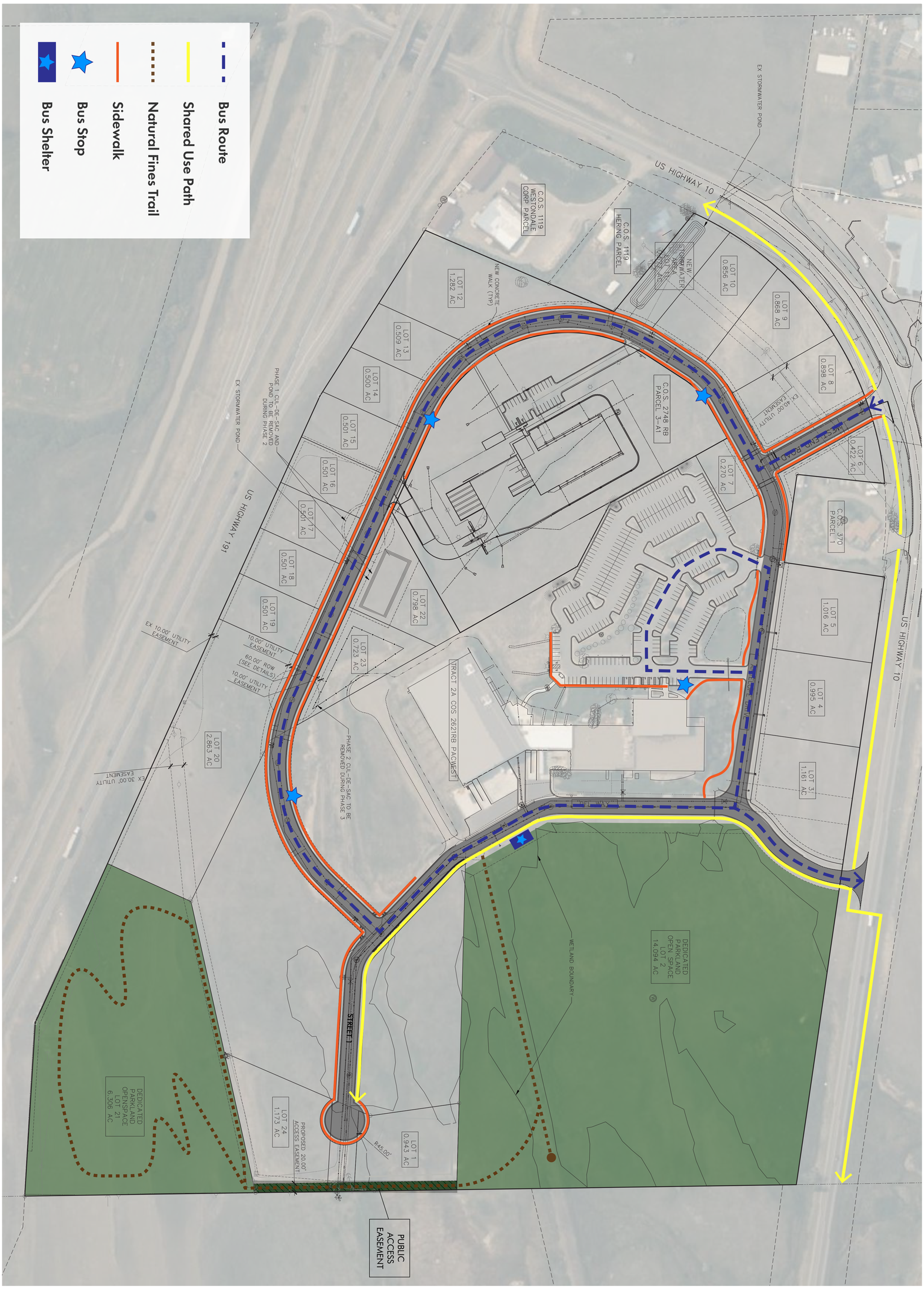


EXHIBIT C

Mountain View Subdivision

Active Transportation Circulation

SANDERSON STEWART

MOUNTAIN VIEW SUBDIVISION

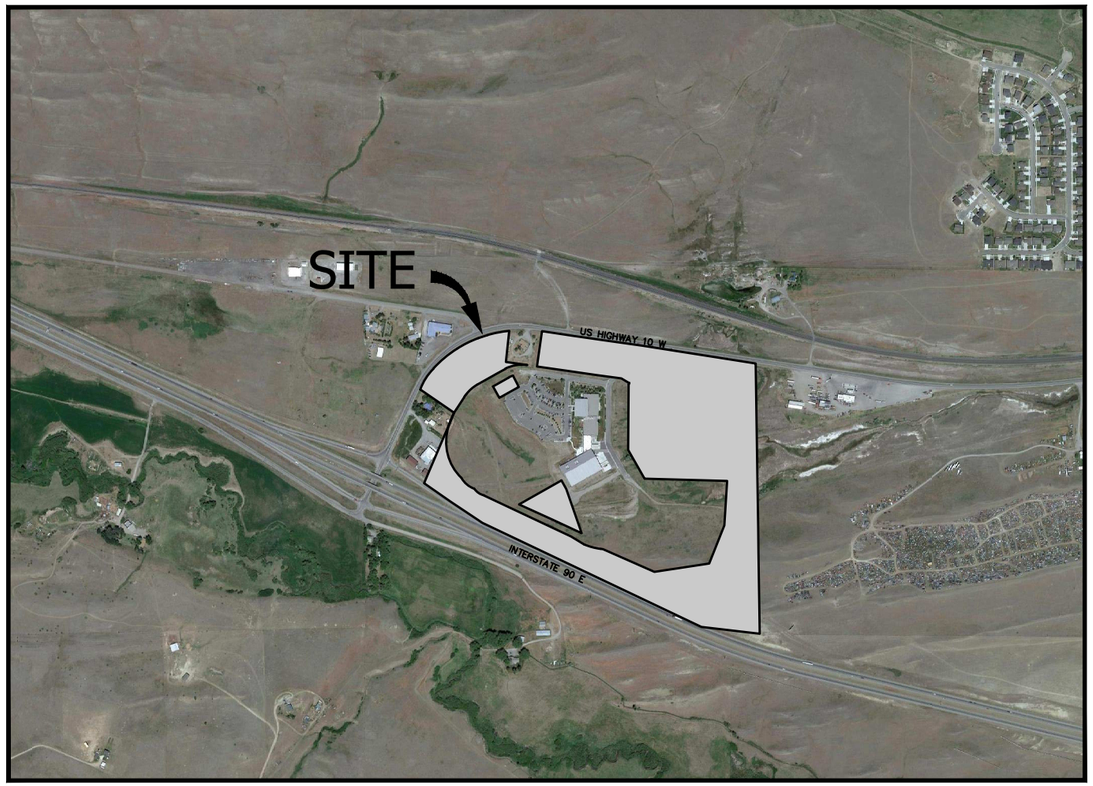
PROPOSED SITE & UTILITY IMPROVEMENTS

FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

PREPARED FOR:

LIVINGSTON WEST, LLC
PO BOX 500
EMIGRANT, MT 59027



NORTH

VICINITY MAP

NOT TO SCALE

FILE: 18005_05_COVER_PROD.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE: -

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY
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SANDERSON STEWART
Enduring Community Design

106 East Babcock, Suite L1 | Bozeman, Montana 59715 | 406.522.9876 | sandersonstewart.com

C1.1

LINETYPES

	EXISTING	PROPOSED
SANITARY SEWER	SS	SS
STORM DRAIN	SD	SD
WATER	W	W
CURB AND GUTTER		
EDGE OF ASPHALT	EDGE OF EX ASPHALT	
EDGE OF GRAVEL	EDGE OF EX GRAVEL	
FENCE - BARBWIRE	X	X
FENCE - CHAINLINK/ WOVEN WIRE		
FENCE - VINYL	V	V
FENCE - WOOD		
FIBER OPTIC	FO	FO
GAS PIPELINE	G	G
OIL PIPELINE	OIL	OIL
UNDERGROUND POWER	P	P
OVERHEAD POWER	OHP	OHP
TELEPHONE	T	T
TELEVISION/CABLE	TV	TV
CONTOUR	3157	3157
DEMO AREA		
PROPOSED ASPHALT		
PROPOSED CONCRETE		
PROPOSED GRAVEL		

ABBREVIATIONS

AC = FINISHED GRADE AT ASPHALT
BC = FINISHED GRADE AT BUILDING CORNER
BRK = GRADE BREAK
BFV = BUTTERFLY VALVE
BVC = BEGIN VERTICAL CURVE
CS = CURB STOP
EA = FINISHED GRADE AT EDGE OF ASPHALT
EC = FINISHED GRADE AT EDGE OF CONCRETE
EVC = END VERTICAL CURVE
EW = FINISHED GRADE AT EDGE OF WALK
EX = APPROXIMATE EXISTING ELEVATION
FL = FINISHED GRADE AT FLOWLINE
FT = FEET
FG = FINISHED GRADE
GR = EXISTING GRADE AT GROUND
GV = GATE VALVE
HP = HIGH POINT
LF = LINEAL FOOT
LT = LEFT

(#) KEYNOTE CALL OUT (SEE KEYNOTE LEGEND)

PC = POINT OF CURVATURE
PI = POINT OF INTERSECTION
POC = POINT ON CURVE
PRC = POINT OF REVERSE CURVE
PT = POINT OF TANGENCY
PVI = POINT OF VERTICAL INTERSECTION
RED = REDUCER
RT = RIGHT
SD = STORM DRAIN
SDI = STORM DRAIN INLET
SDMH = STORM DRAIN MANHOLE
SRVC = SERVICE
SS = SANITARY SEWER
SSMH = SANITARY SEWER MANHOLE
TC = FINISHED GRADE AT TOP BACK OF CURB
TW = FINISHED GRADE AT TOP OF WALL
WTR = WATER
(TYP.) = TYPICAL

SYMBOLS

- EXISTING WATER REDUCER
- PROPOSED WATER REDUCER
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- EXISTING FIRE HYDRANT
- PROPOSED FIRE HYDRANT
- EXISTING CURB STOP
- PROPOSED CURB STOP
- FIRE DEPT. CONNECTION
- WELL
- EXISTING WATER MANHOLE
- WATER METER
- YARD HYDRANT
- EXISTING SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT
- EXISTING STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN MANHOLE
- EXISTING CATCH BASIN
- PROPOSED CATCH BASIN
- ROOF DRAIN
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- COMMUNICATIONS MANHOLE
- COMMUNICATIONS PEDESTAL
- FIBER OPTIC PEDESTAL
- GAS MANHOLE
- GAS METER
- GAS WELL
- GAS VALVE
- ELECTRIC JUNCTION BOX
- ELECTRIC PEDESTAL
- TRANSFORMER
- POWER MANHOLE
- POWER METER
- POWER POLE
- GUYWIRE
- LIGHT POLE
- SIGN
- BOLLARD
- EXISTING MONUMENT BOX
- PROPOSED MONUMENT BOX
- IRRIGATION BOX
- IRRIGATION VALVE
- BUSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- SIGNAL POLE
- FOUND CORNER MONUMENT AS NOTED
- SET CORNER MONUMENT, REBAR WITH CAP
- BENCHMARK
- SECTION QUARTER CORNER
- SECTION CORNER

NOTE:

-EXISTING UNDERGROUND INSTALLATIONS & PRIVATE UTILITIES SHOWN ARE INDICATED ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE ENGINEER. THE ENGINEER DOES NOT GUARANTEE THE ACCURACY OF SUCH INFORMATION. SERVICE LINES (WATER, POWER, GAS, STORM, SEWER, TELEPHONE & TELEVISION) MAY NOT BE STRAIGHT LINES OR AS INDICATED ON THE PLANS. STATE LAW REQUIRES CONTRACTOR TO CALL ALL UTILITY COMPANIES BEFORE EXCAVATION FOR EXACT LOCATIONS.

-ALL IMPROVEMENTS SHALL BE PERFORMED IN ACCORDANCE WITH MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS 6TH EDITION, APRIL, 2010, AND THE CITY OF LIVINGSTON STANDARD MODIFICATIONS, APPROVED MAY 2014.

-UNLESS OTHERWISE SPECIFIED, ALL CONSTRUCTION LAYOUT AND STAKING SHALL BE PERFORMED UNDER THE RESPONSIBLE CHARGE OF A LAND SURVEYOR LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED AND BY A PARTY CHIEF OR ENGINEERING TECHNICIAN EXPERIENCED IN CONSTRUCTION LAYOUT AND STAKING TECHNIQUES AS ARE REQUIRED BY THE SPECIFIC TYPE OF WORK BEING PERFORMED.

PRELIMINARY - FOR REVIEW

SANDERSON STEWART
Enduring Community D

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY
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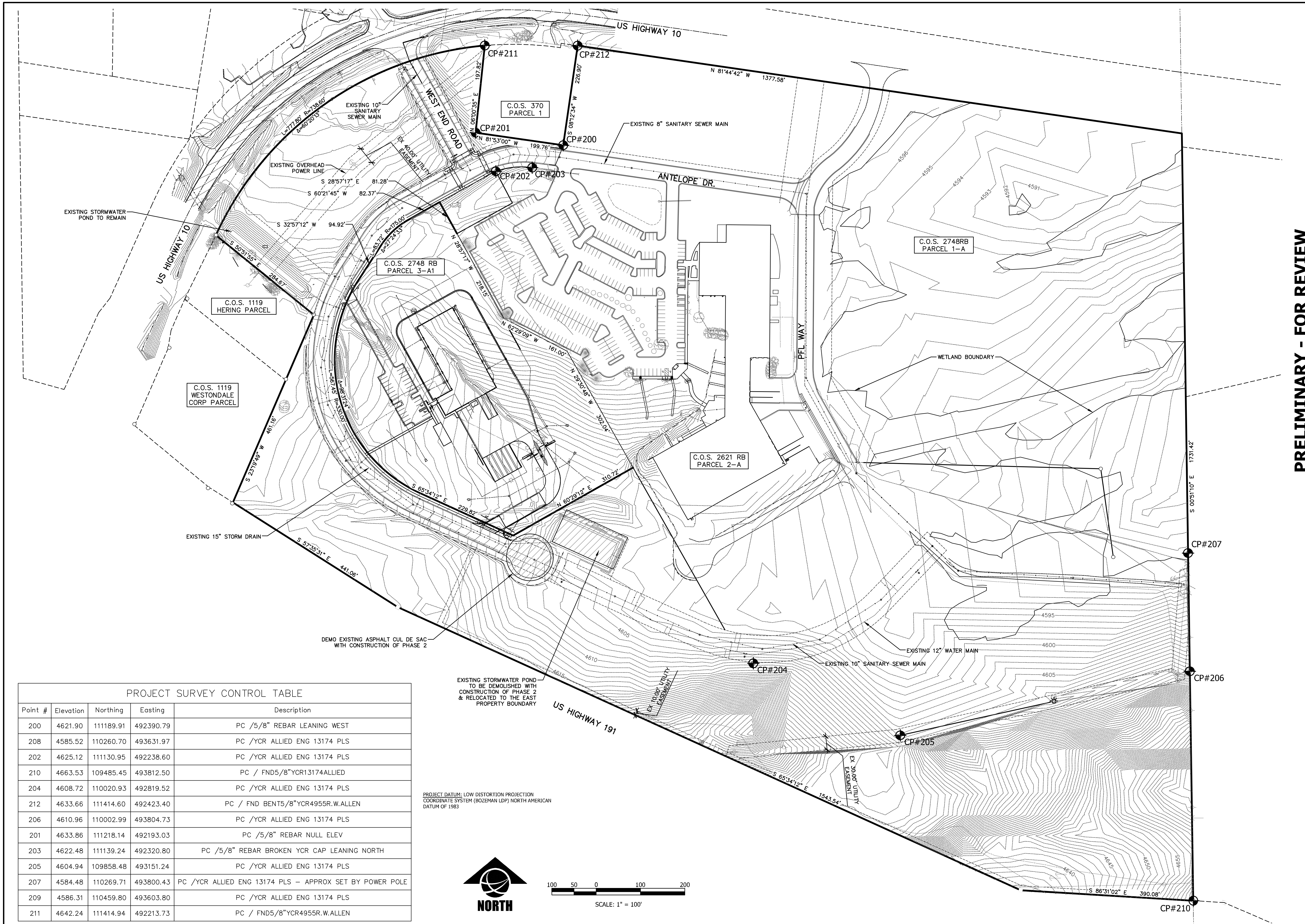
FILE: 18005_05_COVER_PROD.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE: -

MOUNTAIN VIEW SUBDIVISION
PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB
LIVINGSTON, MONTANA

LEGEND, NOTES & ABBREVIATIONS

C1.2



PROJECT SURVEY CONTROL TABLE				
Point #	Elevation	Northing	Easting	Description
200	4621.90	111189.91	492390.79	PC /5/8" REBAR LEANING WEST
208	4585.52	110260.70	493631.97	PC /YCR ALLIED ENG 13174 PLS
202	4625.12	111130.95	492238.60	PC /YCR ALLIED ENG 13174 PLS
210	4663.53	109485.45	493812.50	PC / FND5/8"YCR13174ALLIED
204	4608.72	110020.93	492819.52	PC /YCR ALLIED ENG 13174 PLS
212	4633.66	111414.60	492423.40	PC / FND BENT5/8"YCR4955R.W.ALLEN
206	4610.96	110002.99	493804.73	PC /YCR ALLIED ENG 13174 PLS
201	4633.86	111218.14	492193.03	PC /5/8" REBAR NULL ELEV
203	4622.48	111139.24	492320.80	PC /5/8" REBAR BROKEN YCR CAP LEANING NORTH
205	4604.94	109858.48	493151.24	PC /YCR ALLIED ENG 13174 PLS
207	4584.48	110269.71	493800.43	PC /YCR ALLIED ENG 13174 PLS – APPROX SET BY POWER POLE
209	4586.31	110459.80	493603.80	PC /YCR ALLIED ENG 13174 PLS
211	4642.24	111414.94	492213.73	PC / FND5/8"YCR4955R.W.ALLEN

SANDERSON STEWART
Enduring Community D

PRELIMINARY - FOR REVIEW

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY

FILE: 18005_05_EX_PROD.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE:

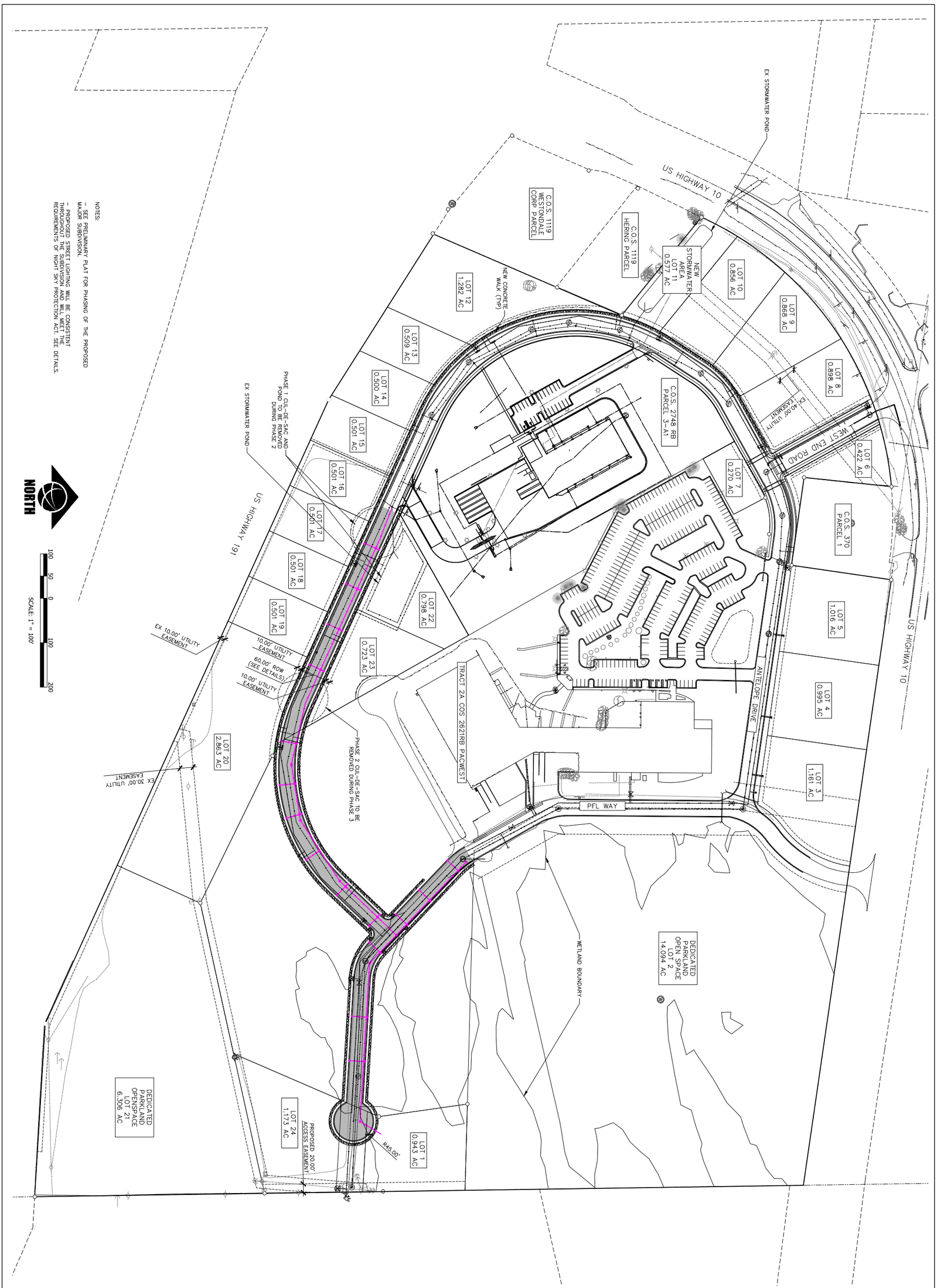
MOUNTAIN VIEW SUBDIVISION

PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

EXISTING SITE & DEMOLITION PLAN

C2.1



PRELIMINARY - FOR REVIEW

C3.1

MOUNTAIN VIEW SUBDIVISION

PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

SITE PLAN

FILE: 18005_05_SITE_PROD.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE: -

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY
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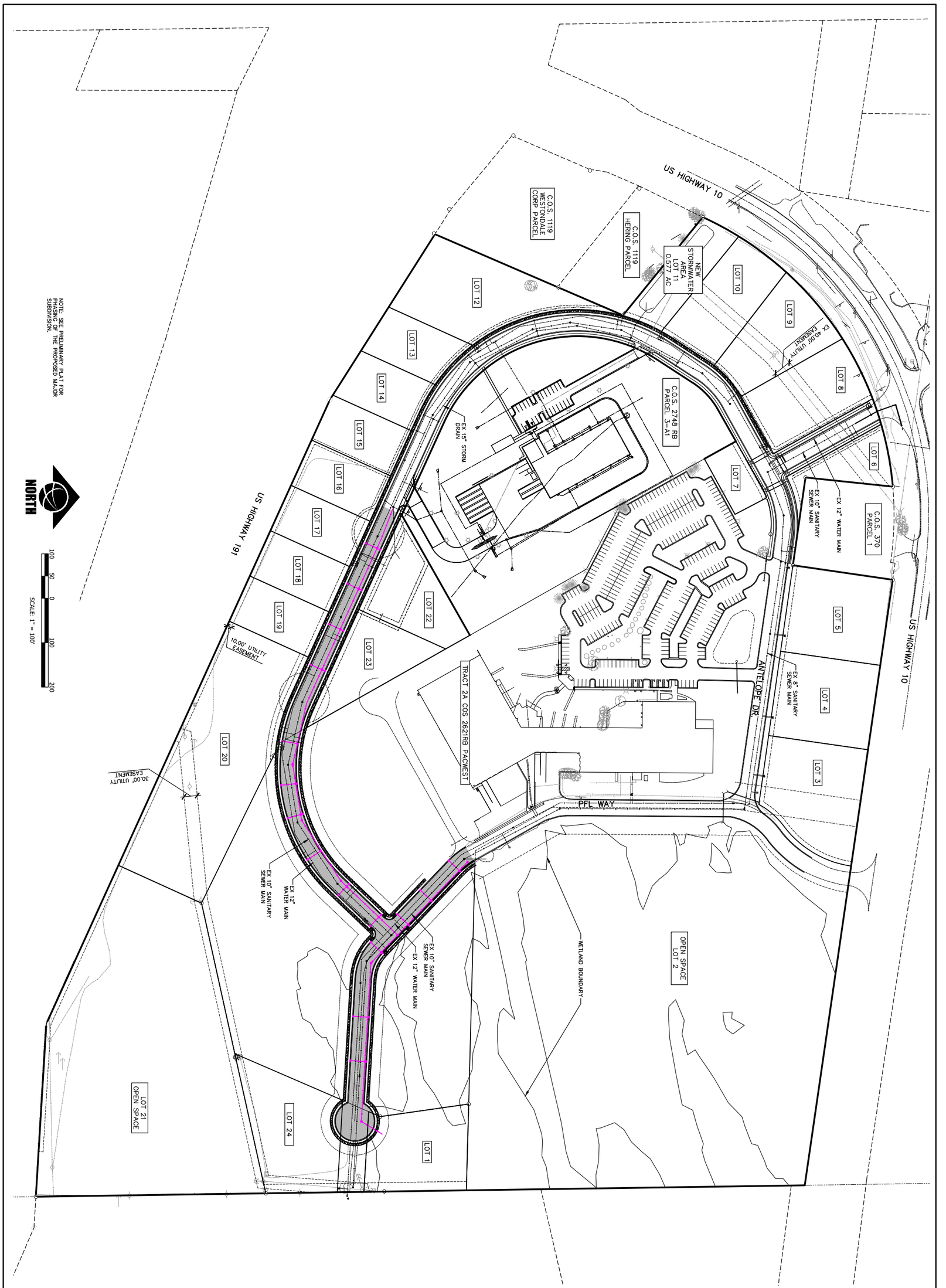
SANDERSON STEWART
Enduring Community D



PRELIMINARY - FOR REVIEW

MOUNTAIN VIEW SUBDIVISION

PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

UTILITY PLAN

C4.1

FILE: 18005_05_UTILITY_PROD.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE: -

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY
-	-
-	-
-	-
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-	-
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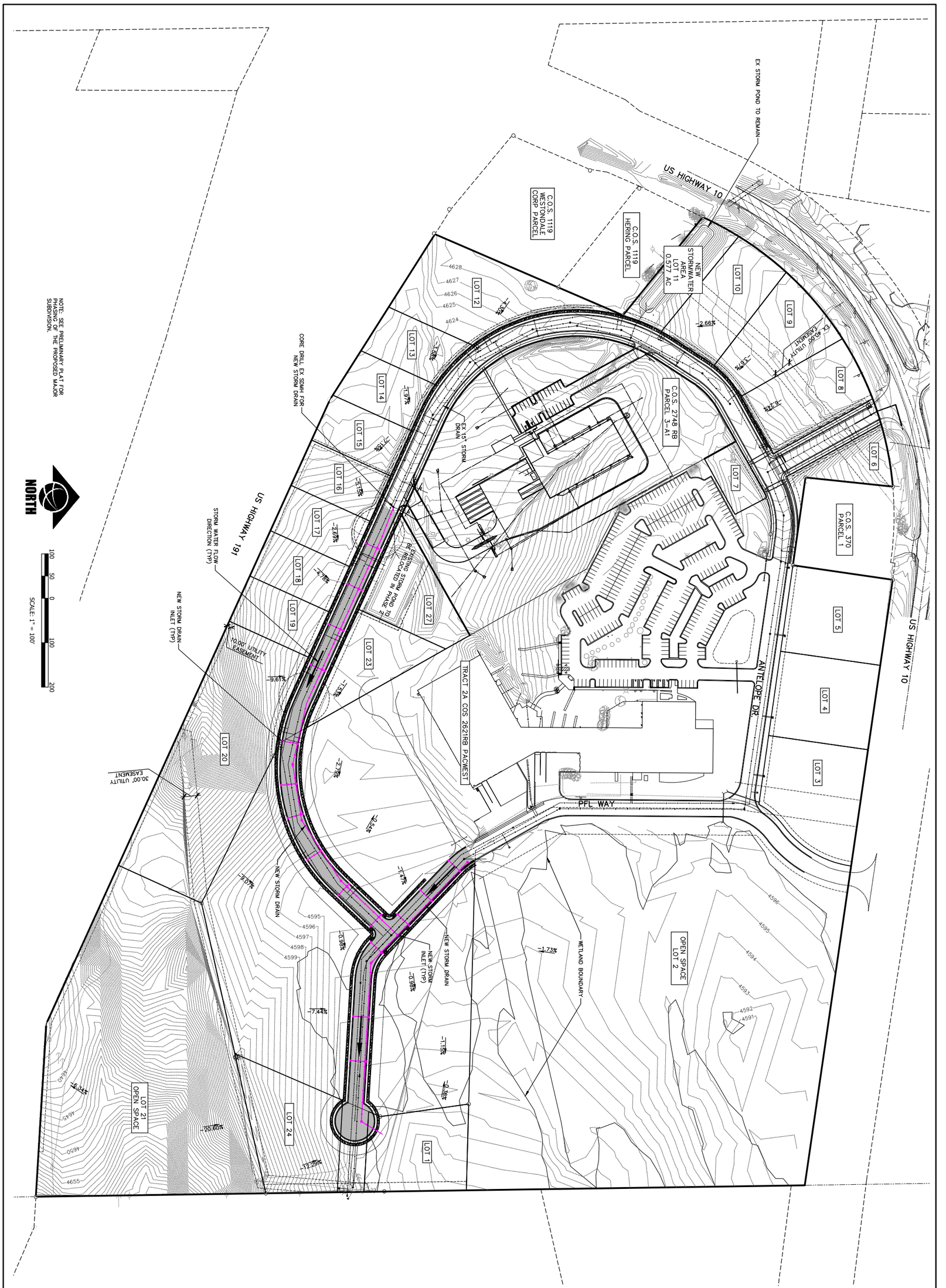
SANDERSON STEWART
Enduring Community D



PRELIMINARY - FOR REVIEW

C5.1

MOUNTAIN VIEW SUBDIVISION

PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

GRADING & STORM DRAINAGE PLAN

FILE:	18005_05_STORM_PROD.DWG
PROJECT NO:	18005.05
CAD:	NAH
QUALITY ASSURANCE:	-

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY
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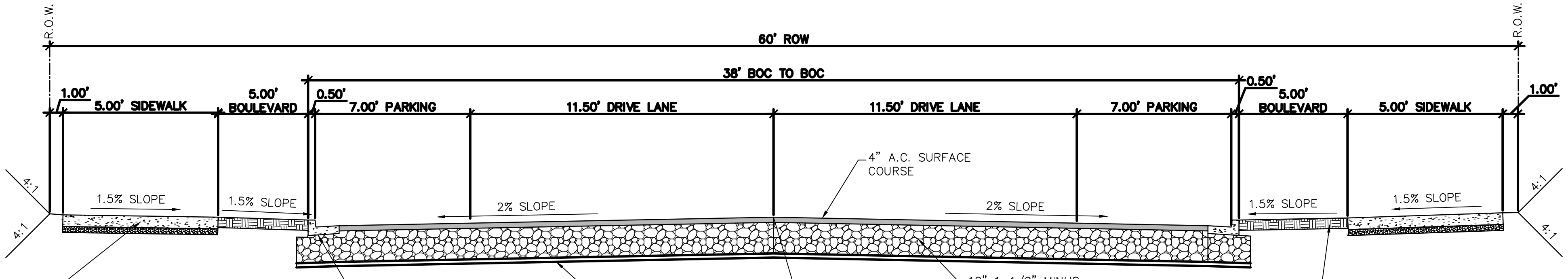
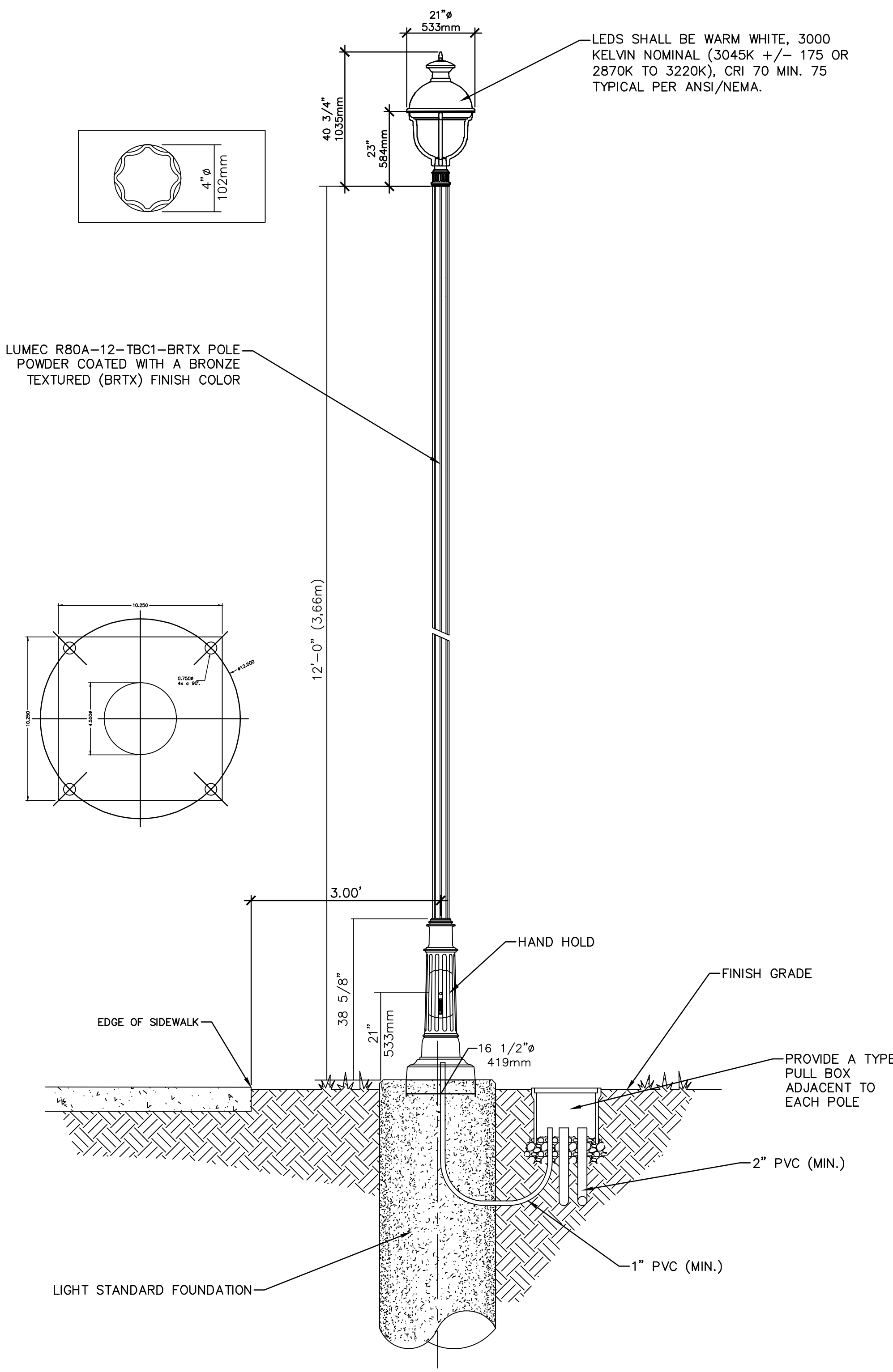


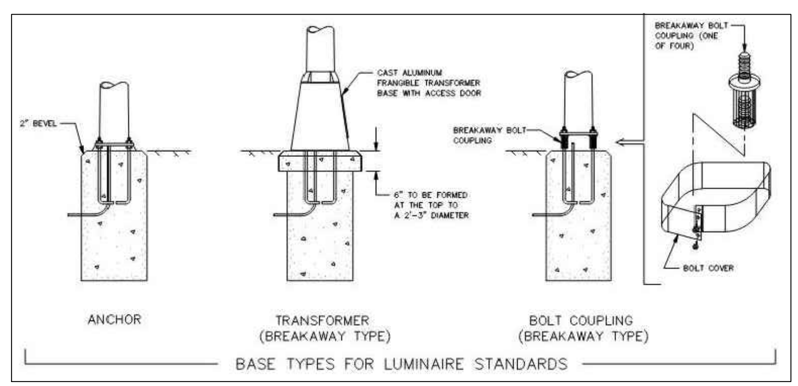
TYPICAL STREET SECTION

NOT TO SCALE

TYPICAL STREET LIGHT STANDARD DETAIL

NOT TO SCALE





SANDERSON STEWART
Enduring Community D...

PRELIMINARY - FOR REVIEW

DRAWING HISTORY

DATE	DESCRIPTION
06/20/23	PRELIMINARY

FILE: 18005_05_DETAILS.DWG
PROJECT NO: 18005.05
CAD: NAH
QUALITY ASSURANCE: -

MOUNTAIN VIEW SUBDIVISION

PROPOSED SITE & UTILITY IMPROVEMENTS
FOR TRACT 1-A OF COS 2748RB

LIVINGSTON, MONTANA

DETAILS

C6.1

PRELIMINARY PLAT OF

MOUNTAIN VIEW SUBDIVISION, PHASES 1, 2, & 3

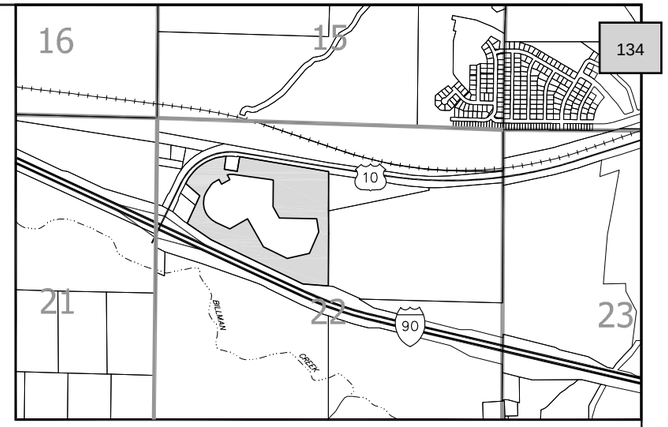
BEING TRACT 1–A OF COS 2748RB,
SITUATED IN THE NW1/4 OF SECTION 22, T. 2 S., R. 9 E., P.M.M.,
CITY OF LIVINGSTON, PARK COUNTY, MONTANA

PREPARED FOR : LIVINGSTON WEST, LLC

JUNE 2023

PREPARED BY : SANDERSON STEWART

BOZEMAN, MONTANA



VICINITY MAP
NOT TO SCALE

CERTIFICATE OF SURVEYOR

The undersigned, a professional land surveyor licensed in the State of Montana, does hereby certify that between _____ and _____ , a survey was performed under their direct supervision for MOUNTAIN VIEW SUBDIVISION, PHASES 1, 2, and 3, and described the same as shown on the accompanying plat and platted in accordance with the provisions of the Montana Subdivision and Platting Act, Section 76–3–101 through 76–3–625, MCA, and the City of Livingston Subdivision Regulations.

DATED this ____ day of _____ , 2023.

SANDERSON STEWART

By: _____
Montana Registration No. _____

CERTIFICATE OF COUNTY TREASURER

I, Kevin J. Larkin, Treasurer of Park County, Montana, do hereby certify that the accompanying Plat has been duly examined and that all real property taxes and special assessments assessed and levied on the land to be subdivided are paid.

DATED this ____ day of _____ , 2023.

By: _____
Treasurer, Park County, Montana

CERTIFICATE OF GOVERNING BODY

The Chair of the City Commission of the City of Livingston, Montana, does hereby certify that the accompanying Plat has been duly reviewed, and has been found to conform to the requirements of the Subdivision and Platting Act, Section 76–3–101 et. seq. MCA, and the City of Livingston Subdivision Regulations, approves it, and hereby accepts the dedication to public use.

DATED this ____ day of _____ , 2023.

_____
Chair of the City Commission
City of Livingston, Montana

CERTIFICATE OF CLERK AND RECORDER

I, Maritza H. Reddington, Clerk and Recorder of Park County, Montana, do hereby certify that the foregoing instrument was filed in my office at _____ o'clock, (a.m., or p.m.), this _____ day of _____ , 2023, and recorded under Document No. _____ , Records of the Clerk and Recorder, Park County, Montana.

By: _____
Clerk and Recorder, Park County, Montana

CERTIFICATE OF DEDICATION

We, the undersigned property owners, do hereby certify that they have caused to be surveyed, subdivided and platted into lots, blocks, roads and parks, as shown on the accompanying plat hereunto annexed, the following described tract of land, to wit:

LEGAL DESCRIPTION:

Tract 1–A of Certificate of Survey No. 2748RB, as recorded in the office of the Clerk and Recorder of Park County, Montana, under Document No. 426634, situated in the NW1/4 of Section 22, T. 2 S., R. 9 E., P.M.M., in the City of Livingston, Park County, Montana.

The above described tract of Land is to be known and designated as MOUNTAIN VIEW SUBDIVISION, PHASES 1, 2, and 3, City of Livingston, Park County, Montana; and the lands included in all roads, avenues, rights–of–way, parks, and common areas shown on said plat are hereby granted and donated to the use of the public forever.

CERTIFICATE OF GRANT OF UTILITY EASEMENTS

The undersigned hereby grants unto each and every person or firm, whether public or private, providing or offering to provide telephone, electric, power, gas, cable television, water or sewer service to the public, the right to joint use of an easement for the construction, maintenance, repair and removal of their lines and other facilities, in, over, and under and across each area designated on this plat as "Utility Easement" to have and hold forever.

CERTIFICATE OF WAIVER

We, the undersigned property owners, do hereby waive the right to protest the creation of Special Improvement Districts. In doing so, we do not waive any right to comment on, protest, and/or appeal any assessment formula which may be imposed, if we believe it to be inequitable. This waiver shall be binding upon the heirs, assigns and purchasers of all lots within this Subdivision.

Dated this ____ day of _____ , 2023.

LIVINGSTON WEST, LLC

By: _____

Title: _____

STATE OF MONTANA)
: ss
County of _____)

This instrument was acknowledged before me on _____ , 2023, by _____ as of LIVINGSTON WEST, LLC.

_____
Notary Public in and for the State of Montana

NOTES

1. A ten foot (10') wide public utility easement exists on the property side of the public right–of–way, to provide for installation of gas, electric, phone, TV cable, and other utilities, as required. No trees are allowed within the utility easement.

PRELIMINARY PLAT OF

MOUNTAIN VIEW SUBDIVISION, PHASES 1, 2, & 3

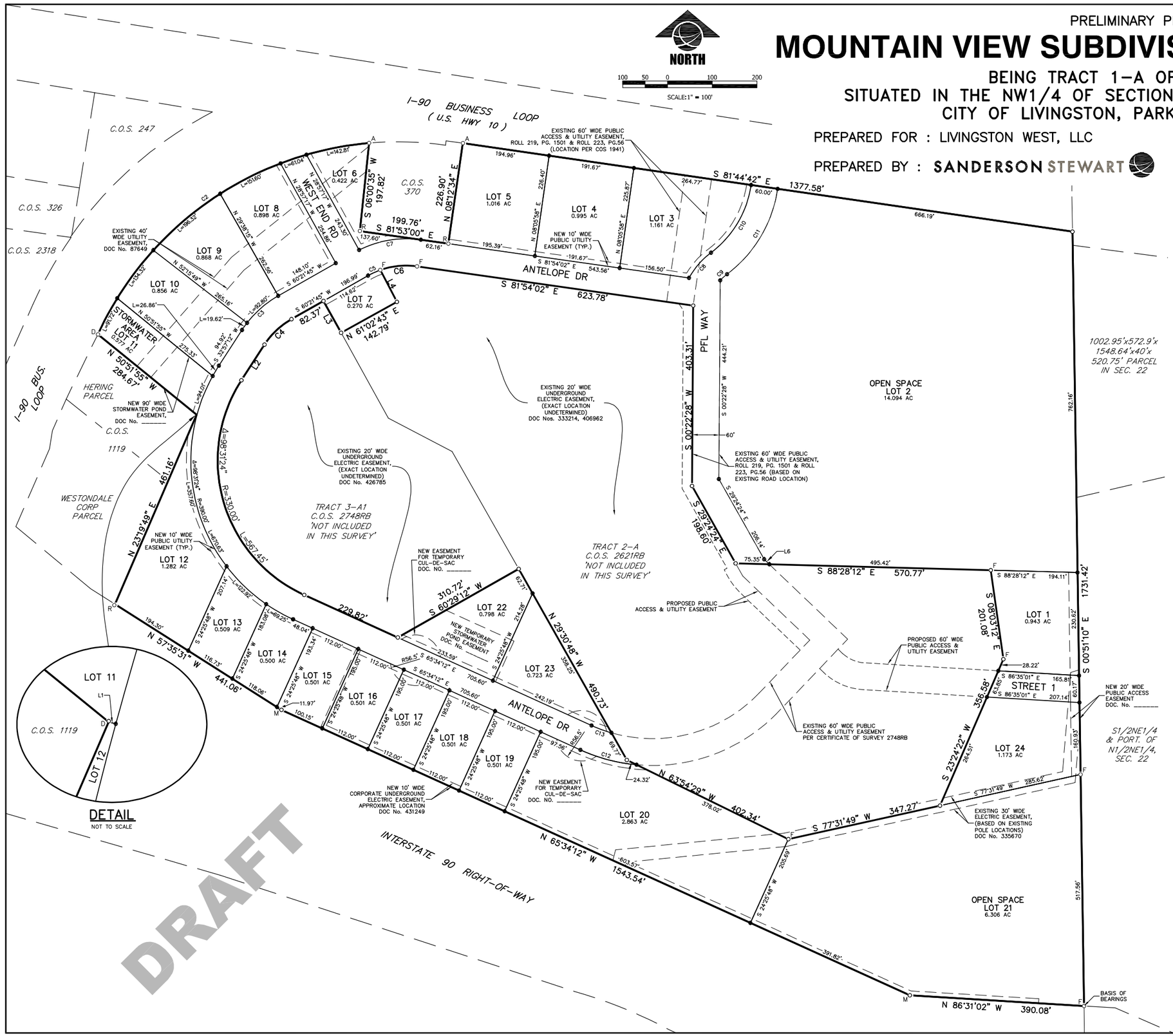
BEING TRACT 1-A OF COS 2748RB,
SITUATED IN THE NW1/4 OF SECTION 22, T. 2 S., R. 9 E., P.M.M.,
CITY OF LIVINGSTON, PARK COUNTY, MONTANA

PREPARED FOR : LIVINGSTON WEST, LLC

JUNE 2023

PREPARED BY : SANDERSON STEWART

BOZEMAN, MONTANA



BASIS OF BEARINGS: THE BASIS OF BEARINGS FOR THIS SURVEY HAS BEEN DERIVED FROM GPS OBSERVATIONS AND IS BASED ON A NAD 83, LAMBERT CONFORMAL CONIC, SINGLE PARALLEL, LOW DISTORTION PROJECTION FOR THE CITY OF BOZEMAN; HAVING A POINT OF ORIGIN AT 46°15'00"N LATITUDE AND 111°15'00"W LONGITUDE WITH A SCALE FACTOR OF 1.000185.

THE GRID TO GROUND COMBINED SCALE FACTOR AT THE SOUTHEAST CORNER OF TRACT 3 OF C.O.S. No. 1941, BEING A REBAR WITH YELLOW CAP MARKED "ALLIED ENG 13174PLS", IS 1.0000188289; THE CONVERGENCE ANGLE IS 0°28'05". DISTANCES ARE INTERNATIONAL FEET. FOR THIS SURVEY, GRID DISTANCE IS ESSENTIALLY EQUAL TO GROUND DISTANCE.

- ○ FOUND SURVEY MONUMENT, REBAR WITH YELLOW CAP '15273'
- $○^{A}$ FOUND SURVEY MONUMENT, REBAR WITH YELLOW CAP '4955'
- $○^{D}$ FOUND SURVEY MONUMENT, REBAR WITH YELLOW CAP '10010'
- $○^{F}$ FOUND SURVEY MONUMENT, REBAR WITH YELLOW CAP '13174'
- $○^{M}$ FOUND SURVEY MONUMENT, 4"x4" CONCRETE ROW MONUMENT
- $○^{R}$ FOUND SURVEY MONUMENT, 5/8" REBAR
- ● SET 5/8" X 18" REBAR WITH YELLOW CAP MARKED WITH THE LICENSE NUMBER OF THE UNDERSIGNED LAND SURVEYOR AND "SANDERSON STEWART"

NOTE: ALL CURVES ARE TANGENT AND ALL PROPERTY LINES INTERSECTING CURVES ARE RADIAL UNLESS OTHERWISE NOTED.

DEVELOPED LOTS (21):	17.785 ACRES
STORMWATER AREA LOTS (1):	0.577 ACRES
OPEN SPACE LOTS (2):	20.400 ACRES
AREA OF DEDICATED R.O.W.:	5.387 ACRES
TOTAL AREA:	44.149 ACRES

FINAL PLAT PHASES

PHASE 1 (LOTS 2 – 17, 21 – 22)
PHASE 2 (LOTS 18 – 20, 23)
PHASE 3 (LOTS 1, 24)

CURVE TABLE					
Curve #	Delta	Radius	Length	Chord Bearing	Chord Distance
C2	60°20'13"	738.60'	777.80'	N 54°48'47" E	742.36'
C3	27°24'33"	235.00'	112.42'	N 46°39'29" E	111.35'
C4	27°24'33"	175.00'	83.72'	N 46°39'29" E	82.92'
C5	10°01'30"	172.43'	30.17'	N 65°22'30" E	30.13'
C6	27°42'42"	172.43'	83.40'	N 84°14'36" E	82.59'
C7	34°59'46"	232.43'	141.97'	S 80°36'05" W	139.77'
C8	23°57'58"	180.00'	75.29'	S 41°09'43" W	74.74'
C9	9°51'41"	120.00'	20.65'	S 48°12'51" W	20.63'
C10	44°58'38"	230.00'	180.55'	S 30°39'23" W	175.95'
C11	44°57'48"	290.00'	227.58'	S 30°39'47" W	221.79'
C12	17°14'40"	390.00'	117.38'	S 74°11'32" E	116.94'
C13	8°15'46"	330.00'	47.59'	S 69°42'05" E	47.55'

LINE TABLE		
Line #	Bearing	Distance
L1	N 74°48'11" W	0.82'
L2	N 32°57'12" E	94.92'
L3	S 28°57'17" E	81.28'
L4	N 27°37'25" W	80.40'
L6	S 46°18'47" E	15.93'

SHEET 2 OF 2

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX A

Preliminary Stormwater Report

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

SANDERSON STEWART

Billings
Bozeman
Denver
Fort Collins

May 3, 2023
Project No. 18005.05

PRELIMINARY STORMWATER REPORT FOR THE MOUNTAIN VIEW SUBDIVISION LIVINGSTON, MONTANA

OVERVIEW NARRATIVE

The purpose of this preliminary drainage report is to present a summary of calculations performed to quantify storm drainage improvements required for the Mountain View Major Subdivision in Livingston, Montana. The project is located in the City of Livingston within Park County, Montana. This site is located between Hwy 10 and Hwy 191. The existing area consists of an access roadway, two (2) commercial facilities, grasslands, and the associated utilities. The storm drain system will be designed to meet the requirements in *The City of Livingston Design Standards and Specification Policy* (DSSP) of August 2022. The "Storm Drainage Report Ruedebusch Offsite Street and Utility" dated May 24, 2022 is referenced in this report, which is located in Appendix C.

EXISTING CONDITIONS

The existing topography of the subdivision flows to the southeast to the existing wetland area. There is a temporary detention pond at the end of the asphalt cul-de-sac as shown in the report previously mentioned. This detention pond will be removed and a new detention pond will be constructed as part of the remaining infrastructure proposed. There is also an existing detention pond to the southeast of the Printing for Less facility that treats a portion of their runoff. The remaining land cover surrounding the proposed roadway is generally vacant grassland. Runoff is generally conveyed into the existing shallow ditches and depressions and directed towards the existing wetland to the east of the site. The new development area is hydrologically divided into five watershed areas in its existing state, Existing Watershed 1, 2, 3, 4, and 5 as shown on Exhibit A in Appendix A. Preliminary hydrologic calculations for these watersheds can be found in Appendix B.

PROPOSED CONDITIONS

The proposed improvements of the Mountain View Subdivision include roads, sidewalks, open lots and open space that will house the stormwater facilities. There will be the removal of two (2) temporary basins as part of the full build out of the subdivision. The temporary detention pond was constructed as a part of the Ruedebusch Offsite Street and Utility project.

The new development area of the subdivision has been broken into seven (7) total basins as shown on Exhibit B in Appendix A. Preliminary hydrologic calculations for these watersheds can be found in Appendix B.

Basin A includes the proposed roadways and sidewalks throughout the southeast side of the subdivision. All other basins include the parcels adjacent to the proposed roadway as seen in Appendix A.

Basin A runoff will be collected in the gutters and conveyed through storm drainage infrastructure toward the proposed detention pond.

Basins B, C, and D runoff will generally drain toward the new street and will be conveyed along swales following the proposed roadway. These swales will convey the runoff towards the proposed detention pond. As development occurs on the lots, the swales will be filled as the developments will be required to mitigate runoff within their site. The new detention basin at the end of the asphalt cul-de-sac will be designed to store and convey the pre-development peak flows from each of these basins.

Basin E and F is generally "open space" that will remain undeveloped. The runoff will follow existing drainage patterns and diverted to the wetland on the eastern edge of the subdivision.

Basin G runoff will drain to an existing culvert under Antelope Drive then to PFL Way to be directed to existing drainage patterns and diverted to the wetlands on the eastern edge of the subdivision.

For the remaining areas of the Mountain View Subdivision, reference the previously approved Ruedebusch Offsite Street and Utility Storm Drainage Report located in Appendix C.

None of the drainage basins in the subdivision will drain into the MDT right of way. There is an existing culvert under Interstate 90 that flows to the north into the subdivision near Basin C. As development occurs, it will be the responsibility of the associated developments to mitigate the additional flow from the MDT right of way.

INLETS

Inlet locations will be designed to capture runoff from the right-of-way area and limit the spread width to less than 9.5-feet for this project's typical section. Bentley's FlowMaster program, which uses the methodology of the FHWA HEC-22 Manual, will be utilized to calculate inlet spacing. This program will be used to calculate the spread width and gutter flow depth at each of the inlets using the calculated peak post-development flow rate from the 25-year storm event, inlet dimensions, and road parameters. The allowable limit for the depth of flow in the curb line is 0.15-feet below the top of curb, but the

design will provide at least 0.3-feet. The inlets will be analyzed with a 50% clogging factor.

PIPES

The Manning's equation will be used to analyze and design the storm drain pipes throughout the project. Pipe slopes will be set to maintain a minimum depth of cover of two feet below final grade and the minimum velocity of 3-fps when flowing full. The storm drain pipes will be designed to convey the peak flow from the 25-year storm event. When the depth of flow in the pipe exceeds full flow capacity, the next larger size pipe will be used.

BASIN/UNDERGROUND DETENTION FACILITY

As mentioned above, a new detention basin is proposed to the northeast of the proposed asphalt cul-de-sac at the end of the street. The proposed detention basin will treat the runoff and limit the discharge flow rate to the 2-year pre-development flow rate from the existing watershed.

The new detention basin will have a maximum side slope steepness of 4:1. Site detention will be calculated using the 10-year design storm allowing for the discharge of the 2-year pre-development flow rate.

MAJOR STORM EVENTS

In the event of a 100-year storm event, the proposed detention basin will overtop and flow to the east with shallow concentrated flow.

Appendices

Appendix A – Watershed Exhibits
Appendix B – Preliminary Hydrology Calculations
Appendix C – Storm Drainage Report Ruedebusch Offsite Street and Utility
Appendix D – 2019 Wetlands Report

Mountain View Subdivision
Stormwater Report
18005.05

APPENDIX A
Watershed Exhibits

ENDURING
COMMUNITY
DESIGN

SANDERSON STEWART

EXHIBIT A

PRE–DEVELOPMENT
WITHIN
MOUNTAIN VIEW SUBDIVISION

NORTH

150 75 0 150 300
SCALE:1" = 150'

PREPARED FOR : LIVINGSTON WEST, LLC.
PREPARED BY : SANDERSON STEWART

SEPTEMBER 2022
LIVINGSTON, MONTANA

EXHIBIT B

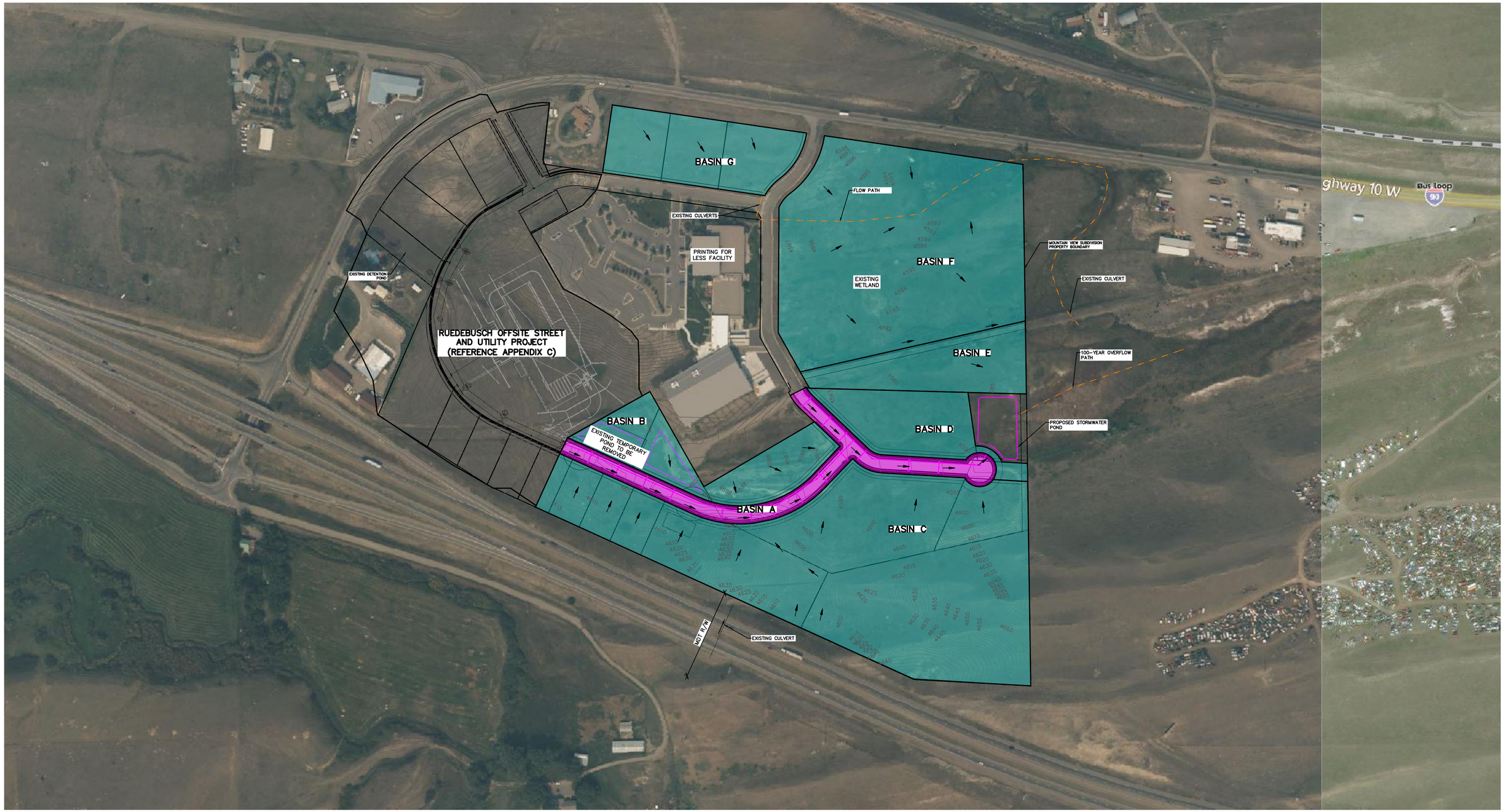
POST–DEVELOPMENT
WITHIN
MOUNTAIN VIEW SUBDIVISION

NORTH

150 75 0 150 300
SCALE:1" = 150'

PREPARED FOR : LIVINGSTON WEST, LLC.
PREPARED BY : SANDERSON STEWART

MAY 2023
LIVINGSTON, MONTANA



Mountain View Subdivision
Stormwater Report
18005.05

APPENDIX B
Preliminary Hydrology Calculations

ENDURING
COMMUNITY
DESIGN

SANDERSON STEWART

HYDROLOGY WORKSHEET

Project: Mountain View Subdivision
Project No.: 18005.05
Date: 05/2/2023

SANDERSON STEWART

PRE DEVELOPMENT/EXISTING BASINS

WS	Tc (hours)	Area (sf)	Area (ac.)	Area Impervious (sf)	Area Gravel (sf)	Area Pervious (sf)	RC	% IC	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	Q_2 Peak Flow (cfs)	Q_{10} Peak Flow (cfs)	Q_{25} Peak Flow (cfs)
1	0.350	804,928	18.48	0	0	804,928	0.20	0%	0.940	1.583	1.840	3.47	5.85	6.80
2	0.450	187,231	4.30	0	0	187,231	0.20	0%	0.796	1.344	1.567	0.68	1.16	1.35
3	0.292	152,213	3.49	0	0	152,213	0.20	0%	1.060	1.782	2.068	0.74	1.25	1.45
4	0.692	518,145	11.89	0	0	518,145	0.20	0%	0.599	1.017	1.190	1.43	2.42	2.83
5	0.283	138,157	3.17	0	0	138,157	0.20	0%	1.080	1.816	2.107	0.69	1.15	1.34

POST DEVELOPMENT/PROPOSED BASINS

WS	Tc (hours)	Area (sf)	Area (ac.)	Area Impervious (sf)	Area Gravel (sf)	Area Pervious (sf)	RC	% IC	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	Q_2 Peak Flow (cfs)	Q_{10} Peak Flow (cfs)	Q_{25} Peak Flow (cfs)
A	0.083	111,236	2.55	83,558	0	27,679	0.73	75%	2.423	4.023	4.611	4.49	7.46	8.55
B	0.283	127,336	2.92	0	0	127,336	0.20	0%	1.080	1.816	2.107	0.63	1.06	1.23
C	0.217	681,016	15.63	0	0	681,016	0.20	0%	1.290	2.162	2.502	4.03	6.76	7.82
D	0.317	103,834	2.38	0	0	103,834	0.20	0%	1.004	1.689	1.962	0.48	0.81	0.94
E	0.300	120,848	2.77	0	0	120,848	0.20	0%	1.040	1.750	2.031	0.58	0.97	1.13
F	0.692	518,145	11.89	0	0	518,145	0.20	0%	0.599	1.017	1.190	1.43	2.42	2.83
G	0.283	138,157	3.17	0	0	138,157	0.20	0%	1.080	1.816	2.107	0.69	1.15	1.34

Mountain View Subdivision
Stormwater Report
18005.05

APPENDIX C

Storm Drainage Report
Ruedebusch Offsite Street and Utility

ENDURING
COMMUNITY
DESIGN

SANDERSON STEWART

STORM DRAINAGE REPORT

RUEDEBUSCH OFFSITE STREET AND UTILITY

21098.01

CITY OF LIVINGSTON

Community Planning

Landscape and Placemaking

Infrastructure Engineering

Surveying and Mapping

Branding

May 24th, 2022

SANDERSON STEWART

ENDURING COMMUNITY DESIGN

RUEDEBUSCH OFFSITE STREET AND UTILITY IMPROVEMENTS

STORM DRAINAGE REPORT

LIVINGSTON, MONTANA

CERTIFICATION

I hereby state that this Storm Drainage Report has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community of professional engineers. The analysis has been prepared utilizing procedures and practices specified by the City of Livingston and within the standard accepted practices.

Steph Hudock

Steph Hudock, P.E.

05/24/2022

Date

SANDERSON STEWART

Billings
Bozeman
Denver
Fort Collins

November 24, 2021
Revised: January 25, 2022
Revised: May 24, 2022
Project No. 21098

STORM DRAINAGE REPORT
FOR
RUEDEBUSCH OFFSITE STREET AND UTILITY IMPROVEMENTS
LIVINGSTON, MONTANA

OVERVIEW NARRATIVE

The purpose of this drainage report is to describe the drainage design associated with the improvements to the Ruedebusch Off-site Public Infrastructure Improvements project. The project is located in the City of Livingston within Park County, Montana. This site is located between Hwy 10 and Hwy 191. The existing area consists of 16.8 acres of grassland with no existing infrastructure or structures. The proposed improvements will consist of a new roadway within a new 60 foot right-of-way and will include drive lanes, curb and gutter, boulevards, and sidewalk on both sides of the road. The project will extend 1,550-feet from Antelope Drive to the West and the road will curve to the SE ending in an asphalt bulb. The storm drain system will be designed to meet the requirements in *The City of Livingston Design Standards and Specification Policy* (DSSP) of February 2021.

HYDROLOGY

The Rational Method and rainfall data provided was used to calculate the runoff volumes for the 10-year storm event for the runoff storage facilities and the 25-year storm event for the storm drain conveyance facilities. The site stormwater improvements have been designed with the intent to meet the current City of Livingston drainage regulations for the entire site to the extent feasible. Watersheds were delineated for both existing and proposed conditions and are shown in Exhibits A and B in Appendix A. The weighted runoff coefficient "C" was calculated for each contributing area using 0.9 for impervious areas, 0.8 for gravel areas, 0.2 for undeveloped areas(grassland), and 0.3 for the landscaped boulevard and adjacent pervious area. The results of the hydrologic analysis for the storm events described above are shown in Appendix B.

Hydrologic Equations

C_{wd} = *Weighted Runoff Coefficient*
A = *Area (acres)*
I = *Rainfall Intensity (in/hr)*
Q = *Peak Runoff (cfs)*
$Q = C_{wd} \times I \times A$

Water Quantity Volume

$Q\ (cfs) = C \times 0.51\ in/hr \times A\ (acre)$
$V\ (cf) = 7200\ sec \times Q\ (ft^3)$

Water Quality Volume

$V\ (cf) = 0.5\ in \div 12\ in \times A\ (sf)$

EXISTING CONDITIONS

The existing topography of the site flows to the southeast to the existing wetland area. There are no existing stormwater facilities in the area. Surficial soils are a topsoil or fill which was encountered in all borings. The underlying soils were a clay with varying amounts of sand and silt ranging from 0.5-feet to 21.5-feet below ground surface. Sand with varying amounts of clay and gravel were present in some borings ranging from 1.5-feet to 6.5 feet below ground surface. Sandstone and claystone were encountered depths below ground surface ranging from 5-feet to 41.5-feet. Groundwater was encountered at ranging depths from 6 to 15 feet below existing site elevations. The Geotechnical Report is attached in Appendix D. The land cover surrounding the corridor is generally vacant grassland. Runoff is generally conveyed into the existing shallow ditches and depressions.

The project area is hydrologically divided into three watershed areas, Existing Watershed 1, 2 and 3 as shown on Exhibit A in Appendix A. Runoff from Existing Watershed 1 overland flows to existing Antelope Drive to the east. This area is captured by an existing culvert which is then routed under an existing approach to a detention basin on COS 2621RB Parcel 2-A.

Runoff from Existing Watershed 3 overland flows to the south and then east eventually draining into the existing wetland to the east of PFL Way. Runoff within Existing Watershed 3 discharges to the outfall location for the proposed drainage system. Therefore, the peak flows from this watershed were compared against the proposed peak flows.

Existing Watershed 3:

Area = 13.06 acres
Runoff Coefficient = 0.2
Time of Concentration = 17.10 min
2-Year Peak Flow = 2.81 cfs
10-Year Peak Flow = 4.72 cfs
25-Year Peak Flow = 5.48 cfs

Runoff from Existing Watershed 3 flows to the existing ditch located on the western edge of the property as shown on Exhibit A in Appendix A. This ditch functions more like a retention area since it is relatively flat with little positive flow and the end of the ditch is filled in.
This ditch not only receives runoff from the adjacent land but also from dual 36-inch crossing culverts under Highway 10. These culverts primarily convey runoff from west of the project area but might also convey irrigation waste water It is unknown how much water is conveyed through these culverts. The water that enters the existing ditch is generally conveyed to the south but the ditch terminates and water is retained within the ditch. There are two overtopping locations of the ditch. The first is at elevation 4626.0' where runoff would overtop into the Highway 10 roadside ditch at the exit of the culverts. There is also an overtopping elevation point at the end of the ditch where it terminates at elevation 4623.00'. For water to enter the end of the ditch, it must first overtop the intermediate high points with in the ditch at elevation 4625.0'. Based on a visual inspection of the ditch and a desktop review, it does not appear that water is conveyed to the end of the ditch. As shown image below taken June 17th, 2021 (Figure 4), most of the runoff that is conveyed to the ditch is blocked by West End Road to the west. Areas of high water retention are characterized by green grass, this ditch does not show the characterizations of high water retention.

Figure 1: Dual 36" Culverts Looking West (exit of culverts)

Figure 2: Entrance to Ditch Looking East (exit of culverts behind photographer)

Figure 3: Center of the Ditch Looking West

Figure 4: End of Ditch Looking East

Figure 5: Aerial Image of Ditch

PROPOSED CONDITIONS

The storm drain design associated with the new road improvements will consist of new curb and gutter, curb inlets and storm drain trunkline. The proposed design is also hydrologically split into two Major Watersheds based on their discharge locations, Proposed Watershed A and Proposed Watershed B as shown on Exhibit B in Appendix A.

Proposed Watershed A is hydrologically split into two sections, Proposed Watershed A1 and A2. Runoff from Proposed Watershed A2 will match existing drainage patterns. Runoff from Proposed Watershed A1 will flow into Antelope Drive east towards the intersection with PFL Way. Runoff will flow in the gutter of PFL Way until the end of the curb where runoff is diverted into the existing wetland to the east. No new inlets and pipes are proposed for Proposed Watershed A.

Runoff from Proposed Watershed B is split into three separate basins as Shown on Exhibit B in Appendix A. Proposed Watershed B1 is the area west of the new Street B, Proposed Watershed B2 is the area east of the new Street B and Proposed Watershed B3 is the area that drains into the proposed retention area to matching the existing retention area.

Proposed Watershed B1: The grade of the new Street B is set above existing grade and therefore a ditch is formed at the edge of the road to tie the new road into existing ground. This ditch will collect a small amount of runoff from the undeveloped land from Proposed Watershed B1 to the west of the road. The peak flow rates from this undeveloped land are relatively small. The ditch conveys runoff to the new detention pond. The ditch is temporary and will be filled in as development occurs on the lots. The alternative would have been to install the road below adjacent grade forcing runoff to drain onto the road, which would have significantly increase the storm drain infrastructure. The temporary ditch cross section side slopes varies depending on how the new road fill slope ties into the existing ground. The minimum ditch capacity was calculated using Bentley's FlowMaster, which applies the Manning's Equation to determine the capacity of the ditch based off the longitudinal slope, side slopes, Manning's Roughness, and depth. A Manning's Roughness coefficient of 0.03 was used to determine the ditch capacity. The smallest ditch capacity for each watershed was compared to the 25-year, 5-minute peak flow to determine if the ditch can adequately convey the runoff. Watershed B1 has a 25-year peak flow of 3.25 cfs, which can be conveyed with the smallest ditch capacity of 7.01 cfs.

As proposed development moves in adjacent to the road, the ditch will be removed as the developments will be required to mitigate runoff within their site. When this adjacent land is developed, the new trunkline has the capacity to carry the 2-year pre development flow rate from the undeveloped plans. The new detention basin at the end of the asphalt bulb has capacity to store and convey the pre-development peak flow from Watershed B1 and B2.

Proposed Watershed B2: This watershed will soon be developed into a new FedEx facility. This area is included in the calculations of the off-site improvements to ensure that the proposed storm drain facilities have the capacity to convey the 2-year pre-development flow rate from the site.

Proposed Watersheds B3: To match existing conditions, the existing capacity of the ditch/retention area was calculated. This volume was estimated to be 4,172 CF. A new retention area is proposed in the same location with a volume of 15,462 CF. In the event that the volume of water to the pond exceeds the available storage capacity, water will be able to overtop into a new 12-inch outlet pipe at an elevation of 4925.50' is also proposed at the east end of the pond and connects into the proposed storm drain system (Inlet D-1) within Street A. However, it is anticipated that the new retention pond has the capacity to retain all of the water diverted to the pond.

INLETS

Inlet locations were designed to capture runoff from the right-of-way area and limit the spread width to less than 9.5-feet for this project's typical section. Bentley's FlowMaster program, which uses the methodology of the FHWA Hec-22 Manual, was used to calculate the spread width and gutter flow depth at each of the inlets using the calculated peak post-development flow rate from the 25-year storm event, inlet dimensions, and road parameters. The allowable limit for the depth of flow in the curb line is 0.15-feet below the top of curb, but the design provides at least 0.3-feet. The inlets were analyzed with a 50% clogging factor. The bypass flow to the bulb is less than the pre-development flow rate and will dissipate into the existing ground conditions to the west. The table in Appendix C summarizes the calculations for each inlet and verifies that they meet design requirements.

PIPES

The Manning's equation was used to analyze and design the storm drain pipes throughout the project. Pipe slopes are set to maintain a minimum depth of cover of two feet below final grade and the minimum velocity of 3-fps when flowing full. The storm drain pipes were designed to convey the peak flow from the 25-year storm event. When the depth of flow in the pipe exceeds full flow capacity, the next larger size pipe was used. The main trunkline was sized to account for the pre-development flow rates from adjacent lots (B1 & B3) in anticipation for future development. Storm drain pipe design analysis is summarized in Appendix C.

BASIN/UNDERGROUND DETENTION FACILITY

As mentioned above, a new detention basin is proposed to the northeast of the proposed asphalt bulb at the end of Street A. The proposed detention basin will treat the runoff and limit the discharge flow rate to the 2-year pre-development flow rate from Existing Watershed 3.

The new detention basin will have a maximum side slope steepness of 4:1. Site detention was calculated using the 10-year design storm allowing for the discharge of the 2-year pre-development flow rate. The proposed design will keep the water depth at a maximum of 1.5 feet.

Because the runoff from Post-development Watershed A1 isn't treated before leaving the project site, the proposed detention basin is designed to treat the equivalent 0.5-inch runoff volume and limit the pre-development flow rate to account for the increase in the 10-year peak flow rate from Post-development Watershed A1. The final discharge location for both Post-development Watershed A1 and new detention pond is the existing wetland to the east at the same location. Watershed A1 sheet flows through Antelope Drive to the south, runoff flows in the gutter to PFL

Way. At the intersection of PFL Way, runoff flows south down the curb and gutter to the end of the Printing for Less Development This is the same general location that the existing water from Watershed B discharges. The time of concentration for Watershed A1 is 13.70 minutes and was used to calculate the peak flows.

Proposed Watershed A1
2-Year Peak Flow Rate = 0.84 cfs
10-Year Peak Flow Rate = 1.41 cfs

Existing Watershed 3
2-Year Peak Flow Rate = 2.81 cfs
10-Year Peak Flow Rate =4.72 cfs

The discharge rate for the detention basin is calculated by subtracting the 10-year post development peak runoff rate from Watershed A1 which flows unrestricted to the existing wetland, from the 2-year predevelopment flow rate to the wetland from existing Watershed 3. A proposed 6-inch outlet pipe will restrict the peak flow leaving the detention pond to 0.92 cfs. This method was used to calculate the allowable outflow from the detention pond because it ensures that during the 10-year storm event the peak flow rate to the wetland is still limited to the 2-year pre-development flow rate from Existing Watershed 3 (2.81 cfs).

Design Flow Rates
2-Year Pre Development Peak Flow Rate from Watershed 3 = 2.81 cfs
10-Year Post Development Peak Flow Rate from Watershed A1 =1.41 cfs

2.81 cfs – 1.41 cfs = 1.40 cfs = Calculated Detention Basin Discharge Rate
Required Detention Discharge Rate = 1.40 cfs
Provided Detention Discharge Rate = 0.92 cfs with 6-inch outlet pipe
Proposed 2-Year Peak Flow Rate to Wetlands = 0.84 cfs + 0.92 cfs = 1.76 cfs
Proposed 10-Year Peak Flow Rate to Wetlands = 1.41 cfs + 0.92 cfs = **2.33 cfs < 2.81 cfs**

If the design were to just compare the 2-year and 10-year flows against eachother, then the peak flow rate during the 10-year storm event would exceed the 2-year pre-development flow rate to the wetlands.

2-Year Storm Event
2.81 cfs – 0.84 cfs = 1.97 cfs

10-Year Storm Event
4.72 cfs – 1.41 cfs = 3.31 cfs

Watershed A through I Required 10-Year Storage Volume = 10,808 CF
Watershed A, C, D, F, G, H, I Required 0.5-inch Treatment Volume = 5,577 CF
Provided Storage Volume = 12,496 CF

The basin is design with a bottom area length of 120 LF, a width of 60 LF, and basin bottom area of 7,200 SF. The basin has a depth of 1.5-feet. The bottom of the basin is at an elevation of 4,603.5-

feet and at this location a borehole of 6.5-feet from existing surface encountered no groundwater. The existing elevation of the borehole is 4602-feet. This gives more than three feet of cover between the stormwater basin and the potential ground water. The 6-inch outlet pipe capacity was estimated to be 0.92 cfs using HY-8 to model the outlet pipe as a culvert. The maximum capacity (0.92 cfs) was determined by finding the capacity of the culvert at the maximum headwater depth of 1.5 feet (maximum pond depth). Calculations have been provided in the Appendix.

The basin area was calculated to release the runoff at a rate less than 145-square feet per 1-cfs for sediment control to treat the runoff. The settling velocity of 40 micron particles is 0.0069 fps allowing sediment to settle and treat the runoff before discharge. This is shown in the post-development basin sizing table in Appendix C. This reduces the total project peak outflow to below that of the pre-development flow rate and post-development flow rate from Watershed A1 discussed below.

Minimum Pond Area for Water Quality Treatment according to Section 2.C.4 of the DSSP and the Sizing Detention Basins Sample Problem on page 74 of the DSSP.

Settling velocity of 40-micron particles = 0.0069 ft/sec
Design Release Rate = 0.92 cfs
Minimum Area Required: 0.92 cfs ÷ 0.0069 ft/sec = 133.3 SF < proposed 7,200 SF

MAJOR STORM EVENTS

In the event of a 100-year storm event, the detention basin to the northeast of the bulb will overtop and flow to the east with shallow concentrated flow. During large storm events runoff will pond at inlets D1 and D2, which are located at a sag in Street A. Once the storm drain drainage facilities are at capacity, runoff will overtop the sidewalks to adjacent properties at the sag location. There are no properties to the west that will be impacted. To the east, if the runoff overtops the sidewalk, it will be captured in the proposed drainage swale before reaching the proposed building, resulting in no anticipated property damage.

In the event that the volume of water directed to the proposed retention basin used capture the water exiting the dual 36-inch culverts, water will be able to overtop in two locations. The first location would be at the exit of the dual 36-inch culverts, where runoff can overtop to the south and flow in the west roadside ditch of Highway 10. The second location would be at the western edge of the pond where runoff would overtop and flow along the toe of slope of the road (the temporary ditch).

Appendices

Appendix A – Watershed Exhibits *(include both existing and proposed in two separate exhibits – A & B)*
Appendix B – Pre-Development Calculations
Appendix C – Post-Development Calculations
Appendix D – Geotechnical Investigation Report

Appendix A

STORMWATER BASINS

EXHIBIT A

EXISTING WATERSHEDS
WITHIN
SUBDIVISION OF S22, T02 S, R09 E, C.O.S. 2621RB
RUEDEBUSCH OFF-SITE STREET AND UTILITY IMPROVEMENTS

NORTH

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

PREPARED FOR : RUEDEBUSCH DEVELOPMENT & CONSTRUCTION INC.
PREPARED BY : SANDERSON STEWART

MAY, 2022
BOZEMAN, MONTANA

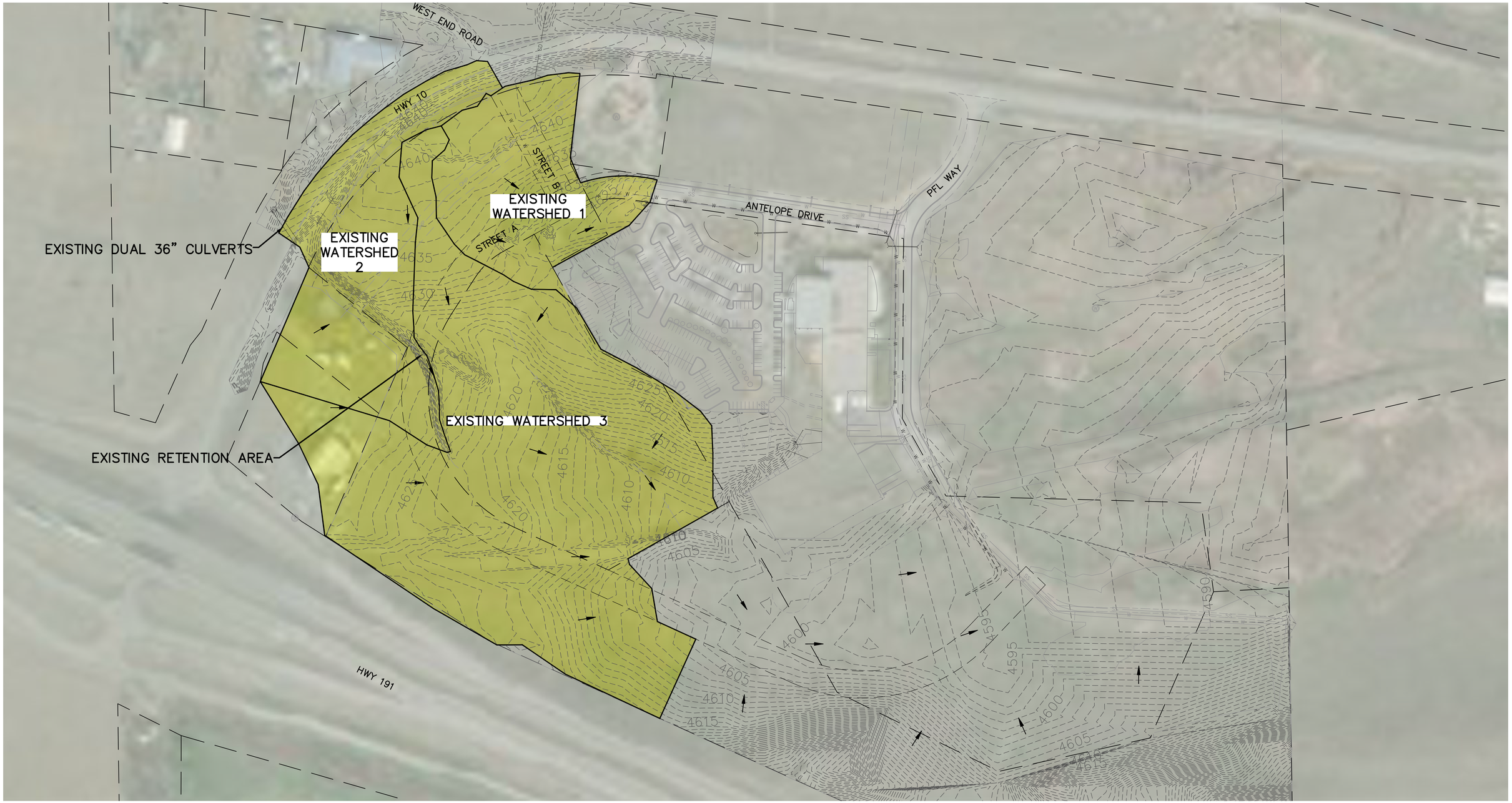


EXHIBIT B

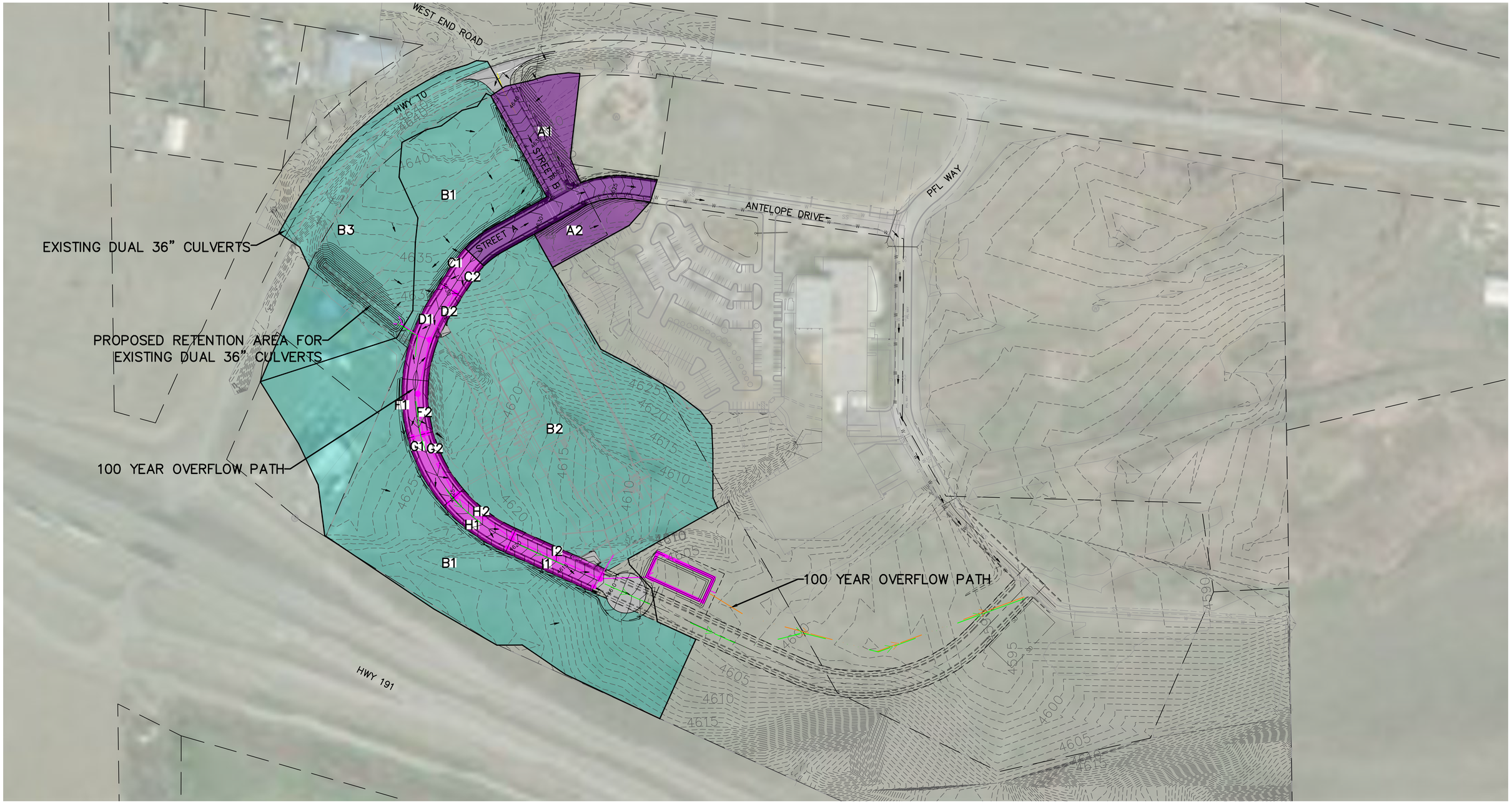
PROPOSED WATERSHEDS
WITHIN
SUBDIVISION OF S22, T02 S, R09 E, C.O.S. 2621RB
RUEDEBUSCH OFF-SITE STREET AND UTILITY IMPROVEMENTS

NORTH

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

PREPARED FOR : RUEDEBUSCH DEVELOPMENT & CONSTRUCTION INC.
PREPARED BY : SANDERSON STEWART

MAY, 2022
BOZEMAN, MONTANA



Appendix B

EXISTING CALCULATIONS

HYDROLOGY WORKSHEET

Project: Reudebush
Project No.: 21098
Date: 05/20/2022

SANDERSON STEWART

PRE DEVELOPMENT/EXISTING BASINS

WS	Tc (hours)	Area (sf)	Area (ac.)	Area Impervious (sf)	Area Gravel (sf)	Area Pervious (sf)	RC	% IC	I_2 (in/hr)	I_{10} (in/hr)	I_{25} (in/hr)	Q_2 Peak Flow (cfs)	Q_{10} Peak Flow (cfs)	Q_{25} Peak Flow (cfs)
1	0.083	139,527	3.20	0	0	139,527	0.20	0%	2.423	4.023	4.611	1.55	2.58	2.95
2	0.167	196,992	4.52	22,510	0	174,482	0.28	11%	1.533	2.564	2.959	1.94	3.25	3.75
3	0.285	568,766	13.06	0	0	568,766	0.20	0%	1.076	1.809	2.099	2.81	4.72	5.48

HYDROLOGY WORKSHEET

Project: Ruedebusch
Project No.: 21098
Date: 5/20/2022

Time of Concentration

Watershed 3	Sheet Flow					Shallow Concentrated Flow				Channel Flow						Tc
	L (ft)	n	P (in)	s (ft/ft)	Tsf (min)	s (ft/ft)	V (ft/s)	L (ft)	Tscf (min)	r (ft)	s (ft/ft)	n	V (ft/s)	L (ft)	Tch (min)	Total (min)
Flow Path 1	275	0.035	1.385	0.0252	9.52											9.52
Flow Path 2	88	0.035	1.385	0.0766	2.45											2.45
Flow Path 3						0.0279	2.70	218	1.35							1.35
Flow Path 4						0.0313	2.85	404	2.36							2.36
Flow Path 5						0.0136	1.88	160	1.42							1.42
Flow Path 6																

Total 17.10

USDA *Urban Hydrology for Small Watersheds TR-55 Manual.*

Sheet Flow Equations

Eq. 3-3

$$T_{sf} = \frac{0.007(nL)0.8}{P_2^{0.5} s^{0.4}}$$

L = Length of overland sheet flow (ft)
n = Manning's roughness
P = 2-year, 24-hour rainfall, in
s = Slope (ft/ft)

Shallow Concentrated Flow Equations

$V = 16.135(s)^{0.5}$ for Grassed Waterways
$V = 6.962(s)^{0.5}$ for Short-grassed pasture
$V = 20.328(s)^{0.5}$ for Pavement

$$T_{scf} = \frac{L}{60V}$$

s = Slope (ft/ft)
L = Length of overland sheet flow (ft)

Channel/Pipe Flow Equations

$$V = \frac{1.49(r^{0.67} s^{0.5})}{n}$$

$$T_{ch} = \frac{L}{60V}$$

L = Length of overland sheet flow (ft)
n = Manning's roughness
s = Slope (ft/ft)
r = hydraulic radius (ft)

Appendix C

PROPOSED CALCULATIONS

HYDROLOGY WORKSHEET

Project: Reudebush
Project No.: 21098
Date: 05/20/2022

POST DEVELOPMENT/PROPOSED BASINS

Time of Concentration= 5 mins

WS	Structure	Area (sf)	Area (ac.)	Area Impervious (sf)	Area Pervious (sf)	Weighted RC	% IC	$V_{0.5\text{-in}}$ (cf)
C1	C1	2,716	0.06	2,241	475	0.84	83%	113.17
C2	C2	2,561	0.06	2,126	435	0.84	83%	106.71
D1	D1	6,551	0.15	5,404	1,147	0.84	82%	272.96
D2	D2	6,137	0.14	5,339	798	0.87	87%	255.71
F1	F1	3,745	0.09	3,087	658	0.84	82%	156.04
F2	F2	3,458	0.08	2,874	584	0.84	83%	144.08
G1	G1	4,884	0.11	4,033	851	0.84	83%	203.50
G2	G2	4,459	0.10	3,706	753	0.84	83%	185.79
H1	H1	4,865	0.11	4,011	854	0.84	82%	202.71
H2	H2	4,492	0.10	3,733	759	0.84	83%	187.17
I1	I1	6,053	0.14	4,993	1,060	0.84	82%	252.21
I2	I2	6,368	0.15	5,635	733	0.88	88%	265.33
							Sub Totals	2,345.38 CF

WS	TOC (min)	Area (sf)	Area (ac.)	Area Impervious (sf)	Area Pervious (sf)	RC	% IC	$V_{0.5\text{-in}}$ (cf)	Q_2 Peak Flow (cfs)	Q_{10} Peak Flow (cfs)	Q_{25} Peak Flow (cfs)
A1	13.70	58,921	1.35	25,052	33,869	0.50	43%	2,455.04	0.84	1.41	1.63
A2	5	18,627	0.43	0	18,627	0.20	0%	776.13	0.21	0.34	0.39
B1	16	323,631	7.43	0	323,631	0.20	0%	0.00	1.67	2.81	3.25
B2	7	291,232	6.69	22,510	268,722	0.25	8%	0.00	3.30	5.49	6.32
B3	7	147,065	3.38	0	147,065	0.20	0%	0.00	1.31	2.18	2.51
							Sub Totals	3,231.17 CF			
							Total	5,576.54 CF			

HYDROLOGY WORKSHEET

Project: Ruedebusch
Project No.: 21098
Date: 1/25/2022

SANDERSON STEWART

Time of Concentration

Watershed A1	Sheet Flow					Shallow Concentrated Flow				Channel Flow						Tc
	L (ft)	n	P (in)	s (ft/ft)	Tsf (min)	s (ft/ft)	V (ft/s)	L (ft)	Tscf (min)	r (ft)	s (ft/ft)	n	V (ft/s)	L (ft)	Tch (min)	Total (min)
Flow Path 1										0.058	0.024	0.015	2.31	1896	13.698	13.70
																0.00
																0.00
																0.00
																0.00
																0.00

Total 13.70

USDA *Urban Hydrology for Small Watersheds TR-55 Manual.*

Sheet Flow Equations

Eq. 3-3

$$T_{sf} = \frac{0.007(nL)0.8}{P_2^{0.5} s^{0.4}}$$

L = Length of overland sheet flow (ft)
n = Manning's roughness
P = 2-year, 24-hour rainfall, in
s = Slope (ft/ft)

Shallow Concentrated Flow Equations

$V = 16.135(s)^{0.5}$ for Grassed Waterways
$V = 6.962(s)^{0.5}$ for Short-grassed pasture
$V = 20.328(s)^{0.5}$ for Pavement

$$T_{scf} = \frac{L}{60V}$$

s = Slope (ft/ft)
L = Length of overland sheet flow (ft)

Channel/Pipe Flow Equations

$$V = \frac{1.49(r^{0.67} s^{0.5})}{n}$$

$$T_{ch} = \frac{L}{60V}$$

L = Length of overland sheet flow (ft)
n = Manning's roughness
s = Slope (ft/ft)
r = hydraulic radius (ft)

PIPE SIZING WORKSHEET - RATIONAL METHOD

Design Storm	=	25-yr
Intensity	=	4.61 in/hr
Time of Concentration	=	5-min

SANDERSON STEWART

Pipe Run - STREET A

Pipe #	Included Areas	Runoff Coeff.	Total Area (acres)	Peak Flow (cfs)	Added Flow (cfs)	Q Total Flow (cfs)	Pipe Length (ft)	Pipe Slope (ft/ft)	Pipe Size (in)	Qf Flow Full Capacity (cfs)	Vf Flow Full Velocity (fps)	Q/Qf	d/D	V/Vf	d (in)	V Actual (fps)
20	C	0.84	0.12	0.47	0.00	0.47	119	**0.02770**	**15**	10.78	8.78	0.043	0.16	0.42	2.45	3.68
21	C-D	0.85	0.41	1.62	0.87	2.49	124	**0.02000**	**15**	9.16	7.46	0.271	0.41	0.72	6.10	5.35
22	C-E	0.84	0.58	2.23	0.00	2.23	91	**0.02040**	**15**	9.25	7.54	0.241	0.38	0.69	5.77	5.23
23	C-E	0.84	0.58	2.23	0.46	2.70	156	**0.02000**	**15**	9.16	7.46	0.294	0.42	0.73	6.35	5.46
24	C-G	0.84	0.79	3.06	0.00	3.06	158	**0.01270**	**15**	7.30	5.95	0.420	0.51	0.81	7.70	4.82
25	C-H	0.84	1.01	3.89	0.79	4.68	217	**0.01500**	**15**	7.93	6.46	0.590	0.63	0.90	9.38	5.80
26	C-I	0.84	1.29	4.99	1.86	6.85	101	**0.01680**	**15**	8.40	6.84	0.816	0.77	0.99	11.50	6.77
12	C-I	NA	NA	2.58	0.00	2.58	14	**0.01000**	**12**	3.57	4.55	0.722	0.71	0.95	8.49	4.34

INLET WORKSHEET 25-YEAR

Project: Ruedebusch
Project No.: 21098
Date: 01/25/2022

SANDERSON STEWART

Structure Info		Roadway Inputs		Peak Flow		Gutter Spread			Intercepted	Bypass
Structure Name	Type	Cross Slope (ft/ft)	Long. Slope (ft/ft)	Q (cfs)	Q + Bypass (cfs)	Spread Width (ft)	Depth (in)	Depth (ft)	Qint	Qb (cfs)
High Point										
C1	On Grade	2.00%	2.75%	0.24	0.24	3.5	0.8	0.07	0.20	**0.04**
D1	Sag	2.00%	2.45%	0.58	0.62	7.7	1.8	0.15	0.62	**0.00**
F1	On Grade	2.00%	1.13%	0.33	0.33	4.6	1.1	0.09	0.26	**0.07**
G1	On Grade	2.00%	1.85%	0.43	0.50	5.0	1.2	0.10	0.36	**0.14**
H1	On Grade	2.00%	2.77%	0.43	0.57	4.8	1.2	0.10	0.41	**0.16**
I1	On Grade	2.00%	4.35%	0.54	0.70	4.8	1.1	0.09	0.49	**0.21**

Structure Info		Roadway Inputs		Peak Flow		Gutter Spread			Intercepted	Bypass
Structure Name	Type	Cross Slope (ft/ft)	Long. Slope (ft/ft)	Q (cfs)	Q + Bypass (cfs)	Spread Width (ft)	Depth (in)	Depth (ft)	Qint	Qb (cfs)
High Point										
C2	On Grade	2.00%	2.75%	0.23	0.23	2.2	0.5	0.04	0.22	**0.01**
D2	On Grade	2.00%	2.45%	0.56	0.57	7.3	1.8	0.15	0.57	**0.00**
F2	On Grade	2.00%	1.13%	0.31	0.31	4.5	1.1	0.09	0.25	**0.06**
G2	On Grade	2.00%	1.85%	0.40	0.45	4.8	1.1	0.09	0.35	**0.10**
H2	On Grade	2.00%	2.77%	0.40	0.50	4.6	1.1	0.09	0.37	**0.13**
I2	On Grade	2.00%	4.35%	0.59	0.72	4.8	1.2	0.10	0.50	**0.22**

RATIONAL METHOD FOR WATER QUANTITY VOLUME CALCULATIONS
BASIN SIZING

Design Storm Frequency = 10 yrs.
Discharge Rate, d = 0.92 cfs

Surface Type	Area A (ft^2)	Area (acres)	Runoff Coefficient C	Frequency Factor Cf	C x C_f
Impervious	72,234	1.66	0.9	1	0.90
Landscape	61,603	1.41	0.3	1	0.30
Undeveloped (B1 & B2)	614,863	14.12	0.2	1	0.20
Totals	**748,700**	**17.19**	**0.28**	**1**	**0.276**

Rainfall Duration, t (min)	Rainfall Intensity, i (in/hr)	Runoff Volume = C_{wd} x A x i x t (ft^3)	Discharge Volume = d x t (ft^3)	Site Detention = Runoff Volume - Discharge Volume (ft^3)
1	11.45	3256.84	55.20	3201.64
5	4.02	5720.52	276.00	5444.52
10	2.56	7291.15	552.00	6739.15
15	1.97	8402.88	828.00	7574.88
20	1.63	9293.02	1104.00	8189.02
25	1.41	10047.90	1380.00	8667.90
30	1.26	10709.98	1656.00	9053.98
35	1.14	11303.68	1932.00	9371.68
40	1.04	11844.51	2208.00	9636.51
45	0.96	12342.99	2484.00	9858.99
50	0.90	12806.65	2760.00	10046.65
60	0.80	13650.52	3312.00	10338.52
75	0.69	14759.36	4140.00	10619.36
80	0.66	15096.55	4416.00	10680.55
90	0.61	15731.89	4968.00	10763.89
100	0.57	16322.86	5520.00	10802.86
103	0.56	16492.60	5685.60	10807.00
104	0.56	16548.47	5740.80	10807.67
105	**0.56**	**16603.99**	**5796.00**	**10807.99**
106	0.55	16659.16	5851.20	10807.96
180	0.39	20051.25	9936.00	10115.25
360	0.25	25556.54	19872.00	5684.54
720	0.16	32573.36	39744.00	-----
1440	0.10	41516.72	79488.00	-----

POND OUTFALL PIPE CALCULATIONS

Crossing Properties

Name: POND OUTLET

Parameter	Value	Units
DISCHARGE DATA		
Discharge Method	Minimum, Design, and Maximum	
Minimum Flow	0.000	cfs
Design Flow	1.500	cfs
Maximum Flow	3.000	cfs
TAILWATER DATA		
Channel Type	Triangular Channel	
Side Slope (H:V)	6.000	_:1
Channel Slope	0.0100	ft/ft
Manning's n (channel)	0.030	
Channel Invert Elevation	4602.300	ft
Rating Curve	View...	
ROADWAY DATA		
Roadway Profile Shape	Constant Roadway Elevation	
First Roadway Station	0.000	ft
Crest Length	20.000	ft
Crest Elevation	4605.000	ft
Roadway Surface	Paved	
Top Width	20.000	ft

Culvert Properties

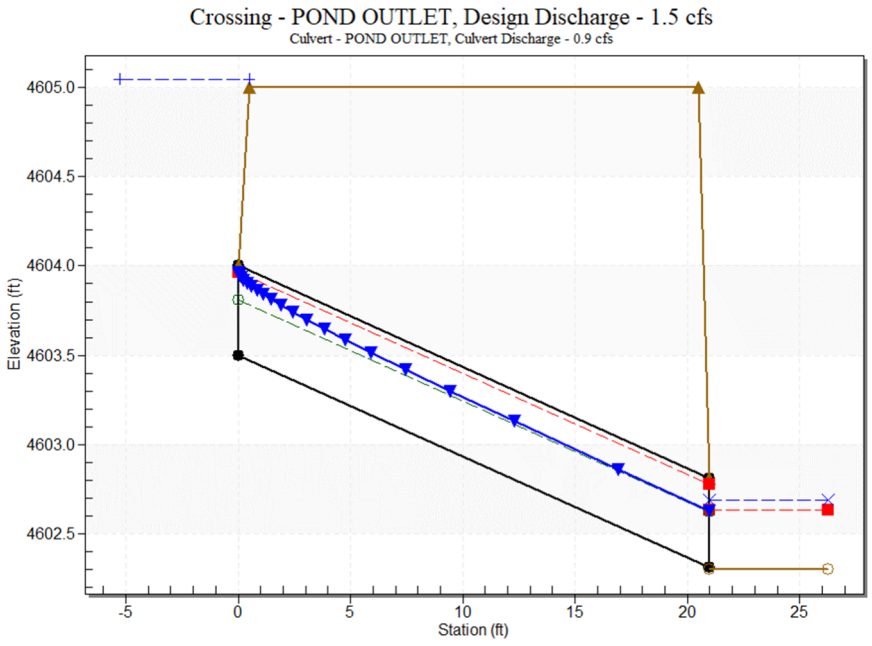
POND OUTLET

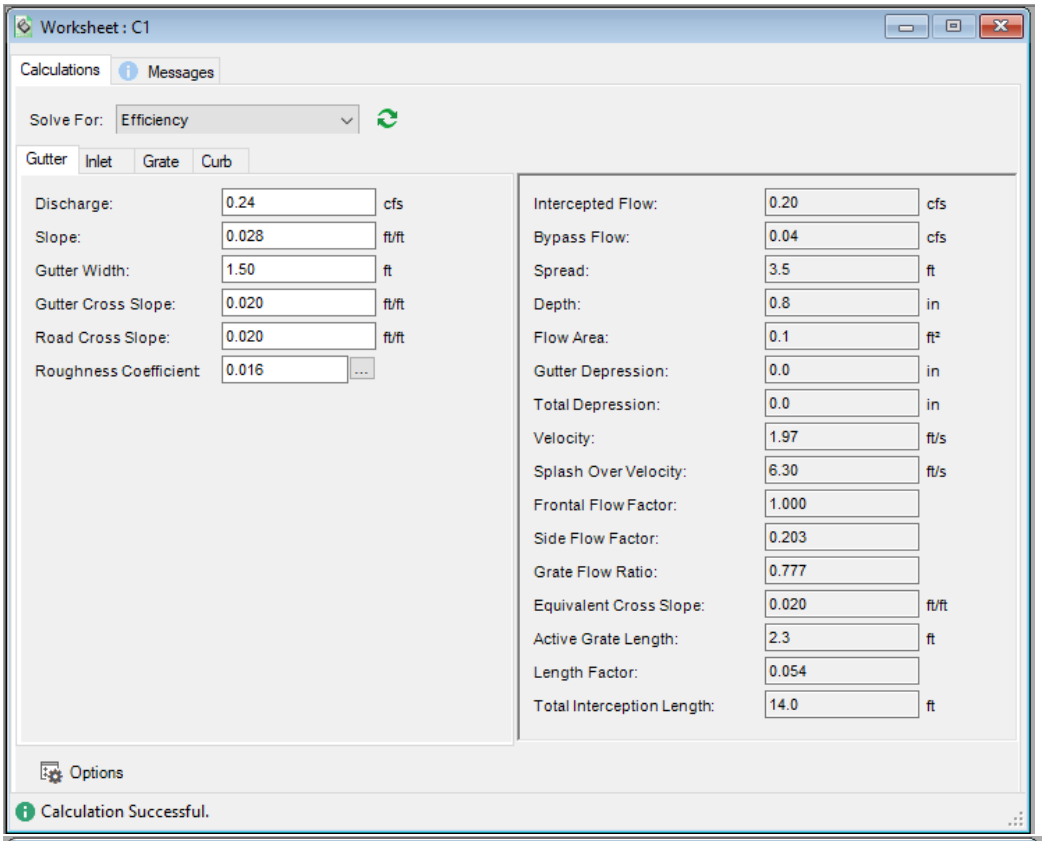
Add Culvert | Duplicate Culvert | Delete Culvert

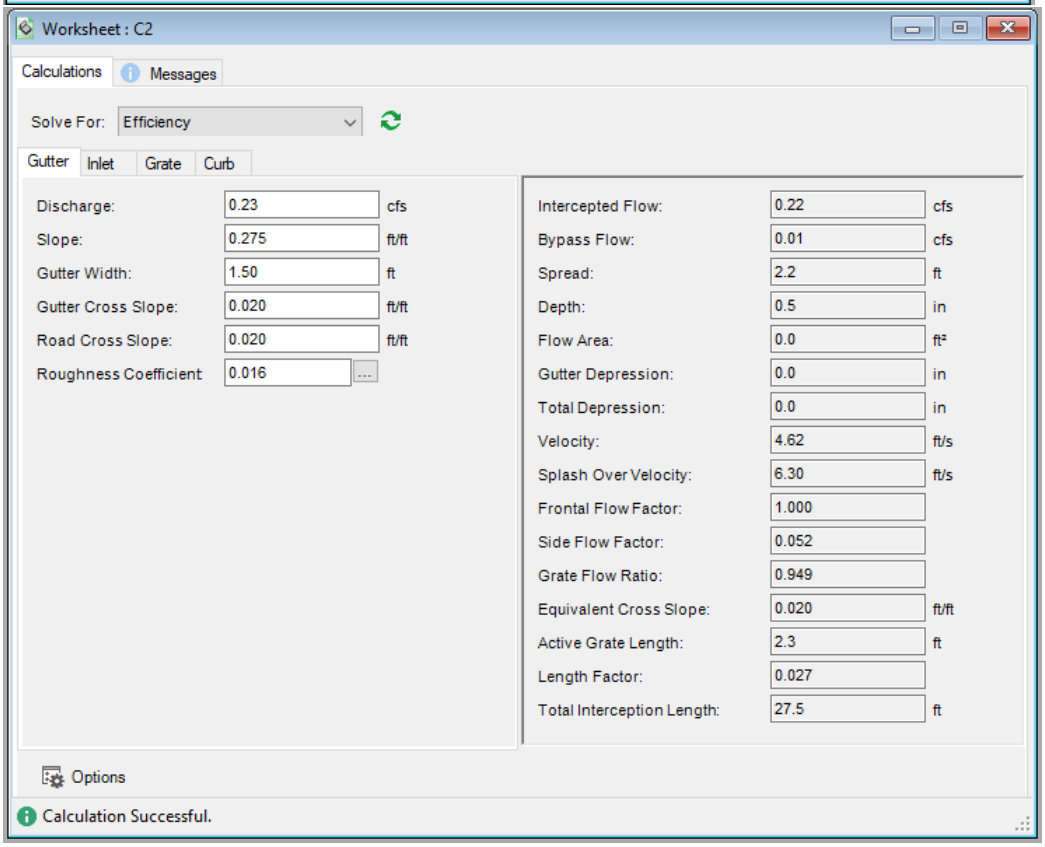
Parameter	Value	Units
CULVERT DATA		
Name	POND OUTLET	
Shape	Circular	
Material	Smooth HDPE	
Diameter	0.500	ft
Embedment Depth	0.000	in
Manning's n	0.013	
Culvert Type	Straight	
Inlet Configuration	Thin Edge Projecting (Ke=0.9)	
Inlet Depression?	No	
SITE DATA		
Site Data Input Option	Culvert Invert Data	
Inlet Station	0.000	ft
Inlet Elevation	4603.500	ft
Outlet Station	21.000	ft
Outlet Elevation	4602.310	ft
Number of Barrels	1	
Computed Culvert Slope	0.056667	ft/ft

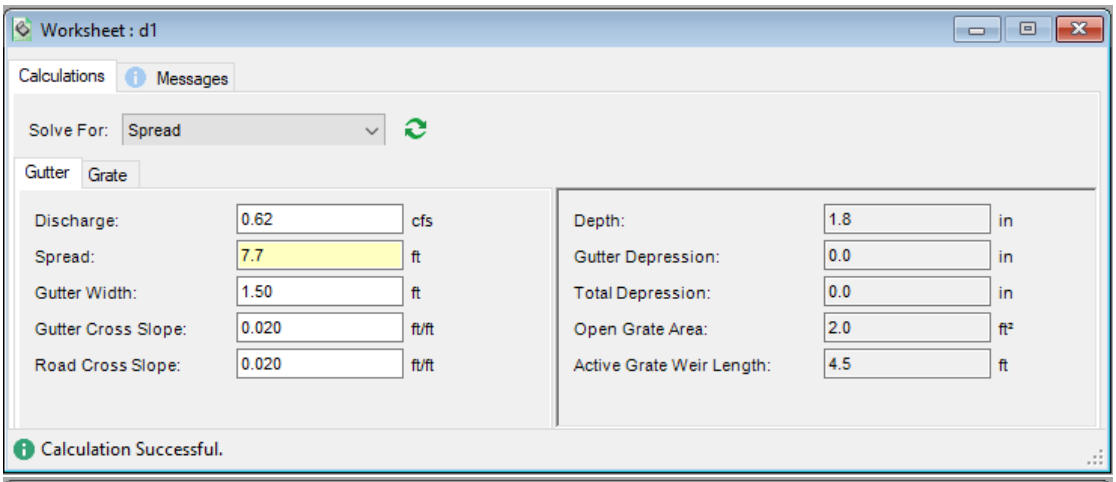
Table 1 - Summary of Culvert Flows at Crossing: POND OUTLET

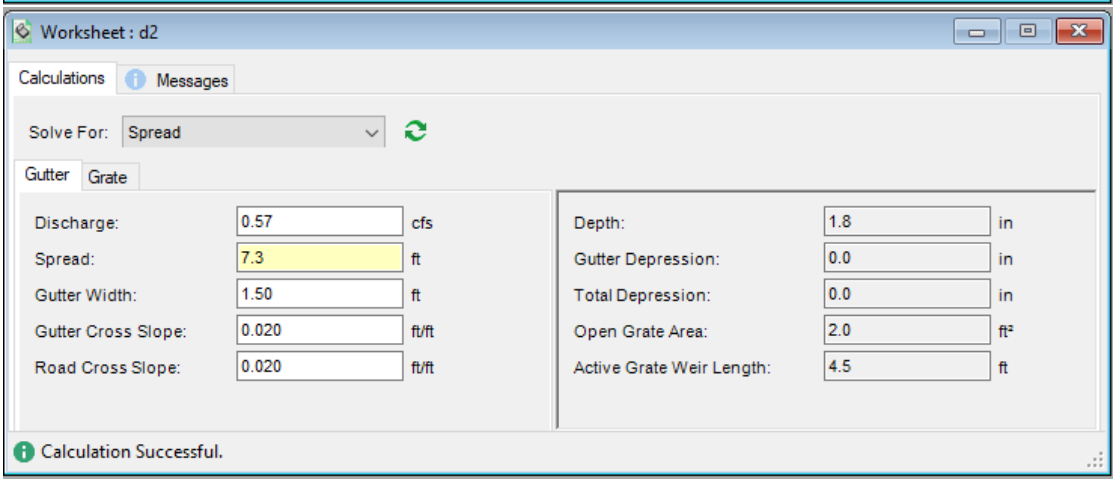
Headwater Elevation (ft)	Total Discharge (cfs)	POND OUTLET Discharge (cfs)	Roadway Discharge (cfs)	Iterations
4603.50	0.00	0.00	0.00	1
4603.93	0.30	0.30	0.00	1
4604.31	0.60	0.60	0.00	1
4604.94	0.90	0.90	0.00	1
4605.03	1.20	0.93	0.26	9
4605.04	1.50	0.94	0.55	4
4605.06	1.80	0.94	0.85	4
4605.07	2.10	0.95	1.14	3
4605.08	2.40	0.95	1.44	3
4605.10	2.70	0.96	1.74	3
4605.11	3.00	0.96	2.02	2
4605.00	0.92	0.92	0.00	Overtopping

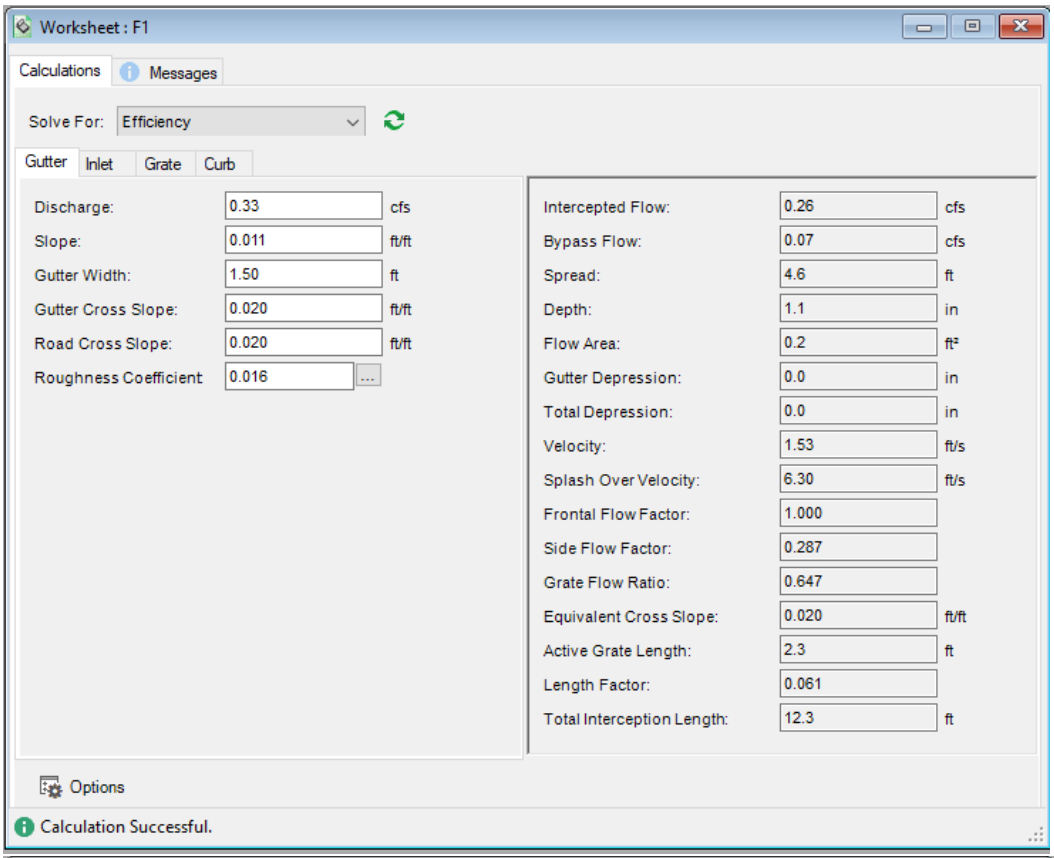


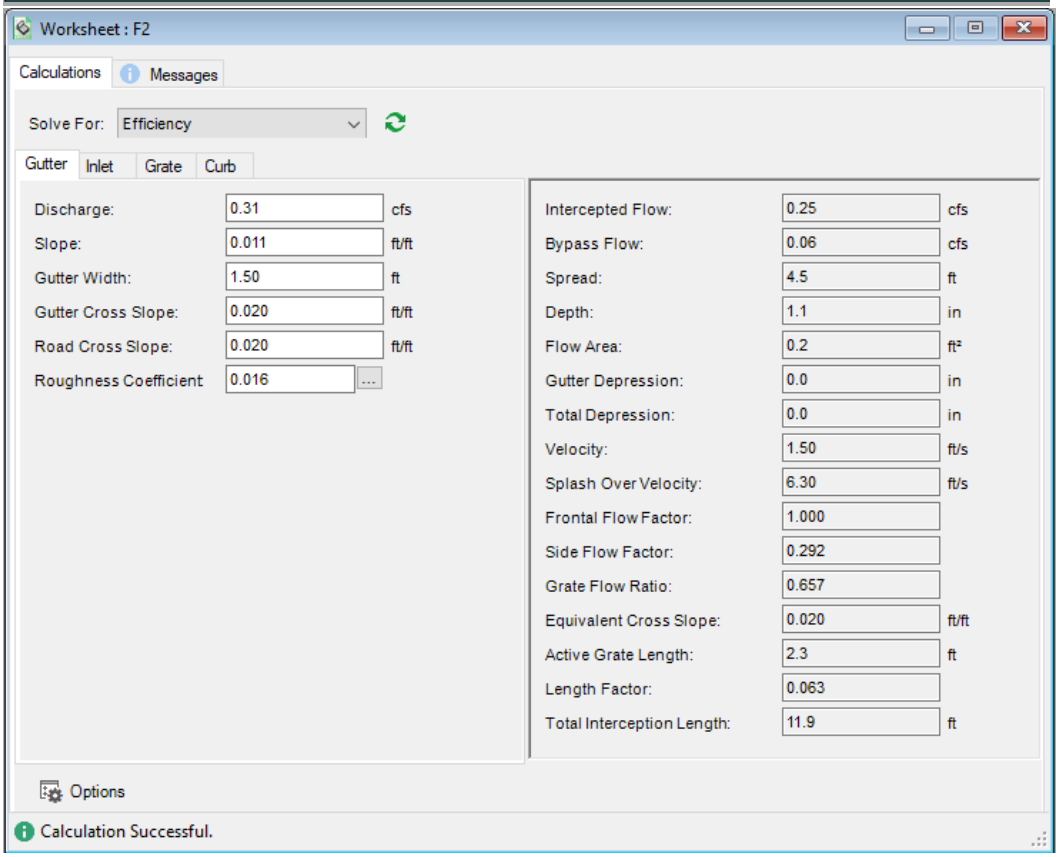

Worksheet : C1
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.24 cfs
Slope: 0.028 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.20 cfs
Bypass Flow: 0.04 cfs
Spread: 3.5 ft
Depth: 0.8 in
Flow Area: 0.1 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 1.97 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.203
Grate Flow Ratio: 0.777
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.054
Total Interception Length: 14.0 ft
Options
Calculation Successful.

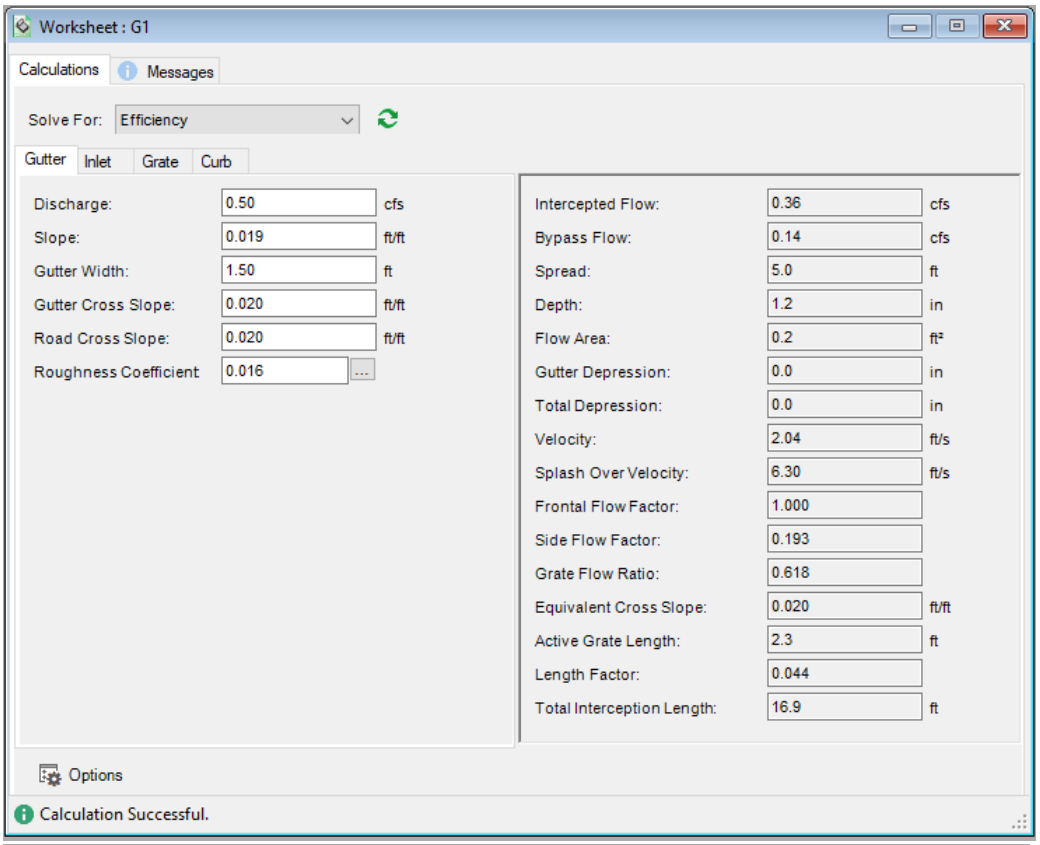

Worksheet : C2
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.23 cfs
Slope: 0.275 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.22 cfs
Bypass Flow: 0.01 cfs
Spread: 2.2 ft
Depth: 0.5 in
Flow Area: 0.0 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 4.62 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.052
Grate Flow Ratio: 0.949
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.027
Total Interception Length: 27.5 ft
Options
Calculation Successful.

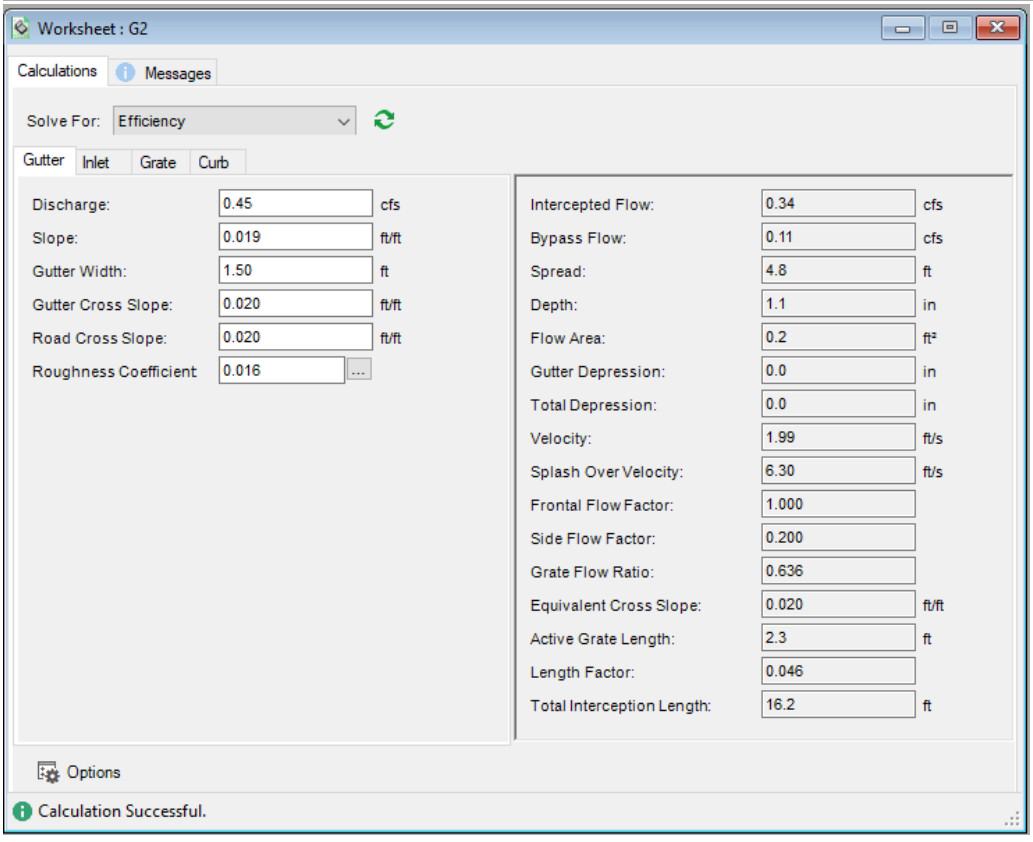

Worksheet : d1
Calculations
Messages
Solve For: Spread
Gutter
Grate
Discharge: 0.62 cfs
Spread: 7.7 ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Depth: 1.8 in
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Open Grate Area: 2.0 ft²
Active Grate Weir Length: 4.5 ft
Calculation Successful.

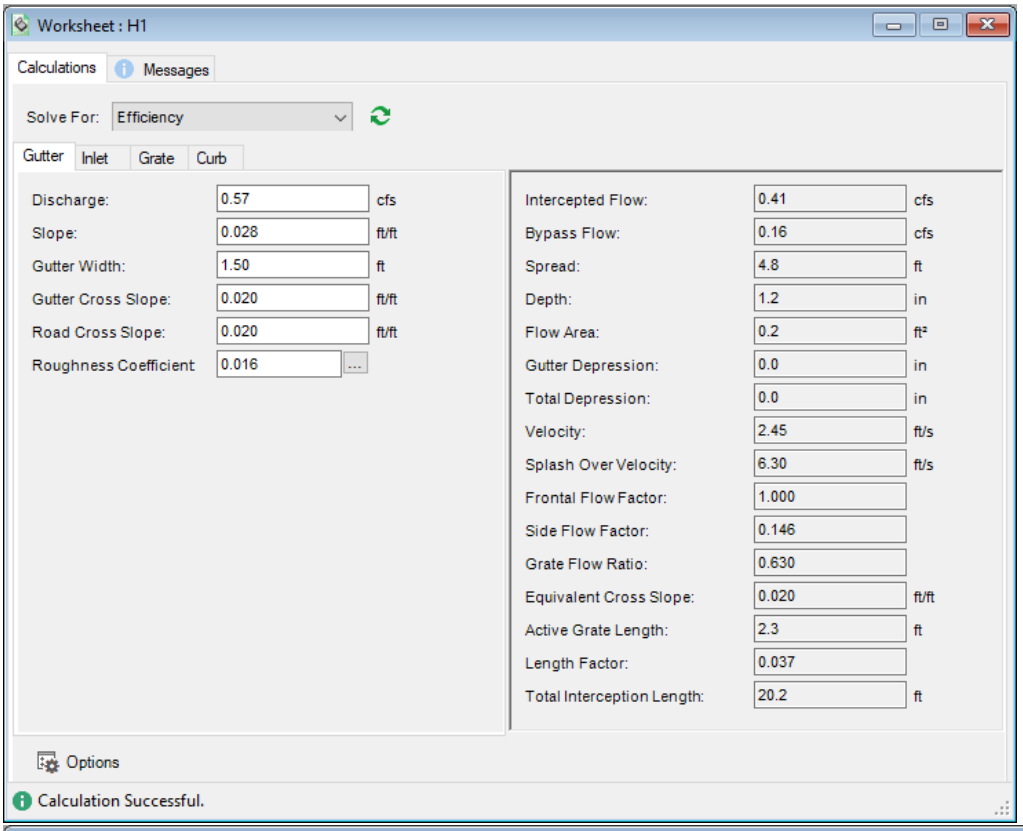

Worksheet : d2
Calculations
Messages
Solve For: Spread
Gutter
Grate
Discharge: 0.57 cfs
Spread: 7.3 ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Depth: 1.8 in
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Open Grate Area: 2.0 ft²
Active Grate Weir Length: 4.5 ft
Calculation Successful.

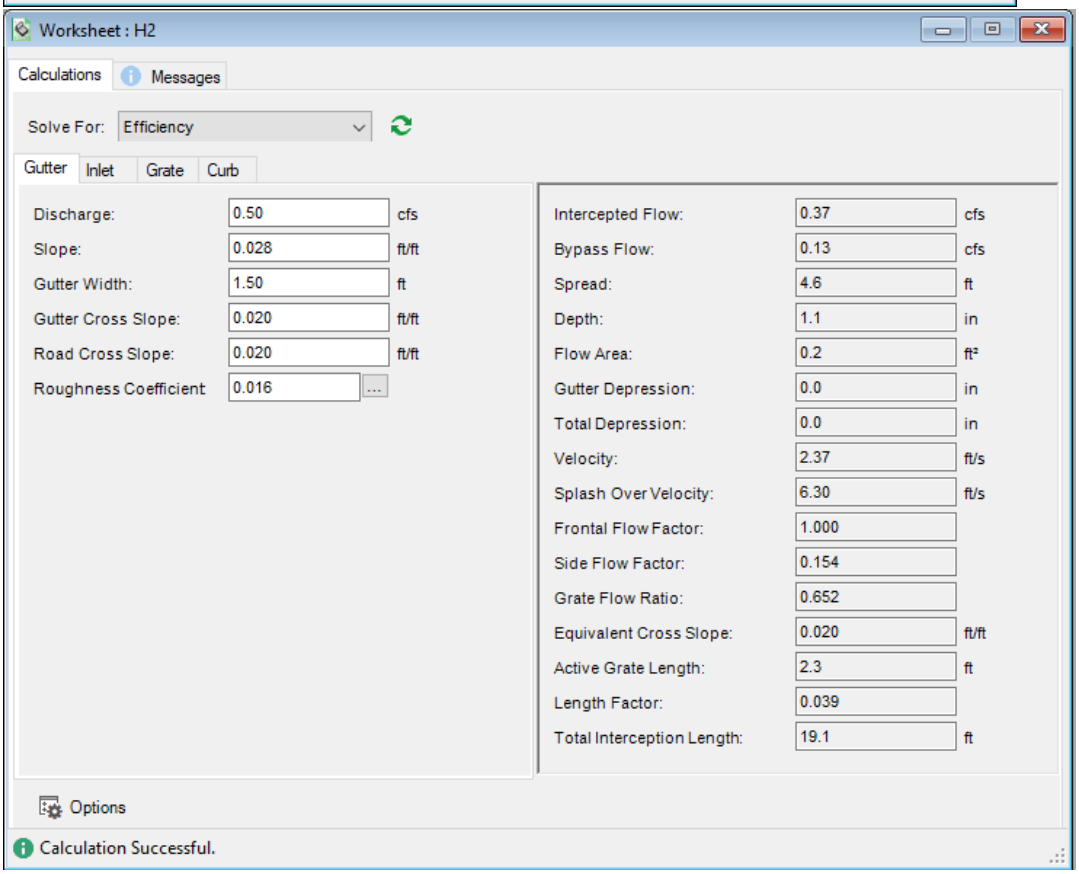

Worksheet : F1
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.33 cfs
Slope: 0.011 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.26 cfs
Bypass Flow: 0.07 cfs
Spread: 4.6 ft
Depth: 1.1 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 1.53 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.287
Grate Flow Ratio: 0.647
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.061
Total Interception Length: 12.3 ft
Options
Calculation Successful.

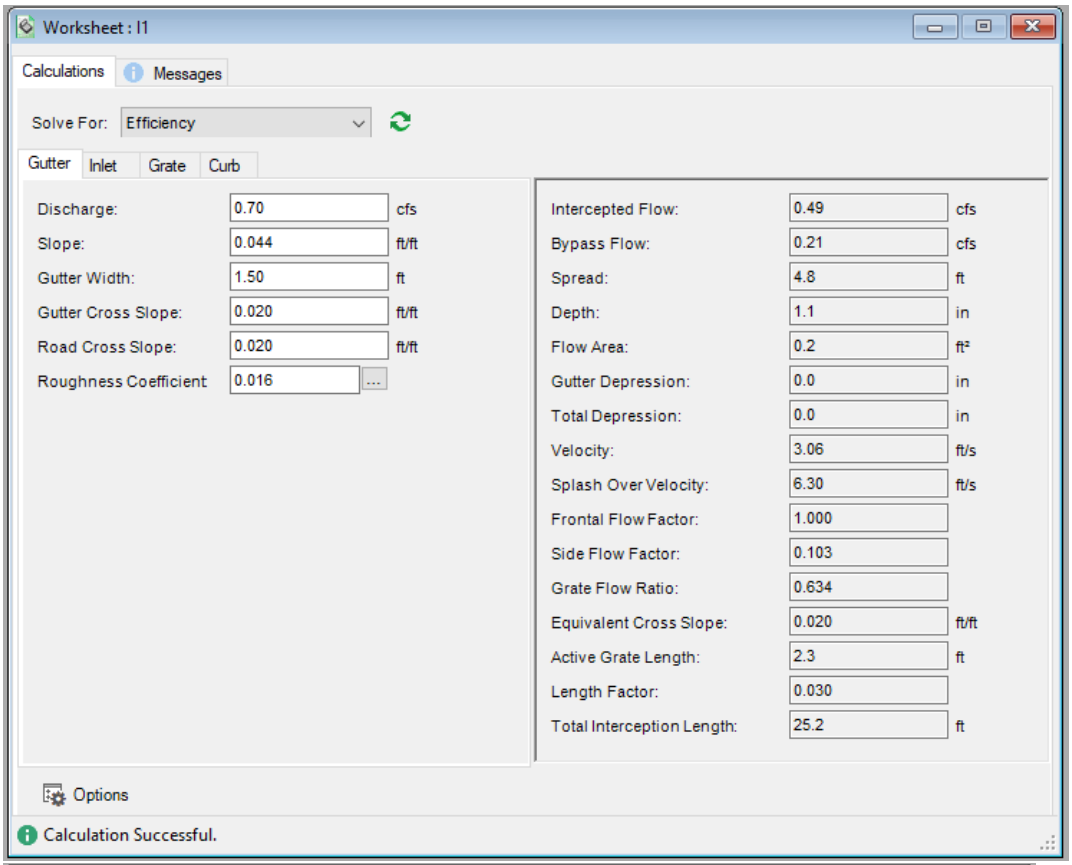

Worksheet : F2
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.31 cfs
Slope: 0.011 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.25 cfs
Bypass Flow: 0.06 cfs
Spread: 4.5 ft
Depth: 1.1 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 1.50 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.292
Grate Flow Ratio: 0.657
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.063
Total Interception Length: 11.9 ft
Options
Calculation Successful.

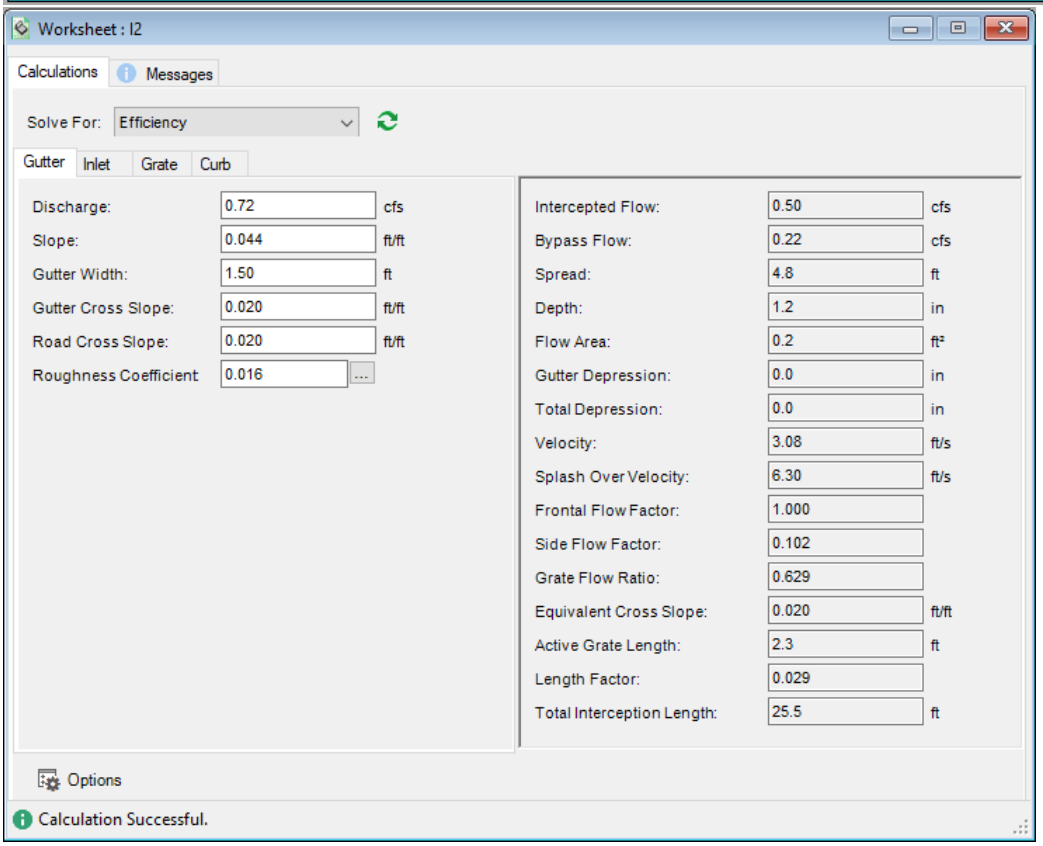

Worksheet : G1
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.50 cfs
Slope: 0.019 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.36 cfs
Bypass Flow: 0.14 cfs
Spread: 5.0 ft
Depth: 1.2 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 2.04 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.193
Grate Flow Ratio: 0.618
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.044
Total Interception Length: 16.9 ft
Options
Calculation Successful.


Worksheet : G2
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.45 cfs
Slope: 0.019 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.34 cfs
Bypass Flow: 0.11 cfs
Spread: 4.8 ft
Depth: 1.1 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 1.99 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.200
Grate Flow Ratio: 0.636
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.046
Total Interception Length: 16.2 ft
Options
Calculation Successful.

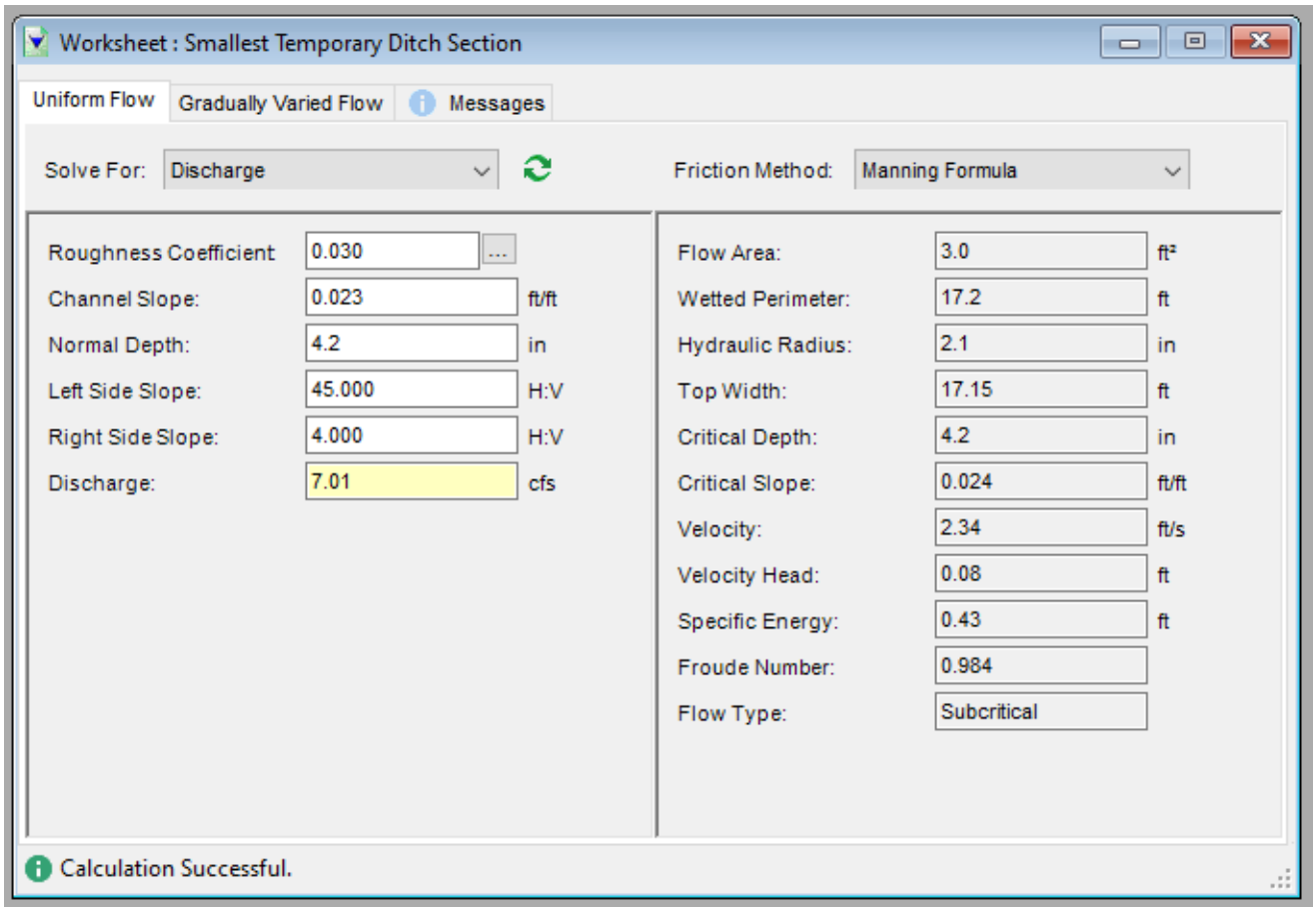

Worksheet : H1
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.57 cfs
Slope: 0.028 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.41 cfs
Bypass Flow: 0.16 cfs
Spread: 4.8 ft
Depth: 1.2 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 2.45 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.146
Grate Flow Ratio: 0.630
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.037
Total Interception Length: 20.2 ft
Options
Calculation Successful.


Worksheet : H2
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.50 cfs
Slope: 0.028 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient 0.016
Intercepted Flow: 0.37 cfs
Bypass Flow: 0.13 cfs
Spread: 4.6 ft
Depth: 1.1 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 2.37 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.154
Grate Flow Ratio: 0.652
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.039
Total Interception Length: 19.1 ft
Options
Calculation Successful.


Worksheet : I1
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.70 cfs
Slope: 0.044 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient: 0.016
Intercepted Flow: 0.49 cfs
Bypass Flow: 0.21 cfs
Spread: 4.8 ft
Depth: 1.1 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 3.06 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.103
Grate Flow Ratio: 0.634
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.030
Total Interception Length: 25.2 ft
Options
Calculation Successful.


Worksheet : I2
Calculations
Messages
Solve For: Efficiency
Gutter
Inlet
Grate
Curb
Discharge: 0.72 cfs
Slope: 0.044 ft/ft
Gutter Width: 1.50 ft
Gutter Cross Slope: 0.020 ft/ft
Road Cross Slope: 0.020 ft/ft
Roughness Coefficient: 0.016
Intercepted Flow: 0.50 cfs
Bypass Flow: 0.22 cfs
Spread: 4.8 ft
Depth: 1.2 in
Flow Area: 0.2 ft²
Gutter Depression: 0.0 in
Total Depression: 0.0 in
Velocity: 3.08 ft/s
Splash Over Velocity: 6.30 ft/s
Frontal Flow Factor: 1.000
Side Flow Factor: 0.102
Grate Flow Ratio: 0.629
Equivalent Cross Slope: 0.020 ft/ft
Active Grate Length: 2.3 ft
Length Factor: 0.029
Total Interception Length: 25.5 ft
Options
Calculation Successful.

Smallest Ditch Section of Temporary Ditch Along West Edge of Street B



Appendix D

GEOTECHNICAL REPORT

Terracon GeoReport

Geotechnical Engineering Report

4.55 Acre Site Development
Livingston, MT
May 7, 2021
Terracon Project No. 26215031

Prepared for:
Ruedebusch Development and Construction
Madison, WI

Prepared by:
Terracon Consultants, Inc.
Billings, Montana

May 7, 2021

Ruedebusch Development and Construction
4605 Dovetail Drive
Madison, WI 53704

Attn: Mr. Dave Hull
P: (608) 249-2012 ext. 232
E: DaveH@ruedebusch.com

Re: Geotechnical Engineering Report
4.55 Acre Site Development
PFL Way
Livingston, MT
Terracon Project No. 26215031

Dear Mr. Hull:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with revised Terracon Proposal No. P26215031 dated April 2, 2021. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations and floor slabs for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Jane O. Scott, E.I.T.
Staff Engineer

Gary W. Rome, P.E.
Senior Project Manager

REPORT TOPICS

Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

Note: Refer to each individual Attachment for a listing of contents.

Geotechnical Engineering Report

4.55 Acre Site Development

PFL Way

Livingston, MT

Terracon Project No. 26215031

May 7, 2021

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for development of the proposed 4.55 acre site to be located near PFL Way in Livingston, MT. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil (and rock) conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Stormwater considerations
- Foundation design and construction
- Floor slab design and construction
- Seismic site classification per IBC
- Lateral earth pressures
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of fifteen test borings to depths ranging from approximately 6.5 to 41.5 feet below existing site grades.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located near PFL Way in Livingston, Montana. Latitude/Longitude (approximate): 45.6519° N, 110.6082° W See **Site Location**
Existing Improvements	The site is currently undeveloped.

Item	Description
Current Ground Cover	Native grasses above an open pit location, including clay, sand, and gravel ground cover in pit area.
Existing Topography	The site is relatively flat, with a slight grade from the north/northwest toward the south/southeast with elevations ranging from 4.620 to 4,615 feet above mean sea level (MSL).
Geology	Subsurface conditions consist of near alluvium, mainly valley fill deposits consisting of clay, silt, sand and minor gravel with inclusions of glacial drift (cobbles/boulders). The alluvium is underlain by Upper Cretaceous claystone and interbedded sandstone of the Billman Creek Formation of the Livingston Group.

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	An email with supporting documents was received from Mr. Dave Hull on February 18, 2021 containing a site layout and a requested scope of services. Following delivery of the initial proposal, four (4) additional borings were requested by Mr. Hull on March 31, 2021.
Proposed Structures	The project includes: ■ A one-story, 18,540 square foot distribution building ■ Automobile parking, capacity 44 spaces to the west of the building ■ Van parking, capacity 6 spaces to the south of the building ■ 28-foot trailer parking, capacity 3 east of detention pond area ■ Tractor parking, capacity 2 north side of building ■ Dolly parking, capacity 3 east of detention pond ■ Loading/unloading spaces, capacity 3 north side of building ■ Potential fenced detention pond area, north of building
Building Construction	Proposed building construction not provided at time of report preparation.
Maximum Loads	Maximum column loads: 155 kips
Below-Grade Structures	None anticipated.
Free-Standing Retaining Walls	None specified at the time of report preparation

Item	Description
Pavements	Paved driveway and parking will be constructed on approximately 3 acres of the parcel. Both rigid (concrete) and flexible (asphalt) pavement sections are considered. Anticipated pavement types obtained from spreadsheet provided by Ruedebusch titled "Livingston SS CY21_202110227" dated April 21, 2021: Type 1: all other pavement, heavy duty ■ Approx. 145,000 ESALs Type 2: employee parking lot, light duty ■ Less than 100 ESALs The pavement design period is assumed to be 10 years.

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Surficial Conditions**	Topsoil or fill encountered surficially in all borings.
2	**Clay**	Clay with varying amounts of sand and silt present in all borings except P-5.
3	**Sand**	Sand with varying amounts of clay and gravel present in P-5 and P-9.
4	**Sedimentary Bedrock**	Sandstone and/or claystone bedrock present in all borings except B-5. P-1, and P-3 through P-9.

Groundwater Conditions

The boreholes were observed while drilling for the presence and level of groundwater. The water levels observed in the boreholes can be found on the boring logs in **Exploration Results**, and are summarized on the following page.

Boring Number	Approximate Depth to Groundwater while Drilling (feet)	Approximate Depth Bottom of Boring (feet)
B-1	6	21.5
B-3	7	41.5
B-5	7	21.5
PD-1	15	26.5

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project. Fluctuations in groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater monitoring wells and periodic measurement of groundwater levels over a sufficient period of time.

Laboratory Testing

Laboratory test results indicate that the clay soils tested exhibit swell potential ranging from approximately 0.2 to 0.8 percent when subjected to an applied load of 1,000 pounds per square foot (psf) at in-situ water contents. When exposed to increases in moisture content at an applied load of 1,000 psf, the clay soils exhibited swell potential ranging from 0.2 to 0.8 percent, followed by low to moderate compression at increased loadings up to 4 kips per square foot (ksf).

Laboratory test results indicate that a relatively undisturbed sample of the clay soil obtained from boring PD-1 at approximate depths of 5 to 7 feet exhibited a hydraulic conductivity of 1.85×10^{-4} centimeters per second (cm/s) when placed under a confining pressure of approximately 500 psf.

The results of laboratory testing completed for this project can be found in the **Exploration Results** section of this report.

GEOTECHNICAL OVERVIEW

Based on the results of our field investigation, laboratory testing program and geotechnical analyses, development of the site is considered feasible from a geotechnical viewpoint provided that the conclusions and considerations provided herein are incorporated into the design and construction of the project. We have identified the following geotechnical conditions that could impact design and construction of the proposed project.

The distribution building may be constructed on shallow foundations bearing on structural fill. Additional foundation and floor slab information pertaining to the structures can be found in the **Shallow Foundations** sections of this report. The **General Comments** section provides an understanding of the report limitations.

Existing Fill Materials

Approximately 2 feet of existing fill material was encountered in Boring P-3. The fill material did not possess man-made debris to indicate fill, but was characterized as possible fill due to its texture. The fill depth presented in the boring log is approximate and the total depth, lateral extent, and composition of fill material present on the site may not become evident until construction and should be expected to vary across the site.

We do not possess any information regarding whether the fill encountered was placed under the observation of a geotechnical engineer. There is an inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill, will not be discovered, resulting in movements that could cause distress to structures and pavements. Based on the results of our field exploration and laboratory testing, it is our opinion the fill materials should not be used to support foundations, floor slabs, or pavements without complete removal and replacement with compacted structural fill. Provided the owner is willing to accept an increased risk of movement, we have provided an option for partial removal and replacement of fill materials below pavements. After removal of existing fill, surfaces to receive structural fill should be prepared as recommended in the **Earthwork** section of this report.

To better characterize the extents of the fill material we recommend that test pits be excavated either before or during construction, and a representative of the geotechnical engineer be on site to observe test pit excavations to confirm that the existing fill is consistent with what was encountered in our borings. Additional removal and replacement may be required should unsuitable soils be encountered that differ from what was observed during our field exploration.

There exists the potential for construction debris and/or domestic trash to be encountered within the fill on some portions of the site. Because construction debris was not encountered in the borings drilled at this site, the potential for encountering construction debris and domestic trash is considered to be low. The fill materials should be observed for the presence of trash and debris during site grading and construction.

The existing fill materials can be reused as structural fill below foundations, floor slabs, and pavements provided it meets the requirements for structural fill in the **Earthwork** section. Further, some additional removal and replacement may be required if unsuitable or soft materials are exposed during removal of the fill materials.

Low Strength Soils

Test boring data indicate that low strength soils may be locally present. Consequently, low strength soils could be encountered in excavations and these conditions may require some corrective work. Corrective work could involve removal and re-compaction or replacement, or the use of geotextiles. Lightweight equipment may be required to reduce subgrade pumping. In any event, Terracon should be contacted to observe excavations to evaluate conditions and to provide guidance concerning corrective work (if needed).

In addition, moisture infiltration to pavement subgrade combined with continued repetitive traffic may cause the on-site clay soils to become unstable and lead to premature pavement distress. To reduce the risk of pavement distress, we recommend that pavements be supported on a minimum of 6 inches of structural fill. We recommend that subgrade soils be designed and graded to provide positive drainage away from pavements.

Groundwater

During our field exploration, groundwater was encountered in borings B-1, B-3, B-5, and PD-1 at depths ranging from 6 to 15 feet below existing site grades. Depending on site grading, groundwater could be encountered during construction, and if encountered, a temporary dewatering system consisting of well points or shallow trenches leading to a sump pit where the water could be removed by pumping will be necessary. The individual contractor(s) should be made aware of the possibility of encountering groundwater, and plan for dewatering during construction. If groundwater is encountered in foundation excavations, we recommend that a permanent foundation perimeter drain system be included in the design of the foundations.

EARTHWORK

Earthwork is anticipated to include clearing and grubbing, excavations, and fill placement. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria, as necessary, to render the site in the state considered in our geotechnical engineering evaluation for foundations, floor slabs, and pavements.

Site Preparation

Prior to placing fill, existing vegetation, root mat, and any deleterious material should be removed. Complete stripping of the topsoil should be performed within the limits of the proposed building and pavement areas.

Prior to the placement of fill, the subgrade should be proofrolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proofrolling should be performed under the

direction of the Geotechnical Engineer. Areas excessively deflecting under the proofroll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Based on the results of laboratory testing, some of the clay soil has in-situ moisture contents in excess of the optimum moisture content. Mechanical mixing or air-drying of clay soils prior to placing and compacting as fill should be anticipated. If schedule does not allow time to moisture condition fill prior to placement, consideration should be given to importing structural fill.

Existing Fill

As noted in **Geotechnical Characterization**, boring P-3 encountered existing fill to a depth of approximately 2 feet below existing grade. The fill appears to have been placed in a controlled manner, but we have no records to indicate the degree of control. Support of pavements, on or above existing fill soils, is discussed in this report. However, even with the recommended construction procedures, there is inherent risk for the owner that compressible fill or unsuitable material, within or buried by the fill will, not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by following the recommendations contained in this report.

If the owner elects to construct pavements on the existing fill, the following protocol should be followed. Once the planned subgrade elevation has been reached, the entire pavement area should be proofrolled. Areas of soft or otherwise unsuitable material should be undercut and replaced with either new structural fill or suitable, existing on site materials.

Fill Material Types

Engineered fill required to achieve design grade should be classified as Structural Fill and general fill. Structural Fill is material used below, or within 10 feet of structures, pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for Structural Fill and general fill should meet the following material property requirements:

Soil Type [1]	USCS Classification	Acceptable Parameters
Granular	GW, GP, SW, SP (and dual symbols)	For Structural Fill: 100% passing 3-inch sieve, 30-60% passing No. 4 sieve; less than 10% passing No. 200 sieve
On-Site Soils [2]	CL, SP, SC, SM	The on-site sand and lean clay soils are suitable for use as general fill and structural fill including: site grading, utility trench and exterior foundation backfill of foundations, and pavement subgrade.

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.
2. Significant moisture conditioning of the on-site clays may be necessary to meet compaction requirements; this will likely require mechanical mixing or air-drying to achieve proper moisture content and will be challenging during wet/cold seasons.

Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

Item	Structural Fill	General Fill
Maximum Lift Thickness	8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used	Same as Structural Fill
Minimum Compaction Requirements [1, 2, 3]	98% of max. below foundations 95% of max. foundation wall backfill, utility trench backfill, slab and pavement subgrades	Same as Structural Fill
Water Content Range [1]	Low plasticity cohesive: -2% to +2% of optimum Granular: -3% to +3% of optimum	As required to achieve min. compaction requirements

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D698).
2. Low and high plasticity cohesive fill should not be compacted to more than 100% of standard Proctor maximum dry density.
3. If the granular material is a coarse sand or gravel, or of a uniform size, or has a low fines content, compaction comparison using local practices may be more appropriate. It should be noted that ASTM D698 allows for rock-correction of samples with up to 30% Retained on the 3/4" screen, but that this can lead to values not attainable in the field. ASTM allows for use of engineering judgement of field test strips.

Utility Trench Backfill

For low permeability subgrades, utility trenches are a common source of water infiltration and migration. Utility trenches penetrating beneath the building should be effectively sealed to restrict water intrusion and flow through the trenches, which could migrate below the building. The trench should provide an effective trench plug that extends at least 5 feet from the face of the building

exterior. The plug material should consist of cementitious flowable fill or low permeability clay. The trench plug material should be placed to surround the utility line. If used, the clay trench plug material should be placed and compacted to comply with the water content and compaction recommendations for structural fill stated previously in this report.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, roof leaks, and pavement distress.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure are anticipated to be accomplished with conventional construction equipment. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to construction.

The groundwater table could affect overexcavation efforts, especially for over-excavation and replacement of lower strength soils. A temporary dewatering system consisting of sumps with pumps could be necessary to achieve the recommended depth of over-excavation.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, "Excavations" and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the

information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of Terracon. Monitoring should include documentation of adequate removal of vegetation and topsoil, proof rolling, and mitigation of areas delineated by the proof roll to require mitigation. Each lift of compacted fill should be tested, evaluated, and reworked as necessary until approved by Terracon prior to placement of additional lifts.

In areas of foundation excavations, the bearing subgrade and exposed conditions at the base of the recommended over-excavation should be evaluated under the direction of Terracon. In the event that unanticipated conditions are encountered, Terracon should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of Terracon into the construction phase of the project provides the continuity to maintain Terracon's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

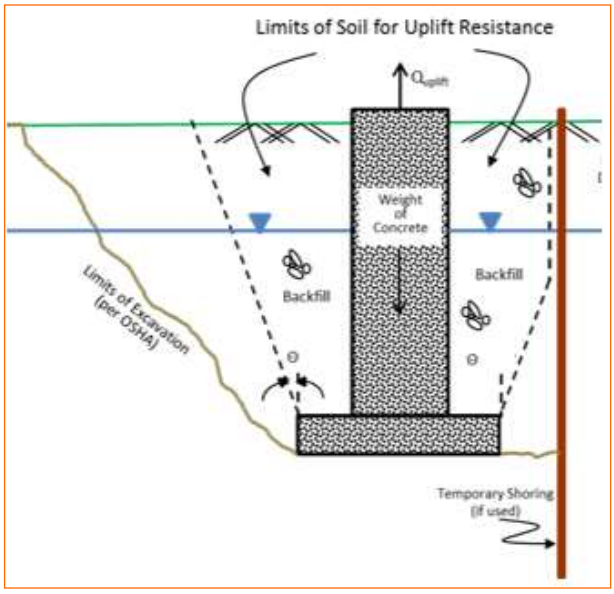
Design Parameters – Compressive Loads

Item	Description
Maximum Allowable Bearing pressure [1, 2]	2,000 psf (foundations bearing on structural fill)
Required Bearing Stratum [3]	2 feet of granular structural fill
Minimum Foundation Dimensions	Columns: 24 inches
Ultimate Coefficient of Sliding Friction [4]	0.70 (granular structural fill)
Minimum Embedment below Finished Grade [5]	Exterior footings / unheated areas: 42 inches Interior footings in heated areas: 24 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 3/4 inch
Estimated Differential Settlement [2, 6]	About 1/2 of total settlement

Item	Description
1.	Assumes proper preparation of bearing surface in accordance with **Site Preparation**. Based on a minimum factor of safety of 3.
2.	Values provided are for maximum loads noted in **Project Description**. The foundation movement will depend upon the variations within the subsurface soil profile, the structural loading conditions, the embedment depth of the footings, the thickness of compacted fill, the quality of the earthwork operations, and maintaining uniform soil water content throughout the life of the structure. The estimated movements are based on maintaining uniform soil water content during the life of the structure. Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage and irrigation practices should be incorporated into the design and operation of the facility. Failure to maintain soil water content and positive drainage will nullify the movement estimates provided above.
3.	Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in **Earthwork**.
4.	Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
5.	Embedment necessary to minimize the effects of frost and/or seasonal water content variations. For sloping ground, maintain depth below the lowest adjacent exterior grade within 5 horizontal feet of the structure.
6.	Differential settlement estimated for a column spacing of 50 feet.

Design Parameters - Uplift Loads

Uplift resistance of spread footings can be developed from the effective weight of the footing and the overlying soils. As illustrated on the subsequent figure, the effective weight of the soil prism defined by diagonal planes extending up from the top of the perimeter of the foundation to the ground surface at an angle, θ, of 20 degrees from the vertical can be included in uplift resistance. The maximum allowable uplift capacity should be taken as a sum of the effective weight of soil plus the dead weight of the foundation, divided by an appropriate factor of safety. A maximum total unit weight of 100 pcf should be used for the on-site soil backfill. This unit weight should be reduced to 38 pcf for portions of the backfill or natural soils below the groundwater elevation.

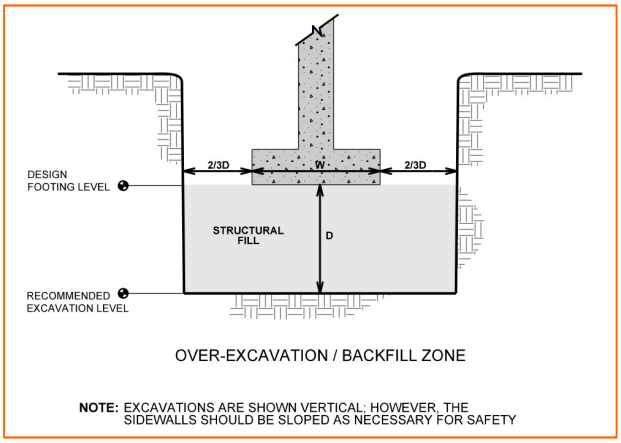


Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

Over-excavation for structural fill placement below footings should be conducted as shown below. The over-excavation should be backfilled up to the footing base elevation, with granular structural fill placed, as recommended in the **Earthwork** section.

To limit the intrusion of fines and improve constructability, we recommend a geotextile separator fabric, such as a Mirafi 180N or equivalent be placed at the granular structural fill/on-site clay soil interface. To limit the infiltration of surface water, we recommend exterior foundation walls be backfilled with the on-site clay materials.



SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the International Building Code (IBC). Based on the soil and bedrock properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is C**. Subsurface explorations at this site were extended to a maximum depth of 41.5 feet. The site properties below the maximum boring depth of 41.5 feet to 100 feet were estimated based on our

experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

FLOOR SLABS

Depending upon the finished floor elevation, unsuitable, weak, soft to medium stiff soils may be encountered at the floor slab subgrade level. These soils should be replaced with granular structural fill so the floor slab is supported on at least 1 foot of compacted granular structural fill.

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure and positive drainage of the aggregate base beneath the floor slab.

Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	A minimum of 1 foot of granular structural fill, placed and compacted in accordance with the recommendations in **Earthwork**,
Estimated Modulus of Subgrade Reaction [2]	200 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

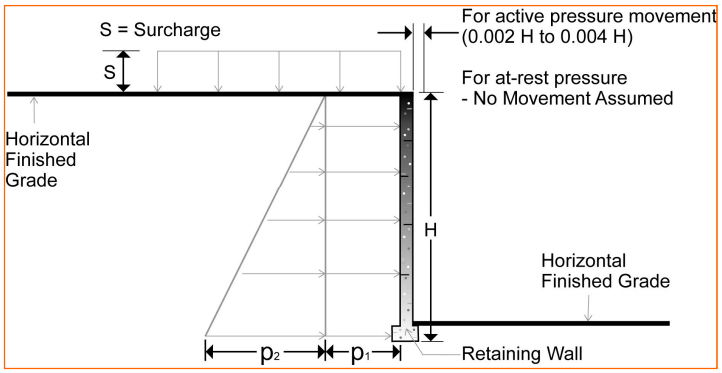
Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The “at-rest” condition assumes no wall rotation and is commonly used for below grade exterior walls and other walls restrained from movement. The recommended design lateral earth pressures below are applicable to cast-in-place concrete walls, do not include a factor of safety, and do not provide for possible hydrostatic pressure on the walls (unless stated). These recommendations are not applicable to the design of modular block – geogrid reinforced backfill walls and additional analyses and evaluation would be required.



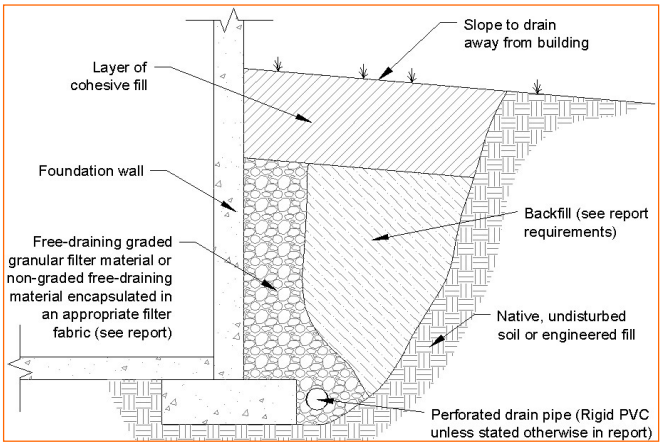
Lateral Earth Pressure Design Parameters				
Earth Pressure Condition [1]	**Coefficient for Backfill Type** [2]	**Surcharge Pressure** [3, 4, 5] **p_1 (psf)**	**Effective Fluid Pressures (psf)** [2, 4, 5]	
			Unsaturated [6]	**Submerged** [6]
Active (Ka)	Granular - 0.27 Fine Grained - 0.49	(0.27)S (0.49)S	(35)H (55)H	(80)H (85)H
At-Rest (Ko)	Granular - 0.43 Fine Grained - 0.66	(0.43)S (0.66)S	(55)H (70)H	(90)H (95)H
Passive (Kp)	Granular - 3.69 Fine Grained - 2.04	--- ---	(480)H (225)H	(315)H (160)H

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
2. Uniform, horizontal backfill, compacted to at least 95% of the ASTM D 698 maximum dry density, rendering a maximum unit weight of 130 pcf and an angle of internal friction of 35° for granular structural fill, and a maximum unit weight of 110 pcf and an angle of internal friction of 20° for fine-grained on-site soils.
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.
6. To achieve "Unsaturated" conditions, follow guidelines in **Subsurface Drainage for Below-Grade Walls** below. "Submerged" conditions are recommended when drainage behind walls is not incorporated into the design.

Backfill placed against structures should consist of granular soils or low plasticity cohesive soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

Subsurface Drainage for Below-Grade Walls

A perforated rigid plastic drain line installed behind the base of walls and extends below adjacent grade is recommended to prevent hydrostatic loading on the walls. The invert of a drain line around a below-grade building area or exterior retaining wall should be placed near foundation bearing level. The drain line should be sloped to provide positive gravity drainage to daylight or to a sump pit and pump. The drain line should be surrounded by clean, free-draining granular material having less than 5% passing the No. 200 sieve, such as ASTM No. 57 aggregate. The free-draining aggregate should be encapsulated in a filter fabric. The granular fill should extend to within 2 feet of final grade, where it should be capped with compacted cohesive fill to reduce infiltration of surface water into the drain system.



As an alternative to free-draining granular fill, a pre-fabricated drainage structure may be used. A pre-fabricated drainage structure is a plastic drainage core or mesh which is covered with filter fabric to prevent soil intrusion, and is fastened to the wall prior to placing backfill.

PAVEMENTS

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Based on the planned grading, we anticipate the onsite soils will be utilized in subgrade construction. A California Bearing Ratio (CBR) test has been performed on a disturbed bulk sample of the clay subgrade obtained from boring P-7 at an approximate depth of 1 to 4 feet below existing grade. This material was compacted at about 95 percent of the standard proctor maximum dry density at approximately optimum moisture. The moisture-density relationship and CBR test results are presented in the **Exploration Results** section.

Pavement Design Parameters

A subgrade CBR of 2 was used for the AC pavement designs, based on laboratory testing of the clay subgrade soils encountered on site. A modulus of subgrade reaction of 60 pci was used for the PCC pavement designs. A modulus of rupture of 580 psi was used for pavement concrete.

Design of pavements for the project is based on procedures outlined in the AASHTO Guide for Design of Pavement Structures, 1993, coupled with publications by the Asphalt Institute and the American Concrete Institute on the design of parking lots and our local experience. Pavement design input parameters and resulting pavement sections are provided in the following tables:

Design Criteria	Value
Roadway Classification	Private parking areas and drive lanes
Estimated Growth Factor Percentage	1.0
Provided ESALs – Light Duty	< 100
Provided ESALs – Heavy Duty	145,000

The following design parameters were utilized for pavement thickness design:

Pavement Thickness Design Parameters		
Input Parameter	**Flexible (asphalt)**	**Rigid (concrete)**
Reliability	90%	90%
Serviceability Loss	2.2	2.0
Standard Deviation	0.45	0.35
Asphalt Layer Coefficient	0.41	N/A
Aggregate Base Coefficient	0.14	N/A
Concrete Elastic Modulus(E_c)	N/A	3,605,000 psi
Concrete Modulus of Rupture (S_c)	N/A	580 psi
Load Transfer Coefficient (J)	N/A	3.8[1]

1. The Load Transfer Coefficient value provided is based on jointed plain concrete pavement with doweled longitudinal and expansion joints at a spacing interval no greater than 15 feet. Also, doweled into the concrete curb and gutter.

Pavement Section Thicknesses

Based on the parameters presented above, we recommend the following pavement sections be considered:

Asphaltic Concrete Design		
Layer	**Thickness (inches)**	
	Type 1: Heavy Duty [1]	**Type 2: Light Duty** [1]
AC [2]	4	3
Aggregate Base [3]	12	6
Total Thickness	**16**	**9**

Asphaltic Concrete Design		
Layer	**Thickness (inches)**	
	Type 1: Heavy Duty [1]	**Type 2: Light Duty** [1]

1. See **Project Description** for more specifics regarding Light Duty and Heavy Duty traffic.
2. All materials should meet the current Montana Public Works Standard Specifications (MPWSS) Section 2510.
3. A 1.5-inch minus base course meeting the requirements of MPWSS Section 02235 is recommended.

Prior to proceeding with construction of the pavement section, a passing proofroll of the subgrade should be documented. A Mirafi 180N or equivalent geotextile fabric should be placed at the natural fine-grained soil/Structural Fill interface to limit the intrusion of fines into the base course and improve constructability.

Asphalt concrete should be composed of aggregate, filler, and additives (if required), with approved bituminous material. The asphalt concrete should conform to approved mix design which include volumetrics, Marshall Properties, optimum asphalt content, project mix formula, and recommended mixing and placing temperatures. The asphalt concrete should be consistent with an approved mix design conforming to MPWSS. Aggregate used in the asphalt should meet MPWSS for quality and gradation.

Asphalt material should be placed in lifts of not more than 3 inches and should be compacted to the minimum standards outlined in the MPWSS. In addition, the average of the density tests should be a minimum of 93 percent with no single test below 92 percent of the maximum theoretical maximum, as determined by ASTM D2041.

The recommended sections in this report are based on the selected parameters presented herein and Terracon's experience with similar projects and soil conditions. Parameters may vary with the specific project and material source. Variation of these parameters may change the thickness of the pavement sections presented. If traffic details differ substantially from those presented above, Terracon should be notified to re-evaluate the recommendations provided.

Portland Cement Concrete Design		
Layer	**Thickness (inches)**	
	Type 1: Heavy Duty [1]	**Type 2: Light Duty** [1]
PCC [2]	7	5
Aggregate **B**ase [3]	6	6
Total Thickness	**13**	**11**

Portland Cement Concrete Design		
Layer	Thickness (inches)	
	Type 1: Heavy Duty [1]	Type 2: Light Duty [1]

1. See **Project Description** for more specifics regarding Light Duty and Heavy Duty traffic.
2. All materials should meet the current Montana Public Works Standard Specifications (MPWSS).
3. A 1.5-inch minus base course meeting the requirements of MPWSS Section 02235 is recommended.

Portland cement concrete should meet the requirements of MPWSS. It is recommended concrete for rigid pavements have a minimum 28-day compressive strength of 4,000 psi and be placed with a maximum slump of 4 inches. The pavement concrete slabs should be steel reinforced and sufficient joint provisions should be included in the design to prevent potential issues related to expansion and contraction of the concrete. Steel reinforcement and joint spacing should be assessed by the Structural Engineer for the project. Although not required for structural support, the minimum 6-inch thick base course layer recommended below concrete pavements will help reduce potential for slab curl, shrinkage cracking, and subgrade pumping through joints.

Pavement design methods are intended to provide structural sections with adequate thickness over a subgrade such that wheel loads are reduced to a level the subgrade can support. The support characteristics of the subgrade for pavement design do not account for shrink/swell movements of the clay subgrades such as the soils encountered in the borings. Thus, the pavement may be adequate from a structural standpoint, yet still experience cracking and deformation due to the shrink/swell related movement of the subgrade. It is, therefore, important to minimize moisture changes in the subgrade to reduce shrink/swell movements.

Openings in pavements, such as decorative landscape areas, are sources for water infiltration into surrounding pavement systems. Water can collect in the islands and migrate into the surrounding subgrade soils thereby degrading support of the pavement. This is especially applicable for islands and raised concrete curbs, irrigated foliage, and low permeability near-surface soils. The civil design for the pavements with these conditions should include features to restrict or collect and discharge excess water from the islands. Examples of features are edge drains connected to the storm water collection system or other suitable outlets and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive

drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

Based on the groundwater elevations encountered during the field investigation, we do not anticipate groundwater will affect long-term pavement performance. Therefore, installation of subdrains beneath the pavement footprint is not recommended.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g., crack and joint sealing and patching) and global maintenance (e.g., surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install below pavement drainage systems surrounding areas anticipated for frequent wetting.
- Install joint sealant and seal cracks immediately.
- Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
- Place compacted, low permeability backfill against the exterior side of curb and gutter.
- Place curb, gutter and/or sidewalk directly on clay subgrade soils rather than on unbound granular base course materials.

FROST CONSIDERATIONS

The fine-grained soils on this site are frost susceptible, and small amounts of water can affect the performance of the slabs on-grade, sidewalks, and pavements. Exterior slabs should be anticipated to heave during winter months. If frost action needs to be eliminated in critical areas, we recommend the use of non-frost susceptible (NFS) fill or structural slabs (for instance, structural stoops in front of building doors). Placement of NFS material in large areas may not be

feasible; however, the following recommendations are provided to help reduce potential frost heave:

- Provide surface drainage away from the building and slabs, and toward the site storm drainage system.
- Install drains around the perimeter of the building, stoops, below exterior slabs and pavements, and connect them to the storm drainage system.
- Grade clayey subgrades, so groundwater potentially perched in overlying more permeable subgrades, such as sand or aggregate base, slope toward a site drainage system.
- Place NFS fill as backfill beneath slabs and pavements critical to the project.
- Place a 3 horizontal to 1 vertical (3H:1V) transition zone between NFS fill and other soils.
- Place NFS materials in critical sidewalk areas.

As an alternative to extending NFS fill to the full frost depth, consideration can be made to placing extruded polystyrene or cellular concrete under a buffer of at least 2 feet of NFS material.

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary

Boring	Sample Depth (feet)	Soil Description	Soluble Sulfate (%)	Electrical Resistivity [1] (Ω-cm)	pH
B-2	2.5 – 4.0	CL	0.03	1,620	8.1
B-4	2.5 – 4.0	CL	2.00	328	7.5

1. Performed on a saturated sample of soil.

Results of water-soluble sulfate testing indicate that samples of the on-site soils have an exposure class of S2 when classified in accordance with Table 19.3.1.1 of the American Concrete Institute (ACI) Design Manual. Concrete should be designed in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 19.

To improve sulfate resistance of concrete in severe sulfate exposure when Type V cement is not available, the following should be considered:

- Use of Type I-II modified cement for sulfate resistance

- Cement should have a tricalcium aluminate content of not more than 8%.
- Concrete mixture should contain at least 20% Class F fly ash.
- Provide air-entrainment of 4% to 7% by volume.
- Lower the water to cement ratio to 0.4 to 0.45.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our Scope of Services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

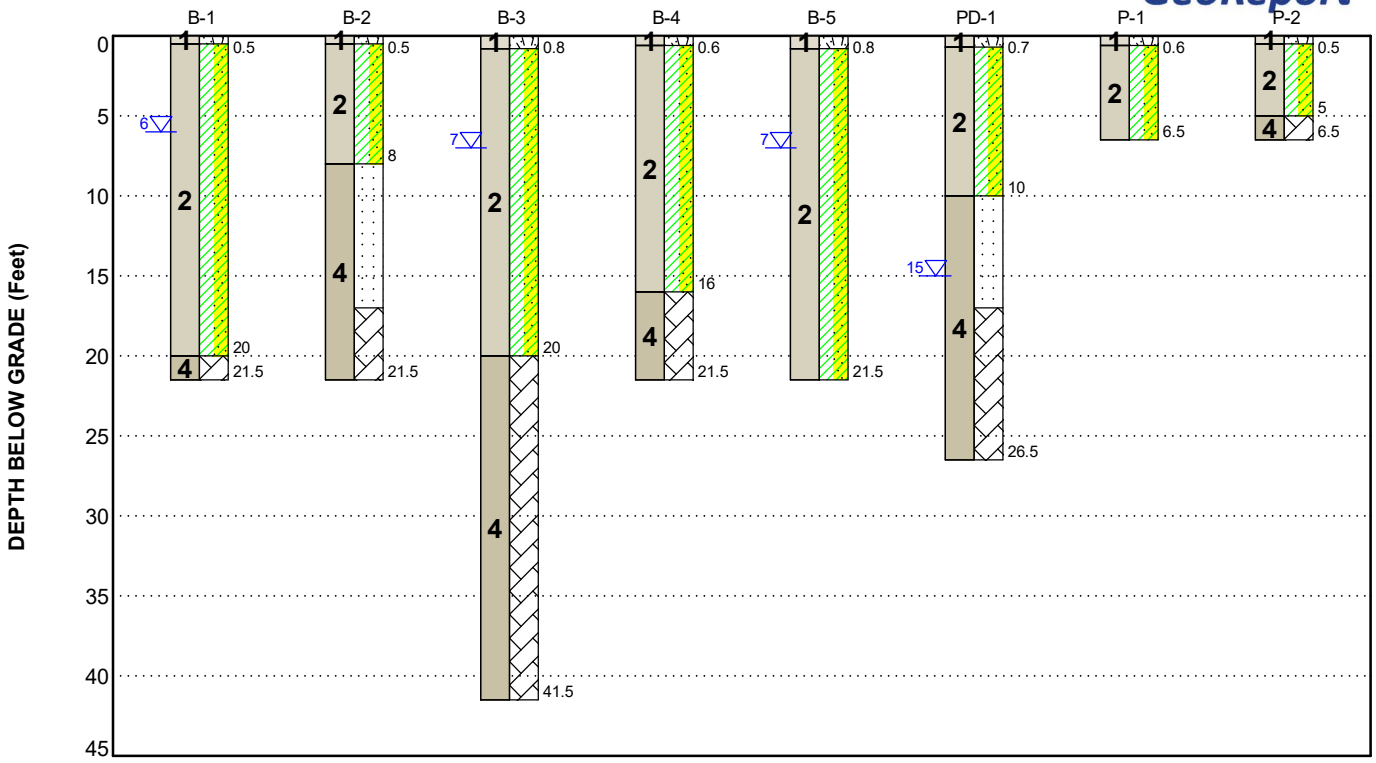
Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

FIGURES

Contents:

GEOMODEL

4.55 Acre Site ■ Livingston, MT
Terracon Project No. 26215031



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Surficial Conditions	Topsoil or fill encountered surficially in all borings.
2	Clay	Clay with varying amounts of sand and silt present in all borings except P-5.
3	Sand	Sand with varying amounts of clay and gravel present in P-5 and P-9.
4	Sedimentary Bedrock	Sandstone and/or claystone present in all borings except B-5, P-1, and P-3 through B-9.

LEGEND

Topsoil
Sandstone
Lean Clay with Sand
Claystone

First Water Observation

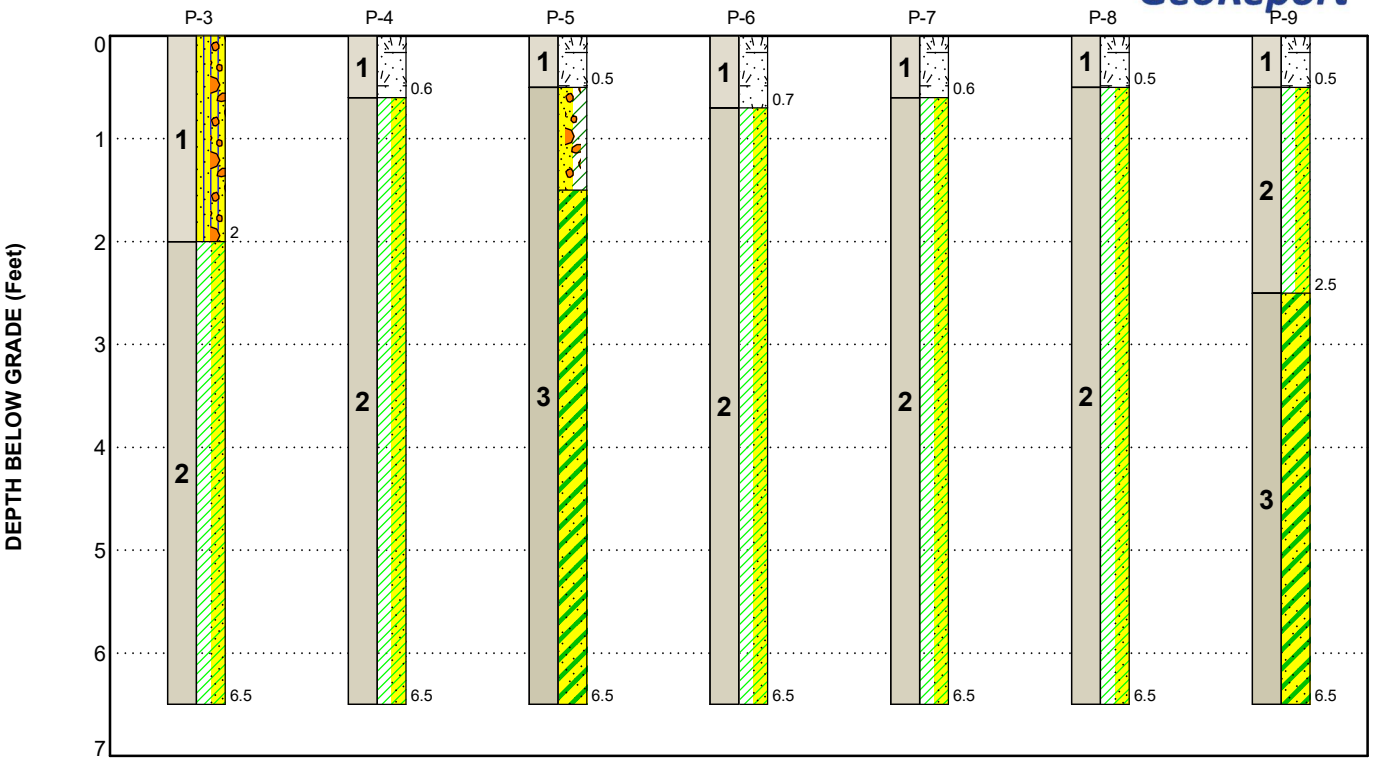
Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

GEOMODEL

4.55 Acre Site ■ Livingston, MT
Terracon Project No. 26215031

Terracon GeoReport



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	**Surficial Conditions**	Topsoil or fill encountered surficially in all borings.
2	**Clay**	Clay with varying amounts of sand and silt present in all borings except P-5.
3	**Sand**	Sand with varying amounts of clay and gravel present in P-5 and P-9.
4	**Sedimentary Bedrock**	Sandstone and/or claystone present in all borings except B-5, P-1, and P-3 through B-9.

LEGEND

- Silty Sand with Gravel
- Poorly-graded Sand with Clay and Gravel
- Lean Clay with Sand
- Clayey Sand
- Topsoil

▽ First Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
5	21.5 to 41.5	Building Center and Corners
1	26.5	Detention Pond Area
9	6.5	Pavement Areas

Boring Layout and Elevations: The locations of the borings were originally laid out by Terracon personnel using a handheld GPS unit (estimated horizontal accuracy of about ±10 feet). If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted drill rig using continuous-flight, hollow stem augers. Four samples were obtained in the upper 10 feet of each boring and at intervals of 5 feet thereafter. In the thin-walled tube sampling procedure, a thin-walled, seamless steel tube with a sharp cutting edge was pushed hydraulically into the soil to obtain a relatively undisturbed sample. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. For safety purposes, all borings were backfilled with auger cuttings after their completion.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a Geotechnical Engineer. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project engineer reviewed the field data and assigned laboratory tests to better understand the engineering properties of the various soil and rock strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards

noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D2166 Standard Test Method for Unconfined Compressive Strength of Cohesive Soil
- ASTM D2435 Standard Test Methods for One-Dimensional Consolidation Properties of Soils Using Incremental Loading
- ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
- ASTM D1883 Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils
- ASTM D5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
- Resistivity, pH, and soluble sulfate content

The laboratory testing program often included examination of soil samples by an engineer. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

Rock classification was conducted using locally accepted practices for engineering purposes. Boring log rock classification was determined using the Description of Rock Properties.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

4.55 Acre Site Development ■ Livingston, MT
May 7, 2021 ■ Terracon Project No. 26215031

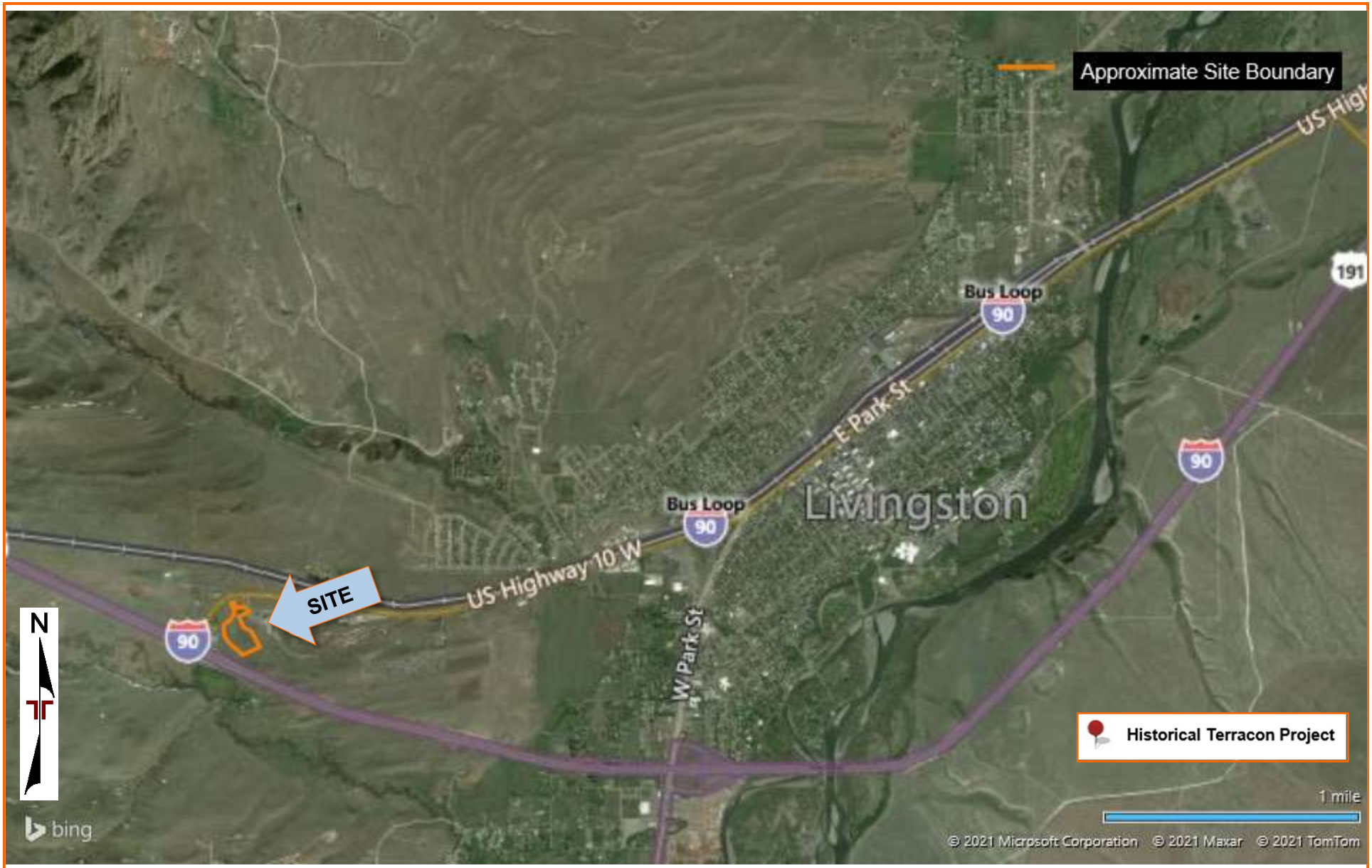


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

4.55 Acre Site Development ■ Livingston, MT
May 7, 2021 ■ Terracon Project No. 26215031

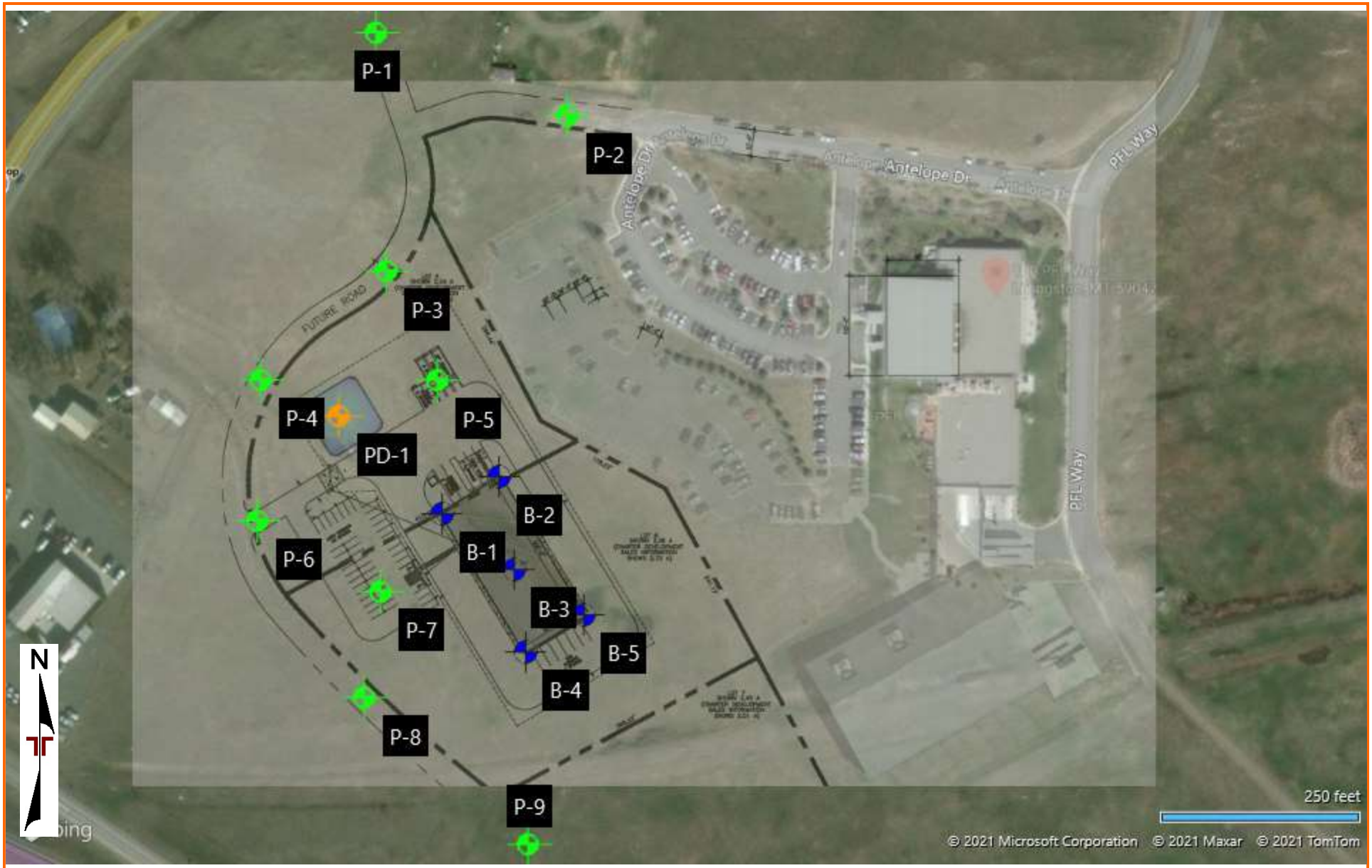


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6521° Longitude: -110.6087°

MODEL LAYER	GRAPHIC LOG	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.5	**TOPSOIL**, dark brown, moist									
2			**LEAN CLAY WITH SAND (CL)**, brown to light purplish gray, moist to wet, medium stiff to very stiff				2-4-5 N=9		23.9			
							4-5-5 N=10		24.1			
				5	▽		3-2-3 N=5		23.4			
							2-3-3 N=6					
				10			2-2-6 N=8					
				15			5-9-14 N=23					
4		20.0	**SEDIMENTARY BEDROCK - CLAYSTONE**, dark purplish brown, wet	20			25-22-40 N=62					
		21.5	***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 20' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-12-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. B-2

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6522° Longitude: -110.6084°

MODEL LAYER	GRAPHIC LOG	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.5	**TOPSOIL**, dark brown, moist									
2			**LEAN CLAY WITH SAND (CL)**, dark brown, moist, very stiff				4-6-9 N=15		24.4			
							5-7-8 N=15		10.5			
		8.0		5			7-22-43 N=65		11.1			
4			**SANDSTONE**, light brown to light gray, moist	10			50		3.1			
		17.0		15			50/4"					
			SEDIMENTARY BEDROCK - CLAYSTONE, light gray to light purple, moist	20			20-33-50/5"		15.4			
		21.5	***Boring Terminated at 21.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 20' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. B-3

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6519° Longitude: -110.6083°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.8				2-3-3 N=6		23.4			
						3-3-4 N=7		27.2			
			5								
				▽			250	31.5	100	46-23-23	79
						4-4-5 N=9					
2			10			2-3-4 N=7					
			15			3-7-10 N=17					
		20.0	20			14-27-26 N=53					
4			25			19-39-50 N=89					

TOPSOIL, dark brown, moist

LEAN CLAY WITH SAND (CL), dark brown to light purplish gray, moist to wet, medium stiff to very stiff

SEDIMENTARY BEDROCK - CLAYSTONE, light gray to light gray, wet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 40' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-12-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. B-3

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION See Exploration Plan Latitude: 45.6519° Longitude: -110.6083° DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
4		**SEDIMENTARY BEDROCK - CLAYSTONE**, light gray to light gray, wet *(continued)*	30			29-50					
			35			12-22-49 N=71					
			40			13-20-30 N=50					
		41.5 ***Boring Terminated at 41.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 40' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-12-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. B-4

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6516° Longitude: -110.6082°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.6									
2					X	3-2-3 N=5		14.7			
					X	6-6-7 N=13		16.4			
			5		X	4-5-5 N=10		21.2			
					X	3-4-4 N=8		19.7			
			10		X	7-10-9 N=19		21.9			
4		16.0	15		X	10-17-19 N=36		19.3			
		21.5	20		X	18-27-29 N=56		16.8			

TOPSOIL, light brown, moist

LEAN CLAY WITH SAND (CL), light brown to brown, moist, medium stiff to very stiff

SEDIMENTARY BEDROCK - CLAYSTONE, gray with purple, moist

Boring Terminated at 21.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 20' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-12-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. B-5

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6518° Longitude: -110.6080°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.8				2-3-4 N=7		21.9			
						4-5-5 N=10		22.9			
			5								
				▽			850	32.8	88	46-22-24	74
						2-2-2 N=4					
2			10			2-3-4 N=7					
			15			12-14-10 N=24					
			20			7-12-14 N=26					
		21.5									

TOPSOIL, dark brown, moist

LEAN CLAY WITH SAND (CL), dark brown to brown, moist to wet, medium stiff to very stiff

Boring Terminated at 21.5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 20' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-12-2021 | Boring Completed: 04-12-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. PD-1

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction Madison, WI

SITE: Near PFL Way Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6524° Longitude: -110.6092°

MODEL LAYER	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1	0.7	**TOPSOIL**, dark brown, moist									
2		**LEAN CLAY WITH SAND (CL)**, light brown, moist, medium stiff to stiff				2-4-4 N=8		15.9			
						3-3-4 N=7		17.8			
			5								
	10.0					4-4-8 N=12		15.3			
		SANDSTONE, light brown, moist to wet	10			15-19-50/4"		11.7			
	17.0		15	▽		50/2"					
4		**SEDIMENTARY BEDROCK - CLAYSTONE**, light gray to light brown, wet	20			34-50					
	26.5		25			50					
		Boring Terminated at 26.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 25' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021	Boring Completed: 04-13-2021
Drill Rig: BK-81	Driller: Haztech
Project No.: 26215031	

BORING LOG NO. P-1

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6538° Longitude: -110.6090°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.6 **TOPSOIL**, light brown to light gray, moist				3-4-6 N=10		19.6			
2		**LEAN CLAY WITH SAND (CL)**, light brown to light gray, moist, stiff to hard	5			11-14-17 N=31		15.2			
		6.5				17-25-26 N=51		12.7			
		Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-2

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6535° Longitude: -110.6080°

MODEL LAYER	GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.5	**TOPSOIL**, light brown, moist									
2			**LEAN CLAY WITH SAND (CL)**, light gray to light brown, moist, medium stiff to stiff				3-5-5 N=10		14.6			
							4-4-3 N=7		14.5			
		5.0		5								
4			**SEDIMENTARY BEDROCK - CLAYSTONE**, light gray to light brown, moist				13-30-37 N=67		10.8			
		6.5	***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-3

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6529° Longitude: -110.6089°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		**FILL - SILTY SAND WITH GRAVEL (SM)**, fine to coarse grained, rounded, brown, moist, medium dense				10-7-4 N=11					
		2.0									
2		**LEAN CLAY WITH SAND (CL)**, light brown, moist, very stiff				7-10-13 N=23		13.6			
			5			11-13-13 N=26		16.7			
		6.5									
		Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-4

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		LOCATION See Exploration Plan Latitude: 45.6526° Longitude: -110.6095° DEPTH 0.6 **TOPSOIL**, dark brown, moist									
2		**LEAN CLAY WITH SAND (CL)**, brown, moist, stiff				2-5-6 N=11		17.3			
						4-5-4 N=9		10.7			
			5			5-5-5 N=10		9.5			
		6.5 ***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-5

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		See Exploration Plan Latitude: 45.6526° Longitude: -110.6087° 0.5 **TOPSOIL**, dark brown				6-7-8 N=15		9.8			
		1.5 **POORLY GRADED SAND WITH CLAY AND GRAVEL (SP-SC)**, fine to coarse grained, rounded, brown, moist, medium dense									
3		**CLAYEY SAND (SC)**, fine grained, light gray to light purple, moist, medium dense to very dense				3-10-8 N=18		11.3			
			5								
						8-16-40 N=56		11.5			
		6.5 ***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-6

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		See Exploration Plan Latitude: 45.6521° Longitude: -110.6096° 0.7 **TOPSOIL**, dark brown, moist				2-4-9 N=13		19.4			
2		**LEAN CLAY WITH SAND (CL)**, brown, moist	5			10-13-10 N=23		22.4			
						6-5-6 N=11		20.6			
		6.5 ***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-7

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		LOCATION See Exploration Plan Latitude: 45.6518° Longitude: -110.6090° DEPTH 0.6 **TOPSOIL**, dark brown, moist				2-2-2 N=4		20.5			
2		**LEAN CLAY WITH SAND (CL)**, dark brown, moist, medium stiff to stiff	5			7-8-7 N=15		17.9		43-18-25	81
		6.5				4-4-5 N=9		20.4			
		Boring Terminated at 6.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021
Drill Rig: BK-81 | Driller: Haztech
Project No.: 26215031

BORING LOG NO. P-8

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

MODEL LAYER	GRAPHIC LOG	LOCATION / DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		LOCATION See Exploration Plan Latitude: 45.6515° Longitude: -110.6090° DEPTH 0.5 **TOPSOIL**, dark brown, moist									
2		**LEAN CLAY WITH SAND (CL)**, dark brown, moist	5			2-2-2 N=4		21.8			
						5-6-5 N=11		11.4			
						4-7-9 N=16		28.1			
		6.5 ***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

BORING LOG NO. P-9

PROJECT: 4.55 Acre Site

CLIENT: Ruedebusch Development & Construction
Madison, WI

SITE: Near PFL Way
Livingston, MT

LOCATION See Exploration Plan

Latitude: 45.6510° Longitude: -110.6082°

MODEL LAYER	GRAPHIC LOG	DEPTH		DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	UNCONFINED COMPRESSIVE STRENGTH (psf)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
1		0.5	**TOPSOIL**, dark brown, moist									
2			**LEAN CLAY WITH SAND (CL)**, dark brown, moist, medium stiff to stiff				2-2-2 N=4		18.9			
		2.5										
3			**CLAYEY SAND (SC)**, fine grained, light brown, moist, medium dense				2-4-7 N=11		12.1			
				5								
							7-8-8 N=16		10.4			
		6.5	***Boring Terminated at 6.5 Feet***									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
0 - 5' Hollow Stem Auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Groundwater not encountered

Terracon
2110 Overland Ave Ste 124
Billings, MT

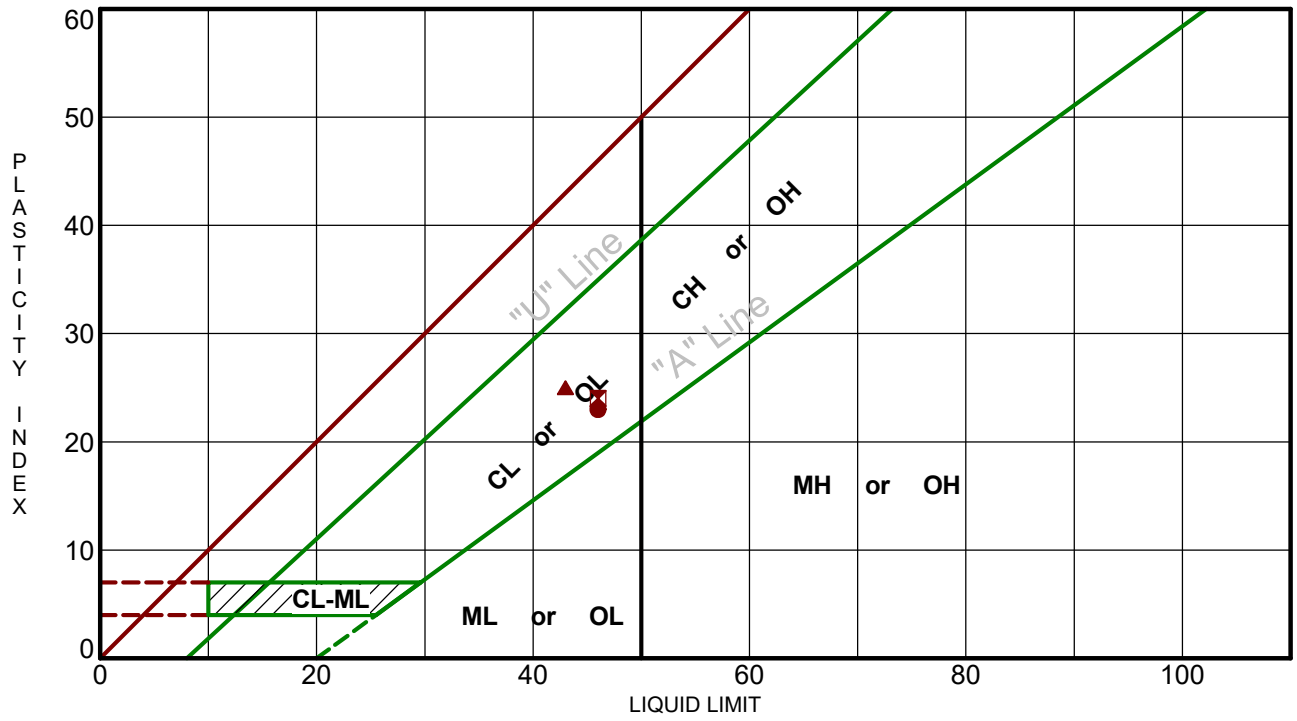
Boring Started: 04-13-2021 | Boring Completed: 04-13-2021

Drill Rig: BK-81 | Driller: Haztech

Project No.: 26215031

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID		Depth	LL	PL	PI	Fines	USCS	Description
●	B-3	5 - 7	46	23	23	78.7	CL	LEAN CLAY with SAND
⊠	B-5	5 - 7	46	22	24	74.2	CL	LEAN CLAY with SAND
▲	P-7	1 - 4	43	18	25	81.2	CL	LEAN CLAY with SAND

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

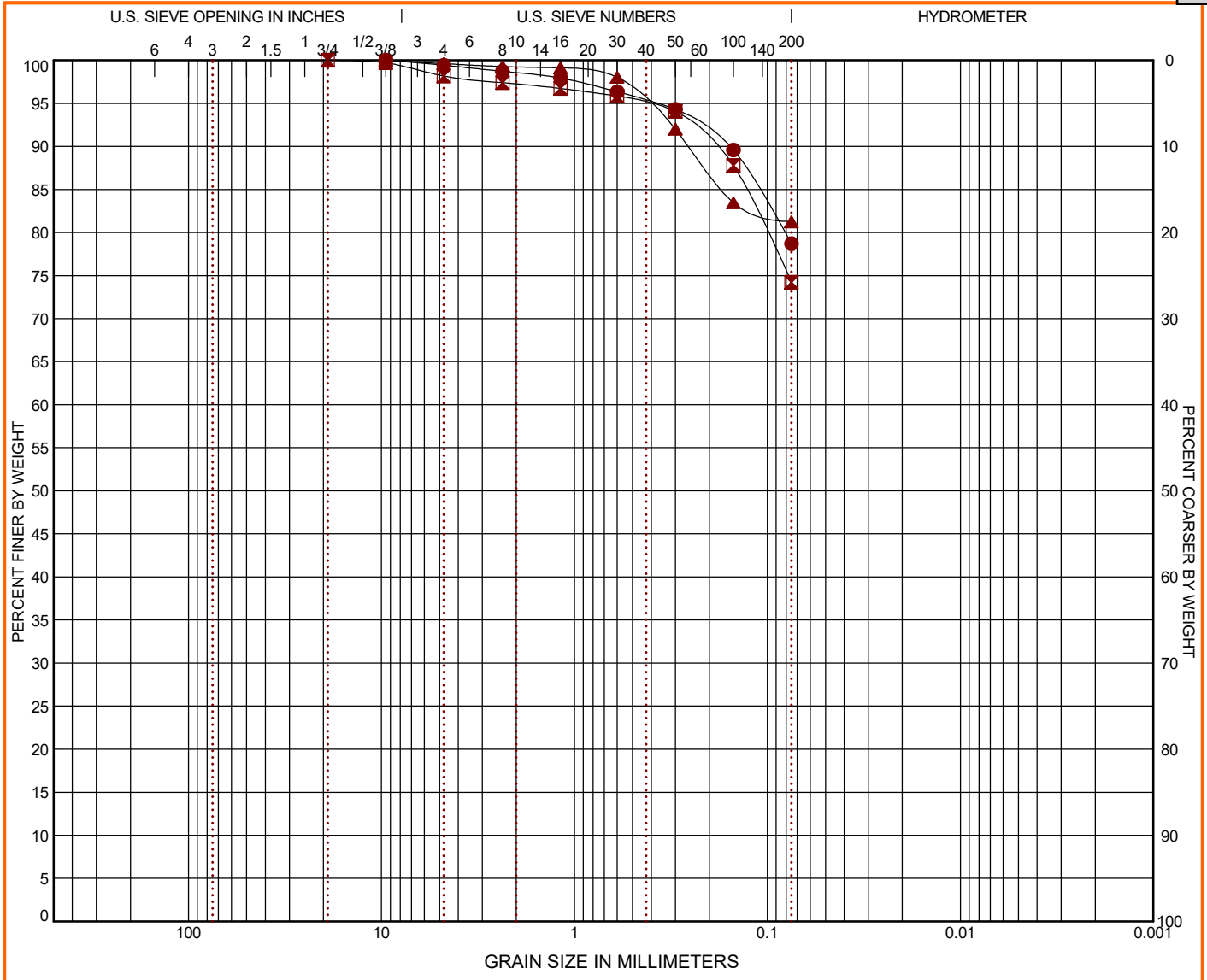
Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

GRAIN SIZE DISTRIBUTION

ASTM D422



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	**B-3**	**5 - 7**	**0.0**	**0.6**	**20.7**		**78.7**		**CL**
⊠	**B-5**	**5 - 7**	**0.0**	**1.8**	**23.9**		**74.2**		**CL**
▲	**P-7**	**1 - 4**	**0.0**	**0.4**	**18.4**		**81.2**		**CL**

	GRAIN SIZE		
	●	⊠	▲
D_{95}	**0.381**	**0.433**	**0.424**
D_{60}			
D_{50}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_C			
C_U			

●		⊠		▲	
Sieve	**% Finer**	**Sieve**	**% Finer**	**Sieve**	**% Finer**
3/8"	100.0	3/4"	100.0	3/8"	100.0
#4	99.42	3/8"	99.71	#4	99.6
#8	98.71	#4	98.16	#8	99.26
#16	97.93	#8	97.39	#16	99.11
#30	96.33	#16	96.72	#30	98.01
#50	94.3	#30	95.83	#50	92.0
#100	89.58	#50	94.06	#100	83.45
#200	78.7	#100	87.76	#200	81.24
		#200	74.23		

	SOIL DESCRIPTION
●	LEAN CLAY with SAND (CL)
⊠	LEAN CLAY with SAND (CL)
▲	LEAN CLAY with SAND (CL)

	REMARKS
●	
⊠	
▲	

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

Terracon
2110 Overland Ave Ste 124
Billings, MT

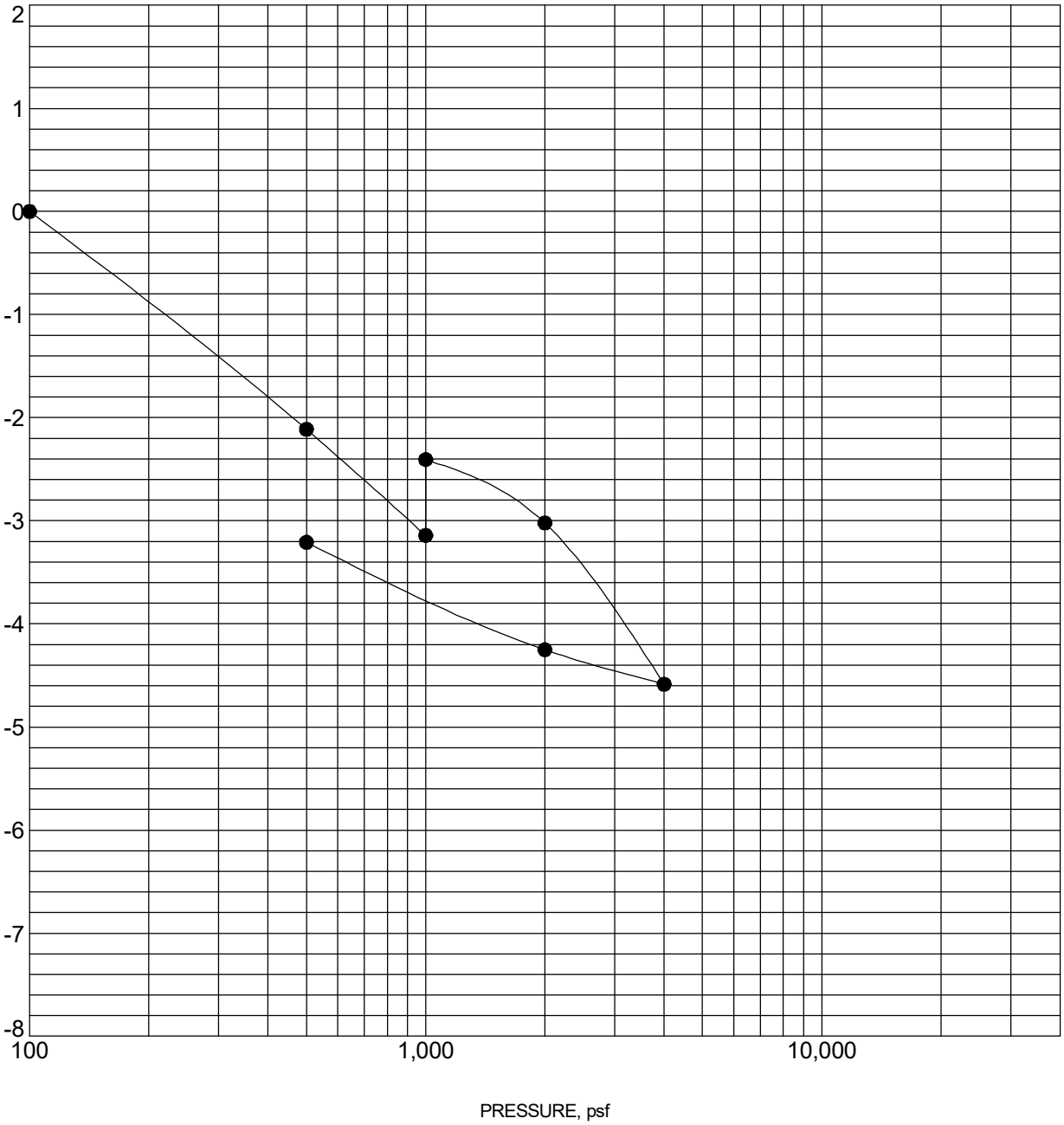
PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. 73155080 GRAIN SIZE - D95-D50 26215031 4.55 ACRE SITE.GPJ TERRACON_DATATEMPLATE.GDT 4/28/21

SWELL CONSOLIDATION TEST

ASTM D2435



Specimen Identification			Classification	γ_d, pcf	WC, %
●	B-3	5 - 7 ft	LEAN CLAY with SAND(CL)	96	27.5

NOTES: Sample inundated with water at 1,000 psf.

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

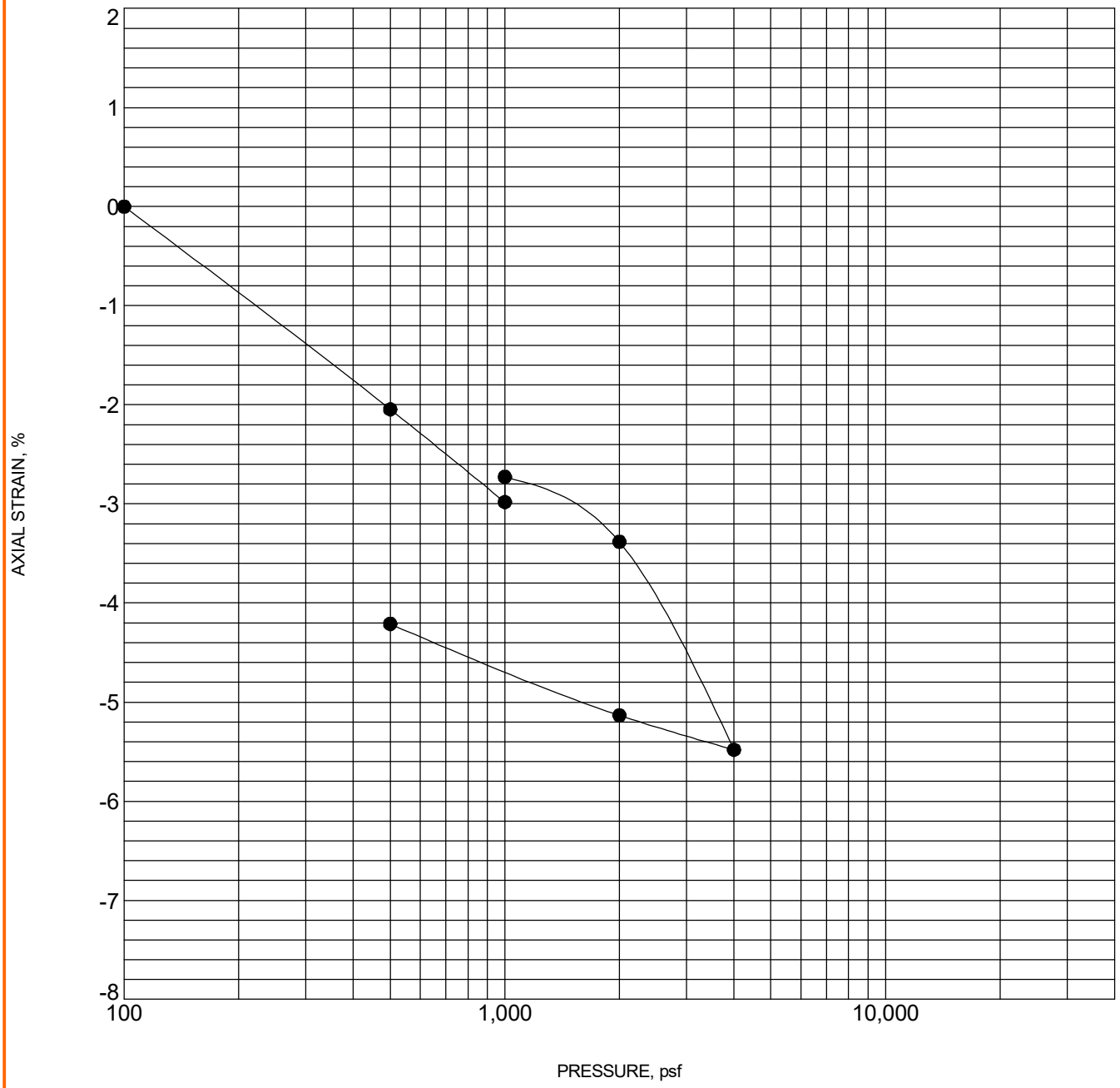
Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

SWELL CONSOLIDATION TEST

ASTM D2435



Specimen Identification			Classification	γ_d, pcf	WC, %
●	B-5	5 - 7 ft	LEAN CLAY with SAND(CL)	93	27.8

NOTES: Sample inundated with water at 1,000 psf.

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

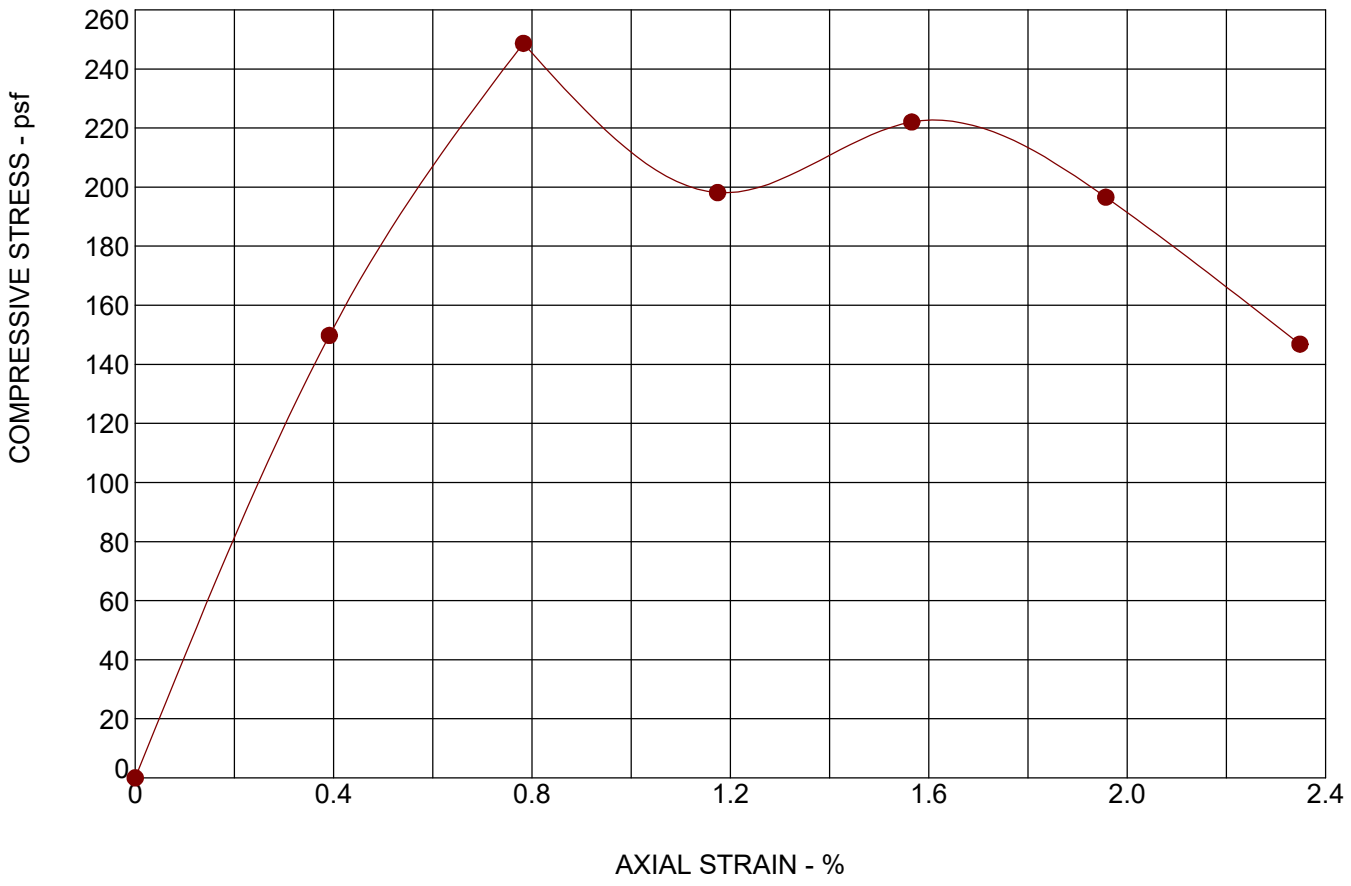
Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE PHOTOGRAPH

SPECIMEN TEST DATA

Moisture Content:	%	31.5
Dry Density:	pcf	100
Diameter:	in.	2.70
Height:	in.	5.11
Height / Diameter Ratio:		1.89
Calculated Saturation:	%	
Calculated Void Ratio:		
Assumed Specific Gravity:		
Failure Strain:	%	0.78
Unconfined Compressive Strength	(psf)	249
Undrained Shear Strength:	(psf)	124
Strain Rate:	in/min	0.0500
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: B-3 @ 5 - 7 feet

DESCRIPTION: LEAN CLAY with SAND(CL)

LL	PL	PI	Percent < #200 Sieve
46	23	23	78.7

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

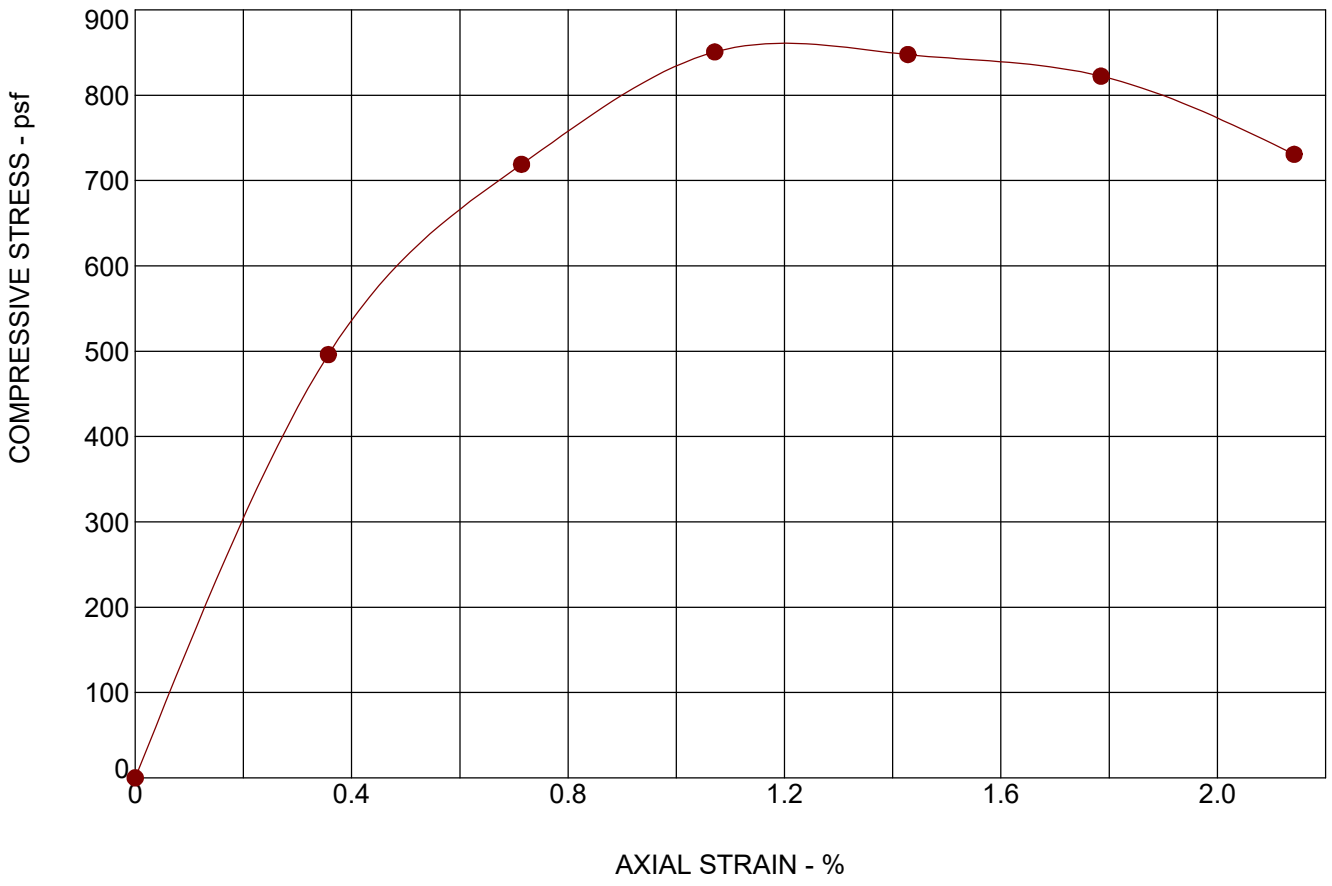
Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

UNCONFINED COMPRESSION TEST

ASTM D2166



SPECIMEN FAILURE PHOTOGRAPH

SPECIMEN TEST DATA

Moisture Content:	%	32.8
Dry Density:	pcf	88
Diameter:	in.	2.85
Height:	in.	5.60
Height / Diameter Ratio:		1.97
Calculated Saturation:	%	
Calculated Void Ratio:		
Assumed Specific Gravity:		
Failure Strain:	%	1.07
Unconfined Compressive Strength	(psf)	851
Undrained Shear Strength:	(psf)	425
Strain Rate:	in/min	0.0500
Remarks:		

SAMPLE TYPE: Shelby Tube

SAMPLE LOCATION: B-5 @ 5 - 7 feet

DESCRIPTION: LEAN CLAY with SAND(CL)

LL	PL	PI	Percent < #200 Sieve
46	22	24	74.2

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

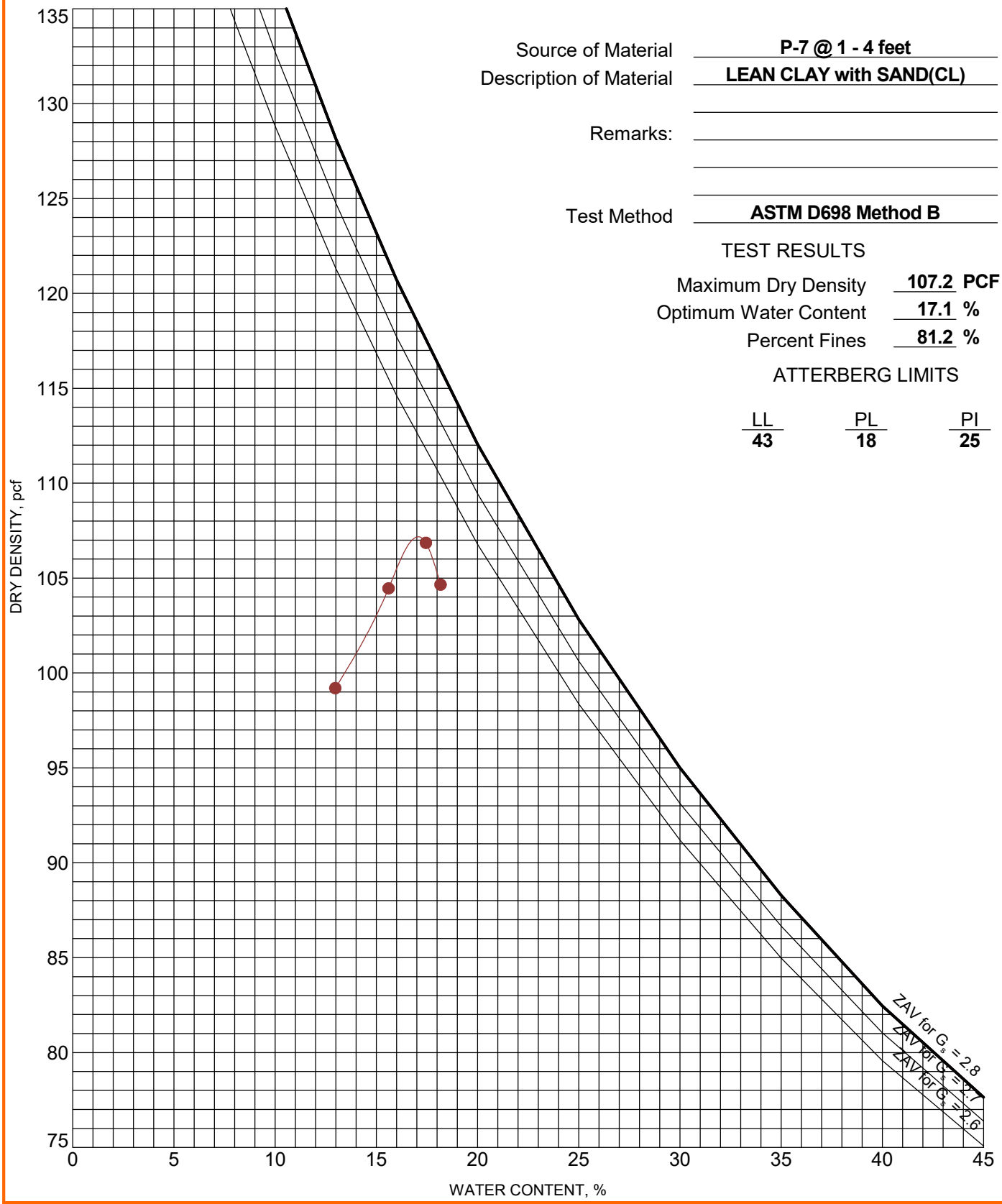
Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

MOISTURE-DENSITY RELATIONSHIP

ASTM D698/D1557



Source of Material	**P-7 @ 1 - 4 feet**
Description of Material	**LEAN CLAY with SAND(CL)**
Remarks:	
Test Method	**ASTM D698 Method B**

TEST RESULTS

Maximum Dry Density	**107.2**	**PCF**
Optimum Water Content	**17.1**	**%**
Percent Fines	**81.2**	**%**

ATTERBERG LIMITS

LL	PL	PI
43	**18**	**25**

PROJECT: 4.55 Acre Site

SITE: Near PFL Way
Livingston, MT

Terracon
2110 Overland Ave Ste 124
Billings, MT

PROJECT NUMBER: 26215031

CLIENT: Ruedebusch Development & Construction
Madison, WI

PROJECT:	4.55 Acre Site	**PROJECT NO:**	26215031
LOCATION:	Livingston, Montana		
MATERIAL:	Lean Clay with Sand		
SAMPLE SOURCE:	P-7 @ 1 to 4 feet	**DATE:**	4/28/2021
REVIEWED BY:	TG		

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY-COMPACTED SOILS (ASTM D1883)

COMPACTION(%)	94.9%		
COMPACTION:	Recompacted at 95% MDD near optimum moisture		
PERCENT SWELL	3.6%		

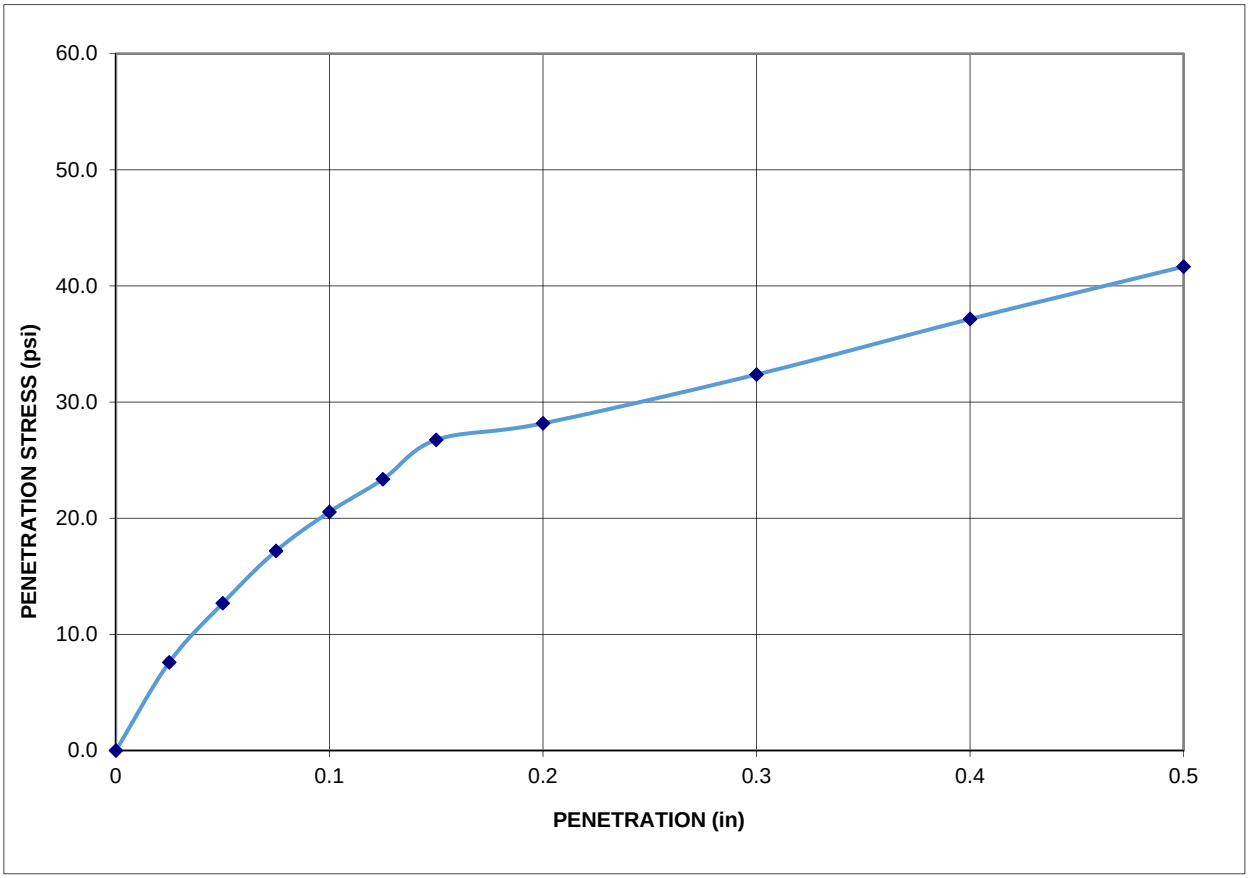
	BEFORE SOAK	AFTER SOAK
DRY DENSITY	101.8 lbs./cu.ft	98.2 lbs./cu.ft
PERCENT MOISTURE	17.1 %	26.8 %

SURCHARGE WEIGHT 10 lbs.

PENETRATION	CORRECTED C B R
0.100	2.1%
0.200	1.9%

D698 PROCTOR

DRY DENSITY(pcf)	107.2
MOISTURE(%)	17.1



HYDRAULIC CONDUCTIVITY DETERMINATION

(FLEXIBLE-WALL PERMEAMETER - FALLING-HEAD-ASTM D 5084 Method C)

Project : 4.55 Acre Site
Date: 4/28/2021
Project No. : 26215031
Boring No.: PD-1 Other Location:
Sample: - Tube Number : C1 Tube Capacity: 25.0 cm
Depth (ft): - Area (sq. centimeter): 0.8755 Factor (cm) = 1.14

Material Description : Lean Clay with Sand (CL)
Specimen Type: Shelby Tube

SAMPLE DATA

Wet Wt. sample + ring or tare : 553.7 g
Tare or ring Wt. : 0.0 g
Wet Wt: of Sample : 553.7 g

				Before Test		After Test	
Diameter :	2.862 in	7.26948	cm^2	Tare No.:	Mr. T	Tare No.:	Bill
Length :	2.771 in	7.03834	cm	Wet Wt.+tare:	156.62	Wet Wt.+tare:	772.21
Area:	6.433 in^2	41.505	cm^2	Dry Wt.+tare:	139.60	Dry Wt.+tare:	672.3
Volume :	17.826 in^3	292.124	cm^3	Tare Wt:	30.70	Tare Wt:	232.97
Unit Wt.(wet):	**1.90** g/cm^3	**118.3**	pcf	Dry Wt.:	108.9	Dry Wt.:	439.33
Unit Wt.(dry):	**1.64** g/cm^3	**102.3**	pcf	Water Wt.:	17.02	Water Wt.:	99.91
				% moist.:	**15.6**	% moist.:	**22.7**

Specific Gravity : **2.70** Max Dry Density = OMC % =
(estimated: X actual: _) % of max = % +/- OMC =
Calculated % saturation: 94.9 Void ratio (e) = **0.647** Porosity (n)= **0.393**

Pressure Differential (psi) = 2.0 Pressure Head (cm) = **140.82**

Hydraulic Gradient:	Maximum*	Minimum*	Average*
	20.0	**16.0**	**20.1**

TEST READINGS

Date/time (i) m/d hr:min	Date/time (f) m/d/hr:min	elapsed t (day)	elapsed t (sec)	H initial Hi (cm)	H final Hf (cm)	Flow in qi (cc)	Flow out qo (cc)	temp (deg C)	α (temp corr)	k (cm/sec)	k (ft./day)
4/27 10:00	4/27 10:00	0.0001	5	6.7	5.7	1.0	1.0	23.2	0.927	2.22E-04	6.28E-01
4/27 10:00	4/27 10:00	0.0001	5	5.7	4.9	0.8	0.8	23.2	0.927	1.84E-04	5.22E-01
4/27 10:00	4/27 10:00	0.0001	5	4.9	4.1	0.8	0.8	23.2	0.927	1.73E-04	4.90E-01
4/27 10:00	4/27 10:00	0.0001	5	4.1	3.4	0.7	0.7	23.2	0.927	1.62E-04	4.58E-01

SUMMARY

k_a = 1.85E-04 cm/sec (k Acceptance criteria: Vm< = 50 %)

Reading	qo/qi	acceptance	ki		Vm	
1	0.97	ok	k1 =	2.22E-04 cm/sec	19.7	%
2	0.95	ok	k2 =	1.84E-04 cm/sec	0.5	%
3	0.97	ok	k3 =	1.73E-04 cm/sec	6.6	%
4	1.00	ok	k4 =	1.62E-04 cm/sec	12.7	%

k = 1.85E-04 cm/sec (hydraulic conductivity)

Acceptance criteria as Vm:
(Variation from ASTM D 5084)
50 % for ka >= 1.00E-08
95% for ka < 1.00E-08
Acceptance criteria for qo/qi ratio:
0.75 <= qo/qi <= 1.25
(All acceptance criteria for 4 consecutive readings)

$$Vm = \frac{|ka - ki|}{ka} \times 100$$

*__Hydraulic Gradient Notes__:
Maximum and **Minimum** refer to the range possible during the test. The maximum and/or mimimum limits may not be reached. **Average** is the average of **actual** hydraulic gradients achieved during the test.

ANALYTICAL SUMMARY REPORT

May 06, 2021

Terracon Consultants
2110 Overland Ave Ste 124
Billings , MT 59102-6440

Work Order: B21041350 Quote ID: B5647

Project Name: 26215031

Energy Laboratories Inc Billings MT received the following 2 samples for Terracon Consultants on 4/19/2021 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B21041350-001	B-2 [2.5-4]feet	04/13/21 10:00	04/19/21	Soil	pH, Saturated Paste Saturated Paste Extraction ASA Resistivity, Sat Paste Sulfate-Geochemical
B21041350-002	B-4 [2.5-4]feet	04/12/21 12:00	04/19/21	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative. Any issues encountered during sample receipt are documented in the Work Order Receipt Checklist.

The results as reported relate only to the item(s) submitted for testing. This report shall be used or copied only in its entirety. Energy Laboratories, Inc. is not responsible for the consequences arising from the use of a partial report.

If you have any questions regarding these test results, please contact your Project Manager.

Report Approved By:

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Terracon Consultants
Project: 26215031
Report Date: 05/06/21

Lab ID: B21041350-001
Client Sample ID: B-2 [2.5-4]
Collection Date: 04/13/21 10:00
DateReceived: 04/19/21
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SATURATED PASTE EXTRACT							
Resistivity, Sat. Paste	1620	ohm-cm		1		Calculation	04/29/21 09:22 / srm
pH, sat. paste	8.1	s.u.		0.1		ASA10-3	04/29/21 09:22 / srm
CHEMICAL CHARACTERISTICS							
Sulfate, HCL Extractable	0.03	wt%		0.01		MTDOT	05/05/21 09:21 / srm

Lab ID: B21041350-002
Client Sample ID: B-4 [2.5-4]
Collection Date: 04/12/21 12:00
DateReceived: 04/19/21
Matrix: Soil

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SATURATED PASTE EXTRACT							
Resistivity, Sat. Paste	328	ohm-cm		1		Calculation	04/29/21 09:22 / srm
pH, sat. paste	7.5	s.u.		0.1		ASA10-3	04/29/21 09:22 / srm
CHEMICAL CHARACTERISTICS							
Sulfate, HCL Extractable	2.00	wt%		0.01		MTDOT	05/05/21 09:21 / srm

Report Definitions:
RL - Analyte Reporting Limit
QCL - Quality Control Limit
MCL - Maximum Contaminant Level
ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Terracon Consultants **Work Order:** B21041350 **Report Date:** 05/06/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **ASA10-3**										Batch: 154910
Lab ID: **B21041133-001A DUP**	Sample Duplicate					Run: MISC-SOIL_210429A				04/29/21 09:22
pH, sat. paste		7.70	s.u.	0.10				0.0	10	
Lab ID: **LCS-2104290922**	Laboratory Control Sample					Run: MISC-SOIL_210429A				04/29/21 09:22
pH, sat. paste		7.10	s.u.	0.10	95	90	110			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Terracon Consultants **Work Order:** B21041350 **Report Date:** 05/06/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **Calculation**										Batch: 154910
Lab ID: **B21041133-001A DUP**	Sample Duplicate					Run: MISC-SOIL_210429A				04/29/21 09:22
Resistivity, Sat. Paste		1150	ohm-cm	1.0		70	130	3.4	30	
Lab ID: **LCS-2104290922**	Laboratory Control Sample					Run: MISC-SOIL_210429A				04/29/21 09:22
Resistivity, Sat. Paste		249	ohm-cm	1.0	102	70	130			

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Terracon Consultants **Work Order:** B21041350 **Report Date:** 05/06/21

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **MTDOT**										Batch: R360273
Lab ID: **B21041350-001A DUP**	Sample Duplicate					Run: MISC-SOIL_210506A				05/05/21 09:21
Sulfate, HCL Extractable		0.03	wt%	0.01				13	30	
Lab ID: **LCS**	Laboratory Control Sample					Run: MISC-SOIL_210506A				05/05/21 09:21
Sulfate, HCL Extractable		0.08	wt%	0.01	109	70	130			
Lab ID: **MBLK1**	Method Blank					Run: MISC-SOIL_210506A				05/05/21 09:21
Sulfate, HCL Extractable		0.009	wt%							

Qualifiers:

RL - Analyte Reporting Limit

ND - Not detected at the Reporting Limit (RL)

Work Order Receipt Checklist

Terracon Consultants

B21041350

Login completed by: Leslie S. Cadreau
Date Received: 4/19/2021

Reviewed by: BL2000\darcy
Received by: dac

Reviewed Date: 4/20/2021
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all shipping container(s)/cooler(s)?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on all sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received in all shipping container(s)/cooler(s)?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	19.4°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Radiochemical precision results represent a 2-sigma Total Measurement Uncertainty.

Contact and Corrective Action Comments:

None

Chain of Custody & Analytical Request Record

ENERGY LABORATORIES — Trust our People. Trust our Data.

www.energylab.com

Page _____ of _____

Account Information (Billing information)

Company/Name	Terracon
Contact	Chris LaRance
Phone	406-656-3072
Mailing Address	2110 Overland Avenue, Suite 124
City, State, Zip	Billings, MT 59102
Email	Chris.LaRance@terracon.com
Receive Invoice	☐ Hard Copy ☒ Email
Receive Report	☐ Hard Copy ☐ Email
Purchase Order	
Quote	
Bottle Order	

Report Information (if different than Account Information)

Company/Name	
Contact	Travis Goracke
Phone	
Mailing Address	
City, State, Zip	
Email	Travis.Goracke@terracon.com
Receive Report	☐ Hard Copy ☒ Email
Special Report/Formats:	☐ LEVEL IV ☐ NELAC ☐ EDD/EDT (contact laboratory) ☐ Other

Comments

Project Information

Project Name, PWSID, Permit, etc.	262150.3.1
Sampler Name	J. Schaefbauer
Sampler Phone	701-429-3294
Sample Origin State	MT
EPA/State Compliance	☐ Yes ☒ No
Lab provided preservatives were used	☐ Yes ☒ No

MINING CLIENTS, please indicate sample type.
*if ore has been processed or refined, call before sending.
☐ Byproduct 11 (e)2 material ☐ Unprocessed ore (NOT ground or refined)*

Matrix Codes
A - Air
W - Water
S - Soils/Solids
V - Vegetation
B - Bioassay
O - Other
DW - Drinking Water

Analysis Requested

pH, Sulphates, Saturation

See Attached

All turnaround times are standard unless marked as RUSH

Energy Laboratories MUST be contacted prior to RUSH sample submittal for charges and scheduling – See Instructions Page

	Sample Identification (Name, Location, Interval, etc.)	Collection Date	Collection Time	Number of Containers	Matrix (See Codes Above)	RUSH TAT	ELI LAB ID (Laboratory Use Only)
1	B-2, 2.5-4'	4/13/21	1000		S		B21041350
2	B-4, 2.5-4'	4/12/21	1200				
3							
4							
5							
6							
7							
8							
9							
10							

Custody Record MUST be signed	Relinquished by (print)	Date/Time	Signature	Received by (print)	Date/Time	Signature
	Jordan Schaefbauer	4/19/21 1302				
	Relinquished by (print)	Date/Time	Signature	Received by Laboratory (print)	Date/Time	Signature
				Dylan Chiravalle	4/19/21 17:00	

LABORATORY USE ONLY

Shipped By	Cooler ID(s)	Custody Seals Y N C B	Intact Y N	Receipt Temp °C	Temp Blank Y N	On Ice Y N	Payment Type CC Cash Check	Amount $	Receipt Number (cash/check only)

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All subcontracted data will be clearly notated on your analytical report.

ELI-COC-06/08 v.2

SUPPORTING INFORMATION

Contents:

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS
4.55 Acre Site ■ Livingston, MT
Terracon Project No. 26215031

SAMPLING	WATER LEVEL	FIELD TESTS
Grab Sample Shelby Tube Split Spoon	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** **Cave In Encountered** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification as noted on the soil boring logs is based Unified Soil Classification System. Where sufficient laboratory data exist to classify the soils consistent with ASTM D2487 "Classification of Soils for Engineering Purposes" this procedure is used. ASTM D2488 "Description and Identification of Soils (Visual-Manual Procedure)" is also used to classify the soils, particularly where insufficient laboratory data exist to classify the soils in accordance with ASTM D2487. In addition to USCS classification, coarse grained soils are classified on the basis of their in-place relative density, and fine-grained soils are classified on the basis of their consistency. See "Strength Terms" table below for details. The ASTM standards noted above are for reference to methodology in general. In some cases, variations to methods are applied as a result of local practice or professional judgment.

LOCATION AND ELEVATION NOTES

Exploration point locations as shown on the Exploration Plan and as noted on the soil boring logs in the form of Latitude and Longitude are approximate. See Exploration and Testing Procedures in the report for the methods used to locate the exploration points for this project. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELEVANCE OF SOIL BORING LOG

The soil boring logs contained within this document are intended for application to the project as described in this document. Use of these soil boring logs for any other purpose may not be appropriate.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or [$Cc<1$ or $Cc>3.0$] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or [$Cc<1$ or $Cc>3.0$] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K, L, M, N]
			Liquid limit - not dried			Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K, L, M, P]
			Liquid limit - not dried			Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay.

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

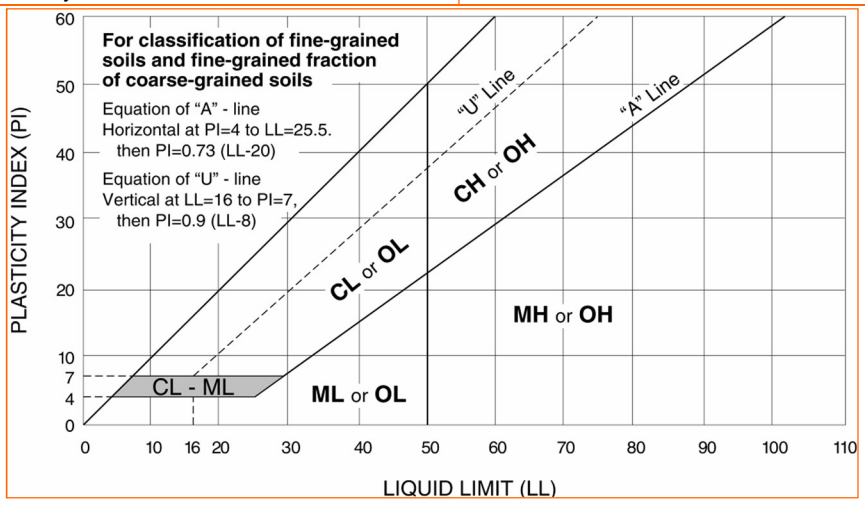
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



WEATHERING	
Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" no discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.
HARDNESS (for engineering description of rock – not to be confused with Moh's scale for minerals)	
Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding, and Foliation Spacing in Rock [1]

Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

1. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

Rock Quality Designator (RQD) [1]

RQD, as a percentage	Diagnostic description
Exceeding 90	Excellent
90 – 75	Good
75 – 50	Fair
50 – 25	Poor
Less than 25	Very poor

1. RQD (given as a percentage) = length of core in pieces 4 inches and longer / length of run

Joint Openness Descriptors

Openness	Descriptor
No Visible Separation	Tight
Less than 1/32 in.	Slightly Open
1/32 to 1/8 in.	Moderately Open
1/8 to 3/8 in.	Open
3/8 in. to 0.1 ft.	Moderately Wide
Greater than 0.1 ft.	Wide

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976. U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX B

Preliminary Sewer & Water Design Report

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

June 2023
Project No. 18005.05

PRELIMINARY SEWER AND WATER DESIGN REPORT FOR MOUNTAIN VIEW SUBDIVISION LIVINGSTON, MONTANA

SITE NARRATIVE

The purpose of this preliminary report is to summarize the design of the completed sanitary sewer and water main installation associated with the Mountain View Major Subdivision in Livingston, Montana. The project will provide water service stubs and sanitary stubs to serve future lots within the subdivision. The following report will summarize the water and sewer main design and capacity calculations for the water and sewer services to the Mountain View Major Subdivision and the existing facilities currently contributing to the infrastructure. The "Sewer and Water Design Report Ruedebusch Infrastructure Improvements" document dated April 18, 2022, is referenced in this report, which the City of Livingston has approved.

SITE DEVELOPMENT PLAN

The assumed development plan proposes three general development areas to include highway commercial, light industrial/commercial at 60% lot coverage, and multi-family residential. The highway commercial lots are proposed to include a 50-room hotel, two gas stations with 20 total fueling positions, one 2,000 square-foot coffee shop, and one 5,000 square-foot fast-food restaurant. Approximately 165,101 square feet are proposed for industrial uses, as well as 12 apartments on the residential lots.

SEWER

The existing 10-inch sanitary sewer system has capacity to handle the proposed build out of Mountain View Major Subdivision. Refer to the "Sewer and Water Design Report Ruedebusch Infrastructure Improvements" document dated April 18, 2022.

Capacity calculations were conducted per the City of Livingston Design Standards Revised August 2022. The 10-inch sewer main capacity at 75 percent full is 391-gal/min using the minimum pipe slope of 0.0028 ft/ft.

Using a zoned Highway Commercial designation peak flow calculations for the existing and sewer pipes were completed to find the overall peak flow in the 10-inch sewer main exiting the subdivision to the southeast. Highway Commercial zoning requires "Maximum Property Use Estimates" (MPUE) based on DEQ Circular 4 to determine typical wastewater flow estimates.

Highway Commercial designations were broken into lots, area, and people. The designation of lots assumed a 4-plex on each lot with 2.5 people per living unit, and 100-gallons per capita per day. Area assumed 1,000 gallons per acre per day. The designation of people had a different assumption based on if the lot was designated to a small hotel, coffee shop, automobile service station, or restaurant. Refer to *DEQ Circular 4* to reference flow assumptions. Using the above assumptions, the average daily flow exiting the subdivision was estimated at 13.67 gal/min. A peaking factor of 4.24 was then applied for a peak hourly flow rate of 57.99 gal/min. An infiltration flowrate of 150 gal/acre/day was then used to calculate a total peak hourly flow rate with infiltration at 59.80 gal/min, which is significantly less than the 10-inch capacity of 391 gal/min stated above.

WATER

The existing 12-inch water system has the capacity to handle the build out of Mountain View Major Subdivision. Refer to the Sewer and Water Design Report Ruedebusch Infrastructure Improvements" documents dated April 18, 2022.

Given the Highway Commercial zoning (non-residential lots), the proposed 12.35 acres serving the proposed area would serve around 97 persons based on wastewater usage of 127.5 gal/day/person (1,000 gal/day/acre x 12.35 acres)/127.5 gal per day per person = 97 persons). The 3 lots with assumed 4-plex development with 2.5 people per living unit add an additional 30 persons. The small hotel, coffee shop, two automobile service stations, and restaurant add an additional 452 persons. The proposed area would serve around 579 persons. Using a more conservative value of 600 people, the average daily domestic flow using 127.5 gpd/person per Livingston Design Standards is as follows:

Average Daily Flow = 600 people x 127.5 gal/day/person = 76,500 gal/day = 53.13 gpm

Using a peaking factor of 2.36 per the City of Livingston Design Standards, the Maximum Day Demand is as follows:

Maximum Day Demand = 2.36 x 53.13 = 125.38 gpm (round to 126 gpm)

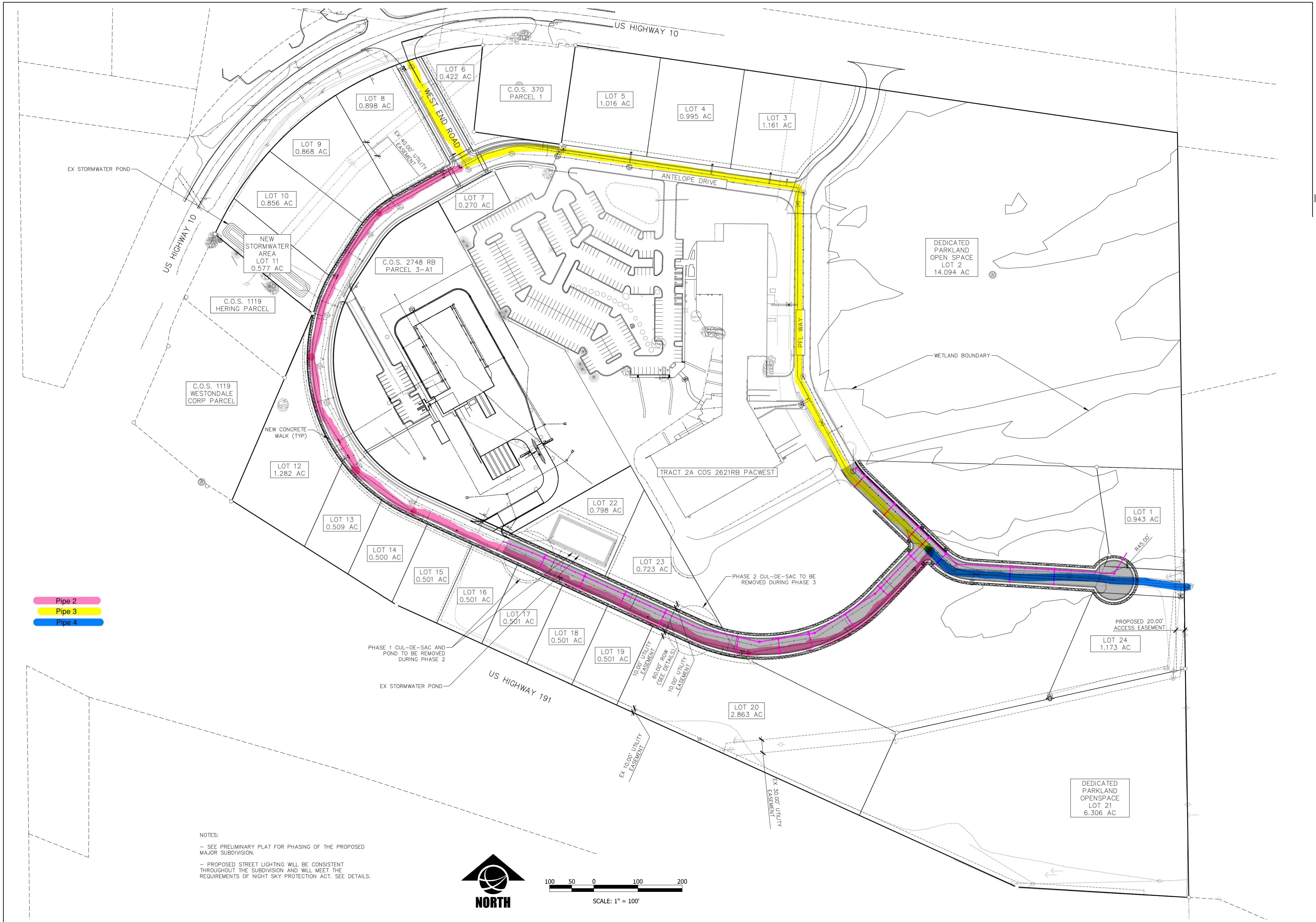
The water main will be designed using a fire flow of 1,500 gpm plus the 126 gpm domestic flow for a total of 1,626 gpm.

CONCLUSION

Based on the assumptions provided above and the Sewer and Water Design Report for the Ruedebusch Infrastructure Improvements, the existing 10-inch sanitary sewer and 12-inch water main installation will provide the required capacity for the build out of the planned developments in the project area. Please contact Sumner Anacker, PE for any questions pertaining to this preliminary report by email, sanacker@sandersonstewart.com or by phone 406-922-4308.

Attached:

- Pipe Designation Map
- Pipe 2 Spreadsheet
- Pipe 3 Spreadsheet
- Pipe 4 Spreadsheet


US HIGHWAY 10
US HIGHWAY 191
WEST END ROAD
ANTELOPE DRIVE
PFL WAY
LOT 6 0.422 AC
LOT 8 0.898 AC
LOT 9 0.868 AC
LOT 10 0.856 AC
LOT 7 0.270 AC
C.O.S. 370 PARCEL 1
LOT 5 1.016 AC
LOT 4 0.995 AC
LOT 3 1.161 AC
EX 40.00' UTILITY EASEMENT
EX STORMWATER POND
NEW STORMWATER AREA LOT 11 0.577 AC
C.O.S. 2748 RB PARCEL 3-A1
C.O.S. 1119 HERING PARCEL
C.O.S. 1119 WESTONDALE CORP PARCEL
DEDICATED PARKLAND OPEN SPACE LOT 2 14.094 AC
WETLAND BOUNDARY
NEW CONCRETE WALK (TYP)
LOT 12 1.282 AC
TRACT 2A COS 2621RB PACWEST
LOT 22 0.798 AC
LOT 13 0.509 AC
LOT 14 0.500 AC
LOT 15 0.501 AC
LOT 16 0.501 AC
LOT 17 0.501 AC
LOT 18 0.501 AC
LOT 19 0.501 AC
LOT 23 0.723 AC
LOT 1 0.943 AC
R45.00'
PHASE 2 CUL-DE-SAC TO BE REMOVED DURING PHASE 3
PROPOSED 20.00' ACCESS EASEMENT
LOT 24 1.173 AC
Pipe 2
Pipe 3
Pipe 4
PHASE 1 CUL-DE-SAC AND POND TO BE REMOVED DURING PHASE 2
EX STORMWATER POND
10.00' UTILITY EASEMENT
60.00' ROW (SEE DETAILS)
10.00' UTILITY EASEMENT
LOT 20 2.863 AC
EX 10.00' UTILITY EASEMENT
EX 30.00' UTILITY EASEMENT
DEDICATED PARKLAND OPENSPACE LOT 21 6.306 AC
NORTH
100 50 0 100 200
SCALE: 1" = 100'

NOTES:

- SEE PRELIMINARY PLAT FOR PHASING OF THE PROPOSED MAJOR SUBDIVISION.
- PROPOSED STREET LIGHTING WILL BE CONSISTENT THROUGHOUT THE SUBDIVISION AND WILL MEET THE REQUIREMENTS OF NIGHT SKY PROTECTION ACT. SEE DETAILS.

SANDERSON STEWART

Enduring Community D

PIPE DESIGNATION EXHIBIT

Pipe 2
Project: 18005.05 Mountain View Subdivision
Date: 06/20/2023

SANDERSON STEWART

Capacity Calclulations

10" Pipe Flowing Full Capacity	1.16	cfs
10" Pipe Flowing Full Capacity	522	gal/min
Q/Qfill @ 75% full,	0.75	per nomograph
Capacity @ 75% full	391	gal/min

System Demand

Service Lots

DESIGNATION	Lots (#)			Area (AC)
HC (MPUE - Assumed 4-plex on each lot, 2.5 people per living unit, 100-gallons per capita per day)	1.00	1000.00	gal/day	2.863

Service Area

Designation	Area (AC)			
HC (MPUE - Assumed 1,000 gallons/acre/day)	5.8645	5864.5	gal/day	

Designation	People (#)			Area (AC)
HC (Small Hotel - Assumed 48 gallons/guest/day)	150	7200	gal/day	0.856
HC (Small Hotel - Assumed 10 gallons/employee/day)	5	50	gal/day	
HC (Coffee Shop - Assumed 6 gallons/customer/day)	100	600	gal/day	0.868
HC (Coffee Shop - Assumed 10 gallons/employee/day)	3	30	gal/day	
HC (Automobile Service Station - Assumed 10 gallons/vehicle served/day)	45	450	gal/day	0.898
HC (Automobile Service Station - Assumed 12 gallons/employee/day)	2	24	gal/day	

Total Service (Pipe 2)

	15218.50	gal/day	11.3495
	10.57	gal/min	

Peaking Factor (per DEQ circular 2 formula)	4.24	
Peak Hourly Flow	44.85	gal/min
Infiltration at 150 gal/acre/day (per City of Livingston)	1702.43	gal/day
Infiltration gal/min	1.18	gal/min
Total Peak Hourly Flow plus Infiltration	**46.03**	**gal/min**

Result

Q/Qfull based on peak hour	0.09
Percent Full for 8" From Nomograph at peak hour	25%

Pipe 3
Project: 18005.05 Mountain View Subdivision
Date: 09/15/2022

SANDERSON STEWART

Capacity Calclulations

8" Pipe Flowing Full Capacity	0.77	cfs
8" Pipe Flowing Full Capacity	344	gal/min
(8") Q/Qfill @ 75% full,	0.75	per nomograph
(8") Capacity @ 75% full	258	gal/min
10" Pipe Flowing Full Capacity	1.16	cfs
10" Pipe Flowing Full Capacity	522	gal/min
(10") Q/Qfill @ 75% full,	0.75	per nomograph
(10") Capacity @ 75% full	391	gal/min

System Demand

Service Lots

DESIGNATION	People (#)			Area (AC)
HC (Automobile Service Station - Assumed 10 gallons/vehicle served/day)	45	450	gal/day	1.016
HC (Automobile Service Station - Assumed 12 gallons/employee/day)	2	24	gal/day	1.016
HC (Restaurant - Assumed 3 gallons/customer/day)	100	300	gal/day	1.161

Service Area

DESIGNATION	Area (AC)		
HC (MPUE - Assumed 1,000 gallons/acre/day)	1.687	1687	gal/day
		1.71	gal/min
Peaking Factor (per DEQ circular 2 formula)		4.24	
Peak Hourly Flow		7.25	gal/min
Infiltration at 150 gal/acre/day (per City of Livingston)		579.60	gal/day
Infiltration gal/min		0.40	gal/min
Total Peak Hourly Flow plus Infiltration		**7.65**	**gal/min**

Result

Q/Qfull based on peak hour	0.01
Percent Full for 8" From Nomograph at peak hour	10%

Pipe 4
Project: 18005.05 Mountain View Subdivision
Date: 09/28/2022

SANDERSON STEWART

Capacity Calclulations

10" Pipe Flowing Full Capacity	1.16	cfs
10" Pipe Flowing Full Capacity	522	gal/min
Q/Qfill @ 75% full,	0.75	per nomograph
Capacity @ 75% full	391	gal/min

System Demand

Service Lots

DESIGNATION	Lots (#)			Area (AC)
HC (MPUE - Assumed 4-plex on each lot, 2.5 people per living unit, 100-gallons per capita per day)	2.00	2000.00	gal/day	2.116
Pipe 4	**1.39**	**gal/min**		

Previous Service (Pipe 2 and 3)

Pipe 2	10.57	gal/min
Pipe 3	1.71	gal/min
All Pipes	**13.67**	**gal/min**
Peaking Factor (per DEQ Circular 2 Formula)	4.24	
Peak Hourly Flow	57.99	gal/min
Infiltration at 150 gal/acre/day (per City of Livingston)	2599.43	gal/day
Infiltration gal/min	1.81	gal/min
Total Peak Hourly Flow plus Infiltration	**59.80**	**gal/min**

Result

Q/Qfull based on peak hour	0.11
Percent Full for 10" From Nomograph at peak hour	28%

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX C
Subdivision Improvements

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 21, 2023
Project No. 18005.05

MOUNTAIN VIEW
MAJOR SUBDIVISION
PRELIMINARY PLAT APPLICATION
SUBDIVISION IMPROVEMENTS

The proposed general improvements of the Mountain View Subdivision include streets, street signage, boulevards, sidewalks, and street lighting. All these improvements will be designed to meet the requirements established in the City of Livingston Public Works Design Standards and Specifications Policy including the corresponding Modifications to Montana Public Works Standards. As such all sidewalks will be ADA compliant and all street lighting will meet the requirements of the Night Sky Protection Act.

STREETS & ALLEYS

All the proposed streets and any future alleys will be designed and constructed in accordance with the City of Livingston Public Works Standards and Subdivision Regulations. The proposed new streets are designed to the "local" street classification standards approved by the City of Livingston for the recently completed Ruedebusch FedEx project. For more details see the Civil Engineering Plans.

DRAINAGE STRUCTURES

All proposed stormwater drainage structures will be designed and constructed in accordance with the City of Livingston Public Works Standards and applicable DEQ Circulars. For more information and details see Appendix A: Preliminary Stormwater Report and Civil Engineering Plans.

SIGNS

The proposed Mountain View Subdivision will meet the standards established by the City of Livingston Public Works Standards and Manual on Uniform Control Devices.

SIDEWALKS

All the proposed sidewalks will be designed and constructed in accordance with the City of Livingston Public Works Standards and Subdivision Regulations. The proposed new sidewalks will be designed and constructed to match the specifications and standards approved by the City of Livingston for the recently completed Ruedebusch FedEx project. For more information see the Civil Engineering Plans.

STREETLIGHTS

All the proposed street lighting will be designed and installed in accordance with the City of Livingston Public Works Standards, Subdivision Regulations, and the Night Sky Protection Act. The proposed new streetlights will be installed to match the specifications and standards approved by the City of Livingston for the recently completed Ruedebusch FedEx project. For more information see the Civil Engineering Plans.

SOLID WASTE FACILITIES

Per the Administrative Rules of Montana17.36.309, the Mountain View Subdivision tenants will store solid waste in adequate containers and will contract with the City of Livingston Solid Waste Department to be removed frequently to prevent a nuisance.

FIRE HYDRANTS

All the required fire hydrants will be designed and installed in accordance with the City of Livingston Public Works Standards and Subdivision Regulations. For more details see the Civil Engineering Plans.

SEWER, WATER & STORM FACILITIES

All the proposed sewer, water, and stormwater facilities will be designed and constructed in accordance with the City of Livingston Public Works Standards, Subdivision Regulations, and applicable DEQ Circulars. The new subdivision wet utilities will be designed and installed to integrate with the existing City services including those recently constructed for the Ruedebusch FedEx project. For more information and details see Appendix A: Preliminary Stormwater Report, Appendix B: Preliminary Sewer & Water Report, and the Civil Engineering Plans.

MAIL DELIVERY

Mail deliver services will be provided for the proposed Mountain View Subdivision on a contract basis from the United States Postal Service. It is anticipated the USPS will require that the subdivision would need to provide a central mailbox bank. For more details see Appendix H: Private Service Providers Review.

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX D

Mountain View Subdivision Traffic Impact Study

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

MOUNTAIN VIEW SUBDIVISION

TRAFFIC IMPACT STUDY

18005.05

Mr. Andrew Field
Livingston West, LLC
100 PFL Way
Livingston, MT 59047

Placemaking

Infrastructure Engineering

Surveying + Mapping

Community Planning

Landscape Architecture

Branding + Visualization

May 2023

SANDERSON STEWART

ENDURING COMMUNITY DESIGN

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INTRODUCTION

This traffic impact study (TIS) assesses the traffic-related impacts associated with the proposed Mountain View Subdivision in Livingston, Montana on the surrounding transportation system. This report also provides recommendations to mitigate any such impacts. The methodology and analysis procedures used in this study employ the latest technology and nationally accepted standards in the areas of site development and transportation impact assessment. Recommendations made in this report are based on professional judgment and these principles.

SITE LOCATION AND DESCRIPTION

Mountain View Subdivision is located southeast of US Highway 10 north of the Interstate 90 interchange west of Livingston, Montana. The site is bordered by Interstate 90 to the south, US Highway 10 to the west and north, and undeveloped land to the east. An existing Printing for Less (PFL) facility is contained within the proposed subdivision. Figure 1 on the following page depicts the study area.

SITE DEVELOPMENT PLAN

The site development plan proposes three general development areas to include highway commercial, light industrial/ commercial at 60% lot coverage, and multi-family residential. The highway commercial lots are proposed to include a 50-room hotel, two gas stations with 20 total fueling positions, a 2,000 square-foot coffee shop, and a 5,000 square-foot fast-food restaurant. Approximately 165,101 square feet are proposed for industrial uses, as well as 12 apartments on the residential lots.

Access to the site is proposed via a new full-movement road connection to US 10 across from West End Road and new internal connections to PFL Way, which also accesses US 10. Figure 2 (page 3) shows the current proposed site plan for Mountain View Subdivision.

EXISTING CONDITIONS

Streets

Figure 3 on page 4 shows the MDT street classifications and speed limits on study area streets. Additional conditions of study area streets most likely to be affected by the development are described below.

All study area streets are paved. The EB and WB I-90 ramps all have single lane approaches and US 10, West End Road, and PFL Way all have two-lane sections. West Park Street has one thru lane in each direction in the study area with multiple turn lanes at the US 10 intersection. US 10 and the ramps all have paved shoulders, while there is curb and gutter on West Park Street and on PFL Way beginning approximately 150 feet south of US 10. There is a minimally used at-grade railroad crossing on US 10 approximately 70 feet west of West Park Street and another crossing approximately another 0.2-miles to the west.

Figure 1. Study Area
Mountain View Subdivision IIS

Figure 2. Site Layout

Mountain View Subdivision TIS

Figure 3. Street and Intersection Characteristics

Intersections

Figure 3 also shows the traffic control utilized at each study area intersection. The West Park Street/US 10 intersection has separate southbound left-turn, thru, and right-turn lanes, and a dedicated northbound left-turn lane. Although there are no marked eastbound turn lanes, the approach provides adequate width that right-turning vehicles often form a separate lane. The signal at this intersection operates with protected/permissive phasing for northbound left turns and permissive phasing for all other movements. The remaining intersections in the study area have no auxiliary turn lanes and are all stop-controlled.

Bicycle/Pedestrian Facilities

There is a paved path along the north side of US 10 beginning at the westernmost railroad crossing and continuing east and then north along the west side of West Park Street. A sidewalk is provided along the eastern side of West Park Street. There are also sidewalks and multi-use paths within the Printing for Less development area. There are no other bicycle or pedestrian facilities in the study area.

Traffic Volumes

Weekday AM and PM peak hour turning movement counts were collected for study area intersections on Tuesday, August 30, 2022. The traffic data was collected using Miovision Scout video-based systems. In general, the weekday AM and PM peak hour periods were found to occur from 7:30 to 8:30 AM and 4:30 to 5:30 PM. Raw count data was adjusted for seasonal variation using MDT seasonal adjustment factors. Figure 4 on page 6 summarizes the calculated Existing Conditions (2022) peak hour turning movement volumes for the AM and PM peak hours. Detailed traffic count data worksheets are included in Appendix A.

Intersection Capacity

Intersection capacity calculations for Existing Conditions (2022) were performed for the study area intersections using Synchro, Version 11, which is based on the Highway Capacity Manual, 6th Edition (Transportation Research Board, 2016) methodologies. Level of service (LOS) is defined as a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience. LOS is a qualitative measure of the performance of an intersection with values ranging from LOS A, indicating good operation and low vehicle delays, to LOS F, which indicates congestion and longer vehicle delays. LOS C is typically considered a minimum acceptable threshold for operations in Montana-based communities, though exceptions are made in certain cases.

The results of the Existing Conditions (2022) intersection capacity calculations showed that all intersections and approaches operate at LOS C or better except for the eastbound approach at the West Park Street/US 10 intersection, which operates at LOS D during the AM peak hour, although just under a second over the LOS C cutoff threshold. Figure 4 also shows the Existing Conditions (2022) LOS results at each intersection. Projected 95th percentile queuing is moderate at the West Park Street/US 10 intersection, with queues of up to 13 vehicles on West Park Street and up to 11 vehicles on US 10 to the west, which extends across the at-grade rail crossing. US 10 provides a stop bar in advance of the crossing for eastbound vehicles to queue and prevent them from stopping across the railroad tracks. A detailed capacity summary table and capacity calculation worksheets for the study area intersections can be found in Appendix B.

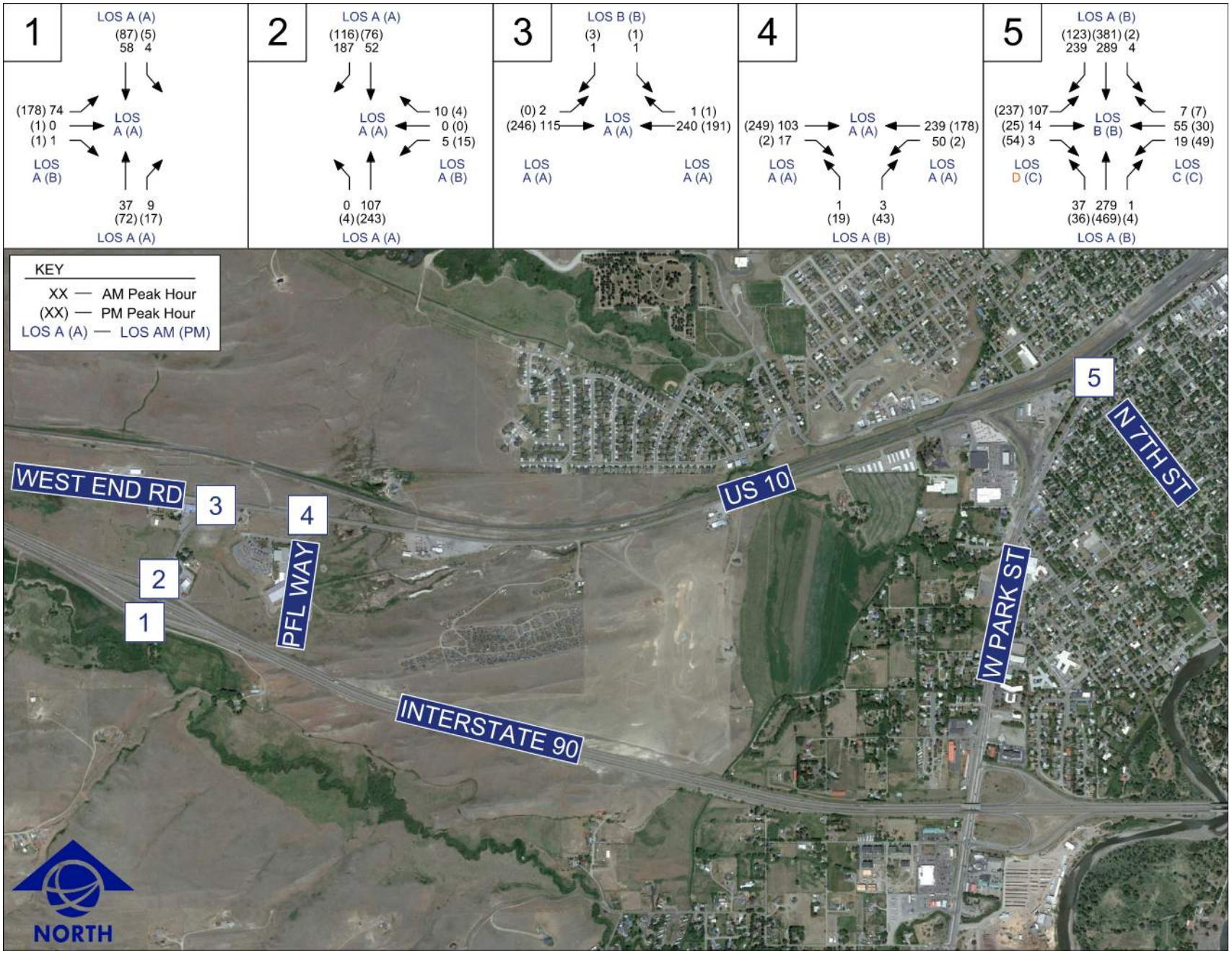


Figure 4. Existing Conditions (2022) Peak Hour Traffic Volumes

Crash Analysis

Historical crash data was requested from MDT and Montana Highway Patrol (MHP) for the 5-year period from January 1, 2015 through December 31, 2019 for all study area intersections. No MDT information could be provided for the West Park Street/US 10 or US 10/West End Road intersections and MHP has no record of crashes at these two intersections. The crash data was analyzed for the purpose of calculating intersection crash/severity rates and evaluating collision type trends. Tables 1 and 2 below and on page 8, respectively, illustrate the results of that analysis.

Table 1. Crash History – Frequency and Severity Statistics

Intersection	2015-2019 DEV[1]	Reported Crashes[2]	Crash Type			Crash Data[3]			HSM Predictions[4]	
			PDO	Injury	Fatality	Average Crash Frequency (Crash/Yr)	Crash Rate (Crash/ MVE)	Severity Index	Predicted Average Crash Frequency (Crash/Yr)	Predicted Crash Rate (Crash/ MVE)
US Hwy 10/I-90 EB Ramps	1774	4	4	0	0	0.8	1.24	1.00	0.23	0.36
US Hwy 10/I-90 WB Ramps	3579	1	1	0	0	0.2	0.15	1.00	0.19	0.15
US Hwy 10/West Park Street	15815	1	1	0	0	0.2	0.03	1.00	2.50	0.43
US Hwy 10/West End Road	5069	0	0	0	0	0.0	0.00	0.00	0.16	0.09
US Hwy 10/PFL Way	4962	0	0	0	0	0.0	0.00	0.00	0.42	0.23

[1] Daily Entering Volume (DEV) estimated from 2022 peak hour counts and 2015 through 2019 MDT published ADTs
[2] Crashes reported from January 1, 2015 to December 31, 2019
[3] Crash rates expressed as crashes per million vehicles entering (MVE)
[4] Rates calculated using SPICE tool using Highway Safety Manual (HSM) 1st Edition predictive methodology

Intersection crash frequency rates were calculated on the basis of crashes per million vehicles entering (MVE). The MVE metric was estimated based on published historical ADT volumes from the MDT website and 2022 peak hour counts. The highest crash rate was observed to be 1.24 crashes/MVE at the intersection of US 10/I-90 EB Ramps, but the high crash rate is most likely due to the very low traffic volumes since only four crashes occurred during the five years at the intersection. Crash rates for the other study area intersections were 0.00 and 0.15 crashes/MVE. These rates are shown in Table 1.

To evaluate the relative significance of the calculated historical crash rates, an expected rate was calculated using the predictive crash rate formulas in the American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual (HSM). The process involves calculating the number of crashes predicted at a given intersection in a year based on traffic demand (AADTs) and various physical and traffic environment-based conditions, such as lane configurations and traffic signal phasing. The calculation results in a crashes-per-year prediction. An equivalent MVE frequency rate was then back calculated to compare the predicted crash rate with the actual historical crash rate at the intersection. The results of the calculations showed that the historical crash rate is 3 times higher than the predicted crash rate at the intersection of US 10/I-90 EB Ramps. This is most likely due to four crashes occurring with low volumes at the intersection. The predicted crash rate is equal to the historical crash rate at the intersection of US 10/I-90 WB Ramps. There were no recorded crashes that occurred at the remaining study area intersections during the 5-year period.

In general, the crash rates are generally low relative to intersections with similar attributes that Sanderson Stewart has analyzed around the state over the years. The HSM rate predictions and 5-year crash totals for each intersection are summarized in Table 1.

Severity indexes were also calculated for all study area intersections based on standard MDT protocols. A severity index gives an indication of relative crash severity for a location based on the number of fatal, injury, and property damage only (PDO) crashes. The severity indexes were found to be relatively low (0.00 or 1.00) due to all recorded crashes being PDO. The severity rates are also shown in Table 1.

Collision types were also quantified to identify any significant trends in the crash data. Table 2 below presents the results of that analysis. Fixed object crashes were the most commonly reported collision type (2 of 4, 50%) at the intersection of US 10/I-90 EB Ramps. Three (3) of the 5 total study area intersection crashes were single vehicles crashes (run-off-road or fixed object). All fixed object crashes occurred during daylight with dry roadway conditions. It is possible that high speeds on US Highway 10 are contributing to the single vehicle crashes and inability of drivers to have time to react when leaving a lane before a collision occurs.

Table 2. Crash History – Collision Type

	Collision Type				
	Right Angle	**Rear End**	**Fixed Object**	**Run Off Road**	**Total**
US Hwy 10/I-90 EB Ramps	1	1	2		4
US Hwy 10/I-90 WB Ramps				1	1
US Hwy 10/West Park Street	1				1
US Hwy 10/West End Road					0
US Hwy 10/PFL Way					0

A speed study is recommended to be completed on US 10 upon development of Mountain View Subdivision. It is likely that operations on the highway will become more urban in nature with the addition of the subdivision trips and speed limit changes may be necessary.

It is important to note that more detailed information about individual crashes would be needed to determine exact causes for each collision and identify any additional trends.

TRIP GENERATION

This study utilized *Trip Generation Manual*, 11th Edition, published by the Institute of Transportation Engineers (ITE), which is the most widely accepted source in the United States for determining trip generation projections. These projections are used to analyze the impacts of a new development on the surrounding area. For the purposes of this study, Land Use Code 110 – General Light Industrial, Land Use Code 220 – Multifamily Housing (Low-Rise), Land Use Code 310 – Hotel, Land Use Code 934 – Fast-Food Restaurant with Drive-Thru Window, Land Use Code 937 – Coffee/Donut Shop with Drive-Thru Window, and Land Use Code 945 – Convenience Store/Gas Station were utilized to estimate trip generation for Mountain View Subdivision. Table 3 on the following page illustrates the results of the trip generation calculations for the site.

At full buildout, Mountain View Subdivision is projected to generate a total of 9,991 gross average weekday trips with 866 trips (484 entering/382 exiting) generated during the AM peak hour and 754 trips (343 entering/411 exiting) generated during the PM peak hour.

Trip generation projections provide an estimate of the total number of trips that would be generated by a proposed development. However, to estimate the net number of new trips made by personal vehicles external to the site, adjustments must often be made to account for internal capture trips, pass-by trips, and trips made by alternate modes.

Table 3. Trip Generation Summary

Land Use	Independent Variable		Average Weekday			AM Peak Hour			PM Peak Hour		
	Intensity	Units	total	enter	exit	total	enter	exit	total	enter	exit
Highway Commercial											
Hotel[1]	50	Rooms	400	200	200	23	13	10	30	15	15
Internal Capture Trips**			200	93	107	3	1	2	19	11	8
Convenience Store/Gas Station[2]	20	Veh Fueling Positions	5302	2651	2651	321	161	160	368	184	184
Internal Capture Trips**			1091	507	584	35	14	21	92	51	41
Pass-By Trips (Avg. Rate = 56%)**			2359	1201	1158	160	82	78	154	74	80
Coffee/Donut Shop w/ Drive-Thru Window[3]	2	1000 SF GFA	1067	534	533	172	88	84	78	39	39
Internal Capture Trips**			372	201	171	16	10	6	31	13	18
Pass-By Trips (Avg. Rate = 49%)**†			340	163	177	76	38	38	23	13	10
Fast-Food Restaurant w/ Drive-Thru Window[4]	5	1000 SF GFA	2337	1169	1168	223	114	109	165	86	79
Internal Capture Trips**			817	441	376	21	13	8	68	29	39
Pass-By Trips (Avg. Rate = 49%)**			745	357	388	98	49	49	48	28	20
Light Industrial/Commercial											
General Light Industrial[5]	165.101	1000 SF GFA	804	402	402	122	107	15	107	15	92
Residential											
Multifamily Housing (Low-Rise)[6]	12	Dwelling Units	81	41	40	5	1	4	6	4	2
Internal Capture Trips**			32	14	18	1	0	1	4	3	1
Total Gross Trips			**9991**	**4997**	**4994**	**866**	**484**	**382**	**754**	**343**	**411**
Total Internal Capture Trips			**2512**	**1256**	**1256**	**76**	**38**	**38**	**214**	**107**	**107**
Total Pass-By Trips			**3444**	**1721**	**1723**	**334**	**169**	**165**	**225**	**115**	**110**
Total New External Trips			**4035**	**2020**	**2015**	**456**	**277**	**179**	**315**	**121**	**194**

(1) Hotel - Land Use 310* — Units = Rooms
- Average Weekday: Average Rate = 7.99 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 0.46 (56% entering/44% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 0.59 (51% entering/49% exiting)

(2) Convenience Store/Gas Station - Land Use 945* — Units = Vehicle Fueling Positions
- Average Weekday: Average Rate = 265.12 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 16.06 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 18.42 (50% entering/50% exiting)

(3) Coffee/Donut Shop with Drive-Thru Window - Land Use Code 937* — Units = 1000 SF GFA
- Average Weekday: Average Rate = 533.57 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 85.88 (51% entering/49% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 38.99 (50% entering/50% exiting)

(4) Fast-Food Restaurant with Drive-Thru Window - Land Use 934* — Units = 1000 SF GFA
- Average Weekday: Average Rate = 467.48 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 44.61 (51% entering/49% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 33.03 (52% entering/48% exiting)

(5) General Light Industrial - Land Use 110* — Units = 1000 SF GFA
- Average Weekday: Average Rate = 4.87 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 0.74 (88% entering/12% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 0.65 (14% entering/86% exiting)

(6) Multifamily Housing (Low-Rise) - Land Use 220* — Units = Dwelling Units
- Average Weekday: Average Rate = 6.74 (50% entering/50% exiting)
- Peak Hour of the Adjacent Street, One Hour between 7 and 9 AM: Average Rate = 0.40 (24% entering/76% exiting)
- Peak Hour of the Adjacent Street, One Hour between 4 and 6 PM: Average Rate = 0.51 (63% entering/37% exiting)

**Trip Generation, 11th Edition*, Institute of Transportation Engineers, 2021

***Trip Generation Handbook, 3rd Edition*, Institute of Transportation Engineers, 2017

†Pass-By Trips Average Rate for Coffee/Donut Shop w/ Drive-Through Window is not included in ITE Pass-By data, therefore 49% Pass-By Average Rate for Fast Food Restaurant w/ Drive-Through was selected

Internal capture (IC) trips are trips that do not have origins or destinations external to a project site and therefore do not have an impact on external traffic operations. IC trips most often occur in mixed-use developments where residential, commercial, and office-related land uses exhibit a high rate of internal trip exchange. IC trips were therefore calculated between the commercial, and residential uses in the subdivision.

Pass-by trips are trips that are made as intermediate stops on the way from a point of origin to a primary trip destination. Pass-by trips are attracted from traffic "passing by" on an adjacent street that offers direct access to that site. Pass-by trips are primarily attracted by commercial type land uses such as restaurants, convenience markets, and gas stations and were therefore also calculated for this study.

Trips made by alternate modes (walking, biking, transit) were considered as negligible for this site due to its location and the lack of multi-modal accessibility on US 10.

With reductions made for internal capture and pass-by trips, the Mountain View Subdivision is projected to generate 4,305 net new external vehicular trips on a typical weekday with 456 trips (277 entering/179 exiting) during the AM peak hour and 315 trips (121 entering/194 exiting) during the PM peak hour.

TRIP DISTRIBUTION

Trip distribution is an estimate of site-generated trip routing, which can be determined by several methods such as computerized travel demand models, calculation of travel time for various available routes, and/or simple inspection of existing traffic patterns within the project area. For this study, distribution percentages were calculated based on existing traffic volumes and other nearby studies. Figure 5 on page 11 presents the trip distribution scheme.

TRAFFIC ASSIGNMENT

Traffic assignment is the procedure whereby site-generated vehicle trips are assigned to study area streets, intersections, and site access driveways based on the calculated trip distribution and the physical attributes of the development site. Using this approach, site-generated trips for Mountain View Subdivision were assigned to the study area intersections for the purposes of projecting future traffic volumes for analysis. The results of this exercise are also illustrated in Figure 5 on page 11.

TRAFFIC IMPACTS

Traffic Volumes

Based on information from the client, a buildout year of 2027 was utilized for the purposes of calculating future traffic projections. In addition to site-generated trips, background traffic volumes will also likely increase for study area streets and intersections due to general growth. To account for that growth, historical MDT traffic data on US 10 and I-90 was reviewed, and it was determined that an annual background growth rate (AGR) of 2% would be conservatively appropriate for modeling ambient growth on US 10 and West Park Street, and 4% AGR would be appropriate on the I-90 ramps. Future (2027) traffic projections for the facility were then calculated by combining existing traffic volumes with anticipated background growth, site-generated traffic assignments, and projected trips for the FedEx facility currently under construction within the Mountain View Subdivision area. Figure 6 on page 12 illustrates the resulting AM and PM peak hour traffic volume projections.

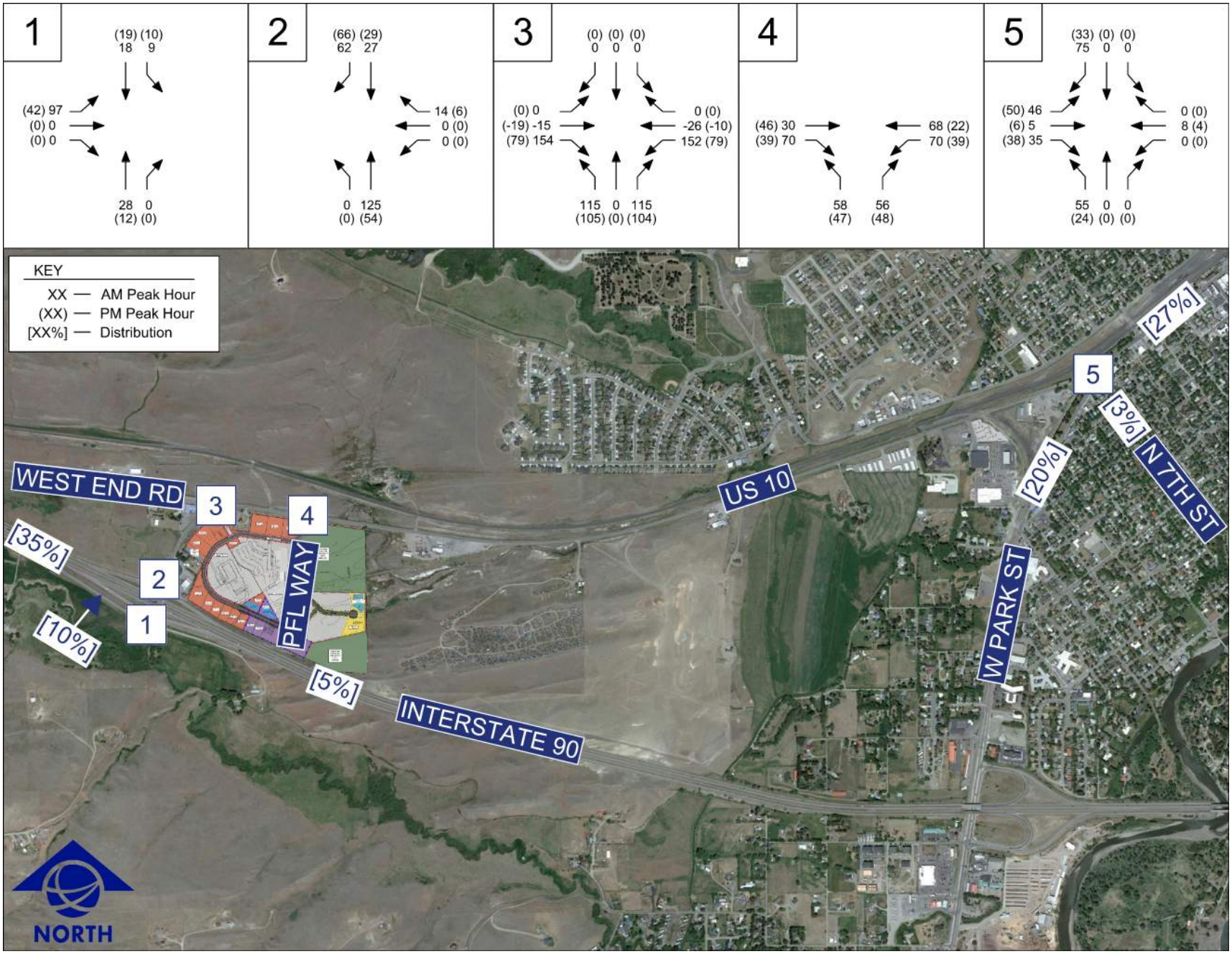


Figure 5. Trip Distribution & Traffic Assignment Summary

Mountain View Subdivision TIS

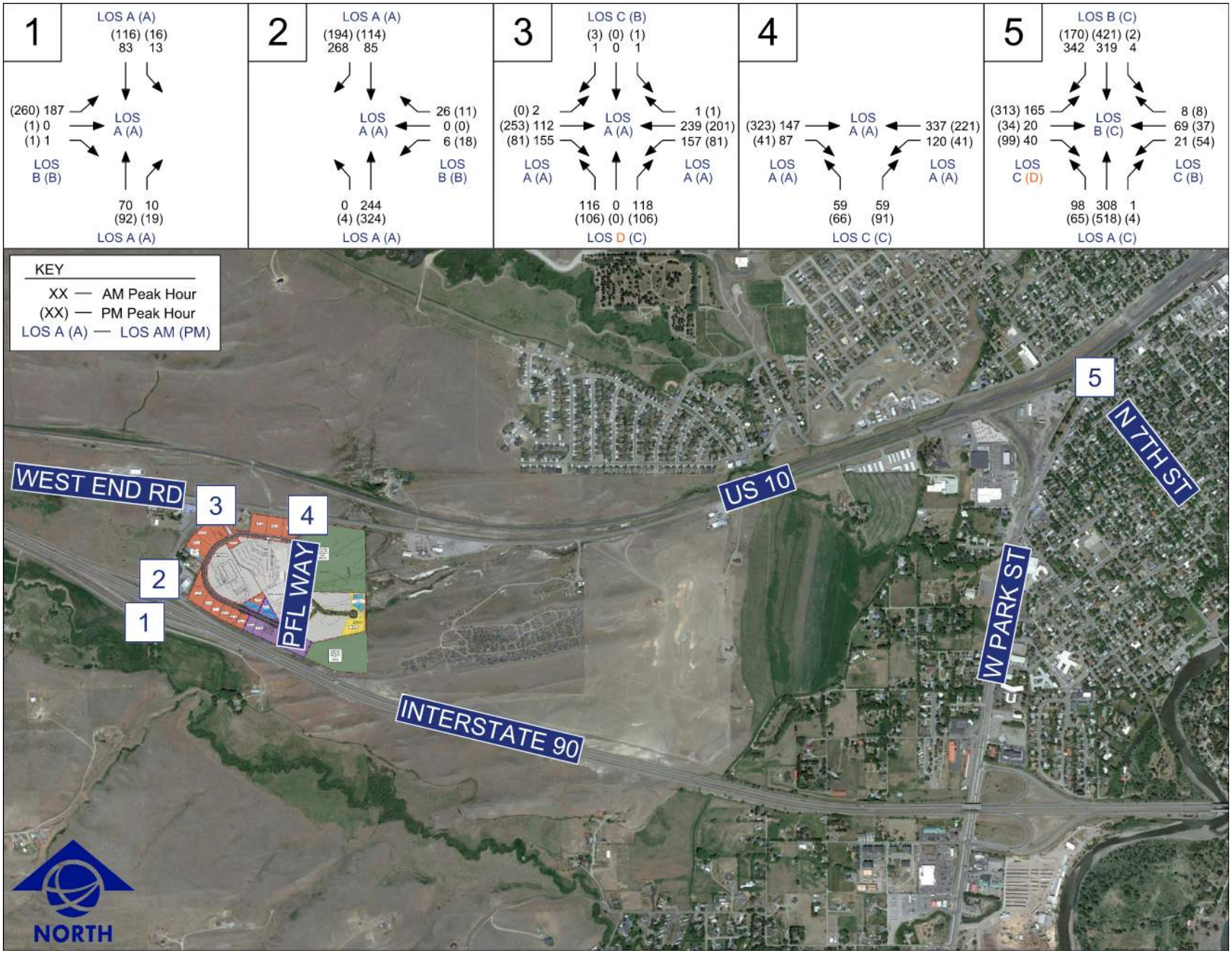


Figure 6. Future (2027) Traffic Projections

Mountain View Subdivision TIS

Intersection Capacity

Intersection capacity calculations were performed for the Future (2027) scenario based on the AM and PM peak hour traffic volume projections presented in Figure 6. Peak hour factors (PHFs) for the design year were conservatively assumed to be 0.92 for all intersections, per HCM guidelines and common industry practice for future scenarios. The assumed values were utilized to not overestimate future congestion in the study area. Figure 6 also shows the Future (2027) LOS results at each intersection.

Future (2027) scenario capacity results are projected to be similar to Existing Conditions (2022) results. The northbound approach at the US 10/West End Road intersection is projected to operate at LOS D during the AM peak hour with the addition of subdivision trips. The West Park Street/US 10 intersection is projected to operate at LOS D on the eastbound approach during the PM peak hour. During the AM peak hour, that approach is projected to improve from LOS D to C because the average delay value decreases due to the addition of eastbound right-turning trips from Mountain View Subdivision which have low delay values. All other intersections and approaches are projected to continue to operate at or above LOS C. Projected 95th percentile queuing is projected to worsen at the West Park Street/US 10 intersection, with a queue of 19 vehicles projected eastbound on US 10. A detailed intersection capacity summary table and capacity calculation worksheets for the Future (2027) traffic projection scenario can be found in Appendix C.

Bicycle and Pedestrian Facilities

It is recommended that the road ditches on the south side of US 10 be regraded in order to build a multi-use path along the entirety of US 10, as requested by the City of Livingston. It is assumed the full path typical section will fit within the existing MDT Highway 10 right-of-way, but ultimate location will be determined through final design. Designing the path to an elevation close to the roadway elevation will require the roadside berms to be regraded which subsequently will optimize sight distance.

Mitigation Alternatives

A variety of potential mitigation improvement options were evaluated to address existing concerns and/or projected impacts for the study area streets and intersections. The following paragraphs provide details on that analysis.

Auxiliary Turn Lanes

Auxiliary right- and left-turn lane warrants were evaluated based on the methodology outlined in the MDT Traffic Engineering Manual (November 2007) for the Existing Conditions (2022) and Future (2027) analysis scenarios:

- **US 10/PFL Way intersection:** A westbound left-turn lane is warranted based on the Existing Conditions (2022) scenario. An eastbound right-turn lane is not projected to be warranted in the Future (2027) scenario, but the turning volume is only two vehicles below the required threshold for considering a turn lane.
- **US 10/West End Road intersection:** An eastbound right-turn lane and a westbound left-turn lane are both projected to be warranted based on the Future (2027) scenario.
- **I-90 WB Ramps/US 10 intersection:** A southbound right-turn is warranted based on the Existing Conditions (2022) scenario.

- **I-90 EB Ramps/US 10 intersection:** No turn lanes are warranted based on the Existing Conditions (2022) or Future (2027) scenarios.

The high volume of trips added to the network by the Mountain View Subdivision are projected to trigger the warrants for turn lanes into the site access intersections. The final decision to install any turn lanes shall be made by MDT after evaluation of what impacts they may have to other aspects of the intersections or adjacent intersections. Auxiliary turn lane warrant worksheets for Existing Conditions (2022) and Future (2027) scenarios can be found in Appendix D.

Improved Intersection Capacity

The warranted eastbound right-turn and westbound left-turn lanes at the US 10/West End Road intersection are projected to reduce northbound delay during the AM peak hour by over 6 seconds/vehicle, resulting in an improved capacity of LOS C on that approach in the Future (2027) scenario. These lanes should be considered for installation due to the projected capacity improvements, as well as the safety benefits provided by separating thru and turning movements on a higher speed facility.

The warranted turn lanes at the US 10/PFL Way and I-90 WB Ramps/US 10 intersections are projected to have a minimal impact on capacity, and both intersections are projected to operate at LOS C or better with existing lane configurations. Although these turn lanes do not provide capacity benefits, they should be considered by MDT due to their potential to improve safety at the intersections by separating thru and turning movements, particularly at the PFL Way intersection where the speed limit is 60 mph.

Minor changes to the signal timing plan at the West Park Street/US 10 intersection are projected to improve capacity from LOS D to LOS C during the PM peak hour in the Future (2027) scenario.

Other Area Developments

Although a development application was previously submitted for land on the northwest side of US 10, that application was denied, and no further plans have been made public for potential development at that location or other sites adjacent to the Mountain View Subdivision area. Therefore, no additional trips were added to the Future (2027) scenario to account for potential area development in addition to the ambient background growth.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The preceding analysis has shown that construction of the facility will generate a substantial volume of new traffic demand for area streets and intersections. Through the planned development, it is estimated that approximately 4,035 new external vehicle trips could be generated daily upon full buildout of the subdivision. This would result in approximately 2,000 new vehicle trips per day on US 10 just west of the West Park Street intersection.

An evaluation of Existing Conditions (2022) intersection capacity showed that all intersections and approaches currently operate at LOS C or better except for the eastbound approach at the West Park Street/US 10 intersection, which operates at LOS D during the AM peak hour. A crash history analysis showed that crash and severity rates are generally low for all study area intersections. Fixed object/run off road collisions were found to be the most common amongst historical crashes overall, with speed possibly being a contributing factor.

Initial intersection capacity analysis results for the Future (2027) scenario projected that the new northbound approach at the US 10/West End Road intersection would operate at LOS D during the AM peak hour. The eastbound approach at the West Park Street/US 10 intersection is also projected to worsen to LOS D during the PM peak hour.

Auxiliary turn lane warrants were evaluated at all study area intersections. Based on the application of MDT Traffic Engineering Manual criteria, turn lanes were found to be warranted at the US 10/PFL Way, US 10/West End Road, and I-90 WB Ramps/US 10 intersections. The warranted lanes should be considered for installation based on projected capacity improvements at the US 10/West End Road intersection and potential safety benefits at all three intersections provided by separating thru and turning movements. The final decision to install any turn lanes will be made by MDT.

Recommendations

The following list of recommendations is based on the analysis results from this study and professional judgment:

- An R1-1 (stop) sign shall be installed on the southern leg of the new site access intersection with US 10 at West End Road.
- A speed study should be conducted for US 10 upon full buildout of Mountain View Subdivision to evaluate whether the resulting traffic increase and safety concerns may warrant reduced speed limits.
- Installation of the following turn lanes should be considered, although MDT may decide the intersection characteristics and safety considerations would not benefit from the warranted lanes.
    - A westbound left-turn lane should be considered at the US 10/PFL Way intersection based on Existing Conditions (2022) and Future (2027) scenario turn lane warrant results. An eastbound right-turn lane should also be considered at the intersection, as Future (2027) projected volumes are extremely close to meeting the warrant. These lanes may provide safety benefits at the intersection.
    - A westbound left-turn lane and eastbound right-turn lane should be considered at the US 10/West End Road intersection based on Future (2027) scenario turn lane warrant results. These lanes are projected to provide capacity benefits and may provide safety benefits at the intersection.
    - A southbound right-turn lane should be considered at the I-90 WB Ramps/US 10 intersection based on Existing Conditions (2022) turn lane warrant results. This turn lane may provide safety benefits at the intersection.
- Safety and operations should be monitored at the West Park Street/US 10 intersection as area volumes increase, particularly on the west leg. Steps should be taken to prevent vehicles from stopping across the railroad tracks if necessary, and the signal timing plan should be reevaluated as capacity deteriorates. If deemed necessary by an engineering study, a pre-signal on US 10 may be considered as outlined in Chapter 8C.09.16 of the MUTCD. Any modifications to the at-grade railroad crossing shall be evaluated by and coordinated with MRL and BNSF.
- Any proposed improvements should be coordinated with MDT area projects and all transportation-related improvements shall be designed in accordance with MDT standards (where applicable), the City of Livingston, and the Manual on Uniform Traffic Control Devices (MUTCD).

TRAFFIC VOLUME DATA

APPENDIX A

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

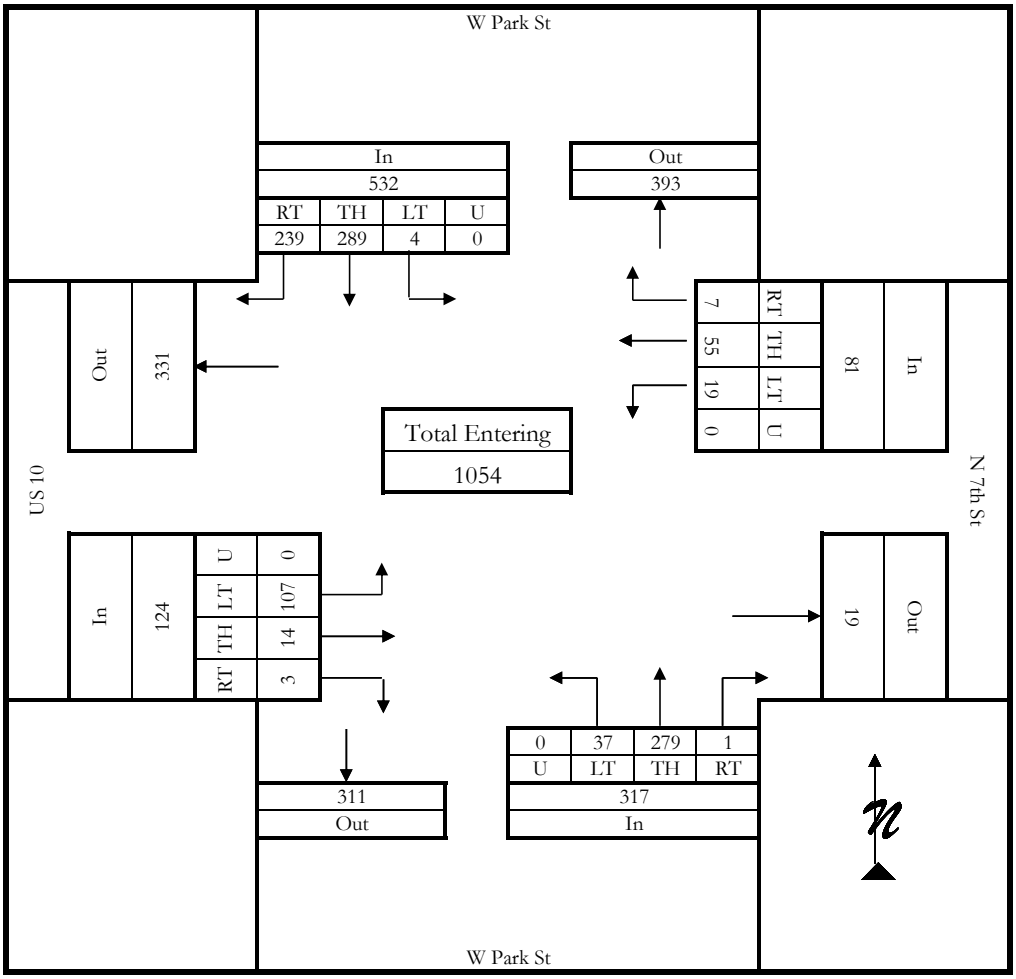
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & W Park St
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	AM Peak Hour (7:30 - 8:30 AM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	W Park St	East/West Street:	US 10

Vehicle Volumes and Adjustments

	W Park St Southbound					W Park St Northbound					US 10 Eastbound					N 7th St Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		1.00	1.00	1.00	1.00		
7:30 AM	59	60	0	0	119	0	49	6	0	55	2	3	32	0	37	0	12	3	0	15	226
7:45 AM	59	79	0	0	138	0	82	12	0	94	0	4	32	0	36	2	19	6	0	27	295
8:00 AM	65	89	4	0	158	1	82	11	0	94	1	4	22	0	27	2	13	4	0	19	298
8:15 AM	56	61	0	0	117	0	66	8	0	74	0	3	21	0	24	3	11	6	0	20	235
Grand Total	239	289	4	0	532	1	279	37	0	317	3	14	107	0	124	7	55	19	0	81	1054
Medium Truck %	2.9	3.5	0.0	0.0	3.2	0.0	1.8	0.0	0.0	1.6	0.0	0.0	2.8	0.0	2.4	0.0	0.0	10.5	0.0	2.5	
Heavy Truck %	0.8	1.4	0.0	0.0	1.1	0.0	1.1	2.7	0.0	1.3	0.0	0.0	1.9	0.0	1.6	0.0	0.0	0.0	0.0	0.0	
Total Truck %	3.8	4.8	0.0	0.0	4.3	0.0	2.9	2.7	0.0	2.8	0.0	0.0	4.7	0.0	4.0	0.0	0.0	10.5	0.0	2.5	
Total %	22.7	27.4	0.4	0.0	50.5	0.1	26.5	3.5	0.0	30.1	0.3	1.3	10.2	0.0	11.8	0.7	5.2	1.8	0.0	7.7	100.0
PHF	0.84	0.84	0.84			0.85	0.85	0.85			1.00	1.00	1.00			1.00	1.00	1.00			0.88



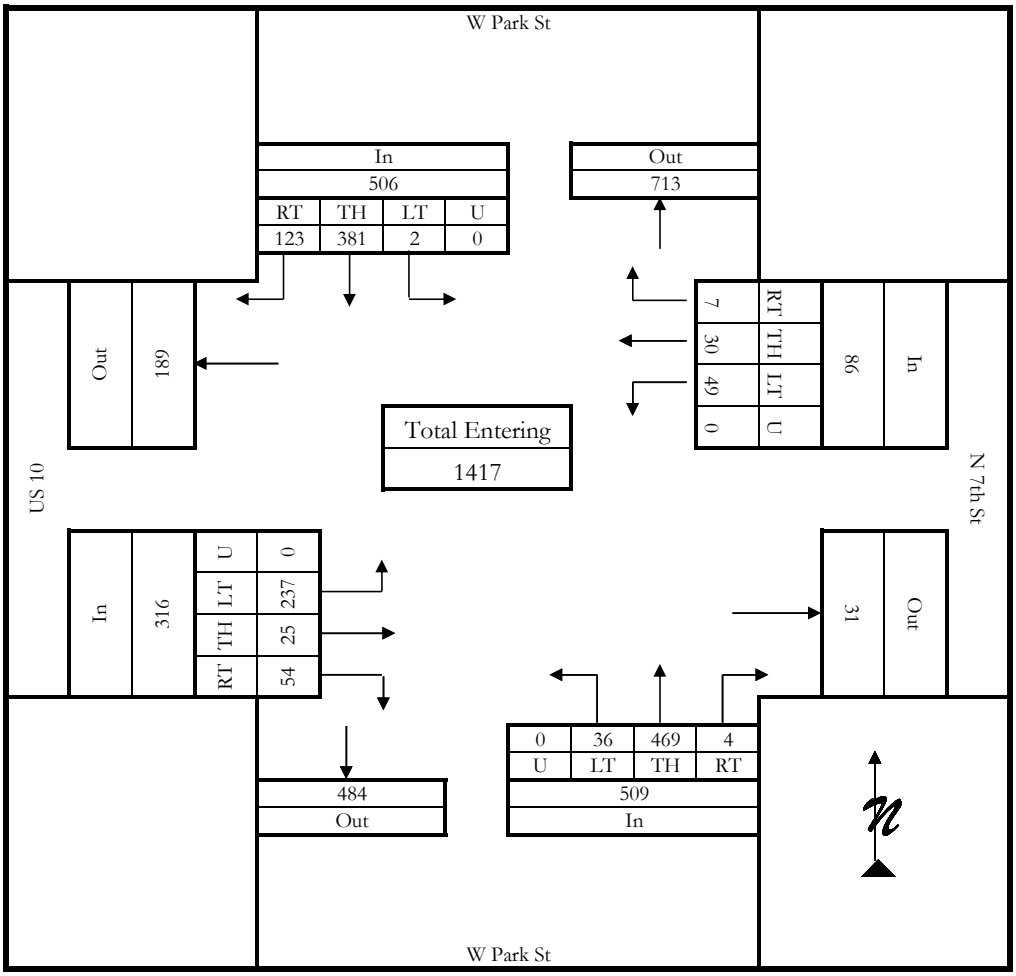
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & W Park St
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	PM Peak Hour (4:30 - 5:30 PM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	W Park St	East/West Street:	US 10

Vehicle Volumes and Adjustments

	W Park St Southbound					W Park St Northbound					US 10 Eastbound					N 7th St Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		1.00	1.00	1.00	1.00		
4:30 PM	31	77	0	0	108	4	123	11	0	138	6	4	53	0	63	2	6	9	0	17	326
4:45 PM	29	101	0	0	130	0	102	5	0	107	17	6	61	0	84	3	6	14	0	23	344
5:00 PM	42	97	1	0	140	0	145	11	0	156	17	9	58	0	84	0	8	17	0	25	405
5:15 PM	21	106	1	0	128	0	99	9	0	108	14	6	65	0	85	2	10	9	0	21	342
Grand Total	123	381	2	0	506	4	469	36	0	509	54	25	237	0	316	7	30	49	0	86	1417
Medium Truck %	0.8	0.3	0.0	0.0	0.4	0.0	1.1	2.8	0.0	1.2	0.0	4.0	0.8	0.0	0.9	0.0	0.0	2.0	0.0	1.2	
Heavy Truck %	0.8	1.0	0.0	0.0	1.0	0.0	0.4	2.8	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	1.6	1.3	0.0	0.0	1.4	0.0	1.5	5.6	0.0	1.8	0.0	4.0	0.8	0.0	0.9	0.0	0.0	2.0	0.0	1.2	
Total %	8.7	26.9	0.1	0.0	35.7	0.3	33.1	2.5	0.0	35.9	3.8	1.8	16.7	0.0	22.3	0.5	2.1	3.5	0.0	6.1	100.0
PHF	0.90	0.90	0.90			0.81	0.81	0.81			0.95	0.95	0.95			0.86	0.86	0.86			0.88



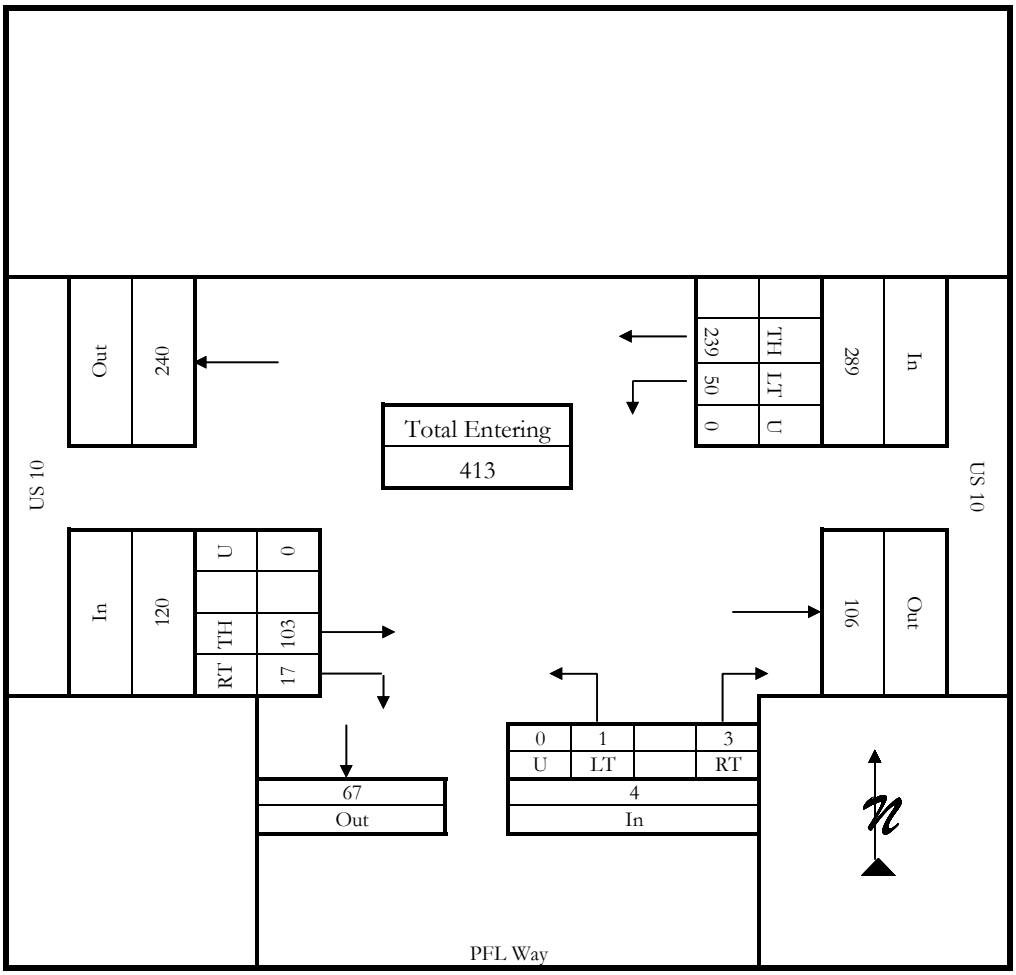
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & PFL Way
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	AM Peak Hour (7:30 - 8:30 AM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	PFL Way	East/West Street:	US 10

Vehicle Volumes and Adjustments

	PFL Way Southbound					PFL Way Northbound					US 10 Eastbound					US 10 Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		
7:30 AM						0	0	1	0	1	4	35	0	0	39	0	60	5	0	65	105
7:45 AM						0	0	0	0	0	7	35	0	0	42	0	47	23	0	70	112
8:00 AM						0	0	0	0	0	4	16	0	0	20	0	74	16	0	90	110
8:15 AM						3	0	0	0	3	2	17	0	0	19	0	58	6	0	64	86
Grand Total	0	0	0	0	0	3	0	1	0	4	17	103	0	0	120	0	239	50	0	289	413
Medium Truck %						0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	1.7	0.0	2.9	0.0	0.0	2.4	
Heavy Truck %						0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.8	0.0	3.8	0.0	0.0	3.1	
Total Truck %						0.0	0.0	0.0	0.0	0.0	0.0	2.9	0.0	0.0	2.5	0.0	6.7	0.0	0.0	5.5	
Total %	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.2	0.0	1.0	4.1	24.9	0.0	0.0	29.1	0.0	57.9	12.1	0.0	70.0	100.0
PHF						1.00	1.00	1.00			0.71	0.71	0.71			1.00	1.00	1.00			0.92



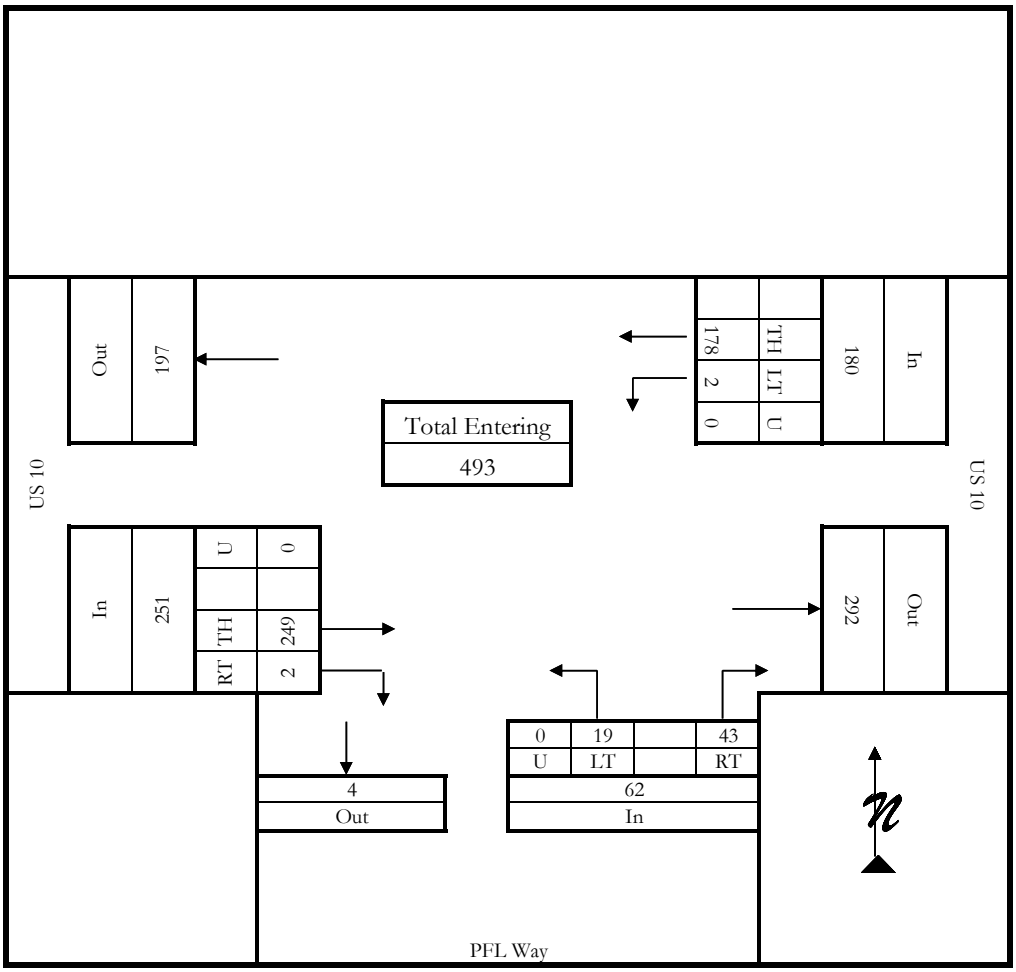
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & PFL Way
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	PM Peak Hour (4:30 - 5:30 PM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	PFL Way	East/West Street:	US 10

Vehicle Volumes and Adjustments

	PFL Way Southbound					PFL Way Northbound					US 10 Eastbound					US 10 Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		
4:30 PM					0	5	0	3	0	8	1	66	0	0	67	0	44	1	0	45	120
4:45 PM					0	8	0	4	0	12	0	60	0	0	60	0	33	1	0	34	106
5:00 PM					0	21	0	10	0	31	0	52	0	0	52	0	50	0	0	50	133
5:15 PM					0	9	0	2	0	11	1	71	0	0	72	0	51	0	0	51	134
Grand Total	0	0	0	0	0	43	0	19	0	62	2	249	0	0	251	0	178	2	0	180	493
Medium Truck %					0.0	0.0	0.0	5.3	0.0	1.6	0.0	1.2	0.0	0.0	1.2	0.0	2.8	0.0	0.0	2.8	
Heavy Truck %					0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	1.6	0.0	3.4	0.0	0.0	3.3	
Total Truck %					0.0	0.0	0.0	5.3	0.0	1.6	0.0	2.8	0.0	0.0	2.8	0.0	6.2	0.0	0.0	6.1	
Total %	0.0	0.0	0.0	0.0	0.0	8.7	0.0	3.9	0.0	12.6	0.4	50.5	0.0	0.0	50.9	0.0	36.1	0.4	0.0	36.5	100.0
PHF						1.00	1.00	1.00			0.88	0.88	0.88			0.88	0.88	0.88			0.92



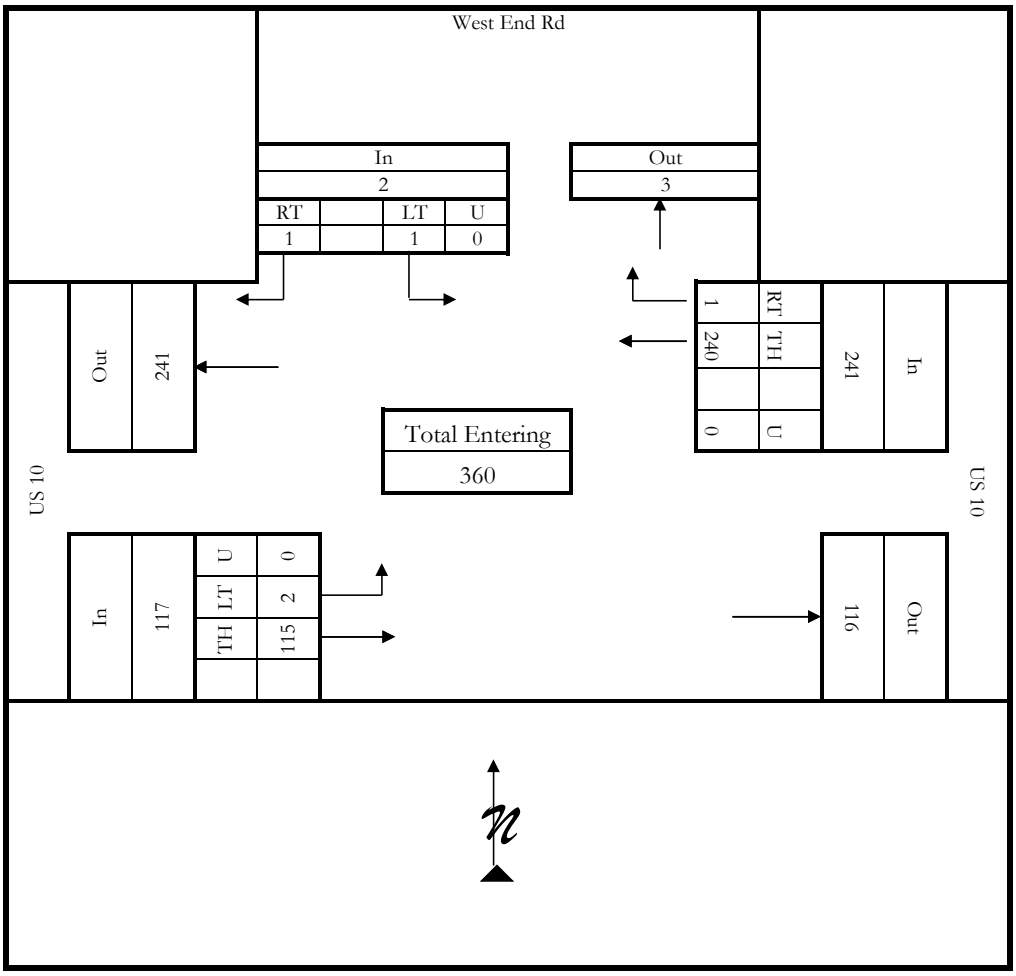
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & West End Rd
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	AM Peak Hour (7:30 - 8:30 AM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	West End Rd	East/West Street:	US 10

Vehicle Volumes and Adjustments

	West End Rd Southbound					West End Rd Northbound					US 10 Eastbound					US 10 Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		
7:30 AM	1	0	0	0	1	0	0	0	0	0	0	38	1	0	39	1	60	0	0	61	101
7:45 AM	0	0	1	0	1	0	0	0	0	0	0	40	1	0	41	0	45	0	0	45	87
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	19	0	0	19	0	77	0	0	77	96
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	18	0	0	18	0	58	0	0	58	76
Grand Total	1	0	1	0	2	0	0	0	0	0	0	115	2	0	117	1	240	0	0	241	360
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.7	0.0	2.9	0.0	0.0	2.9	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	1.7	0.0	3.8	0.0	0.0	3.7	
Total Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	3.4	0.0	6.7	0.0	0.0	6.6	
Total %	0.3	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	31.9	0.6	0.0	32.5	0.3	66.7	0.0	0.0	66.9	100.0
PHF	0.50	0.50	0.50			1.00	1.00	1.00			0.75	0.75	0.75			0.99	0.99	0.99			0.89



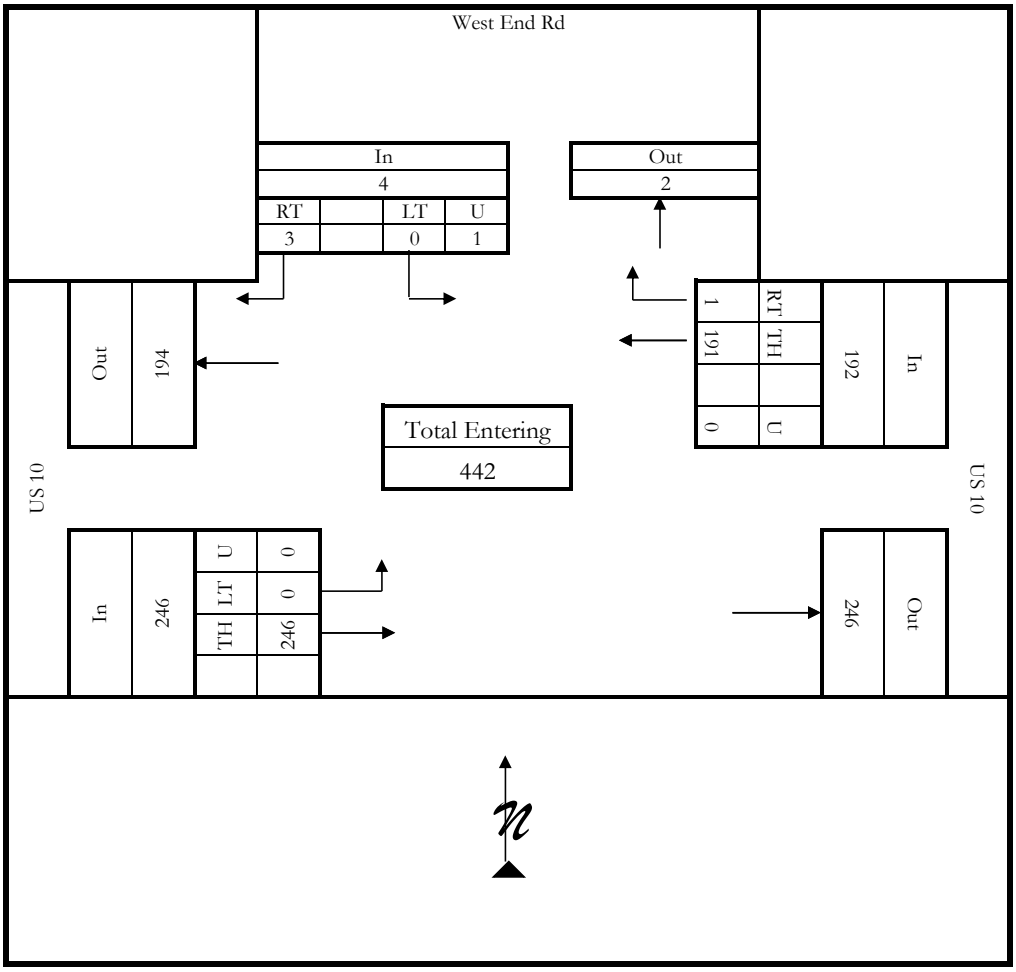
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & West End Rd
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	PM Peak Hour (4:30 - 5:30 PM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	West End Rd	East/West Street:	US 10

Vehicle Volumes and Adjustments

	West End Rd Southbound					West End Rd Northbound					US 10 Eastbound					US 10 Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	66	0	0	66	1	45	0	0	46	113
4:45 PM	2	0	0	0	2	0	0	0	0	0	0	59	0	0	59	0	36	0	0	36	97
5:00 PM	0	0	0	1	1	0	0	0	0	0	0	51	0	0	51	0	58	0	0	58	110
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	70	0	0	70	0	52	0	0	52	122
Grand Total	3	0	0	1	4	0	0	0	0	0	0	246	0	0	246	1	191	0	0	192	442
Medium Truck %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0	3.7	0.0	0.0	3.6	
Heavy Truck %	33.3	0.0	0.0	100.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	3.1	0.0	0.0	3.1	
Total Truck %	33.3	0.0	0.0	100.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	0.0	0.0	2.8	0.0	6.8	0.0	0.0	6.8	
Total %	0.7	0.0	0.0	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	55.7	0.0	0.0	55.7	0.2	43.2	0.0	0.0	43.4	100.0
PHF	1.00	1.00	1.00			1.00	1.00	1.00			0.88	0.88	0.88			0.92	0.92	0.92			0.90



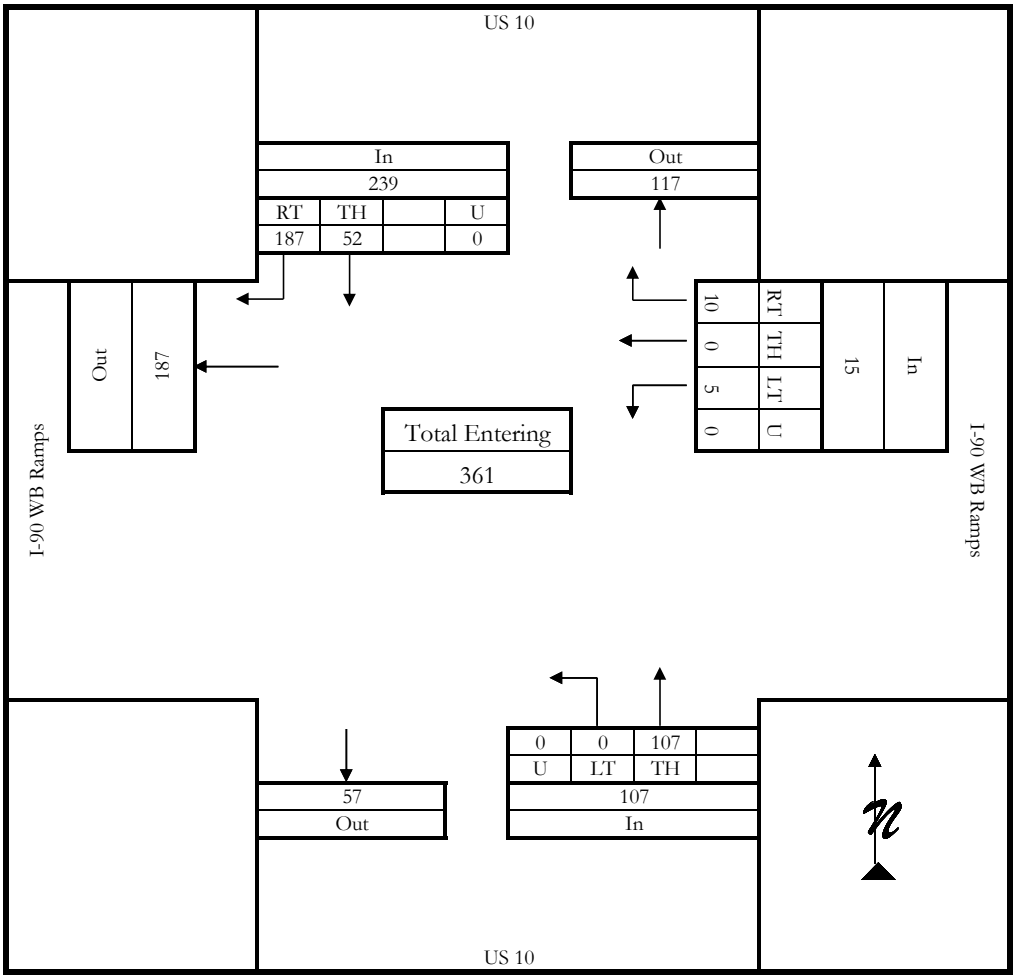
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & I-90 WB Ramps
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	AM Peak Hour (7:30 - 8:30 AM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	US 10	East/West Street:	I-90 WB Ramps

Vehicle Volumes and Adjustments

	US 10 Southbound					US 10 Northbound					I-90 WB Ramps Eastbound					I-90 WB Ramps Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		0.87	0.87	0.87	0.87		0.87	0.87	0.87	0.87		
7:30 AM	49	12	0	0	61	0	35	0	0	35					0	3	0	0	0	3	99
7:45 AM	35	12	0	0	47	0	37	0	0	37					0	4	0	3	0	7	91
8:00 AM	58	16	0	0	74	0	18	0	0	18					0	3	0	1	0	4	96
8:15 AM	45	12	0	0	57	0	17	0	0	17					0	0	0	1	0	1	75
Grand Total	187	52	0	0	239	0	107	0	0	107	0	0	0	0	0	10	0	5	0	15	361
Medium Truck %	2.1	3.8	0.0	0.0	2.5	0.0	0.9	0.0	0.0	0.9					0.0	0.0	0.0	0.0	0.0	0.0	
Heavy Truck %	3.7	3.8	0.0	0.0	3.8	0.0	0.9	0.0	0.0	0.9					0.0	0.0	0.0	0.0	0.0	0.0	
Total Truck %	5.9	7.7	0.0	0.0	6.3	0.0	1.9	0.0	0.0	1.9					0.0	0.0	0.0	0.0	0.0	0.0	
Total %	51.8	14.4	0.0	0.0	66.2	0.0	29.6	0.0	0.0	29.6	0.0	0.0	0.0	0.0	0.0	2.8	0.0	1.4	0.0	4.2	100.0
PHF	0.99	0.99	0.99			0.76	0.76	0.76								1.00	1.00	1.00			0.92



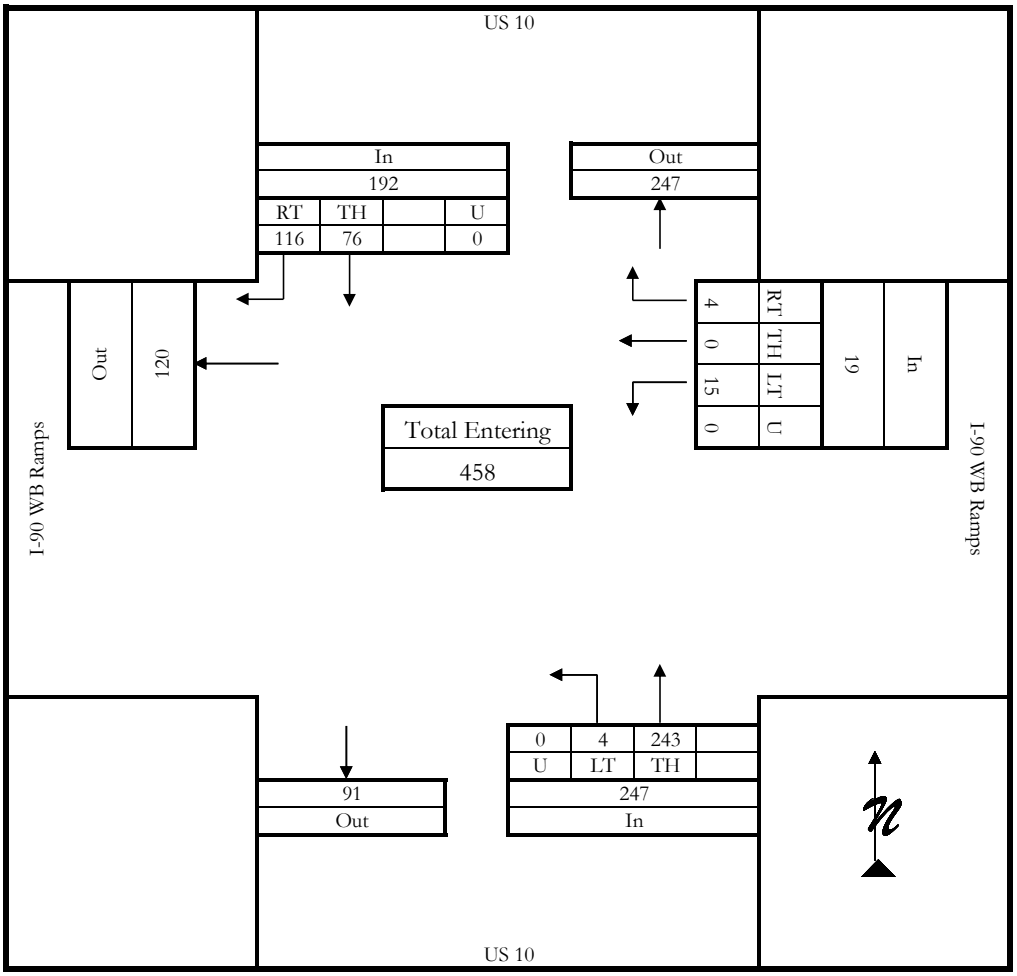
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & I-90 WB Ramps
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	PM Peak Hour (4:30 - 5:30 PM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	US 10	East/West Street:	I-90 WB Ramps

Vehicle Volumes and Adjustments

	US 10 Southbound					US 10 Northbound					I-90 WB Ramps Eastbound					I-90 WB Ramps Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	0.89	0.89	0.89	0.89		0.89	0.89	0.89	0.89		0.87	0.87	0.87	0.87		0.87	0.87	0.87	0.87		
4:30 PM	27	15	0	0	42	0	65	1	0	66					0	0	0	4	0	4	112
4:45 PM	23	19	0	0	42	0	58	3	0	61					0	2	0	3	0	5	108
5:00 PM	37	19	0	0	56	0	49	0	0	49					0	0	0	4	0	4	109
5:15 PM	29	23	0	0	52	0	71	0	0	71					0	2	0	4	0	6	129
Grand Total	116	76	0	0	192	0	243	4	0	247	0	0	0	0	0	4	0	15	0	19	458
Medium Truck %	5.2	3.9	0.0	0.0	4.7	0.0	0.4	0.0	0.0	0.4					0.0	25.0	0.0	6.7	0.0	10.5	
Heavy Truck %	2.6	3.9	0.0	0.0	3.1	0.0	1.2	0.0	0.0	1.2					0.0	25.0	0.0	0.0	0.0	5.3	
Total Truck %	7.8	7.9	0.0	0.0	7.8	0.0	1.6	0.0	0.0	1.6					0.0	50.0	0.0	6.7	0.0	15.8	
Total %	25.3	16.6	0.0	0.0	41.9	0.0	53.1	0.9	0.0	53.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0	3.3	0.0	4.1	100.0
PHF	0.92	0.92	0.92			0.87	0.87	0.87								0.82	0.82	0.82			0.89



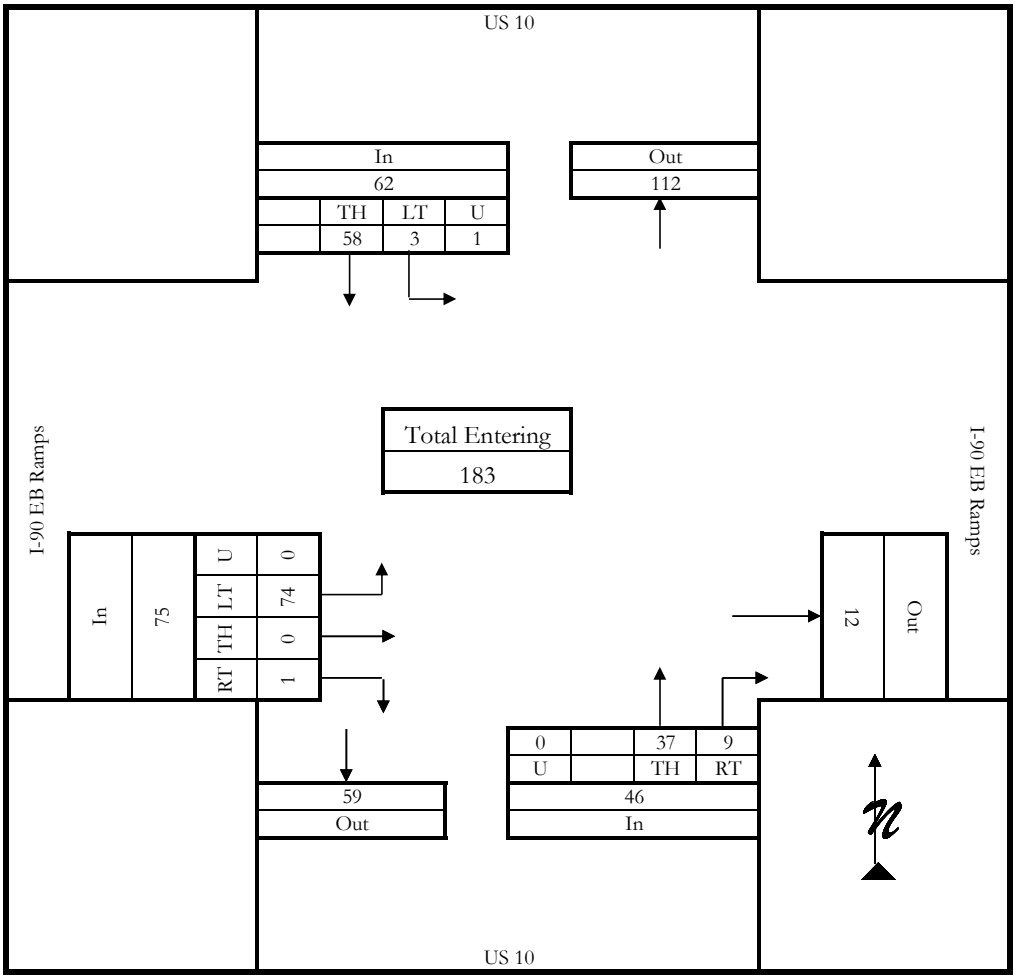
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & I-90 EB Ramps
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	AM Peak Hour (7:30 - 8:30 AM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	US 10	East/West Street:	I-90 EB Ramps

Vehicle Volumes and Adjustments

	US 10 Southbound					US 10 Northbound					I-90 EB Ramps Eastbound					I-90 EB Ramps Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.87	0.87	0.87	0.87		0.87	0.87	0.87	0.87		
7:30 AM	0	12	2	0	14	5	15	0	0	20	0	0	23	0	23					0	57
7:45 AM	0	15	0	1	16	2	11	0	0	13	0	0	27	0	27					0	56
8:00 AM	0	18	1	0	19	1	7	0	0	8	1	0	11	0	12					0	39
8:15 AM	0	13	0	0	13	1	4	0	0	5	0	0	13	0	13					0	31
Grand Total	0	58	3	1	62	9	37	0	0	46	1	0	74	0	75	0	0	0	0	0	183
Medium Truck %	0.0	5.2	0.0	0.0	4.8	0.0	2.7	0.0	0.0	2.2	0.0	0.0	2.7	0.0	2.7					0.0	
Heavy Truck %	0.0	0.0	33.3	100.0	3.2	11.1	0.0	0.0	0.0	2.2	0.0	0.0	1.4	0.0	1.3					0.0	
Total Truck %	0.0	5.2	33.3	100.0	8.1	11.1	2.7	0.0	0.0	4.3	0.0	0.0	4.1	0.0	4.0					0.0	
Total %	0.0	31.7	1.6	0.5	33.9	4.9	20.2	0.0	0.0	25.1	0.5	0.0	40.4	0.0	41.0	0.0	0.0	0.0	0.0	0.0	100.0
PHF	0.97	0.97	0.97			0.88	0.88	0.88			0.69	0.69	0.69								0.81



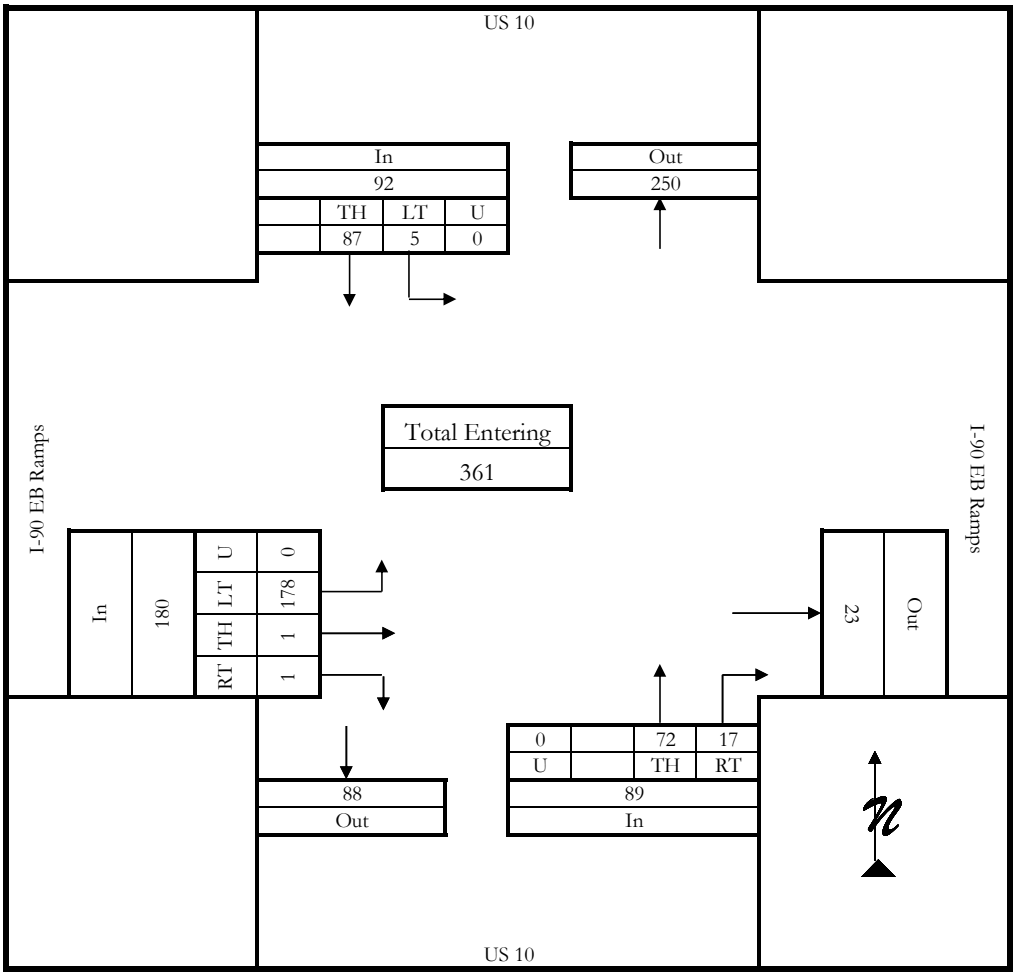
INTERSECTION TURNING MOVEMENT COUNT SUMMARY

General Information

Counted By:	Wyatt Brown	Intersection:	US 10 & I-90 EB Ramps
Agency/Company:	Sanderson Stewart		
Date Performed:	Tuesday, August 30, 2022	Jurisdiction:	Livingston, MT /MDT
Count Time Period:	PM Peak Hour (4:30 - 5:30 PM)		
Project Number:	18005.05	Project Description:	Mountain View Subdivision
North/South Street:	US 10	East/West Street:	I-90 EB Ramps

Vehicle Volumes and Adjustments

	US 10 Southbound					US 10 Northbound					I-90 EB Ramps Eastbound					I-90 EB Ramps Westbound					Int.
Start Time	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Right	Thru	Left	U-turn	Total	Total
Factor	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.87	0.87	0.87	0.87		0.87	0.87	0.87	0.87		
4:30 PM	0	18	2	0	20	8	21	0	0	29	1	0	44	0	45					0	94
4:45 PM	0	21	1	0	22	3	28	0	0	31	0	0	35	0	35					0	88
5:00 PM	0	21	1	0	22	2	10	0	0	12	0	1	39	0	40					0	74
5:15 PM	0	27	1	0	28	4	13	0	0	17	0	0	60	0	60					0	105
Grand Total	0	87	5	0	92	17	72	0	0	89	1	1	178	0	180	0	0	0	0	0	361
Medium Truck %	0.0	2.3	40.0	0.0	4.3	11.8	1.4	0.0	0.0	3.4	0.0	0.0	0.6	0.0	0.6					0.0	
Heavy Truck %	0.0	0.0	0.0	0.0	0.0	5.9	1.4	0.0	0.0	2.2	0.0	0.0	1.7	0.0	1.7					0.0	
Total Truck %	0.0	2.3	40.0	0.0	4.3	17.6	2.8	0.0	0.0	5.6	0.0	0.0	2.2	0.0	2.2					0.0	
Total %	0.0	24.1	1.4	0.0	25.5	4.7	19.9	0.0	0.0	24.7	0.3	0.3	49.3	0.0	49.9	0.0	0.0	0.0	0.0	0.0	100.0
PHF	0.82	0.82	0.82			1.00	1.00	1.00			0.75	0.75	0.75								0.85



CAPACITY CALCULATIONS – EXISTING CONDITIONS (2022)

APPENDIX B

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

Intersection	Approach	Existing (2022)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
West Park Street & US 10	EB	35.6	D	5	34.8	C	11
	WB	33.4	C	3	24.8	C	3
	NB	4.1	A	5	13.2	B	13
	SB	6.7	A	7	15.1	B	13
	Intersection	11.4	B	--	19.4	B	--
Intersection Control		*One-Way Stop-Controlled (NB)*					
US 10 & PFL Way	EB	0.0	A	0	0.0	A	0
	WB	1.3	A	1	0.1	A	0
	NB	9.6	A	0	10.8	B	1
	Intersection	1.0	A	--	1.4	A	--
Intersection Control		*One-Way Stop-Controlled (SB)*					
US 10 & West End Road	EB	0.1	A	0	0.0	A	0
	WB	0.0	A	0	0.0	A	0
	SB	10.3	B	0	10.9	B	0
	Intersection	0.1	A	--	0.1	A	--
Intersection Control		*One-Way Stop-Controlled (WB)*					
US 10 & I-90 WB Ramps	WB	9.3	A	1	11.4	B	1
	NB	0.0	A	0	0.1	A	0
	SB	0.0	A	0	0.0	A	0
	Intersection	0.4	A	--	0.5	A	--
Intersection Control		*One-Way Stop-Controlled (EB)*					
US 10 & I-90 EB Ramps	EB	9.7	A	1	11.4	B	2
	NB	0.0	A	0	0.0	A	0
	SB	0.5	A	0	0.4	A	0
	Intersection	4.1	A	--	5.8	A	--

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	5	0	10	0	107	0	0	52	187
Future Vol, veh/h	0	0	0	5	0	10	0	107	0	0	52	187
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	8	6
Mvmt Flow	0	0	0	5	0	11	0	116	0	0	57	203

Major/Minor	Minor1			Major1			Major2			
Conflicting Flow All	275	376	116	260	0	-	-	-	0
Stage 1	116	116	-	-	-	-	-	-	-
Stage 2	159	260	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	719	558	942	1316	-	0	0	-	-
Stage 1	914	803	-	-	-	0	0	-	-
Stage 2	875	697	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	719	0	942	1316	-	-	-	-	-
Mov Cap-2 Maneuver	719	0	-	-	-	-	-	-	-
Stage 1	914	0	-	-	-	-	-	-	-
Stage 2	875	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1316	-	854	-	-
HCM Lane V/C Ratio	-	-	0.019	-	-
HCM Control Delay (s)	0	-	9.3	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	0	1	0	0	0	0	37	9	4	58	0
Future Vol, veh/h	74	0	1	0	0	0	0	37	9	4	58	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	0	0	0	0	3	11	33	5	0
Mvmt Flow	91	0	1	0	0	0	0	46	11	5	72	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	134	139	72	-	0	0	57	0	0
Stage 1	82	82	-	-	-	-	-	-	-
Stage 2	52	57	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.5	6.2	-	-	-	4.43	-	-
Critical Hdwy Stg 1	5.44	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.44	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	-	-	-	2.497	-	-
Pot Cap-1 Maneuver	855	756	996	0	-	-	1371	-	0
Stage 1	936	831	-	0	-	-	-	-	0
Stage 2	965	851	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	852	0	996	-	-	-	1371	-	-
Mov Cap-2 Maneuver	852	0	-	-	-	-	-	-	-
Stage 1	936	0	-	-	-	-	-	-	-
Stage 2	961	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	854	1371	-
HCM Lane V/C Ratio	-	-	0.108	0.004	-
HCM Control Delay (s)	-	-	9.7	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	115	240	1	1	1
Future Vol, veh/h	2	115	240	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	4	7	0	0	0
Mvmt Flow	2	129	270	1	1	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	271	0	-	0	404	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	133	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1304	-	-	-	606	773
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	898	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1304	-	-	-	605	773
Mov Cap-2 Maneuver	-	-	-	-	605	-
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	898	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1304	-	-	-	679
HCM Lane V/C Ratio	0.002	-	-	-	0.003
HCM Control Delay (s)	7.8	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Queues
15: W Park St & Hwy 10/7th St

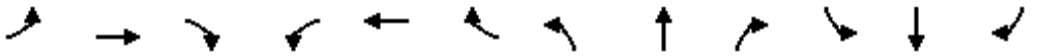
09/09/2022

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	141	93	42	318	5	328	272
v/c Ratio	0.59	0.32	0.06	0.28	0.01	0.33	0.28
Control Delay	38.9	27.3	5.2	7.3	11.2	12.0	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	27.3	5.2	7.3	11.2	12.0	2.6
Queue Length 50th (ft)	65	38	5	57	1	86	0
Queue Length 95th (ft)	106	69	18	119	7	171	37
Internal Link Dist (ft)	582	178		347		219	
Turn Bay Length (ft)			100		100		100
Base Capacity (vph)	365	446	710	1127	587	984	956
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.21	0.06	0.28	0.01	0.33	0.28

Intersection Summary

HCM 6th Signalized Intersection Summary
15: W Park St & Hwy 10/7th St

09/09/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	14	3	19	55	7	37	279	1	4	289	239
Future Volume (veh/h)	107	14	3	19	55	7	37	279	1	4	289	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1750	1750	1614	1750	1750	1709	1709	1750	1750	1682	1695
Adj Flow Rate, veh/h	122	16	3	22	62	8	42	317	1	5	328	272
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	5	0	0	10	0	0	3	3	0	0	5	4
Cap, veh/h	240	20	4	87	158	18	614	1241	4	795	1099	939
Arrive On Green	0.12	0.12	0.12	0.12	0.12	0.12	0.04	0.73	0.73	0.65	0.65	0.65
Sat Flow, veh/h	1287	169	32	254	1300	148	1628	1703	5	1078	1682	1437
Grp Volume(v), veh/h	141	0	0	92	0	0	42	0	318	5	328	272
Grp Sat Flow(s),veh/h/ln	1487	0	0	1702	0	0	1628	0	1708	1078	1682	1437
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	0.6	0.0	5.0	0.1	6.7	6.5
Cycle Q Clear(g_c), s	7.2	0.0	0.0	4.0	0.0	0.0	0.6	0.0	5.0	0.1	6.7	6.5
Prop In Lane	0.87		0.02	0.24		0.09	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	264	0	0	262	0	0	614	0	1245	795	1099	939
V/C Ratio(X)	0.53	0.00	0.00	0.35	0.00	0.00	0.07	0.00	0.26	0.01	0.30	0.29
Avail Cap(c_a), veh/h	495	0	0	533	0	0	776	0	1245	795	1099	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	0.0	0.0	32.6	0.0	0.0	3.8	0.0	3.6	4.8	6.0	5.9
Incr Delay (d2), s/veh	1.7	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.5	0.0	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	0.0	1.7	0.0	0.0	0.2	0.0	1.5	0.0	2.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	0.0	0.0	33.4	0.0	0.0	3.9	0.0	4.1	4.8	6.7	6.7
LnGrp LOS	D	A	A	C	A	A	A	A	A	A	A	A
Approach Vol, veh/h		141			92			360			605	
Approach Delay, s/veh		35.6			33.4			4.1			6.7	
Approach LOS		D			C			A			A	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		64.3		15.7	6.0	58.3		15.7				
Change Period (Y+Rc), s		6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0		23.0	11.0	31.0		23.0				
Max Q Clear Time (g_c+I1), s		7.0		9.2	2.6	8.7		6.0				
Green Ext Time (p_c), s		2.2		0.6	0.0	3.1		0.4				

Intersection Summary												
HCM 6th Ctrl Delay			11.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	103	17	50	239	1	3
Future Vol, veh/h	103	17	50	239	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	7	0	0
Mvmt Flow	112	18	54	260	1	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	130	0	489	121
Stage 1	-	-	-	-	121	-
Stage 2	-	-	-	-	368	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1468	-	542	936
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1468	-	519	936
Mov Cap-2 Maneuver	-	-	-	-	519	-
Stage 1	-	-	-	-	909	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	779	-	-	1468	-
HCM Lane V/C Ratio	0.006	-	-	0.037	-
HCM Control Delay (s)	9.6	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	15	0	4	4	243	0	0	76	116
Future Vol, veh/h	0	0	0	15	0	4	4	243	0	0	76	116
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	0	0	0	7	0	50	0	2	0	0	8	8
Mvmt Flow	0	0	0	17	0	4	4	273	0	0	85	130

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	431	496	273	215	0	-	-	-	0
Stage 1	281	281	-	-	-	-	-	-	-
Stage 2	150	215	-	-	-	-	-	-	-
Critical Hdwy	6.47	6.5	6.7	4.1	-	-	-	-	-
Critical Hdwy Stg 1	5.47	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.47	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4	3.75	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	572	478	664	1367	-	0	0	-	-
Stage 1	755	682	-	-	-	0	0	-	-
Stage 2	866	729	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	570	0	664	1367	-	-	-	-	-
Mov Cap-2 Maneuver	570	0	-	-	-	-	-	-	-
Stage 1	753	0	-	-	-	-	-	-	-
Stage 2	866	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1367	-	588	-	-
HCM Lane V/C Ratio	0.003	-	0.036	-	-
HCM Control Delay (s)	7.6	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	178	1	1	0	0	0	0	72	17	5	87	0
Future Vol, veh/h	178	1	1	0	0	0	0	72	17	5	87	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	0	0	0	0	0	0	3	18	40	2	0
Mvmt Flow	209	1	1	0	0	0	0	85	20	6	102	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	209	219	102	-	0	0	105	0	0
Stage 1	114	114	-	-	-	-	-	-	-
Stage 2	95	105	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.5	6.2	-	-	-	4.5	-	-
Critical Hdwy Stg 1	5.42	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	-	-	-	2.56	-	-
Pot Cap-1 Maneuver	779	683	959	0	-	-	1280	-	0
Stage 1	911	805	-	0	-	-	-	-	0
Stage 2	929	812	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	775	0	959	-	-	-	1280	-	-
Mov Cap-2 Maneuver	775	0	-	-	-	-	-	-	-
Stage 1	911	0	-	-	-	-	-	-	-
Stage 2	924	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	776	1280	-
HCM Lane V/C Ratio	-	-	0.273	0.005	-
HCM Control Delay (s)	-	-	11.4	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	246	191	1	1	3
Future Vol, veh/h	0	246	191	1	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	0	3	7	0	100	33
Mvmt Flow	0	273	212	1	1	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	213	0	-	0	486	213
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	4.1	-	-	-	7.4	6.53
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.2	-	-	-	4.4	3.597
Pot Cap-1 Maneuver	1369	-	-	-	400	755
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	592	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1369	-	-	-	400	755
Mov Cap-2 Maneuver	-	-	-	-	400	-
Stage 1	-	-	-	-	636	-
Stage 2	-	-	-	-	592	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1369	-	-	-	618
HCM Lane V/C Ratio	-	-	-	-	0.007
HCM Control Delay (s)	0	-	-	-	10.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Queues
15: W Park St & Hwy 10/7th St

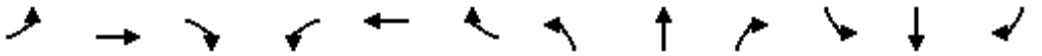
09/09/2022

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	358	98	41	538	2	433	140
v/c Ratio	0.84	0.23	0.10	0.59	0.01	0.54	0.19
Control Delay	44.9	20.0	11.2	19.0	18.5	23.2	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	20.0	11.2	19.0	18.5	23.2	7.4
Queue Length 50th (ft)	175	36	10	206	1	190	13
Queue Length 95th (ft)	265	67	27	325	5	302	50
Internal Link Dist (ft)	582	178		347		219	
Turn Bay Length (ft)			100		100		100
Base Capacity (vph)	493	495	416	915	336	811	737
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.20	0.10	0.59	0.01	0.53	0.19

Intersection Summary

HCM 6th Signalized Intersection Summary
15: W Park St & Hwy 10/7th St

09/09/2022



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	237	25	54	49	30	7	36	469	4	2	381	123
Future Volume (veh/h)	237	25	54	49	30	7	36	469	4	2	381	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1695	1750	1723	1750	1750	1668	1723	1750	1750	1736	1723
Adj Flow Rate, veh/h	269	28	61	56	34	8	41	533	5	2	433	140
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	4	0	2	0	0	6	2	0	0	1	2
Cap, veh/h	370	31	68	287	162	34	424	994	9	427	893	751
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.04	0.58	0.58	0.51	0.51	0.51
Sat Flow, veh/h	1060	110	240	791	573	121	1589	1704	16	881	1736	1460
Grp Volume(v), veh/h	358	0	0	98	0	0	41	0	538	2	433	140
Grp Sat Flow(s),veh/h/ln	1411	0	0	1486	0	0	1589	0	1720	881	1736	1460
Q Serve(g_s), s	17.5	0.0	0.0	0.0	0.0	0.0	1.0	0.0	17.1	0.1	14.5	4.6
Cycle Q Clear(g_c), s	21.8	0.0	0.0	4.3	0.0	0.0	1.0	0.0	17.1	11.0	14.5	4.6
Prop In Lane	0.75		0.17	0.57		0.08	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	470	0	0	484	0	0	424	0	1003	427	893	751
V/C Ratio(X)	0.76	0.00	0.00	0.20	0.00	0.00	0.10	0.00	0.54	0.00	0.48	0.19
Avail Cap(c_a), veh/h	616	0	0	638	0	0	490	0	1003	427	893	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	0.0	24.6	0.0	0.0	10.1	0.0	11.4	16.6	14.1	11.7
Incr Delay (d2), s/veh	4.1	0.0	0.0	0.2	0.0	0.0	0.1	0.0	2.1	0.0	1.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	0.0	0.0	1.6	0.0	0.0	0.3	0.0	6.7	0.0	5.9	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	0.0	0.0	24.8	0.0	0.0	10.2	0.0	13.4	16.6	16.0	12.3
LnGrp LOS	C	A	A	C	A	A	B	A	B	B	B	B
Approach Vol, veh/h		358			98			579			575	
Approach Delay, s/veh		34.8			24.8			13.2			15.1	
Approach LOS		C			C			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.5		31.5	6.2	52.3		31.5				
Change Period (Y+Rc), s		6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s		43.0		35.0	7.0	33.0		35.0				
Max Q Clear Time (g_c+I1), s		19.1		23.8	3.0	16.5		6.3				
Green Ext Time (p_c), s		3.9		1.7	0.0	3.1		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			19.4									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	249	2	2	178	19	43
Future Vol, veh/h	249	2	2	178	19	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	6	5	0
Mvmt Flow	271	2	2	193	21	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	273	0	469	272
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	-	-	4.1	-	6.45	6.2
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.2	-	3.545	3.3
Pot Cap-1 Maneuver	-	-	1302	-	547	772
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	829	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1302	-	546	772
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	827	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	685	-	-	1302	-
HCM Lane V/C Ratio	0.098	-	-	0.002	-
HCM Control Delay (s)	10.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

CAPACITY CALCULATIONS – FUTURE (2027)

APPENDIX C

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

Intersection	Approach	Future (2027)					
		AM Peak			PM Peak		
		Avg Delay (s/veh)	LOS	95th % Queue (veh)	Avg Delay (s/veh)	LOS	95th % Queue (veh)
Intersection Control		*Signalized*					
West Park Street & US 10	EB	32.9	C	8	36.6	D	19
	WB	27.8	C	4	19.5	B	4
	NB	6.7	A	6	20.1	C	15
	SB	11.7	B	9	22.8	C	14
	Intersection	14.8	B	--	25.3	C	--
Intersection Control		*One-Way Stop-Controlled (NB)*					
US 10 & PFL Way	EB	0.0	A	0	0.0	A	0
	WB	2.1	A	1	1.3	A	1
	NB	16.5	C	2	15.5	C	2
	Intersection	3.6	A	--	3.5	A	--
Intersection Control		*Two-Way Stop-Controlled (NB/SB)*					
US 10 & West End Road	EB	0.1	A	0	0.0	A	0
	WB	3.3	A	1	2.4	A	1
	NB	28.2	D	5	21.2	C	3
	SB	16.3	C	0	13.8	B	0
	Intersection	8.8	A	--	6.3	A	--
Intersection Control		*One-Way Stop-Controlled (WB)*					
US 10 & I-90 WB Ramps	WB	10.3	B	1	12.3	B	1
	NB	0.0	A	0	0.1	A	0
	SB	0.0	A	0	0.0	A	0
	Intersection	0.5	A	--	0.6	A	--
Intersection Control		*One-Way Stop-Controlled (EB)*					
US 10 & I-90 EB Ramps	EB	11.2	B	1	13.4	B	2
	NB	0.0	A	0	0.0	A	0
	SB	1.0	A	0	0.9	A	0
	Intersection	6.0	A	--	7.2	A	--

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	6	0	26	0	244	0	0	85	268
Future Vol, veh/h	0	0	0	6	0	26	0	244	0	0	85	268
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	5	4
Mvmt Flow	0	0	0	7	0	28	0	265	0	0	92	291

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	503	648	265	383	0	-	-	-	0
Stage 1	265	265	-	-	-	-	-	-	-
Stage 2	238	383	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	-	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	532	392	779	1187	-	0	0	-	-
Stage 1	784	693	-	-	-	0	0	-	-
Stage 2	806	616	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	532	0	779	1187	-	-	-	-	-
Mov Cap-2 Maneuver	532	0	-	-	-	-	-	-	-
Stage 1	784	0	-	-	-	-	-	-	-
Stage 2	806	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1187	-	717	-	-
HCM Lane V/C Ratio	-	-	0.049	-	-
HCM Control Delay (s)	0	-	10.3	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	187	0	1	0	0	0	0	70	10	13	83	0
Future Vol, veh/h	187	0	1	0	0	0	0	70	10	13	83	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	0	0	0	0	3	10	15	3	0
Mvmt Flow	203	0	1	0	0	0	0	76	11	14	90	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	200	205	90	-	0	0	87	0	0
Stage 1	118	118	-	-	-	-	-	-	-
Stage 2	82	87	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.5	6.2	-	-	-	4.25	-	-
Critical Hdwy Stg 1	5.42	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	-	-	-	2.335	-	-
Pot Cap-1 Maneuver	789	695	973	0	-	-	1431	-	0
Stage 1	907	802	-	0	-	-	-	-	0
Stage 2	941	827	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	781	0	973	-	-	-	1431	-	-
Mov Cap-2 Maneuver	781	0	-	-	-	-	-	-	-
Stage 1	907	0	-	-	-	-	-	-	-
Stage 2	932	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.2	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	782	1431	-
HCM Lane V/C Ratio	-	-	0.261	0.01	-
HCM Control Delay (s)	-	-	11.2	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0	-

Intersection	
Int Delay, s/veh	8.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	2	112	155	157	239	1	116	0	118	1	0	1
Future Vol, veh/h	2	112	155	157	239	1	116	0	118	1	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	4	0	0	5	0	0	0	0	0	0	0
Mvmt Flow	2	122	168	171	260	1	126	0	128	1	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	261	0	0	290	0	0	813	813	206	877	897	261
Stage 1	-	-	-	-	-	-	210	210	-	603	603	-
Stage 2	-	-	-	-	-	-	603	603	-	274	294	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1315	-	-	1283	-	-	299	315	840	271	281	783
Stage 1	-	-	-	-	-	-	797	732	-	489	492	-
Stage 2	-	-	-	-	-	-	489	492	-	736	673	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1315	-	-	1283	-	-	263	265	840	202	237	783
Mov Cap-2 Maneuver	-	-	-	-	-	-	263	265	-	202	237	-
Stage 1	-	-	-	-	-	-	795	731	-	488	415	-
Stage 2	-	-	-	-	-	-	412	415	-	622	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3.3	28.2	16.3
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	402	1315	-	-	1283	-	-	321
HCM Lane V/C Ratio	0.633	0.002	-	-	0.133	-	-	0.007
HCM Control Delay (s)	28.2	7.7	0	-	8.2	0	-	16.3
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	4.2	0	-	-	0.5	-	-	0

Queues
15: W Park St & Hwy 10/7th St

05/11/2023

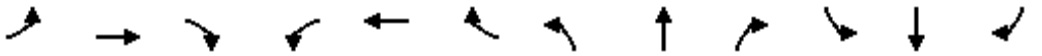
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	244	107	107	336	4	347	372
v/c Ratio	0.79	0.29	0.18	0.32	0.01	0.42	0.41
Control Delay	45.2	24.1	7.1	9.5	14.2	17.1	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	24.1	7.1	9.5	14.2	17.1	3.4
Queue Length 50th (ft)	106	40	19	76	1	112	0
Queue Length 95th (ft)	#186	78	41	137	7	207	51
Internal Link Dist (ft)	582	178		347		219	
Turn Bay Length (ft)			100		100		100
Base Capacity (vph)	370	449	625	1040	487	832	907
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.24	0.17	0.32	0.01	0.42	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
15: W Park St & Hwy 10/7th St

05/11/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	20	40	21	69	8	98	308	1	4	319	342
Future Volume (veh/h)	165	20	40	21	69	8	98	308	1	4	319	342
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1682	1750	1750	1614	1750	1750	1709	1709	1750	1750	1682	1709
Adj Flow Rate, veh/h	179	22	43	23	75	9	107	335	1	4	347	372
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	0	0	10	0	0	3	3	0	0	5	3
Cap, veh/h	287	26	50	97	262	28	504	1110	3	682	938	808
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.06	0.65	0.65	0.56	0.56	0.56
Sat Flow, veh/h	1054	133	254	215	1323	141	1628	1703	5	1061	1682	1448
Grp Volume(v), veh/h	244	0	0	107	0	0	107	0	336	4	347	372
Grp Sat Flow(s),veh/h/ln	1441	0	0	1679	0	0	1628	0	1708	1061	1682	1448
Q Serve(g_s), s	8.7	0.0	0.0	0.0	0.0	0.0	2.0	0.0	6.8	0.1	9.2	12.2
Cycle Q Clear(g_c), s	13.0	0.0	0.0	4.2	0.0	0.0	2.0	0.0	6.8	0.1	9.2	12.2
Prop In Lane	0.73		0.18	0.21		0.08	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	363	0	0	387	0	0	504	0	1114	682	938	808
V/C Ratio(X)	0.67	0.00	0.00	0.28	0.00	0.00	0.21	0.00	0.30	0.01	0.37	0.46
Avail Cap(c_a), veh/h	488	0	0	533	0	0	636	0	1114	682	938	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.7	0.0	0.0	27.4	0.0	0.0	6.5	0.0	6.0	7.9	9.9	10.5
Incr Delay (d2), s/veh	2.2	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.7	0.0	1.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	0.0	1.8	0.0	0.0	0.6	0.0	2.3	0.0	3.4	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	0.0	0.0	27.8	0.0	0.0	6.7	0.0	6.7	7.9	11.0	12.4
LnGrp LOS	C	A	A	C	A	A	A	A	A	A	B	B
Approach Vol, veh/h		244			107			443			723	
Approach Delay, s/veh		32.9			27.8			6.7			11.7	
Approach LOS		C			C			A			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		58.2		21.8	7.5	50.6		21.8				
Change Period (Y+Rc), s		6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s		45.0		23.0	11.0	31.0		23.0				
Max Q Clear Time (g_c+I1), s		8.8		15.0	4.0	14.2		6.2				
Green Ext Time (p_c), s		2.3		0.9	0.1	3.4		0.5				

Intersection Summary												
HCM 6th Ctrl Delay			14.8									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	147	87	120	337	59	59
Future Vol, veh/h	147	87	120	337	59	59
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	0	0	4	0	0
Mvmt Flow	160	95	130	366	64	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	255	0	834	208
Stage 1	-	-	-	-	208	-
Stage 2	-	-	-	-	626	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1322	-	341	837
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	537	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1322	-	299	837
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	832	-
Stage 2	-	-	-	-	471	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	16.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	441	-	-	1322	-
HCM Lane V/C Ratio	0.291	-	-	0.099	-
HCM Control Delay (s)	16.5	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.2	-	-	0.3	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	18	0	11	4	324	0	0	114	194
Future Vol, veh/h	0	0	0	18	0	11	4	324	0	0	114	194
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	1	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	0	5	0	10	0	2	0	0	4	4
Mvmt Flow	0	0	0	20	0	12	4	352	0	0	124	211

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	590	695	352	335	0	-	-	-	0
Stage 1	360	360	-	-	-	-	-	-	-
Stage 2	230	335	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.5	6.3	4.1	-	-	-	-	-
Critical Hdwy Stg 1	5.45	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4	3.39	2.2	-	-	-	-	-
Pot Cap-1 Maneuver	465	368	674	1236	-	0	0	-	-
Stage 1	699	630	-	-	-	0	0	-	-
Stage 2	801	646	-	-	-	0	0	-	-
Platoon blocked, %					-			-	-
Mov Cap-1 Maneuver	463	0	674	1236	-	-	-	-	-
Mov Cap-2 Maneuver	463	0	-	-	-	-	-	-	-
Stage 1	696	0	-	-	-	-	-	-	-
Stage 2	801	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	WBLn1	SBT	SBR
Capacity (veh/h)	1236	-	525	-	-
HCM Lane V/C Ratio	0.004	-	0.06	-	-
HCM Control Delay (s)	7.9	0	12.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	260	1	1	0	0	0	0	92	19	16	116	0
Future Vol, veh/h	260	1	1	0	0	0	0	92	19	16	116	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	0	0	0	0	3	15	10	2	0
Mvmt Flow	283	1	1	0	0	0	0	100	21	17	126	0

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	271	281	126	-	0	0	121	0	0
Stage 1	160	160	-	-	-	-	-	-	-
Stage 2	111	121	-	-	-	-	-	-	-
Critical Hdwy	6.42	6.5	6.2	-	-	-	4.2	-	-
Critical Hdwy Stg 1	5.42	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.3	-	-	-	2.29	-	-
Pot Cap-1 Maneuver	718	631	930	0	-	-	1418	-	0
Stage 1	869	769	-	0	-	-	-	-	0
Stage 2	914	800	-	0	-	-	-	-	0
Platoon blocked, %					-	-		-	
Mov Cap-1 Maneuver	709	0	930	-	-	-	1418	-	-
Mov Cap-2 Maneuver	709	0	-	-	-	-	-	-	-
Stage 1	869	0	-	-	-	-	-	-	-
Stage 2	902	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1	SBL	SBT
Capacity (veh/h)	-	-	710	1418	-
HCM Lane V/C Ratio	-	-	0.401	0.012	-
HCM Control Delay (s)	-	-	13.4	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.9	0	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	0	253	81	81	201	1	106	0	106	1	0	3
Future Vol, veh/h	0	253	81	81	201	1	106	0	106	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	3	0	1	5	0	0	0	0	100	0	33
Mvmt Flow	0	275	88	88	218	1	115	0	115	1	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	219	0	0	363	0	0	715	714	319	772	758	219
Stage 1	-	-	-	-	-	-	319	319	-	395	395	-
Stage 2	-	-	-	-	-	-	396	395	-	377	363	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.2	8.1	6.5	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	7.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	7.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.3	4.4	4	3.597
Pot Cap-1 Maneuver	1362	-	-	1201	-	-	348	359	726	223	339	749
Stage 1	-	-	-	-	-	-	697	657	-	473	608	-
Stage 2	-	-	-	-	-	-	633	608	-	485	628	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1362	-	-	1201	-	-	324	329	726	176	311	749
Mov Cap-2 Maneuver	-	-	-	-	-	-	324	329	-	176	311	-
Stage 1	-	-	-	-	-	-	697	657	-	473	558	-
Stage 2	-	-	-	-	-	-	578	558	-	408	628	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.4	21.2	13.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	448	1362	-	-	1201	-	-	413
HCM Lane V/C Ratio	0.514	-	-	-	0.073	-	-	0.011
HCM Control Delay (s)	21.2	0	-	-	8.2	0	-	13.8
HCM Lane LOS	C	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	2.9	0	-	-	0.2	-	-	0

Queues
15: W Park St & Hwy 10/7th St

05/11/2023

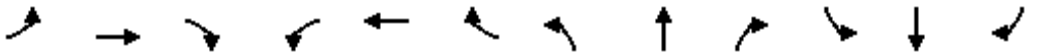
Lane Group	EBT	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	485	108	71	567	2	458	185
v/c Ratio	0.95	0.22	0.23	0.72	0.01	0.71	0.30
Control Delay	57.6	18.3	13.7	25.6	18.5	32.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	18.3	13.7	25.6	18.5	32.1	8.6
Queue Length 50th (ft)	246	36	21	259	1	234	22
Queue Length 95th (ft)	#474	76	42	365	5	336	67
Internal Link Dist (ft)	582	178		347		219	
Turn Bay Length (ft)			100		100		100
Base Capacity (vph)	508	492	313	819	231	666	639
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.22	0.23	0.69	0.01	0.69	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
15: W Park St & Hwy 10/7th St

05/11/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	313	34	99	54	37	8	65	518	4	2	421	170
Future Volume (veh/h)	313	34	99	54	37	8	65	518	4	2	421	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1695	1750	1723	1750	1750	1695	1723	1750	1750	1736	1723
Adj Flow Rate, veh/h	340	37	108	59	40	9	71	563	4	2	458	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	4	0	2	0	0	4	2	0	0	1	2
Cap, veh/h	429	39	115	332	212	44	319	854	6	298	730	614
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.05	0.50	0.50	0.42	0.42	0.42
Sat Flow, veh/h	984	107	312	737	579	120	1615	1708	12	858	1736	1460
Grp Volume(v), veh/h	485	0	0	108	0	0	71	0	567	2	458	185
Grp Sat Flow(s),veh/h/ln	1403	0	0	1435	0	0	1615	0	1721	858	1736	1460
Q Serve(g_s), s	25.7	0.0	0.0	0.0	0.0	0.0	2.1	0.0	22.1	0.2	18.7	7.6
Cycle Q Clear(g_c), s	30.0	0.0	0.0	4.3	0.0	0.0	2.1	0.0	22.1	15.1	18.7	7.6
Prop In Lane	0.70		0.22	0.55		0.08	1.00		0.01	1.00		1.00
Lane Grp Cap(c), veh/h	582	0	0	588	0	0	319	0	860	298	730	614
V/C Ratio(X)	0.83	0.00	0.00	0.18	0.00	0.00	0.22	0.00	0.66	0.01	0.63	0.30
Avail Cap(c_a), veh/h	613	0	0	620	0	0	371	0	860	298	730	614
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	0.0	19.4	0.0	0.0	14.9	0.0	16.8	25.1	20.5	17.3
Incr Delay (d2), s/veh	9.2	0.0	0.0	0.1	0.0	0.0	0.3	0.0	3.9	0.0	4.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	0.0	0.0	1.6	0.0	0.0	0.8	0.0	9.3	0.0	8.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	0.0	19.5	0.0	0.0	15.3	0.0	20.7	25.1	24.6	18.6
LnGrp LOS	D	A	A	B	A	A	B	A	C	C	C	B
Approach Vol, veh/h		485			108			638			645	
Approach Delay, s/veh		36.6			19.5			20.1			22.8	
Approach LOS		D			B			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		51.0		39.0	7.2	43.9		39.0				
Change Period (Y+Rc), s		6.0		6.0	3.0	6.0		6.0				
Max Green Setting (Gmax), s		43.0		35.0	7.0	33.0		35.0				
Max Q Clear Time (g_c+I1), s		24.1		32.0	4.1	20.7		6.3				
Green Ext Time (p_c), s		3.8		0.9	0.0	3.0		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			25.3									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	3.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	323	41	41	221	66	91
Future Vol, veh/h	323	41	41	221	66	91
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	0	0	3	2	0
Mvmt Flow	351	45	45	240	72	99

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	396	0	704	374
Stage 1	-	-	-	-	374	-
Stage 2	-	-	-	-	330	-
Critical Hdwy	-	-	4.1	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.3
Pot Cap-1 Maneuver	-	-	1174	-	403	677
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1174	-	385	677
Mov Cap-2 Maneuver	-	-	-	-	385	-
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	513	-	-	1174	-
HCM Lane V/C Ratio	0.333	-	-	0.038	-
HCM Control Delay (s)	15.5	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	-	-	0.1	-

AUXILIARY TURN LANE WARRANT WORKSHEETS

APPENDIX D

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

TURN LANE WARRANTS		US 10 & PFL Way		US 10 & West End Road		I-90 WB Ramps & US 10		I-90 EB Ramps & US 10	
		AM	PM	AM	PM	AM	PM	AM	PM
2022	NB Right-Turn Lane							NO	NO
	NB Left-Turn Lane					NO	NO		
	SB Right-Turn Lane					YES	YES		
	SB Left-Turn Lane							NO	NO
	EB Right-Turn Lane	NO	NO						
	EB Left-Turn Lane			NO	NO				
	WB Right-Turn Lane			NO	NO				
	WB Left-Turn Lane	YES	NO						
2027	NB Right-Turn Lane							NO	NO
	NB Left-Turn Lane					NO	NO		
	SB Right-Turn Lane					YES	YES		
	SB Left-Turn Lane							NO	NO
	EB Right-Turn Lane	NO	NO	YES	YES				
	EB Left-Turn Lane			NO	NO				
	WB Right-Turn Lane			NO	NO				
	WB Left-Turn Lane	YES	YES	YES	YES				

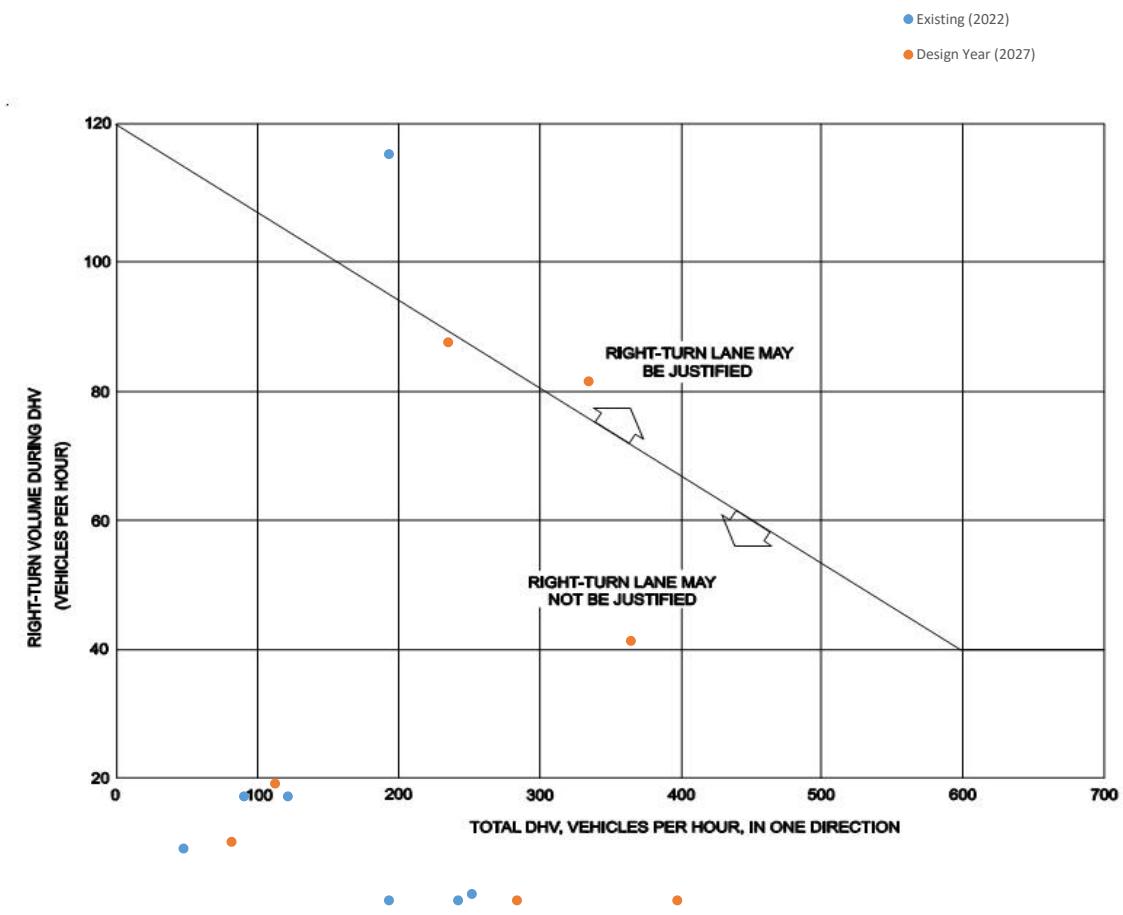
Existing Traffic Volumes (2022) - Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Total DHV (veh/hr)	Right-Turn Volume During DHV (veh/hr, one direction)	Required Right-Turn Volume for Warranted Lane	Warranted Right-Turn Lane? (Y/N)	Speed Limit at Approach	Adjustment
Hwy 10 & PFL EB	AM weekday	120	17	104	N	60	0
	PM weekday	251	2	87	N	60	0
US 10 & West End WB	AM weekday	241	1	88	N	45	0
	PM weekday	192	1	94	N	45	0
I-90 WB & US 10 SB	AM weekday	239	187	108	Y	45	20
	PM weekday	192	116	114	Y	45	20
I-90 EB & US 10 NB	AM weekday	46	9	114	N	45	0
	PM weekday	89	17	108	N	45	0

Future Traffic Volumes (2027) - Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Total DHV (veh/hr)	Right-Turn Volume During DHV (veh/hr, one direction)	Required Right-Turn Volume for Warranted Lane	Warranted Right-Turn Lane? (Y/N)	Speed Limit at Approach	Adjustment
Hwy 10 & PFL EB	AM weekday	234	87	89	N	60	0
	PM weekday	364	41	71	N	60	0
US 10 & West End EB	AM weekday	269	155	104	Y	45	20
	PM weekday	334	81	75	Y	45	0
US 10 & West End WB	AM weekday	397	1	67	N	45	0
	PM weekday	283	1	82	N	45	0
I-90 WB & US 10 SB	AM weekday	353	268	73	Y	45	0
	PM weekday	308	194	79	Y	45	0
I-90 EB & US 10 NB	AM weekday	80	10	109	N	45	0
	PM weekday	111	19	105	N	45	0

Guidelines for Right-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (Figure 28.4A)



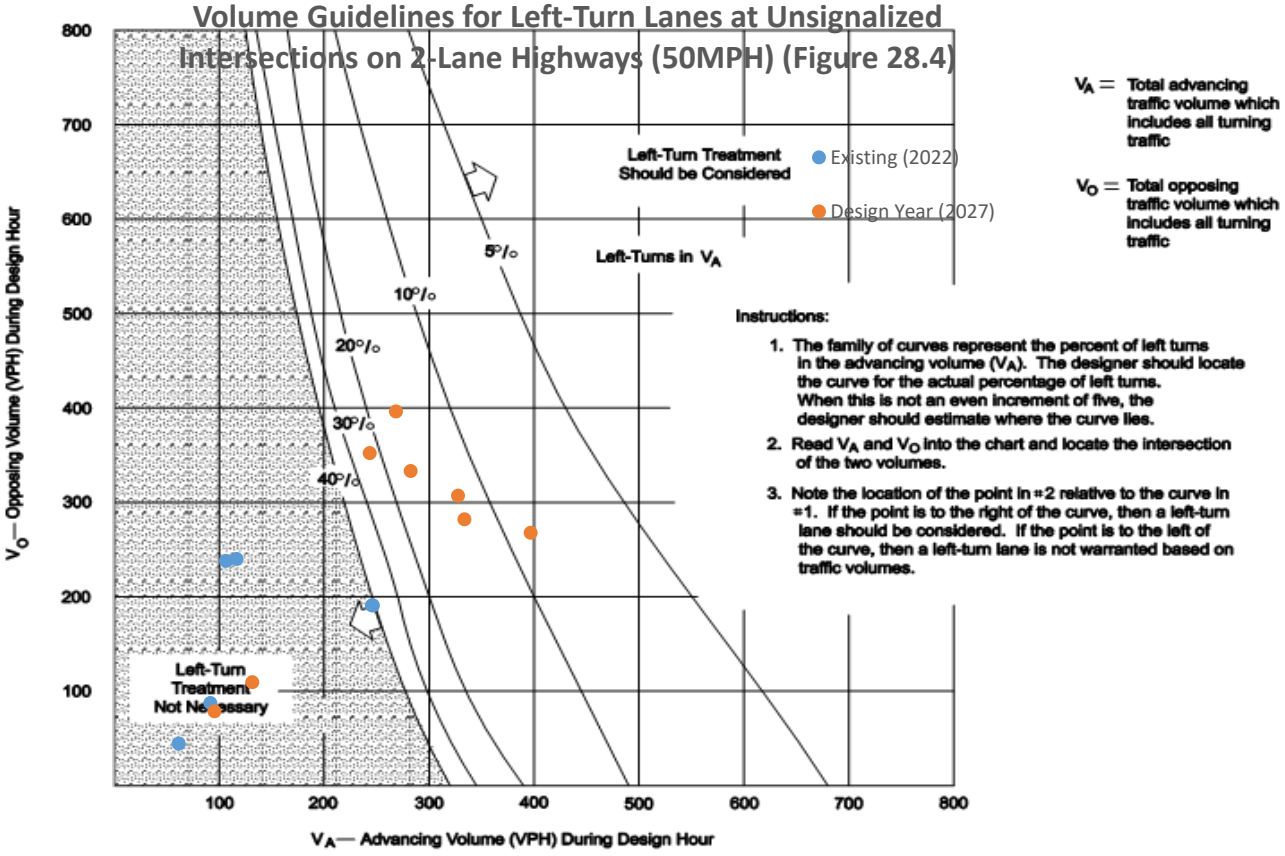
Existing Traffic Volumes (2022) - Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Va = Total advancing traffic volume	Val = Total left-turn volume in advancing traffic	Percent left-turns in Va	Vo = Total opposing traffic volume	Warranted Left-Turn Lane? (Y/N)	Speed Limit at Approach
Hwy 10 & PFL WB	AM weekday	289	50	17.3%	120	Y	60
	PM weekday	180	2	1.1%	251	N	60
US 10 & West End EB	AM weekday	117	2	1.7%	241	N	45
	PM weekday	246	0	0.0%	192	N	45
I-90 WB & US 10 NB	AM weekday	107	0	0.0%	239	N	45
	PM weekday	247	4	1.6%	192	N	45
I-90 EB & US 10 SB	AM weekday	62	4	6.5%	46	N	45
	PM weekday	92	5	5.4%	89	N	45

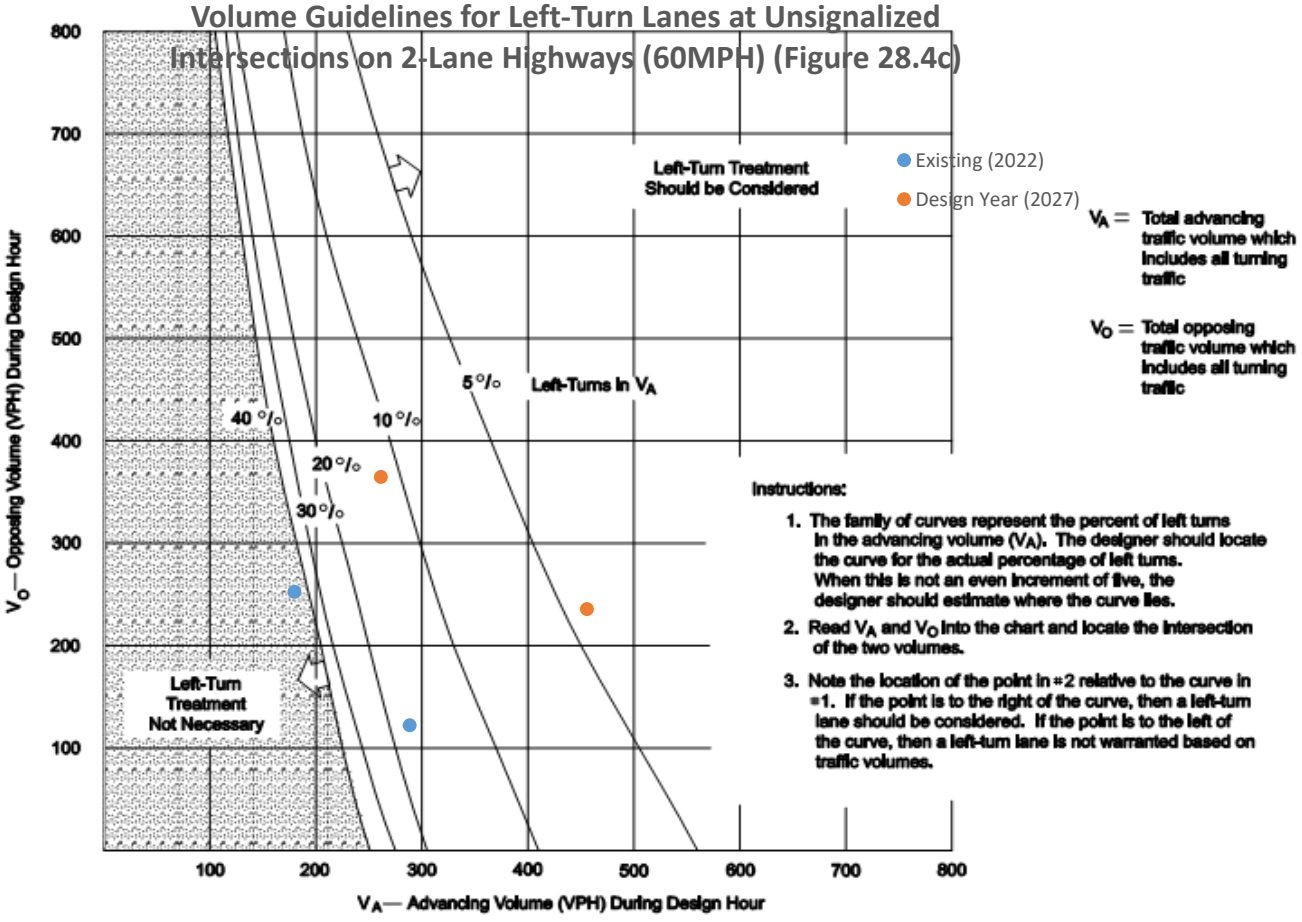
Future Traffic Volumes (2027) - Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways

Approach	Time	Va = Total advancing traffic volume	Val = Total left-turn volume in advancing traffic	Percent left-turns in Va	Vo = Total opposing traffic volume	Warranted Left-Turn Lane? (Y/N)	Speed Limit at Approach
Hwy 10 & PFL WB	AM weekday	457	120	26.3%	234	Y	60
	PM weekday	262	41	15.6%	364	Y	60
US 10 & West End EB	AM weekday	269	2	0.7%	397	N	45
	PM weekday	334	0	0.0%	283	N	45
US 10 & West End WB	AM weekday	397	157	39.5%	269	Y	45
	PM weekday	283	81	28.6%	334	Y	45
I-90 WB & US 10 NB	AM weekday	244	0	0.0%	353	N	45
	PM weekday	328	4	1.2%	308	N	45
I-90 EB & US 10 SB	AM weekday	96	13	13.5%	80	N	45
	PM weekday	132	16	12.1%	111	N	45

Volume Guidelines for Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (50MPH) (Figure 28.4)



Volume Guidelines for Left-Turn Lanes at Unsignalized Intersections on 2-Lane Highways (60MPH) (Figure 28.4c)



ENDURING COMMUNITY DESIGN

SANDERSONSTEWART.COM

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX E

Wetland Delineation Report

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

Printing for Less

Wetland Delineation Report

Prepared By:

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09/13/2019

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Appendix A – Project Area Maps

Appendix B – Mapped Wetland Boundary

Appendix C – Wetland Determination Data Forms

Appendix D – Site Photographs

Introduction

A routine wetland delineation was conducted by Sundog Ecological Inc., on June 19th and 26th, 2019 on behalf of property owner, Printing for Less (PFL), to verify wetland boundaries east of PFL Way. The purpose of this wetland delineation was to investigate the project area, identify areas meeting technical guidelines for wetlands, delineate the extent of wetlands within the project area and to classify these wetland habitats. This report describes methodologies used, summarizes results of wetland investigations, and provides technical documentation for all delineated wetlands within the project area. Figures referred to in text are included in Appendices at the end of the report.

Site Description

The PFLWetland Delineation site is located in the northwest quarter of Section 22, Township 2 South, Range 9 East, approximately 2.15 miles west of Livingston, Montana. The property is located immediately east of the Printing for Less headquarters on PFL Way. Upland communities are comprised of pasture grasses, Montana State Listed noxious weeds, small shrubs and other weedy species. Wetlands communities are dominated by mixed grasses, rushes, sedges and cattails. Four wetland types and one upland type were identified within project boundaries.

Figure 1: Location of the Printing for Less Wetland Delineation Site relative to US Interstate 90 and MT Highway 10.

Directions to site from Bozeman: From North 7th Avenue take Interstate 90 east for 22.7 miles, exiting at Livingston Exit 330. Turn left onto 1-90 Business Loop/MT Highway 10 for 0.5 miles. Turn right onto PFL Way, the project area is on the left.

Waterbodies and Waterways

While there are no direct waterbodies or streams on the PFL wetland site, there is a stream that flows west from the north side of the Interstate 90 business loop to the south side and eventually discharges into the wetland in the northeast corner of the site. A review of aerial photos shows that this water

appears to be diverted from Fleshman Creek (north of the site). Other waterways in the area include Billman Creek (south of the site) and the Yellowstone River (east of the site).

Methods

This wetland delineation was conducted using the routine on-site-approach in accordance with standard practices outlined in the 1987 Army Corps of Engineers (ACOE) Wetland Delineation Manual (Environmental Laboratory 1987) and by Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast - Version 2.0 (ACOE 2010). The study evaluated the presence or absence of indicators of three wetlands parameters described in the ACOE Wetland Delineation Manual. Under the delineation procedures outlined in this manual, an area must exhibit characteristic wetland hydrology, hydric soils, and hydrophytic vegetation to be considered a wetland. If field investigation determines that any of the three parameters are not satisfied, the area does not usually qualify as a wetland. Wetlands were classified according to the Cowardin classification system (Cowardin *et al*., 1979). Non-wetland water bodies such as streams were classified according to flow regime (perennial, seasonal, etc.) and substrate (rock bottom, unconsolidated bottom, etc.) according to the Cowardin system (Cowardin *et al*., 1979).

Prior to conducting field studies, available background and supplementary reference materials were reviewed, including aerial photographs and maps from: Google Earth Pro, National Wetlands Inventory, Montana Natural Heritage Program, the Park County Soil Survey, Web Soil Survey, the National Wetlands Plant List, plat and topographic maps. Site maps used for assessment of the Printing for Less wetland delineation site are included in Appendix A.

As part of a delineation report, data forms and technical information are required by the ACOE to document the three parameters for any area determined to be wetland. A total of seventeen (17) data points were observed. Wetland boundaries were drawn utilizing field data, aerial photographs and topographic boundaries. Wetland boundaries were surveyed using survey grade GPS equipment and data point locations were collected using a resource grade handheld GPS unit. Exact accuracy of maps and locations of boundaries and data points is limited by the accuracy of data collection devices (less than 30 cm for survey grade and 0.5 to 2 meters for handheld). Data forms for sample locations are provided in Appendix B. Representative photographs of sample locations and delineated wetlands are provided in Appendix D.

Results

The following discussion provides an overview of each of the four wetland components inventoried at the PFL wetland delineation site. In June 2019, four wetland types were identified and delineated within the 25-acre project boundary. All potential areas of impact were assessed for dominant hydrophytic vegetation, hydric soils, and evidence of wetland hydrology. Wetland areas outside of the project limits were not assessed. Overall, 17 (seven matched sets) data points were investigated to determine the wetland/upland boundary within the project area. Data points were placed along the wetland/upland boundary and in areas where vegetation and topographic changes appeared across the landscape.

The location of identified wetlands, upland sample points and wetland sample points are shown on Figure 1 (Appendix B). Data forms for sample locations can be found in Appendix C. Photographs of sample locations are located in Appendix D.

Vegetation

Approximately 34 plant species were identified within the proposed project site (Table 1). Plants observed at sample locations are listed on their respective data forms. Of the plant species observed, four are listed as Montana State noxious weeds. Three priority 2B species observed are: whitetop (*Cardaria draba*), Canada thistle (*Cirsium arvense*) and gypsyflower (*Cynoglossum officinale*); which are widespread on the property. One priority 3 species, Russian olive (*Elaeagnus angustifolia)*, was observed in a few isolated locations. A weed management plan should be developed and implemented for this site.

Uplands

A total of 7 upland sample points (paired with 9 wetland sample points) were documented within the project area and are shown on Figure 1, Appendix B. These sample points were used to assist in establishing wetland boundaries and to determine/verify upland areas. Taken throughout the project limits, sample points varied throughout upland areas. Uplands generally occur in areas of slightly higher topography and in some cases, convex surfaces. Vegetation within the uplands included a mix of hydrophytic and upland species but facultative upland (FACU) generally dominated the overall cover. Common species noted in the uplands included: smooth brome, redtop and Kentucky bluegrass. Soils ranged from a grey, very dark greyish brown to dark brown and typically lacked redox concentrations. Soil textures varied, but generally ranged from a silty clay loam to silty loam.

Delineated Wetlands

Four wetland types, covering 13-acres were delineated within the PFL wetland delineation site boundaries.

Wetland Type 1 is dominated by cattails (*Typha latifolia)* and occupies 1.75 acres of wetlands. Wetland Type 1 areas are generally located along the east property boundary, extending west of the property. Cattails were observed in both the north and central wetland cells (1.43 and 0.32 acres, respectfully).

Wetland Type 2 is a willow dominated scrub-shrub community with a *Salix exigua* (narrowleaf willow) overstory and a mixed *Juncus/Agrostis (J. balticus, A. alba*) understory. Wetland Type 2 accounts for 0.35 wetland acres located along north (0.21 acres) and south sides (0.14 acres) of the abandoned railroad grade.

Wetland Type 3 is dominated by a mixed *Juncus* community (*J. balticus, J. effusus)* with lesser amounts of reed canary grass (*Phalaris arundinacea*), redtop (*A. alba) and* Rocky Mountain iris (*Iris missouriensis*). Wetland Type 3 occupies 4.02 acres.

Wetland Type 4 is the largest wetland community, covering 6.68 acres (5.11, 1.07 and 0.5 acres in the north, central and south complexes, respectively). This community is comprised of redtop, Rocky Mountain iris, common rush, reed canary grass and Baltic rush.

Table 1: Plant species observed at the Printing for Less Wetland Delineation Site.

Scientific Name	Common Name	Indicator Status
Achillea millefolium	common yarrow	FACU
Agrostis alba	redtop	FAC
Agroypron intermedium	intermediate wheatgrass	UPL
Alopecurus arundinaceus	Garrison creeping foxtail	FAC
Bromus inermis	smooth brome	UPL
Cardaria draba	whitetop	UPL
Carex nebrascensis	Nebraska sedge	OBL
Carex stipata	awlfruit sedge	OBL
Cirsium arvense	Canada thistle	FACU
Cynoglossum officinale	gypsyflower	FACU
Dactylis glomerata	orchard grass	FACU
Elaeagnus angustifolia	Russian olive	FAC
Eleocharis palustris	common spikerush	OBL
Elymus lanceolatus	streambank wheatgrass	FACU
Equisetum hyemale	rough horsetail	FACW
Helianthus annus	common sunflower	FACU
Hordeum jubatum	foxtail barley	FAC
Iris missourienssis	Rocky Mountain iris	FACW
Juncus balticus	Baltic rush	FACW
Juncus effusus	common rush	FACW
Mentha arvesis	field mint	FACW
Pascopyrum smithii	western wheatgrass	FACU
Poa pratensis	Kentucky bluegrass	FAC
Rosa woodsii	Wood's rose	FACU
Salix exigua	narrowleaf willow	FACW
Schoenoplectus pungens	common threesqure	OBL
Solidago canadensis	Canada goldenrod	FACU
Sonchus arvensis	field sowthistle	FACU
Sporobolus airoides	alkali sacaton	FAC
Stipa viradula	green needlegrass	UPL
Symphoricarpos albus	common snowberry	FACU
Taraxacum officinale	common dandelion	FACU
Triglochin maritima	seaside arrowgrass	OBL
Typha latifolia	broadleaf cattail	OBL

Table 2: Wetland characteristics identified at the Printing for Less Wetland Delineation Site.

Site	General Location	Size (Acres)	Cowardin Class	Primary Hydrology	Dominant Vegetation
Upland	Throughout project area	12.00	none	none	smooth brome, Kentucky bluegrass, common snowberry
Wetland Type 1	Throughout project area	1.75	PEMA	ground and surface water	cattails, common rush
Wetland Type 2	Throughout project area	0.35	PSS	ground and surface water	narrowleaf willow, redtop, Baltic rush
Wetland Type 3	Throughout project area	4.22	PEMA	ground and surface water	common rush, Baltic rush, Rocky Mountain iris, redtop
Wetland Type 4	Throughout project area	6.68	PEMA	ground and surface water	redtop, Rocky Mountain iris, reed canary grass, common rush, Baltic rush

Soils

One soil unit was observed within the project limits of the PFL wetland delineation site, the Reedpoint-Tanna-Ethridge complex. This soil complex is variable with loamy, sandy clay loam and silty clay loam soils. Soil matrix observations for hues were 7.5 YR and 10YR, matrix values ranged from 2 to 5 and chromas were 2 or less. Redox concentrations were generally common throughout most observed wetland soils within the project area. Redox values ranged from 4 to 6 and chromas were 3 or less. Hydric soil indicators were generally Hydrogen Sulfide odor (A4), depleted matrix (F3) or redox dark surface (F6). Detailed soil descriptions for each wetland and upland sample point are provided on the wetland delineation data forms, in Appendix C.

Hydrology

Typical conditions for the region were observed during field sampling. Primary indictors of wetland hydrology were surface water present (A1), saturation (A3) or Hydrogen Sulfide odor (C1). Most wetlands sites also met wetland hydrology indicators based on secondary indicators of geomorphic position (D2) and positive FAC-Neutral test (D5). Depressional wetlands and swales are supported by high groundwater or seasonal groundwater expressed at or near ground surface. Hydrologic indicators at sample locations are documented on their respective data forms located in Appendix C.

Wetland Boundaries

Wetland boundaries were generally readily identifiable due to changes in topography, shifts in vegetation structure or changes in vegetation dominance from FAC to wetter (FACW, OBL) or drier (FACU, UPL) species, changes in hydrology and/or changes in soil types. Topographic breaks were frequently used to help identify wetland boundaries in depressions and swales. In some areas, shifts in plant species composition toward drier species such as smooth brome (*Bromus inermis*) and common snowberry (*Symphoricarpos albus)* also assisted with boundary determinations. When Kentucky bluegrass, redtop or Baltic rush were common in both wetland and upland sample plots, subsurface explorations to assess soil and hydrology assisted in identifying boundaries.

Wetland Impacts

This wetland delineation report for PFL provides baseline information that will assist in developing practices to minimize wetland impacts during development.

Threatened and Endangered Species

A review of USFWS Information, Planning and Conservation System database for the site listed the Canada Lynx as threatened and the North American Wolverine as proposed threatened. Development within the PFL site is not expected to impact any of these species as there are no critical habitats for these species within the project area.

Cultural Resources and Historic Structures

There are no cultural resources, historic or other structures that would be impacted by development activities at the PFL wetland delineation site.

Summary

Four wetland types and one upland type were identified within the PFL wetland delineation site project boundaries totaling 13 and 12 acres, respectively. The largest wetland area accounts for 6.68-acres of mixed *Agrostis* community that is abundant throughout the site. Three wetlands were classified as palustrine emergent wetlands (9.65 acres) and one wetland was classified as shrub-scrub (0.35 acres).

References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S.D.I Fish and Wildlife Service. Washington D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers. Washington, DC.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List. 2014 Update of Wetland Ratings. Phytoneuron 2014-41:1-42.

Reed, P.B. 1988. National list of plant species that occur in wetlands: North West (Region 9). Biological Report 88(26.9), May 1988. U.S. Fish and Wildlife Service, Washington, DC.

U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center

Websites

Montana Department of Agriculture website. Accessed July 2019 at https://agr.mt.gov/Weeds

Montana Natural Heritage Program website. Accessed in July 2019 at http://mtnhp.org/mapviewer

USDA, Natural Resources Conservation Service Web Soil Survey. Park County, Montana. Accessed July 2019 at: http://websoilsurvey.nrcs.usda.gov/app/

U.S. Fish and Wildlife Service National Wetlands Inventory website. Accessed in July 2019 at: https://www.fws.gov/wetlands/data/mapper.html.

US Fish & Wildlife Service. Information for Planning and Conservation. Accessed in July 2019 at: https://ecos.fws.gov/ipac/

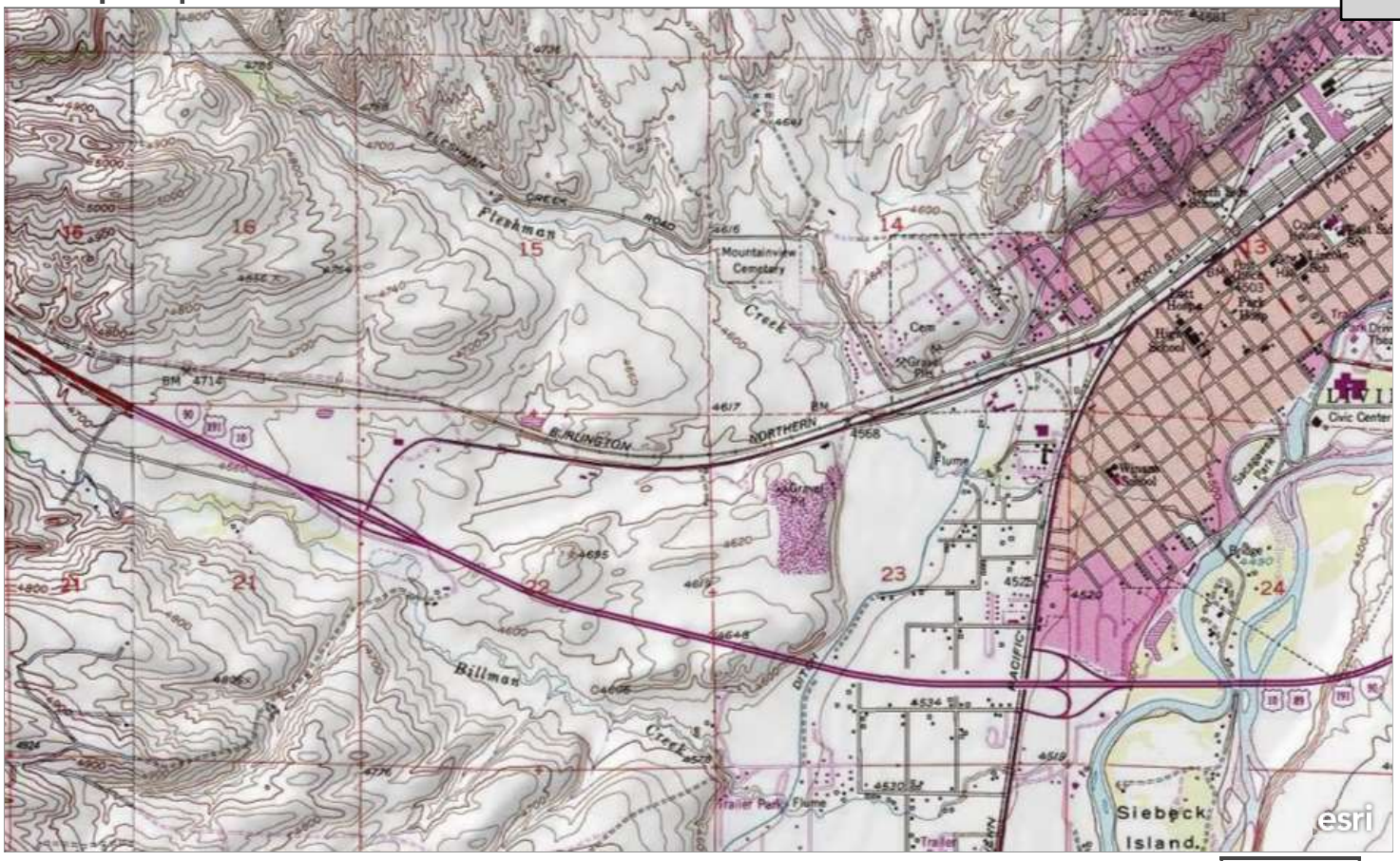
Appendix A

Aerial Overview of the Printing for Less Wetland Delineation Site
Topographic Overview of the Printing for Less Wetland Delineation Site
National Wetland Inventory – Mapped Wetlands of the Printing for Less Wetland Delineation Site
Montana Natural Heritage Program - Mapped Wetlands of the Printing for Less Wetland Delineation Site
Soils of the Printing for Less Wetland Delineation Site in Park County, MT


343
PFL Way
90
Prairie Dog Rd
Google Earth
© 2018 Google
N
1000 ft

USA Topo Maps

344



This map features detailed USGS topographic maps for the United States at multiple scales.

July 23, 2019

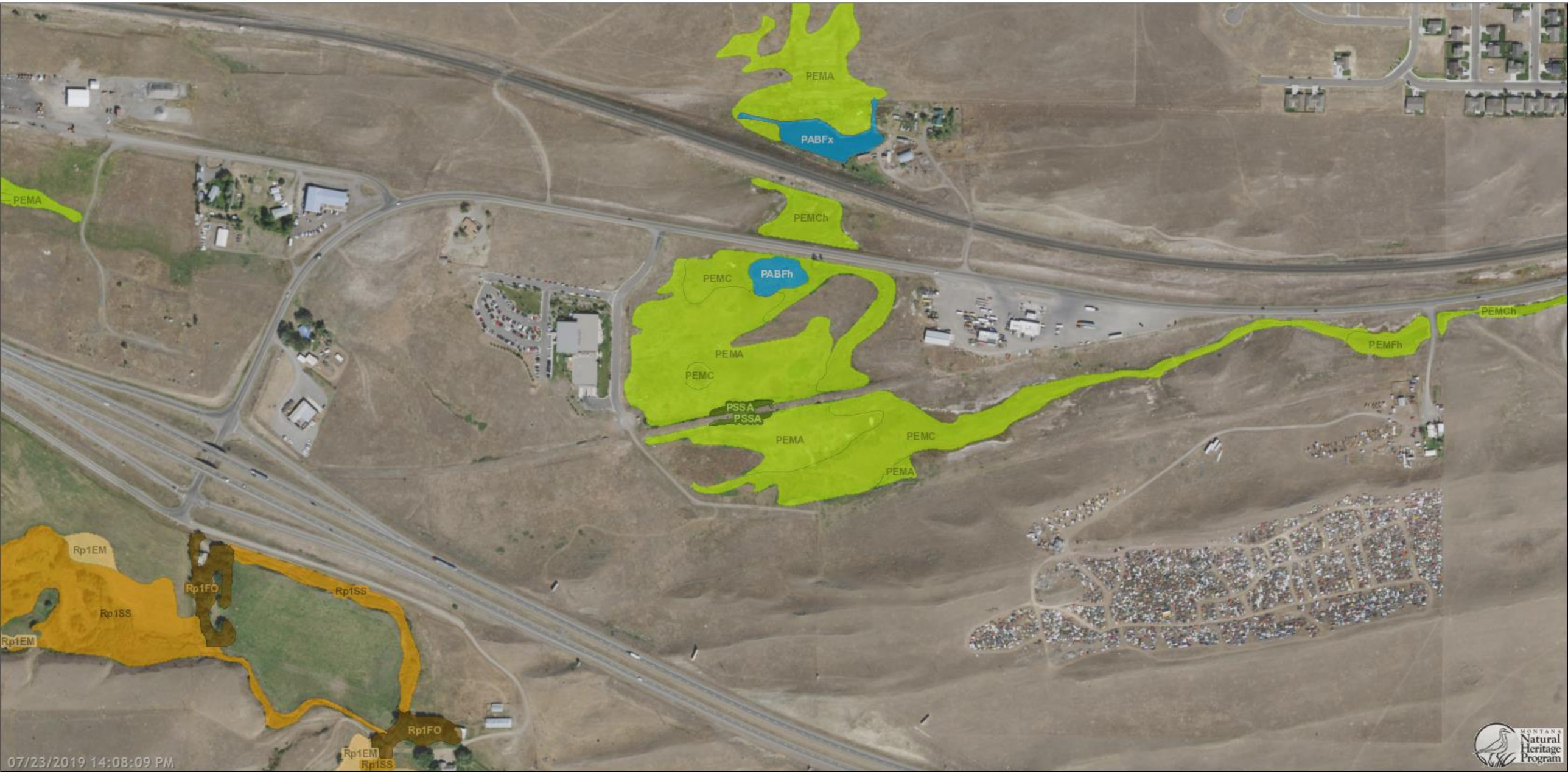
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

NHP Map Viewer

Latitude	Longitude
45.64766	-110.58097
45.65676	-551

346



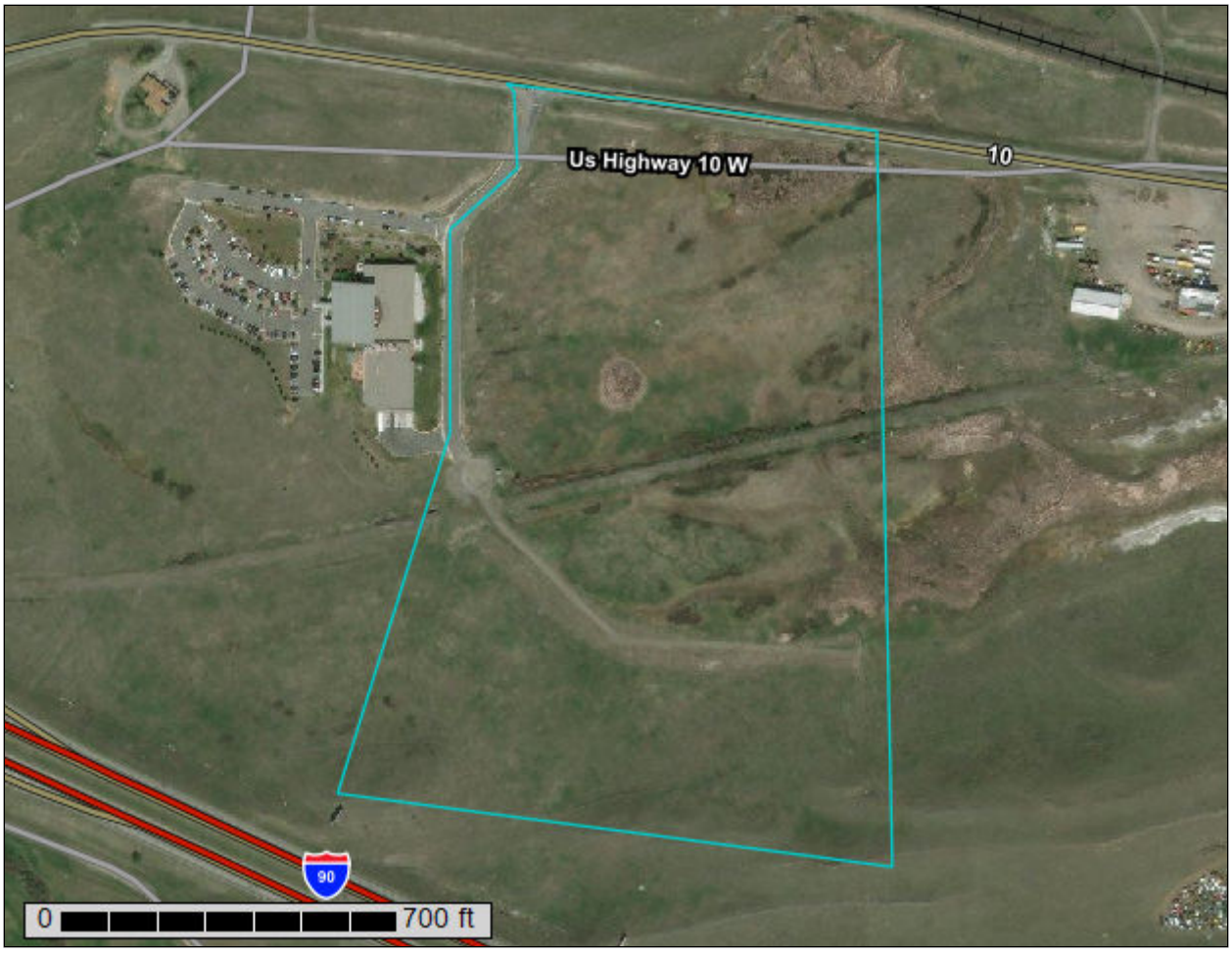
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Park County Area, Montana



July 23, 2019

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:2,910 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N 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: Park County Area, Montana
Survey Area Data: Version 10, Sep 11, 2018

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

Date(s) aerial images were photographed: Aug 3, 2009—Sep 1, 2016

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
5401D	Ethridge-Tanna-Reedpoint complex, 2 to 15 percent slopes	0.8	2.3%
5502E	Reedpoint-Tanna-Ethridge complex, 4 to 35 percent slopes	32.4	97.7%
Totals for Area of Interest		**33.2**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Park County Area, Montana

5401D—Ethridge-Tanna-Reedpoint complex, 2 to 15 percent slopes

Map Unit Setting

National map unit symbol: 582g
Elevation: 4,300 to 5,100 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Ethridge and similar soils: 35 percent
Tanna and similar soils: 25 percent
Reedpoint and similar soils: 15 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ethridge

Setting

Landform: Swales on hills
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from sedimentary rock

Typical profile

A - 0 to 4 inches: clay loam
Bt - 4 to 17 inches: clay loam
Bk1 - 17 to 53 inches: clay loam
2Bk2 - 53 to 60 inches: gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 9-14" p.z. (R044XS330MT)
Hydric soil rating: No

Description of Tanna

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 8 inches: clay loam
Bt - 8 to 16 inches: clay loam
Bk - 16 to 23 inches: loam
Cr - 23 to 60 inches: weathered bedrock, bedrock
Cr - 23 to 60 inches:

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 9-14" p.z. (R044XS339MT)
Hydric soil rating: No

Description of Reedpoint

Setting

Landform: Hills
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy residuum weathered from sandstone

Typical profile

A1 - 0 to 2 inches: very channery loam
A2 - 2 to 8 inches: extremely channery loam
R - 8 to 18 inches: bedrock

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: 4 to 10 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): 7s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Very Shallow (VSw) 9-14" p.z. (R044XS348MT)
Hydric soil rating: No

Minor Components

Yamacall

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Silty (Si) 9-14" p.z. (R044XS339MT)
Hydric soil rating: No

Cabbart

Percent of map unit: 10 percent
Landform: Scarp slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow Limy (SwLy) 9-14" p.z. (R044XS612MT)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

5502E—Reedpoint-Tanna-Ethridge complex, 4 to 35 percent slopes

Map Unit Setting

National map unit symbol: 580l
Elevation: 4,300 to 5,200 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 43 to 45 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Reedpoint and similar soils: 35 percent
Tanna and similar soils: 25 percent
Ethridge and similar soils: 20 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Reedpoint

Setting

Landform: Dip slopes
Landform position (two-dimensional): Summit, shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Loamy residuum weathered from sandstone

Typical profile

A1 - 0 to 2 inches: very channery loam
A2 - 2 to 8 inches: extremely channery loam
R - 8 to 18 inches: bedrock

Properties and qualities

Slope: 4 to 35 percent
Depth to restrictive feature: 4 to 10 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: Very Shallow (VSw) 9-14" p.z. (R044XS348MT)
Hydric soil rating: No

Description of Tanna

Setting

Landform: Swales on dip slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Loamy alluvium derived from sandstone and shale

Typical profile

A - 0 to 2 inches: sandy clay loam
Bt - 2 to 8 inches: clay loam
Bk - 8 to 26 inches: loam
Cr - 26 to 30 inches: weathered bedrock
R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 4 to 25 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock; 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Silty (Si) 9-14" p.z. (R044XS339MT)
Hydric soil rating: No

Description of Ethridge

Setting

Landform: Swales on dip slopes
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey alluvium derived from sandstone and shale

Typical profile

A - 0 to 5 inches: clay loam
Bt - 5 to 21 inches: clay loam
Bk1 - 21 to 30 inches: clay loam
2Bk2 - 30 to 60 inches: gravelly loam

Properties and qualities

Slope: 4 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Clayey (Cy) 9-14" p.z. (R044XS330MT)
Hydric soil rating: No

Minor Components

Cabbart

Percent of map unit: 12 percent
Landform: Scarp slopes
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Shallow Limy (SwLy) 9-14" p.z. (R044XS612MT)
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent

Bigsandy

Percent of map unit: 3 percent
Landform: Drainageways
Landform position (two-dimensional): Footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Saline Subirrigated (SSb) 9-14" p.z. (R044XS333MT)
Hydric soil rating: Yes

Appendix B

Figure 1 – Mapped Wetland Boundary at the Printing for Less Wetland Delineation Site

360

NO.	REVISIONS	DRAWN BY	DATE

0 100 200 300
SCALE (FEET)

PROJECT ENGINEER: RO	DRAWN BY: Sanderson Stewart
DESIGNED BY:	REVIEWED BY:

PRINTING FOR LESS
WETLAND DELINEATION
LIVINGSTON, MT

32 DISCOVERY DRIVE
BOZEMAN, MT 59718
PHONE (406) 582-0221
FAX (406) 582-5770
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Civil Engineering
Geotechnical Engineering
Land Surveying

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PROJECT #: 18-018	FIGURE
DATE: 09/05/2019	W-1

\\10.10.8\Users\Projects\2018\18-018 Printing For Less Addition Geotech\97-Received-Sent\2019_08_29 SS ACAD\18-018 Wetlands_AES.dwg Sep 11, 2019 - 10:19am

Appendix C

Printing for Less Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

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Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 1

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.53"N **Long.:** 110°36'10.41"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Sample located south of gravel access drive.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	75	☑ 78.9%	UPL
2. Litter	15	☐ 15.8%	
3. Poa pratensis	5	☐ 5.3%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	75	x 5 =	375
Column Totals:	80 (A)		390 (B)

Prevalence Index = B/A = 4.875

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Community dominated by pasture grasses.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR	3/2	93	7.5YR	5/1	7	C	M	Silty Clay Loam	wet, not saturated
6-13	7.5YR	3/2	95	7.5YR	5/3	3	C	M	Silty Clay	very clayey
				7.5YR	4/4	2	C	M		
13-22	7.5YR	4/2	80	7.5YR	5/3	20	C	M	Silty Clay Loam	reddish profile, wet, not saturated

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 3 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators were observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

364

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 2

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.65"N **Long.:** 110°36'10.65"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located eight feet from sample point 1.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Elaeagnus angustifolia	5	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Poa pratensis	35	☑ 36.8%	FAC
2. Sporobolus airoides	30	☑ 31.6%	FAC
3. Litter	15	☐ 15.8%	
4. Hordeum jubatum	10	☐ 10.5%	FAC
5. Sonchus arvensis	5	☐ 5.3%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 5

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	85 (A)		260 (B)

Prevalence Index = B/A = 3.059

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Sample dominated by Kentucky bluegrass and alkai sacaton.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR	4/1	100						Silty Clay Loam	saturated to soil surface
4-12	7.5YR	3/1	94	7.5YR	6/1	3	C	M	Silty Clay Loam	
				7.5YR	5/2	3	C	M		
12-18+	7.5YR	3/2	50	7.5YR	4/2	50			Silty Clay Loam	soil almost appears mixed

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 4 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ◉ **No** ○ Depth (inches): 0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil saturated to surface.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 3

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.66"N **Long.:** 110°36'10.80"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-TannaEthridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located in small depression.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Elaeagnus angustifolia	3	☐ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	3	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Schoenoplectus pungens	65	☑ 81.3%	OBL
2. Sporobolus airoides	5	☐ 6.3%	FAC
3. Juncus effusus	5	☐ 6.3%	FACW
4. Juncus balticus	5	☐ 6.3%	FACW
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	80	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 5

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	65	x 1 =	65
FACW species	10	x 2 =	20
FAC species	8	x 3 =	24
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	83 (A)		109 (B)

Prevalence Index = B/A = 1.313

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Mixed wetland species were observed at this sample location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/1	90	10YR	5/2	10	C	M	Silty Clay Loam	aturated to soil surface, mottles at 4 inches
6-14+	10YR	2/1	100						Silty Clay Loam	dark, saturated, stinky

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Strong mottles at 4 inches with hydrogen sulfide odor.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ○	**No** ◉	Depth (inches):	
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Sample was saturated to surface with hydrogen sulfide odor. Two seconday indicators were also observed.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 4

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** convex **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.62"N **Long.:** 110°36'14.77"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○ No ◉	**Is the Sampled Area within a Wetland?**	Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:
Upland site, southwest of PFL Way.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	60	☑ 66.7%	UPL
2. Litter	10	☐ 11.1%	
3. Cardaria draba	10	☐ 11.1%	UPL
4. Poa pratensis	5	☐ 5.6%	FAC
5. Sporobolus airoides	5	☐ 5.6%	FAC
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	90	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	70	x 5 =	350
Column Totals:	80 (A)		380 (B)

Prevalence Index = B/A = 4.750

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Smooth brome and weeds dominated this location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/2	100						Silty Clay Loam	friable
6-12	10YR	3/3	100						Silty Clay Loam	Damp
12-22+	10YR	3/3	98	10YR	5/2	20	C	M	Silty Clay Loam	small mottles at 16 inches

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

Small mottles at 16 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology was observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

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Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 5

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.47"N **Long.:** 110°36'14.28"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located in slight depression.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Poa pratensis	50	☑ 47.6%	FAC
2. Juncus effusus	25	☑ 23.8%	FACW
3. Litter	15	☐ 14.3%	
4. Cirsium arvense	5	☐ 4.8%	FAC
5. Cardaria draba	5	☐ 4.8%	UPL
6. Carex microptera	5	☐ 4.8%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	105	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	55	x 3 =	165
FACU species	5	x 4 =	20
UPL species	5	x 5 =	25
Column Totals:	90 (A)		260 (B)

Prevalence Index = B/A = 2.889

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Kentucky bluegrass and Baltic rush were most dominant at this location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	3/1	100						Silty Clay Loam	saturated to soil surface
6-18+	10YR	3/2	92	10YR	5/1	5	C	M	Silty Clay Loam	increased saturation
				10YR	4/2	3	C	M		

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 6 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ◉ **No** ○ Depth (inches): 0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil saturated to surface. Two secodnary indicators of wetland hydrology were also observed.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

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Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 6

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'2.28"N **Long.:** 110°36'14.17"W **Datum:** WGS 84

Soil Map Unit Name: reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located in slight depression south of access road.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Juncus effusus	20	☑ 26.7%	FACW
2. Carex microptera	20	☑ 26.7%	FACU
3. Sporobolus airoides	15	☑ 20.0%	FAC
4. Alopecurus arundinaceus	10	☐ 13.3%	FAC
5. Cirsium arvense	5	☐ 6.7%	FAC
6. Litter	5	☐ 6.7%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	75	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	30	x 3 =	90
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	70 (A)		210 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Sample loction contained approximately 25% water.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	100						Silt Loam	saturated to surface
6-12	10YR	4/1	95	10YR	4/6	5	C	M	Silt Loam	mottles at 6 inches

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Good mottles at 6 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ◉	**No** ○	Depth (inches):	1
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

One inch of surface water was observed.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

374

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 7

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** concave **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'4.28"N **Long.:** 110°36'10.81"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located in wetland swale.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Juncus effusus	50	☑ 52.1%	FACW
2. Litter	10	☐ 10.4%	
3. Solidago canadensis	10	☐ 10.4%	FACU
4. Rosa woodsii	5	☐ 5.2%	FACU
5. Symphoricarpos albus	5	☐ 5.2%	FACU
6. Helianthus annuus	5	☐ 5.2%	FACU
7. Taraxacum officinale	5	☐ 5.2%	FACU
8. Eleocharis palustris	3	☐ 3.1%	OBL
9. Triglochin maritima	3	☐ 3.1%	OBL
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	96	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	6	x 1 =	6
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	86 (A)		226 (B)

Prevalence Index = B/A = 2.628

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Baltic rush dominated this sample location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	100						Silt Loam	saturated to soil surface
6-14	10YR	4/1	93	10YR	4/6	7	C	M	Silt Loam	mottles at 6 inches

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 6 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ○	**No** ◉	Depth (inches):	
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil saturated to surface. Two secondary indicators of wetland hydrology were also observed.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 19-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 8

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'4.49"N **Long.:** 110°36'11.13"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○ No ◉	**Is the Sampled Area within a Wetland?**	Yes ○ No ◉
Hydric Soil Present?	Yes ○ No ◉		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:
Located approximately three feet above sample seven.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Bromus inermis	50	☑ 51.0%	UPL
2. Symphoricarpos albus	20	☑ 20.4%	FACU
3. Poa pratensis	10	☐ 10.2%	FAC
4. Litter	5	☐ 5.1%	
5. Rosa woodsii	5	☐ 5.1%	FACU
6. Juncus balticus	5	☐ 5.1%	FACW
7. Iris missouriensis	3	☐ 3.1%	FACW
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	98	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	8	x 2 =	16
FAC species	10	x 3 =	30
FACU species	25	x 4 =	100
UPL species	50	x 5 =	250
Column Totals:	93 (A)		396 (B)

Prevalence Index = B/A = 4.258

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Smooth brome and snowberry dominated this sample location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/2	100					Silty Clay Loam	damp
4-22+	10YR	3/3	100					Silty Clay Loam	damp

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators were observed at this sample location.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrology indicators were observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 9

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'3.32"N **Long.:** 110°36'10.83"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ○ No ◉
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ○ No ◉		

Remarks:
Two of three wetland indicators were observed at this sample location.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Agrostis gigantea	50	☑ 52.6%	FAC
2. Cirsium arvense	10	☐ 10.5%	FAC
3. Poa pratensis	10	☐ 10.5%	FAC
4. Juncus balticus	10	☐ 10.5%	FACW
5. Litter	10	☐ 10.5%	
6. Cardaria draba	5	☐ 5.3%	UPL
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	5	x 5 =	25
Column Totals:	85 (A)		255 (B)

Prevalence Index = B/A = 3.000

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Redtop dominated the sample location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR	3/2	100						silty clay loam	rooty, organic
2-8	10YR	4/1	97	10YR	5/1	3	C	M	Silty Clay Loam	increase clay as increase depth, 3% mottles at 6
8-22	10YR	4/1	92	10YR	5/1	5	C	M	Silty Clay Loam	very clayey, very wet soil
				10YR	5/3	3	C	M		

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 6 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydric soil indicators were observed at this locaiton.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

380

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 10

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'3.37"N **Long.:** 110°36'9.90"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located three feet below sample nine.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Juncus effusus	65	☑ 68.4%	FACW
2. Alopecurus arundinaceus	25	☑ 26.3%	FAC
3. Mentha arvensis	5	☐ 5.3%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	25	x 3 =	75
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		215 (B)

Prevalence Index = B/A = 2.263

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Sample location dominated by Baltic rush.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR	4/1	90	10YR	4/4	5	C	M	Silty Clay Loam	saturated to soil surface
				10YR	4/6	5	C	M		increase clay as increae depth

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☑ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Black (10YR 2/1) spots throughout profile from 2 to 4 inches. Hydrogen sulfide odor was observed.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ○	**No** ◉	Depth (inches):	
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Soil saturated to surface. Soil had a hydrogen sulfide odor. Two secondary indicators of wetland hydrology were observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 11

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'3.43"N **Long.:** 110°36'9.48"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Cattail marsh.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Typha latifolia	40	☑ 42.1%	OBL
2. Juncus effusus	35	☑ 36.8%	FACW
3. Carex nebrascensis	10	☐ 10.5%	OBL
4. Mentha arvensis	5	☐ 5.3%	FACW
5. Litter	5	☐ 5.3%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	50	x 1 =	50
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		130 (B)

Prevalence Index = B/A = 1.444

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Site dominated by cattails and Baltic rush.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	100						Silty Clay Loam	saturated, stinky soil
6-14+	10YR	4/1	95	10YR	4/6	5	C	M	Silty Clay Loam	stinky, silky soil

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Hydrogen sulfide odor was observed.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ◉	**No** ○	Depth (inches):	1
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	0

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Approximately one inch of surface water.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 12

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'6.36"N **Long.:** 110°36'11.12"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** FSW

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Shrub/scrub sample location along railroad grade.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Salix exigua	40	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	40	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Juncus effusus	20	☑ 37.7%	FACW
2. Agrostis gigantea	15	☑ 28.3%	FAC
3. Triglochin maritima	5	☐ 9.4%	OBL
4. Eleocharis palustris	5	☐ 9.4%	OBL
5. Litter	3	☐ 5.7%	
6. Symphoricarpos albus	5	☐ 9.4%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	53	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	10	x 1 =	10
FACW species	60	x 2 =	120
FAC species	15	x 3 =	45
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	90 (A)		195 (B)

Prevalence Index = B/A = 2.167

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Salix overstory with mixed understory.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/1	100						Silty Clay Loam	saturated, surface water
6-15	10YR	4/1	94	10YR	4/6	6	C	M	Silty Clay Loam	mottles at 6 inches

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Mottles at 6 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☑ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ◉	**No** ○	Depth (inches):	1
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

One inch of surface water was observed. Two secondary indicators of wetland hydrology were observed at this location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 13

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'6.52"N **Long.:** 110°36'11.22"W **Datum:** WGS 84

Soil Map Unit Name: reedpoint-Tanna-Ethridge complex **NWI classification:** FSW

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
No wetland indicators were observed at this sample location.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1. Salix exigua	5	☑ 100.0%	FACW
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	5	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Symphoricarpos albus	50	☑ 53.8%	FACU
2. Rosa woodsii	15	☐ 16.1%	FACU
3. Dactylis glomerata	10	☐ 10.8%	FACU
4. Achillea millefolium	10	☐ 10.8%	FACU
5. Equisetum hyemale	5	☐ 5.4%	FACW
6. Helianthus annuus	3	☐ 3.2%	FACU
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	93	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	88	x 4 =	352
UPL species	0	x 5 =	0
Column Totals:	98 (A)		372 (B)

Prevalence Index = B/A = 3.796

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Snowberry domianted this site.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	3/2	100					silty lay loam	organic, rooty
4-20	10YR	4/1	100					Silty Clay Loam	increase clay as deeper in profile

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

No hydric soil indicators were observed at this sample location.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology was observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

388

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 14

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): **Local relief (concave, convex, none):** **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'10.46"N **Long.:** 110°36'8.06"W **Datum:** WGS 84

Soil Map Unit Name: **NWI classification:**

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** (If needed, explain any answers in Remarks.)

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present?	Yes ○	No ◉	
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:
Sample located along eastern boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft.)			
1. Agrostis gigantea	30	☑ 32.3%	FAC
2. Juncus effusus	30	☑ 32.3%	FACW
3. Litter	15	☐ 16.1%	
4. Solidago canadensis	10	☐ 10.8%	FACU
5. Poa pratensis	5	☐ 5.4%	FAC
6. Cirsium arvense	3	☐ 3.2%	FAC
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	93	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	38	x 3 =	114
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	78 (A)		214 (B)

Prevalence Index = B/A = 2.744

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Redtop and Baltic rush dominated this location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	3/1	100						silty clay loam	organic, rooty
3-12	10YR	4/2	94	10YR	4/6	3	C	M	Silty Clay Loam	mottles start at 3 inches
				10YR	5/2	3	C	M		
12-18+	10YR	4/2	87	10YR	4/6	8	C	M	Silty Clay Loam	increase mottles
				10YR	5/2	5	C	M		

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

Mottles at 3 inches.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Two secondary indicators of wetland hydrology were observed at this sample location

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

390

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 15

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'10.70"N **Long.:** 110°36'8.20"W **Datum:** WGS 84

Soil Map Unit Name: Reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Hydric Soil Present? Yes ○ No ◉	
Wetland Hydrology Present? Yes ○ No ◉	

Remarks:
Sample located along eastern boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Symphoricarpos albus	40	☑ 42.1%	FACU
2. Pascopyrum smithii	25	☑ 26.3%	FACU
3. Juncus balticus	10	☐ 10.5%	FACW
4. Solidago canadensis	10	☐ 10.5%	FACU
5. Cirsium arvense	5	☐ 5.3%	FAC
6. Stipa viridula	5	☐ 5.3%	UPL
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	95	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	5	x 3 =	15
FACU species	75	x 4 =	300
UPL species	5	x 5 =	25
Column Totals:	95 (A)		360 (B)

Prevalence Index = B/A = 3.789

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
Dominated by snowberry and Baltic rush.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR	4/1	100					Silty Clay Loam	powdery, friable
3-6	10YR	4/2	100					Silty Clay Loam	dry
6-18+	10YR	5/2	100					Silty Clay Loam	friable

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ○ **No** ◉

Remarks:

No hydric soil indicators were observed at this sample location.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No evidence of wetland hydrology was observed at this sample location.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

392

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 16

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'13.27"N **Long.:** 110°36'15.76"W **Datum:** WGS 84

Soil Map Unit Name: reedpoint-Tanna-Ethridge complex **NWI classification:** none

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:
Sample located at toe slope along Business 90.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Poa pratensis	20	☑ 23.5%	FAC
2. Pascopyrum smithii	20	☑ 23.5%	FACU
3. Hordeum jubatum	15	☑ 17.6%	FAC
4. Agropyron intermedium	10	☐ 11.8%	UPL
5. Sonchus arvensis	10	☐ 11.8%	FACU
6. Solidago canadensis	5	☐ 5.9%	FACU
7. Iris missouriensis	5	☐ 5.9%	FACW
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	85	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	35	x 3 =	105
FACU species	35	x 4 =	140
UPL species	10	x 5 =	50
Column Totals:	85 (A)		305 (B)

Prevalence Index = B/A = 3.588

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
MIxed grasses were observed.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/1	100						Silty Clay Loam	dry
4-16	10YR	4/2	95	10YR	5/4	5	C	M	Silty Clay Loam	yellowish mottles

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

possible mixed profile close to the road?

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present? **Yes** ○ **No** ◉ Depth (inches):

Water Table Present? **Yes** ○ **No** ◉ Depth (inches):

Saturation Present? (includes capillary fringe) **Yes** ○ **No** ◉ Depth (inches):

Wetland Hydrology Present? **Yes** ○ **No** ◉

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

No hydric soil indicators were observed at this locaiton.

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

394

Project/Site: Printing for Less **City/County:** Livingston/Park **Sampling Date:** 26-Jun-19

Applicant/Owner: Printing for Less **State:** MT **Sampling Point:** PFL 17

Investigator(s): B Schultz **Section, Township, Range:** S 22 T 2 S R 9 E

Landform (hillslope, terrace, etc.): Undulating **Local relief (concave, convex, none):** none **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR E **Lat.:** 45°39'12.97"N **Long.:** 110°36'15.75"W **Datum:** WGS 84

Soil Map Unit Name: reedpoint-Tanna-Ethridge complex **NWI classification:** PEMA

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉ No ○	**Is the Sampled Area within a Wetland?**	Yes ◉ No ○
Hydric Soil Present?	Yes ◉ No ○		
Wetland Hydrology Present?	Yes ◉ No ○		

Remarks:
Sample located at toe slope along Business 90.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	0	**= Total Cover**	
Sapling/Shrub Stratum (Plot size: 15 ft.)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	**= Total Cover**	
Herb Stratum (Plot size: 5 ft.)			
1. Agrostis gigantea	50	☑ 53.8%	FAC
2. Iris missouriensis	15	☐ 16.1%	FACW
3. Litter	10	☐ 10.8%	
4. Alopecurus arundinaceus	5	☐ 5.4%	FAC
5. Rosa woodsii	5	☐ 5.4%	FACU
6. Cynoglossum officinale	3	☐ 3.2%	FACU
7. Elymus lanceolatus	5	☐ 5.4%	FACU
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	93	**= Total Cover**	
Woody Vine Stratum (Plot size:)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	**= Total Cover**	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	55	x 3 =	165
FACU species	13	x 4 =	52
UPL species	0	x 5 =	0
Column Totals:	83 (A)		247 (B)

Prevalence Index = B/A = 2.976

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrologic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Primarily redtop was observed at this sample location.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: PFL 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	4/1	100						Silty Clay Loam	dry, rooty
4-8	10YR	4/1	94	10YR	5/1	3	C	M	Silty Clay Loam	saturated
, saturate				10YR	4/6	3	C	M		
8-16	10YR	4/2	85	10YR	4/6	10	C	M	Silty Clay Loam	oxidized root zones? Calcium? Salts?
				10YR	6/1	5	C	M		

[1]Type: C=Concentration. D=Depletion. RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Location: PL=Pore Lining. M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (except in MLRA 1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)

Indicators for Problematic Hydric Soils [3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** ◉ **No** ○

Remarks:

Salt concentrations on surface

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (LRR A)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
- ☐ Drainage Patterns (B10)
- ☐ Dry Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (LRR A)
- ☐ Frost Heave Hummocks (D7)

Field Observations:

Surface Water Present?	**Yes** ○	**No** ◉	Depth (inches):	
Water Table Present?	**Yes** ○	**No** ◉	Depth (inches):	
Saturation Present? (includes capillary fringe)	**Yes** ◉	**No** ○	Depth (inches):	4

Wetland Hydrology Present? **Yes** ◉ **No** ○

Describe Recorded Data (stream gauge, monitor well, aerial photos, previous inspections), if available:

Remarks:

Saturated at 4 inches below ground surface

Appendix D

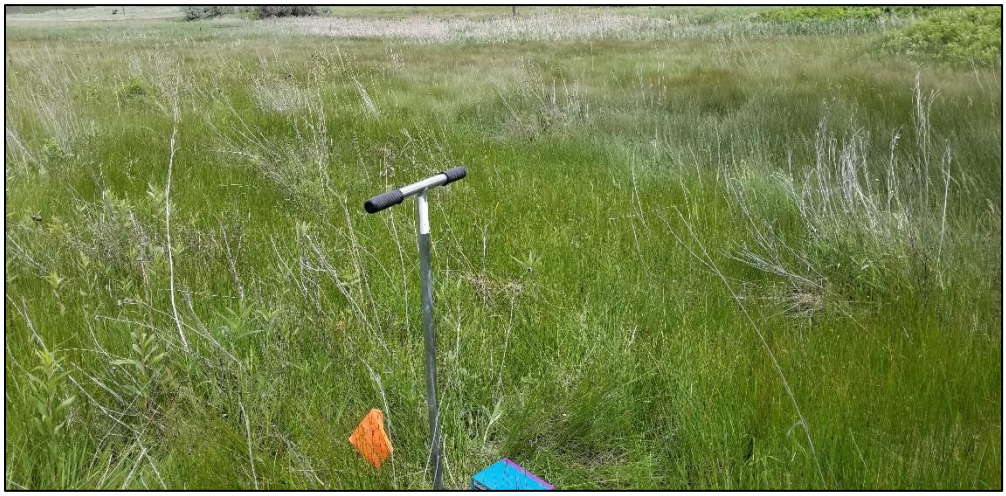
Printing for Less Wetland Delineation Site Photographs

(Data Points 1-3)

(Data Point 4)

(Data Point 5)

(Data Point 6)



(Data Point 7)

(Data Point 8)

(Data Point 9)

(Data Points 10-11)

(Data Point 12)

(Data Point 13)

(Data Point 14)

(Data Point 15)

(Data Point 16)

(Data Point 17)

)

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX F

Public Agency Review

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Jen Smithham
Helena Area Resource Office
Montana Fish, Wildlife, and Parks
PO Box 200701
Helena, MT 59620-0701
fwpcomments@mt.gov

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Ms. Smithham:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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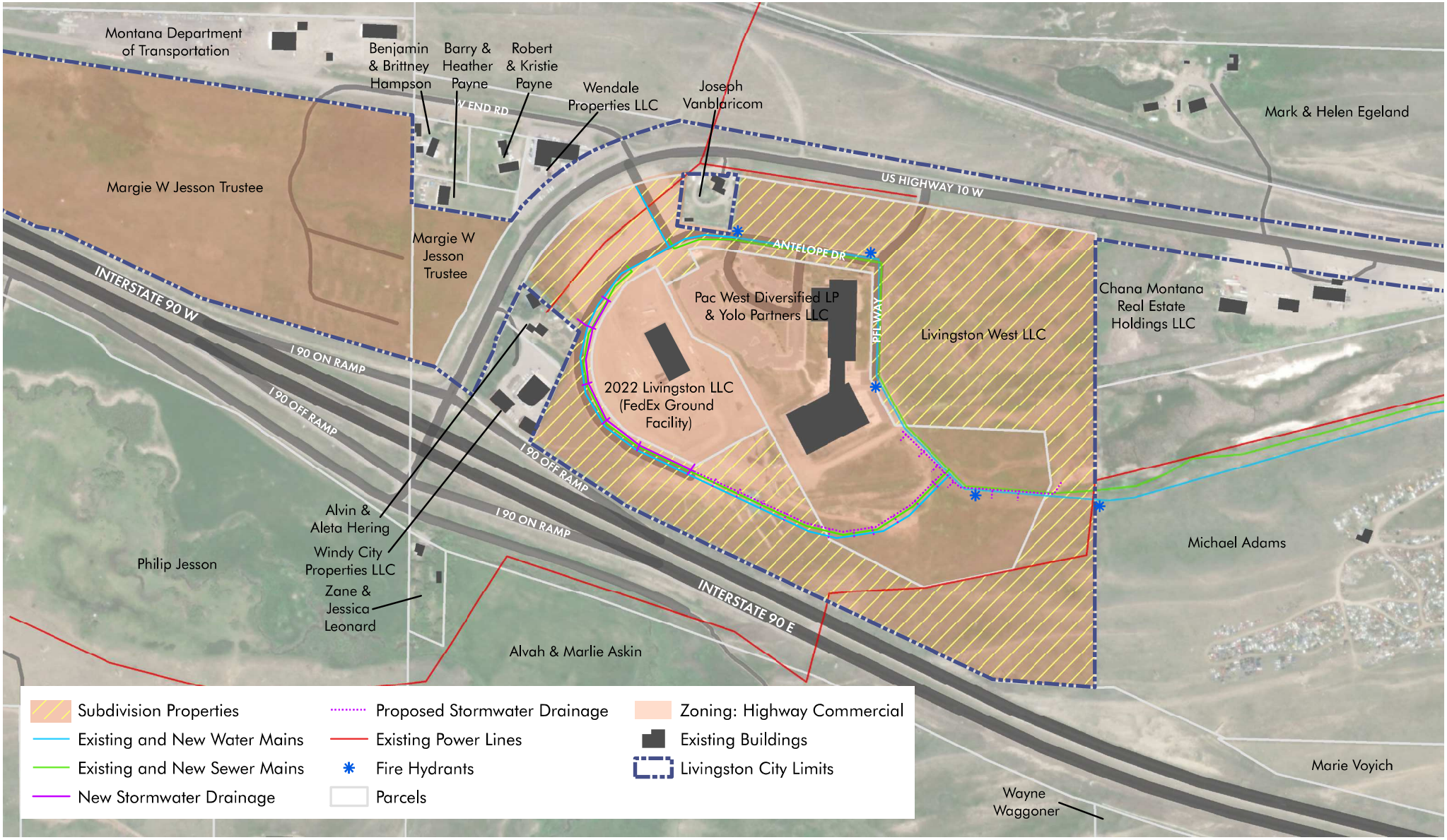
If you have any further questions or comments, please do not hesitate to call me at (406) 922-4314 or email me at sanacker@sandersonstewart.com.

Sincerely,

Sumner Anacker, PE
Project Engineer
Sanderson Stewart
106 East Babcock Street, Suite L1
Bozeman, MT 59715
sanacker@sandersonstewart.com
ph: 406-922-4314



June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Lonnie Von Oesen, SIAP Planner
Rail, Transit, & Planning Division
Montana Department of Transportation
PO Box 201001
Helena, MT 59601-2001
lvonoesen@mt.gov

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Mr. Von Oesen:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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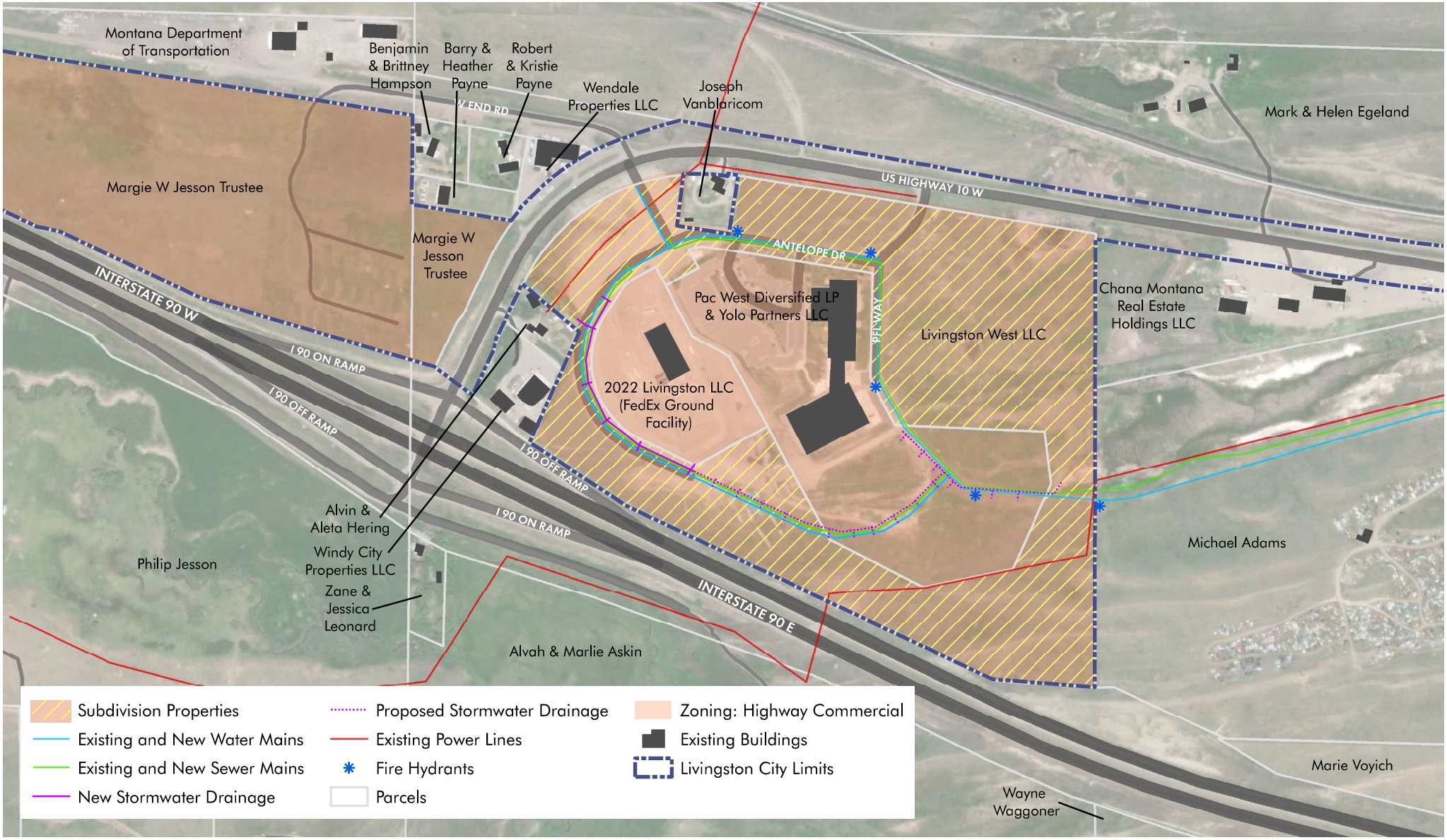

June 5, 2023

SANDERSONSTEWART

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NORTH

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SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Pete Brown
State Historic Preservation Officer
Montana Historical Society
PO Box 201201
Helena, MT 59620-1201
pebrown@mt.gov

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Mr. Brown:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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Sumner Anacker

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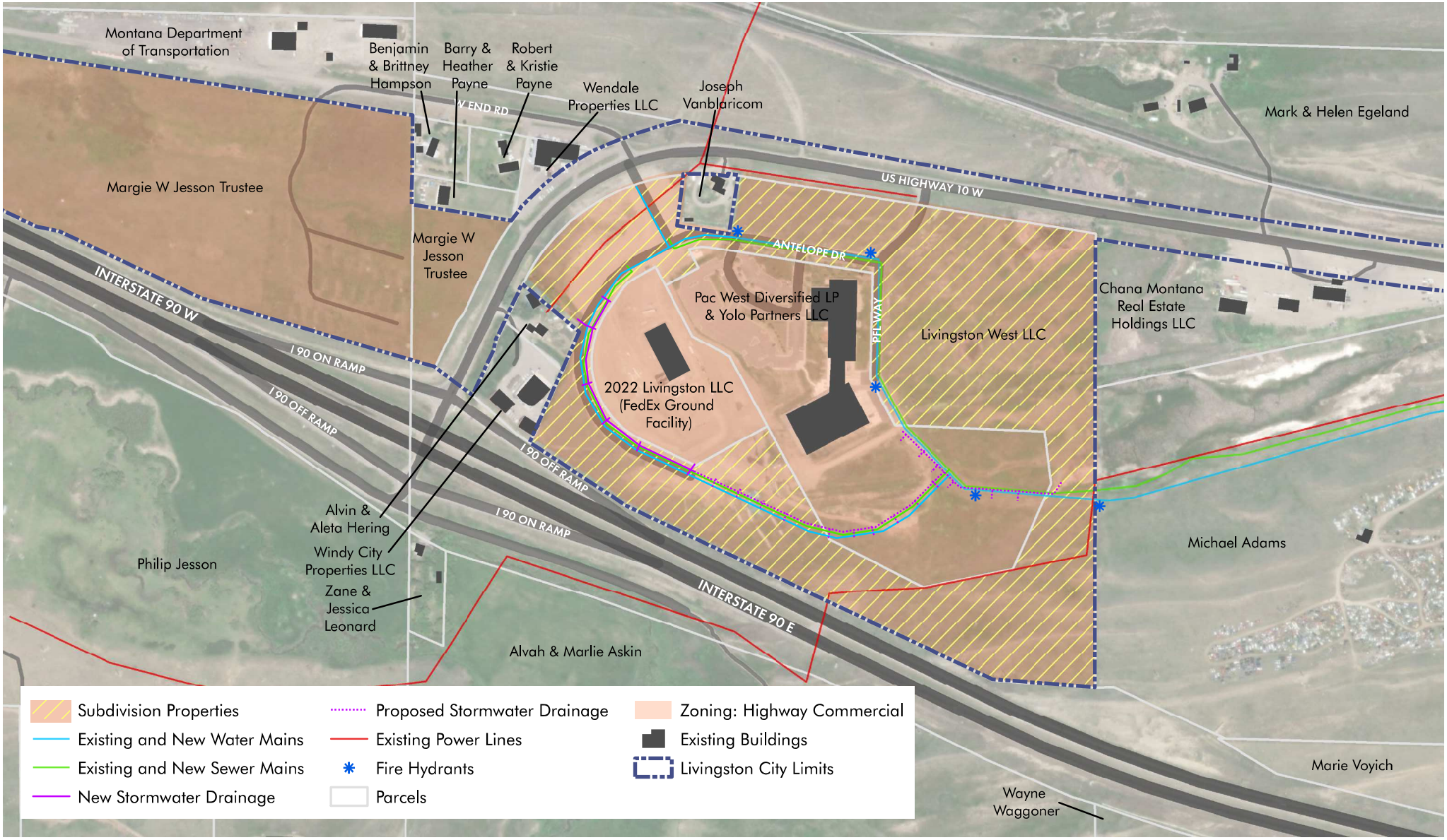
sanacker@sandersonstewart.com
ph: 406-922-4314



June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

Sumner Anacker

From: Murdo, Damon <dmurdo@mt.gov>
Sent: Thursday, June 8, 2023 2:59 PM
To: Sumner Anacker
Subject: RE: Mountain View Subdivision Preliminary Plat - Request for Comment (SHPO)
Attachments: Reports.pdf; 2023060806.pdf

June 8, 2023

Sumner Anacker
Sanderson Stewart
106 East Babcock St, Suite L
Bozeman MT 59715

MONTANA HISTORICAL SOCIETY
State Historic Preservation Office

RE: MOUNTAIN VIEW SUBDIVISION, LIVINGSTON. SHPO Project #: 2023060806

Dear Sumner:

I have conducted a cultural resource file search for the above-cited project located in Section 22, T2S R9E. According to our records there have been no previously recorded sites within the designated search locale. However, there have been a few previously conducted cultural resource inventories done in the area. I've attached a list of these reports. If you would like any further information regarding these reports, you may contact me at the number listed below.

It is SHPO's position that any structure over fifty years of age is considered historic and is potentially eligible for listing on the National Register of Historic Places. If any structures are within the Area of Potential Effect, and are over fifty years old, we would recommend that they be recorded, and a determination of their eligibility be made prior to any disturbance taking place.

As long as there will be no disturbance or alteration to structures over fifty years of age, we feel that there is a low likelihood cultural properties will be impacted. We, therefore, feel that a recommendation for a cultural resource inventory is unwarranted at this time. However, should structures need to be altered or if cultural materials are inadvertently discovered during this project, we would ask that our office be contacted, and the site investigated.

If you have any further questions or comments, you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. I have attached an invoice for the file search. Thank you for consulting with us.

Sincerely,

Damon Murdo
Cultural Records Manager
State Historic Preservation Office

File: LOCAL/SUBDIVISIONS/2023

Township:2 S Range:9 E Section: 22

GREISER T. WEBER, ET AL.

11/1/2000 RESULTS OF A CULTURAL RESOURCES INVENTORY FOR THE TOUCH AMERICA/AT & T FIBER OPTIC CABLE ROUTE BETWEEN BILLINGS AND LOOKOUT PASS IN MONTANA

CRABS Document Number: ZZ 6 23275 Agency Document Number:

Township:2 S Range:9 E Section: 22

LAHREN LARRY A.

1/16/2004 CULTURAL RESOURCE EVALUATIONS OF THE PROPOSED PRINTING FOR LESS FACILITY IN PARK COUNTY MONTANA

CRABS Document Number: PA 6 27162 Agency Document Number:

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX G

Private Service Providers Review

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Julie Sterr
Lumen
Julie.Sterr1@lumen.com

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Ms. Sterr:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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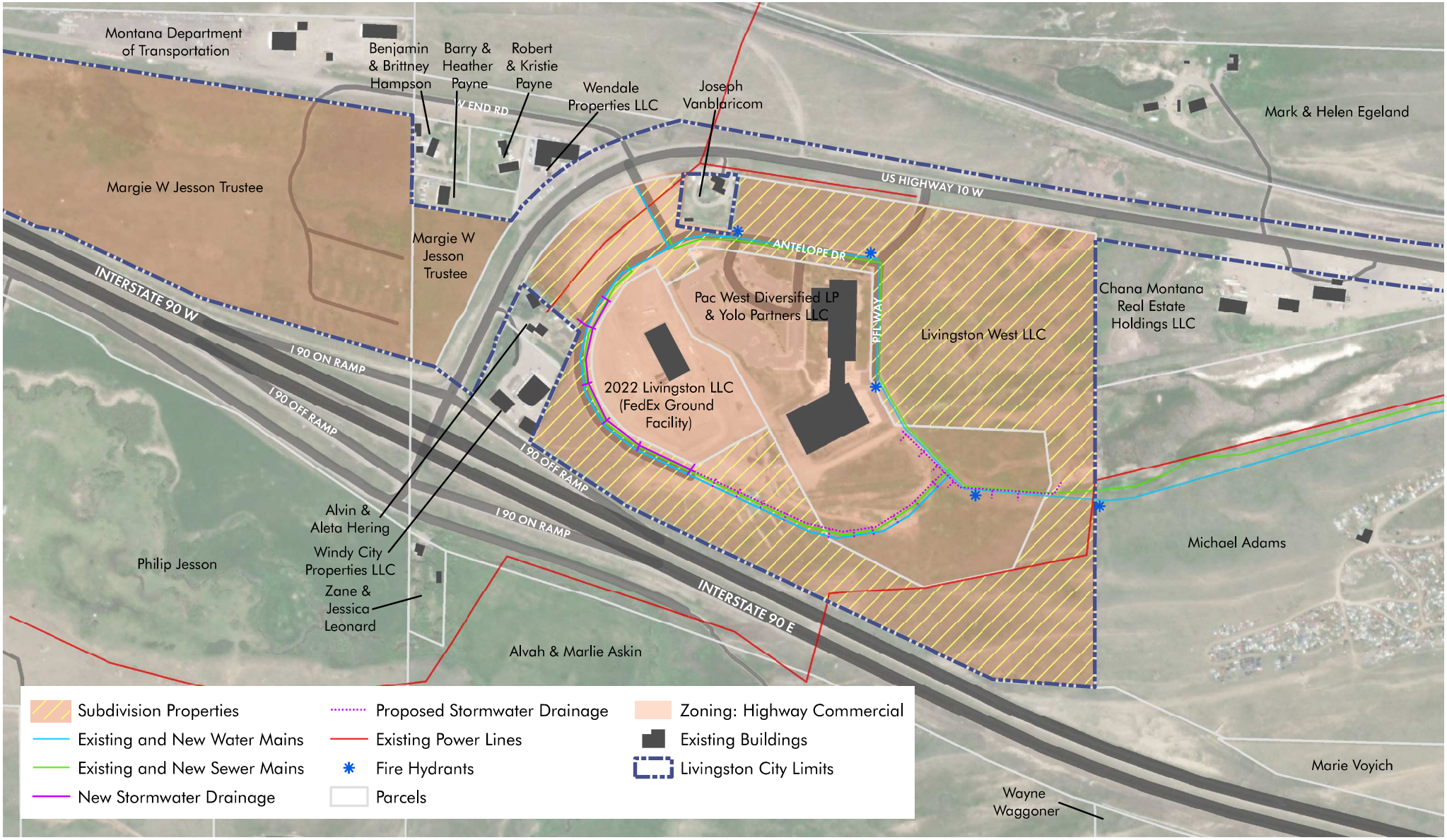
Sincerely,

Sumner Anacker, PE
Project Engineer
Sanderson Stewart
106 East Babcock Street, Suite L1
Bozeman, MT 59715
sanacker@sandersonstewart.com
ph: 406-922-4314



June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Sheryl Raddas
Windrider
414 E Callender Street
Livingston, MT 59047
sraddas@parkcounty.org

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Ms. Raddas:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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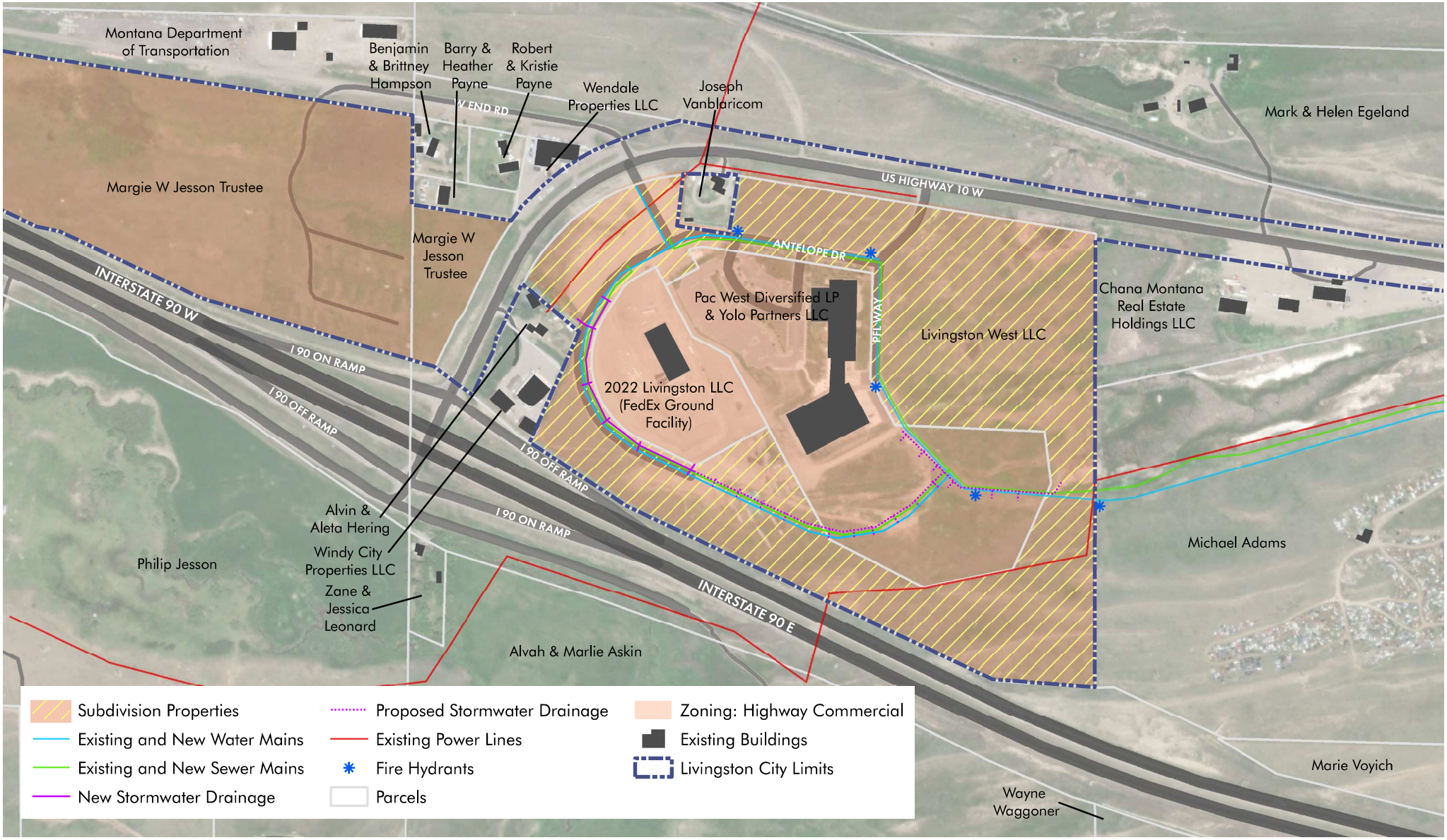

June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Matt Fettig
Manager of District Operations – Livingston
Northwestern Energy
224 S B Street
Livingston, MT
matthew.fettig@northwestern.com

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Mr. Fettig:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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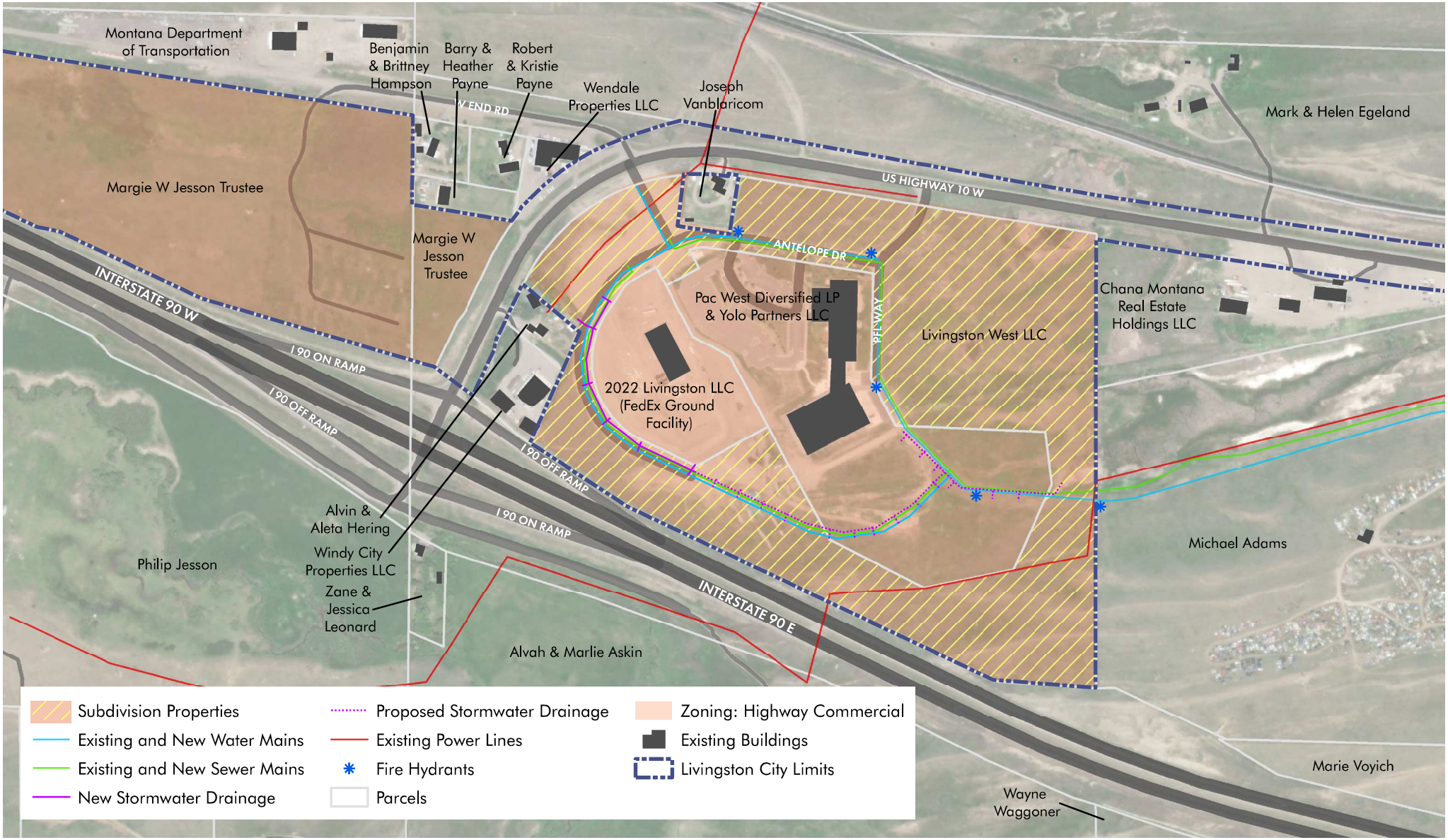

June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

NorthWestern Energy
Delivering a Bright Future

sent via email June 7, 2023

Chris Naumann
Sanderson Stewart – Senior Planner
106 E Babcock St. – Suite L1
Bozeman, MT 59718

Dear Chris,

Northwestern Energy is willing and able to provide electric and natural gas services to the proposed Mountain View Subdivision in Livingston, MT near the West Interchange and 100 PFL Way. The area in question consists of portions of T2S, R9E, S22.

These services will be provided in accordance with applicable Montana Public Services rules and regulations and the current Northwestern Energy tariff schedule. NWE has both underground and overhead electric, as well as gas distribution in and around the project area.

Northwestern Energy shall determine the locations of all transformers, underground lines and equipment for proper installation and maintenance. These facilities shall be located on front lot lines in the utility easement right-of-way unless otherwise approved by both parties.

As the project gets closer to approved plat and a finalized development plan, please reach out to NWE directly in order to start the utility planning, design and sizing process for your development. Please feel free to contact me if you have any questions or require any additional information.

Sincerely,

Matt Fettig

Matt Fettig
Livingston District Manager
matthew.fettig@northwestern.com
224 S. B St.
Livingston, MT 59047
406-582-4606

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Matt Grose
Park Electric Cooperative
PO Box 1119
Livingston, MT 59047-1119
mgrose@parkelectric.coop

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Mr. Grose:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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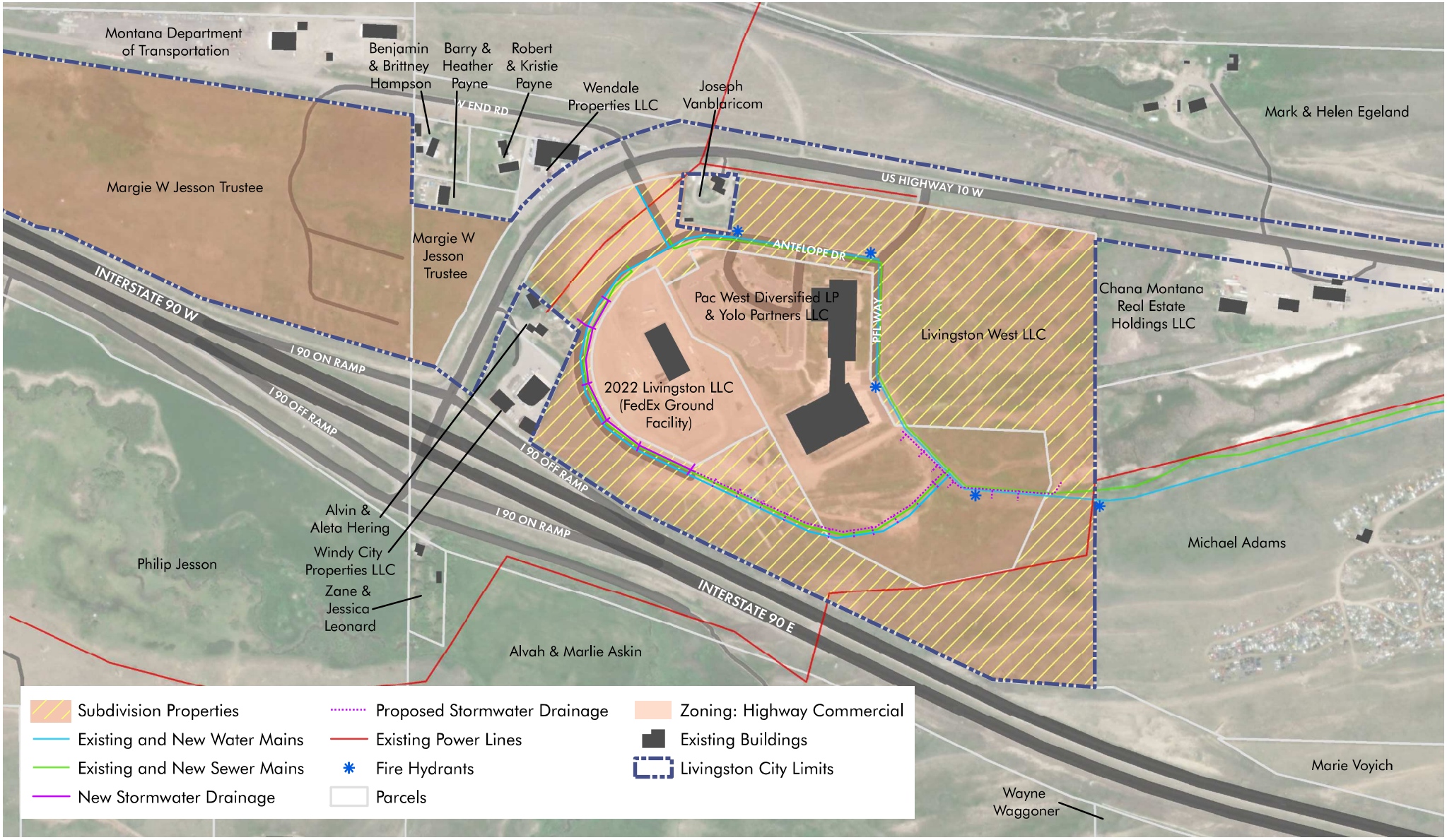

June 5, 2023

SANDERSONSTEWART

Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

SANDERSON STEWART

Billings
Bozeman
Fort Collins

June 7, 2023

Daniel Payne
United States Postal Service
105 N 2nd Floor
Livingston, MT 59047-9998
daniel.f.payne@usps.gov

Delivered via Email

Reference: Mountain View Subdivision, Livingston, Montana

Dear Mr. Payne:

We are soliciting your comments regarding a proposed highway commercial subdivision with the City of Livingston. The project would create 22 highway commercial lots, two (2) dedicated parkland open space lots, and public right-of-way totaling 44.149 acres. These new lots would be served by the City of Livingston water and sanitary sewer systems.

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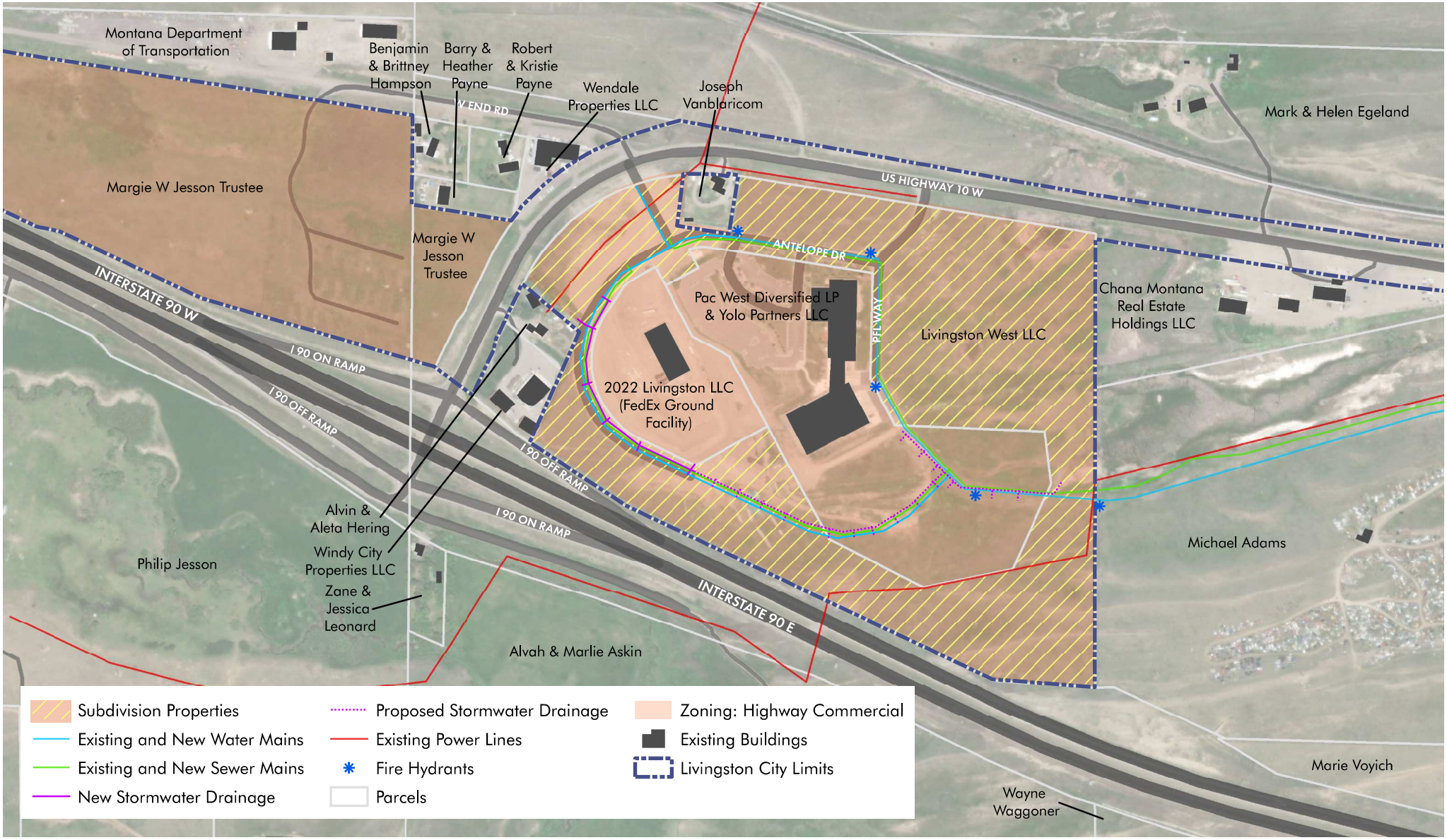

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Mountain View Subdivision: Vicinity Map

NORTH

0 250 500 1,000 Feet

MOUNTAIN VIEW MAJOR SUBDIVISION PRELIMINARY PLAT APPLICATION

Project No. 18005.05

APPENDIX H

Covenants, Conditions, and Restrictions Summary

ENDURING COMMUNITY DESIGN

SANDERSON STEWART

Mountain View Subdivision

SUMMARY OF COVENANTS

The purpose of these covenants is to facilitate the Mountain View Subdivision becoming an appealing entrance to the City, preserve and protect the interests and investment of the individual owners, and provide for an attractive appearance for buildings across the development without creating a "cookie-cutter" approach to design. The following is a summary list of the protective covenants for Mountain View Subdivision. This list is not intended to be all-inclusive or a replacement of the actual covenants.

GENERAL

- The purpose of these covenants is to provide for individual and community decision making.
- Property Owners' Association (hereafter "The Association") Design Review Committee shall implement and enforce covenants and guidelines. The Developer shall be the Chair of the Design Review Committee until the majority of the lots are sold.
- 4-sided 3-dimensional architectural designs are required for review by the Design Review submittal.
- The Association will be responsible for maintenance of streets and common areas.
- Individual parcel owners may not build fences or structures on common easements.
- Individual property owners are responsible for the control of noxious weeds. The Association will be responsible for common areas.
- Approved landscaping installation required within one year of construction completion.
- Where there is a common border between a commercial use and a residential use, a landscape feature (such as a row of trees or landscaped berm) must be installed to provide a graceful transition between use types.
- Construction, improvements, landscaping, or alteration to exterior of any building or addition of any structure to a lot requires an Association Design Review Committee approval.
- No RV, boat, trailer, junk, or inoperable vehicle storage allowed on site unless stored inside a garage.
- No open burning allowed.
- All garbage shall be stored in animal-proof containers or be made unavailable to animals.
- Shielded downlight exterior lighting only in conformance with the City of Livingston's Night Sky Protection Act
- Property is located within view of agricultural activities, which may cause noise, dust, odors, etc.

RESIDENTIAL

- Traditional stick-built homes shall be built to current IRC standards.
- No mobile, modular, or re-located homes allowed but ADU units can be considered in a back yard on a case-by-case basis.
- Onsite parking must be addressed in design review submittals.

- A maximum of two (2) dogs or two (2) cats may be kept on any lot. Commercial breeding, care or keeping of animals is not allowed.
- Fencing should be wildlife friendly.
- All garbage shall be stored in animal-proof containers or be made unavailable to animals.
- Architectural design must include multiple roof elements ideally incorporating both varying heights and intersecting ridgelines.
- A tri-color paint scheme of natural colors is encouraged.

COMMERCIAL / OFFICE / INDUSTRIAL

- All buildings shall be built to current UBC standards.
- Onsite parking must be addressed in design review submittals. Spaces shall be paved and provide adequate driveway and space for movement of vehicles.
- The office portion of the building can be three stories, while the maximum height of any office/warehouse is 42'.
- Signage must be professionally done and approved by the City of Livingston.
- Ground lines, wires, antennas, or satellite dishes shall be placed out of sight as much as possible.