Print Form

TOWN OF ERIE
Community Development Department – Planning Division
645 Holbrook Street – PO Box 750 – Erie, CO 80516
Tel: 303.926.2770 – Fax: 303.926.2706 – Web: www.erieco.gov

LAND USE APPLICATION

Please fill in this form completely. Incomplete applications will not be processed.

STAFF USE ONLY

FILE NAME:

FILE NO: DATE SUBMITTED: FEES PAID:

PROJECT/BUSINESS NAME: Swink - Southern Land Company

PROJECT ADDRESS: TBD - generally west of County Road 7 and south of Erie Parkway

PROJECT DESCRIPTION: The Swink property is proposed to be a high quality residential addition to the Town of Erie, this proposal will include a significant amount of open space, parks, and a new school site for the benefit of the Town of Erie.

LEGAL DESCRIPTION *(attach legal description if Metes & Bounds)*

Subdivision Name: N/A

Filing #: Lot #: Block #: Section: 36 Township: 1 North Range: 69 West

OWNER *(attach separate sheets if multiple)*

Name/Company: Erie Land Company, LLC
Contact Person: Heidi Majerik
Address: 1601 Blake Street, Suite 200
City/State/Zip: Denver, CO - 80202
Phone: 303-888-3866 Fax:
E-mail: heidi.majerik@southernland.com

AUTHORIZED REPRESENTATIVE

Company/Firm:
Contact Person:
Address:
City/State/Zip:
Phone: Fax:
E-mail:

MINERAL RIGHTS OWNER *(attach separate sheets if multiple)*

Name/Company: Anadarko Petroleum Corp.
Address: 1099 18th Street, Suite 1800
City/State/Zip: Denver, CO - 80202

MINERAL LEASE HOLDER *(attach separate sheets if multiple)*

Name/Company: Anadarko Petroleum Corp.
Address: 1099 18th Street, Suite 1800
City/State/Zip: Denver, CO - 80202

LAND-USE & SUMMARY INFORMATION

Present Zoning: AG
Proposed Zoning: MDR & LDR
Gross Acreage: 156.79 acres
Gross Site Density (du/ac): approximately 1.8 du/ac
Lots/Units Proposed: 230-280 depending on product
Gross Floor Area: NA

SERVICE PROVIDERS

Electric: Public Service
Metro District: N/A at this time
Water *(if other than Town)*:
Gas: Public Service
Fire District: Mountain View Fire
Sewer *(if other than Town)*:

PAGE TWO MUST BE SIGNED AND NOTARIZED

DEVELOPMENT REVIEW FEES

ANNEXATION		**SUBDIVISION**	
☐ Major (10+ acres)	$ 4000.00	☐ Sketch Plan	$ 1000.00 + 10.00 per lot
☐ Minor (less than 10 acres)	$ 2000.00	☐ Preliminary Plat	$ 2000.00 + 40.00 per lot
☐ Deannexation	$ 1000.00	☐ Final Plat	$ 2000.00 + 20.00 per lot
COMPREHENSIVE PLAN AMENDMENT		☐ Minor Subdivision Plat	$ 2000.00
☐ Major	$ 3000.00	☐ Minor Amendment Plat	$ 1000.00 + 10.00 per lot
☐ Minor	$ 1200.00	☐ Road Vacation (constructed)	$ 1000.00
ZONING/REZONING		☐ Road Vacation (paper)	$ 100.00
☒ Rezoning	$ 1700.00 + 10.00 per acre	**SITE PLAN**	
☐ PUD Rezoning	$ 1700.00 + 10.00 per acre	☐ Residential	$ 1400.00 + 10.00 per unit
☐ PUD Amendment	$ 1700.00 + 10.00 per acre	☐ Non-Resi. (>10,000 sq. ft.)	$ 2200.00
☐ Major PD Amendment	$ 3700.00 + 10.00 per acre	☐ Non-Resi. (>2,000 sq. ft.)	$ 1000.00
☐ Minor PD Amendment	$ 500.00	☐ Non-Resi. (<2,000 sq. ft.)	$ 200.00
SPECIAL REVIEW USE		☐ Amendment (major)	$ 1100.00
☐ Major	$ 1000.00	☐ Amendment (minor)	$ 350.00
☐ Minor	$ 400.00	**VARIANCE**	**$ 600.00**
☐ Oil & Gas	$ 1200.00	**SERVICE PLAN**	**$ 10,000.00**

*All fees **include** both Town of Erie Planning & Engineering review. These fees **do not include** referral agency review fees, outside consultant review fees, or review fees incurred by consultants acting on behalf of staff. See Town of Erie Municipal Code, Title 2-10-5 for all COMMUNITY DEVELOPMENT FEES.*

The undersigned is fully aware of the request/proposal being made and the actions being initiated on the referenced property. The undersigned understand that the application must be found to be complete by the Town of Erie before the request can officially be accepted and the development review process initiated. The undersigned is aware that the applicant is fully responsible for all reasonable costs associated with the review of the application/request being made to the Town of Erie. Pursuant to Chapter 7 (Section 7.2.B.5) of the Unified Development Code (UDC) of the Town of Erie, applicants shall pay all costs billed by the Town for legal, engineering and planning costs incurred by staff, including consultants acting on behalf of staff, necessary for project review. By this acknowledgement, the undersigned hereby certify that the above information is true and correct.

Owner: Heidi Majerik Date: 7/25/18

Owner: Date:

Applicant: Date:

STATE OF COLORADO)
) ss.
County of DENVER)

The foregoing instrument was acknowledged before me this 26 day of JULY, 2018, by HEIDI MAJERIK.

My commission expires: 6-21-2022
Witness my hand and official seal.

NANCY RELIHAN
Notary Public
State of Colorado
Notary ID # 20184026021
My Commission Expires 06-21-2022

Nancy Relihan
Notary Public

Erie Land Company, LLC
1601 Blake Street
Suite 200
Denver, CO 80202
Phone: 303-888-38663150

November 4, 2019

Town of Erie
Community Development Department
645 Holbrook Street
Erie, CO 80516

RE: Rezoning, Swink Tract

To Whom It May Concern:

General Project Concept:

Erie Land Company LLC ("Applicant") is pleased to submit the enclosed Initial Zoning application for the property located at the southwest corner of Erie Parkway and Weld County Road 7 This project consists of a parcel with an area of 151.53 acres, (some of this area is adjacent roadways that are being annexed as part of this proposal) that is not currently located in the Town of Erie but is depicted in the Town of Erie Comprehensive Plan as a mix of MDR along Eire Parkway, and LDR to the south. Town staff has requested that as part of the Initial Zoning we provide an OS zoning as a buffer along the south, as well as identify an area along the south as PLI for the future School Site dedication.

The design of the Concept Plan emphasizes a walkable neighborhood with a direct connection through the open space to the Neighborhood Park at the promontory along the east property line. The vehicular circulation provides direct access through the community while leading to or terminating at the Neighborhood Park. Every resident is within a 5 minute walk to the Neighborhood Park, a Pocket Park and various connections to the pedestrian trail network.

The Applicant is making a request to zone the property in conformance with the Comprehensive Plan, to a mix of base zoning categories consisting of Medium-Density Residential (MR), Low-Density Residential (LR), Agricultural/Open Space (AG/OS), and Public Land and Institution (PLI). This Zoning assumes the following breakdown as approximate acreages for each of the proposed Zoning categories:

Zoning Category	Area
MR	21.952 Acres
LR	40.241 Acres
AG/OS	48.450 Acres
PLI	40.887 Acres

The provision for a Community Park is not required due to the population generated from this proposal not meeting the minimum acreage requirements for a Community Park. (The requirements

for Town Neighborhood Park and Town Open Space will be met and dedicated to the Town and maintained by the Town as part of the full Dearmin/Swink properties. The Swink property in isolation does not generate the need for a Neighborhood Park. The requirements for Pocket Parks and the remaining open space will be maintained by the HOA or Metro District. The project proposes one community amenity area that will be maintained by the HOA or Metro District in the full Dearmin/Swink property.

St. Vrain Valley School District provides service to this parcel. The District has identified this area in conjunction with the Dearmin tract for a future school site. The Concept Plan depicts the location that has been discussed with the School District for dedication.

Proposed Development Timeline:

The project is likely to be constructed in phases. In general, the project will likely phase from north to south. We are hopeful that we will complete the Annexation and Initial Zoning by the end of this year, and will move directly into the next entitlement process which will likely include a PUD and Preliminary Plat, and could include a Re-Zoning application if boundaries shift as part of these entitlement efforts. Following those processes, we will move towards any Final Plats or Site Plans that will be required to produce construction documents and hope to start actual land development in early 2021.

Relationship to Existing Land Uses:

The property requested for this Initial Zoning is currently undeveloped. The adjacent parcels are currently being used for agriculture, estate residential uses, and a high school. The Town of Erie Comprehensive Plan – 2015 Update depicts this property to include Medium-Density Residential (MDR) and Low-Density Residential (LDR) – which is consistent with this Initial Zoning request. The Concept Plan depicts how this project will tie into the Dearmin property, a major ditch and major roads surround the balance of the property.

Approval Criteria:

The Initial Zoning Request mirrors the Town's Comprehensive Plan Map. Below is an analysis of the Initial Zoning Approval Criteria.

1. The Initial Zoning will promote the public health, safety, and general welfare;

The initial zoning for the Swink property will conform to the requirements of the Municipal Code. The stated general purpose of the Municipal Code is the promotion of the health, safety, and general welfare of the Town of Erie. Specifically, the addition of the Swink property to the Westerly Community will include a Neighborhood Park, other Park Uses, Trail Corridors, Open Space that exceeds Town requirements, a School Site, as well as an efficient and integrated transportation network. The Westerly Community will contribute to the improvements required for Erie Parkway. The Swink addition will provide internal street connections, as well as an additional connection to

Erie Parkway, and road improvements will be coordinated with the adjacent Community Commercial corner. The plan will also provide trail connections to the larger Westerly Community.

2. The Initial Zoning is consistent with the Town's Comprehensive Plan and the purposes of the Municipal Code;

The initial zoning proposed for the property is a combination of Medium Density Residential and Low Density Residential, and Agricultural/Open Space, which is in compliance with the Town of Erie Comprehensive Plan Land Use designations.

3. Adequate facilities and services (including roads and transportation, water, gas, electric, police and fire protection, and sewage and waste disposal, as applicable) will be available to serve the subject property while maintaining adequate levels of service to existing development;

The project Engineer will collaborate with the Town of Erie Public Works department to verify that adequate facilities are available to serve the property. In addition, the developer may be responsible for extending services and improving roads as a part of this proposal.

4. The Initial Zoning is not likely to result in significant adverse impacts upon the natural environment, including air, water, noise, storm water management, wildlife, and vegetation, or such impacts will be substantially mitigated;

The design for the Swink portion of the Westerly Community includes land for a Neighborhood Park, other Park Areas, a Trail Corridor, significant Open Space, and a School Site. The majority of the property has been farmed and as such any impacts from the development of a residential community that will include open space, trails and park amenities will not result in a significant adverse impact.

5. The Initial Zoning is not likely to result in significant adverse impacts upon other property in the vicinity of the subject property; and

The initial zoning for the property will allow for road, open space, trail and park improvements that are not likely to result in significant adverse impacts for other properties in the vicinity of this property. The extension of municipal services to this area will result in a positive impact for the future of other properties in the vicinity of this property.

6. Future uses on the subject property will be compatible in scale with uses on other properties in the vicinity of the subject property.

Future uses on this property will be residential which is compatible with the uses on the adjacent properties, which include Erie Highlands & Colliers Hill. The Westerly Community is generally

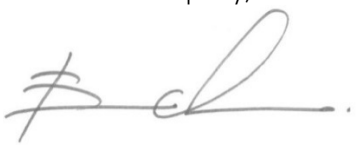
bounded by major roads to the North, West and East, and provides a significant Open Space buffer along the South boundary of the property.

Mineral Rights:

A surface agreement exists with the existing mineral owner. There are 2 existing wells on the property. The real property owners and the mineral owner are currently negotiating a new surface agreement, and the northern most well is currently being plugged and abandoned. This agreement has the mineral owner relinquishing its surface rights to any land being rezoned and plugging and abandoning the existing wells in exchange for a monetary payment.

Thank you for your consideration of the project and we look forward to reviewing the plans with the Town of Erie.

Sincerely,
Erie Land Company, LLC



Heidi Majerik
Vice President and General Manager

Swink Assessment of Impact Report

Water Distribution System
The Swink Water Distribution system will follow the recommendations outlined in the Merrick Utility Study commissioned by the Town of Erie for the development of this region. Water looping will be provided by connecting to the 30" waterline within Erie Parkway and we expect to have to connect to the project directly to the west of this parcel across County Road 5. Waterlines will be constructed throughout the development within roadways to service the proposed homes and commercial buildings within the development.

There is a new non-potable storage tank being constructed directly north of the site and we anticipate a conveyance line being constructed within County Road 5 to the south to the project boundary. We anticipate having a non-potable system within the development to service the larger community parks and in order to have proper flow and pressure, that a storage pond with pumps will be required.

Sanitary Sewer System
Sanitary sewer mains, laterals and manholes will be constructed throughout the project street network and will gravity flow to the sanitary sewer interceptor line at the northwest corner of the Dearmin site in Erie Parkway. It is anticipated the sewer will outflow along to a new main within Erie Parkway and connect to the existing conveyance system.

Roadway Network
The addition of this property to the Town of Erie will include improvements to Erie Parkway and a County Road 7 adjacent to the property.

The interior streets will include curb and gutter. The street network will be developed to provide dual access to neighborhood pods to meet life safety requirements. Intersection locations will be designed with consideration of appropriate separation from existing streets and line up with known future planned roadways.

Storm Drainage and Detention
The site lies within the St. Vrain Creek and Middle South Platte basins. Development is focused in the St Vrain Creek basin and is shown and described in the Town of Erie Outfall Systems Plan (East of Coal Creek). Development of Swink will create a series of piped conveyance systems that will convey runoff to Erie Parkway and County Road 5 where a new detention and water quality pond will be constructed by this project. After being treated and attenuated, runoff will discharge to north west into the recently constructed conveyance system in the Colliers project where it will eventually outfall into Coal Creek.

Dry Utilities
The electric, gas and cable services that will be constructed within the project will be similar to what is already being anticipated for this area.

Parks, & Open Space
As part of the overall Dearmin/Swink Community, and as depicted in the concept plan, we will meet the dedication requirements for Park and Open Space within the property.

Law Enforcement and Fire Protection
As is typical for residential development the new residents that are being served by the Town of Erie Fire and Police will have an additional modest impact on the existing services. This impact is offset by the fees, and additional taxes that the new residents pay within the Town of Erie.

School Impact
We are in discussions with the St. Vrain County School District, about the potential of a school site within this property and where the appropriate location is within the development.

Phase II Drainage Report for:

Dearmin-Swink

Prepared for:

Erie Land Company, LLC
1601 Blake Street, Suite 200
Denver, Colorado 80202

Prepared by:

Matrix DESIGN GROUP

TABLE OF CONTENTS

APPENDICIES

ENGINEER'S CERTIFICATION

"I hereby certify that this Phase II Drainage report for the design of Dearmin-Swink was prepared by me (or under my direct supervision) in accordance with the provisions of the Town of Erie Standards and Specifications for Design and Construction for the owners thereof. I understand that the Town of Erie does not and will not assume liability for drainage facilities designed by others, including the designs presented in this report."

_____

Patrick Chelin
Registered Professional Engineer
State of Colorado
No. 36448

TOWN ACCEPTANCE

This report has been reviewed and found to be in general compliance with the Town of Erie Standards and Specifications for Design and Construction and other Town requirements. **THE ACCURACY AND VALIDITY OF THE ENGINEERING DESIGN, DETAILS, DIMENSIONS, QUANTITIES, AND CONCEPTS IN THIS REPORT REMAINS THE SOLE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.**

Accepted by: _____ _____
Town Engineer Date

If during the construction process or at any time within one year following the acceptance by the TOWN of the completed improvements, any deficiencies or errors are discovered in the construction plans, specifications, drainage reports, or the actual constructed improvements, the TOWN shall have the right to require the developer to make any and all corrections which may be deemed necessary by the TOWN. The costs associated with any such corrections shall be the sole responsibility of the developer.

I. GENERAL LOCATION AND DESCRIPTION

This report summarizes the proposed stormwater system for the Dearmin-Swink project in the Town of Erie. Dearmin-Swink is a combination of two parcels of land. The Swink property lies within the east ½ of section 21, Township 1 North, Range 68 West of the 6th Principal Meridian. The Dearmin property lies within the west ½ of the aforementioned section. This report is prepared for both parcels. This development is a proposed single-family project to be developed by Erie Land Company, LLC. Discussed are the overall stormwater concepts, site hydrology and hydraulics, detention basins and water quality facilities.

A. Location

The project area is located within the following location:

Township, Range, ¼ Section. The property is contained within a portion of section 21, Township 1 North, Range 68 West of the 6th Principal Meridian, County of Weld, State of Colorado.

Street Location. The property is located in the Town of Erie, County of Weld, State of Colorado. The property is bordered by Erie Parkway (Weld County Road 8) on the north, Weld County Road 5 on the West, Weld County Road 6 on the south and a community ditch on the east. Interstate 25 is located approximately 1 mile to the east of the site.

Major Drainageways. There are no major drainageways on this property.

Surrounding Developments. To the west of the site is Erie Highlands Subdivision Filing 11, which is currently under construction, and an abandoned auto-salvage yard. To the north is Erie High School and vacant land. East of the site are existing residential, agricultural and commercial sites. South of the site are existing commercial sites in addition to vacant land. No other proposed or existing developments, adjacent to the site, exist currently.

B. Property Description

Area. This drainage report is for 417.68 acres.

Ground Cover and Soils. The site is currently undeveloped land. The ground cover consists of native grass vegetation sloping from the southeast to the northwest at approximately 3 to 6 percent. Soils are Cascajo gravelly sandy loam, Colby loam, Midway-Shingle complex, Nunn loam, Nunn clay loam, Weld loam and Wiley-Colby complex. The soils are classified as NRCS hydrologic soils groups A, B, C and D.

Major Drainageways. There are no major drainageways on or adjacent to this property.

An existing irrigation ditch referred to as “Community Ditch” is located east of the site. This existing ditch flows south to north and does not impact the site.

General Project Description. Dearmin-Swink will consist of 1,132 single family residential lots, a school, open space and a detention pond. Proposed development activities will include overlot grading, utility improvements, paving, landscaping and building construction. Access to the site will be provided from Weld County Road 5, Weld County Road 7 and Erie Parkway.

Irrigation Facilities. An existing irrigation ditch referred to as “Community Ditch” is located east of the site. This existing ditch flows south to north and does not impact the site.

Proposed Land Use. Dearmin-Swink is proposed to be a Low Density Residential (LR), Medium Density Residential (MR) and Neighborhood Mixed Use (NMU) development.

Wetland Areas. There are no existing wetland areas within the site.

Existing Easements. An existing 10’ Vessels oil and gas easement (Rec. No. 2078820 & 2078821) exists within Weld County Road 7. An existing Left hand water district easement (Rec. No. 3833970) exists in the northeast portion of the site, adjacent to Weld County Road 7.

II. DRAINAGE BASINS

A. Major Basin Description

Dearmin-Swink lies within the St. Vrain Creek and Middle South Platte Basin. FIRM Panels 08013C0442J, 08123C2070E and 08013CO444J encompass the site. Existing use for this parcel is Agricultural with the planned use being Residential. An existing irrigation ditch named Community Ditch runs along the east portion of the site. Community Ditch is currently used for irrigation and will not be impacted by this development. There are no existing ponds, lakes or other drainage structures existing onsite.

B. Sub-Basin Description

This site mainly lies within the St. Vrain Creek Watershed Basin with a small portion lying within the Middle South Platte Watershed Basin. On-site historic flows within the St. Vrain Creek Basin drain northwest towards a low point near the northwest corner of the site. Historic flows are collected in an existing culvert and conveyed under Weld County Road 5 and Erie Parkway. Flows continue northwest in an existing swale and ultimately into Boulder and Weld County Ditch. Historic flows within the Middle South Platte Watershed Basin drain southeast into Community Ditch. There are no historic flows coming onsite.

III. DRAINAGE DESIGN CRITERIA

A. Development Criteria Reference and Constraints

No adverse impacts to downstream or adjacent drainage facilities are to be expected. No jurisdictional wetlands are present on the project site. This site is not part of a larger master plan.

B. Hydrological Criteria

Rainfall depths of 1.01, 1.73 and 2.70-inches were used for the 2-year, 10 year and 100-year storm events respectively.

The rational method was used to compute design flow rates for the minor (2-year) and major (100-year) storm for sizing onsite storm sewer systems within the Dearmin-Swink basins. Land use characteristics and the associated runoff coefficients were determined for each basin. Time of concentrations were calculated based on the initial time or overland flow time, plus the travel time in the storm sewer, gutter, or drainage swale. The one-hour rainfall and time of concentrations were used to calculate rainfall intensities. Detailed runoff calculations for each basin and design points will be included with the Phase III Drainage Report.

C. Hydraulic Criteria

1. Storm Sewers – Pipes will be sized to convey the 100-year storm in accordance the Town's hydraulic criteria limits for the major storm event. StormCAD will be used to check the proposed pipe size and to determine the HGL/EGL. StormCAD results will be included within the Phase III Drainage Report.
2. Inlets – Storm drain inlets have been designed to capture all of the basin flows for the 100-year event with no runover to downstream inlets. UD-Inlet v4.05 was used to calculate inlet capacities and is attached. Allowable street capacities for the proposed improvements meet the requirements of the Town of Erie Standards. Internal streets for Dearmin-Swink are public. Runoff from both the minor and major storm events is contained within the curb section of the proposed streets and will not adversely impact the adjacent buildings. Inlet sizing calculation will be included in the Phase III Drainage Report.
3. Manholes/Inlets – Headloss was analyzed in the StormCAD model utilizing Figure 7-13 Bend Loss Coefficients from Urban Storm Drainage Criteria Manual Volume 1.
4. Detention Pond – UD-Detention v3.07 was used to determine the size and release rate of the proposed detention pond. The detention pond and outlet structure have been designed to release 90% of the predeveloped flows. A proposed culvert from the outlet structure will connect to the existing culvert which runs under Weld County Road 5.

D. Adaptations from Criteria

No variances are requested.

IV. DRAINAGE FACILITY DESIGN

A. General Concept

Stormwater runoff will generally flow from southeast to northwest. Stormwater runoff from within the site will be conveyed be a combination of overland, street and storm sewer flow to the onsite detention pond.

The onsite detention pond is designed using Urban Drainage version 3.07, UD-Detention Spreadsheet and has a required volume of 27.87 acre-feet. The spillway is located on the northwest side of the site and will overflow onto Erie Parkway (Weld County Road 8). This spillway will only activate in storms greater than the 100-year storm. The 100-year storm and smaller storms will be contained within the pond and will flow out through the outlet structure. There is currently no storm sewer system or detention on the site.

There are no off-site flows entering the proposed site. The detention pond and outlet structure have been designed to release 90% of the predeveloped flows. No adverse impacts to downstream or adjacent drainage facilities are to be expected.

V. SUMMARY

A. Compliance with Standards

The stormwater system design adheres with the *2018 Town of Erie – Standards and Specifications* and the *Urban Storm Drainage Criteria Manual by the Urban Drainage and Flood Control District*.

B. Drainage Concepts

Existing drainage patterns for the site will stay relatively the same, although site grading will change localized patterns.

V. REFERENCES

1. Town of Erie, revised Janurary 2018. *2018 Standards and Specifications.*
2. Urban Drainage and Flood Control District, 2017, *Design Criteria Manual, Volumes 1 and 2.*

Appendix A – Vicinity Map

R:\18.994.001 (Dearmin Swink)\Dwg\Exhibits\Vicinity Map.dwg

VICINITY MAP

Matrix DESIGN GROUP
AN EMPLOYEE-OWNED COMPANY

DEARMIN - SWINK

JULY 2018

FIGURE No. 1

Appendix B – Site Hydrologic Calculations

DEARMIN-SWINK - ERIE, CO

Matrix Project #: 18.994

Prepared By: GMV

COMPOSITE BASIN - WEIGHTED "C" CALCULATIONS

-REFERENCE UDFCD Vol.1 RUNOFF Table 6-3

	Residential							Lawns				
	Single Family			Multi-Unit				Clay Soil				
	0.25 acres	2.5 acres or larger	5 DU's/Ac 3,000 sf 2 story	(attached)	Roof	Streets: Paved	Gravel	2-7% Slope	>7% Slope	Historic		
% Imperv.	45.00%	12.00%	63.00%	75.00%	90.00%	100.00%	40.00%	2.00%	2.00%	2.00%		
											Total	Percent
BASIN	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Impervious
1	1.28					0.00				0.00	1.28	45.0%
2	1.41					0.61				8.72	10.74	13.2%
3	2.00					0.48				1.29	3.77	37.3%
4	0.00					0.27				0.09	0.36	75.5%
5	0.75					0.33				0.51	1.59	42.6%
6	5.36					1.27				0.34	6.97	52.9%
7	0.00					0.43				0.73	1.16	38.3%
8	5.00					1.39				1.00	7.39	49.5%
9	0.00					0.62				0.20	0.82	76.1%
10	0.91					0.00				0.00	0.91	45.0%
11	1.21					0.39				2.61	4.21	23.4%
12	0.00					0.58				7.44	8.02	9.1%
13	1.95					0.78				3.40	6.13	28.1%
14	0.11					0.57				6.19	6.87	10.8%
15	1.69					0.97				6.53	9.19	20.3%
16	0.00					0.32				3.78	4.10	9.6%
17	0.00					0.33				0.18	0.51	65.4%
18	0.00					0.71				0.30	1.01	70.9%
19	0.00					0.16				0.06	0.22	73.3%
20	2.79					1.15				0.93	4.87	49.8%
21	3.43					2.30				2.87	8.60	45.4%

	Residential							Lawns				
	Single Family			Multi-Unit				Clay Soil				
	0.25 acres	2.5 acres or larger	5 DU's/Ac 3,000 sf 2 story	(attached)	Roof	Streets: Paved	Gravel	2-7% Slope	>7% Slope	Historic		
% Imperv.	45.00%	12.00%	63.00%	75.00%	90.00%	100.00%	40.00%	2.00%	2.00%	2.00%		
											Total	Percent
BASIN	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Impervious
22	6.73					2.23				0.70	9.66	54.6%
23	1.30					0.45				0.00	1.75	59.1%
24	0.00					0.21				0.06	0.27	78.2%
25	1.48					0.71				0.52	2.71	51.2%
26	0.00					0.35				0.64	0.99	36.6%
27	1.63					1.22				0.07	2.92	66.9%
28	0.00					0.25				0.00	0.25	100.0%
29	1.08					0.57				0.78	2.43	44.1%
30	2.92					1.32				1.44	5.68	46.9%
31	4.36					2.86				1.42	8.64	56.1%
32	4.44					1.20				1.60	7.24	44.6%
33	3.79					1.46				1.45	6.70	47.7%
34	5.59					1.94				1.68	9.21	48.7%
35	0.00					0.31				0.11	0.42	74.3%
36	6.10					0.60				0.22	6.92	48.4%
37	2.33					0.76				0.23	3.32	54.6%
38	3.10					0.80				0.25	4.15	53.0%
39	0.00					0.37				0.12	0.49	76.0%
40	3.10					0.42				0.13	3.65	49.8%
41	2.72					0.86				0.26	3.84	54.4%
42	0.00					0.25				0.08	0.33	76.2%
43	2.33					0.53				0.16	3.02	52.4%
44	1.40					0.83				0.55	2.78	52.9%
45	0.00					0.34				0.10	0.44	77.7%
46	1.57					0.49				0.07	2.13	56.2%
47	1.79					1.12				0.20	3.11	62.0%
48	2.42					1.42				1.50	5.34	47.5%
49	2.80					1.89				3.78	8.47	38.1%

	Residential							Lawns				
	Single Family			Multi-Unit				Clay Soil				
	0.25 acres	2.5 acres or larger	5 DU's/Ac 3,000 sf 2 story	(attached)	Roof	Streets: Paved	Gravel	2-7% Slope	>7% Slope	Historic		
% Imperv.	45.00%	12.00%	63.00%	75.00%	90.00%	100.00%	40.00%	2.00%	2.00%	2.00%		
											Total	Percent
BASIN	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Impervious
50	5.06					1.97				0.70	7.73	55.1%
51	3.32					1.27				1.56	6.15	45.5%
52	6.41					1.16				0.56	8.13	49.9%
53	1.31					0.45				0.68	2.44	43.2%
54	0.77					0.77				0.32	1.86	60.4%
55	2.96					0.86				0.28	4.10	53.6%
56	0.39					0.33				0.04	0.76	66.6%
57	0.63					0.32				0.46	1.41	43.5%
58	0.00					0.25				0.13	0.38	66.5%
59	1.19					0.62				0.54	2.35	49.6%
60	0.00					0.18				0.06	0.24	75.5%
61	3.01					0.95				0.29	4.25	54.4%
62	5.28					0.90				0.28	6.46	50.8%
63	0.00					0.49				0.16	0.65	75.9%
64	4.01					1.34				0.40	5.75	54.8%
65	0.00					0.39				0.12	0.51	76.9%
66	6.56					1.58				0.57	8.71	52.2%
67	2.22					1.27				0.40	3.89	58.5%
68	0.67					0.99				2.65	4.31	31.2%
69	0.61					0.70				0.90	2.21	44.9%
70	0.96					1.35				1.60	3.91	46.4%
71	5.00					2.01				1.45	8.46	50.7%
72	0.83					2.02				0.20	3.05	78.6%
73	0.00					0.32				0.16	0.48	67.3%
74	2.20					0.48				0.15	2.83	52.0%
75	1.55					0.62				0.39	2.56	51.8%
76	0.00					0.27				0.14	0.41	66.5%
77	1.26					0.19				0.03	1.48	51.2%

	Residential							Lawns				
	Single Family			Multi-Unit				Clay Soil				
	0.25 acres	2.5 acres or larger	5 DU's/Ac 3,000 sf 2 story	(attached)	Roof	Streets: Paved	Gravel	2-7% Slope	>7% Slope	Historic		
% Imperv.	45.00%	12.00%	63.00%	75.00%	90.00%	100.00%	40.00%	2.00%	2.00%	2.00%		
											Total	Percent
BASIN	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Area	Impervious
78	1.11					0.50				0.54	2.15	47.0%
79	0.73					0.10				0.06	0.89	48.3%
80	2.09					1.18				0.63	3.90	54.7%
81	1.34					0.71				1.52	3.57	37.6%
82	0.00					1.33				0.38	1.71	78.2%
Total	**152.34**	**0.00**	**0.00**	**0.00**	**0.00**	**67.29**	**0.00**	**0.00**	**0.00**	**83.64**	**303.27**	**45.3%**

DEARMIN-SWINK - ERIE, CO

CORE Project #: 18.994

Prepared By: GMV

COMPOSITE DEVELOPED BASIN -WEIGHTED "C" CALCULATIONS

-REFERENCE UDFCD Vol.1 RUNOFF Table 6-4

i = % imperviousness/100 expressed as a decimal

C_A = Runoff coefficient for NRCS HSG A soils

C_B = Runoff coefficient for NRCS HSG B soils

C_{CD} = Runoff coefficient for NRCS HSG C and D soils.

Natural Resource Conservation Service (NRCS)

Table 6-4. Runoff coefficient equations based on NRCS soil group and storm return period

NRCS Soil Group	Storm Return Period						
	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
A	$C_A = 0.84i^{1.302}$	$C_A = 0.86i^{1.276}$	$C_A = 0.87i^{1.232}$	$C_A = 0.84i^{1.124}$	$C_A = 0.85i+0.025$	$C_A = 0.78i+0.110$	$C_A = 0.65i+0.254$
B	$C_B = 0.84i^{1.169}$	$C_B = 0.86i^{1.088}$	$C_B = 0.81i+0.057$	$C_B = 0.63i+0.249$	$C_B = 0.56i+0.328$	$C_B = 0.47i+0.426$	$C_B = 0.37i+0.536$
C/D	$C_{C/D} = 0.83i^{1.122}$	$C_{C/D} = 0.82i+0.035$	$C_{C/D} = 0.74i+0.132$	$C_{C/D} = 0.56i+0.319$	$C_{C/D} = 0.49i+0.393$	$C_{C/D} = 0.41i+0.484$	$C_{C/D} = 0.32i+0.588$

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
1	45.0%	0.45	A	0.30	0.31	0.33	0.46						
			B	0.33	0.36	0.42	0.64		1.28	0.34	0.40	0.47	0.67
			C or D	0.34	0.40	0.47	0.67	1.28					
2	13.2%	0.13	A	0.06	0.06	0.07	0.21						
			B	0.08	0.10	0.16	0.49		10.74	0.09	0.14	0.23	0.54
			C or D	0.09	0.14	0.23	0.54	10.74					
3	37.3%	0.37	A	0.23	0.24	0.26	0.40						
			B	0.27	0.29	0.36	0.60		3.77	0.27	0.34	0.41	0.64
			C or D	0.27	0.34	0.41	0.64	3.77					
4	75.5%	0.76	A	0.58	0.60	0.62	0.70						
			B	0.60	0.63	0.67	0.78		0.36	0.61	0.65	0.69	0.79
			C or D	0.61	0.65	0.69	0.79	0.36					
5	42.6%	0.43	A	0.28	0.29	0.30	0.44						
			B	0.31	0.34	0.40	0.63		1.59	0.32	0.38	0.45	0.66
			C or D	0.32	0.38	0.45	0.66	1.59					
6	52.9%	0.53	A	0.37	0.38	0.40	0.52						
			B	0.40	0.43	0.49	0.67		6.97	0.41	0.47	0.52	0.70
			C or D	0.41	0.47	0.52	0.70	6.97					
7	38.3%	0.38	A	0.24	0.25	0.27	0.41						
			B	0.27	0.30	0.37	0.61		1.16	0.28	0.35	0.42	0.64
			C or D	0.28	0.35	0.42	0.64	1.16					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
8	49.5%	0.50	A	0.34	0.35	0.37	0.50		7.39	0.38	0.44	0.50	0.69
			B	0.37	0.40	0.46	0.66						
			C or D	0.38	0.44	0.50	0.69	7.39					
9	76.1%	0.76	A	0.59	0.61	0.62	0.70		0.82	0.61	0.66	0.70	0.80
			B	0.61	0.64	0.67	0.78						
			C or D	0.61	0.66	0.70	0.80	0.82					
10	45.0%	0.45	A	0.30	0.31	0.33	0.46		0.91	0.34	0.40	0.47	0.67
			B	0.33	0.36	0.42	0.64						
			C or D	0.34	0.40	0.47	0.67	0.91					
11	23.4%	0.23	A	0.13	0.14	0.15	0.29		4.21	0.16	0.23	0.31	0.58
			B	0.15	0.18	0.25	0.54						
			C or D	0.16	0.23	0.31	0.58	4.21					
12	9.1%	0.09	A	0.04	0.04	0.05	0.18		8.02	0.06	0.11	0.20	0.52
			B	0.05	0.06	0.13	0.47						
			C or D	0.06	0.11	0.20	0.52	8.02					
13	28.1%	0.28	A	0.16	0.17	0.18	0.33		6.13	0.20	0.27	0.34	0.60
			B	0.19	0.22	0.29	0.56						
			C or D	0.20	0.27	0.34	0.60	6.13					
14	10.8%	0.11	A	0.05	0.05	0.06	0.19		6.87	0.07	0.12	0.21	0.53
			B	0.06	0.08	0.14	0.48						
			C or D	0.07	0.12	0.21	0.53	6.87					
15	20.3%	0.20	A	0.11	0.11	0.12	0.27		9.19	0.14	0.20	0.28	0.57
			B	0.13	0.15	0.22	0.52						
			C or D	0.14	0.20	0.28	0.57	9.19					
16	9.6%	0.10	A	0.04	0.04	0.05	0.19		4.10	0.06	0.11	0.20	0.52
			B	0.05	0.07	0.14	0.47						
			C or D	0.06	0.11	0.20	0.52	4.10					
17	65.4%	0.65	A	0.48	0.50	0.52	0.62		0.51	0.52	0.57	0.62	0.75
			B	0.51	0.54	0.59	0.73						
			C or D	0.52	0.57	0.62	0.75	0.51					
18	70.9%	0.71	A	0.54	0.55	0.57	0.66		1.01	0.56	0.62	0.66	0.77
			B	0.56	0.59	0.63	0.76						
			C or D	0.56	0.62	0.66	0.77	1.01					
19	73.3%	0.73	A	0.56	0.58	0.59	0.68		0.22	0.59	0.64	0.67	0.78
			B	0.58	0.61	0.65	0.77						
			C or D	0.59	0.64	0.67	0.78	0.22					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
20	49.8%	0.50	A	0.34	0.35	0.37	0.50		4.87	0.38	0.44	0.50	0.69
			B	0.37	0.40	0.46	0.66						
			C or D	0.38	0.44	0.50	0.69	4.87					
21	45.4%	0.45	A	0.30	0.31	0.33	0.46		8.60	0.34	0.41	0.47	0.67
			B	0.33	0.36	0.42	0.64						
			C or D	0.34	0.41	0.47	0.67	8.60					
22	54.6%	0.55	A	0.38	0.40	0.41	0.54		9.66	0.42	0.48	0.54	0.71
			B	0.41	0.45	0.50	0.68						
			C or D	0.42	0.48	0.54	0.71	9.66					
23	59.1%	0.59	A	0.42	0.44	0.46	0.57		1.75	0.46	0.52	0.57	0.73
			B	0.45	0.49	0.54	0.70						
			C or D	0.46	0.52	0.57	0.73	1.75					
24	78.2%	0.78	A	0.61	0.63	0.64	0.72		0.27	0.63	0.68	0.71	0.80
			B	0.63	0.66	0.69	0.79						
			C or D	0.63	0.68	0.71	0.80	0.27					
25	51.2%	0.51	A	0.35	0.37	0.38	0.51		2.71	0.39	0.45	0.51	0.69
			B	0.38	0.41	0.47	0.67						
			C or D	0.39	0.45	0.51	0.69	2.71					
26	36.6%	0.37	A	0.23	0.24	0.25	0.40		0.99	0.27	0.34	0.40	0.63
			B	0.26	0.29	0.35	0.60						
			C or D	0.27	0.34	0.40	0.63	0.99					
27	66.9%	0.67	A	0.50	0.52	0.53	0.63		2.92	0.53	0.58	0.63	0.76
			B	0.53	0.56	0.60	0.74						
			C or D	0.53	0.58	0.63	0.76	2.92					
28	100.0%	1.00	A	0.84	0.86	0.87	0.89		0.25	0.83	0.86	0.87	0.89
			B	0.84	0.86	0.87	0.90						
			C or D	0.83	0.86	0.87	0.89	0.25					
29	44.1%	0.44	A	0.29	0.30	0.32	0.45		2.43	0.33	0.40	0.46	0.66
			B	0.32	0.35	0.41	0.63						
			C or D	0.33	0.40	0.46	0.66	2.43					
30	46.9%	0.47	A	0.31	0.33	0.34	0.48		5.68	0.35	0.42	0.48	0.68
			B	0.35	0.38	0.44	0.65						
			C or D	0.35	0.42	0.48	0.68	5.68					
31	56.1%	0.56	A	0.40	0.41	0.43	0.55		8.64	0.43	0.50	0.55	0.71
			B	0.43	0.46	0.51	0.69						
			C or D	0.43	0.50	0.55	0.71	8.64					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
32	44.6%	0.45	A	0.29	0.31	0.32	0.46		7.24	0.34	0.40	0.46	0.67
			B	0.33	0.36	0.42	0.64						
			C or D	0.34	0.40	0.46	0.67	7.24					
33	47.7%	0.48	A	0.32	0.33	0.35	0.48		6.70	0.36	0.43	0.48	0.68
			B	0.35	0.38	0.44	0.65						
			C or D	0.36	0.43	0.48	0.68	6.70					
34	48.7%	0.49	A	0.33	0.34	0.36	0.49		9.21	0.37	0.43	0.49	0.68
			B	0.36	0.39	0.45	0.66						
			C or D	0.37	0.43	0.49	0.68	9.21					
35	74.3%	0.74	A	0.57	0.59	0.60	0.69		0.42	0.60	0.64	0.68	0.79
			B	0.59	0.62	0.66	0.78						
			C or D	0.60	0.64	0.68	0.79	0.42					
36	48.4%	0.48	A	0.33	0.34	0.36	0.49		6.92	0.37	0.43	0.49	0.68
			B	0.36	0.39	0.45	0.65						
			C or D	0.37	0.43	0.49	0.68	6.92					
37	54.6%	0.55	A	0.38	0.40	0.41	0.54		3.32	0.42	0.48	0.54	0.71
			B	0.41	0.45	0.50	0.68						
			C or D	0.42	0.48	0.54	0.71	3.32					
38	53.0%	0.53	A	0.37	0.38	0.40	0.52		4.15	0.41	0.47	0.52	0.70
			B	0.40	0.43	0.49	0.68						
			C or D	0.41	0.47	0.52	0.70	4.15					
39	76.0%	0.76	A	0.59	0.61	0.62	0.70		0.49	0.61	0.66	0.69	0.80
			B	0.61	0.64	0.67	0.78						
			C or D	0.61	0.66	0.69	0.80	0.49					
40	49.8%	0.50	A	0.34	0.35	0.37	0.50		3.65	0.38	0.44	0.50	0.69
			B	0.37	0.40	0.46	0.66						
			C or D	0.38	0.44	0.50	0.69	3.65					
41	54.4%	0.54	A	0.38	0.40	0.41	0.53		3.84	0.42	0.48	0.53	0.71
			B	0.41	0.44	0.50	0.68						
			C or D	0.42	0.48	0.53	0.71	3.84					
42	76.2%	0.76	A	0.59	0.61	0.62	0.70		0.33	0.61	0.66	0.70	0.80
			B	0.61	0.64	0.67	0.78						
			C or D	0.61	0.66	0.70	0.80	0.33					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
43	52.4%	0.52	A	0.36	0.38	0.39	0.52		3.02	0.40	0.46	0.52	0.70
			B	0.39	0.43	0.48	0.67						
			C or D	0.40	0.46	0.52	0.70	3.02					
44	52.9%	0.53	A	0.37	0.38	0.40	0.52		2.78	0.41	0.47	0.52	0.70
			B	0.40	0.43	0.49	0.67						
			C or D	0.41	0.47	0.52	0.70	2.78					
45	77.7%	0.78	A	0.61	0.62	0.64	0.72		0.44	0.63	0.67	0.71	0.80
			B	0.63	0.65	0.69	0.79						
			C or D	0.63	0.67	0.71	0.80	0.44					
46	56.2%	0.56	A	0.40	0.41	0.43	0.55		2.13	0.44	0.50	0.55	0.71
			B	0.43	0.46	0.51	0.69						
			C or D	0.44	0.50	0.55	0.71	2.13					
47	62.0%	0.62	A	0.45	0.47	0.48	0.59		3.11	0.49	0.54	0.59	0.74
			B	0.48	0.51	0.56	0.72						
			C or D	0.49	0.54	0.59	0.74	3.11					
48	47.5%	0.48	A	0.32	0.33	0.35	0.48		5.34	0.36	0.42	0.48	0.68
			B	0.35	0.38	0.44	0.65						
			C or D	0.36	0.42	0.48	0.68	5.34					
49	38.1%	0.38	A	0.24	0.25	0.26	0.41		8.47	0.28	0.35	0.41	0.64
			B	0.27	0.30	0.37	0.60						
			C or D	0.28	0.35	0.41	0.64	8.47					
50	55.1%	0.55	A	0.39	0.40	0.42	0.54		7.73	0.43	0.49	0.54	0.71
			B	0.42	0.45	0.50	0.69						
			C or D	0.43	0.49	0.54	0.71	7.73					
51	45.5%	0.45	A	0.30	0.31	0.33	0.46		6.15	0.34	0.41	0.47	0.67
			B	0.33	0.36	0.43	0.64						
			C or D	0.34	0.41	0.47	0.67	6.15					
52	49.9%	0.50	A	0.34	0.35	0.37	0.50		8.13	0.38	0.44	0.50	0.69
			B	0.37	0.40	0.46	0.66						
			C or D	0.38	0.44	0.50	0.69	8.13					
53	43.2%	0.43	A	0.28	0.29	0.31	0.45		2.44	0.32	0.39	0.45	0.66
			B	0.31	0.34	0.41	0.63						
			C or D	0.32	0.39	0.45	0.66	2.44					
54	60.4%	0.60	A	0.44	0.45	0.47	0.58		1.86	0.47	0.53	0.58	0.73
			B	0.47	0.50	0.55	0.71						
			C or D	0.47	0.53	0.58	0.73	1.86					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
55	53.6%	0.54	A	0.37	0.39	0.40	0.53		4.10	0.41	0.47	0.53	0.70
			B	0.41	0.44	0.49	0.68						
			C or D	0.41	0.47	0.53	0.70	4.10					
56	66.6%	0.67	A	0.49	0.51	0.53	0.63		0.76	0.53	0.58	0.62	0.76
			B	0.52	0.55	0.60	0.74						
			C or D	0.53	0.58	0.62	0.76	0.76					
57	43.5%	0.43	A	0.28	0.30	0.31	0.45		1.41	0.33	0.39	0.45	0.66
			B	0.32	0.35	0.41	0.63						
			C or D	0.33	0.39	0.45	0.66	1.41					
58	66.5%	0.66	A	0.49	0.51	0.53	0.63		0.38	0.52	0.58	0.62	0.76
			B	0.52	0.55	0.60	0.74						
			C or D	0.52	0.58	0.62	0.76	0.38					
59	49.6%	0.50	A	0.34	0.35	0.37	0.50		2.35	0.38	0.44	0.50	0.69
			B	0.37	0.40	0.46	0.66						
			C or D	0.38	0.44	0.50	0.69	2.35					
60	75.5%	0.76	A	0.58	0.60	0.62	0.70		0.24	0.61	0.65	0.69	0.79
			B	0.60	0.63	0.67	0.78						
			C or D	0.61	0.65	0.69	0.79	0.24					
61	54.4%	0.54	A	0.38	0.40	0.41	0.53		4.25	0.42	0.48	0.53	0.71
			B	0.41	0.44	0.50	0.68						
			C or D	0.42	0.48	0.53	0.71	4.25					
62	50.8%	0.51	A	0.35	0.36	0.38	0.51		6.46	0.39	0.45	0.51	0.69
			B	0.38	0.41	0.47	0.66						
			C or D	0.39	0.45	0.51	0.69	6.46					
63	75.9%	0.76	A	0.59	0.60	0.62	0.70		0.65	0.61	0.66	0.69	0.80
			B	0.61	0.64	0.67	0.78						
			C or D	0.61	0.66	0.69	0.80	0.65					
64	54.8%	0.55	A	0.38	0.40	0.41	0.54		5.75	0.42	0.48	0.54	0.71
			B	0.42	0.45	0.50	0.68						
			C or D	0.42	0.48	0.54	0.71	5.75					
65	76.9%	0.77	A	0.60	0.62	0.63	0.71		0.51	0.62	0.67	0.70	0.80
			B	0.62	0.65	0.68	0.79						
			C or D	0.62	0.67	0.70	0.80	0.51					
66	52.2%	0.52	A	0.36	0.37	0.39	0.52		8.71	0.40	0.46	0.52	0.70
			B	0.39	0.42	0.48	0.67						
			C or D	0.40	0.46	0.52	0.70	8.71					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
67	58.5%	0.59	A	0.42	0.43	0.45	0.57		3.89	0.46	0.51	0.57	0.72
			B	0.45	0.48	0.53	0.70						
			C or D	0.46	0.51	0.57	0.72	3.89					
68	31.2%	0.31	A	0.18	0.19	0.21	0.35		4.31	0.22	0.29	0.36	0.61
			B	0.22	0.24	0.31	0.57						
			C or D	0.22	0.29	0.36	0.61	4.31					
69	44.9%	0.45	A	0.30	0.31	0.32	0.46		2.21	0.34	0.40	0.46	0.67
			B	0.33	0.36	0.42	0.64						
			C or D	0.34	0.40	0.46	0.67	2.21					
70	46.4%	0.46	A	0.31	0.32	0.34	0.47		3.91	0.35	0.42	0.48	0.67
			B	0.34	0.37	0.43	0.64						
			C or D	0.35	0.42	0.48	0.67	3.91					
71	50.7%	0.51	A	0.35	0.36	0.38	0.51		8.46	0.39	0.45	0.51	0.69
			B	0.38	0.41	0.47	0.66						
			C or D	0.39	0.45	0.51	0.69	8.46					
72	78.6%	0.79	A	0.61	0.63	0.65	0.72		3.05	0.63	0.68	0.71	0.81
			B	0.63	0.66	0.69	0.80						
			C or D	0.63	0.68	0.71	0.81	3.05					
73	67.3%	0.67	A	0.50	0.52	0.53	0.64		0.48	0.53	0.59	0.63	0.76
			B	0.53	0.56	0.60	0.74						
			C or D	0.53	0.59	0.63	0.76	0.48					
74	52.0%	0.52	A	0.36	0.37	0.39	0.52		2.83	0.40	0.46	0.52	0.70
			B	0.39	0.42	0.48	0.67						
			C or D	0.40	0.46	0.52	0.70	2.83					
75	51.8%	0.52	A	0.36	0.37	0.39	0.51		2.56	0.40	0.46	0.52	0.70
			B	0.39	0.42	0.48	0.67						
			C or D	0.40	0.46	0.52	0.70	2.56					
76	66.5%	0.67	A	0.49	0.51	0.53	0.63		0.41	0.53	0.58	0.62	0.76
			B	0.52	0.55	0.60	0.74						
			C or D	0.53	0.58	0.62	0.76	0.41					
77	51.2%	0.51	A	0.35	0.37	0.38	0.51		1.48	0.39	0.45	0.51	0.69
			B	0.38	0.42	0.47	0.67						
			C or D	0.39	0.45	0.51	0.69	1.48					
78	47.0%	0.47	A	0.31	0.33	0.34	0.48		2.15	0.36	0.42	0.48	0.68
			B	0.35	0.38	0.44	0.65						
			C or D	0.36	0.42	0.48	0.68	2.15					

Basin ID	% Imperv.	*i*	Soil Type	Runoff Coefficients, C				Basin Area	Total Area	Weighted Runoff Coefficients, C			
				2-Year	5-Year	10-Year	100-Year			2-Year	5-Year	10-Year	100-Year
79	48.3%	0.48	A	0.33	0.34	0.35	0.49	0.89	0.89	0.37	0.43	0.49	0.68
			B	0.36	0.39	0.45	0.65						
			C or D	0.37	0.43	0.49	0.68						
80	54.7%	0.55	A	0.38	0.40	0.41	0.54	3.90	3.90	0.42	0.48	0.54	0.71
			B	0.41	0.45	0.50	0.68						
			C or D	0.42	0.48	0.54	0.71						
81	37.6%	0.38	A	0.24	0.25	0.26	0.40	3.57	3.57	0.28	0.34	0.41	0.64
			B	0.27	0.30	0.36	0.60						
			C or D	0.28	0.34	0.41	0.64						
82	78.2%	0.78	A	0.61	0.63	0.64	0.72	1.71	1.71	0.63	0.68	0.71	0.80
			B	0.63	0.66	0.69	0.79						
			C or D	0.63	0.68	0.71	0.80						

DEARMIN-SWINK - ERIE, CO

CORE Project #: 18.994

Prepared By: GMV

TIME OF CONCENTRATION CALCULATIONS

-REFERENCE UDFCD Vol.1 Section 2.4

NRCS Conveyance factors, K -REFERENCE UDFCD Vol.1 RUNOFF Table 6-2

SF-2

Heavy Meadow	2.50	Short Grass Pasture & Lawns	7.00	Grassed Waterway	15.00
Tillage/field	5.00	Nearly Bare Ground	10.00	Paved Area & Shallow Gutter	20.00

SUB-BASIN DATA			INITIAL / OVERLAND TIME			TRAVEL TIME T(t)						T(c) CHECK (URBANIZED BASINS)		FINAL T(c)
DRAIN BASIN	AREA ac.	C(5)	Length ft.	Slope %	T(i) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	% IMPER-VIOUS	USDCM Eq . 6-5	min.
1	1.28	0.40	107	2.8	9.2	0	0.0	20.00			9.2	45.0%	18.4	9.2
2	10.74	0.14	300	2.3	22.6	315	2.9	20.00	3.4	1.5	24.1	13.2%		24.1
3	3.77	0.34	293	3.8	15.1	470	2.1	20.00	2.9	2.7	17.8	37.3%	20.0	17.8
4	0.36	0.65	11	4.4	1.7	252	1.2	20.00	2.2	1.9	3.6	75.5%	13.4	5.0
5	1.59	0.38	73	1.4	10.0	230	6.5	20.00	5.1	0.8	10.8	42.6%	18.9	10.8
6	6.97	0.47	120	4.2	7.8	558	3.9	20.00	4.0	2.3	10.1	52.9%	17.3	10.1
7	1.16	0.35	13	3.9	3.1	287	2.4	20.00	3.1	1.5	4.6	38.3%	19.7	5.0
8	7.39	0.44	12	4.2	2.6	900	1.4	20.00	2.4	6.2	8.8	49.5%	18.4	8.8
9	0.82	0.66	14	3.6	2.0	1164	1.6	20.00	2.6	7.5	9.5	76.1%	13.8	9.5
10	0.91	0.40	103	3.9	8.2	0	0.0	20.00			8.2	45.0%	18.4	8.2
11	4.21	0.23	300	6.3	14.8	705	3.8	20.00	3.9	3.0	17.8	23.4%	22.5	17.8
12	8.02	0.11	300	10.3	14.3	535	3.6	20.00	3.8	2.3	16.6	9.1%		16.6
13	6.13	0.27	216	8.3	11.0	533	2.1	20.00	2.9	3.1	14.1	28.1%	21.7	14.1
14	6.87	0.12	236	3.0	18.9	501	3.0	20.00	3.5	2.4	21.3	10.8%		21.3
15	9.19	0.20	267	5.2	15.4	218	0.9	20.00	1.9	1.9	17.3	20.3%	22.9	17.3
16	4.10	0.11	300	4.3	19.0	307	7.2	7.00	1.9	2.7	21.7	9.6%		21.7
17	0.51	0.57	13	3.9	2.2	408	2.2	20.00	3.0	2.3	4.5	65.4%	15.1	5.0
18	1.01	0.62	14	3.5	2.2	1214	2.4	20.00	3.1	6.5	8.7	70.9%	14.6	8.7
19	0.22	0.64	14	7.0	1.7	239	2.1	20.00	2.9	1.4	3.1	73.3%	13.7	5.0
20	4.87	0.44	14	7.0	2.4	720	1.5	20.00	2.5	4.8	7.2	49.8%	18.1	7.2
21	8.60	0.41	215	3.3	12.4	719	1.8	20.00	2.7	4.4	16.8	45.4%	18.9	16.8
22	9.66	0.48	35	1.4	5.8	1068	2.2	20.00	2.9	6.1	11.9	54.6%	17.5	11.9
23	1.75	0.52	268	3.4	11.5	165	1.2	20.00	2.2	1.2	12.7	59.1%	16.1	12.7
24	0.27	0.68	19	2.6	2.4	145	0.7	20.00	1.7	1.4	3.8	78.2%	12.8	5.0

SUB-BASIN DATA			INITIAL / OVERLAND TIME			TRAVEL TIME T(t)						T(c) CHECK (URBANIZED BASINS)		FINAL T(c)
DRAIN BASIN	AREA ac.	C(5)	Length ft.	Slope %	T(i) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	% IMPER-VIOUS	USDCM Eq . 6-5	min.
25	2.71	0.45	226	2.2	13.5	259	1.2	20.00	2.2	2.0	15.5	51.2%	17.6	15.5
26	0.99	0.34	62	3.2	7.4	255	1.2	20.00	2.2	1.9	9.3	36.6%	20.0	9.3
27	2.92	0.58	12	8.2	1.6	1317	2.0	20.00	2.8	7.8	9.4	66.9%	15.5	9.4
28	0.25	0.86	1698	0.0	58.3	1698	1.5	20.00	2.5	11.3	69.6	100.0%	10.0	10.0
29	2.43	0.40	38	2.6	5.7	853	2.2	20.00	3.0	4.7	10.4	44.1%	19.1	10.4
30	5.68	0.42	13	3.8	2.9	1141	1.9	20.00	2.8	6.8	9.7	46.9%	18.9	9.7
31	8.64	0.50	9	5.7	1.8	1735	2.2	20.00	3.0	9.6	11.4	56.1%	17.6	11.4
32	7.24	0.40	12	4.1	2.8	1123	1.9	20.00	2.7	6.9	9.7	44.6%	19.3	9.7
33	6.70	0.43	16	3.1	3.4	721	2.8	20.00	3.3	3.6	7.0	47.7%	18.4	7.0
34	9.21	0.43	12	4.1	2.6	1274	2.0	20.00	2.8	7.6	10.2	48.7%	18.7	10.2
35	0.42	0.64	14	3.7	2.0	264	0.8	20.00	1.7	2.6	4.6	74.3%	13.6	5.0
36	6.92	0.43	251	8.4	9.5	874	0.9	20.00	1.9	7.7	17.2	48.4%	18.7	17.2
37	3.32	0.48	10	5.0	2.1	579	2.6	20.00	3.2	3.0	5.1	54.6%	17.1	5.1
38	4.15	0.00	13	3.9	4.5	1045	1.7	20.00	2.6	6.7	11.2	53.0%	17.8	11.2
39	0.49	0.66	12	4.1	1.7	451	1.6	20.00	2.5	3.0	4.7	76.0%	13.4	5.0
40	3.65	0.44	308	3.2	14.1	506	1.4	20.00	2.4	3.5	17.6	49.8%	18.0	17.6
41	3.84	0.48	14	3.6	2.8	771	2.6	20.00	3.2	4.0	6.8	54.4%	17.2	6.8
42	0.33	0.66	9	5.4	1.4	327	3.1	20.00	3.5	1.6	3.0	76.2%	13.2	5.0
43	3.02	0.46	12	4.0	2.6	642	2.5	20.00	3.2	3.3	5.9	52.4%	17.5	5.9
44	2.78	0.47	14	3.5	2.8	853	1.6	20.00	2.6	5.5	8.3	52.9%	17.7	8.3
45	0.44	0.67	16	3.2	2.1	384	1.3	20.00	2.3	2.8	4.9	77.7%	13.1	5.0
46	2.13	0.50	18	2.8	3.3	431	1.4	20.00	2.4	3.0	6.3	56.2%	16.8	6.3
47	3.11	0.54	11	4.6	2.0	557	2.5	20.00	3.2	2.9	4.9	62.0%	15.8	5.0
48	5.34	0.42	13	4.0	2.8	911	2.5	20.00	3.2	4.7	7.5	47.5%	18.5	7.5
49	8.47	0.35	14	3.5	3.4	1639	3.2	20.00	3.6	7.6	11.0	38.1%	20.6	11.0
50	7.73	0.49	13	4.0	2.5	1548	2.7	20.00	3.3	7.8	10.3	55.1%	17.6	10.3
51	6.15	0.41	19	2.7	3.9	1226	2.1	20.00	2.9	7.0	10.9	45.5%	19.2	10.9
52	8.13	0.44	15	3.3	3.1	1647	1.8	20.00	2.7	10.2	13.3	49.9%	18.8	13.3
53	2.44	0.39	300	4.7	13.4	565	3.9	20.00	3.9	2.4	15.8	43.2%	19.0	15.8
54	1.86	0.53	7	15.2	1.1	1207	3.2	20.00	3.6	5.6	6.7	60.4%	16.4	6.7
55	4.10	0.47	13	3.8	2.6	1005	1.6	20.00	2.5	6.7	9.3	53.6%	17.7	9.3
56	0.76	0.58	16	6.5	2.0	335	0.3	20.00	1.1	5.1	7.1	66.6%	15.2	7.1

SUB-BASIN DATA			INITIAL / OVERLAND TIME			TRAVEL TIME T(t)						T(c) CHECK (URBANIZED BASINS)		FINAL T(c)
DRAIN BASIN	AREA ac.	C(5)	Length ft.	Slope %	T(i) min	Length ft.	Slope %	Coeff.	Velocity fps	T(t) min.	COMP. T(c)	% IMPER-VIOUS	USDCM Eq . 6-5	min.
57	1.41	0.39	13	3.9	2.9	441	2.5	20.00	3.2	2.3	5.2	43.5%	18.9	5.2
58	0.38	0.58	19	2.6	3.0	309	1.6	20.00	2.5	2.1	5.1	66.5%	14.9	5.1
59	2.35	0.44	14	3.5	3.0	482	2.5	20.00	3.2	2.5	5.5	49.6%	17.9	5.5
60	0.24	0.65	16	6.2	1.8	208	1.0	20.00	2.0	1.7	3.5	75.5%	13.3	5.0
61	4.25	0.48	17	2.9	3.3	909	2.5	20.00	3.2	4.7	8.0	54.4%	17.3	8.0
62	6.46	0.45	14	3.5	3.0	1118	2.5	20.00	3.2	5.8	8.8	50.8%	18.1	8.8
63	0.65	0.66	13	3.8	1.9	609	3.0	20.00	3.4	3.0	4.9	75.9%	13.4	5.0
64	5.75	0.48	14	3.6	2.7	793	2.9	20.00	3.4	3.9	6.6	54.8%	17.1	6.6
65	0.51	0.67	12	4.3	1.6	430	0.9	20.00	1.9	3.8	5.4	76.9%	13.3	5.4
66	8.71	0.46	12	4.0	2.6	878	1.9	20.00	2.8	5.2	7.8	52.2%	17.8	7.8
67	3.89	0.51	13	3.9	2.4	761	2.1	20.00	2.9	4.4	6.8	58.5%	16.6	6.8
68	4.31	0.29	11	4.7	2.9	744	2.6	20.00	3.2	3.9	6.8	31.2%	21.3	6.8
69	2.21	0.40	11	9.1	2.0	482	1.0	20.00	2.0	4.0	6.0	44.9%	18.9	6.0
70	3.91	0.42	12	4.1	2.7	660	2.6	20.00	3.2	3.4	6.1	46.4%	18.6	6.1
71	8.46	0.45	13	3.8	2.7	1740	1.7	20.00	2.6	11.2	13.9	50.7%	18.8	13.9
72	3.05	0.68	14	3.7	1.8	978	1.5	20.00	2.5	6.5	8.3	78.6%	13.3	8.3
73	0.48	0.59	19	2.6	3.0	312	1.3	20.00	2.3	2.3	5.3	67.3%	14.8	5.3
74	2.83	0.46	16	3.2	3.1	597	1.7	20.00	2.6	3.8	6.9	52.0%	17.6	6.9
75	2.56	0.46	252	4.0	11.6	311	1.3	20.00	2.3	2.3	13.9	51.8%	17.5	13.9
76	0.41	0.58	19	2.6	3.0	336	1.5	20.00	2.4	2.3	5.3	66.5%	14.9	5.3
77	1.48	0.45	300	3.0	14.0	63	3.2	20.00	3.6	0.3	14.3	51.2%	17.3	14.3
78	2.15	0.42	175	1.1	15.5	556	2.5	20.00	3.2	2.9	18.4	47.0%	18.4	18.4
79	0.89	0.43	300	2.7	15.1	432	2.8	20.00	3.3	2.2	17.3	48.3%	18.1	17.3
80	3.90	0.48	12	4.0	2.5	535	2.4	20.00	3.1	2.9	5.4	54.7%	17.0	5.4
81	3.57	0.34	41	1.2	8.1	1047	2.9	20.00	3.4	5.1	13.2	37.6%	20.3	13.2
82	1.71	0.68	15	3.4	2.0	1471	2.4	20.00	3.1	7.9	9.9	78.2%	13.5	9.9

DEARMIN-SWINK - ERIE, CO

CORE Project #: 18.994

Prepared By: GMV

RATIONAL METHOD PEAK RUNOFF

2-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **1.01**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	2yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
1	1	1.28	0.34	9.2	0.43	2.82	1.2					
2	2	10.74	0.09	24.1	0.92	1.80	1.7					
3	3	3.77	0.27	17.8	1.03	2.11	2.2					
4	4	0.36	0.61	5.0	0.22	3.43	0.7					
5	5	1.59	0.32	10.8	0.51	2.65	1.3					
6	6	6.97	0.41	10.1	2.83	2.72	7.7					
7	7	1.16	0.28	5.0	0.33	3.43	1.1					
8	8	7.39	0.38	8.8	2.79	2.87	8.0					
9	9	0.82	0.61	9.5	0.50	2.79	1.4					
10	10	0.91	0.34	8.2	0.31	2.94	0.9					
11	11	4.21	0.16	17.8	0.69	2.11	1.4					
12	12	8.02	0.06	16.6	0.45	2.18	1.0					
13	13	6.13	0.20	14.1	1.23	2.36	2.9					
14	14	6.87	0.07	21.3	0.47	1.92	0.9					
15	15	9.19	0.14	17.3	1.27	2.14	2.7					
16	16	4.10	0.06	21.7	0.25	1.90	0.5					
17	17	0.51	0.52	5.0	0.26	3.43	0.9					
18	18	1.01	0.56	8.7	0.57	2.88	1.6					
19	19	0.22	0.59	5.0	0.13	3.43	0.4					
20	20	4.87	0.38	7.2	1.85	3.08	5.7					
21	21	8.60	0.34	16.8	2.94	2.17	6.4					
22	22	9.66	0.42	11.9	4.06	2.54	10.3					
23	23	1.75	0.46	12.7	0.81	2.47	2.0					
24	24	0.27	0.63	5.0	0.17	3.43	0.6					

RATIONAL METHOD PEAK RUNOFF

2-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **1.01**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	2yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
25	25	2.71	0.39	15.5	1.06	2.26	2.4					
26	26	0.99	0.27	9.3	0.27	2.81	0.7					
27	27	2.92	0.53	9.4	1.55	2.80	4.3					
28	28	0.25	0.83	10.0	0.21	2.73	0.6					
29	29	2.43	0.33	10.4	0.80	2.69	2.2					
30	30	5.68	0.35	9.7	2.02	2.77	5.6					
31	31	8.64	0.43	11.4	3.75	2.59	9.7					
32	32	7.24	0.34	9.7	2.43	2.77	6.7					
33	33	6.70	0.36	7.0	2.42	3.10	7.5					
34	34	9.21	0.37	10.2	3.41	2.71	9.3					
35	35	0.42	0.60	5.0	0.25	3.43	0.9					
36	36	6.92	0.37	17.2	2.54	2.15	5.5					
37	37	3.32	0.42	5.1	1.40	3.41	4.8					
38	38	4.15	0.51	11.2	2.13	2.61	5.6					
39	39	0.49	0.61	5.0	0.30	3.43	1.0					
40	40	3.65	0.38	17.6	1.39	2.12	2.9					
41	41	3.84	0.42	6.8	1.61	3.13	5.0					
42	42	0.33	0.61	5.0	0.20	3.43	0.7					
43	43	3.02	0.40	5.9	1.21	3.27	4.0					
44	44	2.78	0.41	8.3	1.13	2.93	3.3					
45	45	0.44	0.63	5.0	0.28	3.43	0.9					
46	46	2.13	0.44	6.3	0.93	3.21	3.0					
47	47	3.11	0.49	5.0	1.51	3.43	5.2					
48	48	5.34	0.36	7.5	1.92	3.03	5.8					
49	49	8.47	0.28	11.0	2.38	2.63	6.3					
50	50	7.73	0.43	10.3	3.29	2.70	8.9					
51	51	6.15	0.34	10.9	2.11	2.64	5.6					
52	52	8.13	0.38	13.3	3.09	2.42	7.5					

RATIONAL METHOD PEAK RUNOFF

2-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **1.01**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	2yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
53	53	2.44	0.32	15.8	0.79	2.24	1.8					
54	54	1.86	0.47	6.7	0.88	3.15	2.8					
55	55	4.10	0.41	9.3	1.69	2.81	4.8					
56	56	0.76	0.53	7.1	0.40	3.09	1.2					
57	57	1.41	0.33	5.2	0.46	3.39	1.6					
58	58	0.38	0.52	5.1	0.20	3.41	0.7					
59	59	2.35	0.38	5.5	0.89	3.34	3.0					
60	60	0.24	0.61	5.0	0.15	3.43	0.5					
61	61	4.25	0.42	8.0	1.78	2.97	5.3					
62	62	6.46	0.39	8.8	2.51	2.87	7.2					
63	63	0.65	0.61	5.0	0.40	3.43	1.4					
64	64	5.75	0.42	6.6	2.43	3.16	7.7					
65	65	0.51	0.62	5.4	0.32	3.36	1.1					
66	66	8.71	0.40	7.8	3.48	2.99	10.4					
67	67	3.89	0.46	6.8	1.77	3.13	5.5					
68	68	4.31	0.22	6.8	0.97	3.13	3.0					
69	69	2.21	0.34	6.0	0.75	3.26	2.4					
70	70	3.91	0.35	6.1	1.37	3.24	4.4					
71	71	8.46	0.39	13.9	3.28	2.38	7.8					
72	72	3.05	0.63	8.3	1.93	2.93	5.7					
73	73	0.48	0.53	5.3	0.26	3.37	0.9					
74	74	2.83	0.40	6.9	1.13	3.12	3.5					
75	75	2.56	0.40	13.9	1.02	2.38	2.4					
76	76	0.41	0.53	5.3	0.22	3.37	0.7					
77	77	1.48	0.39	14.3	0.58	2.34	1.4					
78	78	2.15	0.36	18.4	0.76	2.08	1.6					
79	79	0.89	0.37	17.3	0.33	2.14	0.7					
80	80	3.90	0.42	5.4	1.64	3.36	5.5					

RATIONAL METHOD PEAK RUNOFF

2-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **1.01**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	2yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
81	81	3.57	0.28	13.2	0.99	2.43	2.4					
82	82	1.71	0.63	9.9	1.08	2.74	3.0					

DEARMIN-SWINK - ERIE, CO

CORE Project #: 18.994

Prepared By: GMV

RATIONAL METHOD PEAK RUNOFF

100-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **2.7**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	100yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
1	1	1.28	0.67	9.2	0.86	7.54	6.5					
2	2	10.74	0.54	24.1	5.78	4.80	27.8					
3	3	3.77	0.64	17.8	2.40	5.64	13.5					
4	4	0.36	0.79	5.0	0.29	9.16	2.6					
5	5	1.59	0.66	10.8	1.05	7.08	7.4					
6	6	6.97	0.70	10.1	4.89	7.28	35.6					
7	7	1.16	0.64	5.0	0.74	9.16	6.8					
8	8	7.39	0.69	8.8	5.08	7.67	38.9					
9	9	0.82	0.80	9.5	0.65	7.45	4.9					
10	10	0.91	0.67	8.2	0.61	7.87	4.8					
11	11	4.21	0.58	17.8	2.44	5.64	13.8					
12	12	8.02	0.52	16.6	4.18	5.84	24.4					
13	13	6.13	0.60	14.1	3.67	6.31	23.2					
14	14	6.87	0.53	21.3	3.63	5.14	18.6					
15	15	9.19	0.57	17.3	5.21	5.72	29.8					
16	16	4.10	0.52	21.7	2.15	5.09	10.9					
17	17	0.51	0.75	5.0	0.38	9.16	3.5					
18	18	1.01	0.77	8.7	0.78	7.70	6.0					
19	19	0.22	0.78	5.0	0.17	9.16	1.6					
20	20	4.87	0.69	7.2	3.35	8.22	27.6					
21	21	8.60	0.67	16.8	5.76	5.80	33.4					
22	22	9.66	0.71	11.9	6.84	6.80	46.5					
23	23	1.75	0.73	12.7	1.27	6.61	8.4					
24	24	0.27	0.80	5.0	0.22	9.16	2.0					

RATIONAL METHOD PEAK RUNOFF

100-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **2.7**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	100yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
25	25	2.71	0.69	15.5	1.88	6.03	11.3					
26	26	0.99	0.63	9.3	0.63	7.51	4.7					
27	27	2.92	0.76	9.4	2.21	7.48	16.6					
28	28	0.25	0.89	10.0	0.22	7.31	1.6					
29	29	2.43	0.66	10.4	1.62	7.19	11.6					
30	30	5.68	0.68	9.7	3.84	7.39	28.4					
31	31	8.64	0.71	11.4	6.17	6.93	42.7					
32	32	7.24	0.67	9.7	4.83	7.39	35.7					
33	33	6.70	0.68	7.0	4.55	8.30	37.8					
34	34	9.21	0.68	10.2	6.30	7.25	45.6					
35	35	0.42	0.79	5.0	0.33	9.16	3.0					
36	36	6.92	0.68	17.2	4.72	5.74	27.1					
37	37	3.32	0.71	5.1	2.35	9.11	21.4					
38	38	4.15	0.75	11.2	3.10	6.98	21.6					
39	39	0.49	0.80	5.0	0.39	9.16	3.6					
40	40	3.65	0.69	17.6	2.51	5.67	14.2					
41	41	3.84	0.71	6.8	2.72	8.38	22.7					
42	42	0.33	0.80	5.0	0.26	9.16	2.4					
43	43	3.02	0.70	5.9	2.11	8.75	18.5					
44	44	2.78	0.70	8.3	1.95	7.83	15.3					
45	45	0.44	0.80	5.0	0.35	9.16	3.2					
46	46	2.13	0.71	6.3	1.52	8.58	13.1					
47	47	3.11	0.74	5.0	2.30	9.16	21.0					
48	48	5.34	0.68	7.5	3.63	8.11	29.4					
49	49	8.47	0.64	11.0	5.42	7.03	38.1					
50	50	7.73	0.71	10.3	5.49	7.22	39.6					
51	51	6.15	0.67	10.9	4.12	7.06	29.1					
52	52	8.13	0.69	13.3	5.60	6.48	36.3					

RATIONAL METHOD PEAK RUNOFF

100-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **2.7**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	100yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
53	53	2.44	0.66	15.8	1.61	5.98	9.6					
54	54	1.86	0.73	6.7	1.36	8.42	11.5					
55	55	4.10	0.70	9.3	2.89	7.51	21.7					
56	56	0.76	0.76	7.1	0.58	8.26	4.8					
57	57	1.41	0.66	5.2	0.93	9.06	8.5					
58	58	0.38	0.76	5.1	0.29	9.11	2.6					
59	59	2.35	0.69	5.5	1.62	8.92	14.4					
60	60	0.24	0.79	5.0	0.19	9.16	1.7					
61	61	4.25	0.71	8.0	3.00	7.94	23.8					
62	62	6.46	0.69	8.8	4.47	7.67	34.3					
63	63	0.65	0.80	5.0	0.52	9.16	4.7					
64	64	5.75	0.71	6.6	4.08	8.46	34.5					
65	65	0.51	0.80	5.4	0.41	8.97	3.7					
66	66	8.71	0.70	7.8	6.08	8.01	48.7					
67	67	3.89	0.72	6.8	2.82	8.38	23.6					
68	68	4.31	0.61	6.8	2.64	8.38	22.1					
69	69	2.21	0.67	6.8	1.48	8.38	12.4					
70	70	3.91	0.67	6.8	2.64	8.38	22.1					
71	71	8.46	0.69	6.8	5.85	8.38	49.0					
72	72	3.05	0.81	6.8	2.46	8.38	20.6					
73	73	0.48	0.76	6.8	0.36	8.38	3.1					
74	74	2.83	0.70	6.8	1.97	8.38	16.5					
75	75	2.56	0.70	6.8	1.78	8.38	14.9					
76	76	0.41	0.76	6.8	0.31	8.38	2.6					
77	77	1.48	0.69	6.8	1.03	8.38	8.6					
78	78	2.15	0.68	6.8	1.45	8.38	12.2					
79	79	0.89	0.68	6.8	0.61	8.38	5.1					
80	80	3.90	0.71	6.8	2.76	8.38	23.1					

RATIONAL METHOD PEAK RUNOFF

100-YR STORM

SF-3 *Rainfall Depth-Duration-Frequency (1-hr) =* **2.7**

-REFERENCE UDFCD Vol.1 EQ 5-1 & EQ 6-1

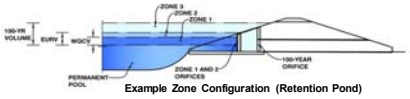
BASIN INFORMATON				DIRECT RUNOFF				TOTAL RUNOFF				
DESIGN POINT	DRAIN BASIN	AREA ac.	100yr RUNOFF COEFF	T(c) min	C x A	I in/hr	Q cfs	T(c) min	SUM C x A	I in/hr	Q cfs	REMARKS
81	81	3.57	0.64	6.8	2.28	8.38	19.1					
82	82	1.71	0.80	6.8	1.38	8.38	11.5					

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

Project: Dearmin - Swink

Basin ID: Basin A



Example Zone Configuration (Retention Pond)

Required Volume Calculation

Selected BMP Type =	EDB	
Watershed Area =	303.27	acres
Watershed Length =	3,635	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	45.30%	percent
Percentage Hydrologic Soil Group A =	8.5%	percent
Percentage Hydrologic Soil Group B =	50.9%	percent
Percentage Hydrologic Soil Groups C/D =	40.6%	percent
Desired WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	
Water Quality Capture Volume (WQCV) =	4.896	acre-feet
Excess Urban Runoff Volume (EURV) =	13.962	acre-feet
2-yr Runoff Volume (P1 = 1.01 in.) =	9.943	acre-feet
5-yr Runoff Volume (P1 = 1.43 in.) =	15.960	acre-feet
10-yr Runoff Volume (P1 = 1.73 in.) =	22.170	acre-feet
25-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet
50-yr Runoff Volume (P1 = 2.4 in.) =	41.050	acre-feet
100-yr Runoff Volume (P1 = 2.7 in.) =	50.546	acre-feet
500-yr Runoff Volume (P1 = 0 in.) =	0.000	acre-feet
Approximate 2-yr Detention Volume =	9.314	acre-feet
Approximate 5-yr Detention Volume =	15.018	acre-feet
Approximate 10-yr Detention Volume =	19.416	acre-feet
Approximate 25-yr Detention Volume =	0.000	acre-feet
Approximate 50-yr Detention Volume =	24.331	acre-feet
Approximate 100-yr Detention Volume =	27.869	acre-feet

Optional User Override 1-hr Precipitation

1.01	inches
1.43	inches
1.73	inches
	inches
2.40	inches
2.70	inches
	inches

Stage-Storage Calculation

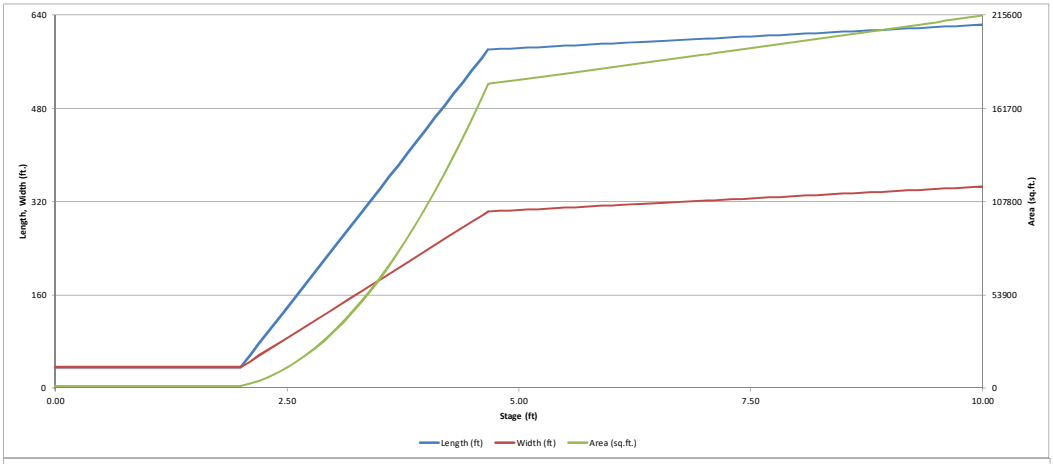
Zone 1 Volume (WQCV) =	4.896	acre-feet
Zone 2 Volume (EURV - Zone 1) =	9.066	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	13.908	acre-feet
Total Detention Basin Volume =	27.869	acre-feet
Initial Surcharge Volume (ISV) =	640	ft^3
Initial Surcharge Depth (ISD) =	0.50	ft
Total Available Detention Depth (H_{total}) =	10.00	ft
Depth of Trickle Channel (H_{TC}) =	1.50	ft
Slope of Trickle Channel (S_{TC}) =	0.005	ft/ft
Slopes of Main Basin Sides (S_{main}) =	4	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	2	
Initial Surcharge Area (A_{ISV}) =	1,280	ft^2
Surcharge Volume Length (L_{ISV}) =	35.8	ft
Surcharge Volume Width (W_{ISV}) =	35.8	ft
Depth of Basin Floor (H_{FLOOR}) =	2.67	ft
Length of Basin Floor (L_{FLOOR}) =	580.6	ft
Width of Basin Floor (W_{FLOOR}) =	302.8	ft
Area of Basin Floor (A_{FLOOR}) =	175,817	ft^2
Volume of Basin Floor (V_{FLOOR}) =	171,004	ft^3
Depth of Main Basin (H_{MAIN}) =	5.33	ft
Length of Main Basin (L_{MAIN}) =	623.2	ft
Width of Main Basin (W_{MAIN}) =	345.5	ft
Area of Main Basin (A_{MAIN}) =	215,299	ft^2
Volume of Main Basin (V_{MAIN}) =	1,040,431	ft^3
Calculated Total Basin Volume (V_{total}) =	**27.869**	acre-feet

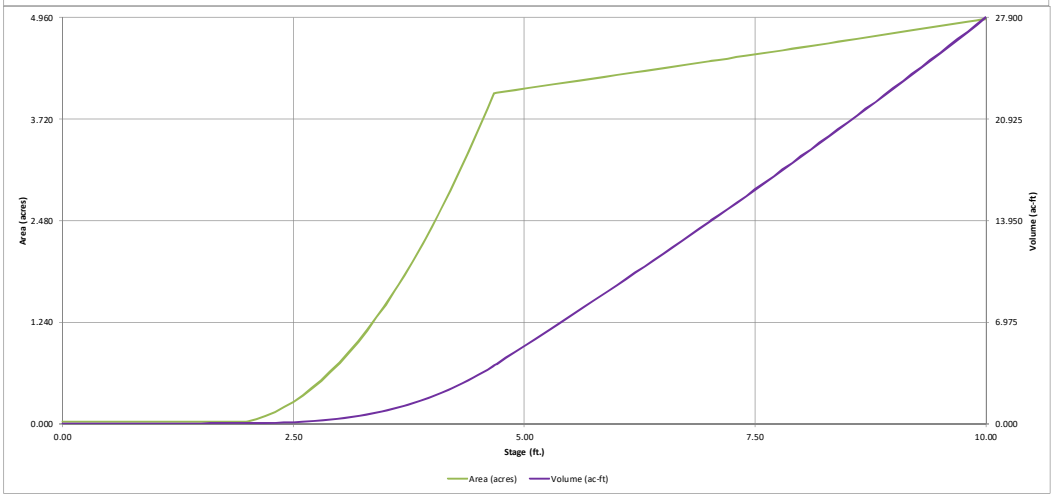
Depth Increment = 0.1 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	0.00		35.8	35.8	1,280		0.029		
ISV	0.50		35.8	35.8	1,280		0.029	627	0.014
	0.60		35.8	35.8	1,280		0.029	755	0.017
	0.70		35.8	35.8	1,280		0.029	883	0.020
	0.80		35.8	35.8	1,280		0.029	1,011	0.023
	0.90		35.8	35.8	1,280		0.029	1,139	0.026
	1.00		35.8	35.8	1,280		0.029	1,267	0.029
	1.10		35.8	35.8	1,280		0.029	1,395	0.032
	1.20		35.8	35.8	1,280		0.029	1,523	0.035
	1.30		35.8	35.8	1,280		0.029	1,651	0.038
	1.40		35.8	35.8	1,280		0.029	1,779	0.041
	1.50		35.8	35.8	1,280		0.029	1,907	0.044
	1.60		35.8	35.8	1,280		0.029	2,035	0.047
	1.70		35.8	35.8	1,280		0.029	2,163	0.050
	1.80		35.8	35.8	1,280		0.029	2,291	0.053
	1.90		35.8	35.8	1,280		0.029	2,419	0.056
	2.00		35.8	35.8	1,280		0.029	2,547	0.058
	2.10		56.2	45.8	2,571		0.059	2,748	0.063
	2.20		76.6	55.8	4,271		0.098	3,087	0.071
	2.30		97.0	65.8	6,378		0.146	3,616	0.083
	2.40		117.4	75.8	8,894		0.204	4,376	0.100
	2.50		137.8	85.8	11,817		0.271	5,408	0.124
	2.60		158.2	95.8	15,149		0.348	6,753	0.155
	2.70		178.6	105.8	18,888		0.434	8,452	0.194
	2.80		199.0	115.8	23,035		0.529	10,545	0.242
	2.90		219.4	125.8	27,591		0.633	13,072	0.300
	3.00		239.8	135.8	32,554		0.747	16,076	0.369
	3.10		260.2	145.8	37,926		0.871	19,597	0.450
	3.20		280.6	155.8	43,705		1.003	23,675	0.544
	3.30		301.0	165.8	49,893		1.145	28,352	0.651
	3.40		321.4	175.8	56,488		1.297	33,667	0.773
	3.50		341.8	185.8	63,492		1.458	39,663	0.911
	3.60		362.2	195.8	70,903		1.628	46,379	1.065
	3.70		382.6	205.8	78,723		1.807	53,857	1.236
	3.80		403.0	215.8	86,950		1.996	62,137	1.426
	3.90		423.4	225.8	95,586		2.194	71,261	1.636
	4.00		443.8	235.8	104,629		2.402	81,268	1.866
	4.10		464.2	245.8	114,081		2.619	92,200	2.117
	4.20		484.6	255.8	123,940		2.845	104,098	2.390
	4.30		505.0	265.8	134,208		3.081	117,002	2.686
	4.40		525.4	275.8	144,883		3.326	130,953	3.006
	4.50		545.8	285.8	155,967		3.581	145,992	3.352
	4.60		566.2	295.8	167,458		3.844	162,160	3.723
Floor	4.67		580.5	302.8	175,745		4.035	174,171	3.998
	4.70		580.8	303.1	176,025		4.041	179,448	4.120
	4.80		581.6	303.9	176,732		4.057	197,086	4.524
Zone 1 (WQCV)	4.90		582.4	304.7	177,441		4.073	214,795	4.931
	5.00		583.2	305.5	178,152		4.090	232,574	5.339
	5.10		584.0	306.3	178,863		4.106	250,425	5.749
	5.20		584.8	307.1	179,576		4.123	268,347	6.160
	5.30		585.6	307.9	180,290		4.139	286,340	6.573
	5.40		586.4	308.7	181,006		4.155	304,405	6.988
	5.50		587.2	309.5	181,722		4.172	322,542	7.405
	5.60		588.0	310.3	182,440		4.188	340,750	7.823
	5.70		588.8	311.1	183,160		4.205	359,030	8.242
	5.80		589.6	311.9	183,880		4.221	377,382	8.663
	5.90		590.4	312.7	184,602		4.238	395,806	9.086
	6.00		591.2	313.5	185,325		4.254	414,302	9.511
	6.10		592.0	314.3	186,050		4.271	432,871	9.937
	6.20		592.8	315.1	186,775		4.288	451,512	10.365
	6.30		593.6	315.9	187,502		4.304	470,226	10.795
	6.40		594.4	316.7	188,230		4.321	489,012	11.226
	6.50		595.2	317.5	188,960		4.338	507,872	11.659
	6.60		596.0	318.3	189,691		4.355	526,804	12.094
	6.70		596.8	319.1	190,423		4.372	545,810	12.530
	6.80		597.6	319.9	191,156		4.388	564,889	12.968
	6.90		598.4	320.7	191,891		4.405	584,041	13.408
	7.00		599.2	321.5	192,627		4.422	603,267	13.849
Zone 2 (EURV)	7.03		599.4	321.7	192,848		4.427	609,049	13.982
	7.10		600.0	322.3	193,364		4.439	622,567	14.292
	7.20		600.8	323.1	194,102		4.456	641,940	14.737
	7.30		601.6	323.9	194,842		4.473	661,387	15.183
	7.40		602.4	324.7	195,583		4.490	680,908	15.632
	7.50		603.2	325.5	196,325		4.507	700,504	16.081
	7.60		604.0	326.3	197,069		4.524	720,174	16.533
	7.70		604.8	327.1	197,814		4.541	739,918	16.986
	7.80		605.6	327.9	198,560		4.558	759,736	17.441
	7.90		606.4	328.7	199,307		4.575	779,630	17.898
	8.00		607.2	329.5	200,056		4.593	799,598	18.356
	8.10		608.0	330.3	200,806		4.610	819,641	18.816
	8.20		608.8	331.1	201,557		4.627	839,759	19.278
	8.30		609.6	331.9	202,310		4.644	859,952	19.742
	8.40		610.4	332.7	203,064		4.662	880,221	20.207
	8.50		611.2	333.5	203,819		4.679	900,565	20.674
	8.60		612.0	334.3	204,575		4.696	920,985	21.143
	8.70		612.8	335.1	205,333		4.714	941,480	21.613
	8.80		613.6	335.9	206,092		4.731	962,051	22.086
	8.90		614.4	336.7	206,852		4.749	982,699	22.560
	9.00		615.2	337.5	207,613		4.766	1,003,422	23.035
	9.10		616.0	338.3	208,376		4.784	1,024,221	23.513
	9.20		616.8	339.1	209,140		4.801	1,045,097	23.992
	9.30		617.6	339.9	209,906		4.819	1,066,049	24.473
	9.40		618.4	340.7	210,672		4.836	1,087,078	24.956
	9.50		619.2	341.5	211,440		4.854	1,108,184	25.440
	9.60		620.0	342.3	212,209		4.872	1,129,366	25.927
	9.70		620.8	343.1	212,980		4.889	1,150,626	26.415
	9.80		621.6	343.9	213,751		4.907	1,171,962	26.905
	9.90		622.4	344.7	214,524		4.925	1,193,376	27.396
Zone 3 (100-year)	10.00		623.2	345.5	215,299		4.943	1,214,867	27.890

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

UD-Detention, Version 3.07 (February 2017)

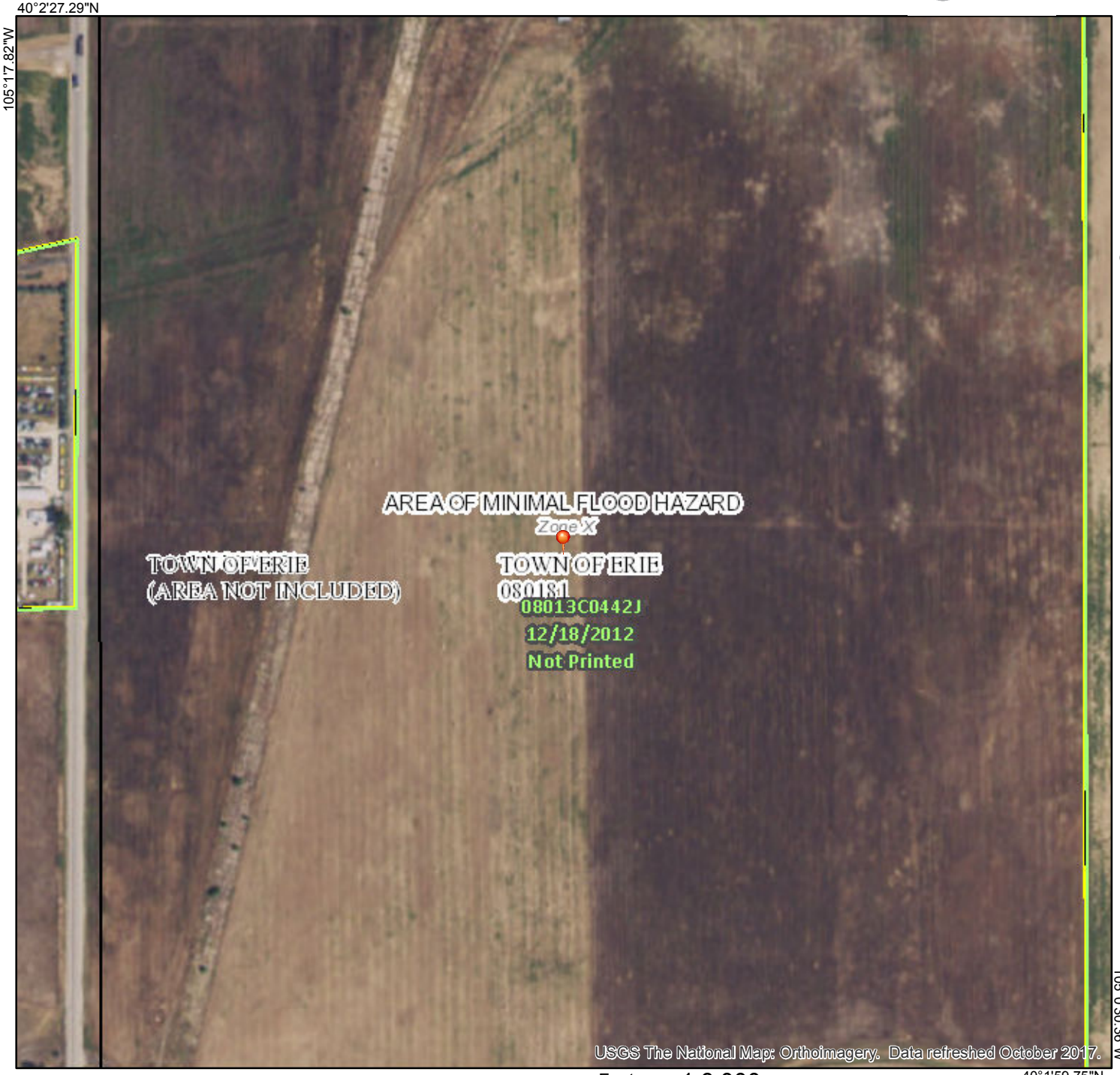




Appendix C – FEMA Map

National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- **SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- **OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- **OTHER AREAS**
  - NO SCREEN — Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- **GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- **OTHER FEATURES**
  - 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transect
  - 513 — Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- **MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/12/2018 at 2:21:10 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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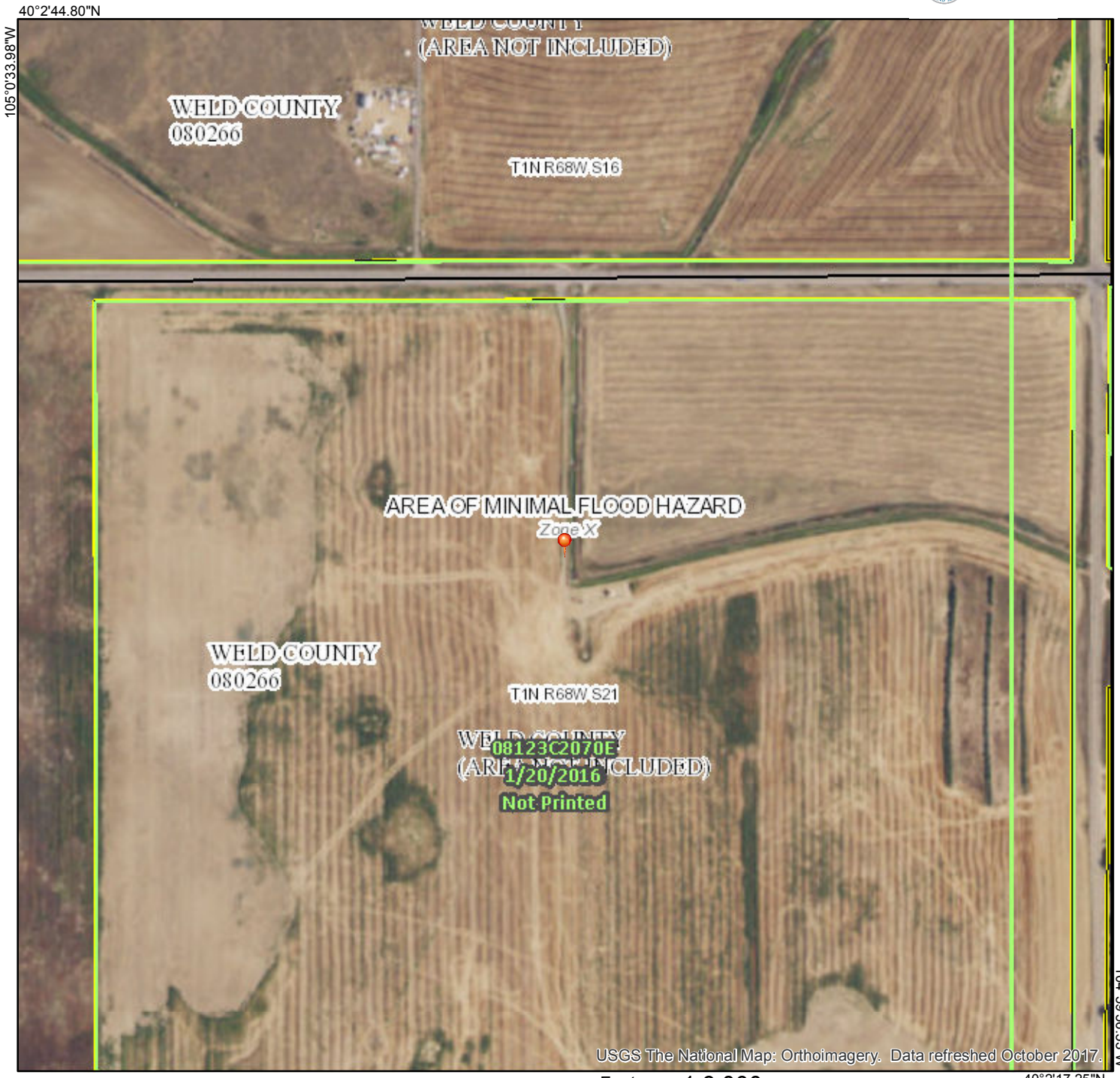
National Flood Hazard Layer FIRMette

FEMA



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
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- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/12/2018 at 2:23:41 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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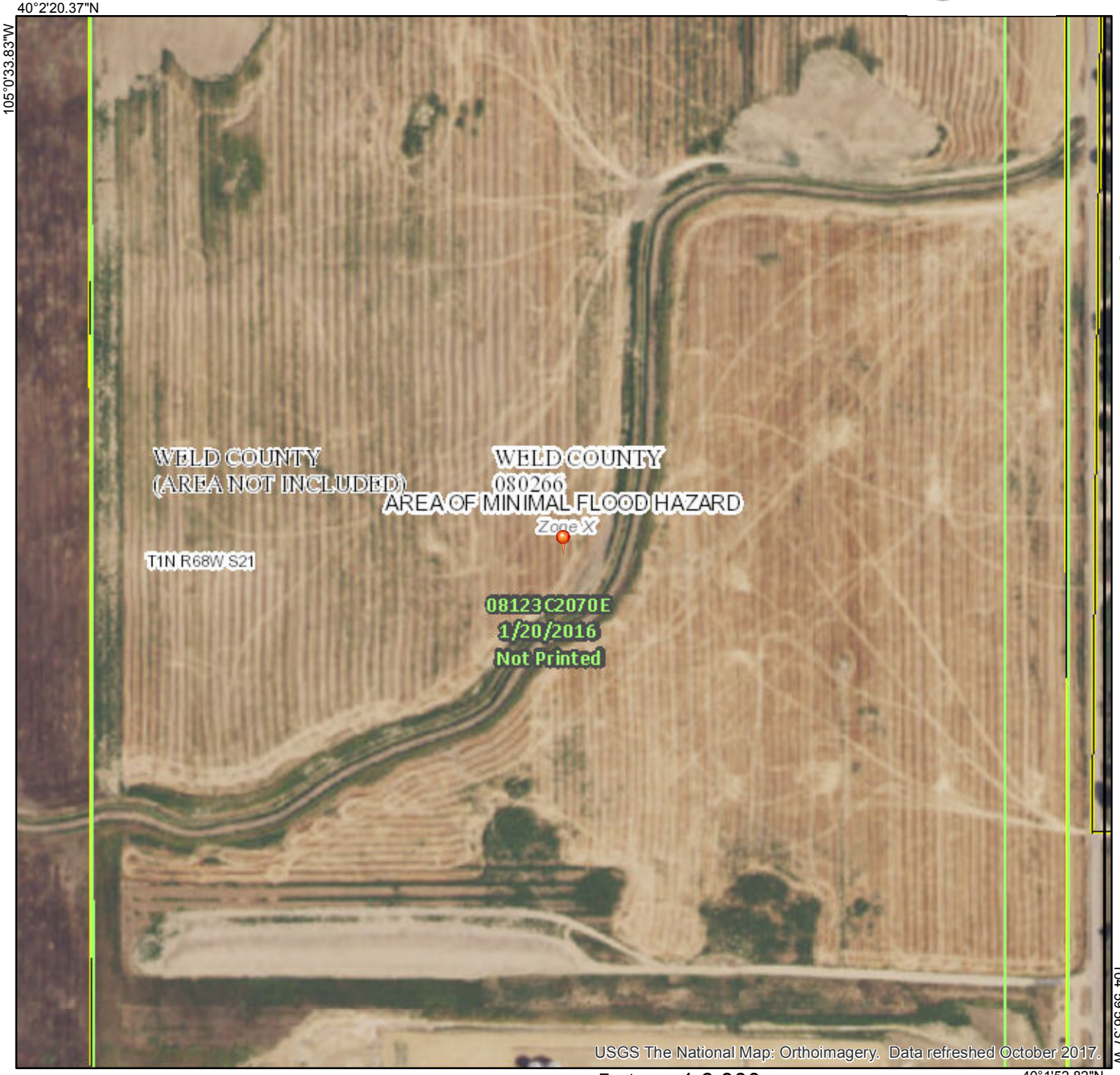
National Flood Hazard Layer FIRMette

FEMA

40°2'20.37"N

105°0'33.83"W



104°59'56.37"W

40°1'52.82"N

Feet 1:6,000

0 250 500 1,000 1,500 2,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
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- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/12/2018 at 2:28:16 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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National Flood Hazard Layer FIRMette

FEMA

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
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- Jurisdiction Boundary
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- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

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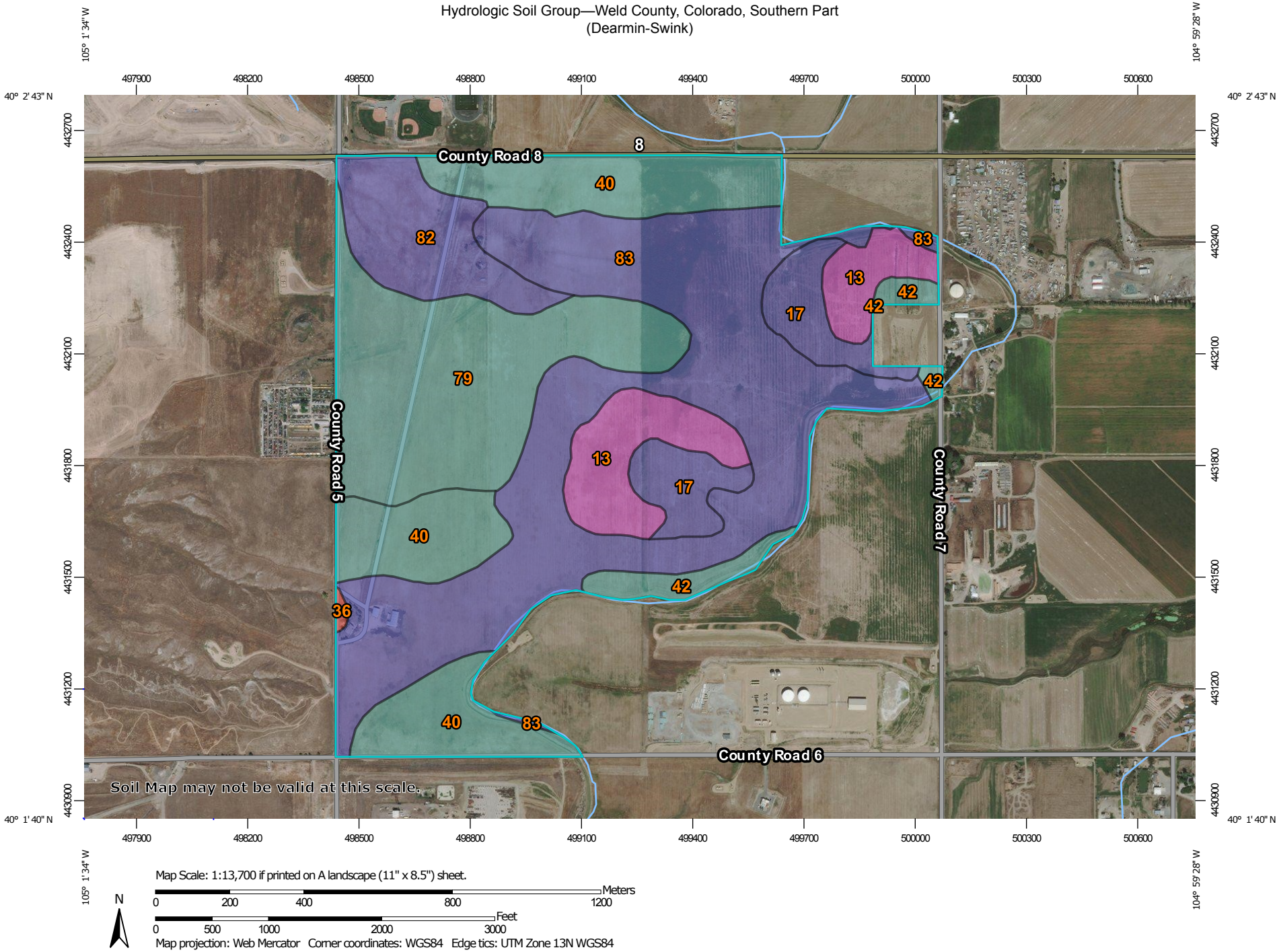
Appendix D – Soils Map

Hydrologic Soil Group—Weld County, Colorado, Southern Part
(Dearmin-Swink)



Map Scale: 1:13,700 if printed on A landscape (11" x 8.5") sheet.

N

0 200 400 800 1200 Meters

0 500 1000 2000 3000 Feet

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

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

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: Weld County, Colorado, Southern Part
Survey Area Data: Version 16, Oct 10, 2017

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

Date(s) aerial images were photographed: Sep 20, 2015—Oct 15, 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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
13	Cascajo gravelly sandy loam, 5 to 20 percent slopes	A	38.2	8.5%
17	Colby loam, 5 to 9 percent slopes	B	27.8	6.2%
36	Midway-Shingle complex, 5 to 20 percent slopes	D	0.7	0.2%
40	Nunn loam, 1 to 3 percent slopes	C	80.7	18.0%
42	Nunn clay loam, 1 to 3 percent slopes	C	12.4	2.8%
79	Weld loam, 1 to 3 percent slopes	C	88.8	19.7%
82	Wiley-Colby complex, 1 to 3 percent slopes	B	33.7	7.5%
83	Wiley-Colby complex, 3 to 5 percent slopes	B	167.3	37.2%
Totals for Area of Interest			**449.6**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Point of Contact for
Matrix Design Group:

Patrick Chelin, PE
1601 Blake St, Suite 200
Denver, CO 80202
Office: 303-572-0200

Matrix DESIGN GROUP

Anniston, AL • Atlanta, GA • Colorado Springs, CO • Denver, CO • Niceville, FL • Parsons, KS • Phoenix, AZ
Pueblo, CO • Sacramento, CA • Tamuning, GU • Texarkana, TX • Washington, DC

Preliminary Traffic Impact Study for:

Dearmin-Swink

Prepared for:

Erie Land Company, LLC
1601 Blake Street, Suite 200
Denver, Colorado 80202

Prepared by:

Matrix DESIGN GROUP

Table of Contents

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Introduction

A 418 acre residential development is being planned on two contiguous parcels in the Town of Erie. The Dearmin parcel is 266.66 acres and the Swink parcel is 151.53 acres. Figure 1 illustrates the general location of the proposed development. As shown, the site is bounded by Erie Parkway on the north, Weld County Road 6 (WCR 6) on the south, Weld County Road 5 (WCR 5) on the west and Weld County Road 7 (WCR 7) on the east.

This report has been prepared to support the Dearmin and Swink properties as they go through the Town of Erie's Annexation, Zoning, Preliminary Plat and PUD processes. The study process was tailored to meet Erie's requirements for a preliminary traffic impact study, which requires the analysis of current and 2040 conditions. Future Final Traffic Studies and Development Agreements will define the responsibilities of the Developer, limits of future improvements and the timing of when infrastructure will be constructed.

Matrix DESIGN GROUP

LEGEND

PROPOSED DEVELOPMENT

DEARMIN-SWINK
PRELIMINARY TIS

Figure 1
VICINITY MAP

Background Conditions

This section describes existing conditions in the vicinity of the proposed development and identifies how the area will likely change over time based on Erie's adopted plans.

Existing Land Use

The Dearmin and Swink parcels are predominantly farmland. The land uses adjacent to the proposed development include:

- North of Erie Parkway – Mostly farmland with Erie High School located in the northeast quadrant of Erie Parkway and WCR 5.
- East of WCR 7 – Mostly farmland with miscellaneous agricultural and industrial uses lining the east side of WCR 7.
- North of WCR 6 – A Crestone petroleum facility is located in the southeast corner of the section.
- South of WCR 6 – Mostly farmland with a regional landfill located in the southeast quadrant of WCR 6 and WCR 5.
- West of WCR 5 – A new residential development is under construction to the west. Farmland and a couple of small businesses currently are directly adjacent to WCR 5. The northwest quadrant of WCR 5 and WCR 6 is part of the Town of Erie's open space system and contains a singletrack.

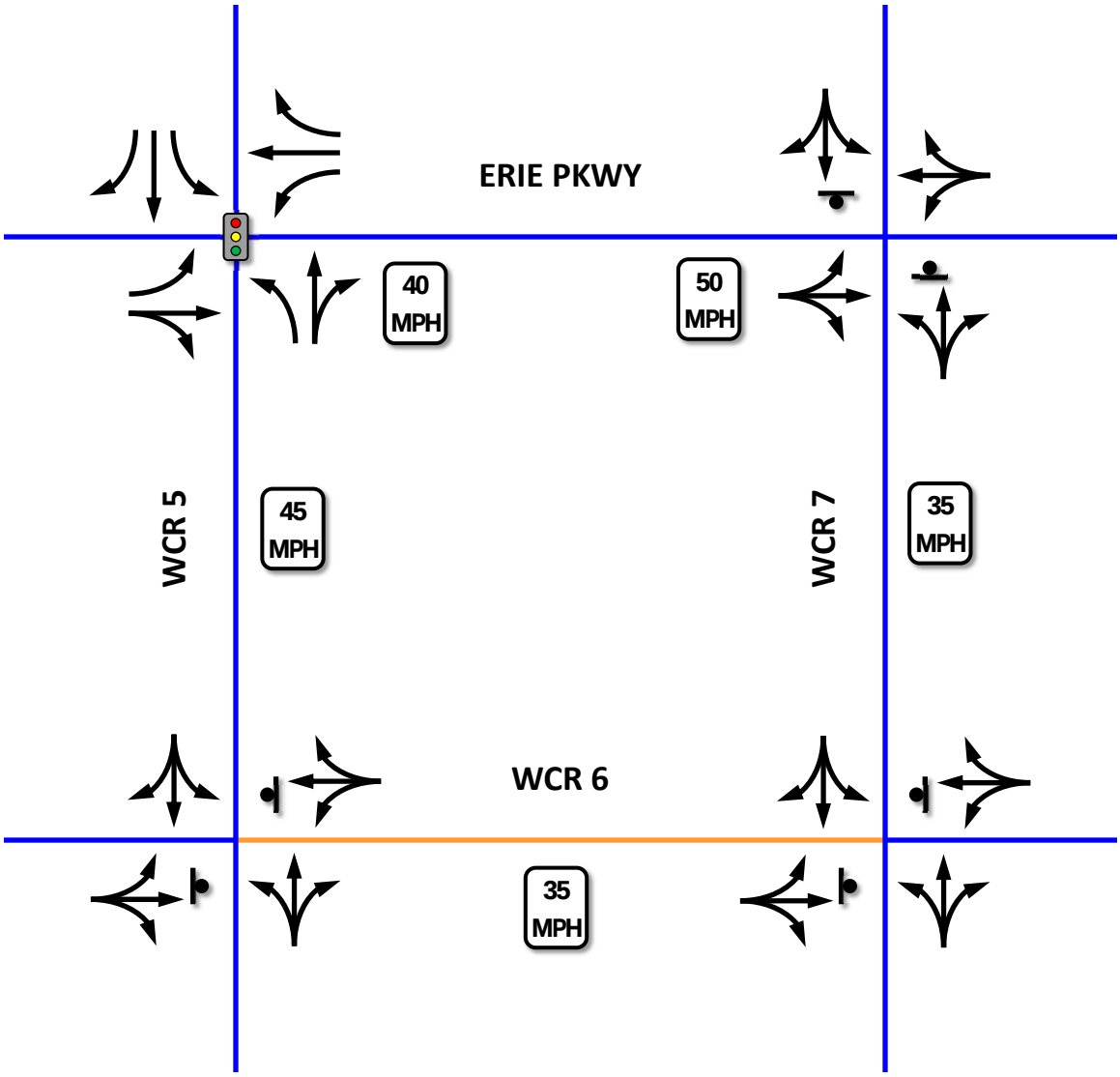
Existing Roadway Network

Figure 2 shows the existing roadway network adjacent to the Dearmin and Swink parcels. Both Erie Parkway and WCR 7 are designated as Principal Arterials, WCR 5 is a Minor Arterial, and WCR 6 is a Collector. Principal arterials are designed primarily for mobility and land access is limited and tightly controlled. For Minor arterials, mobility is still given preference but a higher degree of land access can be permitted. Collectors represent a balance between mobility and land access.

Both Erie Parkway and WCR 5 have bicycle shoulders. None of the roadways adjacent to the proposed development have sidewalks.

Existing Traffic Operations

To determine how efficiently and effectively the perimeter street system accommodates the existing traffic volumes, the key intersections in the vicinity of the proposed development were analyzed using Synchro 9 software. The results are shown as Levels of Service (LOS). LOS is a qualitative measure used to describe the condition of traffic flow and delay, ranging from excellent conditions at LOS A to very poor conditions at LOS F. LOS D is commonly used as the minimum acceptable level of service for urbanized areas.



LEGEND

- 2 LANE PAVED
- 2 LANE UNPAVED
- STOP SIGN
- TRAFFIC SIGNAL
- 40 MPH — SPEED LIMIT
- APPROACH LANES

Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 2

EXISTING ROADWAY NETWORK

Table 1 provides a description of conditions for each level of service at a signalized intersection.

Table 1: Signalized Intersection Level of Service Criteria

Level of Service	Average Stopped Delay*	Description
A	<10	Very low delay. Most vehicles do not stop.
B	>10 to 20	Generally good progression. Slight delays.
C	>20 to 35	Increased number of stopped vehicles
D	>35 to 55	Noticeable congestion.
E	>55 to 80	High delays and frequent cycle failures.
F	>80	Forced flow. Extensive queuing.

*Seconds per vehicle.
Source: *HCM2010 Highway Capacity Manual* (Transportation Research Board, 2010)

For unsignalized (side-street stop controlled) intersections, Synchro 9 software was used again. The software applies the Transportation Research Board's 2010 *Highway Capacity Manual* (HCM) methodology for unsignalized intersections to determine average control delay per vehicle (measured in seconds) for each stop-controlled movement. The method incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side street stop-controlled intersections, delay is represented as the average delay per vehicle for the worst approach, not the overall intersection. Table 2 summarizes the relationship between delay and level of service.

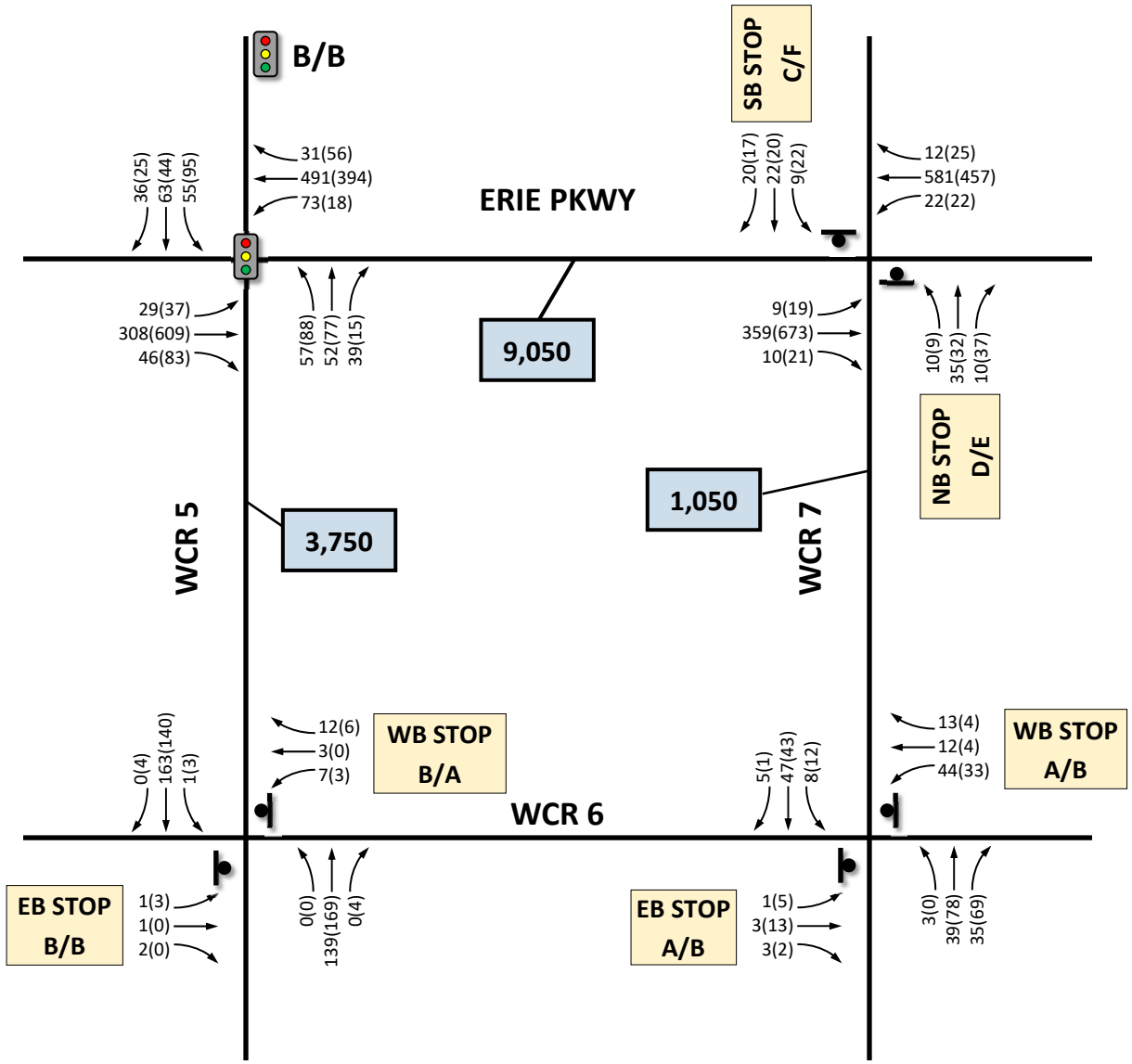
Table 2: Unsignalized Intersection Level of Service Criteria

Level of Service	Average Total Delay (seconds per vehicle)	Description
A	< 10	Little or no conflicting traffic for minor street approach.
B	>10 to 15	Minor street begins to notice absence of available gaps.
C	>15 to 25	Minor street begins experiencing delay for available gaps.
D	>25 to 35	Minor street starts to experience queuing.
E	>35 to 50	Extensive minor street queuing due to insufficient gaps.
F	> 50	Insufficient gaps to allow minor street traffic to cross safely through the major street traffic stream.

Source: *HCM2010 Highway Capacity Manual* (Transportation Research Board, 2010)

Figure 3 shows both the existing peak hour traffic counts and the level of service at the four intersections Erie staff wanted analyzed. Appendix A contains the raw count data for each intersection that was collected in June of this year.

As shown in Figure 3, three of the four intersections operate very well in the peak hours. The fourth intersection, Erie Parkway and WCR 7, meets the minimum acceptable Level of Service in the AM peak hour but the WCR 7 approaches operate either at or over capacity in the PM peak hour. It should be noted the Town of Erie plans to improve this intersection and install a traffic signal within the next couple of years. With these upgrades, this intersection will operate at acceptable service levels. Appendix B contains the analysis output for each intersection and time period.



LEGEND

3,750	DAILY TRAFFIC VOLUME
100(50)	AM(PM) PEAK HOUR TRAFFIC VOLUMES
A/A	AM/PM PEAK HOUR LOS—SIGNALIZED INTERSECTION
EB STOP B/B	AM/PM PEAK HOUR LOS—STOPPED MOVEMENTS
	STOP SIGN
	TRAFFIC SIGNAL

Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 3

EXISTING TRAFFIC OPERATIONS

Future Plans

The Town of Erie recently completed two plans that are applicable to the Dearmin-Swink development. The first is the *Erie Parkway Corridor Study.* This study was completed in 2017 and was intended to identify multimodal transportation improvements to enhance mobility and safety along the entire length of Erie Parkway. The second is the *Erie Transportation Plan.* This plan was completed in January of 2018 and represents an update to the 2008 Transportation Plan. The latest plan provides guidance on how to strategically plan for and accommodate Erie's expected growth over the next 20 plus years. The following are key elements from both plans that apply to the Dearmin-Swink development.

Land Use

Future land use in the vicinity of the Dearmin-Swink development consists of regional commercial and industrial east of WCR 7 and community commercial/residential mixed use west of WCR 7. In the *Erie Transportation Plan*, the traffic analysis zone (TAZ) which contains the parcels for the Dearmin-Swink development showed a total of 330 households and 331 jobs for the entire TAZ.

Roadway

Figure 4 shows the proposed roadway network. As shown, WCR 5, Erie Parkway, and WCR 7 will have two travel lanes in each direction. These travel lanes will be separated by an 18 foot raised median that will accommodate an auxiliary left turn at all full movement intersections. WCR 6 has one travel lane in each direction and it is not clear at this point if the through lanes will be separated by some type of median.

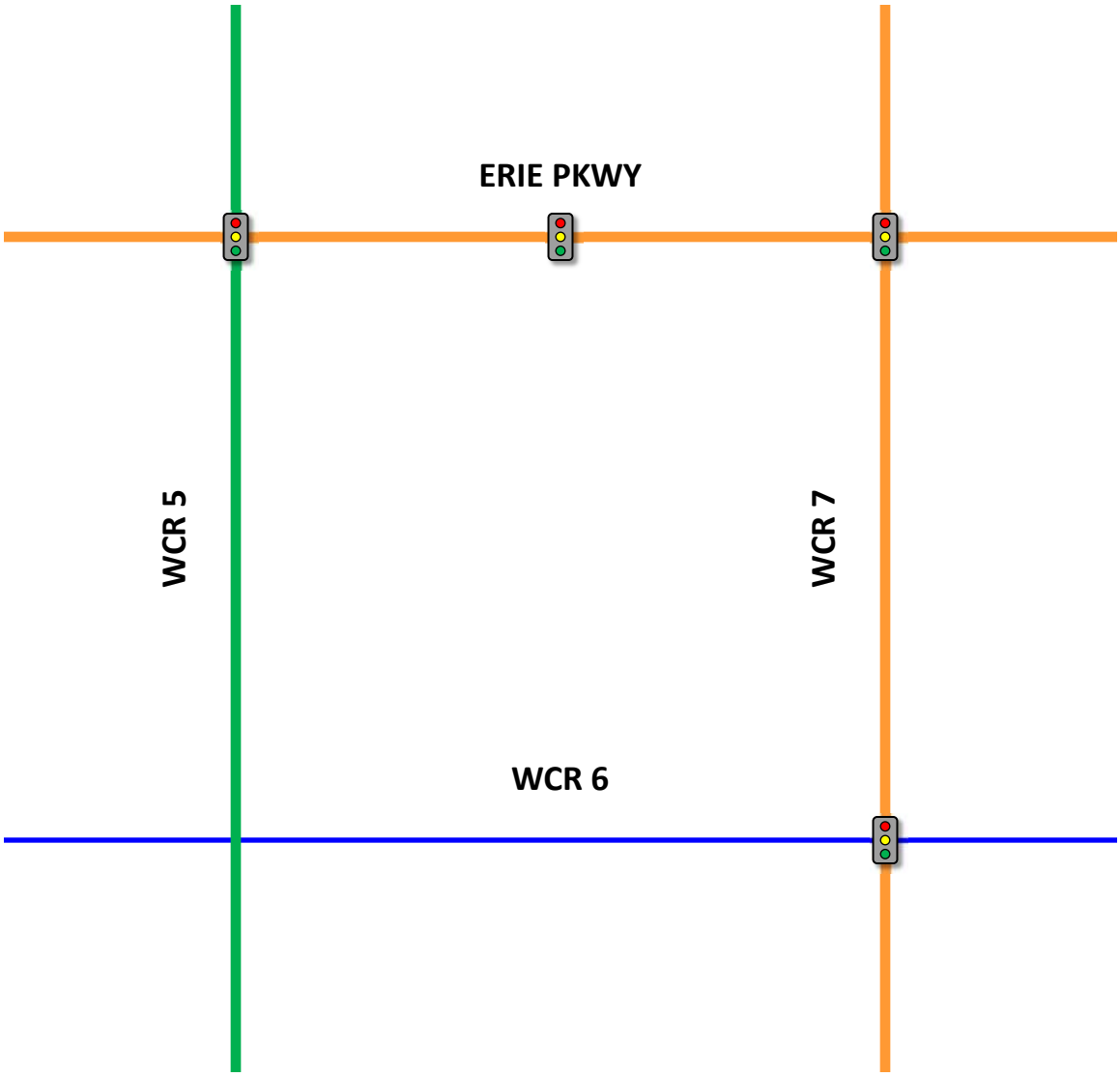
Pedestrians/Bicycles

For pedestrians, both Erie Parkway and WCR 7 will have a 10 foot detached path/bikeway on each side of the street. WCR 5 will have an eight foot detached path/bikeway on each side and WCR 6 will have a five foot detached path only on both sides.

Figure 5 shows the planned bicycle facilities. WCR 5, Erie Parkway, and WCR 7 will have a five foot striped bike lanes in each direction. The *Erie Transportation Plan* does not show bike lanes on WCR 6 but the typical section for various collectors includes bike lanes. The bike lane decision will likely be made during the design process. Through the Dearmin-Swink development, two regional bike facilities are shown. One is a north-south "low stress connector" and the second is a spine trail that will cross Erie Parkway.

Transit

The *Erie Transportation Plan* shows the Jump bus route being extended from the west to I-25 along Erie Parkway. The plan also shows Micro-Mobility Hubs at both the WCR 5/Erie Parkway and the WRC 7/Erie Parkway intersections. These hubs are considered important multi-modal connection points and activity centers.



LEGEND

- 4 LANE PRINCIPAL ARTERIAL
- 4 LANE MINOR ARTERIAL
- 2 LANE COLLECTOR
- TRAFFIC SIGNAL LOCATIONS

SOURCE: ERIE TRANSPORTATION PLAN (2018)

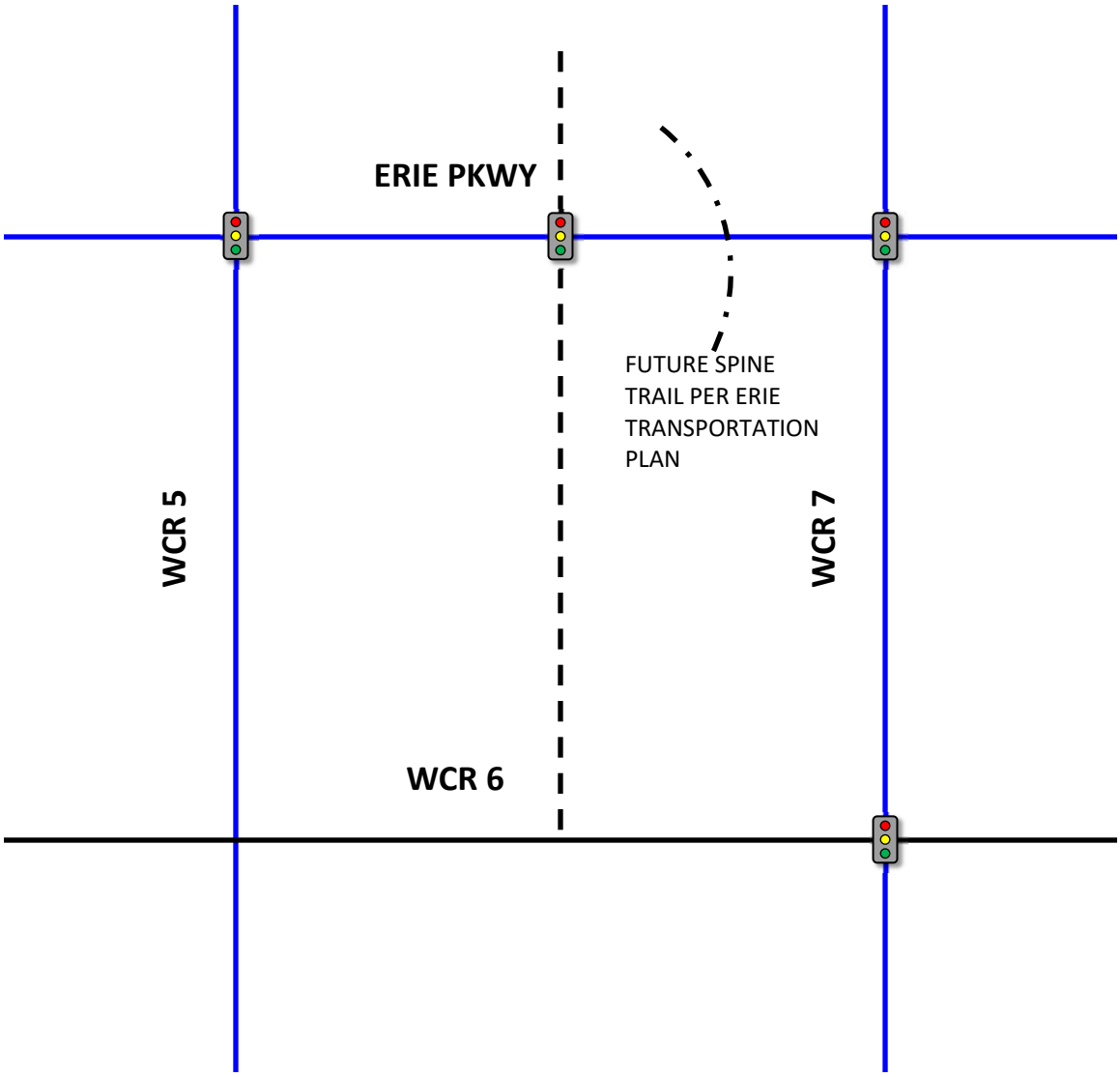
Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 4

PROPOSED ROADWAY NETWORK



LEGEND

- ON-STREET BIKE LANES
- FUTURE ON-STREET LOW STRESS CONNECTOR
- TRAFFIC SIGNAL LOCATIONS

SOURCE: ERIE TRANSPORTATION PLAN (2018)

Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 5

PROPOSED BICYCLE NETWORK

Proposed Development

This section provides specific land use and related vehicle trip information for the proposed development and an assessment of how the proposed development relates to adopted transportation plans.

Project Overview

Figure 6 shows the site plan for the proposed development. It consists of 802 single family detached units, 84 duplex units, 251 townhouse units, 54 live/work units, 21,800 square feet of commercial space, and 6,000 square feet of community space. In addition, the St. Vrain Valley School District is planning to build a middle school (grades six through eight) on 26 acres within the development. It is anticipated this school will have 750 students and 70 to 80 staff members.

As shown in Figure 6, five access points are planned. There are two access points to Erie Parkway, one to WCR 7, and two to WCR 5. There also is a potential future access to Erie Parkway that is not on the Dearmin-Swink property and therefore would be completed by others. Since it will likely connect to the Dearmin-Swink roadway network, it was included in the 2040 analysis.

Trip Generation

The vehicle trips associated with the Dearmin-Swink development were calculated using the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Tenth Edition.* This methodology consists of choosing an independent variable for the land use for a particular time of day. The independent variable correlates to the variation in trip ends and is related to the land use. The value of the independent variable is either multiplied by a weighted average or used in a regression equation to calculate the trips generated by the land use. The *ITE Trip Generation Manual* provides guidance on when to use the weighted average versus the regression equation. In most cases, the regression equations are recommended when there are adequate study data points.

The following ITE Land Use Codes were used in the analysis: Residential – 210; Commercial – 820; Community – 590; and School – 522. The residential code applies to all of the proposed housing types that are planned. Since specific commercial uses are not known at this point, the Land Use Code that includes neighborhood shopping centers was used. The trip rate for this code is 37.75 per 1,000 square feet and is widely considered representative of generic retail uses. The community uses also are not defined at this point and ITE has very little data on community uses. Consequently, the library code was used in this analysis. This should be considered a placeholder and can be refined if needed in the Final Traffic Impact Study. Most likely, the community uses will only generate internal trips. The school code is specific to a middle school.

Table 3 shows the trips that are expected to be generated by the Dearmin-Swink development and middle school.

Matrix DESIGN GROUP

LEGEND

* SITE ACCESS

NORTH

DEARMIN-SWINK
PRELIMINARY TIS

Figure 6
SITE PLAN

Table 3: Trip Generation

Land Use	Daily	AM	In	Out	PM	In	Out
Residential	9,733	812	203	609	1,048	660	388
Commercial	831	21	13	8	176	84	92
Community	426	6	4	2	39	19	20
School	1,598	425	235	200	128	63	65
Total	**12,588**	**1,274**	**455**	**819**	**1,391**	**826**	**565**

Conformance with Adopted Plans

After reviewing both the *Erie Corridor Study* and the *Erie Transportation Plan*, the conformance with adopted plans focuses on the connection of the proposed development to the arterial street network. The *Erie Parkway Corridor Study* showed three new major intersections between WCR 5 and WCR 7 at ¼ mile spacing with the intersection at the ½ mile mark being signalized. The site plan conforms to this recommendation. This new traffic signal is also consistent with the *Erie Transportation Plan.* The proposed access points to WCR 5 are .32 and .54 miles south of Erie Parkway. The *Erie Transportation Plan* recommends ¼ mile spacing for all major intersections. While these intersections do not meet the exact spacing criteria, they are consistent with the spacing intent. The proposed access point to WCR 7 is .17 miles south of Erie Parkway. The location of this intersection was dictated by land ownership and would preclude ¼ mile spacing in the future without restricting various movements.

The site plan is consistent with the two regional bicycle facilities shown in this area in the *Erie Transportation Plan.* All other components of both plans are on the perimeter of the Dearmin-Swink development and are unaffected.

Future Traffic

This section documents the 2040 traffic volumes for the study and provides an explanation on how the volumes were derived.

Trip Distribution

Figure 7 illustrates the expected external distribution of travel for the site-generated trips. The distribution by cardinal direction was based on household and employment commuting characteristics contained in the *Erie Transportation Plan.* The trip distribution by access point was based primarily on directness of travel from each internal traffic analysis zone and the type of traffic control at each access point.

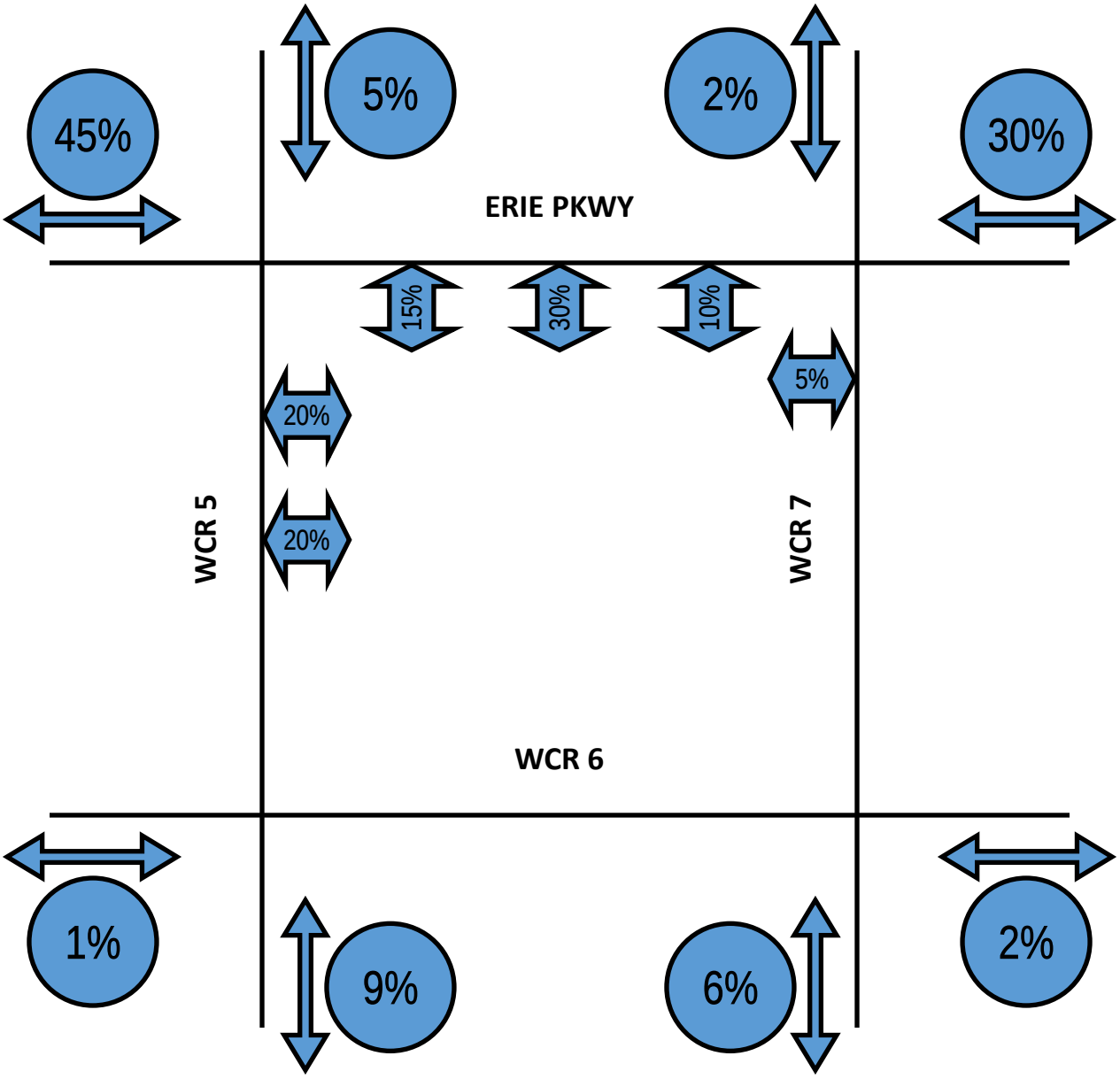
Site Generated Traffic

The site generated trips were assigned to the roadway network based on the trip distribution assumptions. Figure 8 shows the AM and PM peak hour volumes. Internal capture (trips that do not leave the development) were accounted for in the commercial trip rates. Additional internal capture was not applied because the land use mix does not meet the criteria contained in the National Cooperative Highway Research Program (NCHRP) Report 684, which is the definitive guide for determining internal capture. It is likely, however, the community uses also will not generate any trips that either enter or leave the development.

Total Traffic

Figure 9 shows the total daily volumes for the roadway network. The total daily volumes represent both background traffic and site generated traffic. The background traffic volumes for the adjacent roadways came directly from the *Erie Transportation Plan.*

Figure 10 shows the total 2040 peak hour volumes. The peak hour background volumes represent eight percent of the daily volumes, which is typical for a high volume urban area. The individual turning movements were calculated using the link volumes and following the procedures contained in NCHRP 765. It should be noted the background volumes include traffic from TAZ 2759, which includes the Dearmin-Swink development. Since the number of households in the proposed development is 3.4 times higher than what was assumed in the *Erie Transportation Plan,* no adjustments were made. There is, however, a small amount of double counting when the site traffic is added to the background traffic, resulting in a conservation approach.



LEGEND

10% REGIONAL DISTRIBUTION

20% SITE ACCESS DISTRIBUTION

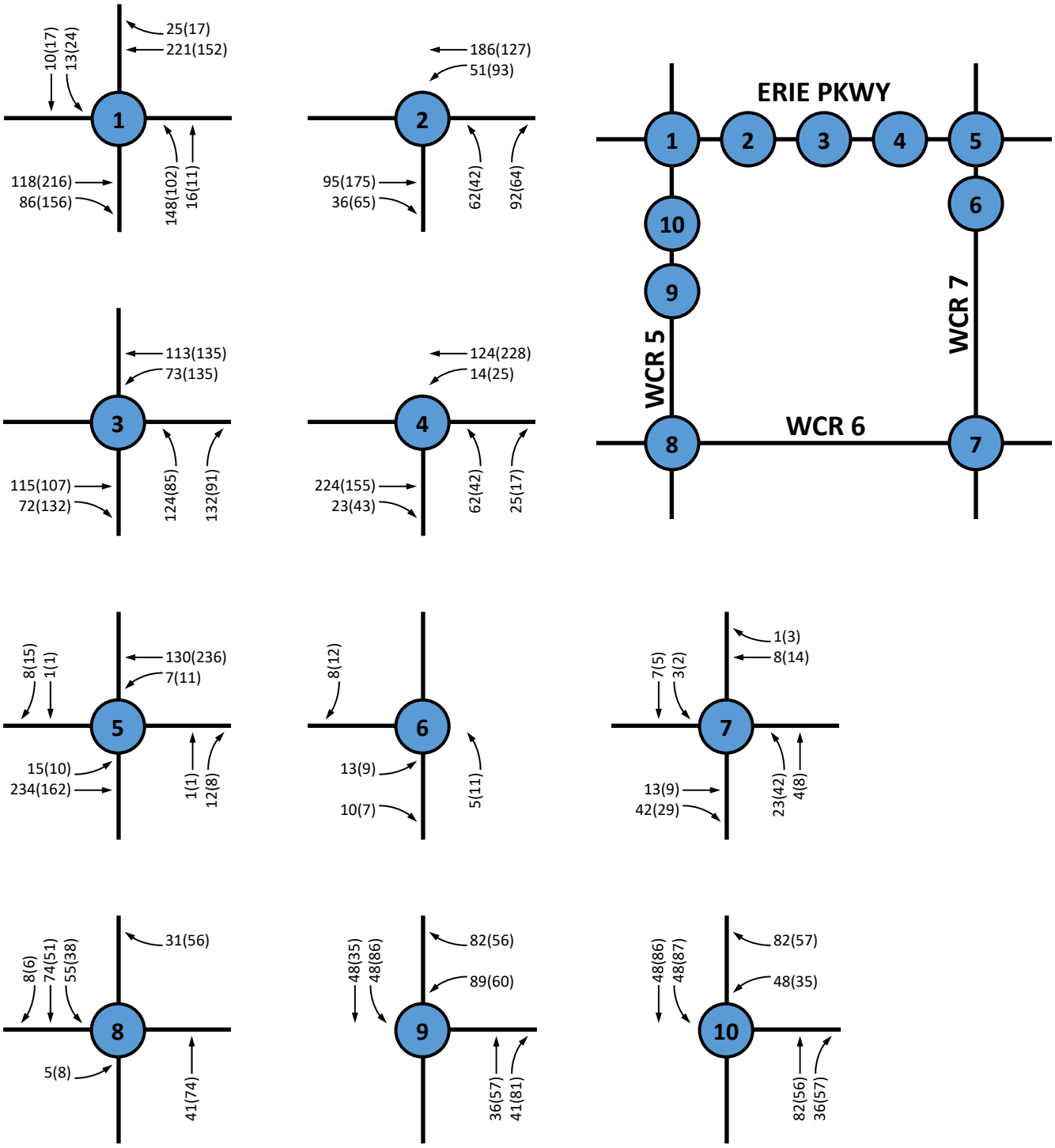
Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 7

TRIP DISTRIBUTION



LEGEND

100(50) → AM(PM) PEAK HOUR TRAFFIC VOLUMES

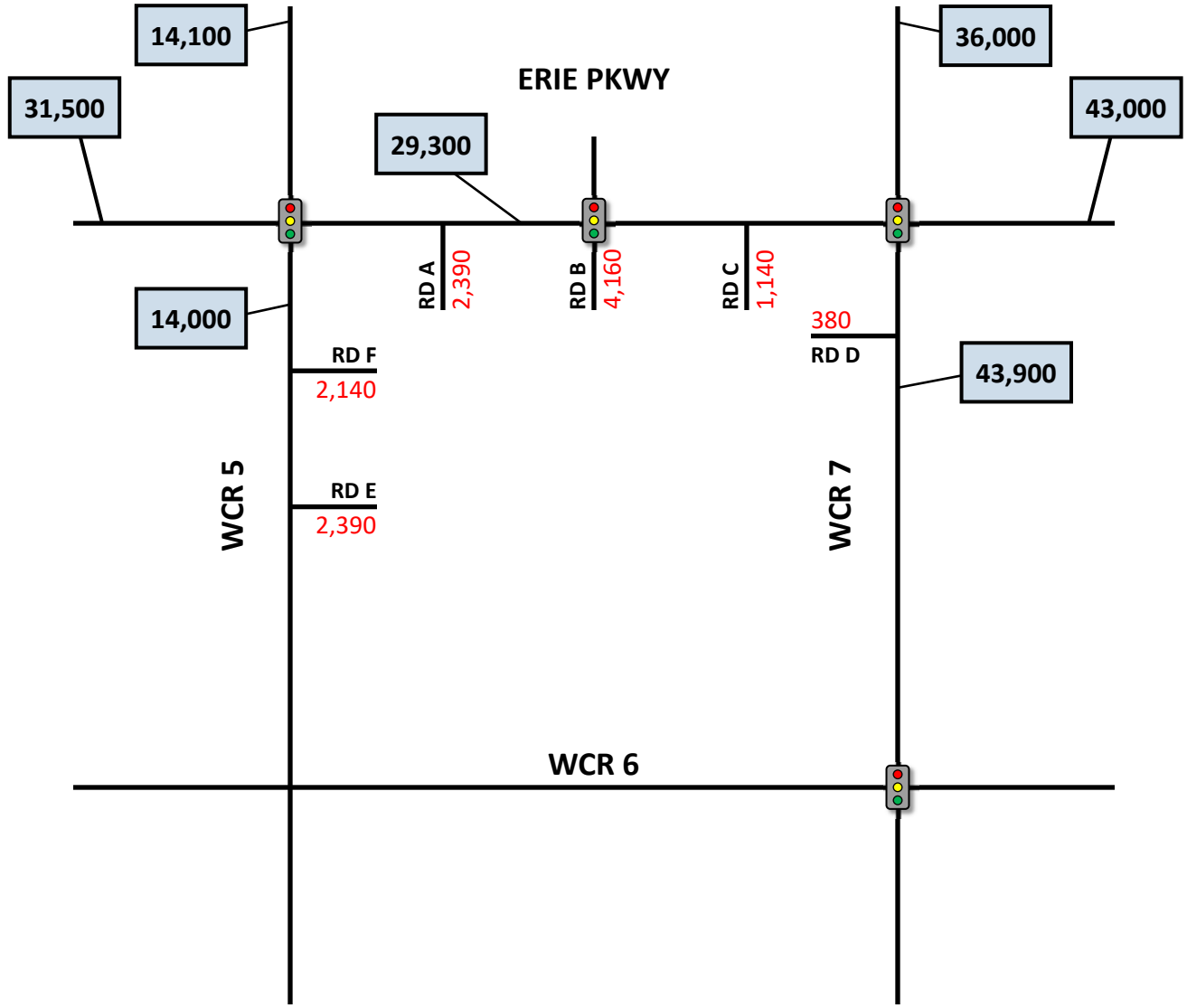
NORTH

Matrix DESIGN GROUP

DEARMIN-SWINK PRELIMINARY TIS

Figure 8

SITE GENERATED TRAFFIC



LEGEND

3,750	DAILY TRAFFIC VOLUME*
	TRAFFIC SIGNAL LOCATION*
RD F	ACCESS TO EXTERNAL STREET SYSTEM
2,390	SITE BUILD-OUT DAILY TRAFFIC VOLUMES

*SOURCE: ERIE TRANSPORTATION PLAN (2018)

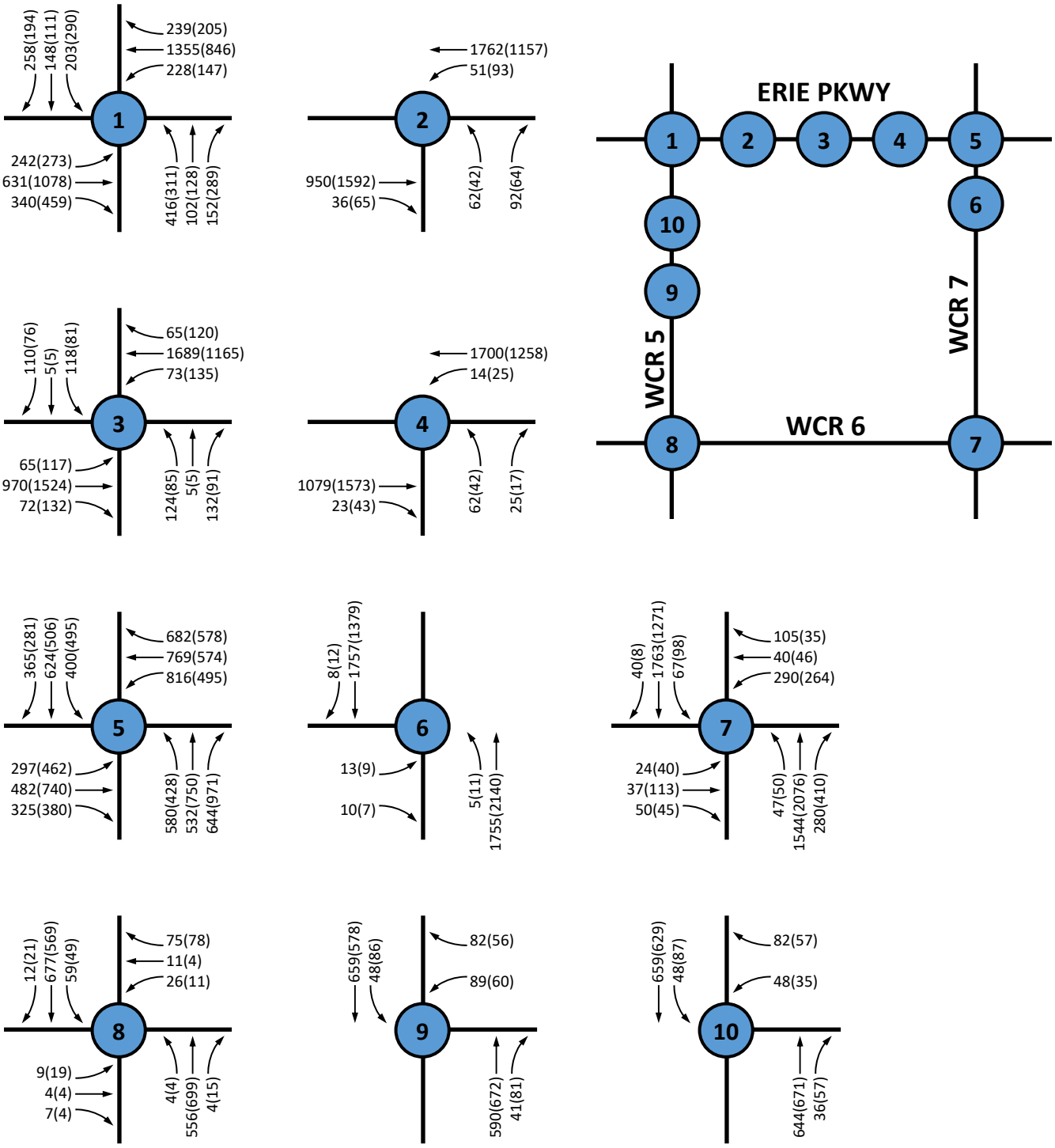
Matrix DESIGN GROUP

NORTH

DEARMIN-SWINK PRELIMINARY TIS

Figure 9

2040 TOTAL DAILY TRAFFIC



LEGEND

100(50) → AM(PM) PEAK HOUR TRAFFIC VOLUMES

NORTH

Matrix DESIGN GROUP

DEARMIN-SWINK PRELIMINARY TIS

Figure 10

2040 TOTAL PEAK HOUR TRAFFIC

Traffic Operations Analysis

Roadway Network

Figure 11 shows the proposed number of lanes for each intersection approach. The number of through lanes is from the *Erie Transportation Plan.* The number of left turn lanes is based on the 2040 peak hour volumes. For any volume over 300, it was assumed two left turn lanes would be needed. The need for a right turn lane was based on information in Colorado's *State Highway Access Code*. Any peak hour volume over 25 vehicles will require an auxiliary right turn lane on Erie Parkway and WCR 7. Any peak hour volume over 50 vehicles will require an auxiliary right turn lane on WCR 5.

Analysis Results

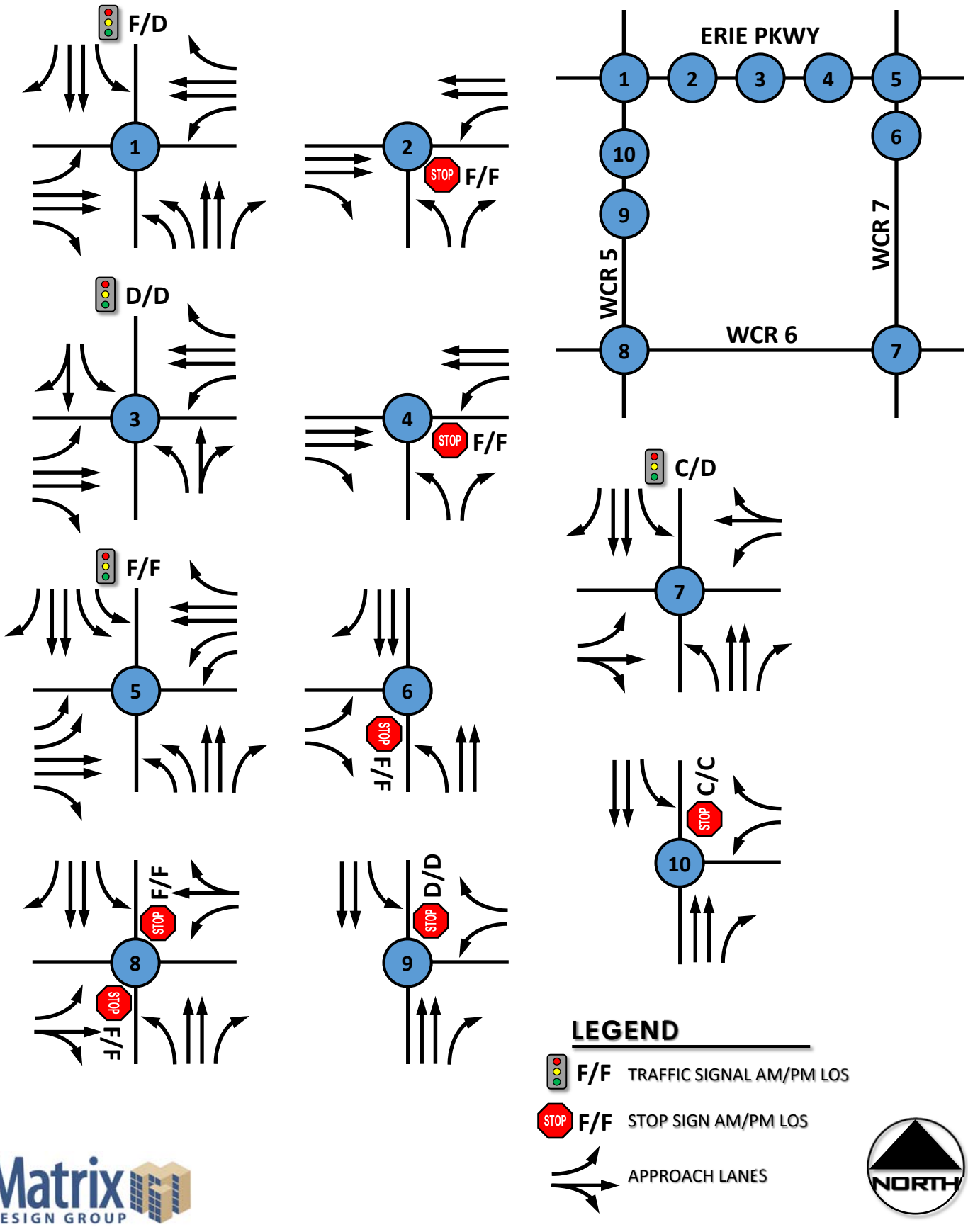
Figure 11 also shows the level of service for each intersection in 2040. Appendix C contains the analysis output for each intersection and time period. The results are summarized below.

External Arterial Intersections

- Erie Parkway and WCR 5 – Acceptable service levels can be achieved by adding a second left turn lane to both the eastbound and westbound approaches.
- Erie Parkway and WCR 7 – This intersection is expected to operate over capacity in both peak hours. The daily volumes on Erie Parkway east of WRC 7 and on WCR 7 south of Erie Parkway exceed the capacity of a four lane arterial. Six through lanes are required for both of these segments. In addition, the high turning movements in each approach to the intersection will likely require a high capacity solution such as a continuous flow intersection.
- WCR 7 and WCR 6 – This intersection is expected to operate at acceptable service levels.
- WCR 5 and WCR 6 – Eastbound and westbound traffic trying to either cross or make a left turn onto WCR 5 will experience long delays. A traffic signal would mitigate this expected problem and meets the Town of Erie's spacing criteria.

Development Access Points

- Erie Parkway and Road A – The left turns out of the development will experience long delays in the AM and PM peak hours.
- Erie Parkway and Road B – This intersection is expected to operate at acceptable service levels in the AM and PM peak hours.
- Erie Parkway and Road C (not part of development and will be done by others) – The northbound to westbound left turns will experience long delays in the AM and PM peak hours.
- WCR 7 and Road D – The left turns out of the development will experience long delays in the AM and PM peak hours.
- WCR 5 and Road E – This intersection is expected to operate at acceptable service levels in both the AM and PM peak hours.
- WCR 5 and Road F – This intersection is expected to operate at acceptable service levels in both the AM and PM peak hours.



Matrix DESIGN GROUP

DEARMIN-SWINK
PRELIMINARY TIS

Figure 11
2040 LEVEL OF SERVICE

Conclusions

The Town of Erie recently completed two plans that are applicable to the Dearmin-Swink development. The first is the *Erie Parkway Corridor Study.* This study was completed in 2017 and was intended to identify multimodal transportation improvements to enhance mobility and safety along the entire length of Erie Parkway. The second is the *Erie Transportation Plan.* This plan was completed in January of 2018 and represents an update to the 2008 Transportation Plan. The latest plan provides guidance on how to strategically plan for and accommodate Erie's expected growth over the next 20 plus years.

Based on this preliminary traffic impact study, the Dearmin-Swink development is in compliance with both plans. The 2040 analysis showed three of the five development access points are expected to operate at acceptable levels of service in both the AM and PM peak hours. At the other two intersections, the access points are under stop sign control and the left turns out of the development are expected to experience long delays for a few hours a day.

The *Erie Transportation Plan* contains an Implementation Section that shows how the transition from the existing to the future arterial roadway network will occur. It appears that it is the Town's policy to require adjacent development to design and construct adjacent roadways. Future Final Traffic Studies and Development Agreements will define the limits of the improvements and required timing.

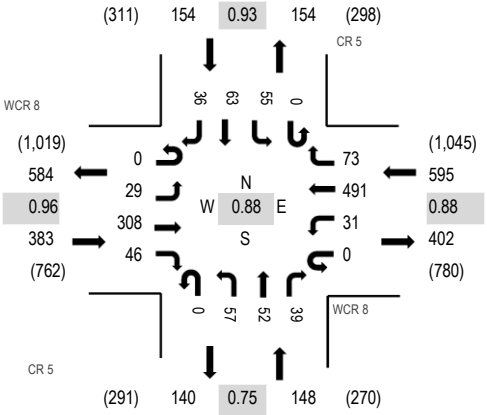
Appendix A: Existing Traffic Counts

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

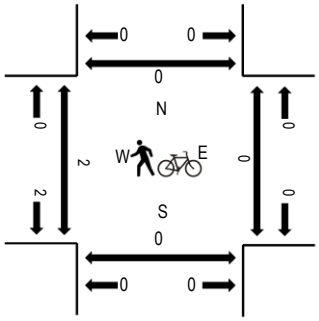
Location: 1 CR 5 & WCR 8 AM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



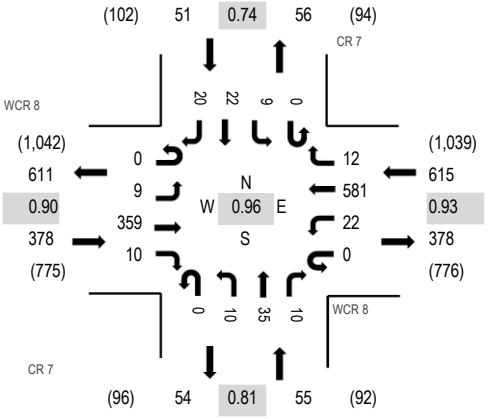
Traffic Counts

Interval Start Time	WCR 8 Eastbound				WCR 8 Westbound				CR 5 Northbound				CR 5 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	5	62	9	0	7	104	23	0	5	6	9	0	12	13	6	261	1,247	0	0	0	0
7:15 AM	0	3	78	8	0	3	134	24	0	8	10	11	0	17	9	3	308	1,280	0	0	0	0
7:30 AM	0	5	84	7	0	5	128	11	0	15	13	5	0	14	16	12	315	1,258	1	0	0	0
7:45 AM	0	16	63	13	0	12	139	22	0	24	18	11	0	11	22	12	363	1,227	0	0	0	0
8:00 AM	0	5	83	18	0	11	90	16	0	10	11	12	0	13	16	9	294	1,141	0	0	0	0
8:15 AM	0	6	83	11	0	4	94	11	0	13	11	10	0	14	19	10	286		0	0	0	0
8:30 AM	0	9	75	18	0	11	72	25	0	13	12	13	0	10	15	11	284		0	0	0	0
8:45 AM	0	11	75	15	0	9	76	14	0	17	11	2	0	13	20	14	277		0	0	0	0
Count Total	0	60	603	99	0	62	837	146	0	105	92	73	0	104	130	77	2,388		1	0	0	0
Peak Hour	0	29	308	46	0	31	491	73	0	57	52	39	0	55	63	36	1,280		1	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

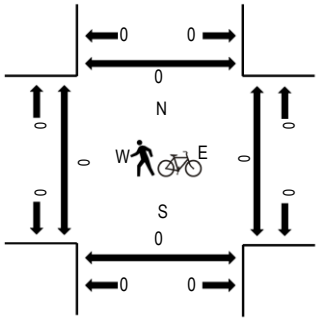
Location: 2 CR 7 & WCR 8 AM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



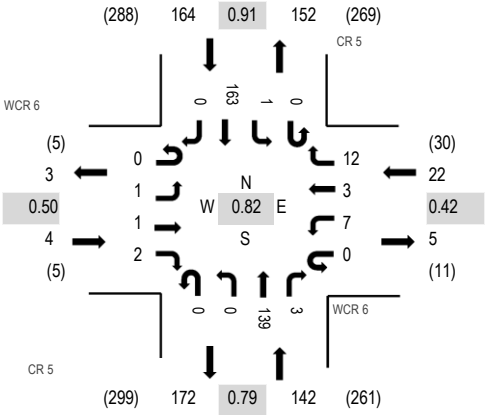
Traffic Counts

Interval Start Time	WCR 8 Eastbound				WCR 8 Westbound				CR 7 Northbound				CR 7 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	1	89	2	0	5	132	3	0	2	8	3	0	1	4	4	254	1,099	0	0	0	0
7:15 AM	0	1	94	1	0	9	148	4	0	4	8	1	0	2	4	5	281	1,083	0	0	0	0
7:30 AM	0	4	100	3	0	3	141	5	0	2	12	3	0	3	6	3	285	1,044	0	0	0	0
7:45 AM	0	3	76	4	0	5	160	0	0	2	7	3	0	3	8	8	279	989	0	0	0	0
8:00 AM	0	0	101	1	0	4	109	5	0	4	4	1	0	2	5	2	238	909	0	0	0	0
8:15 AM	0	5	108	0	0	1	103	4	0	3	2	5	0	0	2	9	242		0	0	0	0
8:30 AM	0	0	91	4	0	3	97	3	0	5	5	5	1	2	6	8	230		0	0	0	0
8:45 AM	0	2	83	2	0	5	86	4	0	0	3	0	0	0	9	5	199		0	0	0	0
Count Total	0	16	742	17	0	35	976	28	0	22	49	21	1	13	44	44	2,008		0	0	0	0
Peak Hour	0	9	359	10	0	22	581	12	0	10	35	10	0	9	22	20	1,099		0	0	0	0

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

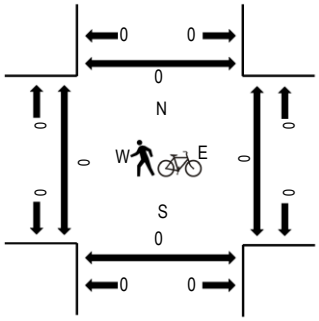
Location: 3 CR 5 & WCR 6 AM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 07:45 AM - 08:45 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	WCR 6 Eastbound				WCR 6 Westbound				CR 5 Northbound				CR 5 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	0	0	0	1	0	0	0	0	20	3	0	1	26	0	51	271	0	0	0	0
7:15 AM	0	0	0	0	0	2	1	1	0	0	32	0	0	0	22	0	58	299	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	31	0	0	0	29	0	61	314	0	0	0	0
7:45 AM	0	0	1	0	0	3	1	9	0	0	42	3	0	0	42	0	101	332	0	0	0	0
8:00 AM	0	1	0	1	0	1	2	1	0	0	27	0	0	0	46	0	79	313	0	0	0	0
8:15 AM	0	0	0	1	0	2	0	1	0	0	34	0	0	1	34	0	73		0	0	0	0
8:30 AM	0	0	0	0	0	1	0	1	0	0	36	0	0	0	41	0	79		0	0	0	0
8:45 AM	0	0	0	1	0	1	0	1	0	0	31	2	0	0	45	1	82		0	0	0	0
Count Total	0	1	1	3	0	11	4	15	0	0	253	8	0	2	285	1	584		0	0	0	0
Peak Hour	0	1	1	2	0	7	3	12	0	0	139	3	0	1	163	0	332		0	0	0	0

All Traffic Data Services Inc.

(303) 216-2439
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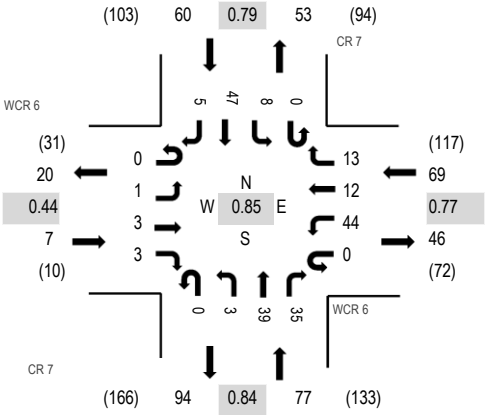
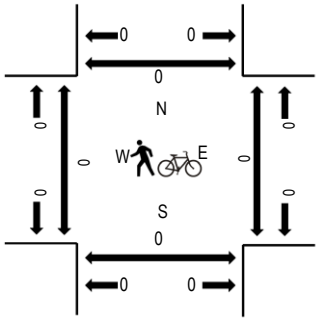
Location: 4 CR 7 & WCR 6 AM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 07:00 AM - 08:00 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	WCR 6 Eastbound				WCR 6 Westbound				CR 7 Northbound				CR 7 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00 AM	0	0	1	3	0	12	2	5	0	0	6	7	0	2	6	1	45	213	0	0	0	0
7:15 AM	0	0	1	0	0	2	0	1	0	1	10	13	0	1	16	1	46	212	0	0	0	0
7:30 AM	0	0	0	0	0	20	2	4	0	1	13	5	0	2	12	0	59	197	0	0	0	0
7:45 AM	0	1	1	0	0	10	8	3	0	1	10	10	0	3	13	3	63	177	0	0	0	0
8:00 AM	0	0	1	0	0	11	4	3	0	0	10	7	0	2	6	0	44	150	0	0	0	0
8:15 AM	0	0	0	0	0	13	1	1	0	0	7	3	0	0	5	1	31		0	0	0	0
8:30 AM	0	0	0	0	0	6	1	3	0	1	10	6	0	0	12	0	39		0	0	0	0
8:45 AM	0	0	1	1	0	2	2	1	0	0	6	6	0	0	16	1	36		0	0	0	0
Count Total	0	1	5	4	0	76	20	21	0	4	72	57	0	10	86	7	363		0	0	0	0
Peak Hour	0	1	3	3	0	44	12	13	0	3	39	35	0	8	47	5	213		0	0	0	0

All Traffic Data Services Inc.
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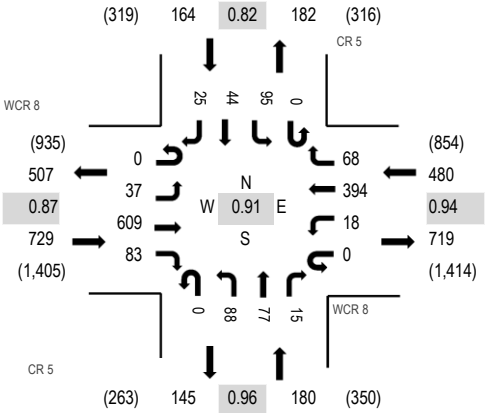
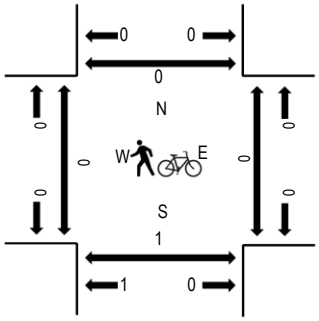
Location: 1 CR 5 & WCR 8 PM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	WCR 8 Eastbound				WCR 8 Westbound				CR 5 Northbound				CR 5 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	7	136	9	0	6	61	15	0	20	17	10	0	24	10	4	319	1,394	0	0	0	0
4:15 PM	1	10	165	15	0	4	79	15	0	24	18	7	0	22	5	10	375	1,465	0	0	0	0
4:30 PM	0	5	152	19	0	3	84	6	0	19	10	6	0	17	11	10	342	1,515	0	0	0	0
4:45 PM	0	7	121	18	0	7	103	16	0	27	16	3	0	19	13	8	358	1,553	0	0	0	0
5:00 PM	0	8	159	21	0	0	94	20	0	18	23	5	0	24	12	6	390	1,534	0	0	0	0
5:15 PM	0	9	178	25	0	3	98	12	0	21	21	5	0	36	11	6	425		0	0	0	0
5:30 PM	0	13	151	19	0	8	99	20	0	22	17	2	0	16	8	5	380		0	0	0	0
5:45 PM	0	9	127	21	0	2	86	13	0	23	9	7	0	22	13	7	339		0	0	0	0
Count Total	1	68	1,189	147	0	33	704	117	0	174	131	45	0	180	83	56	2,928		0	0	0	0
Peak Hour	0	37	609	83	0	18	394	68	0	88	77	15	0	95	44	25	1,553		0	0	0	0

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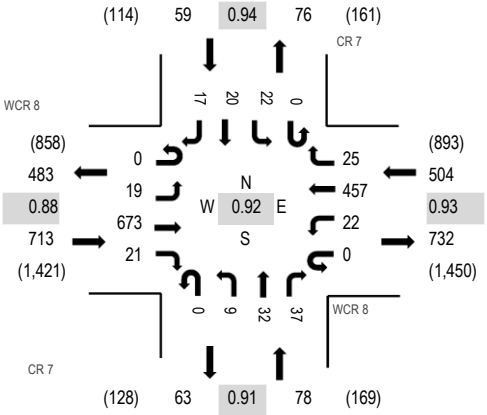
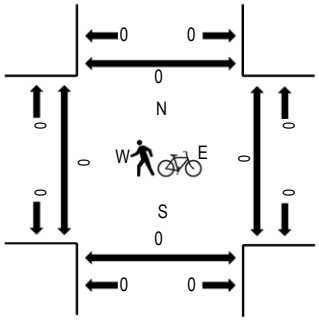
Location: 2 CR 7 & WCR 8 PM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	WCR 8 Eastbound				WCR 8 Westbound				CR 7 Northbound				CR 7 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	6	153	5	0	3	80	3	0	3	13	10	0	2	8	2	288	1,247	0	0	0	0
4:15 PM	0	8	186	4	0	2	86	3	0	1	9	10	0	3	6	5	323	1,290	0	0	0	0
4:30 PM	0	5	176	6	0	6	91	9	0	3	11	11	0	4	6	2	330	1,335	0	0	0	0
4:45 PM	0	3	133	3	0	4	119	8	0	3	12	9	0	4	5	3	306	1,354	0	0	0	0
5:00 PM	0	4	180	5	0	4	102	5	0	1	5	8	0	6	6	5	331	1,350	0	0	0	0
5:15 PM	0	7	194	7	0	7	116	4	0	3	4	10	0	5	5	6	368		0	0	0	0
5:30 PM	0	5	166	6	0	7	120	8	0	2	11	10	0	7	4	3	349		0	0	0	0
5:45 PM	0	4	149	6	0	3	97	6	0	2	8	10	0	4	10	3	302		0	0	0	0
Count Total	0	42	1,337	42	0	36	811	46	0	18	73	78	0	35	50	29	2,597		0	0	0	0
Peak Hour	0	19	673	21	0	22	457	25	0	9	32	37	0	22	20	17	1,354		0	0	0	0

All Traffic Data Services Inc.
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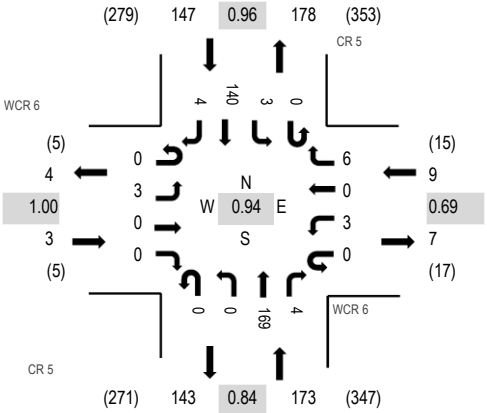
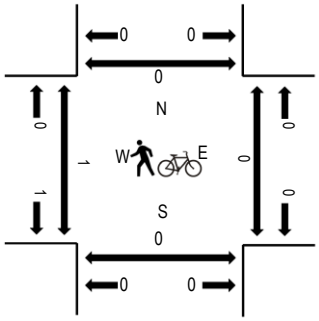
Location: 3 CR 5 & WCR 6 PM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 04:30 PM - 05:30 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

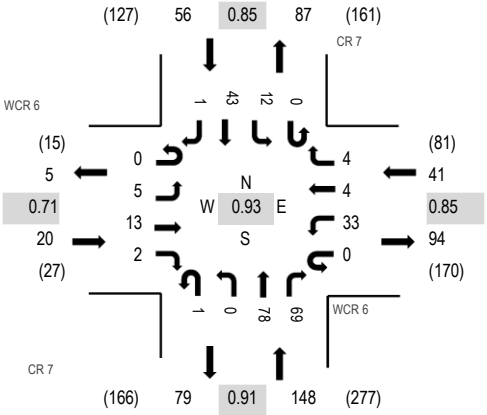
Interval Start Time	WCR 6 Eastbound				WCR 6 Westbound				CR 5 Northbound				CR 5 Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00 PM	0	0	0	0	0	1	0	0	0	0	46	0	0	3	26	0	76	319	0	0	0	0
4:15 PM	0	0	0	0	0	1	0	1	0	0	53	3	0	0	25	0	83	327	0	0	0	0
4:30 PM	0	0	0	0	0	1	0	0	0	0	39	3	0	1	32	1	77	332	0	0	0	0
4:45 PM	0	1	0	0	0	0	0	1	0	0	43	1	0	1	35	1	83	331	0	0	0	0
5:00 PM	0	1	0	0	0	1	0	2	0	0	44	0	0	0	35	1	84	327	0	0	0	0
5:15 PM	0	1	0	0	0	1	0	3	0	0	43	0	0	1	38	1	88		0	0	0	0
5:30 PM	0	1	0	0	0	1	0	2	0	0	33	1	0	1	36	1	76		0	0	0	0
5:45 PM	0	1	0	0	0	0	0	0	0	0	38	0	0	2	38	0	79		0	0	0	0
Count Total	0	5	0	0	0	6	0	9	0	0	339	8	0	9	265	5	646		0	0	0	0
Peak Hour	0	3	0	0	0	3	0	6	0	0	169	4	0	3	140	4	332		0	0	0	0

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

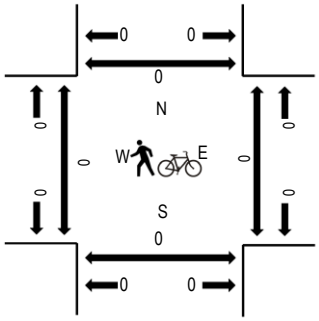
Location: 4 CR 7 & WCR 6 PM
Date and Start Time: Thursday, June 14, 2018
Peak Hour: 04:00 PM - 05:00 PM
Peak 15-Minutes: 04:00 PM - 04:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	WCR 6 Eastbound				WCR 6 Westbound				CR 7 Northbound				CR 7 Southbound				Total	Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	1	6	0	0	9	0	1	0	0	17	19	0	4	13	1	71	265	0	0	0	0
4:15 PM	0	1	1	2	0	8	2	2	0	0	19	22	0	3	8	0	68	261	0	0	0	0
4:30 PM	0	2	4	0	0	11	1	0	1	0	22	15	0	2	12	0	70	250	0	0	0	0
4:45 PM	0	1	2	0	0	5	1	1	0	0	20	13	0	3	10	0	56	243	0	0	0	0
5:00 PM	0	1	1	1	0	8	2	0	0	0	17	21	0	4	12	0	67	247	0	0	0	0
5:15 PM	0	2	0	0	0	7	3	0	0	0	8	16	0	2	19	0	57		0	0	0	0
5:30 PM	0	1	1	0	0	8	2	2	0	2	21	10	0	3	13	0	63		0	0	0	0
5:45 PM	0	0	0	0	1	3	1	3	0	0	19	15	0	2	16	0	60		0	0	0	0
Count Total	0	9	15	3	1	59	12	9	1	2	143	131	0	23	103	1	512		0	0	0	0
Peak Hour	0	5	13	2	0	33	4	4	1	0	78	69	0	12	43	1	265		0	0	0	0

Appendix B: Existing Traffic Level of Service Output

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	308	46	31	491	73	57	52	39	55	63	36
Future Volume (veh/h)	29	308	46	31	491	73	57	52	39	55	63	36
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	32	335	50	34	534	79	62	57	42	60	68	39
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	468	998	149	608	1174	995	395	272	201	376	509	431
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	809	1590	237	998	1870	1585	1287	1000	737	1296	1870	1585
Grp Volume(v), veh/h	32	0	385	34	534	79	62	0	99	60	68	39
Grp Sat Flow(s),veh/h/ln	809	0	1828	998	1870	1585	1287	0	1738	1296	1870	1585
Q Serve(g_s), s	1.9	0.0	8.9	1.5	13.4	1.8	3.4	0.0	4.0	3.4	2.5	1.7
Cycle Q Clear(g_c), s	15.3	0.0	8.9	10.4	13.4	1.8	5.9	0.0	4.0	7.3	2.5	1.7
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.42	1.00		1.00
Lane Grp Cap(c), veh/h	468	0	1147	608	1174	995	395	0	473	376	509	431
V/C Ratio(X)	0.07	0.00	0.34	0.06	0.45	0.08	0.16	0.00	0.21	0.16	0.13	0.09
Avail Cap(c_a), veh/h	468	0	1147	608	1174	995	395	0	473	376	509	431
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.7	0.0	7.9	10.4	8.7	6.6	27.0	0.0	25.3	28.1	24.7	24.4
Incr Delay (d2), s/veh	0.3	0.0	0.8	0.2	1.3	0.2	0.8	0.0	1.0	0.9	0.5	0.4
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	0.4	0.0	3.2	0.3	4.9	0.5	1.1	0.0	1.7	1.1	1.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.0	0.0	8.7	10.5	10.0	6.7	27.8	0.0	26.3	29.0	25.3	24.9
LnGrp LOS	B	A	A	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		417			647			161			167	
Approach Delay, s/veh		9.0			9.6			26.9			26.5	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	29.0	61.0	29.0	61.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	24.5	56.5	24.5	56.5
Max Q Clear Time (g_c+I1), s	7.9	17.3	9.3	15.4
Green Ext Time (p_c), s	0.5	2.6	0.5	4.0

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	1	2	7	3	12	0	139	3	1	163	0
Future Vol, veh/h	1	1	2	7	3	12	0	139	3	1	163	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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	2	8	3	13	0	151	3	1	177	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	340	333	177	334	332	153	177	0	0	154	0	0
Stage 1	179	179	-	153	153	-	-	-	-	-	-	-
Stage 2	161	154	-	181	179	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	614	587	866	620	588	893	1399	-	-	1426	-	-
Stage 1	823	751	-	849	771	-	-	-	-	-	-	-
Stage 2	841	770	-	821	751	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	602	586	866	617	587	893	1399	-	-	1426	-	-
Mov Cap-2 Maneuver	602	586	-	617	587	-	-	-	-	-	-	-
Stage 1	823	750	-	849	771	-	-	-	-	-	-	-
Stage 2	825	770	-	817	750	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	10.1	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1399	-	-	705	736	1426	-	-
HCM Lane V/C Ratio	-	-	-	0.006	0.032	0.001	-	-
HCM Control Delay (s)	0	-	-	10.1	10.1	7.5	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	3	3	44	12	13	3	39	35	8	47	5
Future Vol, veh/h	1	3	3	44	12	13	3	39	35	8	47	5
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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	3	48	13	14	3	42	38	9	51	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	153	158	54	142	141	61	56	0	0	80	0	0
Stage 1	72	72	-	67	67	-	-	-	-	-	-	-
Stage 2	81	86	-	75	74	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	814	734	1013	828	750	1004	1549	-	-	1518	-	-
Stage 1	938	835	-	943	839	-	-	-	-	-	-	-
Stage 2	927	824	-	934	833	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	787	728	1013	817	744	1004	1549	-	-	1518	-	-
Mov Cap-2 Maneuver	787	728	-	817	744	-	-	-	-	-	-	-
Stage 1	936	830	-	941	837	-	-	-	-	-	-	-
Stage 2	898	822	-	922	828	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	9.8	0.3	1
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1549	-	-	838	832	1518	-	-
HCM Lane V/C Ratio	0.002	-	-	0.009	0.09	0.006	-	-
HCM Control Delay (s)	7.3	0	-	9.3	9.8	7.4	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.3	0	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	9	359	10	22	581	12	10	35	10	9	22	20
Future Vol, veh/h	9	359	10	22	581	12	10	35	10	9	22	20
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	390	11	24	632	13	11	38	11	10	24	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	645	0	0	401	0	0	1126	1109	396	1127	1108	639
Stage 1	-	-	-	-	-	-	416	416	-	687	687	-
Stage 2	-	-	-	-	-	-	710	693	-	440	421	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	940	-	-	1158	-	-	182	210	653	182	210	476
Stage 1	-	-	-	-	-	-	614	592	-	437	447	-
Stage 2	-	-	-	-	-	-	424	445	-	596	589	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	940	-	-	1158	-	-	152	200	653	148	200	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	152	200	-	148	200	-
Stage 1	-	-	-	-	-	-	605	584	-	431	433	-
Stage 2	-	-	-	-	-	-	370	431	-	540	581	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	28.1	24.4
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	215	940	-	-	1158	-	-	240
HCM Lane V/C Ratio	0.278	0.01	-	-	0.021	-	-	0.231
HCM Control Delay (s)	28.1	8.9	0	-	8.2	0	-	24.4
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	609	83	18	394	68	88	77	15	95	44	25
Future Volume (veh/h)	37	609	83	18	394	68	88	77	15	95	44	25
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	662	90	20	428	74	96	84	16	103	48	27
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	544	1012	138	342	1174	995	415	416	79	378	509	431
Arrive On Green	0.63	0.63	0.63	0.63	0.63	0.63	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	896	1612	219	711	1870	1585	1325	1527	291	1295	1870	1585
Grp Volume(v), veh/h	40	0	752	20	428	74	96	0	100	103	48	27
Grp Sat Flow(s),veh/h/ln	896	0	1831	711	1870	1585	1325	0	1818	1295	1870	1585
Q Serve(g_s), s	2.0	0.0	23.3	1.6	9.9	1.6	5.3	0.0	3.8	6.0	1.7	1.1
Cycle Q Clear(g_c), s	12.0	0.0	23.3	25.0	9.9	1.6	7.0	0.0	3.8	9.8	1.7	1.1
Prop In Lane	1.00		0.12	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	544	0	1149	342	1174	995	415	0	495	378	509	431
V/C Ratio(X)	0.07	0.00	0.65	0.06	0.36	0.07	0.23	0.00	0.20	0.27	0.09	0.06
Avail Cap(c_a), veh/h	544	0	1149	342	1174	995	415	0	495	378	509	431
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	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	0.0	10.6	18.5	8.1	6.5	27.1	0.0	25.2	29.0	24.5	24.2
Incr Delay (d2), s/veh	0.3	0.0	2.9	0.3	0.9	0.1	1.3	0.0	0.9	1.8	0.4	0.3
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	0.4	0.0	8.5	0.3	3.6	0.5	1.7	0.0	1.7	1.9	0.8	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.2	0.0	13.5	18.8	9.0	6.7	28.4	0.0	26.1	30.8	24.8	24.5
LnGrp LOS	B	A	B	B	A	A	C	A	C	C	C	C
Approach Vol, veh/h		792			522			196			178	
Approach Delay, s/veh		13.4			9.0			27.2			28.2	
Approach LOS		B			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		29.0		61.0		29.0		61.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		24.5		56.5		24.5		56.5				
Max Q Clear Time (g_c+I1), s		9.0		25.3		11.8		27.0				
Green Ext Time (p_c), s		0.6		6.0		0.4		3.0				

Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

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	3	0	0	3	0	6	0	169	4	3	140	4
Future Vol, veh/h	3	0	0	3	0	6	0	169	4	3	140	4
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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	0	3	0	7	0	184	4	3	152	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	350	348	154	346	348	186	156	0	0	188	0	0
Stage 1	160	160	-	186	186	-	-	-	-	-	-	-
Stage 2	190	188	-	160	162	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	605	576	892	608	576	856	1424	-	-	1386	-	-
Stage 1	842	766	-	816	746	-	-	-	-	-	-	-
Stage 2	812	745	-	842	764	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	600	575	892	607	575	856	1424	-	-	1386	-	-
Mov Cap-2 Maneuver	600	575	-	607	575	-	-	-	-	-	-	-
Stage 1	842	764	-	816	746	-	-	-	-	-	-	-
Stage 2	806	745	-	840	762	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	9.8	0	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1424	-	-	600	753	1386	-	-
HCM Lane V/C Ratio	-	-	-	0.005	0.013	0.002	-	-
HCM Control Delay (s)	0	-	-	11	9.8	7.6	0	-
HCM Lane LOS	A	-	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	13	2	33	4	4	0	78	69	12	43	1
Future Vol, veh/h	5	13	2	33	4	4	0	78	69	12	43	1
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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	14	2	36	4	4	0	85	75	13	47	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	201	234	48	205	197	123	48	0	0	160	0	0
Stage 1	74	74	-	123	123	-	-	-	-	-	-	-
Stage 2	127	160	-	82	74	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	757	666	1021	753	699	928	1559	-	-	1419	-	-
Stage 1	935	833	-	881	794	-	-	-	-	-	-	-
Stage 2	877	766	-	926	833	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	745	660	1021	734	693	928	1559	-	-	1419	-	-
Mov Cap-2 Maneuver	745	660	-	734	693	-	-	-	-	-	-	-
Stage 1	935	826	-	881	794	-	-	-	-	-	-	-
Stage 2	868	766	-	900	826	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	10.1	0	1.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1559	-	-	705	745	1419	-	-
HCM Lane V/C Ratio	-	-	-	0.031	0.06	0.009	-	-
HCM Control Delay (s)	0	-	-	10.3	10.1	7.6	0	-
HCM Lane LOS	A	-	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	19	673	21	22	457	25	9	32	37	22	20	17
Future Vol, veh/h	19	673	21	22	457	25	9	32	37	22	20	17
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	732	23	24	497	27	10	35	40	24	22	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	524	0	0	755	0	0	1365	1358	744	1382	1356	511
Stage 1	-	-	-	-	-	-	786	786	-	559	559	-
Stage 2	-	-	-	-	-	-	579	572	-	823	797	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1043	-	-	855	-	-	125	149	415	121	149	563
Stage 1	-	-	-	-	-	-	385	403	-	513	511	-
Stage 2	-	-	-	-	-	-	501	504	-	368	399	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1043	-	-	855	-	-	101	138	415	83	138	563
Mov Cap-2 Maneuver	-	-	-	-	-	-	101	138	-	83	138	-
Stage 1	-	-	-	-	-	-	372	389	-	495	491	-
Stage 2	-	-	-	-	-	-	445	484	-	292	385	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.4	38.4	54.4
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	190	1043	-	-	855	-	-	134
HCM Lane V/C Ratio	0.446	0.02	-	-	0.028	-	-	0.479
HCM Control Delay (s)	38.4	8.5	0	-	9.3	0	-	54.4
HCM Lane LOS	E	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0.1	-	-	2.2

Appendix C: 2040 Level of Service Output – Total Traffic

Intersection	
Int Delay, s/veh	12.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	950	36	51	1762	62	92
Future Vol, veh/h	950	36	51	1762	62	92
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	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1033	39	55	1915	67	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1072	0	2101	517
Stage 1	-	-	-	-	1033	-
Stage 2	-	-	-	-	1068	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	646	-	~ 44	503
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	291	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	646	-	~ 40	503
Mov Cap-2 Maneuver	-	-	-	-	~ 40	-
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	291	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	230.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	40	503	-	-	646	-
HCM Lane V/C Ratio	1.685	0.199	-	-	0.086	-
HCM Control Delay (s)	$ 552.3	13.9	-	-	11.1	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	7	0.7	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	970	72	73	1689	65	124	137	0	118	115	0
Future Volume (veh/h)	65	970	72	73	1689	65	124	137	0	118	115	0
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	1054	78	79	1836	71	135	149	0	128	125	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	134	1886	841	293	1886	841	417	273	0	399	273	0
Arrive On Green	0.04	0.53	0.53	0.04	0.53	0.53	0.14	0.15	0.00	0.14	0.15	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	0	1781	1870	0
Grp Volume(v), veh/h	71	1054	78	79	1836	71	135	149	0	128	125	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	0	1781	1870	0
Q Serve(g_s), s	2.3	25.1	3.1	2.5	63.6	2.8	7.4	9.4	0.0	7.0	7.8	0.0
Cycle Q Clear(g_c), s	2.3	25.1	3.1	2.5	63.6	2.8	7.4	9.4	0.0	7.0	7.8	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.00	1.00		0.00
Lane Grp Cap(c), veh/h	134	1886	841	293	1886	841	417	273	0	399	273	0
V/C Ratio(X)	0.53	0.56	0.09	0.27	0.97	0.08	0.32	0.55	0.00	0.32	0.46	0.00
Avail Cap(c_a), veh/h	317	1892	844	475	1892	844	417	273	0	399	273	0
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.9	19.8	14.7	15.2	28.9	14.6	35.1	50.3	0.0	35.0	49.6	0.0
Incr Delay (d2), s/veh	3.2	0.4	0.0	0.5	14.9	0.0	2.1	7.6	0.0	2.1	5.5	0.0
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	1.2	10.0	1.1	1.0	28.9	1.0	3.5	5.0	0.0	3.3	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	20.2	14.7	15.7	43.7	14.7	37.1	57.9	0.0	37.1	55.0	0.0
LnGrp LOS	C	C	B	B	D	B	D	E	A	D	E	A
Approach Vol, veh/h		1203			1986			284			253	
Approach Delay, s/veh		20.6			41.6			48.0			46.0	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.5	23.0	9.5	71.8	22.5	23.0	9.5	71.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	18.0	18.5	18.0	67.5	18.0	18.5	18.0	67.5
Max Q Clear Time (g_c+I1), s	9.0	11.4	4.5	27.1	9.4	9.8	4.3	65.6
Green Ext Time (p_c), s	0.2	0.4	0.1	9.2	0.2	0.3	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	35.6
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	11	0	26	86	0	4	556	4	59	677	12
Future Vol, veh/h	9	11	0	26	86	0	4	556	4	59	677	12
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	0	-	-	0	-	-	0	-	0	0	-	0
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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	12	0	28	93	0	4	604	4	64	736	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1221	1480	368	1114	1489	302	749	0	0	608	0	0
Stage 1	864	864	-	612	612	-	-	-	-	-	-	-
Stage 2	357	616	-	502	877	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	136	124	629	163	123	694	856	-	-	966	-	-
Stage 1	315	369	-	447	482	-	-	-	-	-	-	-
Stage 2	633	480	-	520	364	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	41	115	629	142	114	694	856	-	-	966	-	-
Mov Cap-2 Maneuver	41	115	-	142	114	-	-	-	-	-	-	-
Stage 1	313	345	-	445	480	-	-	-	-	-	-	-
Stage 2	507	478	-	469	340	-	-	-	-	-	-	-

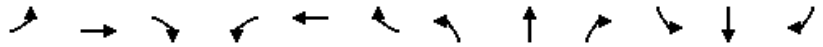
Approach	EB	WB	NB	SB
HCM Control Delay, s	75.2	94	0.1	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	856	-	-	41	115	142	114	966	-	-
HCM Lane V/C Ratio	0.005	-	-	0.239	0.104	0.199	0.82	0.066	-	-
HCM Control Delay (s)	9.2	-	-	118.4	39.9	36.5	111.4	9	-	-
HCM Lane LOS	A	-	-	F	E	E	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.3	0.7	4.8	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	87	0	290	145	0	47	1544	280	67	1763	40
Future Volume (veh/h)	24	87	0	290	145	0	47	1544	280	67	1763	40
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	95	0	315	158	0	51	1678	304	73	1916	43
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	575	0	422	575	0	102	2151	959	125	2151	959
Arrive On Green	0.31	0.31	0.00	0.31	0.31	0.00	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	1228	1870	0	1301	1870	0	224	3554	1585	219	3554	1585
Grp Volume(v), veh/h	26	95	0	315	158	0	51	1678	304	73	1916	43
Grp Sat Flow(s),veh/h/ln	1228	1870	0	1301	1870	0	224	1777	1585	219	1777	1585
Q Serve(g_s), s	1.7	3.8	0.0	24.1	6.6	0.0	14.8	36.5	9.7	26.0	47.7	1.1
Cycle Q Clear(g_c), s	8.3	3.8	0.0	27.9	6.6	0.0	62.5	36.5	9.7	62.5	47.7	1.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	369	575	0	422	575	0	102	2151	959	125	2151	959
V/C Ratio(X)	0.07	0.17	0.00	0.75	0.27	0.00	0.50	0.78	0.32	0.58	0.89	0.04
Avail Cap(c_a), veh/h	568	879	0	633	879	0	102	2151	959	125	2151	959
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	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	26.1	0.0	36.3	27.0	0.0	47.0	15.2	10.0	41.8	17.5	8.3
Incr Delay (d2), s/veh	0.1	0.1	0.0	2.7	0.3	0.0	3.8	1.9	0.2	6.8	5.1	0.0
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	0.5	1.7	0.0	7.8	3.0	0.0	1.4	13.6	3.1	2.1	18.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	26.2	0.0	38.9	27.3	0.0	50.7	17.1	10.1	48.6	22.6	8.3
LnGrp LOS	C	C	A	D	C	A	D	B	B	D	C	A
Approach Vol, veh/h		121			473			2033			2032	
Approach Delay, s/veh		27.1			35.0			16.9			23.2	
Approach LOS		C			D			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		67.0		36.3		67.0		36.3				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		62.5		48.5		62.5		48.5				
Max Q Clear Time (g_c+I1), s		64.5		10.3		64.5		29.9				
Green Ext Time (p_c), s		0.0		0.6		0.0		1.9				

Intersection Summary												
HCM 6th Ctrl Delay			21.8									
HCM 6th LOS			C									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	482	325	816	769	682	580	532	644	400	624	365
Future Volume (veh/h)	297	482	325	816	769	682	580	532	644	400	624	365
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	323	524	353	887	836	741	630	578	700	435	678	397
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	493	2443	1090	897	2443	1090	179	844	376	195	844	376
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	630	3554	1585	1227	3554	1585	1018	3554	1585	840	3554	1585
Grp Volume(v), veh/h	323	524	353	887	836	741	630	578	700	435	678	397
Grp Sat Flow(s),veh/h/ln	315	1777	1585	613	1777	1585	509	1777	1585	420	1777	1585
Q Serve(g_s), s	51.5	6.5	10.7	76.0	11.5	32.9	6.9	17.8	28.5	10.7	21.6	28.5
Cycle Q Clear(g_c), s	63.1	6.5	10.7	82.5	11.5	32.9	28.5	17.8	28.5	28.5	21.6	28.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	493	2443	1090	897	2443	1090	179	844	376	195	844	376
V/C Ratio(X)	0.66	0.21	0.32	0.99	0.34	0.68	3.52	0.68	1.86	2.23	0.80	1.05
Avail Cap(c_a), veh/h	493	2443	1090	897	2443	1090	179	844	376	195	844	376
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.5	6.9	7.5	26.7	7.7	11.0	58.9	41.7	45.7	57.9	43.1	45.7
Incr Delay (d2), s/veh	3.1	0.0	0.2	27.2	0.1	1.7	1149.7	2.3	396.8	569.8	5.7	61.5
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	8.6	2.2	3.3	16.7	3.9	10.4	31.2	8.0	52.5	18.4	10.0	17.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.7	6.9	7.7	53.9	7.7	12.7	1208.5	44.0	442.6	627.7	48.8	107.2
LnGrp LOS	C	A	A	D	A	B	F	D	F	F	D	F
Approach Vol, veh/h		1200			2464			1908			1510	
Approach Delay, s/veh		11.7			25.8			574.7			230.9	
Approach LOS		B			C			F			F	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	33.0	87.0	33.0	87.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	82.5	28.5	82.5
Max Q Clear Time (g_c+I1), s	30.5	65.1	30.5	84.5
Green Ext Time (p_c), s	0.0	10.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	215.1
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	11.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1079	23	14	1700	62	25
Future Vol, veh/h	1079	23	14	1700	62	25
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	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1173	25	15	1848	67	27

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1198	0	2127	587
Stage 1	-	-	-	-	1173	-
Stage 2	-	-	-	-	954	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	578	-	~ 43	453
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	335	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	578	-	~ 42	453
Mov Cap-2 Maneuver	-	-	-	-	~ 42	-
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	335	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	$ 367.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	42	453	-	-	578	-
HCM Lane V/C Ratio	1.605	0.06	-	-	0.026	-
HCM Control Delay (s)	$ 510.3	13.5	-	-	11.4	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	6.9	0.2	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	10	5	1755	1757	8
Future Vol, veh/h	13	10	5	1755	1757	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	11	5	1908	1910	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2874	955	1919	0	-	0
Stage 1	1910	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	~ 13	259	304	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	331	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 13	259	304	-	-	-
Mov Cap-2 Maneuver	~ 13	-	-	-	-	-
Stage 1	100	-	-	-	-	-
Stage 2	331	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 387.2	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	304	-	13	259	-	-
HCM Lane V/C Ratio	0.018	-	1.087	0.042	-	-
HCM Control Delay (s)	17.1	-	$ 670	19.5	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.4	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	82	598	41	48	659
Future Vol, veh/h	89	82	598	41	48	659
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	97	89	650	45	52	716

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1112	325	0	0	695	0
Stage 1	650	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	203	671	-	-	897	-
Stage 1	481	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	191	671	-	-	897	-
Mov Cap-2 Maneuver	191	-	-	-	-	-
Stage 1	453	-	-	-	-	-
Stage 2	601	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.1	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	191	671	897	-
HCM Lane V/C Ratio	-	-	0.506	0.133	0.058	-
HCM Control Delay (s)	-	-	41.7	11.2	9.3	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	2.5	0.5	0.2	-

Intersection	
Int Delay, s/veh	2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	82	644	36	48	659
Future Vol, veh/h	48	82	644	36	48	659
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	89	700	39	52	716

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1162	350	0	0	739	0
Stage 1	700	-	-	-	-	-
Stage 2	462	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	188	646	-	-	863	-
Stage 1	454	-	-	-	-	-
Stage 2	601	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	177	646	-	-	863	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	601	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.7	0	0.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	177	646	863	-
HCM Lane V/C Ratio	-	-	0.295	0.138	0.06	-
HCM Control Delay (s)	-	-	33.6	11.5	9.4	-
HCM Lane LOS	-	-	D	B	A	-
HCM 95th %tile Q(veh)	-	-	1.2	0.5	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	631	340	228	1355	239	416	102	152	203	148	258
Future Volume (veh/h)	242	631	340	228	1355	239	416	102	152	203	148	258
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	263	686	370	248	1473	260	452	111	165	221	161	280
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	1658	740	241	1658	740	916	1629	726	546	1629	726
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	279	3554	1585	534	3554	1585	1840	3554	1585	1103	3554	1585
Grp Volume(v), veh/h	263	686	370	248	1473	260	452	111	165	221	161	280
Grp Sat Flow(s),veh/h/ln	279	1777	1585	534	1777	1585	920	1777	1585	1103	1777	1585
Q Serve(g_s), s	10.7	15.3	19.5	40.7	45.3	12.6	22.2	2.1	7.6	16.8	3.1	13.9
Cycle Q Clear(g_c), s	56.0	15.3	19.5	56.0	45.3	12.6	25.3	2.1	7.6	18.9	3.1	13.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	85	1658	740	241	1658	740	916	1629	726	546	1629	726
V/C Ratio(X)	3.10	0.41	0.50	1.03	0.89	0.35	0.49	0.07	0.23	0.40	0.10	0.39
Avail Cap(c_a), veh/h	85	1658	740	241	1658	740	916	1629	726	546	1629	726
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	21.1	22.3	44.7	29.1	20.4	25.6	18.2	19.6	23.5	18.4	21.4
Incr Delay (d2), s/veh	974.5	0.2	0.5	65.5	6.3	0.3	1.9	0.1	0.7	2.2	0.1	1.5
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	25.5	6.2	7.1	11.6	19.6	4.5	4.8	0.8	2.8	4.5	1.2	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1032.9	21.3	22.8	110.2	35.5	20.7	27.5	18.3	20.4	25.7	18.6	22.9
LnGrp LOS	F	C	C	F	D	C	C	B	C	C	B	C
Approach Vol, veh/h		1319			1981			728			662	
Approach Delay, s/veh		223.4			42.9			24.5			22.8	
Approach LOS		F			D			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	59.5	60.5	59.5	60.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	55.0	56.0	55.0	56.0
Max Q Clear Time (g_c+I1), s	27.3	58.0	20.9	58.0
Green Ext Time (p_c), s	4.2	0.0	2.9	0.0

Intersection Summary	
HCM 6th Ctrl Delay	88.0
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	21.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↱	↰	↑↑	↰	↱
Traffic Vol, veh/h	1592	65	93	1157	42	64
Future Vol, veh/h	1592	65	93	1157	42	64
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	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1730	71	101	1258	46	70

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1801	0	2561	865
Stage 1	-	-	-	-	1730	-
Stage 2	-	-	-	-	831	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	338	-	~ 21	297
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	388	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	338	-	~ 15	297
Mov Cap-2 Maneuver	-	-	-	-	~ 15	-
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	388	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	$ 583
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	15	297	-	-	338	-
HCM Lane V/C Ratio	3.043	0.234	-	-	0.299	-
HCM Control Delay (s)	$ 1439.7	20.8	-	-	20.1	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	6.5	0.9	-	-	1.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	1524	132	135	1165	120	85	96	91	81	81	0
Future Volume (veh/h)	117	1524	132	135	1165	120	85	96	91	81	81	0
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	1657	143	147	1266	130	92	104	99	88	88	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	1728	771	174	1743	777	476	220	210	335	289	0
Arrive On Green	0.05	0.49	0.49	0.06	0.49	0.49	0.15	0.25	0.25	0.05	0.15	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	881	839	1781	1870	0
Grp Volume(v), veh/h	127	1657	143	147	1266	130	92	0	203	88	88	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	0	1719	1781	1870	0
Q Serve(g_s), s	4.2	53.6	6.1	5.0	33.7	5.4	4.4	0.0	12.0	4.9	5.0	0.0
Cycle Q Clear(g_c), s	4.2	53.6	6.1	5.0	33.7	5.4	4.4	0.0	12.0	4.9	5.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.49	1.00		0.00
Lane Grp Cap(c), veh/h	237	1728	771	174	1743	777	476	0	430	335	289	0
V/C Ratio(X)	0.54	0.96	0.19	0.85	0.73	0.17	0.19	0.00	0.47	0.26	0.30	0.00
Avail Cap(c_a), veh/h	409	1740	776	174	1743	777	476	0	430	335	290	0
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.5	29.6	17.3	28.1	24.1	16.9	29.2	0.0	38.1	39.3	44.8	0.0
Incr Delay (d2), s/veh	1.9	13.2	0.1	30.0	1.5	0.1	0.9	0.0	3.7	0.4	0.6	0.0
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	1.8	24.4	2.2	3.4	13.7	1.9	2.0	0.0	5.5	2.2	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.4	42.7	17.5	58.1	25.6	17.0	30.1	0.0	41.7	39.7	45.4	0.0
LnGrp LOS	C	D	B	E	C	B	C	A	D	D	D	A
Approach Vol, veh/h		1927			1543			295			176	
Approach Delay, s/veh		39.5			28.0			38.1			42.6	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	34.4	11.4	62.6	22.5	22.9	10.9	63.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.6	29.9	7.0	58.5	18.0	18.5	18.0	47.5
Max Q Clear Time (g_c+I1), s	6.9	14.0	7.0	55.6	6.4	7.0	6.2	35.7
Green Ext Time (p_c), s	0.0	1.0	0.0	2.4	0.1	0.3	0.2	6.8

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	8	0	11	82	0	4	699	15	49	569	21
Future Vol, veh/h	19	8	0	11	82	0	4	699	15	49	569	21
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	0	-	-	0	-	-	0	-	0	0	-	0
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	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	9	0	12	89	0	4	760	16	53	618	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1157	1508	309	1188	1515	380	641	0	0	776	0	0
Stage 1	724	724	-	768	768	-	-	-	-	-	-	-
Stage 2	433	784	-	420	747	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	151	120	687	144	118	618	939	-	-	836	-	-
Stage 1	383	429	-	360	409	-	-	-	-	-	-	-
Stage 2	571	402	-	581	418	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	47	112	687	129	110	618	939	-	-	836	-	-
Mov Cap-2 Maneuver	47	112	-	129	110	-	-	-	-	-	-	-
Stage 1	381	402	-	359	407	-	-	-	-	-	-	-
Stage 2	444	400	-	532	392	-	-	-	-	-	-	-

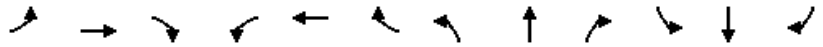
Approach	EB	WB	NB	SB
HCM Control Delay, s	104.5	103.2	0	0.7
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	939	-	-	47	112	129	110	836	-	-
HCM Lane V/C Ratio	0.005	-	-	0.439	0.078	0.093	0.81	0.064	-	-
HCM Control Delay (s)	8.9	-	-	131.7	39.8	35.7	112.3	9.6	-	-
HCM Lane LOS	A	-	-	F	E	E	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.6	0.2	0.3	4.6	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	113	45	264	81	0	50	2076	410	98	1271	8
Future Volume (veh/h)	40	113	45	264	81	0	50	2076	410	98	1271	8
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	123	49	287	88	0	54	2257	446	107	1382	9
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	459	422	168	383	621	0	191	2075	926	67	2075	926
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.00	0.58	0.58	0.58	0.58	0.58	0.58
Sat Flow, veh/h	1309	1272	507	1213	1870	0	389	3554	1585	107	3554	1585
Grp Volume(v), veh/h	43	0	172	287	88	0	54	2257	446	107	1382	9
Grp Sat Flow(s),veh/h/ln	1309	0	1779	1213	1870	0	389	1777	1585	107	1777	1585
Q Serve(g_s), s	2.5	0.0	7.7	24.5	3.5	0.0	11.8	62.5	17.4	0.0	28.3	0.3
Cycle Q Clear(g_c), s	6.1	0.0	7.7	32.2	3.5	0.0	40.1	62.5	17.4	62.5	28.3	0.3
Prop In Lane	1.00		0.28	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	459	0	590	383	621	0	191	2075	926	67	2075	926
V/C Ratio(X)	0.09	0.00	0.29	0.75	0.14	0.00	0.28	1.09	0.48	1.59	0.67	0.01
Avail Cap(c_a), veh/h	617	0	806	530	848	0	191	2075	926	67	2075	926
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.2	0.0	26.4	38.3	25.1	0.0	28.8	22.3	12.9	53.5	15.2	9.3
Incr Delay (d2), s/veh	0.1	0.0	0.3	3.8	0.1	0.0	0.8	48.2	0.4	324.6	0.8	0.0
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	0.8	0.0	3.3	7.6	1.6	0.0	1.1	37.0	5.8	7.9	10.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.3	0.0	26.7	42.2	25.2	0.0	29.6	70.4	13.3	378.1	16.0	9.3
LnGrp LOS	C	A	C	D	C	A	C	F	B	F	B	A
Approach Vol, veh/h		215			375			2757			1498	
Approach Delay, s/veh		26.8			38.2			60.4			41.8	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	67.0	40.0	67.0	40.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	62.5	48.5	62.5	48.5
Max Q Clear Time (g_c+I1), s	64.5	9.7	64.5	34.2
Green Ext Time (p_c), s	0.0	1.2	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	51.4
HCM 6th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	462	740	380	495	574	578	428	750	971	495	506	281
Future Volume (veh/h)	462	740	380	495	574	578	428	750	971	495	506	281
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	502	804	413	538	624	628	465	815	1055	538	550	305
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	654	2443	1090	650	2443	1090	243	844	376	125	844	376
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	861	3554	1585	890	3554	1585	1252	3554	1585	474	3554	1585
Grp Volume(v), veh/h	502	804	413	538	624	628	465	815	1055	538	550	305
Grp Sat Flow(s),veh/h/ln	430	1777	1585	445	1777	1585	626	1777	1585	237	1777	1585
Q Serve(g_s), s	63.7	11.0	13.2	71.5	8.0	24.6	11.7	27.2	28.5	1.3	16.8	21.8
Cycle Q Clear(g_c), s	71.6	11.0	13.2	82.5	8.0	24.6	28.5	27.2	28.5	28.5	16.8	21.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	654	2443	1090	650	2443	1090	243	844	376	125	844	376
V/C Ratio(X)	0.77	0.33	0.38	0.83	0.26	0.58	1.92	0.97	2.80	4.30	0.65	0.81
Avail Cap(c_a), veh/h	654	2443	1090	650	2443	1090	243	844	376	125	844	376
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	7.6	7.9	24.7	7.1	9.7	57.0	45.3	45.7	60.0	41.3	43.2
Incr Delay (d2), s/veh	5.5	0.1	0.2	8.7	0.1	0.8	427.5	22.9	818.5	1505.0	1.8	12.5
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	6.1	3.7	4.0	7.7	2.7	7.6	18.1	14.5	96.6	28.0	7.5	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.1	7.7	8.1	33.4	7.2	10.5	484.6	68.1	864.2	1564.9	43.1	55.7
LnGrp LOS	C	A	A	C	A	B	F	E	F	F	D	E
Approach Vol, veh/h		1719			1790			2335			1393	
Approach Delay, s/veh		13.2			16.2			510.8			633.6	
Approach LOS		B			B			F			F	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	33.0	87.0	33.0	87.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	28.5	82.5	28.5	82.5
Max Q Clear Time (g_c+I1), s	30.5	73.6	30.5	84.5
Green Ext Time (p_c), s	0.0	7.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	293.9
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	11.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1572	43	25	1258	42	17
Future Vol, veh/h	1572	43	25	1258	42	17
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	0	-	0	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1709	47	27	1367	46	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1756	0	2447	855
Stage 1	-	-	-	-	1709	-
Stage 2	-	-	-	-	738	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	352	-	~ 26	302
Stage 1	-	-	-	-	132	-
Stage 2	-	-	-	-	434	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	352	-	~ 24	302
Mov Cap-2 Maneuver	-	-	-	-	~ 24	-
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	434	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	$ 553.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	24	302	-	-	352	-
HCM Lane V/C Ratio	1.902	0.061	-	-	0.077	-
HCM Control Delay (s)	$ 769.8	17.7	-	-	16.1	-
HCM Lane LOS	F	C	-	-	C	-
HCM 95th %tile Q(veh)	5.7	0.2	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	7	11	2140	1379	12
Future Vol, veh/h	9	7	11	2140	1379	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	0	-	-	150
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	8	12	2326	1499	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2686	750	1512	0	-	0
Stage 1	1499	-	-	-	-	-
Stage 2	1187	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	18	354	438	-	-	-
Stage 1	171	-	-	-	-	-
Stage 2	252	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	18	354	438	-	-	-
Mov Cap-2 Maneuver	18	-	-	-	-	-
Stage 1	166	-	-	-	-	-
Stage 2	252	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	201.4	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	438	-	18	354	-	-
HCM Lane V/C Ratio	0.027	-	0.543	0.021	-	-
HCM Control Delay (s)	13.4	-	$ 346.1	15.4	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.5	0.1	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	60	56	672	81	86	578
Future Vol, veh/h	60	56	672	81	86	578
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	65	61	730	88	93	628

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1230	365	0	0	818	0
Stage 1	730	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	170	632	-	-	806	-
Stage 1	438	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	150	632	-	-	806	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	575	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.4	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	150	632	806	-
HCM Lane V/C Ratio	-	-	0.435	0.096	0.116	-
HCM Control Delay (s)	-	-	46.3	11.3	10.1	-
HCM Lane LOS	-	-	E	B	B	-
HCM 95th %tile Q(veh)	-	-	1.9	0.3	0.4	-

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	57	671	57	87	629
Future Vol, veh/h	35	57	671	57	87	629
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	0	0	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	62	729	62	95	684

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1261	365	0	0	791	0
Stage 1	729	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	162	632	-	-	825	-
Stage 1	438	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	143	632	-	-	825	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	388	-	-	-	-	-
Stage 2	553	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.9	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	143	632	825	-
HCM Lane V/C Ratio	-	-	0.266	0.098	0.115	-
HCM Control Delay (s)	-	-	39.1	11.3	9.9	-
HCM Lane LOS	-	-	E	B	A	-
HCM 95th %tile Q(veh)	-	-	1	0.3	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	273	1078	459	147	846	205	311	128	289	290	111	194
Future Volume (veh/h)	273	1078	459	147	846	205	311	128	289	290	111	194
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	297	1172	499	160	920	223	338	139	314	315	121	211
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	198	1658	740	121	1658	740	520	1629	726	469	1629	726
Arrive On Green	0.47	0.47	0.47	0.47	0.47	0.47	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	492	3554	1585	297	3554	1585	1048	3554	1585	938	3554	1585
Grp Volume(v), veh/h	297	1172	499	160	920	223	338	139	314	315	121	211
Grp Sat Flow(s),veh/h/ln	492	1777	1585	297	1777	1585	1048	1777	1585	938	1777	1585
Q Serve(g_s), s	33.6	31.5	29.4	24.5	22.4	10.5	32.0	2.6	16.1	34.2	2.3	10.0
Cycle Q Clear(g_c), s	56.0	31.5	29.4	56.0	22.4	10.5	34.3	2.6	16.1	36.9	2.3	10.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1658	740	121	1658	740	520	1629	726	469	1629	726
V/C Ratio(X)	1.50	0.71	0.67	1.33	0.55	0.30	0.65	0.09	0.43	0.67	0.07	0.29
Avail Cap(c_a), veh/h	198	1658	740	121	1658	740	520	1629	726	469	1629	726
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.3	25.5	24.9	53.8	23.0	19.9	27.8	18.3	22.0	28.7	18.2	20.3
Incr Delay (d2), s/veh	249.7	1.4	2.4	193.2	0.4	0.2	6.2	0.1	1.9	7.5	0.1	1.0
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	19.7	12.9	11.0	10.1	9.0	3.8	8.4	1.1	6.0	8.2	0.9	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	298.0	26.9	27.3	247.1	23.4	20.1	34.0	18.4	23.8	36.2	18.3	21.3
LnGrp LOS	F	C	C	F	C	C	C	B	C	D	B	C
Approach Vol, veh/h		1968			1303			791			647	
Approach Delay, s/veh		67.9			50.3			27.2			28.0	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	59.5	60.5	59.5	60.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	55.0	56.0	55.0	56.0
Max Q Clear Time (g_c+I1), s	36.3	58.0	38.9	58.0
Green Ext Time (p_c), s	3.3	0.0	2.8	0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.7
HCM 6th LOS	D

Point of Contact for
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Office: 303-572-0200

Matrix DESIGN GROUP

Anniston, AL • Atlanta, GA • Colorado Springs, CO • Denver, CO • Niceville, FL • Parsons, KS • Phoenix, AZ
Pueblo, CO • Sacramento, CA • Tamuning, GU • Texarkana, TX • Washington, DC

SECOND AMENDMENT TO RIGHT-OF-WAY AND EASEMENT AGREEMENT

This Second Amendment to the Right of Way and Easement Agreement (the "Second Amendment") is entered into effective as of the ____ day of _____, 2018, by and between Erie Land Company, LLC, a Delaware limited liability company, with an address of 1550 W. McEwen Drive, Suite 200, Franklin, TN 37067 ("Grantor"), and Crestone Peak Resources Holdings, LLC, with an address of 1801 California Street Suite 2500, Denver, Colorado 80202, a Delaware corporation ("Grantee"). Grantor and Grantee may be referred to as "Party" or collectively as the "Parties".

RECITALS

WHEREAS, Encana entered into that certain Right-Of-Way and Easement Agreement with Encana dated the 10th day of September, 2015, recorded at Reception No. 4141049 in the official records of Weld County, Colorado (the "Agreement) covering certain lands located in Weld County, Colorado as both "Grantor" and "Grantee";

WHEREAS, Encana and Liberty entered into the certain First Amendment to Right-Of-Way and Easement Agreement with Crestone dated the 9th day of March, 2017, recorded at Reception No. 4285470 in the official records of Weld County, Colorado (the "Amendment") covering certain lands located in Weld County, Colorado;

WHEREAS, by that certain Special Warranty Deed dated the 15th day of September, 2015, recorded at Reception No. 4145928 in the official records of Weld County, Colorado, Encana conveyed to Liberty an undivided fifty percent (50%) interest in the lands burdened by the Easement;

WHEREAS, Liberty succeeded to an undivided 50% of Encana's fee simple interest in the Agreement as "Grantor";

WHEREAS, by assignment dated April 1, 2015, Crestone Peak Resources Holdings, LLC succeeded to Encana's interest in the Agreement as "Grantee";

WHEREAS, by that certain Special Warranty Deed dated the 22nd of December, 2017, recorded at Reception No. 4362696 in the official records of Weld County, Colorado, Encana and Liberty conveyed one hundred percent (100%) of the lands burdened by the Easement; and

WHEREAS, the Parties now desire to amend the Agreement to change the location of the Easement Lands.

AGREEMENT

NOW, THEREFORE, for and in consideration of the covenants and agreements contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. Each capitalized term used in this Second Amendment, to the extent not otherwise expressly defined in this Second Amendment, shall have the same meaning given to such term in the Agreement.

2. **Exhibit A – Easement Lands**. The location of the Easement and Easement Lands is hereby amended. Exhibit A and Exhibit B attached to the First Amendment is deleted in its entirety and replaced with Exhibit A attached hereto.

3. This Second Amendment and all of the covenants in it shall be binding upon the personal representatives, heirs, successors and assigns of the Parties, and the benefits of this Second Amendment shall inure to their personal representatives, heirs, successors and assigns. The covenants contained herein shall run with the land.

4. Except as amended by this Second Amendment, all other terms and conditions of the First Amendment and the Agreement shall remain in full force and effect. In the event of conflict between the terms of this Second Amendment, First Amendment and the Agreement, this Second Amendment shall control.

5. This Second Amendment, First Amendment and the Agreement comprise the complete and exclusive agreement between the Parties regarding the subject matter herein, and supersede all oral and written communications, negotiations, representations, or agreements in relation to the subject matter made or entered into before the Second Amendment Effective Date.

6. This Second Amendment may be executed in any number of counterparts, each of which shall be deemed an original instrument, and all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the undersigned Parties have caused this Second Amendment to be executed by duly authorized representatives on the dates set forth in the acknowledgements, but to be effective on the date first above written.

GRANTOR:
ERIE LAND COMPANY, LLC

By:_____
Name: Brian Senft
Title: President

GRANTEE:
CRESTONE PEAK RESOURCES HOLDINGS, LLC.

By:_____
Name: Shea Kauffman
Title: Director of Land

ACKNOWLEDGEMENTS

STATE OF ~~COLORADO~~ Tennessee)
COUNTY OF Williamson)

The foregoing instrument was acknowledged before me this 10th day of August, 2018 by Brian Sewell as President for ERIE LAND COMPANY, LLC.

Witness my hand and official seal.

KELLY SCHOOLEY
STATE OF TENNESSEE
NOTARY PUBLIC
WILLIAMSON COUNTY

Kelly Schooley
Notary Public Name:
My Commission Expires:

My Commission Expires May 25, 2020

STATE OF COLORADO)
COUNTY OF DENVER)

The foregoing instrument was acknowledged before me this ____ day of _____, 2018 by _____, as Director of Land for CRESTONE PEAK RESOURCES HOLDINGS, LLC.

Witness my hand and official seal.

Notary Public Name:
My Commission Expires:

FARM LICENSE AGREEMENT

THIS FARM LICENSE AGREEMENT (the "License") is made as of this 28th day of May, 2018, by and between ERIE LAND COMPANY, LLC, a Delaware limited liability company ("Owner") and DAVE HOLSTROM, an individual resident of the State of Colorado ("Licensee").

RECITALS

A. Owner is the owner of those certain parcels of real property in Erie, Weld County, Colorado, which are more particularly described on Exhibit A attached hereto and incorporated herein (the "Property").

B. Owner and Licensee have agreed that Licensee will be permitted to farm the Property in accordance with this License.

LICENSE

1. License and Term. Owner hereby grants to Licensee a non-exclusive license over the Property for a period of one (2) year beginning January 1, 2018. This License shall automatically renew for periods of one (1) year.

2. License Fee. Licensee shall pay the sum of One Dollar ($1.00) per year to Owner as a license fee.

3. Use of the Property. Licensee shall use the Property solely for the purpose granted herein. Licensee hereby agrees to perform the following duties:

(i) Owner shall not be responsible to Licensee for any damage or injury to person or property resulting from Licensee's performance hereunder or attributable to any hazard or defect, whether latent or patent, on the Property.

(ii) Promptly notify Owner of any damage, however caused, to the Property.

(iii) Maintain the Property in a clean and orderly condition and use reasonable diligence in the care, protection and maintenance of the Property.

(iv) Not make any alterations or improvements to the Property.

(v) Procure, at its sole cost and expense, any licenses or permits necessary for Licensee's use of the Property. Licensee agrees to reimburse any penalties, fines, assessments or any other charges levied upon Owner as a result of any failure by Licensee to secure, or abide by the terms of, any such license or permit.

4. Compliance with Laws. Licensee agrees to comply with all federal, state and local laws, rules and regulations while conducting its operations at the Property, including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. Section 9601 et seq., as amended; the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq.; and any other federal, state or local statutes and ordinances, including all amendments thereto, replacements thereof, any rules, regulations or orders adopted and issued pursuant thereto, and any judicial or administrative interpretations thereof.

5. Risk of Loss. Licensee shall bear all risk of loss to any crops located on the Property from the date hereof until the termination of this License.

6. Damage or Destruction of Crops by Owner. In the event Owner damages or destroys any of Licensee's crops on the Property, Owner agrees to reimburse Licensee for the fair market value of the crops, but only in the event that Licensee gives Owner at least ninety (45) days' prior written notice before planting. After Licensee gives notice of his intent to plant crops, Owner will have thirty (15) days to notify Licensee whether or not Owner intends to develop any of the Property in the immediate future. If Owner has immediate plans to develop any of the Property, Owner will designate the areas to be developed and Licensee agrees not to plant in those areas. Owner shall have no liability to Licensee for any crops that are damaged or destroyed on areas designated by Owner to be developed.

7. Insurance. Licensee shall, at its sole cost and expense, maintain during the term of this License, the following insurance which shall be primary and non-contributory to any insurance maintained by Owner, and procured from an insurance company or companies authorized to do business in the state in which the Property is located:

Workers Compensation:	As required by law
Commercial General Liability	$1,000,000.00/occurrence $2,000,000.00/aggregate

The commercial general liability insurance policy shall be primary, on an occurrence-form basis, and specifically name the Indemnified Parties as additional insureds. Licensee shall, prior to the Commencement Date, provide Owner with a certificate of insurance evidencing these requirements. The policies and certificates of insurance shall state that the issuing company shall mail thirty (30) days' prior written notice to the certificate holder should any of the policies be cancelled or materially changed prior to the expiration date. Licensee hereby waives and releases all rights and claims (including all subrogation rights) against the Indemnified Parties with respect to liability for any loss, injury or damage resulting from Licensee's operations or use of the Property.

8. Indemnity. shall defend, indemnify and hold harmless Owner and its employees, agents, directors, officers, representatives, affiliate entities, successors and assigns (collectively, the "Indemnified Parties") from and against any and all costs, expenses (including, without limitation, reasonable attorney fees), liabilities, damages, losses, fines, judgments, claims, actions, lawsuits or demands incurred by or asserted against any one or more of the Indemnified Parties by reason of Licensee's activities on the Property. Licensee's indemnity obligations shall survive expiration or termination of this License.

9. No Lien Rights. Licensee and the Owner agree and confirm that Licensee is not the agent of the Owner for the purpose of the authorization of or the construction of any improvements, additions, alterations, repairs and/or reconstruction which may be performed upon the property by Licensee while Licensee is in possession of the Property pursuant to this License. No person furnishing labor and/or materials to or for the account of Licensee shall be entitled to claim any lien against the interest of the Owner in the Property, and such persons shall look solely to Licensee and Licensee's interests under this License for satisfaction of any such claim. This License supersedes all prior agreements between the parties, whether oral or written, with respect to the possession by Licensee of the Property.

10. Termination. Either party shall have the right to terminate this License upon thirty (30) days' written notice to the other party.

11. Notices. Any notices required to be given to or served upon either party hereto shall be given or served by personal service or by express delivery or by mailing the same, postage prepaid, by United States registered or certified mail, return receipt requested, to the following addresses:

To Owner: Erie Land Company, LLC
c/o Southern Land Company, LLC
1550 W. McEwen Drive, Suite 200
Franklin, Tennessee 37067
Phone: (615) 778-1206

To Licensee: Dave Holstrom
_____
Erie, Colorado _____

Either party may designate a substitute address at any time hereafter by written notice thereof to the other party.

12. Interpretation. The parties to this Agreement have had sufficient time to consult legal counsel and negotiate changes regarding the terms hereof. Neither party shall be deemed the drafter of this Agreement and nothing herein shall be construed against either party due to the drafting hereof.

13. Entire Agreement. This Agreement, together with all exhibits hereto, constitutes the entire agreement between the parties, and supersedes all representations, statements or prior agreements and understandings both written and oral with respect to the matters contained in this Agreement and exhibits hereto. No person has been authorized to give any information or make any representation not contained in this Agreement. This Agreement may be amended only by a signed written agreement between the parties and shall be construed in accordance with the laws of the state in which the Property is located.

14. Attorney's Fees. In the event that either party hereto should (a) retain legal counsel and/or institute any suit against the other for violation of this Agreement or to enforce any of the covenants or conditions herein, or (b) intervene in any suit in which the other is a party to enforce or protect its interest or rights hereunder, the prevailing party in any such suit shall be entitled to its costs, expenses and reasonable fees of its attorney(s) in connection therewith. The rights in this section shall survive termination or expiration of this Agreement

IN WITNESS WHEREOF, the parties have executed this instrument as of the date first above written.

ERIE LAND COMPANY, LLC

By: Southern Land Company, LLC,
Manager

By: Heidi Majerik
Name: Heidi Majerik
Its: Vice President & General Manager

DAVE HOLSTROM

EXHIBIT A

Legal Description – Former Carlson Site

PARCEL A:
A PARCEL OF LAND LOCATED IN THE WEST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE NORTHEAST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 21, AND CONSIDERING THE NORTHERLY LINE OF THE NORTHWEST QUARTER OF SAID OF SECTION 21 TO BEAR NORTH 89°38'17" EAST WITH ALL BEARINGS SHOWN HEREON RELATIVE THERETO; THENCE SOUTH 00°16'01" EAST ALONG THE EASTERLY LINE OF THE NORTHWEST QUARTER OF SAID SECTION 21 A DISTANCE OF 30.00 FEET TO A POINT ON THE SOUTHERLY RIGHT-OF-WAY LINE OF ERIE PARKWAY (WELD COUNTY ROAD 8) AS DESCRIBED IN COMMISSIONERS BOOK 5, PAGE 206 OF THE RECORDS OF THE WELD COUNTY COMMISSIONERS AND THE POINT OF BEGINNING;
THENCE CONTINUING ALONG SAID EASTERLY LINE OF THE NORTHWEST QUARTER OF SECTION 21 SOUTH 00°16'01" EAST A DISTANCE OF 2,619.90 FEET TO THE CENTER CORNER OF SAID SECTION 21;
THENCE SOUTH 00°16'04" EAST ALONG THE EASTERLY LINE OF THE SOUTHWEST QUARTER OF SAID SECTION 21 A DISTANCE OF 1,229.70 FEET TO A POINT ON THE WESTERLY BOUNDARY OF THE COMMUNITY DITCH AS DESCRIBED IN BOOK 63, PAGE 464, RECEPTION NO. 23030 OF THE RECORDS OF THE WELD COUNTY CLERK AND RECORDER;
THENCE ALONG SAID WESTERLY BOUNDARY OF THE COMMUNITY DITCH THE FOLLOWING TWENTY-ONE (21) COURSES:
1) SOUTH 76°41'08" WEST A DISTANCE OF 77.18 FEET TO A POINT OF CURVATURE;
2) ALONG A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 26°32'10", A RADIUS OF 225.00 FEET, AN ARC LENGTH OF 104.21 FEET AND A CHORD THAT BEARS SOUTH 89°57'13" WEST A DISTANCE OF 103.28 FEET;
3) NORTH 76°46'42" WEST A DISTANCE OF 223.90 FEET TO A POINT OF CURVATURE;
4) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 15°24'26", A RADIUS OF 425.00 FEET, AN ARC LENGTH OF 114.29 FEET AND A CHORD THAT BEARS NORTH 84°28'55" WEST A DISTANCE OF 113.94 FEET;
5) SOUTH 87°48'52" WEST A DISTANCE OF 145.31 FEET TO A POINT OF CURVATURE;
6) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 34°36'07", A RADIUS OF 325.00 FEET, AN ARC LENGTH OF 196.27 FEET AND A CHORD THAT BEARS SOUTH 70°30'47" WEST A DISTANCE OF 193.30 FEET;
7) SOUTH 53°12'44" WEST A DISTANCE OF 80.82 FEET TO A POINT OF CURVATURE;
8) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 13°09'14", A RADIUS OF 425.00 FEET, AN ARC LENGTH OF 95.57 FEET AND A CHORD THAT BEARS SOUTH 46°38'08" WEST A DISTANCE OF 97.36 FEET;
9) SOUTH 40°03'31" WEST A DISTANCE OF 199.79 FEET;
10) SOUTH 43°18'24" WEST A DISTANCE OF 274.93 FEET;
11) SOUTH 41°54'01" WEST A DISTANCE OF 126.84 FEET;
12) SOUTH 43°57'21" WEST A DISTANCE OF 169.36 FEET TO A POINT OF CURVATURE;
13) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 62°08'24", A RADIUS OF 225.00 FEET, AN ARC LENGTH OF 244.02 FEET AND A CHORD THAT BEARS SOUTH 12°53'09" WEST A DISTANCE OF 232.24 FEET;
14) SOUTH 18°11'03" EAST A DISTANCE OF 8.91 FEET TO A POINT OF CURVATURE;
15) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 39°02'42", A RADIUS OF 175.00 FEET, AN ARC LENGTH OF 119.26 FEET AND A CHORD THAT BEARS SOUTH 37°42'25" EAST A DISTANCE OF 116.96 FEET;

16) SOUTH 57°13'46" EAST A DISTANCE OF 50.68 FEET TO A POINT OF CURVATURE;
17) ALONG A CURVE TO THE LEFT HAVING A CENTRAL ANGLE OF 24°57'41", A RADIUS OF 425.00 FEET, AN ARC LENGTH OF 185.15 FEET AND A CHORD THAT BEARS SOUTH 69°42'37" EAST A DISTANCE OF 183.69 FEET;
18) SOUTH 82°11'27" EAST A DISTANCE OF 100.58 FEET TO A POINT OF CURVATURE;
19) ALONG A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 22°03'40", A RADIUS OF 575.00 FEET, AN ARC LENGTH OF 221.40 FEET AND A CHORD THAT BEARS SOUTH 71°09'37" EAST A DISTANCE OF 220.03 FEET; 20) SOUTH 60°07'47" EAST A DISTANCE OF 347.74 FEET TO A POINT OF CURVATURE;
21) ALONG A CURVE TO THE RIGHT HAVING A CENTRAL ANGLE OF 02°24'14", A RADIUS OF 475.00 FEET, AN ARC LENGTH OF 19.93 FEET AND A CHORD THAT BEARS SOUTH 58°55'40" EAST A DISTANCE OF 19.93 FEET TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF WELD COUNTY ROAD 6 AS DESCRIBED IN COMMISSIONERS BOOK 86, PAGE 273 OF THE RECORDS OF THE WELD COUNTY COMMISSIONERS;
THENCE SOUTH 89°25'57" WEST ALONG SAID NORTHERLY RIGHT-OF-WAY LINE A DISTANCE OF 2,019.11 TO A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF WELD COUNTY ROAD 5 AS DESCRIBED IN COMMISSIONERS BOOK 86, PAGE 273 OF THE RECORDS OF THE WELD COUNTY COMMISSIONERS;
THENCE NORTH 00°06'17" WEST ALONG SAID EASTERLY RIGHT-OF-WAY LINE A DISTANCE OF 874.06 TO A POINT ON THE BOUNDARY OF THAT PARCEL OF LAND DESCRIBED AT RECEPTION NO. 2978817 OF THE RECORDS OF THE WELD COUNTY CLERK AND RECORDER;
THENCE ALONG SAID BOUNDARY THE FOLLOWING FIVE (5) COURSES:
1) NORTH 89°53'43" EAST A DISTANCE OF 807.64 FEET;
2) NORTH 00°06'17" WEST A DISTANCE OF 457.00 FEET;
3) SOUTH 89°53'43" WEST A DISTANCE OF 608.07 FEET;
4) NORTH 00°06'17" WEST A DISTANCE OF 230.00 FEET;
5) SOUTH 89°53'43" WEST A DISTANCE OF 199.57 FEET TO A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF SAID WELD COUNTY ROAD 5;
THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE THE FOLLOWING TWO (2) COURSES:
1) NORTH 00°06'17" WEST A DISTANCE OF 1,064.19 FEET;
2) NORTH 00°00'31" EAST A DISTANCE OF 1,574.75 FEET TO A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF WELD COUNTY ROAD 5 AS DESCRIBED IN THE DEEDS RECORDED AT RECEPTION NO. 3338310 AND RECEPTION NO. 3338311 OF THE WELD COUNTY CLERK AND RECORDER;
THENCE ALONG SAID EASTERLY RIGHT-OF-WAY LINE AND ALONG THE SOUTHERLY RIGHT-OF-WAY LINE OF ERIE PARKWAY (WELD COUNTY ROAD 8) THE FOLLOWING FOUR (4) COURSES:
1) SOUTH 89°59'29" EAST A DISTANCE OF 60.00 FEET;
2) NORTH 00°00'31" EAST A DISTANCE OF 980.30 FEET;
3) NORTH 89°38'17" EAST A DISTANCE OF 1,106.54 FEET;
4) NORTH 00°21'43" WEST A DISTANCE OF 70.00 FEET TO A POINT ON SAID SOUTHERLY RIGHT-OF-WAY LINE OF ERIE PARKWAY (WELD COUNTY ROAD 8) AS DESCRIBED IN COMMISSIONERS BOOK 5, PAGE 205 OF THE RECORDS OF THE WELD COUNTY COMMISSIONERS;
THENCE NORTH 89°38'17" EAST ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE A DISTANCE OF 1,467.60 FEET TO THE POINT OF BEGINNING.

Legal Description – Former Swink Site

A PORTION OF THE EAST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF WELD, STATE OF COLORADO.

BASIS OF BEARINGS: ASSUMING THE SOUTH LINE OF THE SOUTHEAST CORNER OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, AS MONUMENTED BY A NO. 6 REBAR WITH A 2 INCH ALUMINUM CAP MARKED "LS 25937 1995" AT THE SOUTHEAST CORNER OF SAID SECTION 21 AND A NO. 6 REBAR WITH A 3-1/4 INCH ALUMINUM CAP MARKED "LS 13155 1998" AT THE SOUTH QUARTER CORNER OF SAID SECTION 21 TO BEAR S 89°23'58" W, A DISTANCE OF 2684.63 FEET WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO.

BEGINNING AT THE SOUTHEAST CORNER OF SAID SECTION 21:

THENCE S 89°23'58" W ALONG SAID SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTION 21 A DISTANCE OF 2,684.63 FEET TO SAID SOUTH QUARTER CORNER OF SAID SECTION 21;

THENCE N 00°16'05" W ALONG SAID WEST LINE OF THE SOUTHEAST QUARTER OF SAID SECTION 21 A DISTANCE OF 1,426.59 FEET TO THE NORTHERLY LINE OF SAID 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464 AND THE **POINT OF BEGINNING;**

THENCE N 00°16'05" W CONTINUING ALONG SAID WEST LINE OF THE SOUTHEAST QUARTER OF SECTION 21 A DISTANCE OF 1,223.81 FEET TO THE CENTER QUARTER CORNER OF SECTION 21;

THENCE N 00°16'06" W ALONG THE WEST LINE OF THE NORTHEAST QUARTER OF SECTION 21 A DISTANCE OF 2,649.86 FEET TO THE NORTH QUARTER CORNER OF SECTION 21;

THENCE N 89°38'36" E ALONG THE NORTH LINE OF THE NORTHEAST QUARTER OF SAID SECTION 21 A DISTANCE OF 1,250.37 FEET TO THE WESTERLY LINE OF SAID 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464;

THENCE ALONG THE WESTERLY AND SOUTHERLY LINE OF SAID DITCH THE FOLLOWING ELEVEN (11) COURSES:

12) S 00°49'26" W A DISTANCE OF 411.56 FEET;
13) S 00°42'57" W A DISTANCE OF 225.38 FEET;
14) S 01°25'12" E A DISTANCE OF 155.38 FEET TO A POINT OF CURVE;
15) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 97°55'18", A RADIUS OF 47.00 FEET AND AN ARC LENGTH OF 80.33 FEET;
16) N 80°39'30" E A DISTANCE OF 123.80 FEET;
17) N 73°56'17" E A DISTANCE OF 64.14 FEET;
18) N 74°41'14" E A DISTANCE OF 127.29 FEET;

19) N 77°11'24" E A DISTANCE OF 214.63 FEET;
20) N 79°40'39" E A DISTANCE OF 294.87 FEET TO A POINT OF CURVE;
21) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 32°50'33", A RADIUS OF 575.00 FEET AND AN ARC LENGTH OF 329.60 FEET;
22) S 67°28'48" E A DISTANCE OF 260.91 FEET TO THE EAST LINE OF THE NORTHEAST QUARTER OF SAID SECTION 21;

THENCE S 00°29'40" E ALONG SAID EAST LINE OF THE NORTHEAST QUARTER OF SECTION 21 A DISTANCE OF 471.43 FEET TO THE NORTHERLY LINE OF A PARCEL CONVEYED TO LEFT HAND WATER DISTRICT AS DESCRIBED AT RECEPTION NO. 3833970;

THENCE S 89°30'19" W ALONG SAID NORTHERLY LINE A DISTANCE OF 530.00 FEET TO THE NORTHWEST CORNER OF SAID PARCEL;

THENCE S 00°29'41" E ALONG THE WESTERLY LINE OF SAID PARCEL A DISTANCE OF 680.00 FEET TO THE SOUTHWEST CORNER OF SAID PARCEL;

THENCE N 89°30'19" E ALONG THE SOUTHERLY LINE OF SAID PARCEL A DISTANCE OF 530.00 FEET TO SAID EAST LINE OF THE NORTHEAST QUARTER OF SECTION 21;

THENCE S 00°29'40" E ALONG SAID EAST LINE OF THE NORTHEAST QUARTER OF SECTION 21 A DISTANCE OF 90.15 FEET TO SAID NORTHERLY LINE OF THE 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464;

THENCE ALONG SAID NORTHERLY LINE THE FOLLOWING THIRTY TWO (32) COURSES:

33) S 51°26'38" W A DISTANCE OF 109.05 FEET TO A POINT OF CURVE;
34) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 31°10'54", A RADIUS OF 375.00 FEET AND AN ARC LENGTH OF 204.08 FEET;
35) S 82°37'33" W A DISTANCE OF 226.27 FEET TO A POINT OF CURVE;
36) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 13°34'39", A RADIUS OF 525.00 FEET AND AN ARC LENGTH OF 124.41 FEET;
37) N 83°47'48" W A DISTANCE OF 212.21 FEET TO A POINT OF CURVE;
38) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 20°51'49", A RADIUS OF 565.00 FEET AND AN ARC LENGTH OF 205.74 FEET;
39) S 75°20'23" W A DISTANCE OF 6.27 FEET TO A POINT OF CURVE;
40) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 22°53'26", A RADIUS OF 225.00 FEET AND AN ARC LENGTH OF 89.89 FEET;
41) S 52°26'57" W A DISTANCE OF 22.72 FEET TO A POINT OF CURVE;
42) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 46°45'36", A RADIUS OF 165.00 FEET AND AN ARC LENGTH OF 134.66 FEET;

43) S 05°41'21" W A DISTANCE OF 106.91 FEET;
44) S 01°41'27" W A DISTANCE OF 92.68 FEET;
45) S 01°00'54" W A DISTANCE OF 269.23 FEET TO A POINT OF CURVE;
46) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 09°38'04", A RADIUS OF 1,075.00 FEET AND AN ARC LENGTH OF 180.76 FEET;
47) S 10°38'58" W A DISTANCE OF 50.93 FEET TO A POINT OF CURVE;
48) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 05°50'26", A RADIUS OF 1,225.00 FEET AND AN ARC LENGTH OF 124.87 FEET;
49) S 16°29'24" W A DISTANCE OF 29.52 FEET TO A POINT OF CURVE;
50) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 45°35'42", A RADIUS OF 235.00 FEET AND AN ARC LENGTH OF 187.01 FEET;
51) S 62°05'05" W A DISTANCE OF 52.47 FEET;
52) S 57°50'12" W A DISTANCE OF 48.87 FEET TO A POINT OF CURVE;
53) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 24°38'29", A RADIUS OF 150.00 FEET AND AN ARC LENGTH OF 64.51 FEET;
54) S 33°11'43" W A DISTANCE OF 111.15 FEET TO A POINT OF CURVE;
55) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 36°47'55", A RADIUS OF 200.00 FEET AND AN ARC LENGTH OF 128.45 FEET;
56) S 69°59'39" W A DISTANCE OF 171.86 FEET TO A POINT OF CURVE;
57) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 12°52'09", A RADIUS OF 925.00 FEET AND AN ARC LENGTH OF 207.76 FEET;
58) S 57°07'30" W A DISTANCE OF 139.10 FEET TO A POINT OF CURVE;
59) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 21°33'51", A RADIUS OF 200.00 FEET AND AN ARC LENGTH OF 75.27 FEET;
60) S 78°41'20" W A DISTANCE OF 119.10 FEET TO A POINT OF CURVE;
61) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 33°20'04", A RADIUS OF 145.00 FEET AND AN ARC LENGTH OF 84.36 FEET;
62) N 67°58'36" W A DISTANCE OF 47.24 FEET TO A POINT OF CURVE;
63) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 35°56'55", A RADIUS OF 275.00 FEET AND AN ARC LENGTH OF 172.54 FEET;
64) S 76°04'29" W A DISTANCE OF 23.27 FEET TO THE **POINT OF BEGINNING.**

EXCEPTING THEREFROM THAT PARCEL OF LAND DEDICATED TO WELD COUNTY AS A PUBLIC HIGHWAY IN THAT DEED OF DEDICATION RECORDED JULY 22, 1996 AT RECEPTION NO. 2502152.

SUBJECT TO THE RIGHTS-OF-WAY FOR COUNTY ROAD NUMBERS 7 AND 8 AS DESCRIBED IN BOOK 86 AT PAGE 273.

SAID DESCRIBED PARCEL OF LAND CONTAINS 149.910 GROSS ACRES, MORE OR LESS.

Mr. Todd Bjerkaas
Town of Erie - Community Development
645 Holbrook, - PO Box 750
Erie, CO 80516

July -2018

RE: Swink Property - A Southern Land Company Community
- Town of Erie, Colorado - Initial Zoning Letter of Authorization

The land being submitted for consideration of this Initial Zoning Request is owned by the applicant and therefore the Letter of Authorization is not application to this application.

Sincerely,

John Prestwich

John Prestwich - President, PCS Group, Inc. - RLA

Fidelity National Title
NATIONAL COMMERCIAL SERVICES

950 S Cherry St, #1414
Denver, CO 80246
Phone:

DATE: **December 3, 2019**
FILE NUMBER: **100-N0024878-010-TO2**, Amendment No. **1**
PROPERTY ADDRESS: **Sec 21 Twn 1 North Rg 68 W, Erie, CO**
BUYER/BORROWER: **Purchaser with contractual rights under a purchase agreement with the vested owner identified at Item 4 below**
OWNER(S): **Erie Land Company, LLC, a Delaware limited liability company**
YOUR REFERENCE NUMBER:
ASSESSOR PARCEL NUMBER: **R8946507**

PLEASE TAKE NOTE OF THE FOLLOWING REVISED TERMS CONTAINED HEREIN:

None.

WIRED FUNDS ARE REQUIRED ON ALL CASH PURCHASE TRANSACTIONS. FOR WIRING INSTRUCTIONS, PLEASE CONTACT YOUR ESCROW OFFICE AS NOTED ON THE TRANSMITTAL PAGE OF THIS COMMITMENT.

TO:	**Escrow Officer**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Title Only 10** **(303) 633-7720**
	Escrow Assistant	**ATTN:** **PHONE:** **E-MAIL:**	
	Title Officer	**ATTN:** **PHONE:** **E-MAIL:**	**Eric Stearns** **(303) 692-6778** **estearns@fnf.com**
	Sales Executive	**ATTN:** **E-MAIL:**	**Shari Canon** **scanon@ctt.com**
	Sales Executive 2	**ATTN:** **E-MAIL:**	**None**

TO:	**Fox Rothschild LLP** **1225 17th St.** **Suite 2200** **Denver, CO 80202**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Jed Sonnenshein** **(000) 000-0000** **(303) 292-1200** **jsonnenshein@foxrothschild.com**
TO:	**Southern Land Company** **1225 17th St.** **Suite 2420** **Denver, CO 80202**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Nancy Relihan** **(303) 887-8075** **(000) 000-0000** **nancy.relihan@southernland.com**
TO:	**National Commercial Services Title Only** **950 S Cherry St** **#1414** **Denver, CO 80246**	**ATTN:** **PHONE:** **FAX:** **E-MAIL:**	**Title Only 10** **(303) 633-7720**

END OF TRANSMITTAL

COMMITMENT FOR TITLE INSURANCE

Issued by

Fidelity National Title Insurance Company

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRA CONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY'S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, **Fidelity National Title Insurance Company**, a Florida Corporation (the "Company"), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within 6 Months after the Commitment Date, this Commitment terminates and the Company's liability and obligation end.

Countersigned

By: _____

Darren Hone
Authorized Signature

Fidelity National Title Insurance Company

By: _____

ATTEST — President

_____ Secretary

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

COMMITMENT CONDITIONS

1. DEFINITIONS

(a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.

(b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.

(c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.

(d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.

(e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.

(f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.

(g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.

(h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

(a) the Notice;
(b) the Commitment to Issue Policy;
(c) the Commitment Conditions;
(d) Schedule A;
(e) Schedule B, Part I—Requirements;
(f) Schedule B, Part II—Exceptions; and
(g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

(a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:

(i) comply with the Schedule B, Part I—Requirements;
(ii) eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
(iii) acquire the Title or create the Mortgage covered by this Commitment.

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(b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
(c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
(d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.
(e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
(f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
(g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT

(a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
(b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
(c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
(d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
(e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
(f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is $2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

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Transaction Identification Data for reference only:

Issuing Agent:	Fidelity National Title, National Commercial Services
Issuing Office:	950 S Cherry St, #1414, Denver, CO 80246
Loan ID Number:	
Issuing Office File Number:	100-N0024878-010-TO2, Amendment No. 1
Property Address:	Sec 21 Twn 1 North Rg 68 W, Erie, CO
Revision Number:	Amendment No. 1, Amendment Date: December 3, 2019

SCHEDULE A

AMERICAN LAND TITLE ASSOCIATION COMMITMENT

1. Commitment Date: **November 22, 2019**
2. Policy to be issued:
   (a) ALTA Owners Policy 6-17-06

   Proposed Insured: Purchaser with contractual rights under a purchase agreement with the vested owner identified at Item 4 below

   Proposed Policy Amount: **$**100,000.00

   (b) None

   Proposed Insured:

   Proposed Policy Amount: **$**0.00
3. The estate or interest in the Land described or referred to in this Commitment is:

   FEE SIMPLE
4. The Title is, at the Commitment Date, vested in:

   Erie Land Company, LLC, a Delaware limited liability company
5. The Land is described as follows:

   See Exhibit A attached hereto and made a part hereof.

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SCHEDULE A
(Continued)

PREMIUMS:

Owners Policy	430.00
Tax Certificate	18.00

EXHIBIT A
LEGAL DESCRIPTION

A PORTION OF THE East ½ of Section 21, Township 1 North, Range 68 West of the 6th Principal Meridian, County of Weld, State of Colorado.

Basis of Bearings: Assuming the South line of the Southeast corner of Section 21, Township 1 North, Range 68 West of the 6th Principal Meridian, as monumented by a No. 6 Rebar with a 2 inch aluminum cap marked "LS 25937 1995" at the Southeast corner of said Section 21 and a No. 6 Rebar with a 3 ¼ inch aluminum cap marked "LS 13155 1998" at the South ¼ corner of said Section 21 to bear South 89°23'58" West, a distance of 2684.63 feet with all bearings contained herein relative thereto.

Beginning at the Southeast corner of said Section 21;

Thence South 89°23'58" West along said South line of the Southeast ¼ of Section 21 a distance of 2,684.63 feet to the South ¼ corner of said Section 21;
Thence North 00°16'05" West along the West line of the Southeast ¼ of said Section 21 a distance of 1,426.59 feet to the Northerly line of said 50 foot wide Ditch Parcel as described in Book 63 at Page 464 and the Point of Beginning;
Thence North 00°16'05" West continuing along said West line of the Southeast ¼ of Section 21 a distance of 1,223.81 feet to the Center ¼ corner of Section 21;
Thence North 00°16'06" West along the West line of the Northeast ¼ of Section 21 a distance of 2,649.86 feet to the North ¼ corner of Section 21;
Thence North 89°38'36" East along the North line of the Northeast ¼ of said Section 21 a distance of 1,250.37 feet to the Westerly line of said 50 foot wide Ditch Parcel as described in Book 63 at Page 464;
Thence along the Westerly and Southerly line of said ditch the following eleven (11) courses:
South 00°49'26" West a distance of 411.56 feet;
South 00°42'57" West a distance of 225.38 feet;
South 01°25'12" East a distance of 155.38 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 97°55'18", a radius of 47.00 feet and an arc length of 80.33 feet;
North 80°39'30" East a distance of 123.80 feet;
North 73°56'17" East a distance of 64.14 feet;
North 74°41'14" East a distance of 127.29 feet;
North 77°11'24" East a distance of 214.63 feet;
North 79°40'39" East a distance of 294.87 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 32°50'33", a radius of 575.00 feet and an arc length of 329.60 feet;
South 67°28'48" East a distance of 260.91 feet to the East line of the Northeast ¼ of Section 21;

Thence South 00°29'40" East along said East line of the Northeast ¼ of Section 21 a distance of 471.43 feet to the Northerly line of a parcel conveyed to Left Hand Water District as described at Reception No. 3833970;
Thence South 89°30'19" West along said Northerly line a distance of 530.00 feet to the Northwest corner of said Parcel;
Thence South 00°29'41" East along the Westerly line of said Parcel a distance of 680.00 feet to the Southwest corner of said Parcel;
Thence North 89°30'19" East along the Southerly line of said Parcel a distance of 530.00 feet to said East line of the Northeast ¼ of Section 21;

EXHIBIT A
(Continued)

Thence South 00°29'40" East along said East line of the Northeast ¼ of Section 21 a distance of 90.15 feet to said Northerly line of the 50 foot wide Ditch Parcel as described in Book 63 at Page 464;
Thence along said Northerly line the following thirty two (32) courses:
South 51°26'38" West a distance of 109.05 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 31°10'54", a radius of 375.00 feet and an arc length of 204.08;
South 82°37'33" West a distance of 226.27 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 13°43'39", a radius of 525.00 feet and an arc length of 124.41 feet;
North 83°47'48" West a distance of 212.21 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 20°51'49", a radius of 565.00 feet and an arc length of 205.74 feet;
South 75°20'23" West a distance of 6.27 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 22°53'26", a radius of 225.00 feet and an arc length of 89.89 feet;
South 52°26'57" West a distance of 22.72 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 46°45'36", a radius of 165.00 feet and an arc length of 134.66 feet;
South 05°41'21" West a distance of 106.91 feet;
South 01°41'27" West a distance of 92.68 feet;
South 01°00'54" West a distance of 269.23 feet t a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 09°38'04", a radius of 1,075.00 feet and an arc length of 180.76 feet;
South 10°38'58" West a distance of 50.93 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 05°50'26", a radius of 1,225.00 feet and an arc length of 124.87 feet;
South 16°29'24" West a distance of 29.52 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 45°35'42", a radius of 235.00 feet and an arc length of 187.01 feet;
South 62°05'05" West a distance of 52.47 feet;
South 57°50'12" West a distance of 48.87 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 24°38'29", a radius of 150.00 feet and an arc length of 64.51 feet;
South 33°11'43" West a distance of 111.15 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 36°47'55", a radius of 200.00 feet and an arc length of 128.45 feet;
South 69°59'39" West a distance of 171.86 feet to a point of curve;
Along the arc of a tangent curve to the left, having a central angle of 12°52'09", a radius of 925.00 feet and an arc length of 207.76 feet;
South 57°07'30" West a distance of 139.10 feet to a point of curve;
Along the arc of a tangent curve to the right, having a central angle of 21°33'51", a radius of 200.00 feet and an arc length of 75.27 feet;
South 78°41'20" West a distance of 119.10 feet to a point of curve,
Along the arc of a tangent curve to the right, having a central angle of 33°20'04", a radius of 145.00 feet and an arc length of 84.36 feet;
North 67°58'36" West a distance of 47.24 feet to a point of curve,

EXHIBIT A
(Continued)

Along the arc of a tangent curve to the left, having a central angle of 35°56'55", a radius of 275.00 feet and an arc length of 172.54 feet;
South 76°04'29" West a distance of 23.27 feet to the Point of Beginning,

Excepting therefrom that Parcel of land dedicated to Weld County as a Public Highway in that Deed of Dedication recorded July 22, 1996 at Reception No. 2502152.

Subject to the rights-of-way for County Road Numbers 7 and 8 described in Book 86 at Page 273,

County of Weld,
State of Colorado.

SCHEDULE B

PART I – REQUIREMENTS

All of the following Requirements must be met:

a. Pay the agreed amounts for the interest in the land and/or for the mortgage to be insured.

b. Pay us the premiums, fees and charges for the policy.

c. Obtain a certificate of taxes due from the county treasurer or the county treasurer's authorized agent.

Note: Any documents being executed in conjunction with this transaction must be signed in the presence of an authorized Company employee, an authorized employee of an agent, an authorized employee of the insured lender, or by using Bancserv or other approved third-party service. If the above requirement cannot be met, please call the Company at the number provided in this report.

d. The Company will require the following documents for review prior to the issuance of any title insurance predicated upon a conveyance or encumbrance from the entity named below:

Limited Liability Company: Erie Land Company, LLC, a Delaware limited liability company

a) A copy of its operating agreement, if any, and any and all amendments, supplements and/or modifications thereto, certified by the appropriate manager or member

b) A current dated certificate of good standing from the proper governmental authority of the state in which the entity was created

c) Recordation of a Statement of Authority

d) Copies of resolution(s), agreements and/or other documentation necessary to establish the authority of parties executing on behalf of entities disclosed as part of an organizational structure managing said Limited Liability Company

The Company reserves the right to add additional items or make further requirements after review of the requested documentation.

e. Deed sufficient to convey the fee simple estate or interest in the Land described or referred to herein, to the Proposed Insured Purchaser.

f. Record the Relinquishment, Setback and Waiver Agreement for the East ½ of Section 21, as set forth in Schedule A herein.

g. The Company will require that an Owner's Affidavit be completed by the party(s) named below before the issuance of any policy of title insurance.

Party(s): Erie Land Company, LLC, a Delaware limited liability company

The Company reserves the right to add additional items or make further requirements after review of the requested Affidavit.

SCHEDULE B
PART I – Requirements
(Continued)

Please be advised that our search did not disclose any open Deeds of Trust of record. If you should have knowledge of any outstanding obligation, please contact the Title Department immediately for further review prior to closing.

For each policy to be issued as identified in Schedule A, Item 2; the Company shall not be liable under this commitment until it receives a designation for a Proposed Insured, acceptable to the Company. The Company may amend this commitment to add, among other things, additional exceptions or requirements after the designation of the Proposed Insured.

Note: Please be aware that due to the conflict between federal and state laws concerning the cultivation, distribution, manufacture or sale of marijuana, the Company is not able to close or insure any transaction involving Land that is associated with these activities.

END OF REQUIREMENTS

SCHEDULE B

PART II – EXCEPTIONS

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

1. Any facts, rights, interests or claims that are not shown by the Public Records but which could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.

2. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.

3. Any encroachments, encumbrances, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by Public Records.

4. Any lien or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the Public Records.

5. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the Public Records or attaching subsequent to the effective date hereof but prior to the date the proposed Insured acquires of record for the value the estate or interest or mortgage thereon covered by this Commitment.

   NOTE: The above exception will not appear on policies where closing and settlement has been performed by the Company.

6. Water rights, claims of title to water, whether or not these matters are shown by the Public Records.

7. All taxes and assessments, now or heretofore assessed, due or payable.

   NOTE: This tax exception will be amended at policy upon satisfaction and evidence of payment of taxes.

8. Any existing leases or tenancies, and any and all parties claiming by, through or under said lessees.

9. Right of Way established by the Board of County Commissioners in Transcript of Proceedings recorded October 14, 1889 in Book 86 at Page 273.

10. Reservations by the Union Pacific Railroad Company of (I) oil, coal and other minerals underlying the land, (2) the exclusive right to prospect for, mine and remove oil, coal and other minerals, and (3) the right of ingress and egress and regress to prospect for mine and remove oil, coal and other minerals, all as contained in Deed recorded August 11, 1911 in Book 320 at Page 61, and any and all assignments thereof or interests therein (Section 21).

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SCHEDULE B
PART II – Exceptions
(Continued)

The effect of Release and Quitclaim Deed recorded December 17, 1998 at Reception No. 2661201.

Request for Notification of Surface Development by RME Petroleum Company and RME Land Corp. (fka Union Pacific Resources Company and Union Pacific Land Resources) recorded February 28, 2002 at Reception No. 2954716.

11. An easement for communication and other facilities and incidental purposes granted to Mountain States Telephone and Telegraph Company by the instrument recorded May 7, 1930 in Book 894 at Page 390.

12. Terms, conditions, provisions, agreements and obligations contained in the Agreement as set forth below:

Recording Date: September 27, 1940
Recording No.: Book 1068 at Page 421

Note: Upon recordation of the Relinquishment, Setback and Waiver Agreement, as set forth in Requirement f of Schedule B-1, the above exception will be deleted.

13. All oil, gas and associated liquid hydrocarbons as granted to Champlin Petroleum Company by Mineral Deed recorded November 30, 1972 in Book 681 at Reception No. 1602712, and the terms and conditions contained therein, and any and all assignments thereof or interest therein.

Ratification of Lease recorded December 10, 1990 at Reception No. 2235517.

14. Terms, agreements, provisions, conditions and obligations of a Oil and Gas Lease, executed by Amoco Production Company, as Lessee(s), recorded November 30, 1972 in Book 681 at Reception No. 1602713, and any and all assignments thereof or interests therein.

Notice of Oil and Gas Interest and Surface Use recorded December 7, 2000 at Reception No. 2811875 and Reception No. 2811876 in connection with the above lease.

Recording Supplement to Operating Agreement and Financing Statement by Encana Oil & Gas Inc. and Non-operator parties all as set forth in said instrument as recorded June 22, 2015 at Reception No. 4117884, and any and all assignments thereof or interests therein,

Recording Supplement to Operating Agreement and Financing Statement by Encana Oil & Gas Inc. and Non-operator parties all as set forth in said instrument as recorded June 22, 2015 at Reception No. 4117885, and Recorded October 9, 2018 at Reception No. 4437212, and any and all assignments thereof or interests therein.

Declaration of Pooling recorded July 29, 2019 at Reception No. 4509251; Reception No. 4509252; Reception No. 4509253; Reception No. 4509254 and Reception No. 4509255; and September 12, 2019 at Reception No. 4522621; Reception No. 4522622; Reception No. 4522623; Reception No. 4522624; Reception No. 4522625 and Reception No. 4522636.

15. Terms, conditions, provisions, agreements and obligations contained in the Right of Way Agreement as set forth below:

SCHEDULE B
PART II – Exceptions
(Continued)

Recording Date: December 1, 1986
Recording No.: Reception No. 2078820 and Reception No. 2078821

Note: Upon recordation of the Relinquishment, Setback and Waiver Agreement, as set forth in Requirement f of Schedule B-1, the above exception will be deleted.

16. Terms, conditions, provisions, agreements and obligations contained in the Surface Owner's Agreement as set forth below:

Recording Date: September 27, 1989
Recording No.: Reception No. 2193034

Note: Upon recordation of the Relinquishment, Setback and Waiver Agreement, as set forth in Requirement f of Schedule B-1, the above exception will be deleted.

17. Request for Notification (Mineral Estate Owner) as recorded December 21, 2007 at Reception No. 3525268.

18. Terms, conditions, provisions, agreements and obligations contained in the Agreement Concerning Improvements to County Road # 7 between Ester Swink and Weld County Colorado as set forth below:

Recording Date: January 9, 1996
Recording No.: Reception No. 2471037

19. Terms, conditions, provisions, agreements and obligations contained in the Easement as contained in Rule and Order as set forth below:

Recording Date: March 23, 2012
Recording No.: Reception No. 3833970

20. Terms, conditions, provisions, agreements and obligations contained in the Memorandum of Agreement as set forth below:

Recording Date: October 1, 2014
Recording No.: Reception No. 4050076

21. Terms, conditions, provisions, agreements and obligations contained in the Right of Way Grant as set forth below:

Recording Date: April 30, 2015
Recording No.: Reception No. 4103128

22. Terms, conditions, provisions, agreements and obligations contained in the Right of Way Agreement as set forth below:

SCHEDULE B
PART II – Exceptions
(Continued)

Recording Date: September 10, 2015
Recording No.: Reception No. 4141049

Frist Amendment to said Right-of-Way Easement recorded March 14, 2017 at Reception No. 4285470 and Second Amendment recorded August 14, 2018 at Reception No. 4422990.

23. Terms, conditions, provisions, agreements and obligations contained in the ALTA/NSPS Land Title Survey as set forth below:

Recording Date: October 25, 2017
Recording No.: Reception No. 4346911

24. Terms, conditions, provisions, agreements and obligations contained in the Relinquishment as set forth below:

Recording Date: September 4, 2018
Recording No.: Reception No. 4428217

25. Terms, conditions, provisions, agreements and obligations contained in the Right-of-Way Easement Agreement as set forth below:

Recording Date: February 27, 2019
Recording No.: Reception NO. 4469681

26. Terms, conditions, provisions, agreements and obligations and easement as contained in the Easement Agreement as set forth below:

Recording Date: November 20, 2019
Recording No.: Reception No. 4543148

END OF EXCEPTIONS

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by Fidelity National Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; and Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

SCHEDULE B
PART II – Exceptions
(Continued)

Wire Fraud Alert

This Notice is not intended to provide legal or professional advice. If you have any questions, please consult with a lawyer.

All parties to a real estate transaction are targets for wire fraud and many have lost hundreds of thousands of dollars because they simply relied on the wire instructions received via email, without further verification. **If funds are to be wired in conjunction with this real estate transaction, we strongly recommend verbal verification of wire instructions through a known, trusted phone number prior to sending funds.**

In addition, the following non-exclusive self-protection strategies are recommended to minimize exposure to possible wire fraud.

- **NEVER RELY** on emails purporting to change wire instructions. Parties to a transaction rarely change wire instructions in the course of a transaction.
- **ALWAYS VERIFY** wire instructions, specifically the ABA routing number and account number, by calling the party who sent the instructions to you. DO NOT use the phone number provided in the email containing the instructions, use phone numbers you have called before or can otherwise verify. **Obtain the phone number of relevant parties to the transaction as soon as an escrow account is opened**. DO NOT send an email to verify as the email address may be incorrect or the email may be intercepted by the fraudster.
- **USE COMPLEX EMAIL PASSWORDS** that employ a combination of mixed case, numbers, and symbols. Make your passwords greater than eight (8) characters. Also, change your password often and do NOT reuse the same password for other online accounts.
- **USE MULTI-FACTOR AUTHENTICATION** for email accounts. Your email provider or IT staff may have specific instructions on how to implement this feature.

For more information on wire-fraud scams or to report an incident, please refer to the following links:

Federal Bureau of Investigation:
http://www.fbi.gov

Internet Crime Complaint Center:
http://www.ic3.gov

FIDELITY NATIONAL FINANCIAL, INC.
PRIVACY NOTICE

Fidelity National Financial, Inc. and its majority-owned subsidiary companies (collectively, "FNF," "our," or "we") respect and are committed to protecting your privacy. This Privacy Notice explains how we collect, use, and protect personal information, when and to whom we disclose such information, and the choices you have about the use and disclosure of that information.

Types of Information Collected
We may collect two types of information from you: Personal Information and Browsing Information.

Personal Information. FNF may collect the following categories of Personal Information:
- contact information (*e.g.,* name, address, phone number, email address);
- demographic information (*e.g.,* date of birth, gender, marital status);
- identity information (*e.g.,* Social Security Number, driver's license, passport, or other government ID number);
- financial account information (*e.g.,* loan or bank account information); and
- other personal information necessary to provide products or services to you.

Browsing Information. FNF may automatically collect the following types of Browsing Information when you access an FNF website, online service, or application (each an "FNF Website") from your Internet browser, computer, and/or mobile device:
- Internet Protocol (IP) address and operating system;
- browser version, language, and type;
- domain name system requests; and
- browsing history on the FNF Website, such as date and time of your visit to the FNF Website and visits to the pages within the FNF Website

How Personal Information is Collected
We may collect Personal Information about you from:
- information we receive from you on applications or other forms;
- information about your transactions with FNF, our affiliates, or others; and
- information we receive from consumer reporting agencies and/or governmental entities, either directly from these entities or through others.

How Browsing Information is Collected
If you visit or use an FNF Website, Browsing Information may be collected during your visit. Like most websites, our servers automatically log each visitor to the FNF Website and may collect the Browsing Information described above. We use Browsing Information for system administration, troubleshooting, fraud investigation, and to improve our websites. Browsing Information generally does not reveal anything personal about you, though if you have created a user account for an FNF Website and are logged into that account, the FNF Website may be able to link certain browsing activity to your user account.

Other Online Specifics
Cookies. When you visit an FNF Website, a "cookie" may be sent to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive. Information gathered using cookies helps us improve your user experience. For example, a cookie can help the website load properly or can customize the display page based on your browser type and user preferences. You can choose whether or not to accept cookies by changing your Internet browser settings. Be aware that doing so may impair or limit some functionality of the FNF Website.

Web Beacons. We use web beacons to determine when and how many times a page has been viewed. This information is used to improve our websites.

Do Not Track. Currently our FNF Websites do not respond to "Do Not Track" features enabled through your browser.

Links to Other Sites. FNF Websites may contain links to other websites. FNF is not responsible for the privacy practices or the content of any of those other websites. We advise you to read the privacy policy of every website you visit.

Use of Personal Information
FNF uses Personal Information for three main purposes:
- To provide products and services to you or in connection with a transaction involving you.
- To improve our products and services.
- To communicate with you about our, our affiliates', and third parties' products and services, jointly or independently.

When Information Is Disclosed
We may make disclosures of your Personal Information and Browsing Information in the following circumstances:
- to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure;
- to nonaffiliated service providers who provide or perform services or functions on our behalf and who agree to use the information only to provide such services or functions;
- to nonaffiliated third party service providers with whom we perform joint marketing, pursuant to an agreement with them to jointly market financial products or services to you;

- to law enforcement or authorities in connection with an investigation, or in response to a subpoena or court order; or
- in the good-faith belief that such disclosure is necessary to comply with legal process or applicable laws, or to protect the rights, property, or safety of FNF, its customers, or the public.

The law does not require your prior authorization and does not allow you to restrict the disclosures described above. Additionally, we may disclose your information to third parties for whom you have given us authorization or consent to make such disclosure. We do not otherwise share your Personal Information or Browsing Information with nonaffiliated third parties, except as required or permitted by law.

We reserve the right to transfer your Personal Information, Browsing Information, and any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets, or in the event of bankruptcy, reorganization, insolvency, receivership, or an assignment for the benefit of creditors. By submitting Personal Information and/or Browsing Information to FNF, you expressly agree and consent to the use and/or transfer of the foregoing information in connection with any of the above described proceedings.

Please see "**Choices With Your Information**" to learn the disclosures you can restrict.

Security of Your Information
We maintain physical, electronic, and procedural safeguards to guard your Personal Information. We limit access to nonpublic personal information about you to employees who need to know that information to do their job. When we provide Personal Information to others as discussed in this Privacy Notice, we expect that they process such information in compliance with our Privacy Notice and in compliance with applicable privacy laws.

Choices With Your Information
If you do not want FNF to share your information with our affiliates to directly market to you, you may send an "opt out" request by email, phone, or physical mail as directed at the end of this Privacy Notice. We do not share your Personal Information with nonaffiliates for their use to direct market to you.

Whether you submit Personal Information or Browsing Information to FNF is entirely up to you. If you decide not to submit Personal Information or Browsing Information, FNF may not be able to provide certain services or products to you.

For California Residents: We will not share your Personal Information and Browsing Information with nonaffiliated third parties, except as permitted by California law.

For Nevada Residents: You may be placed on our internal Do Not Call List by calling (888) 934-3354 or by contacting us via the information set forth at the end of this Privacy Notice. Nevada law requires that we also provide you with the following contact information: Bureau of Consumer Protection, Office of the Nevada Attorney General, 555 E. Washington St., Suite 3900, Las Vegas, NV 89101; Phone number: (702) 486-3132; email: BCPINFO@ag.state.nv.us.

For Oregon Residents: We will not share your Personal Information and Browsing Information with nonaffiliated third parties for marketing purposes, except after you have been informed by us of such sharing and had an opportunity to indicate that you do not want a disclosure made for marketing purposes.

For Vermont Residents: We will not share information about your creditworthiness to our affiliates and will not disclose your personal information, financial information, credit report, or health information to nonaffiliated third parties to market to you, other than as permitted by Vermont law, unless you authorize us to make those disclosures.

Information From Children
The FNF Websites are meant for adults and are not intended or designed to attract persons under the age of eighteen (18).We do not collect Personal Information from any person that we know to be under the age of thirteen (13) without permission from a parent or guardian.

International Users
FNF's headquarters is located within the United States. If you reside outside the United States and choose to provide Personal Information or Browsing Information to us, please note that we may transfer that information outside of your country of residence for any of the purposes described in this Privacy Notice. By providing FNF with your Personal Information and/or Browsing Information, you consent to our collection, transfer, and use of such information in accordance with this Privacy Notice.

FNF Website Services for Mortgage Loans
Certain FNF companies provide services to mortgage loan servicers, including hosting websites that collect customer information on behalf of mortgage loan servicers (the "Service Websites"). The Service Websites may contain links to both this Privacy Notice and the mortgage loan servicer or lender's privacy notice. The sections of this Privacy Notice titled When Information is Disclosed, Choices with Your Information, and Accessing and Correcting Information do not apply to the Service Websites. The mortgage loan servicer or lender's privacy notice governs use, disclosure, and access to your Personal Information. FNF does not share Personal Information collected through the Service Websites, except (1) as required or authorized by contract with the mortgage loan servicer or lender, or

(2) as required by law or in the good-faith belief that such disclosure is necessary to comply with a legal process or applicable law, to enforce this Privacy Notice, or to protect the rights, property, or safety of FNF or the public.

Your Consent To This Privacy Notice; Notice Changes
By submitting Personal Information and/or Browsing Information to FNF, you consent to the collection and use of the information in accordance with this Privacy Notice. We may change this Privacy Notice at any time. The revised Privacy Notice, showing the new revision date, will be posted on the FNF Website. Each time you provide information to us following any amendment of this Privacy Notice, your provision of information to us will signify your assent to and acceptance of the terms of the revised Privacy Notice for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you submit to us in any manner that we may choose without notice or compensation to you.

Accessing and Correcting Information; Contact Us
If you have questions, would like to access or correct your Personal Information, or want to opt-out of information sharing for affiliate marketing, send your requests via email to privacy@fnf.com, by phone to (888) 934-3354, or by mail to:

Fidelity National Financial, Inc.
601 Riverside Avenue
Jacksonville, Florida 32204
Attn: Chief Privacy Officer

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE EAST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

LEGAL DESCRIPTION:

A PORTION OF THE EAST 1/2 OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF WELD, STATE OF COLORADO, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 21: AND CONSIDERING THE SOUTH LINE OF THE SOUTHEAST CORNER OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, AS MONUMENTED BY A NO. 6 REBAR WITH A 2 INCH ALUMINUM CAP MARKED "LS 25937 1995" AT THE SOUTHEAST CORNER OF SAID SECTION 21 AND A NO. 6 REBAR WITH A 3 1/4 INCH ALUMINUM CAP MARKED "LS 13155 1998" AT THE SOUTH 1/4 CORNER OF SAID SECTION 21 TO BEAR SOUTH 89°23'58" WEST, A DISTANCE OF 2684.63 FEET WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO.

THENCE SOUTH 89°23'58" WEST ALONG SAID SOUTH LINE OF THE SOUTHEAST 1/4 OF SECTION 21 A DISTANCE OF 2,684.63 FEET TO THE SOUTH 1/4 CORNER OF SAID SECTION 21;

THENCE NORTH 00°16'05" WEST ALONG THE WEST LINE OF THE SOUTHEAST 1/4 OF SAID SECTION 21 A DISTANCE OF 1,426.59 FEET TO THE NORTHERLY LINE OF SAID 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464 AND **THE POINT OF BEGINNING**;

THENCE NORTH 00°16'05" WEST CONTINUING ALONG SAID WEST LINE OF THE SOUTHEAST 1/4 OF SECTION 21 A DISTANCE OF 1,223.81 FEET TO THE CENTER 1/4 CORNER OF SECTION 21;

THENCE NORTH 00°16'06" WEST ALONG THE WEST LINE OF THE NORTHEAST 1/4 OF SECTION 21 A DISTANCE OF 2,649.86 FEET TO THE NORTH 1/4 CORNER OF SECTION 21;

THENCE NORTH 89°38'36" EAST ALONG THE NORTH LINE OF THE NORTHEAST 1/4 OF SAID SECTION 21 A DISTANCE OF 1,250.37 FEET TO THE WESTERLY LINE OF SAID 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464;

THENCE ALONG THE WESTERLY AND SOUTHERLY LINE OF SAID DITCH THE FOLLOWING ELEVEN (11) COURSES:

1.) SOUTH 00°49'26" WEST A DISTANCE OF 411.56 FEET;

2.) SOUTH 00°42'57" WEST A DISTANCE OF 225.38 FEET;

3.) SOUTH 01°25'12" EAST A DISTANCE OF 155.38 FEET TO A POINT OF CURVE;

4.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 97°55'18", A RADIUS OF 47.00 FEET AND AN ARC LENGTH OF 80.33 FEET;

5.) NORTH 80°39'30" EAST A DISTANCE OF 123.80 FEET;

6.) NORTH 73°56'17" EAST A DISTANCE OF 64.14 FEET;

7.) NORTH 74°41'14" EAST A DISTANCE OF 127.29 FEET;

8.) NORTH 77°11'24" EAST A DISTANCE OF 214.63 FEET;

9.) NORTH 79°40'39" EAST A DISTANCE OF 294.87 FEET TO A POINT OF CURVE;

10.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 32°50'33", A RADIUS OF 575.00 FEET AND AN ARC LENGTH OF 329.60 FEET;

11.) SOUTH 67°28'48" EAST A DISTANCE OF 260.91 FEET TO THE EAST LINE OF THE NORTHEAST 1/4 OF SAID SECTION 21;

THENCE SOUTH 00°29'40" EAST ALONG SAID EAST LINE OF THE NORTHEAST 1/4 OF SECTION 21 A DISTANCE OF 471.43 FEET TO THE NORTHERLY LINE OF A PARCEL CONVEYED TO LEFT HAND WATER DISTRICT AS DESCRIBED AT RECEPTION NO. 3833970;

THENCE SOUTH 89°30'19" WEST ALONG SAID NORTHERLY LINE A DISTANCE OF 530.00 FEET TO THE NORTHWEST CORNER OF SAID PARCEL;

THENCE SOUTH 00°29'41" EAST ALONG THE WESTERLY LINE OF SAID PARCEL A DISTANCE OF 680.00 FEET TO THE SOUTHWEST CORNER OF SAID PARCEL;

THENCE NORTH 89°30'19" EAST ALONG THE SOUTHERLY LINE OF SAID PARCEL A DISTANCE OF 530.00 FEET TO SAID EAST LINE OF THE NORTHEAST 1/4 OF SECTION 21;

THENCE SOUTH 00°29'40" EAST ALONG SAID EAST LINE OF THE NORTHEAST 1/4 OF SECTION 21 A DISTANCE OF 90.15 FEET TO SAID NORTHERLY LINE OF THE 50 FOOT WIDE DITCH PARCEL AS DESCRIBED IN BOOK 63 AT PAGE 464;

THENCE ALONG SAID NORTHERLY LINE THE FOLLOWING THIRTY TWO (32) COURSES:

1.) SOUTH 51°26'38" WEST A DISTANCE OF 109.05 FEET TO A POINT OF CURVE;

2.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 31°10'54", A RADIUS OF 375.00 FEET AND AN ARC LENGTH OF 204.08 FEET;

3.) SOUTH 82°37'33" WEST A DISTANCE OF 226.27 FEET TO A POINT OF CURVE;

4.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 13°34'39", A RADIUS OF 525.00 FEET AND AN ARC LENGTH OF 124.41 FEET;

5.) NORTH 83°47'48" WEST A DISTANCE OF 212.21 FEET TO A POINT OF CURVE;

6.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 20°51'49", A RADIUS OF 565.00 FEET AND AN ARC LENGTH OF 205.74 FEET;

7.) SOUTH 75°20'23" WEST A DISTANCE OF 6.27 FEET TO A POINT OF CURVE;

8.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 22°53'26", A RADIUS OF 225.00 FEET AND AN ARC LENGTH OF 89.89 FEET;

9.) SOUTH 52°26'57" WEST A DISTANCE OF 22.72 FEET TO A POINT OF CURVE;

10.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 46°45'36", A RADIUS OF 165.00 FEET AND AN ARC LENGTH OF 134.66 FEET;

11.) SOUTH 05°41'21" WEST A DISTANCE OF 106.91 FEET;

12.) SOUTH 01°41'27" WEST A DISTANCE OF 92.68 FEET;
13.) SOUTH 01°00'54" WEST A DISTANCE OF 269.23 FEET TO A POINT OF CURVE;
14.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 09°38'04", A RADIUS OF 1,075.00 FEET AND AN ARC LENGTH OF 180.76 FEET;

15.) SOUTH 10°38'58" WEST A DISTANCE OF 50.93 FEET TO A POINT OF CURVE;

16.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 05°50'26", A RADIUS OF 1,225.00 FEET AND AN ARC LENGTH OF 124.87 FEET;

17.) SOUTH 16°29'24" WEST A DISTANCE OF 29.52 FEET TO A POINT OF CURVE;

18.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 45°35'42", A RADIUS OF 235.00 FEET AND AN ARC LENGTH OF 187.01 FEET;

19.) SOUTH 62°05'05" WEST A DISTANCE OF 52.47 FEET;

20.) SOUTH 57°50'12" WEST A DISTANCE OF 48.87 FEET TO A POINT OF CURVE;

21.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 24°38'29", A RADIUS OF 150.00 FEET AND AN ARC LENGTH OF 64.51 FEET;

22.) SOUTH 33°11'43" WEST A DISTANCE OF 111.15 FEET TO A POINT OF CURVE;

23.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 36°47'55", A RADIUS OF 200.00 FEET AND AN ARC LENGTH OF 128.45 FEET;

24.) SOUTH 69°59'39" WEST A DISTANCE OF 171.86 FEET TO A POINT OF CURVE;

25.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 12°52'09", A RADIUS OF 925.00 FEET AND AN ARC LENGTH OF 207.76 FEET;

26.) SOUTH 57°07'30" WEST A DISTANCE OF 139.10 FEET TO A POINT OF CURVE;

27.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 21°33'51", A RADIUS OF 200.00 FEET AND AN ARC LENGTH OF 75.27 FEET;

28.) SOUTH 78°41'20" WEST A DISTANCE OF 119.10 FEET TO A POINT OF CURVE;

29.) ALONG THE ARC OF A TANGENT CURVE TO THE RIGHT, HAVING A CENTRAL ANGLE OF 33°20'04", A RADIUS OF 145.00 FEET AND AN ARC LENGTH OF 84.36 FEET;

30.) NORTH 67°58'36" WEST A DISTANCE OF 47.24 FEET TO A POINT OF CURVE;

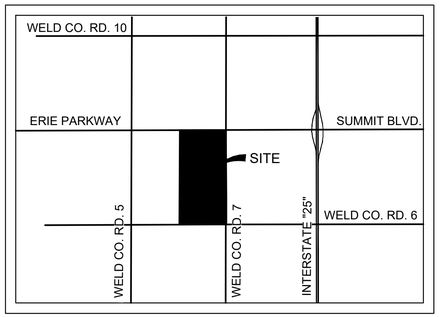
31.) ALONG THE ARC OF A TANGENT CURVE TO THE LEFT, HAVING A CENTRAL ANGLE OF 35°56'55", A RADIUS OF 275.00 FEET AND AN ARC LENGTH OF 172.54 FEET;

32.) SOUTH 76°04'29" WEST A DISTANCE OF 23.27 FEET TO **THE POINT OF BEGINNING**,

EXCEPTING THEREFROM THAT PARCEL OF LAND DEDICATED TO WELD COUNTY AS A PUBLIC HIGHWAY IN THAT DEED OF DEDICATION RECORDED JULY 22, 1996 AT RECEPTION NO. 2502152,

SUBJECT TO THE RIGHTS-OF-WAY FOR COUNTY ROAD NUMBERS 7 AND 8 AS DESCRIBED IN BOOK 86 AT PAGE 273,

COUNTY OF WELD, STATE OF COLORADO.



VICINITY MAP
N.T.S.

TITLE COMMITMENT:

THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY MATRIX DESIGN GROUP, INC., TO DETERMINE THE COMPATIBILITY OF THIS DESCRIPTION WITH THAT OF ADJACENT TRACTS OF LAND, OWNERSHIP OR EASEMENTS OF RECORD. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHTS-OF-WAY OR TITLE OF RECORD, MATRIX DESIGN GROUP INC., RELIED UPON TITLE COMMITMENT NO. 18000310614 - AMENDMENT NO. 2 PREPARED BY STEWART TITLE GUARANTY COMPANY COMMERCIAL SERVICES WITH AN EFFECTIVE DATE OF SEPTEMBER 7, 2018 AT 5:30 P.M. ALL SCHEDULE B EXCEPTIONS THAT ARE GRAPHICALLY PLOTTABLE ARE DEPICTED ON HEREON.

9. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A RIGHT-OF-WAY ESTABLISHED BY THE BOARD OF COUNTY COMMISSIONERS AS RECORDED OCTOBER 14, 1889 IN BOOK 86 AT PAGE NUMBER 273. (SURVEYOR'S NOTE: AT THE TIME OF RECORDATION, THE BOARD OF THE COUNTY COMMISSIONERS DEDICATED A 60 FEET WIDE, BEING 30 FEET ON EACH SIDE OF ALL SECTION AND TOWNSHIP LINES IN WELD COUNTY. THESE EASEMENTS AS RECORDED ARE SHOWN AND IDENTIFIED GRAPHICALLY HEREON.)

10. RESERVATIONS BY THE UNION PACIFIC RAILROAD COMPANY OF (L) OIL, COAL AND OTHER MINERALS UNDERLYING THE LAND, (2) THE EXCLUSIVE RIGHT TO PROSPECT FOR, MINE AND REMOVE OIL, COAL AND OTHER MINERALS, AND (3) THE RIGHT OF INGRESS AND EGRESS AND REGRESS TO PROSPECT FOR MINE AND REMOVE OIL, COAL AND OTHER MINERALS, ALL AS CONTAINED IN DEED RECORDED AUGUST 11, 1911 IN BOOK 320 AT PAGE 61, AND ANY AND ALL ASSIGNMENTS THEREOF OR INTERESTS THEREIN (SECTION 21) ALONG WITH THE "EXCEPTION AND EXCLUSION OF A STRIP OF LAND CONTAINING SEVEN (7) AND 10/100 ARES HERETOFORE CONVEYED BY THE UNION PACIFIC RAILROAD COMPANY TO THE COMMUNITY DITCH AND RESERVOIR COMPANY, FOR RIGHT-OF-WAY, BY DEED NO. 40 DATED SEPTEMBER 20, 1886. NOTE "THE COMPANY MAKES NO REPRESENTATION AS TO THE PRESENT OWNERSHIP OF ANY SUCH INTERESTS. THERE MAY BE LEASES, GRANTS, EXCEPTIONS OR RESERVATIONS OF INTERESTS THAT ARE NOT LISTED." (SURVEYOR'S NOTE: THE LEGAL DESCRIPTIONS CITED IN THESE DOCUMENTS DESCRIBE A PARCEL OF LAND THAT ENCUMBERS AND COMPLETELY ENCOMPASSES THE SUBJECT PROPERTY).

11. AN EASEMENT FOR COMMUNICATION AND OTHER FACILITIES AND INCIDENTAL PURPOSES GRANTED TO MOUNTAIN STATES TELEPHONE AND TELEGRAPH COMPANY BY THE INSTRUMENT RECORDED MAY 7, 1930 IN BOOK 894 AT PAGE 390. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT DESCRIBES A PARCEL OF LAND THAT ENCUMBERS A PORTION OF THE SUBJECT PROPERTY BEING THE WEST ONE-HALF OF THE EAST ONE-HALF OF SECTION 21. "THE SAID TELEPHONE AND TELEGRAPH LINE SHALL BE CONSTRUCTED ALONG THE NORTH- SOUTH ONE-QUARTER SECTION LINE THROUGH THE EAST ONE-HALF OF SAID SECTION 21).

12. TERMS, CONDITIONS, PROVISIONS, AGREEMENTS AND OBLIGATIONS SPECIFIED UNDER THE AGREEMENT BY AND BETWEEN THE UNION PACIFIC RAILROAD COMPANY AND JOHN J. KIRBY AND JOSEPH M. KIRBY RECORDED SEPTEMBER 27, 1940 IN BOOK 1068 AT PAGE 421. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTIONS CITED IN THIS DOCUMENT DESCRIBES A PARCEL OF LAND THAT ENCUMBERS AND COMPLETELY ENCOMPASSES THE SUBJECT PARCEL).

13. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF AN OIL AND GAS LEASE, EXECUTED BY HS RESOURCES INC, AS LESSEE(S), RECORDED DECEMBER 7, 2000, REFERRING TO OIL AND GAS LEASE EXECUTED BY AMOCO PRODUCTION COMPANY IN BOOK 681 AT RECEPTION NO. 1602713, AND ANY AND ALL ASSIGNMENTS THEREOF OR INTERESTS THEREIN. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTIONS CITED IN THIS DOCUMENT DESCRIBES A PARCEL OF LAND THAT ENCUMBERS THAT PORTION OF THE SUBJECT PROPERTY LYING IN THE EAST HALF OF SECTION 21. ADDITIONAL DOCUMENTS IN ITEM 13A REFER TO AGREEMENTS, PROVISIONS, CONDITIONS, AND OBLIGATIONS OF AN OIL AND GAS EASEMENT DESCRIBED IN RECEPTION NUMBERS, 02303881 AND 02209765 TO INCLUDE THOSE AREAS OF THE, EAST ONE-HALF OF SECTION 21 AND THE COMMUNITY DITCH PARCELS (CONTAINING 7.10 ACRES) LOCATED IN THE EAST ONE-HALF OF SECTION 21 RESPECTIVELY).

14. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A RIGHT-OF-WAY AGREEMENT AS RECORDED DECEMBER 1, 1986 AT RECEPTION NO. 02078820. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT ENCUMBERS A PORTION OF THE SUBJECT PROPERTY IN EAST ONE-HALF OF SECTION 21 AND IS GRAPHICALLY SHOWN AND IDENTIFIED HEREON).

15. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A RIGHT-OF-WAY AGREEMENT AS RECORDED DECEMBER 1, 1986 AT RECEPTION NO. 02078821. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT ENCUMBERS A PORTION OF THE SUBJECT PROPERTY IN EAST ONE-HALF OF SECTION 21 AND IS GRAPHICALLY SHOWN AND IDENTIFIED HEREON).

16. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A SURFACE OWNER'S AGREEMENT AS RECORDED SEPTEMBER 27, 1989 AT RECEPTION NO. 02193034. SURVEYOR'S NOTE: THE LEGAL DESCRIPTIONS CITED IN THIS DOCUMENT DESCRIBES A PARCEL OF LAND THAT ENCUMBERS AND COMPLETELY ENCOMPASSES THE SUBJECT PARCEL).

17. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF AN AGREEMENT CONCERNING IMPROVEMENTS TO WELD COUNTY ROAD #7, AS RECORDED SEPTEMBER 29, 1995 AT RECEPTION NO. 2471037 (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT DESCRIBES A PARCEL OF LAND THAT ENCUMBERS THE SUBJECT PROPERTY AND IS GRAPHICALLY SHOWN HEREON).

18. ITEM A: TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF AN AGREEMENT CONCERNING A RULE AND ORDER AND RELEASE OF LIS PENDENS BETWEEN LEFT HAND WATER DISTRICT AND SWINK FAMILY FARMS, ET AL. ITEM B: TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A NON-EXCLUSIVE EASEMENT AGREEMENT BETWEEN SWINK FAMILY FARMS ET AL., AND LEFT-HAND WATER DISTRICT. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT ENCUMBERS THE SUBJECT PROPERTY AND IS GRAPHICALLY SHOWN HEREON).

19. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A MEMORANDUM OF AGREEMENT BETWEEN ENCANA OIL AND GAS, INC., AND SWINK FAMILY FARMS LLLP. (SURVEYOR'S NOTE: THE MEMORANDUM REFERENCED HEREIN DESCRIBES AN AREA OF 20.015 ACRES OF LAND AT THE SOUTHWEST CORNER OF WELD COUNTY ROADS, 8 AND 7, IS BLANKET IN NATURE, ENCUMBERS THE SUBJECT PROPERTY, AND IS NOT GRAPHICALLY SHOWN).

20. THE SECOND AMENDMENT TO AN EASEMENT AND RIGHT-OF-WAY AGREEMENT FOR OIL AND GAS LINES AND INCIDENTAL PURPOSES GRANTED TO CRESTONE PEAK RESOURCES HOLDINGS, LLC., RECORDED ON AUGUST 13, 2018, AT RECEPTION NO. 4422990. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT ENCUMBERS A PORTION OF THE SUBJECT PROPERTY AND IS GRAPHICALLY SHOWN AND IDENTIFIED HEREON).

21. AN APPARENT EASEMENT FOR SHUT-IN OIL AND GAS WELLS, GRAVEL ACCESS ROAD, AND GAS LINE AS DISCLOSED BY ALTA/NSPS LAND TITLE SURVEY RECORDED DATED JUNE 30, 2017, AND LAST REVISED DECEMBER 19, 2017 AT RECEPTION NO. 4346911. (SURVEYOR'S NOTE: THE ALTA/NSPS SURVEY CITED IN THIS DOCUMENT REFERS TO LOCATIONS OF OIL AND GAS WELLS, LINES, AND ACCESS ROADS SURVEYED BY OTHERS AT THE TIME OF RECORDATION AND ARE SHOWN THEREON).

23. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF A RIGHT-OF-WAY GRANT BETWEEN ENCANA OIL AND GAS (USA) IN., AND KERR-MCGEE GATHERING LLC., AS RECORDED APRIL 30, 2015 AT RECEPTION NO. 4103128. (SURVEYOR'S NOTE: THE LEGAL DESCRIPTION CITED IN THIS DOCUMENT ENCUMBERS THAT PORTION OF EAST ONE-HALF OF SECTION 21 AND IS GRAPHICALLY SHOWN AND IDENTIFIED HEREON).

24. TERMS, AGREEMENTS, PROVISIONS, CONDITIONS AND OBLIGATIONS OF RELINQUISHMENT BY AND AMONG, KERR-MCGEE OIL AND GAS ONSHORE LP, KERR-MCGEE GATHERING LLC, ANADARKO LAND CORP., AND ANADARKO E&P ONSHORE LLC., AND ERIE LAND COMPANY LLC., AS RECORDED JULY 3, 2018 AT RECEPTION NO. 4428217. MORE SPECIFICALLY: (1) THE LANDS AS SHOWN AND DESCRIBED ON 'EXHIBIT A' OF RECEPTION NO, 4428217 (2) DEED DATED JULY 18, 1911 AT BOOK 320 AT PAGE 61 (3) QUIT CLAIM DEED DATED SEPTEMBER 28, 1995 AT RECEPTION NO. 2661201 (4) SAID "SUBJECT LANDS" AS MAY BE DESCRIBED BY (1)-(3). (SURVEYOR'S NOTE: THE SUBJECT LANDS AS DESCRIBED AND PLOTTED IN "EXHIBIT A" RECEPTION NO. 442821, EFFECT THE NORTH-SOUTH CENTERLINE OF SAID SECTION 21, AND THOSE LANDS WEST OF SAID LINE. THE SUBJECT PARCEL OF THIS SURVEY IS EFFECTED BY INSTRUMENT (2) AS DESCRIBED IN ITEM 10 OF THIS SURVEY, AND ITEM (3), WHICH ENCOMPASSES AND ENCUMBERS ALL OF SAID SECTION 21.)

SHEET INDEX

GENERAL NOTES:

1. THE BASIS OF BEARINGS: THE NORTH LINE OF THE NORTHEAST ONE-QUARTER OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN MONUMENTED ON THE WEST END BY A FOUND REBAR WITH 2 INCH ALUMINUM CAP ILLEGIBLY STAMPED ENCASED IN A STANDARD MONUMENT WELL AND ON THE EAST END BY A FOUND REBAR WITH 2 INCH ALUMINUM CAP PARTIALLY ILLEGIBLY STAMPED WITH REMAINS OF SYMBOLOGY FOR THE NORTHEAST CORNER OF SECTION 21 AND "1994" ENCASED IN A STANDARD MONUMENT WELL ASSUMED TO BEAR SOUTH 89°38'36" WEST, A DISTANCE OF 2663.38 FEET.

2. NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

3. AT THE TIME OF THE SURVEY THERE WAS NO EVIDENCE OF RECENT EARTH MOVING WORK OR SIGNS OF CONSTRUCTION ACTIVITY.

4. PROPERTY ADDRESS PER PUBLIC RECORD: NOT ASSIGNED VACANT PROPERTY. TAX SCHEDULE NUMBER OF PROPERTY AFFECTED AT THE TIME OF SURVEY: 146721100037.

5. THE PROPERTY IS LOCATED WITHIN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN). OBTAINED FROM THE FLOOD INSURANCE RATE MAP (FIRM), MAP NUMBER 08123C2070E, EFFECTIVE JANUARY 20, 2016.

5. THE 50-FOOT-WIDE STRIP ENCOMPASSING THE PHYSICAL COMMUNITY DITCH WAS DESCRIBED IN BOOK 63 PAGE 464 AS A CONTINUOUS DITCH MEANDERING THROUGH SECTION 21 WITH NO SPECIFIC LOCATION PROVIDED. IT IS APPARENT THAT AN UNRECORDED SURVEY OF THE WEST ONE-HALF OF SECTION 21 PERFORMED BY CVL CONSULTANTS (PLS 35593) AND LATER RETRACED ON MAP REFERENCE 4 SURVEYED THE APPROXIMATE PHYSICAL CENTERLINE OF THE DITCH AND DOCUMENTED THE 50-FOOT-WIDE STRIP SURVEY BY CITING SPECIFIC BEARINGS AND DISTANCES AND SETTING SURVEY MONUMENTS IN THE FIELD. SUBSEQUENT TO THE UNRECORDED SURVEY AND APPARENTLY WITHOUT KNOWLEDGE OF THE PRIOR SURVEY'S EXISTENCE, THE AUTHORS OF MAP REFERENCE 3 AND LATER 5 PERFORMED A SIMILAR MONUMENTED PROCEDURE IN THE EAST ONE-HALF OF SECTION 21. THIS INTERPRETATION OF THE DITCH IN THE EAST ONE-HALF OF SECTION 21 DIFFERS FROM THE ONE PERFORMED IN THE WEST ONE-HALF OF SECTION 21 BY APPROXIMATELY 6 FEET PRODUCING A 5.89 FOOT JOG AT THE NORTH-SOUTH CENTER SECTION LINE. THE SURVEY PERFORMED HEREON, DOCUMENTS AND ACCEPTS THIS JOG AT THE NORTH-SOUTH CENTERLINE OF SECTION 21.

6. THE SUBJECT PROPERTY DESCRIPTION YIELDS A CALCULATED AREA OF 6,600,623 SQUARE FEET (151.52945 ACRES) MORE OR LESS.

SURVEYOR'S CERTIFICATION:

TO ERIE LAND COMPANY LLC, A DELAWARE LIMITED LIABILITY COMPANY AND COMMONWEALTH LAND TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 3, 4, 8, 13, AND 17 OF TABLE A THEREOF.

THE FIELD WORK WAS COMPLETED IN SEPTEMBER 2018.

COLORADO LICENSED
ROBERT L. MEADOWS JR.
34977
10/2/18
PROFESSIONAL LAND SURVEYOR

ROBERT L. MEADOWS JR., PLS 34977

FOR AND ON BEHALF OF
MATRIX DESIGN GROUP, INC.
2435 RESEARCH PARKWAY
COLORADO SPRINGS, CO. 80920

ALTA / NSPS LAND SURVEY DEPOSITING CERTIFICATE:

DEPOSITED THIS _____ DAY OF _____, 2017 A.D. AT _____ O'CLOCK ____M., IN BOOK _____

OF THE COUNTY SURVEY'S LAND SURVEY PLATS/RIGHT OF WAY SURVEYS AT PAGE _____, RECORDS

OF WELD COUNTY, COLORADO.

RECEPTION NUMBER:_____

PREPARED BY:
Matrix DESIGN GROUP
AN EMPLOYEE-OWNED COMPANY

ALTA/NSPS LAND TITLE SURVEY
LOCATED IN THE EAST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

DRAWN BY: -
CHECKED BY: RLM
SCALE: 1" = NA
DATE ISSUED: OCT. 1, 2018
SHEET 1 OF 2 SHEETS

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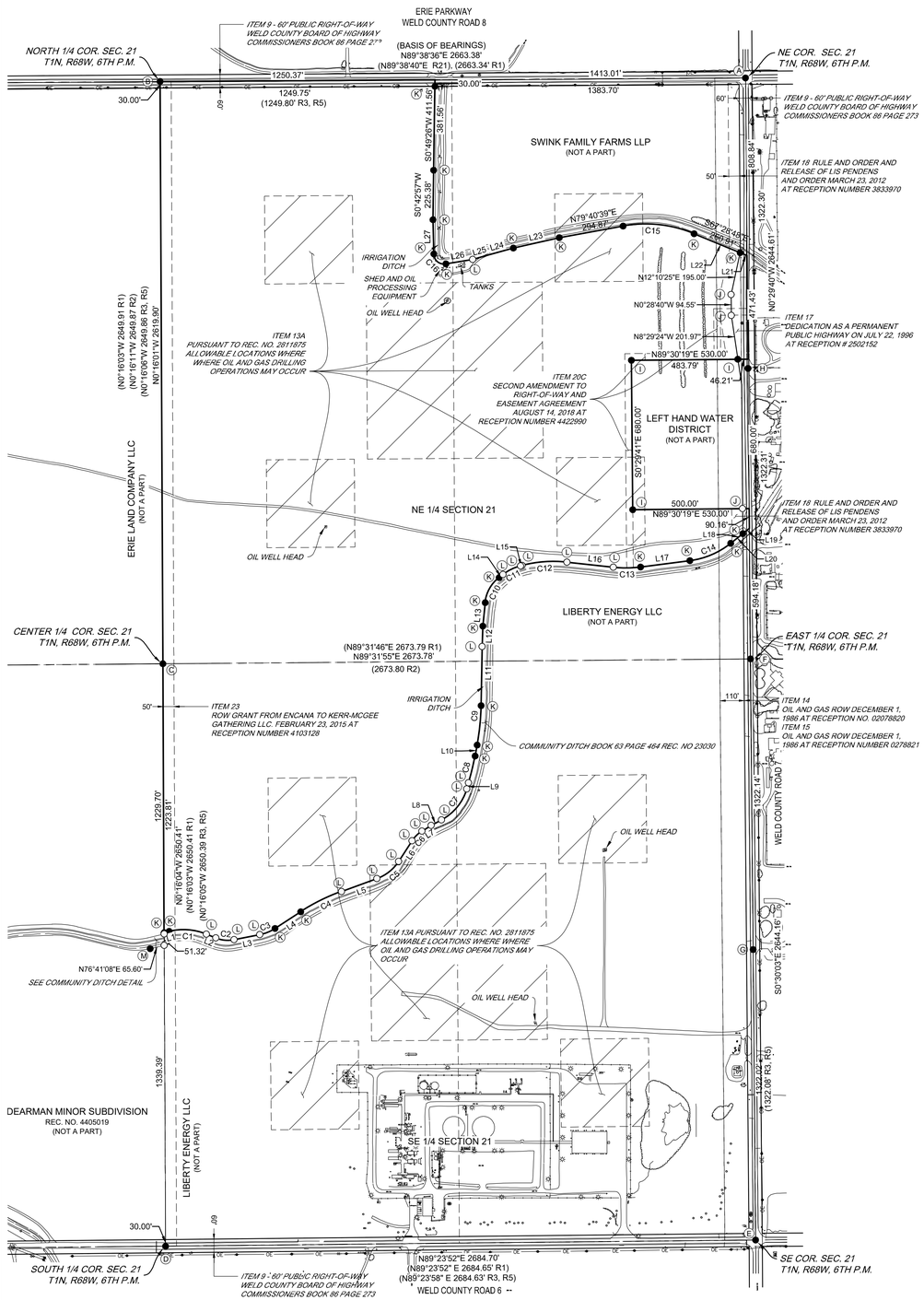
ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE WEST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO



MAP REFERENCE LEGEND

THE FOLLOWING RECORDED DOCUMENTS WERE CONSIDERED IN DEVELOPING THE BOUNDARY DEPICTED ON THIS MAP:

R1 AN ALTA LAND TITLE SURVEY DEPOSITED FOR RECORD ON AUGUST 3, 2006 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 3408839.

R2 AN ALTA LAND TITLE SURVEY DEPOSITED FOR RECORD ON JANUARY 29, 2009 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 3602215.

R3 AN ALTA LAND TITLE SURVEY DEPOSITED FOR RECORD ON MAY 5, 2014 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 4015551.

R4 AN ALTA LAND TITLE SURVEY DEPOSITED FOR RECORD ON SEPTEMBER 3, 2014 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 4043099.

R5 AN ALTA LAND TITLE SURVEY DEPOSITED FOR RECORD ON OCTOBER 25, 2017 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 4346911.

R6 THE FINAL PLAT OF DEARMAN MINOR SUBDIVISION RECORDED JUNE 6, 2018 IN THE WELD COUNTY CLERK AND RECORDER'S OFFICE UNDER RECEPTION NUMBER 4405019.

MONUMENTATION LEGEND

A - INDICATES A FOUND REBAR WITH 2 INCH ALUMINUM CAP PARTIALLY ILLEGIBLY STAMPED WITH REMAINS OF SYMBOLOGY FOR THE NORTHEAST CORNER OF SECTION 21 AND "1994" ENCASED IN A STANDARD MONUMENT WELL ACCEPTED AS REMAINS OF MONUMENT PER MAP REFERENCES R1, R2, R3 AND R5.

B - INDICATES A FOUND REBAR WITH 2 INCH ALUMINUM CAP ILLEGIBLY STAMPED ENCASED IN A STANDARD MONUMENT WELL ACCEPTED AS REMAINS OF MONUMENT PER MAP REFERENCES R1, R2, R3, R4, R5 AND R6.

C - INDICATES A FOUND 6/8 INCH REBAR WITH 2-1/2 INCH ALUMINUM CAP STAMPED "2006 - C 1/4 - S21 - T1N R68 W - PLS 28286" PER MAP REFERENCES R1, R2, R3, R4, R5 AND R6.

D - INDICATES A FOUND REBAR WITH 2-1/2 INCH ALUMINUM CAP APPROPRIATELY STAMPED WITH SYMBOLOGY FOR THE SOUTH ONE-QUARTER CORNER OF SECTION 21 AND " 2017 PLS 38512" ENCASED IN A STANDARD MONUMENT WELL MAP REFERENCE R6.

E - INDICATES A FOUND REBAR WITH 2 INCH ALUMINUM CAP APPROPRIATELY STAMPED WITH SYMBOLOGY FOR THE SOUTHEAST CORNER OF SECTION 21 AND "ALPHA ENGR LS25937 - 1995" ENCASED IN A STANDARD MONUMENT WELL PER MAP REFERENCES R1, R3 AND R5.

F - INDICATES A FOUND REBAR WITH 2 INCH ALUMINUM CAP APPROPRIATELY STAMPED WITH SYMBOLOGY FOR THE EAST ONE-QUARTER CORNER OF SECTION 21 AND "LS 25937 - 1995" ENCASED IN A STANDARD MONUMENT WELL PER MAP REFERENCE R1. R2,R3 AND R5.

G - INDICATES A FOUND REBAR WITH 2 INCH ALUMINUM CAP APPROPRIATELY STAMPED WITH SYMBOLOGY FOR THE SOUTH ONE-SIXTEENTH CORNER OF SECTION 21 AND "ALPHA ENGR LS 25937 - 1995" ENCASED IN A STANDARD MONUMENT WELL PER MAP REFERENCE R1, R3 AND R5.

H - INDICATES A FOUND REBAR WITH 2-1/2 INCH ALUMINUM CAP PARTIALLY ILLEGIBLE STAMPED "LS 24305 - 1999" ENCASED IN A STANDARD MONUMENT WELL ACCEPTED AS REMAINS OF MONUMENT PER MAP REFERENCE R3 AND R5.

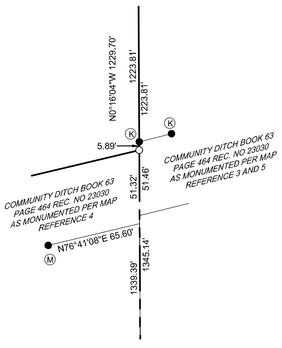
I - INDICATES A FOUND 5/8 INCH REBAR WITH 1-1/2 INC RED PLASTIC CAP STAMPED "PLS 38257" PER MAP REFERENCES R3 AND R5.

J - INDICATES A FOUND 5/8 INCH REBAR VISIBLY DISTURBED ACCEPTED AS REMAINS OF MONUMENT PER MAP REFERENCES R3 AND R5 REPLACED WITH A 5/8 INCH REBAR WITH 1-1/2 INCH ALUMINUM CAP STAMPED "MATRIX PLS 34977".

K - INDICATES A FOUND 5/8 INCH REBAR WITH 1-1/4 INCH ORANGE PLASTIC CAP STAMPED " BASELINE CORP PLS 38285" PER MAP REFERENCE R5.

L - INDICATES A FOUND 5/8 INCH REBAR VISIBLY DISTURBED ACCEPTED AS REMAINS OF MONUMENT PER MAP REFERENCE R5 REPLACED WITH A 5/8 INCH REBAR WITH 1-1/2 INCH ALUMINUM CAP STAMPED "MATRIX PLS 34977".

M - INDICATES A FOUND 5/8 INCH REBAR WITH 1-1/4 INCH RED PLASTIC CAP STAMPED "CVL LS 35596" PER MAP REFERENCE R4.



COMMUNITY DITCH DETAIL 1" = 50'

SEE NOTE 5 ON SHEET 1

CURVE TABLE					
CURVE	DELTA	RADIUS	LENGTH	CHORD BEARING	CHORD LENGTH
C1	35°56'55"	275.00'	172.54'	N85°57'03"W	169.72'
C2	33°20'04"	145.00'	84.36'	S84°38'38"E	83.18'
C3	21°33'50"	200.00'	75.27'	N67°54'25"E	74.83'
C4	12°52'09"	925.00'	207.76'	S63°33'34"W	207.33'
C5	36°47'56"	200.00'	128.45'	N51°35'41"E	126.26'
C6	24°00'42"	150.00'	62.86'	S45°12'04"W	62.40'
C7	45°35'41"	235.00'	187.01'	N39°17'14"E	182.11'
C8	5°50'26"	1225.00'	124.87'	N13°34'11"E	124.82'
C9	9°38'04"	1075.00'	180.76'	N05°49'56"E	180.55'
C10	46°45'36"	165.00'	134.66'	S29°04'09"W	130.95'
C11	22°53'25"	225.00'	89.89'	S63°53'40"W	89.29'
C12	20°51'49"	565.00'	205.74'	S85°46'18"W	204.60'
C13	13°34'39"	525.00'	124.41'	N89°24'52"E	124.12'
C14	31°10'55"	375.00'	204.09'	N67°02'05"E	201.58'
C15	32°50'33"	575.00'	329.60'	N83°54'04"W	325.10'
C16	97°55'18"	47.00'	80.33'	S50°22'51"E	70.90'

LINE TABLE		
LINE	BEARING	LENGTH
L1	S76°04'29"W	23.35'
L2	N67°58'36"W	47.24'
L3	S78°41'20"W	119.10'
L4	S57°07'30"W	139.10'
L5	S69°59'39"W	171.86'
L6	S33°11'43"W	111.17'
L7	S57°50'12"W	50.50'
L8	N62°05'05"E	52.47'
L9	N16°29'24"E	29.52'
L10	S10°38'58"W	50.93'
L11	S01°00'54"W	269.23'
L12	S01°41'27"W	92.68'
L13	N05°41'21"E	106.91'
L14	N52°26'57"E	22.72'

LINE TABLE		
LINE	BEARING	LENGTH
L15	N75°20'23"E	6.27'
L16	S83°47'48"E	212.21'
L17	N82°37'33"E	226.26'
L18	N51°26'38"E	109.04'
L19	N51°26'38"E	38.15'
L20	N51°26'38"E	70.89'
L21	S67°28'48"E	35.89'
L22	S67°28'48"E	225.02'
L23	N77°11'24"E	214.63'
L24	N74°41'14"E	127.29'
L25	N73°56'17"E	64.14'
L26	N80°39'30"E	123.80'
L27	S01°25'12"E	155.38'

N

300' 150' 0 300' 600'

SCALE: 1"= 300'

● INDICATES A FOUND MONUMENT DESCRIBED WITHIN THE MONUMENTATION LEGEND

○ INDICATES A SET NO. 5 REBAR WITH 1-1/2" ALUMINUM CAP STAMPED "MATRIX PLS 34977"

SYMBOL LEGEND FROM AERIAL SURVEY

FENCE	RAILROAD LIGHT
POLE	RAILROAD SWITCH
POST	POLE ANCHOR
SIGN	MANHOLE
2-POST SIGN	ELECTRIC BOX
TREE	POWER POLE
WALL	TRAFFIC LIGHT
CONCRETE GUARD RAIL	LIGHT POLE
GUARD RAIL	STORM INLET
	WATER VALVE

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PREPARED BY:
Matrix DESIGN GROUP
AN EMPLOYEE-OWNED COMPANY

ALTA/NSPS LAND TITLE SURVEY

LOCATED IN THE EAST HALF OF SECTION 21, TOWNSHIP 1 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF ERIE, COUNTY OF WELD, STATE OF COLORADO

DRAWN BY: -
CHECKED BY: RLM
SCALE: 1" = 300'
DATE ISSUED: OCT 1, 2018