

PLANNING COMMISSION

Mike Simone, Chairperson
Bushrod White, Vice-Chairperson
Carlos Barron
Lynne Derby
Kathy Kvasnicka
Thomas Meyers
Paul Weber

**Planning Commission Agenda
Regular Meeting
Fort Lupton City Hall – 130 S. McKinley Ave.*
Thursday, June 10, 2021
6:00 P.M.**

(Order & Contents Subject to Change by Action of the Commission)

** Login information on how to attend this meeting virtually (optional) is on the second page of this Agenda.*

Call to Order – Roll Call

Approval of Agenda

Consent Agenda – Consent Agenda items are considered to be routine and will be enacted by one motion and vote. There will be no separate discussion of Consent Agenda items unless a Commission member so requests, in which case the item may be removed from the Consent Agenda and considered at the end of the Consent Agenda.

- a. Approval of the Minutes of the May 13, 2021 Meeting

Public Comment – This portion of the Agenda is provided to allow members of the audience to present comments to the Planning Commission related to items not otherwise listed on the Agenda.

Action Items

- a. **P2021-015 A&D Custom Cruisers Special Use Permit**
- b. **P2021-016 Murata Farms Preliminary Plat & Preliminary PUD Plan**

Discussion Items

- a. Review of Meeting Discussion
- b. Development Code Update

Future Business

- a. Next Meeting of the Planning Commission is June 24, 2021 at 6:00 PM.

Adjourn

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Virtual Meeting Instructions

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When calling in, please be sure to mute your microphone on your computer, phone or tablet. Planning staff and/or the Chairman of the Planning Commission will provide instructions on when and how comments can be made by the public virtually.

RECORD OF PROCEEDINGS
FORT LUPTON PLANNING COMMISSION
May 13, 2021

The Planning Commission of the City of Fort Lupton met in session virtually via GoToMeeting, on Thursday, May 13, 2021.

Chair Mike Simone called the meeting to order at 6:01 pm and gave the following advisement:

Tonight's meeting shall be held virtually so as to ensure the health and safety of the general public and the City of Fort Lupton Planning Commission and staff.

The intent and purpose of the virtual appearance options is to allow the City to be innovative in providing the general public the most meaningful access possible in light of the current challenges present as a result of the Covid-19 pandemic. Therefore, subject to social distancing and public health orders, members of the general public will be offered the opportunity to be electronically present for meetings at the City, subject to existing health conditions.

An electronic link has been made available for tonight's meeting on the City's website and social media platforms and as posted at City Hall, so that the general public, Planning Commission and staff may participate electronically via the internet or on the phone.

ROLL CALL

Roll was taken and those present were Chair Mike Simone, Vice-Chair Bush White and Commission Members Carlos Barron, Kathy Kvasnicka and Thomas Meyers. Also in attendance were Planning Director Todd Hodges, City Planner II Alyssa Knutson, City Planner I Maria Lancto, City Clerk Mari Peña and Planning Administrative Assistant Magaly Morales-Tejada.

APPROVAL OF AGENDA

Chair Simone called for a motion to approve the agenda. It was moved by Vice-Chair Bush White and seconded by Kathy Kvasnicka

CONSENT AGENDA

Chair Simone called for a motion to approve the consent agenda. It was moved by Vice-Chair Bush White and seconded by Kathy Kvasnicka.

PUBLIC COMMENT

Chair Simone asked if there was anyone who would like to comment on an item not on the agenda tonight. Hearing none, he closed Public Comment

**RECORD OF PROCEEDINGS
FORT LUPTON PLANNING COMMISSION
May 13, 2021**

ACTION ITEMS

Chair Simone addressed the applicant, Leonard Toews.

He asked if Mr. Toews understood that Members of the Planning Commission may be appearing tonight via virtual connection and may not be appearing in-person.

Mr. Toews stated yes.

Chair Simone asked if he consented to the applicable members voting on his submittal, even though said members are not present in person.

Mr. Toews stated yes.

Chair Simone asked if he understood that he had the right to continue this public hearing to such a date to allow a full in-person public hearing.

Mr. Toews stated yes.

Chair Simone asked if he voluntarily signed and submitted the written waiver and consent to proceed electronically tonight.

Mr. Toews stated yes.

Chair Simone asked if he waived his right to proceed in an in-person public hearing and has consented to proceed forward voluntarily tonight in this virtual planning commission meeting.

Mr. Toews stated yes.

P2021-012: Brandywine Farms Minor Subdivision

Planner Maria Lancto presented this item. Ms. Lancto stated that this property is located at the northwest corner of the intersection of Highway 52 and County Road 23 and is zoned Agriculture. She stated that this minor subdivision will result in three separate lots; Lot 1 being 1 acre, Lot 2 approximately 4.3 acres and lot 3 25.26 acres. She stated that the applicants have also submitted for a change of zone for Lot 1, which is being reviewed at the public hearing following this. Ms. Lancto stated that the use of the property is not being changed at this time. Ms. Lancto stated that all notification requirements had been met, including publishing in the newspaper, posting at the property and mailing to neighbors. Ms. Lancto stated that the applicants, Leonard and Sherri Toews, are available to speak further about the proposal and answer any questions.

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Chair Simone addressed the applicant, Leonard Toews. He asked if he had anything to add or present on behalf of his application.

Mr. Toews stated that the properties west and adjacent to his property are both commercially zoned. He stated that his property has been on the City's comprehensive plan for quite some time. Mr. Toews stated that they see themselves as a gateway to Fort Lupton and see their property as a key point in furthering the development in the area.

Chair Simone asked Mr. Toews if he felt he had a full opportunity to participate in the public hearing.

Mr. Toews stated yes.

Chair Simone asked Mr. Toews if there was anything he would have liked to present in support of his presentation that he felt he was prevented from doing.

Mr. Toews stated no.

Chair Simone opened up the public comment portion of the Hearing for the action item. Hearing no one from the public wishing to speak, Chair Simone closed the Public Hearing.

Chair Simone opened up the hearing to Planning Commissioners' comments and questions. With no questions from Planning Commissioners, Chair Simone called for a motion to approve P2021-0012.

It was moved by Kathy Kvasnicka and seconded by Bush White. Motion passed unanimously.

P2021-013 Brandywine Farms Change of Zone

Planner Maria Lancto presented this item. She stated that this application is for Lot 1 of the Brandywine Farms Minor Subdivision, located at the northwest corner of Highway 52 and County Road 23. Ms. Lancto stated that the applicants are requesting this lot be rezoned from Agriculture to "C-2" Heavy Commercial. She stated that this location is designated for commercial transition land uses in the City's Comprehensive Plan, therefore this request is appropriate for the future of this area. Ms. Lancto stated that there is no proposed development with this application and any land use proposals would be brought back to the City for review. She stated that all notification requirements had been met, including publishing in the newspaper, posting at the property and mailing to neighbors.

Chair Simone asked the applicant, Leonard Toews, if there was anything he would like to add on behalf of his application.

Mr. Toews reiterated that his property is at a key intersection to start future development.

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Chair Simone asked Mr. Toews if the previous answers to question on his consent to an virtual question applied to this action item.

Mr. Toews stated yes.

Chair Simone opened up the public comment portion of the Hearing for the action item. Hearing no one from the public wishing to speak, Chair Simone closed the Public Hearing.

Chair Simone asked Mr. Toews if he felt he had a full opportunity to participate in tonight's public hearing.

Ms. Toews stated yes.

Chair Simone opened up the hearing to Planning Commissioners' comments and questions.

Member Carlos Barron asked if there were any future plans for this lot.

Mr. Toews stated that there is not currently, but they do see potential for the property in the future.

Vice-Chair White asked for clarification on heavy commercial zoning.

Planning Director Todd Hodges explained that along the highway, heavy commercial allows for more development than standard retail. He stated that under the current Code, any future development would come before Planning Commission.

Vice-Chair White asked for a worst case scenario use in heavy commercial zoning.

Planner Alyssa Knutson read the permitted uses and special uses listed in the Fort Lupton Municipal Code for C-2 Heavy Commercial zoning. She stated that all uses permitted in C-1 are also permitted in C-2.

Mr. Toews added that they currently operate a floral greenhouse on Lot 2 of this property and have hopes of expanding into a plant nursery.

With no further questions from Planning Commissioners, Chair Simone called for a motion to approve P2021-013.

It was moved by Vice-Chair White and seconded by Kathy Kvasnicka. Motion passed unanimously.

P2021-0014 Chapter 16 Article II Amendments

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Planner Maria Lancto presented this item. She stated that this is a review of proposed changes to Article 2 of Chapter 16 of the Fort Lupton Municipal Code. Ms. Lancto stated that during the November elections of 2020, citizens voted to allow medical and retail marijuana stores to operate within Fort Lupton. Ms. Lancto stated that since then staff has been working on a series of ordinances which, with state statutes, will regulate this use. She stated that these ordinances include a Medical Marijuana Ordinance, a Retail Marijuana Ordinance, the tax ordinance and changes to the zoning ordinance. Ms. Lancto stated that all 4 of these will be brought before City Council the following Tuesday, May 18, however the zoning ordinance must first be reviewed by Planning Commission. She stated this meeting and presentation is only for the proposed changes to the zoning chapter of the code. Ms. Lancto stated that the city will only allow a medical marijuana store to operate within a retail store, a standalone medical establishment will not be permitted as the city will only be allowing a maximum of 4 establishments at this time. Ms. Lancto stated that through discussion and research City staff has determined that Commercial and Industrial zoning works best for this use, so it will be permitted in the C-1, C-2, I-1 and I-2 zone districts. She stated that the city wants to leave open the possibility for this use in a PUD that allows for commercial and industrial uses, however this use would need to be specifically included in the PUD standards. Ms. Lancto stated that zoning is not the only way in which the location of these establishments will be regulated, she stated that they will not be permitted within or adjacent to residential properties, in downtown, within 1,000 feet from any school, childcare center, juvenile or adult halfway house, correction facility or substance abuse rehabilitation center or within 500 feet of a park with a playground and the establishments will be separated by 1,500 or 3,000 feet depending on the population - similar to how the city currently handles liquor licenses. Ms. Lancto referred to a map that depicts the buffers of where these establishments would not be allowed. Ms. Lancto stated that there will be a special tax of 3.1% to be collected by the city, in addition to the current 4.0% that is collected by the state. She stated that this rate may decrease or increase without further approval so long as it doesn't exceed 10%. Ms. Lancto stated that following this public meeting, there will be a public hearing with City Council on May 18, 2021 which will include this zoning ordinance and other ordinances related to this use. She explained that all ordinances that are approved require a second reading and publishing in the newspaper, which is a 60-day process, therefore the expected effective date of these ordinances is July 23, 2021. Ms. Lancto stated that the zoning ordinance includes changes to sections 16-40, 16-42 and 16-45. She stated that staff recommends that medical and retail marijuana stores be added as permitted uses in the C-1 and I-1 districts as well as adding to the end of section 16-45(c)(1) language that reads "medical marijuana stores and retail marijuana stores are permitted uses in PUDs, provided that they meet the qualifications and criteria set forth in Articles 7 and 8 of chapter 6 of this Code and are approved as part of the PUD approval process." She stated that the proposed resolution would need to be amended so that section 16-45(c)(1) of Exhibit A to the resolution referenced Chapter 6 and not Chapter 16. She stated that with these changes, no amendment is needed for sections for C-2 or I-2 zoning as the code currently lists all C-1 permitted uses are permitted uses in C-2 and similarly for I-1 and I-2 zoning. Ms. Lancto stated that Mari Peña, the City Clerk is also online and that staff will try to answer any questions, but that some questions may need to be passed along to City Council.

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Chair Mike Simone opened up the meeting to public comments.

Chair Simone opened up the public comment portion of the Hearing for the action item. Hearing no one from the public wishing to speak, Chair Simone closed the Public Hearing.

Chair Mike Simone opened up the meeting to Planning Commissioner's comments.

Member Thomas Meyers stated that there are a lot of DOT businesses in the area and feels as though having marijuana readily available for retail within the city would create conflict with DOT drivers.

Member Carlos Barron stated that he operates a DOT business and they require quarterly drug testing. He stated that all DOT employees should be aware of the regulations.

Member Meyers reiterated that having marijuana retail readily available near drivers who may make the choice to drive under the influence could have bigger consequences as they are driving larger vehicles than the average driver on the road.

Member Kathy Kvasnicka stated that Fort Lupton is not the first city in the area allowing for retail of marijuana, and that it already is readily available in the area. She stated that the retail of marijuana will bring in great revenue to the City.

Chair Simone stated that while good points were being made, this discussion is outside of the Planning Commissions role. He stated that he would like to recommend that staff bring to City Council's attention that many CDOT drivers are not aware that marijuana is still a federal offense and recommended that notice be required to be posted in marijuana establishments.

Planning Director Hodges stated that this can be brought to City Council although he is unsure if that would be a conflict with state regulations.

Chair Simone asked if home day cares are included in the buffers on the map.

Planning Director Hodges stated yes, all legally licensed childcares are included.

Chair Simone asked how future home day cares would be affected if there is an existing marijuana establishment in the area where a home daycare is being proposed.

City Clerk Mari Peña stated that if there is an existing marijuana facility, then a new home daycare would be allowed in the buffer area if they choose to be within that distance and it would not affect the status of the existing marijuana facility.

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Chair Simone suggested that in the amendment being made to the Code, they also amend the wording for Medical and Dental Clinics to list "Healthcare and Dental Clinics"

Planning Director Hodges stated that they could look at that as part of the overall code change.

Vice-Chair White asked if the land use process for marijuana establishments could be through Special Use Permits rather than permanent.

Planning Director Hodges stated that from a land use planning perspective, applications for these establishments will be treated the same as other retail establishments, the only benefit from a Special Use Permit is that it is non-transferable. He stated that retail and medical establishments are a mandate of the voters of the City and the City is just regulating how and where these establishments can be located.

Member Meyers asked for clarification on what the Planning Commissioners votes are needed for, if these establishments have already been mandated by the voters.

Planning Director Hodges stated that the Planning Commission is voting on this use being allowed in the specified zoning districts.

Chair Simone stated that Planning Commissioners should vote based upon compliance with the regulations.

Planner Knutson stated that Planning Commissioners are voting on the recommendation to City Council.

Planning Director Hodges stated that the Planning Commissioners have the ability to recommend changes to the section being reviewed and although this is a mandate of the citizens, that the commissioners have the purview to regulate how this works in the city.

Vice-Chair White reiterated that he would like to see it regulated as a special use permit rather than other land use types as to not allow transferability and not make it as readily available, as he has seen firsthand the effects that having marijuana readily available has on youth that he works with.

City Clerk Mari Pena stated that transferability is regulated through the state and there are many requirements in order for anybody to open or operate an establishment. Ms. Pena stated that licensing is heavily regulated through the state. She stated that the requirements are not only similar as those for liquor licenses, but there are in fact more requirements for marijuana retail.

Mr. Meyers asked for clarification of the votes and if he could vote no based on whether or not he agrees with the allowed uses in the zoning.

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Chair Simone stated yes

Planner Knutson stated yes and explained that the Planning Commission is only voting on the amendment to the zoning district uses.

With no further questions from Planning commissioners, Chair Simone asked for a motion to approve P2021-0014. It was moved by Member Kathy Kvasnicka and seconded by Member Carlos Barron.

Motion passed on a roll call vote of 4 “yes” votes and 1 “no” vote.

DISCUSSION ITEMS

Review of Meeting Discussion

A review of meeting discussions took place.

Development Code Update

A discussion of the Development Code Update took place.

FUTURE BUSINESS

The next meeting of the Planning Commission is scheduled for June 10, 2021 at 6:00 PM.

ADJOURNMENT

Chair Mike Simone adjourned the meeting at 7:03 PM.

Submitted by

Magaly Morales-Tejada, Planning Assistant

Approved by Planning Commission

Mike Simone, Chair

RESOLUTION NO. P2021-015

A RESOLUTION OF THE PLANNING COMMISSION OF FORT LUPTON RECOMMENDING TO CITY COUNCIL APPROVAL OF DAVID CORDER'S APPLICATION FOR A SPECIAL USE PERMIT FOR AN AUTO BODY AND PAINT SHOP AT 721 5TH STREET AND LOCATED IN THE NORTHWEST QUARTER OF SECTION 5, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN, CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.

WHEREAS, the Planning Commission held a public hearing on June 10, 2021, for the purpose of reviewing David Corder's special use permit application for an auto body and paint shop; and

WHEREAS, after review of the application and supporting documentation, the Planning Commission finds the request for a special use permit generally conforms with City codes and requirements and policies therein; and

WHEREAS, all legal requirements for the public hearing have been met including publication of the legal notice in the Fort Lupton Press, mailing of public hearing notices to adjacent property owners within 100 feet and posting of the hearing on the site; and

NOW THEREFORE BE IT RESOLVED, the Planning Commission has considered the application and has taken into consideration all referral comments and any citizen testimony in response to this application. Based upon the facts presented on this date, the Planning Commission hereby recommends approval of David Corder's special use permit for an auto body and paint shop on a property at 721 5th Street and located in the Northwest Quarter of Section 5, Township 1 North, Range 66 West of the 6th P.M. in Fort Lupton, Colorado, with the following conditions:

I. Prior to recording the special use permit map:

- A. The title of the site plan and special use permit map shall include the Project No.: LUP2021-0014 & Plan No. SUP2021-0003.
- B. Any redline comments provided by staff shall be made to the special use permit map.
- C. Applicant shall work with the Planning Department and Public Works to locate the dumpster appropriately. Applicant shall also provide details on screening of dumpster.
- D. Applicant shall provide written acknowledgement of the comments from Pro Code, Inc.
- E. Applicant shall provide written acknowledgement of the comments from United Power.

F. Applicant shall provide written evidence that the comments from Public Works have been adequately addressed.

G. The following note shall be added:

1. The property shall be maintained to the curb, or roadway if no curb exists.
2. The City reserves the right to reevaluate traffic impacts in the future if there is an increase or change from what was represented to the City in evaluating this special use permit.
3. Any proposed signage shall be submitted to the City for review and permitting.
4. Any future expansion of the site or addition of a buildings or other structures not shown on the special use permit map will require the review from the Planning Department, Building Department, Engineering Department and the Fire District to determine if additional requirements are necessary prior to release of building permits.

II. The mylar map and additional requirements shall be submitted within 120 days from the date of City Council approval.

DONE THIS 10^h DAY OF JUNE, 2021 BY THE PLANNING COMMISSION FOR THE CITY OF FORT LUPTON, COLORADO.

Chairman

ATTEST:

Planning Director

**A&D CUSTOM CRUISERS
SPECIAL USE PERMIT STAFF REPORT
Project No. LUP2021-0014 & Plan No. SUP2021-0003**

PROJECT DESCRIPTION

Project No.: LUP2021-0014 / Plan No. SUP2021-0003

Project Name: A&D Custom Cruisers Special Use Permit

Applicant's Name: David Corder with A&D Custom Cruisers LLC

Location of Request:

The site is located at 721 5th Street in a portion of the Northwest Quarter of Section 5, Township 1 North, Range 66 West of the 6th P.M. in Fort Lupton, Colorado. The site is situated at the northwest corner of the intersection of 5th Street and Main Street.



Nature of Request:

The Applicant has submitted a request for a special use permit for an auto body and paint shop on a property located at 721 5th Street. This property is zoned C-1 General Commercial. Within the C-1 Zone District, a special use permit is required for auto, truck, boat, trailer and farm equipment sales, services and repairs.

Site Size: The Property is 0.241 acres, more or less.

Zone District: 'C-1' General Commercial

Proposed Use: Auto body and paint shop.

Existing Use: Currently vacant; previously was an auto parts retail store.

Hearing Dates: Planning Commission: Thursday, June 10, 2021 at 6:00
City Council: Tuesday, July 6, 2021 at 7:00 PM

Hearing Location: Fort Lupton City Hall – Council Chambers, 130 S. McKinley Ave., Fort Lupton, Colorado, or virtually via GoToMeeting.

Staff Recommendation: Approval with conditions, as shown on the proposed resolution.

SUMMARY OF PREVIOUS APPLICATIONS

To staff's knowledge, there are no prior applications for these properties through the City of Fort Lupton.

APPLICATION PROCESS

The Applicant is requesting approval of a special use permit for an auto body and paint shop. A special use permit application is processed under [Section 16-7](#) of the Code.

After required public notice of the special use permit application, the Planning Commission shall consider the application, referral comments and any public testimony at a public hearing and make a recommendation to City Council to approve, approve with conditions or deny the special use permit. The Planning Commission's comments shall be based on the evidence presented, conformance with the Comprehensive Plan and compliance with the City's standards, regulations and policies.

The City Council shall then conduct a public hearing and evaluate the application, referral agency comments, Planning Commission recommendation and any public testimony, and shall approve, conditionally approve, continue for additional information or for further study or deny the application based on the evidence presented and compliance with the City's standards, regulations and policies and other guidelines.

NOTIFICATION REQUIREMENTS

The Zoning Regulations require published notice of the hearings at least fifteen (15) days prior to the hearings. The Planning Commission and City Council hearings was published in the Fort Lupton Press on May 26, 2021.

Notice of the public hearings was posted on May 26, 2021 at the Property, which is at least fifteen (15) days prior to the hearings, as required by the Zoning Regulations.

Notice was mailed to neighbors within one-hundred (100) feet of the Property on May 25, 2021, as required by the Zoning Regulations of the Code.

CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES

The property is located within the 'C-1' General Commercial Zone District. The Municipal Code does not list auto body and paint shops as a use by right, but does list auto, truck, boat, trailer and farm equipment sales, services and repairs as being allowed with an approved special use permit. Section 16-7 states that it is the intent of the special use permit is to provide flexibility, to provide a means for setting performance standards for individual land uses and to help diversify uses within a zoning district. It further states that the list of permitted uses in each zone district is exclusive, meaning that uses not specifically described are not permitted, but similar uses and compatible uses, may be permitted as special uses as set forth in [Section 16-7].

Section 16-7(d) states that the City shall use the following criteria to evaluate the Applicant's request for a special use permit:

1. The special use shall satisfy all applicable provisions of the Code and shall be consistent with the intent of the Comprehensive Plan.

Staff Comment: The Applicant has been working with City staff to comply with applicable provisions of the Code.

2. The special use shall not substantially alter the character of the district or the neighborhood.

Staff Comment: The property previously operated as an auto parts retail store. Additionally, to the east and west are auto body businesses. An auto body and paint shop conforms to the current character of this neighborhood.

3. The special use will result in efficient on- and off-site traffic circulation, and will not have an adverse impact on adjacent uses or present hazardous conditions for pedestrians or vehicles.

Staff Comment: The proposed use does not add additional traffic from what currently exists.

4. Adequate conditions of approval shall address: traffic; activity levels; light; noise; odor; building type, style and scale; hours of operation; dust; erosion and other performance issues identified through the public hearing process.

Staff Comment: The proposed use will have minimal impact on these items. Conditions of approval will address any item that is impacted.

5. The term of the special use permit and any reporting and inspection requirements as might be reasonably necessary to ensure compliance with conditions of approval may also be specified by the City Council.

Staff Comment: A special use permit is non-transferable, and therefore if a new owner were to occupy the property, the auto body and paint shop approved through this application would no longer be permitted unless a new application were submitted and approved. Planning Department staff will ensure compliance with other conditions of approval, either as listed on the proposed Resolution or as added by City Council.

CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Fort Lupton Comprehensive Plan designates this area as the Downtown Mixed-use type. Largely defined within the Downtown Subarea Plan, this area is intended for higher density mixed-use development that will establish an urban, pedestrian-oriented district at the heart of the community.

While auto oriented uses are not encouraged in this land use designation, the special use permit is appropriate due to the small scale of this shop and the temporary nature of a special use permit. Additionally, the existing building, which will be utilized, is oriented towards the street contributing to the urban and pedestrian oriented character of this area.

REFERRALS

Referrals were provided to the list below. Any comments received are enclosed with the Planning Commission packet.

Building Inspector	OMI	City Attorney
GIS Specialist	Police Chief	Public Works Director
Fort Lupton Fire Protection District	CDOT	United Power
Comcast	CenturyLink	Xcel Energy
Postmaster		

STAFF RECOMMENDATION

Staff recommends conditional approval of the A&D Custom Cruisers Special Use Permit. Conditions are listed under the proposed Resolution included with the Planning Commission packet.

For more information on this development, please refer to the Planning Commission packet provided. Additional documents are available for review at the Fort Lupton City Hall.



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621
www.fortluptonco.gov

Phone: 303.857.6694
Fax: 303.857.0351

Project No. _____

Land Use Application Form

A. CONTACT INFORMATION

- 1) Property Owner Name: Don & Luann Patton
 Company: _____
 Phone: 303-901-2413 Email: _____
 Address: 4502 County Rd 31 Fort Lupton Colo 80621
 Preferred method of contact? Email: Phone: Mail:
- 2) Representative Name: DAVID CORDER
 Company: A+D Custom Cruisers LLC
 Phone: 303-857-4947 Email: ADCcustomcruisers@gmail.com
 Address: 1340 Factory Circle Ft. Lupton CO 80621
 Preferred method of contact? Email: Phone: Mail:
- 3) Billing Contact (where invoices should be directed to): DAVID CORDER
 Billing Company: A+D Custom Cruisers LLC
 Phone: 303-857-4947 Email: ADCcustomcruisers@gmail.com
 Address: 1340 Factory Circle Ft Lupton CO 80621

B. SITE DESCRIPTION

Site Address: 721 - 5th St. Fort Lupton CO 80621
 Parcel Number: _____

Existing Zone Classification: _____ Proposed Zone Classification: _____

Water Type: City Name: _____

Sewage Type: City District Name or Location Hauled to: _____

C. APPLICATION TYPE (CHECK ALL THAT APPLY)

Sketch Plat

Preliminary Plat

Final Plat

Minor Subdivision

Amended Plat

Site Plan

Administrative Site Plan

Special Use Permit

Oil & Gas Permit

Annexation & Initial Zone

Change of Zone

Comp Plan Amendment

PUD Plan (Preliminary & Final)

Variance

Administrative Variance

Appeal

Other: _____

Project No. _____

D. PROJECT DESCRIPTION

Project Name: _____

Please provide a short description of the proposed project in the space provided below:

Auto Body & Paint Shop

E. REQUIRED DOCUMENTS

For an application to be considered complete, and for planning staff to begin review and schedule any applicable public hearings, this Land Use Application Form must be fully completed and all required attachments included. Planning staff will review the application for completeness and will provide notice to the representative and/or owner whether the application has been deemed complete.

F. CERTIFICATIONS

Representative Certification

By signing this application, I attest that I am acting with the knowledge and consent of all owners of the property that is the subject of this application, and that I have been designated to act as the representative for the project described in this land use application. I further certify that all information submitted with this application is true and accurate to the best of my knowledge.

Representative: David Corder Date: 2-19-2021

Owner Certification

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I authorize the representative listed on this application, if any, to communicate directly with City officials and to submit documentation and information regarding this application on my behalf.

Owner: Don Patton Date: 2-19-2021

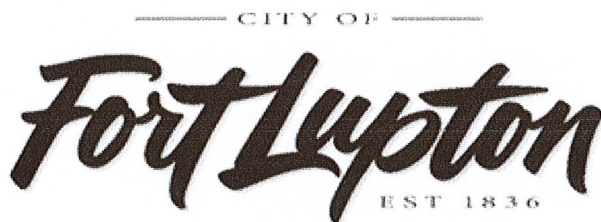
For Office Use Only

Received Date: _____

If the application is not complete, state reasons why it is incomplete:

Deemed Complete Date: _____

Fees Submitted: _____ Escrow Submitted: _____



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303-857-6694
Fax: 303.857.0351

www.fortluptonco.gov

APPLICATION FOR SPECIAL USE PERMIT

A pre-application conference and site visit may be required prior to submitting the Special Use Permit Application. The applicant may meet with representatives from the Planning Department to discuss the applicant's intended submittal, the City's application requirements and processes and other information relevant to the proposed application. Please contact the Planning Department at 303-857-6694.

Applicant should provide the following:

1. Plat of area with proposed zoning with vicinity map identifying site and surrounding area. If you are constructing a new building or adding to an existing building as part of this application, you must also submit a plot plan, construction plans, and a drainage plan. Approval of the special use permit will be based upon the drawings submitted unless changes are recommended by the engineer, planning commission, or city council.
2. Information as requested.

The applicant is responsible for the following:

1. Posting a hearing notice on the property 15 days prior to the hearing.

Name of Property Owner(s): Don & Luann Patton Phone: 303-901-2413

Address: 4502 County Rd 31 Fort Lupton CO 80621

Applicant (if different from owner): DAVID CORDER

Address: 155 Vaille Dr. Ft. Lupton CO 80621

Home Phone: NA Cell Phone: 303-710-0404

Address or location of Property for which Special Use Permit is being requested:

721 - 5th Street Fort Lupton CO 80621

Legal Description _____

Current Zoning: _____

Reason for Request:

to Move my Body shop & Paint shop
A & D Custom Cruisers

Please answer the following questions in detail.

1. What is the proposed use?

Auto Body & Paint shop

2. How will the proposed use impact the surrounding properties as it relates to the following areas:

Noise Limited to Inside the Building - Running Air Compressor & Fans -

Dust Inside the Building

Odor maybe A little - Everything is Filtered

Safety Not

Traffic Not

Light Not

3. What are the proposed hours of operation?

8 AM to 6 PM Monday - Friday - Sometimes Saturdays

4. Are you required to obtain any special licenses or permits through any other government agency? If yes, what types of licenses and permits are required?

NO

5. If this application is for a daycare, how many children will you be caring for?

NO

6. If this application is for an assisted living facility, how many units will you have in the facility?

NO

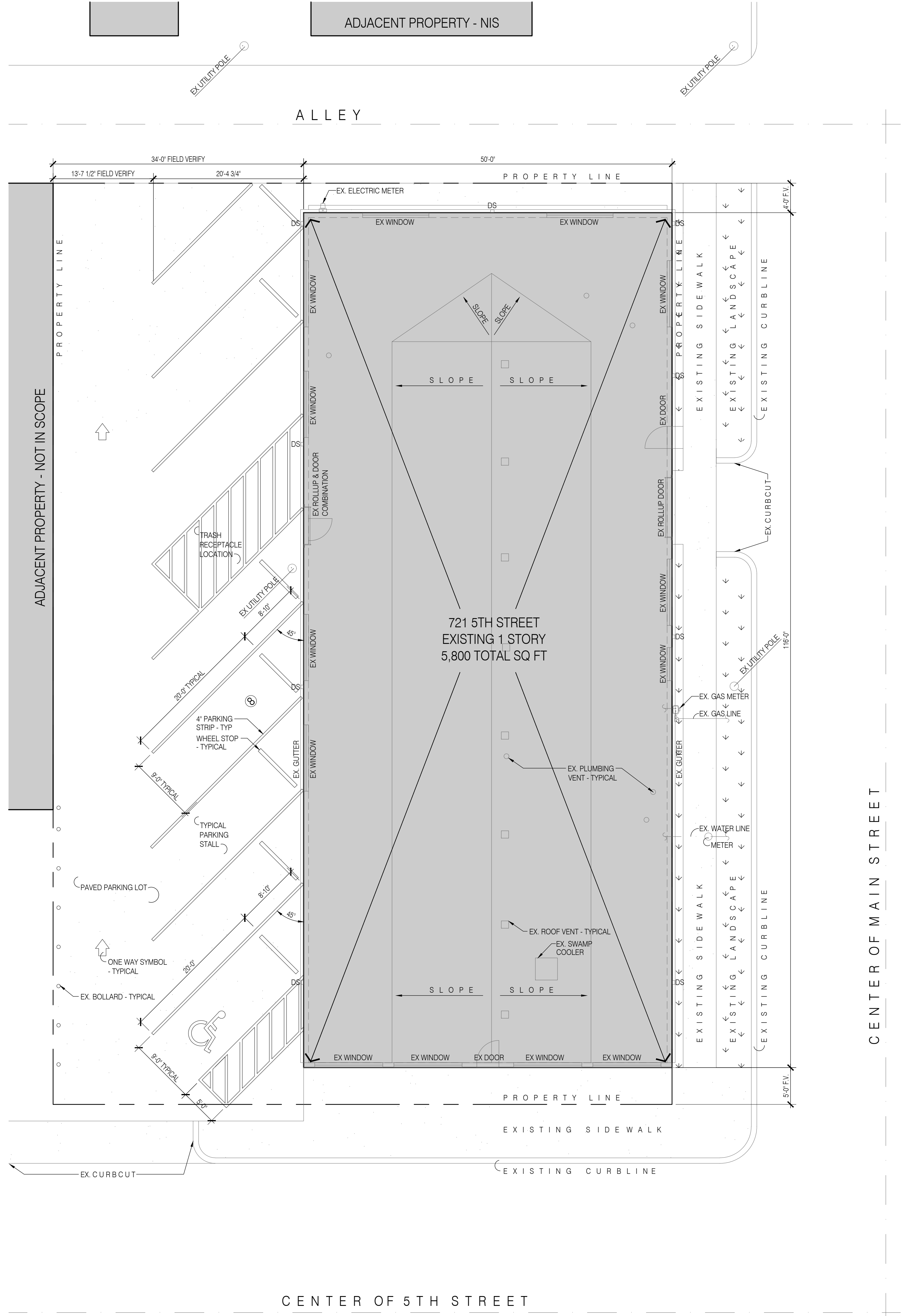
7. How many employees will work at the proposed facility?

5-8 person's

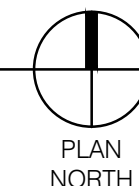
The applicant hereby certifies that the above information, along with the attached plans and project descriptions, is correct. The applicant agrees to comply with the provisions of the zoning ordinances, building code and all other applicable sections of the City Code, Land Use Code, City Plan and all other laws and ordinances affecting the construction and occupancy of the proposed building.

Signature(s): David Coulter

Date: 2-19-2021



1 ARCHITECTURAL SITE & ROOF PLAN
SCALE: 1/8" = 1'-0"



ZONING INFORMATION:				
ADDRESS: 721 5TH STREET, FORT LUPTON, CO 80621				
ZONE DISTRICT	PRIMARY USE(S)	ZONE LOT SIZE (GROSS AREA)	GROSS FLOOR AREA BY USE	LANDSCAPE AREA (GROSS AREA)
C-1	AUTOBODY SHOP (F-1)	10,500 SF	5,800 SF AUTOBODY SHOP (F-1)	N/A
BUILDING HEIGHT, STORIES (MIN./MAX)		BUILDING HEIGHT, FEET (MIN./MAX)	TRANSPARENCY PROVIDED (PRIMARY STREET)	BUILDING FORM
1		15'	N/A	INDUSTRIAL
STANDARD PARKING SPACES	COMPACT PARKING SPACES	ACCESSIBLE PARKING SPACES	TOTAL PARKING SPACES	BICYCLE PARKING SPACES
PROVIDED: 7	REQUIRED: 5	REQUIRED: 00	PROVIDED: 01	REQUIRED: 01
PROVIDED: 8	REQUIRED: 6	PROVIDED: 00	REQUIRED: 00	
LEGAL DESCRIPTION		RECEPTION NO. 2763646, LOTS 10, 11, 12, BLOCK 12, IN THE CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO		
PREVIOUS USE		AUTO PARTS RETAIL STORE (M)		
PROPOSED USE		AUTOBODY SHOP (F-1)		
TOTAL BUILDING AREA		5,800 SF (PER ASSESSOR'S RECORDS)		
EXISTING BUILDING PERMIT & ZONING LOG #		ZONING: NONE LISTED		
		BUILDING PERMITS: NONE LISTED		

- SITE PLAN GENERAL NOTES
- VERIFY EXACT LOCATION OF ALL UTILITIES IN THE FIELD. THIS DRAWING IS TO BE USED AS A UTILITY REFERENCE ONLY.
 - VERIFY ALL DIMENSIONS SHOWN FOR EXISTING CONDITIONS.
 - NOTIFICATION OF DISCREPANCIES SHOULD BE ISSUED TO THE ARCHITECT IMMEDIATELY UPON DISCOVERY.
 - COMPLY WITH ALL LOCAL, STATE, NATIONAL, AND FEDERAL SAFETY REQUIREMENTS. COMPLY WITH GOVERNING EPA NOTIFICATION REGULATIONS BEFORE STARTING DEMOLITION. COMPLY WITH HAULING AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.

SPECIAL USE PERMIT APPLICATION

CERTIFICATIONS FOR SITE PLAN, SPECIAL USE PERMIT AND CHANGE OF ZONE APPLICATIONS

PROPERTY DESCRIPTION
A parcel of land in the City of Fort Lupton, Colorado, located in the NW of 1/4 of Section 05, T01 R66 of the 6th P.M. and more particularly described as follows:
RECEPTION NO. 2763646, LOTS 10, 11, 12, BLOCK 12, IN THE CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO

OWNER'S APPROVAL
Know All Men By These Presents, that GENERAL PARTS DISTRIBUTION LLC, being the sole owner of the land described herein, and _____ are all of the mortgagees and holders of liens upon the property, and each and all hereby consent to this plat and join the conveyance and dedication of all streets, roads, alleys, easements, public ways and places shown hereon.
IN WITNESS WHEREOF, we have hereunto set our hands and seals this ____ day of _____, 2016.

STATE OF COLORADO,)
COUNTY OF WELD) ss
The foregoing instrument was acknowledged before me by _____ on this ____ day of _____, 2016. Witness my hand and seal.
My commission expires _____
Notary Public

CITY ENGINEER'S APPROVAL
Approved this ____ day of _____, 2016.
City Engineer

CITY WATER AND SEWER DEPARTMENT APPROVAL
Approved this ____ day of _____, 2016.
Director of Public Works

CITY ADMINISTRATOR'S APPROVAL
Approved this ____ day of _____, 2016.
City Administrator

PLANNING COMMISSION RECOMMENDATION
Recommended this ____ day of _____, 2016, by Resolution No. _____.
Chairperson, Fort Lupton Planning Commission

MAYOR'S CERTIFICATE
This is to certify that a plat of the above-described property was approved by [Ordinance/Resolution] No. _____ of the City of Fort Lupton passed and adopted on the ____ day of _____, A.D., 2016 and that the Mayor of the City of Fort Lupton, as authorized by said [ordinance/resolution] on behalf of the City of Fort Lupton, hereby acknowledges and adopts the said plat upon which this certificate is endorsed for all purposes indicated thereon.
Attest: _____
City Clerk (Seal)
Mayor

Studio K2 Architecture
1525 Market St., Suite 200
Denver, CO 80202
Phone: 303.534.4480

The Professional Architect's seal affixed to this sheet applies only to the material and items shown on this sheet. All drawings, instruments or other documents not exhibiting this seal shall not be considered prepared by this architect, and this architect expressly disclaims any and all responsibility for such plans, drawings or documents not exhibiting this seal.

A&D CUSTOM CRUISER

SITE PLAN FOR SPECIAL USE PERMIT

S I T E P L A N

FORT LUPTON, CO 80621

721 5TH STREET

NO. REVISION / SUBMISSIONS	DATE
USE PERMIT SET	05.03.21

PROJECT NUMBER: 2021.013
DATE: 05.03.21

ARCHITECTURAL SITE & ROOF PLAN

DRAWING NUMBER: AS001

Page 22 of 571



Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694

Fax: 303.857.0351

www.fortluptonco.gov

MEMO

To: Todd Hodges
Alyssa Knutson

From: Roy Vestal

Date: May 28, 2021

Subject: A&D Custom Cruisers Special Use Permit (LUP2021-0014)
Site Plan Review

Public Works has reviewed the submitted information for the above referenced development project with the following comments for inclusion with the Site Plan submittal.

1. Utilities -

a. Water - Chapter 3

- i. No cross connections are documented at this location on our Back Flow database.
- ii. Section 3.24.08 Backflow prevention may be required for this service connection. Any pressure creating devices would require back flow protection.
- iii. Please have a certified backflow technician inspect the plumbing at this location to determine if backflow devices are required. Contact Amber for more information for who is on the certified list and how to obtain an inspection report.

Magaly Morales-Tejada

From: Jonathan Gesick
Sent: Friday, May 14, 2021 2:59 PM
To: Magaly Morales-Tejada
Cc: Maria Lancto; Alyssa Knutson; Todd Hodges
Subject: RE: Referral Response Request: A&D Custom Cruisers Special Use Permit (LUP2021-0014)

Not sure what the building has been used for in the past but a Change of Use permit may be required. Also the installation of a paint booth would require a building permit.

Jonathan Gesick

Certified Building Official

(970) 305-3161

www.procodeinc.net



Confidentiality Notice: This electronic transmission and any attached documents or other writings are intended only for the person or entity to which it is addressed and may contain information that is privileged, confidential or otherwise protected from disclosure. If you have received this communication in error, please immediately notify sender by return e-mail and destroy the communication. Any disclosure, copying, distribution or the taking of any action concerning the contents of this communication or any attachments by anyone other than the named recipient is strictly prohibited.

From: Magaly Morales-Tejada
Sent: Wednesday, May 12, 2021 1:51 PM
Cc: Maria Lancto; Alyssa Knutson; Todd Hodges
Subject: Referral Response Request: A&D Custom Cruisers Special Use Permit (LUP2021-0014)

Good Afternoon,

The documentation located at the following link is submitted to you for review and recommendation for a special use permit being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: <https://www.fortlupton.org/DocumentCenter/Index/599>.

Any comments you consider relevant to this request would be appreciated. Please reply by **June 2, 2021**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, June 10, 2021 at 6:00 PM; and
- City Council: Tuesday, July 6, 2021 at 7:00 PM

Your time in this matter is greatly appreciated!

Magaly Morales-Tejada

Planning assistant

130 S. McKinley Ave.

Fort Lupton, CO 80621

Direct: 720-466-6111



The information transmitted is intended only for the person or entity to which it is addressed and may contain CONFIDENTIAL material. If you receive this information in error, please delete or destroy the information.

Please be cautious

This email was sent outside of your organization



June 1, 2021

Fort Lupton Planning Department
130 S. McKinley Avenue
Fort Lupton, CO 80621
www.fortlupton.org

Re: A&D Custom Cruisers Special Use Permit Project No. LUP2021-0014; Plan No. SPR2021-0003

Dear Mr. Hodges and Ms. Knutson:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the A&D Custom Cruisers Special Use Permit; Plan No. SPR2021-0003. After review of the information, United Power has no concerns or objection to the proposed Project No. LUP2021-0014; contingent upon United Power's ability to maintain all existing rights, facilities/equipment, and existing easements. This request should not hinder our ability for future expansion, including all present and any future accommodations for electrical distribution.

Please note, the property owner/developer/contractor must submit an application along with CAD data for new electric service via <https://www.unitedpower.com/construction>. United Power would like to work with these persons early in the construction process on getting an electric design prepared so that we can request any additional easements needed and hopefully have those easements dedicated on the plat rather than obtaining separate document(s). Obtaining easements via a separate document can be time consuming and could cause delays.

As a Reminder: No permanent structures are acceptable within the dry utility easement(s); such as, window wells, wing walls, retaining walls, basement walls, roof overhang, anything affixed to the house like decks, etc. United Power considers any structure that impedes the access, maintenance, and safety of our facilities a permanent structure. No exceptions will be allowed, and any encroachments could result in penalties.

Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested. We look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

Amber Mendoza

Amber Mendoza, RWA
ROW Agent
720.249.9315 | platreferral@unitedpower.com

Magaly Morales-Tejada

From: John Fryar
Sent: Thursday, May 13, 2021 9:56 AM
To: Magaly Morales-Tejada
Subject: RE: Referral Response Request: A&D Custom Cruisers Special Use Permit (LUP2021-0014)

I don't see any LE issues.



Chief John Fryar

From: Magaly Morales-Tejada
Sent: Wednesday, May 12, 2021 1:51 PM
Cc: Maria Lancto; Alyssa Knutson; Todd Hodges
Subject: Referral Response Request: A&D Custom Cruisers Special Use Permit (LUP2021-0014)

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- City Council: Tuesday, July 6, 2021 at 7:00 PM

Your time in this matter is greatly appreciated!

Magaly Morales-Tejada
Planning assistant
130 S. McKinley Ave.
Fort Lupton, CO 80621
Direct: 720-466-6111



Colorado Community Media
750 W. Hampden Ave. Suite 225
Englewood, CO 80110

City of Ft Lupton Legals
130 S McKinley Avenue
Fort Lupton CO 80621

Description: No. FLP222312 A&D Custom Cruisers Special

AFFIDAVIT OF PUBLICATION

State of Colorado }
County of Weld } ss

This Affidavit of Publication for the Fort Lupton Press, a weekly newspaper, printed and published for the County of Weld, State of Colorado, hereby certifies that the attached legal notice was published in said newspaper once in each week, for 1 successive week(s), the last of which publication was made 5/26/2021, and that copies of each number of said paper in which said Public Notice was published were delivered by carriers or transmitted by mail to each of the subscribers of said paper, according to their accustomed mode of business in this office.



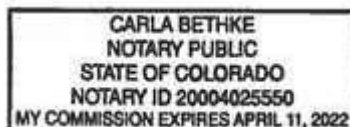
For the Fort Lupton Press

State of Colorado }
County of Weld } ss

The above Affidavit and Certificate of Publication was subscribed and sworn to before by the above named Gerard Healey, publisher of said newspaper, who is personally known to me to be the identical person in the above certificate on 5/26/2021. Gerard Healey has verified to me that he has adopted an electronic signature to function as his signature on this document.

20004025550-157765

Carla Bethke
Notary Public
My commission ends April 11, 2022



Public Notice

CITY OF FORT LUPTON NOTICE OF PUBLIC HEARING

Notice is hereby given that the City of Fort Lupton is in receipt of an application for a special use permit referred to as the A&D Custom Cruisers Special Use Permit located at 721 5th Street in Fort Lupton, Colorado, pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on **June 10, 2021, at 6:00 P.M., and before the City Council on July 6, 2021, at 7:00 P.M. or as soon as possible thereafter.**

The public hearings shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that the City Hall remains closed at the time of the hearings, the public hearings will be held remotely, accessible to the public by phone and internet. Information on how to attend the hearings will be provided in the agenda as posted on the City's website, www.fortluptonco.gov.

Further information is available through the City Planning and Building Department at (303) 857-6694.

ALL INTERESTED PERSONS MAY ATTEND.

LEGAL DESCRIPTION

LOT 10, 11 AND 12, BLOCK 12, IN THE CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.

Legal Notice No. FLP222312
First Publication: May 26, 2021
Last Publication: May 26, 2021
Publisher: Fort Lupton Press

Sign Posting Affidavit

A&D Custom Cruisers Special Use Permit

Project No. LUP2021-0014 / Plan No. SUP2021-0003



Facing 5th Street



Facing Main Street

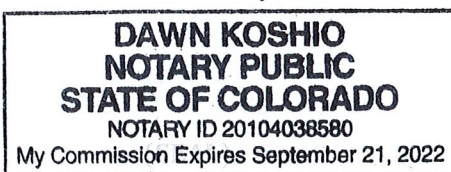
I, David Corder hereby acknowledge that the aforementioned property was posted in accordance with City Codes. Said public hearing notice was posted on this 26 day of May, 2021.

David Corder

Signature of Owner or Owner's Representative

The foregoing instrument was acknowledged before me by David Corder, this 26th day of May, 2021. Witness my hand and seal.

My commission expires 09/21/2022.



Dawn Koshio

Notary Public

CERTIFICATE OF MAILING

I, the undersigned, hereby certify that on the 25th day of May, 2027, a true and correct copy of the foregoing Notice of Public Hearings for the A&D Custom Cruisers Special Use Permit was sent via United States Mail, postage pre-paid, to the following addresses:

RD PURIFOY REAL ESTATE LLC
601 DENVER AVE
FORT LUPTON, CO 80621

IGNACIO SALINAS
516 MAIN ST
FORT LUPTON, CO 80621

ALONSO GUERRERO
805 5TH ST
FORT LUPTON, CO 80621

DOROTHY SANCHEZ
2633 MATHER ST
FORT LUPTON, CO 80621

MARIA GLORIA VASQUEZ
808 HARRISON ST
FORT LUPTON, CO 80621

GAYLE F GREENE
RONALD M GREENE
PO BOX 1247
FORT MORGAN, CO 80701

EVELYN M VANBUSKIRK
DONALD & LUAN PATTON
4502 COUNTY ROAD 31
FORT LUPTON, CO 80621

MICHAEL R HAWTHORNE
575 MAIN ST
FORT LUPTON, CO 80621

ARMIDA ROJO
LUIS ROJO
1303 7TH ST
FORT LUPTON, CO 80621

ROSAURA ROJAS
555 MAIN ST
FORT LUPTON, CO 80621

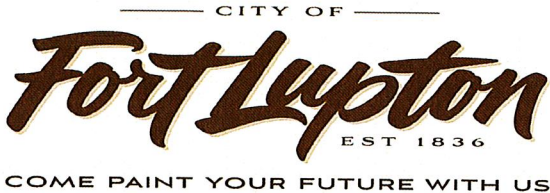
C/O GRAY OIL
710 DENVER AVE
FORT LUPTON, CO 80621

AMERICAN PIZZA PARTNERS LP
7700 E POLO DR
WICHITA, KS 67206

SONIA SAENZ
4455 WINDMILL DR
BRIGHTON, CO 80601



City Official



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694
Fax: 303.857.0351

www.fortluptonco.gov

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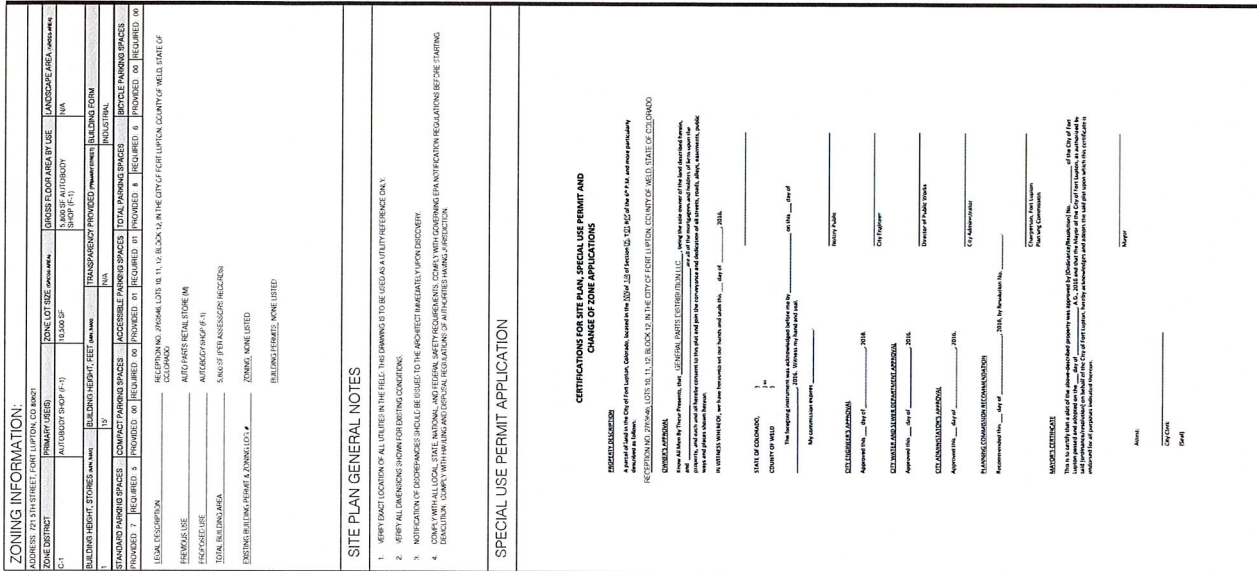
Further information is available through the City Planning and Building Department at (303) 857-6694.

ADDITIONAL INFORMATION AND DOCUMENTS ON THIS APPLICATION CAN BE FOUND AT BIT.LY/FLDEVELOPMENT AND SCROLLING DOWN TO THE ROW TITLED: A&D CUSTOM CRUISERS SPECIAL USE PERMIT.

ALL INTERESTED PERSONS MAY ATTEND.

LEGAL DESCRIPTION

LOT 10, 11 AND 12, BLOCK 12, IN THE CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.

[illegible]

RESOLUTION NO. P2021-016

A RESOLUTION OF THE PLANNING COMMISSION OF FORT LUPTON RECOMMENDING TO CITY COUNCIL APPROVAL OF THE MURATA FARMS PRELIMINARY PLAT AND PRELIMINARY PUD PLAN FOR A MIXED USE RESIDENTIAL AND COMMERCIAL SUBDIVISION LOCATED IN THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 4, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH P.M., CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.

WHEREAS, the Planning Commission held a public hearing on June 10, 2021, for the purpose of reviewing the Murata Farms Preliminary Plat and Preliminary PUD Plan; and

WHEREAS, the Murata Farms Preliminary Plat and Preliminary PUD Plan proposes 180 single family detached homes, as well as future development tracts for planned paired homes, townhomes, and commercial development; and

WHEREAS, after review of the application for the Murata Farms Preliminary Plat and Preliminary PUD Plan, and consideration of staff comments, applicant's presentation, and any public input, the Planning Commission finds the request for the Murata Farms Preliminary Plat and Preliminary PUD Plan conforms with City codes, and requirements and policies therein; and

WHEREAS, all legal requirements for the public hearing have been met, including mailing of public hearing notices to adjacent property owners within 500 feet; and

NOW THEREFORE BE IT RESOLVED, the Planning Commission has considered the application and has taken into consideration all referral comments and any citizen testimony in response to this application. Based upon the facts presented on this date, the Planning Commission hereby recommends approval of the Murata Farms Preliminary Plat and Preliminary PUD Plan located in the North Half of the Southwest Quarter of Section 4, Township 1 North, Range 66 West of the 6th P.M., City of Fort Lupton, County of Weld, State of Colorado with the following conditions:

I. Prior to submitting the Final Plat and Final PUD Plan:

- A. Any redline comments provided by City staff shall be made to the preliminary plat.
- B. Applicant shall provide written evidence that the comments from the Public Works Director have been adequately addressed.
- C. Applicant shall provide written evidence that the comments from CDOT have been adequately addressed.

- D. Applicant shall provide written evidence that the comments from United Power have been adequately addressed. Utility easements will need to be shown on the plat.
- E. Applicant shall provide written evidence that the comments from Xcel Energy (Public Service Company) have been adequately addressed. Utility easements will need to be shown on the plat.
- F. Applicant shall provide written evidence that the comments from Kerr-McGee Gathering LLC have been adequately addressed.
- G. Applicant shall work with Planning Department staff to finalize trail names on the preliminary and final maps.
- H. Applicant shall provide written evidence that the comments from the Division of Water Resources have been adequately addressed, and discuss the potential conveyance of water rights with the Public Works Director.
- I. Applicant shall provide written detail on how the comments previously provided by Colorado Parks and Wildlife will be addressed.
- J. Applicant shall finalize street names with City staff and update all drawings with those names.
- K. Referral comments that impact the layout of the preliminary plat shall be incorporated into the preliminary plat, including providing easements as required by utility companies.
- L. The following note shall be added to the Preliminary Plat and Preliminary PUD Plan map:
 - 1. Unless specifically modified by a PUD plan, all provisions of the City's Code and adopted standards and specifications shall apply within PUD Districts.
 - 2. At the time of platting, future Phases 3 – 5 shall finalize PUD development standards for approval by City Council.

DONE THIS 10th DAY OF JUNE, 2021 BY THE PLANNING COMMISSION FOR THE CITY OF FORT LUPTON, COLORADO.

Chairman

ATTEST:

Planning Director



**MURATA FARMS PRELIMINARY PLAT & PRELIMINARY PUD PLAN
STAFF REPORT
LUP2021-0012 & PPL2021-0002**

PROJECT DESCRIPTION

Project Nos.: LUP2021-0012 & PPL2021-0002

Project Name: Murata Farms Preliminary Plat & Preliminary PUD Plan

Applicant's Name: M-J PERRI COMPANY ("Applicant")

Location of Request:

The site consists of a parcel of land west and adjacent to County Road 29 ½, and south and adjacent to Highway 52 in Fort Lupton (the "Property"). The Property is located in the North Half of the Southwest Quarter of Section 4, Township 1 North, Range 66 West of the Sixth Principal Meridian, City of Fort Lupton, County of Weld, State of Colorado.



Nature of Request:

The Applicant has submitted a request for a preliminary plat and preliminary PUD plan for a mixed use subdivision that will consist of 180 single family detached homes (Phases 1 and 2, which are being reviewed and platted at this stage), as well as future development tracts for planned paired homes, townhomes, and commercial development at the northwest corner of the site. These additional phases will require separate platting approval by the Planning Commission and City Council.

Site Size: 72.7 acres, more or less.

Zone District: PUD Planned Unit Development.

Proposed Use: Residential uses including 180 single family detached homes, as well as future development tracts for planned paired homes, townhomes, and commercial development at the northwest corner of the site. The Property will also include four pocket parks, along with greenways and trail connections.

Existing Use: Vacant/agricultural with two well sites with appurtenances. One well is abandoned and plugged, while the second well remains active.

Hearing Dates: Planning Commission – June 10, 2021 at 6:00 PM; and
City Council – July 6, 2021 at 7:00 PM.

Hearing Location: Fort Lupton City Hall – Council Chambers, 130 S. McKinley Ave., Fort Lupton, Colorado.

Staff Recommendation: Approval with conditions, as shown on the proposed resolution.

SUMMARY OF PREVIOUS APPLICATIONS

In 2002, the City Council approved the Murata Farms Annexation and Initial Zoning to 'PUD' Planned Unit Development.

On April 7, 2020, the Fort Lupton City Council approved the Sketch Plat for this project as part of the City's major subdivision process. The Preliminary Plat and Preliminary PUD Plan are the next phase of the subdivision process and zoning process for a planned unit development.

APPLICATION PROCESS

The Applicant is requesting approval of a preliminary plat and preliminary PUD plan for a residential subdivision that will include 180 single family detached homes, as well as future development tracts for planned paired homes, townhomes, and commercial development at the northwest corner of the site. The Property will also include four pocket parks, along with greenways and trail connections.

Under the Fort Lupton Municipal Code, after required public notice of the preliminary plat and PUD plan, the Planning Commission shall consider the application, referral comments and any public testimony at a public hearing and make a recommendation to City Council to approve, approve with conditions or deny the preliminary plat. The Planning Commission's comments shall be based on the evidence presented, conformance with the Comprehensive Plan and compliance with the City's standards, regulations and policies.

The City Council shall then conduct a public hearing and evaluate the preliminary plat and preliminary PUD plan, referral agency comments, Planning Commission recommendation and any public testimony. City Council shall approve, conditionally approve, continue for additional information or for further study or deny the application based on the evidence presented and compliance with the City's standards, regulations and policies and other guidelines.

References to the Preliminary PUD Plan establishes the unique regulations and standards for development on the Property. This includes, but is not limited to, any deviations from the City's Zoning

Regulations, Residential Design Standards and Specification for Design and Construction of Public Improvements and Zoning Regulations.

NOTIFICATION REQUIREMENTS

The Subdivision Regulations require published notice of the hearings in a timely manner prior to the hearings. The Planning Commission and City Council hearings were published in the Fort Lupton press on May 26, 2021.

Notice of the public hearings were posted on the Property on May 26, 2021, pursuant to the Subdivision Regulations, which require the Applicant post the Property with notice of the hearings at least fifteen (15) days prior to the hearings.

Notice was mailed to neighbor within 500 feet of the Property, and owners and lessees of mineral interests on May 25, 2021.

CONFORMANCE WITH CITY STANDARDS, REGULATIONS AND POLICIES

The area is zoned PUD Planned Unit Development with commercial, neighborhood, and residential uses. The objective of a PUD is to provide for the planning and development of substantial tracts of land, suitable in location and character for the uses proposed, as unified and integrated entities in accordance with detailed development plans.

The Preliminary Plat and Preliminary PUD Plan is for a mixed use subdivision to include 180 single family detached homes, as well as future development tracts for planned paired homes, townhomes, and commercial development at the northwest corner of the site. The street names and layout have been initially reviewed by the Design Review Team, including representatives from the Fire District, Engineering, Public Works and Planning. Some of the proposed street names will require changes and the Applicant is working with City staff to finalize names prior to submittal of the Final Plat and Final PUD Plan.

The Applicant has submitted the required documents pursuant to the Code. The City Engineer has provided comments related to the construction plans, and the proposed resolution includes conditions of approval to ensure that any concerns are addressed as part of the final plat review process.

Approval of a PUD Plan is being reviewed concurrently with the Preliminary Plat. All development within a PUD zone district must be in accordance with a PUD plan. PUD plans shall contain unique district regulations that apply to the PUD zone district. All provisions of the City's Code and adopted standards and specifications shall apply within PUD zone districts, unless specifically modified in the PUD plan. Deviations from the City's standards are noted on the Preliminary Plat and Preliminary PUD Plan map.

CONFORMANCE WITH THE COMPREHENSIVE PLAN

The Future Land Use Map designates this area as Single-Family Attached land use with a portion in the northeast corner of the Property designated as Commercial General land use. The Single-Family Attached designation allows for single family attached homes in formal, planned developments. These provide higher density and more affordable housing options to complement traditional single family detached neighborhoods. Opportunities for new single family attached will help increase housing diversity and attract a wide range of potential residents. The Commercial General designation allows for commercial

businesses that offer residents basic goods and services. This supports a range of development styles, including stand-alone businesses on smaller properties as well as commercial shopping centers with multiple tenants. Primarily located along the City's major corridors, expansion of general commercial will offer residents greater shopping options within Fort Lupton and contribute to increased local commerce. In addition to commercial, these areas can include small office buildings, medical practices, and public and semi-public uses.

The proposed development plans for a variety of residential uses including single family detached homes, paired homes and attached townhomes. Furthermore, the plan includes a small area of Commercial General uses. Although Single-Family Detached housing is planned for a large portion of the site, generally, the application complies with and meets the intent of the Comprehensive Plan by including paired homes and townhomes, as well as the commercial corner.

The proposal also complies with the Parks and Trails Master Plan, which identifies a collector trail as running along the Highway 52 to the south, as well as a portion of the Main Fulton Ditch Trail, and a trailhead for the Main Fulton Ditch Trail along S. College Avenue (County Road 29 ½). The proposal includes plans for development of these amenities.

REFERRALS

Referrals were provided to the list below. Any comments received are enclosed with the Planning Commission packet.

City Attorney	Police Chief	Public Works Director
Recreation Manager	Golf Course Manager	Water Treatment Plant Manager
GIS Specialist	Fort Lupton Fire Protection District	CDOT
Colorado Parks and Wildlife	Division of Water Resources	Army Corp of Engineers
United Power	Comcast	CenturyLink
Xcel Energy	Postmaster	Weld County Dept. of Planning
Weld County School District RE-8	NCWCD	Fulton Ditch Company
Western Midstream		

***For more information on this development, please refer to the Planning Commission packet provided.
Additional documents are available for review at the Fort Lupton City Hall.***



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621Phone: 303.857.6694
Fax: 303.857.0351www.fortlupton.org

Project No. _____

Land Use Application Form

A. CONTACT INFORMATION

- 1) Property Owner Name: Perry L. Murata, President and Glenice Tani, Treasurer
 Company: M-J Perri Company
 Phone: 720-505-0733/303-857-4823 Email: plmurata@comcast.net/glenicetani7@gmail.com
 Address: 7215 S. Himalaya Way Centennial, CO 80016/14286 Highway 52, Ft. Lupton, CO 80621
 Preferred method of contact? Email: ☐ Phone: ☐ Mail: ☐
- 2) Representative Name: Eric Eckberg, JHome LLC - John Cork, Coronado West
 Company: JHome LLC for Coronado West
 Phone: 303-472-6720/480-820-0977 Email: eric@jehome.com/jcork@coronadowest.com
 Address: 2696 S. Colorado Blvd #320, Denver, CO 80222/8655 S. Priest Drive, Tempe, AZ 85284
 Preferred method of contact? Email: ☒ Phone: ☐ Mail: ☐
- 3) Billing Contact (where invoices should be directed to): Eric Eckberg c/o John Cork
 Billing Company: Coronado West (John Cork)
 Phone: 303-472-6720/480-820-0977 Email: eric@jehome.com/jcork@coronadowest.com
 Address: 2696 S. Colorado Blvd #320, Denver, CO 80222/8655 S. Priest Drive, Tempe, AZ 85284

B. SITE DESCRIPTION

Site Address: 14284 Highway 53, Ft. Lupton, CO 80621
 Parcel Number: 147104000069
 Existing Zone Classification: Agriculture Proposed Zone Classification: PUD
 Water Type: Municipal Name: Fort Lupton
 Sewage Type: Municipal District Name or Location Hauled to: _____

C. APPLICATION TYPE (CHECK ALL THAT APPLY)

- | | | |
|--|--|--|
| ☐ Sketch Plat | ☐ Administrative Site Plan | ☒ PUD Plan (Preliminary & Final) |
| ☒ Preliminary Plat | ☐ Special Use Permit | ☐ Variance |
| ☐ Final Plat | ☐ Oil & Gas Permit | ☐ Administrative Variance |
| ☐ Minor Subdivision | ☐ Annexation & Initial Zone | ☐ Appeal |
| ☐ Amended Plat | ☐ Change of Zone | ☐ Other: _____ |
| ☐ Site Plan | ☐ Comp Plan Amendment | |

Project No. _____

D. PROJECT DESCRIPTION

Project Name: Murata Farms

Please provide a short description of the proposed project in the space provided below:

The Preliminary Plat/PUD for Murata Farms is planned as a Mixed Use neighborhood including 180 Single Family Lots with Tract established for the future platting and development of Paired Homes, Townhomes and Commercial uses.

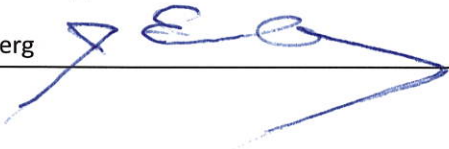
E. REQUIRED DOCUMENTS

For an application to be considered complete, and for planning staff to begin review and schedule any applicable public hearings, this Land Use Application Form must be fully completed and all required attachments included. Planning staff will review the application for completeness and will provide notice to the representative and/or owner whether the application has been deemed complete.

F. CERTIFICATIONS

Representative Certification

By signing this application, I attest that I am acting with the knowledge and consent of all owners of the property that is the subject of this application, and that I have been designated to act as the representative for the project described in this land use application. I further certify that all information submitted with this application is true and accurate to the best of my knowledge.

Representative: J. Eric Eckberg  Date: 2/19/21

Owner Certification

I hereby certify that I am the legal owner of record of the property that is the subject of this application. I hereby authorize the representative listed on this application, if any, to communicate directly with City officials and to submit documentation and information regarding this application on my behalf.

Owner: See owners authorizations attached Date: 2/19/21

For Office Use Only

Received Date: _____

If the application is not complete, state reasons why it is incomplete:

Deemed Complete Date: _____

Fees Submitted: _____ Escrow Submitted: _____

Instructions for Submitting the Land Use Application Form

DEFINITIONS

Words in the singular include the plural and words in the plural include the singular.

Application refers to the official submittal to the City of Fort Lupton's Planning Department for review of the proposed land use development identified in the land use application form. The application includes the form, all materials submitted for review of the project, including those documents required under the Land Use Regulations of the Municipal Code, and any additional information provided.

Project refers to the land use development identified on the land use application form and application materials.

Property refers to the land that is being proposed for development as described in the land use application form and application materials.

A. CONTACT INFORMATION

- 1) Provide contact information for all owners of any property that is the subject of the application. If the contact information for all property owners will not fit on the space provided, submit a separate sheet for the additional owners.
- 2) Provide contact information for all persons, firms or businesses that are authorized by the owners identified in Section A(1) to work on the land use application, including, but not limited to, discussing the project, submitting application materials, and attending meeting and hearings. If the contact information for all representatives will not fit on the space provided, submit a separate sheet for the additional representatives.
- 3) Provide contact and mailing information for the person that should receive all invoices for the project. If this person changes at any time, contact the Planning Department immediately to update this information.

B. SITE DESCRIPTION

Provide all information requested. Parcel numbers and address information may be found at the Weld County Property Portal at <https://www.co.weld.co.us/maps1/propertyportal/>. Current zoning can be found at <http://www.fortlupton.org/405/Zoning>.

C. APPLICATION TYPE

Select the land use application that is applicable to the project. If there are multiple land use application types being submitted to run concurrently, select all that apply. The land use application types will be identified during the required pre-application meeting. If you have any questions about this, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.

D. PROJECT DESCRIPTION

Please select a project name that will be referenced throughout the project and a description of what the project entails. If you need more space for the project description, please attach a separate sheet.

E. REQUIRED DOCUMENTS

Required documents will be discussed during the pre-application meeting with the Planning Department. If any documents are missing, the acceptance of the application may be delayed until the submittal is complete.

F. CERTIFICATIONS

Representative Certification. Provide the signature of all authorized representatives in this section.

Owner Certification. Provide the signature of all owners of properties included in the application in this section.

For any other questions, please contact the Planning Department at 303.857.6694 or planningdept@fortlupton.org.

Murata Farms

Preliminary Plat - Preliminary PUD Narrative

May 10, 2021

1. Team

Developer/Applicant

Eric Eckberg
Coronado West
2696 S. Colorado Blvd., #320
Denver, CO 80222
303-472-6720
eric@jehome.com

Civil Engineer

Travis Frazier, PE
Redland
1500 West Canal Court
Littleton, CO 80120
720-283-6783 Ext. 126
tfrazier@redland.com

Landscape Architect

Karen Henry, PLA
Henry Design Group, Inc.
1501 Wazee Street, #1-C
Denver, CO 80202
303-446-2368
khenry@henrydesigngroup.com

2. Location and Property Description

The 72.71-acre property is located at the southwest corner of Hwy. 52 and WCR 29-1/2. More particularly described as being in a portion of the North One-Half of the Southwest One-Quarter of Section 4, Township 1 North, Range 66 West of the 6th Principal Meridian, Weld County, Colorado.

3. Adjacent Land Uses

North: Highway 52 and the Coyote Creek residential subdivision and Golf Course
South: The Mountain Sky residential subdivision
East: WCR 29-1/2 and the proposed Taylor Annexation subdivision
West: Appel residential subdivision

4. Site Features

The site is a gently rolling farm field comprising of crops and weeds. Existing vegetation includes indigenous trees and shrubs adjacent to the existing structures, along the Fulton Ditch and access roads to the well sites. A segment of the Fulton Ditch parallels Hwy. 52 in the eastern half of the site. Two well sites with appurtenances are on the property. The well within proposed Lot 2 Block 14 has been plugged and abandoned. As such, a pocket park is proposed on this site. An active well remains in the northern portion within Tract N. Another existing well is located off-site to the southwest of the

property. The required well setbacks will remain. A 30-foot-wide pipeline easement traverses the site in a north-south direction connecting the two operating well sites. The pipeline easement will remain in place as an open space trail corridor. The existing structures will be removed from the site.

Soil Type. The NRCS soil survey indicates that the soil on site is primarily sandy loams. The northern region of the property includes Olney Loams with Grades ranging from 1 to 5% with the majority of the site being under 3% for slope. The south eastern corner of the site includes an Otero Sandy loam with typical grades below 3%. The south west corner of the site includes Vona Sandy Loams with grades typically below 3%. These soil types are generally rated in Wind Erodibility Group 3 which has a higher susceptibility for wind erosion.

Geologic Characteristics. Refer to attached Geotechnical report "Preliminary Geotechnical Investigation Murata Farms (Muraco Subdivision) Southwest of Highway 52 and County Road 29 ½" By CTL Thompson dated October 31, 2019.

5. Zoning

The property was zoned Planned Unit Development (PUD) for a mix of neighborhood commercial, office and residential uses concurrent with the Annexation of the property. As indicated in the Annexation Agreement, the PUD is for agriculture and residential purposes consistent with the current use of the land. These land uses are permitted until such time a PUD Plan is approved for the property. The proposed Preliminary Plat/PUD indicates the proposed uses satisfying the requirement of the Annexation Agreement thereby allowing for the development of Murata Farms for a mixture of uses including single family detached residential, paired homes, townhomes, parks, trails, open space and commercial and office uses.

6. Proposed Land Uses

The Preliminary Plat/PUD proposes a total of 180 Single Family Detached homes and future development tracts. Lot 3 Block 14 is 7.29 acres and is proposed 58 Paired Homes. Lot 2 Block 14 is 5.13 acres and is proposed for 61 Townhomes. Lot 1 Block 14 is 2.52 acres and is planned for Commercial development. The commercial site is located at the Southwest corner of Highway 52 and WCR 29-1/2. The development will include four pocket parks

and a system of open space/greenway trail corridors for a total of 13.43 acres of parks and open space.

7. Compliance with the Ft. Lupton Comprehensive Plan and Plans and Design Standards

The proposed development integrates the goals set out in the Town Comprehensive Plan in the following ways:

Growth and Development. The proposed development is designed to provide connections at pre-determined locations to the existing and proposed adjacent neighborhoods. In addition, the layout provides continuous, direct, convenient, and safe pedestrian trails in open space corridors between the proposed parks, residences and the neighborhood commercial area.

The site is well situated for both housing and a commercial corner per the Comprehensive Plan. The plan also provides for diversity in housing types for the community. The commercial site is positioned to take advantage of the WCR 29-1/2 frontage and proximity to Aims Community College.

Transportation and Mobility. Murata Farms provides a safe and efficient transportation network that accommodates pedestrians, vehicles and bicycles. The main entrance is located along Highway 52 at the Coyote Creek Drive alignment. This collector street continues south providing future access to the Mountain Sky neighborhood. Local street access is also provided from this collector to Silverado Lane to the West. Secondary access is from WCR 29-1/2. A collector street meanders through the site in an east/west direction providing a connection to the extension of Coyote Creek Drive. This through collector street will provide convenient access to local streets internal to the neighborhoods for vehicles, bicycles, and pedestrians alike. The proposed neighborhood is planned as a pedestrian oriented and walkable community with on-street sidewalks and off-street trail connections throughout the community providing connections to future adjacent neighborhoods and the planned Regional Trail along the Fulton Ditch.

Parks, Open Space and Environmental Features. The proposed parks, open space and trails within the development will provide high quality recreational opportunities for neighborhood residents and create connections to future

neighborhoods and uses beyond the project boundaries. The proposed neighborhood complies with the Parks and Trails Master Plan, as follows:

- a. A portion of the Fulton Ditch Trail will be constructed providing for a connection to the proposed Trailhead at the corner of County Road 29-1/2 and HWY 52.
- b. Connector Trails will be provided along Hwy. 52 and County Road 29-1/2 providing for connections to the Trailhead, the Fulton Ditch Trail, and the Fort Lupton Trail west of the neighborhood.
- c. Neighborhood Trails will provide connectivity to the Connector Trails.
- d. Sidewalks will be provided where off-street trails are not available to ensure connectivity to adjacent neighborhood.

A proposed Trails Map is provided in the Preliminary Plat/PUD Plan set.

The neighborhood feature is provided by a park at the southeast corner of the intersection of the two collector streets providing good visibility and access. Three addition pocket parks are located within the single-family neighborhoods and are interconnected by open space/greenway Neighborhood trail corridors. One additional pocket park is proposed in the future paired home and townhome neighborhoods.

Public Facilities and Services. The proposed development is a logical extension of the City of Fort Lupton public services without placing additional burdens on existing residents and businesses. Infrastructure will be provided as necessary to meet the requirements of the Comprehensive Plan and/or the Land Use Code.

8. Public Land Dedication

Public land dedication for parks and open space is provided in accordance with the Fort Lupton's Subdivision regulations as follows:

REQUIRED PARK & OPEN SPACE

10 Acres per 1,000 Residents = 8.665 Acres

3 Residents per SFD & Paired Home dwelling unit (238 x 3 = 714 Residents)

2.5 Residents per SFA & MF dwelling unit ($61 \times 2.5 = 152.5$ Residents)

PROVIDED PARK & OPEN SPACE

Land Use	Area (acres)	No Credit (acres)
Parks/Open Space	4.22	
Open Space Landscape Area/Detention		3.33
Fulton Ditch Corridor	4.38	
Well Site Radius		1.52
Total	8.60	4.85

9. Utility Service

Stormwater Drainage. A Phase II Drainage Report has been prepared in compliance with the City of Fort Lupton Criteria and is included with the application. The proposed drainage design includes expansion of the Mountain Sky detention and water quality pond for peak flow attenuation for minor and major event flows. The plan also anticipates that the existing Fulton Ditch will not be impacted with additions stormwater runoff from the proposed development.

Evidence of Adequate Water Supply. The City of Fort Lupton will provide domestic water in conjunction with the development agreement that will be negotiated with the Final Plat.

Looped connectivity will be provided at a stub connection in Silverado Lane at the western edge of the property and in 29 ½ to the east.

Hydrant testing in the area indicates that residual pressures under 1300 gpm flow conditions generally maintain 68 psi. Development of this site will include similar fire flow demands which indicates that the area water system can support demands on the system.

Evidence of Adequate Sewer Service. The City of Fort Lupton will provide sanitary sewer service in conjunction with the development agreement that will be

negotiated with the Final Plat.

Sanitary Sewer service is available at the south west corner of the site with an existing manhole located in the extension of the future County Road 29-1/2.

Conversations with the City include a discussion about a 12" sewer main located at the south west corner of the site which will serve as the sewer outfall for the site. A final evaluation of the impact on the downstream system will be developed in conjunction with the City as anticipated loads on the system are presented.

10. Public Services.

- a. Life Safety. Fire and Police Protection and Law enforcement for the property would be provided by the Fort Lupton Police Department. It is not anticipated that there would be special security needs or a specific need for additional officers. Fire protection for the property would be provided by Fort Lupton Fire Department. It is not anticipated that the project would pose special fire hazards. Fire prevention requirements, fire detection, fire lanes, emergency access, etc. will be provided as required by code.
- b. Schools. The project is within the Weld RE-8 School District. The applicant will work with the District to identify and address any impacts of this project.
- c. Recreation and Open Space. The project will include park amenities, including open spaces and trails, and active and passive recreation.

11. Traffic Statement

Site development is proposed in compliance with the Fort Lupton Transportation Plan from June 2018. The site is currently served by Highway 52 and Weld County Road 29 ½. Highway 52 is currently a 2-lane paved road section that is planned for a future 4 lane arterial road. The minimum required right of way for Highway 52 is 120 feet in accordance with the City of Fort Lupton 4-lane major Arterial section.

Weld County Road 29 ½ is currently a dirt road planned as an urban collector. The City of Fort Lupton typical ROW section for a 4 lane Major Collector is 110 feet. This is consistent with what Mountain Sky provided to the south. The

developer will dedicate the required half right of way for each of these roadways in conjunction with Final Plat approval.

A north/south road will access Hwy. 52 at the Coyote Creek Drive intersection. This collector street will intersect with the proposed east/west collector street. The north/south collector will provide a connection into the Mountain Sky Neighborhood and local street access at Silverado Lane to the west. The east/west collector street will access WCR 29-1/2 and provide local street access to the proposed neighborhoods both north and south of the collector. The connections to surrounding Arterial Roadways have been designed to disperse traffic evenly within the development. A full Traffic Impact Study is provided with this Preliminary Plat/Preliminary PUD application.

12. Commercial Mineral Deposits

There are currently oil & gas facilities within the property but there are no known commercial mineral deposits on-site.

13. Cultural and Historical

A preliminary search of the History Colorado Office of Archaeology and Historic Preservation. The report indicates there may be one survey located within the Section 4 but the exact location has not been determined, the report is attached.

14. Phasing

The development is proposed in five (5) phases. Trails and parks included in the phase boundaries will be constructed with that phase. The project will generally develop in phases from the east progressing to the west. Phase 1 will include the eastern half of the single family lots from County Rd 29 ½ to the north south trail corridor, comprising of 95 lots. Phase 2 will be the balance of the 85 single- family lots located between the north/south trail corridor and the Appel subdivision. Phase 3 will be the paired homes. Phase 4 will be the townhomes and Phase 5 will be the commercial area.

It is anticipated that construction will commence upon completion of the entitlement and permitting process. The initial phase of development will

include the necessary infrastructure to serve phase 1. Development will continue based on market demand.

A proposed Phasing Plan is provided in the Preliminary Plat/PUD Plan set.

LOCATED IN THE NORTH HALF OF THE SOUTHWEST QUARTER OF SECTION 4, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
CITY OF FORT LUPTON, COUNTY OF WELD, STATE OF COLORADO.

COVER SHEET

1

1. Intent. The Murata Farms Planned Unit Development (PUD) is a 72.71- acre mixed-use neighborhood. The PUD will provide an attractive living and working environment using innovative site planning and design techniques that respond to the existing site conditions and existing adjacent land uses. The PUD is intended to meet the goals of the City of Fort Lupton PUD district as stated in the City's Municipal Code and Comprehensive Plan.

The PUD also provides for a mixture of retail and service commercial and businesses located along the frontage of Highway-52.

- An interconnected public street system that is bicycle and pedestrian friendly. Trails are provided in all green court/open space areas. Homes facing the public streets and green courts will have interesting elevations, thereby enhancing the pedestrian experience.
- Common open space and a pocket park provide areas for passive and active recreational opportunities.
- Conditions, covenants, and restrictions will be provided to ensure cohesive architecture and landscaping throughout the neighborhood.

- ## VARIATIONS TO THE RESIDENTIAL DESIGN STANDARDS

4. Lot Variation. Lot variations shall be provided within Murata Farms as follows. No minimum or maximum of any lot size is required.

- 5,250 Square Feet
- 6,050 Square Feet
- 6,600 Square Feet

Townhome Lots: 900 Square Feet

6. Single Family Paired or Duplex Residential

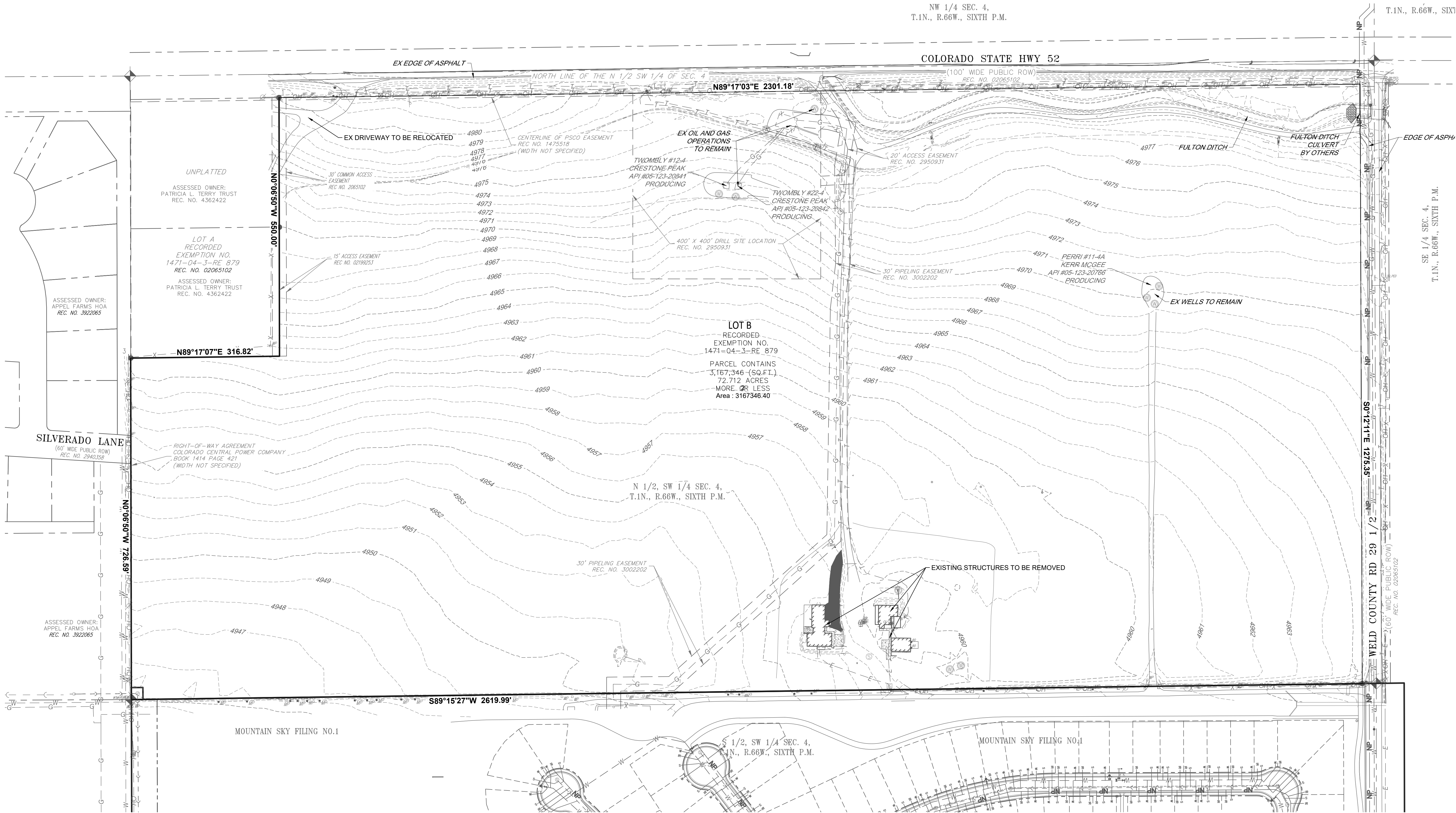
- Mix of roof colors: Where asphalt shingles are used three (3) distinct roof colors are required to be dispersed throughout the neighborhood.
- One (1) in every three (3) pairs of homes shall contain one front porch which is at least six (6) feet in depth and eight (8) feet in width.
- If the pair contains front loading garages to the public street right-of-way, the garage doors shall be recessed a minimum of two (2) feet from the front façade or face of the front porch. Inside or outside side loading garages or garages facing an auto court are exempt from this requirement.
- Garage Design Standards (Applies to garages facing a public street right-of-way) (Replaces Sec.17-44-228 of the RDS)
 - a. Alternate loaded garages are encouraged but not required.
 - b. At least 25% of all street facing garages shall be recessed a minimum of 4 feet behind the front façade of the structure or covered porch.
 - c. An additional 25 % of all street facing garages shall be recessed a minimum of 2 feet behind the front façade of the structure or covered porch.
 - d. There is no maximum garage door coverage for the front loading paired or duplex homes. However, garages shall not be forward of the façade of the primary structure or front porch more than two (2) feet.
 - e. Rear loaded, and auto court garages are exempt from this requirement.
 - f. A horizontal or vertical offset on the rear elevation of an alley loaded paired home is not required. The variation shall be provided by a change in color, roof form or color or cladding.

- | USE / STANDARD | MURATA FARMS PUD | CITY OF FORT LUPTON – R-2
RESIDENTIAL DISTRICT MEDIUM
DENSITY |
|--|------------------------|---|
| Single Family Residential | | |
| Permitted Land Uses | Single Family Detached | NA |
| Maximum Number of Dwelling Units | 180 | |
| Minimum Lot Size | 5,000 SF | 6,000 SF |
| Minimum Lot Frontage at front
property line | 30-feet | 30-feet |
| Maximum Building Height | 35-feet | 35-feet |
| Setbacks | | |
| Front | | |
| -to face of garage door ⁽²⁾ | 20 feet | 25 feet |
| -to structure and porch (non-
garage side) | 15 feet | |
| Side | 5-feet | 5-feet |
| Rear | 15-feet | 20-feet |
| Corner Side | 10-feet | 20-feet |
| Maximum Building Height | 35-feet | 35-feet |
| Minimum Floor Area | 900 SF | 750 SF two story/900 SF Ranch / 750
SF Tri-level |

1. Measurement per Fort Lupton Municipal Code
2. As measured from back of sidewalk on a public street right-of-way or edge of pavement on a private drive/alley.
3. Accessory uses/structures shall meet the requirements of the Fort Lupton Municipal Code.
4. Permitted encroachments into building setbacks:
 - a. Architectural features including but not limited to eaves, bay windows, chimneys, entertainment centers, brick ledges, cantilevers, counterforts, cornices, canopies, wing walls and like architectural features may encroach into the required setbacks a maximum of 24 inches.
 - b. Window wells may encroach into required setbacks a maximum of 36 inches
 - c. Unenclosed or uncovered patios less than 30 inches above grade may encroach into building setbacks to within five (5) feet of the rear lot line and two (2) feet within a side lot line.
 - d. Encroachments may not extend into easements without written approval from the easement holder.
5. All setbacks are measured to the building foundation.

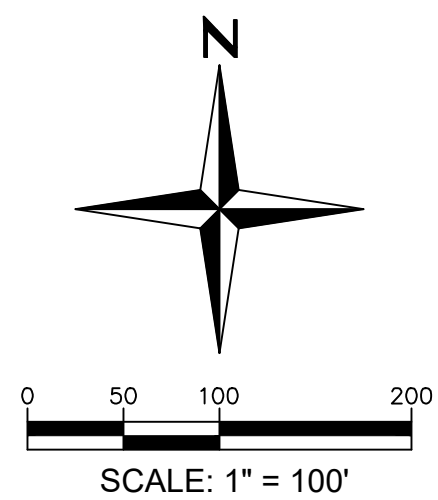
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I:\2019\19032 - Murata Farms\CADD\Sheet Sets\Preliminary Plat\19032 - Existing Conditions.dwg Job: 3 EXISTING CONDITIONS May 07, 2021 - 1:27pm jramirez



EXISTING LEGEND

	PROPERTY LINE		IRRIGATION LINE
	R.O.W.		SANITARY SEWER
	LOT LINE		STORM SEWER
	EASEMENT LINE		ELECTRIC LINE
	SECTION LINE		GAS LINE
	ROAD CENTERLINE		TELEPHONE LINE
	EDGE OF PAVEMENT		FIBER OPTICS LINE
	CURB AND GUTTER		CONTOUR MAJOR
	CONCRETE		CONTOUR MINOR
	FENCE		
	RETAINING WALL		
	WATER LINE		
	RAW WATER LINE		
	NON-POTABLE WATER LINE		



MURATA FARMS
PRELIMINARY PLAT / PUD

EXISTING CONDITIONS

SHEET

3

APPLICANT:



ENGINEER:

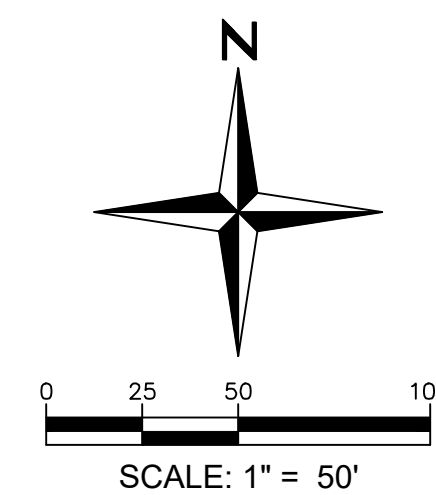


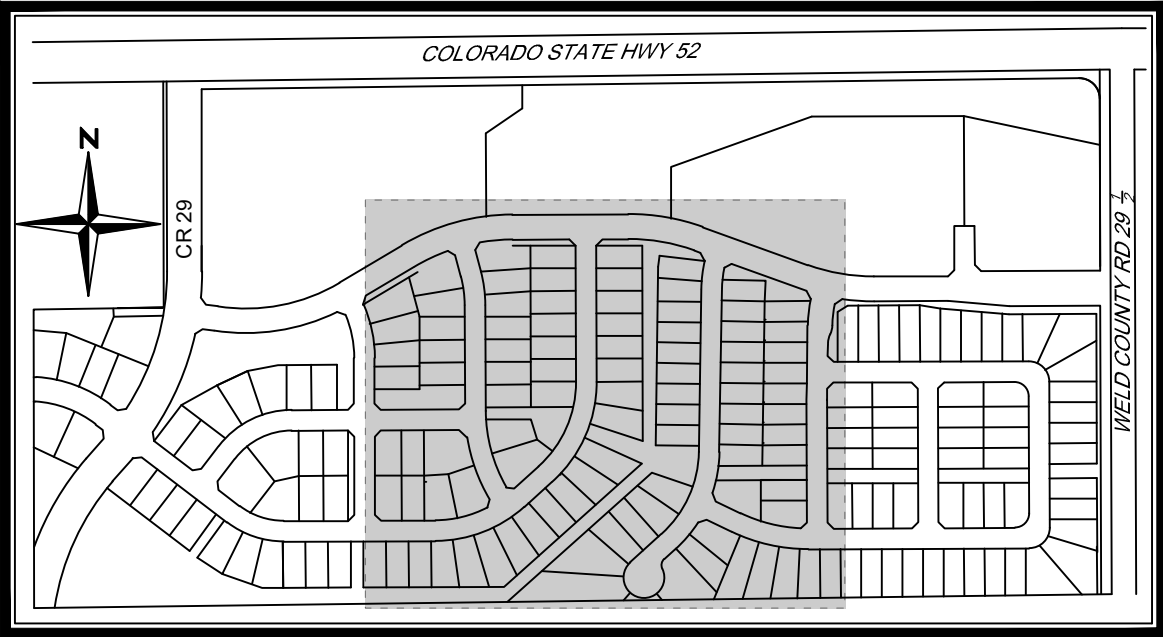
LANDSCAPE ARCHITECT / PLANNER:





- ## PROPOSED LEGEND
- | | |
|---|--------------------------|
|  | PROPOSED PROPERTY LINE |
|  | PROPOSED R.O.W. |
|  | PROPOSED LOT LINE |
|  | PROPOSED SETBACK |
|  | PROPOSED EASEMENT |
|  | PROPOSED ROAD CENTERLINE |
|  | PROPOSED CURB AND GUTTER |
|  | PROPOSED SIDEWALK |





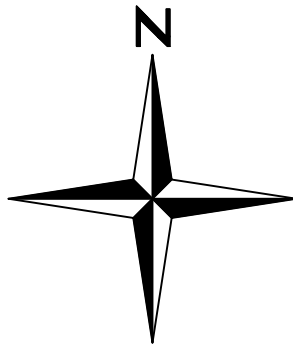
KEYMAP
N.T.S.

EXISTING LEGEND

- EXISTING PROPERTY LINE
- EXISTING R.O.W.
- EXISTING LOT LINE
- EXISTING EASEMENT
- SECTION LINE
- ROAD CENTERLINE
- EDGE OF PAVEMENT
- CURB AND GUTTER
- CONCRETE

PROPOSED LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED R.O.W.
- PROPOSED LOT LINE
- PROPOSED SETBACK
- PROPOSED EASEMENT
- PROPOSED ROAD CENTERLINE
- PROPOSED CURB AND GUTTER
- PROPOSED SIDEWALK



0 25 50 100
SCALE: 1" = 50'

MURATA FARMS
PRELIMINARY PLAT / PUD

SITE PLAN

SHEET

5

CORONADO
WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

APPLICANT:

DRAWN JLR
CHECKED TUF
APPROVED TUF
PROJECT NO. 19032
HORIZ. SCALE
VERT. SCALE

NOTES

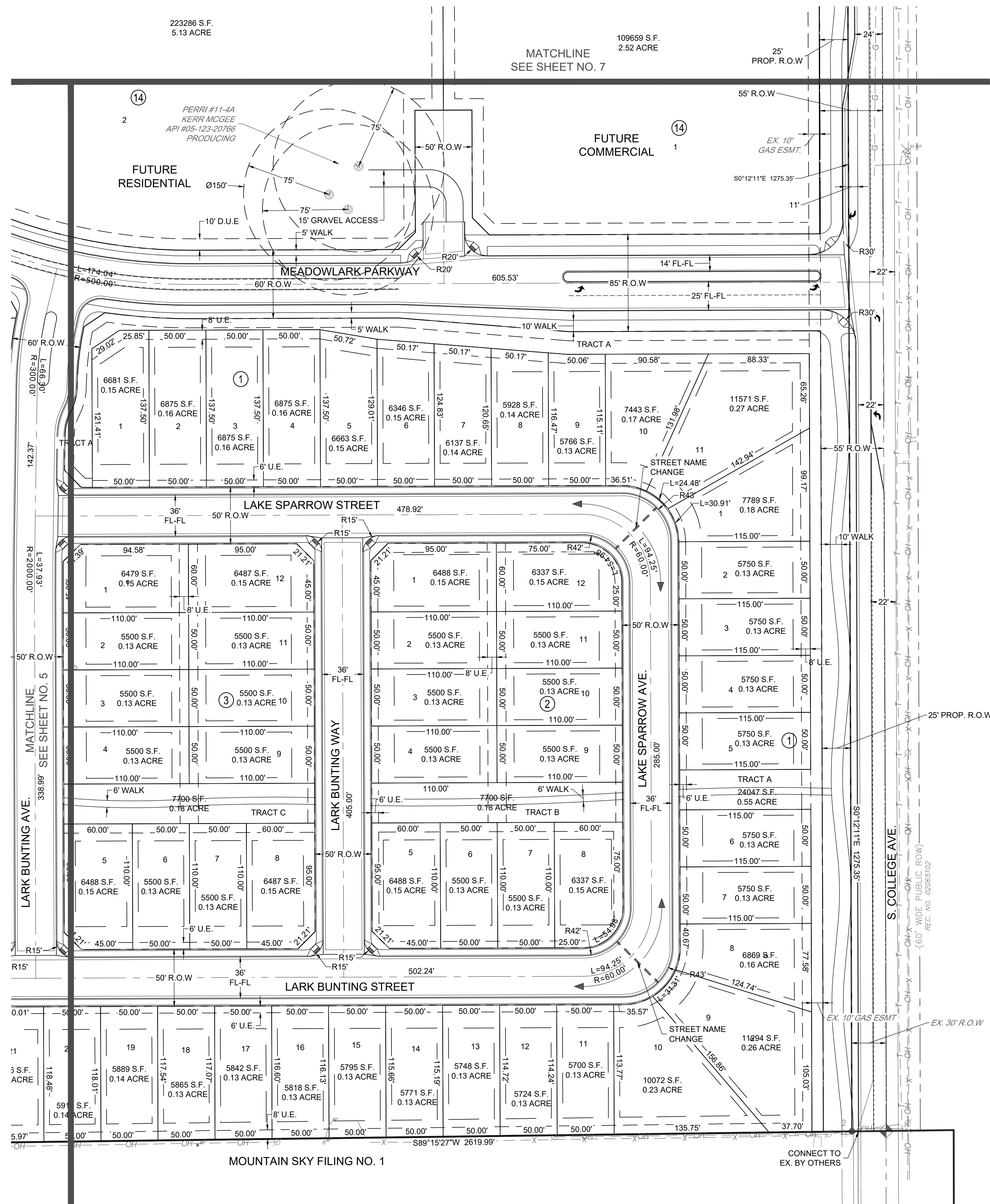
DATE	NO.	DESCRIPTION
2021-02-22	1	1st Submittal
2021-05-06	2	2nd Submittal

ENGINEER:

Redland
WHERE GREAT PLACES BEGIN
733 S. 19th Street, Suite 100
Phoenix, AZ 85080
RELAND.COM
303.446.2368 • herrydesigngroup.com

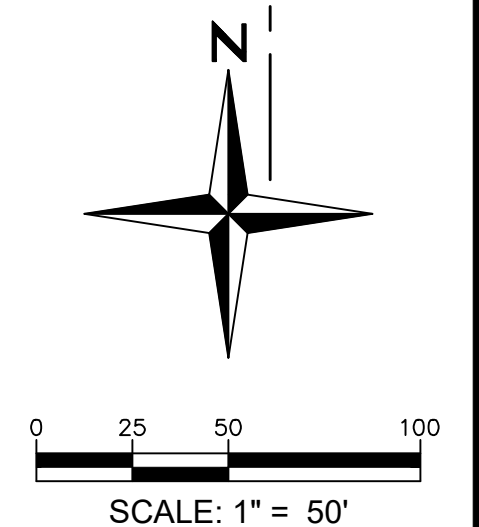
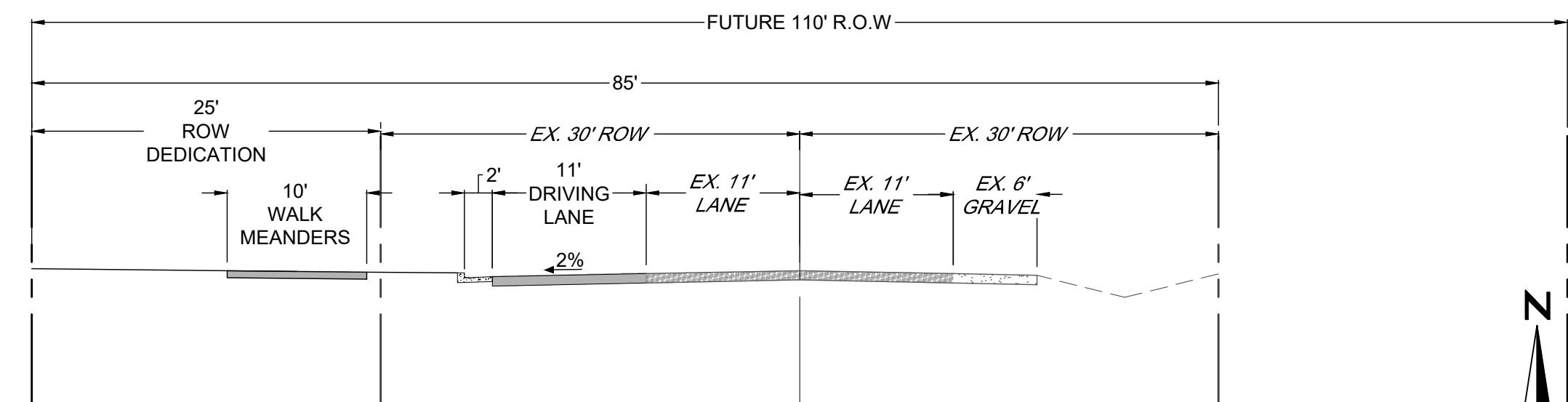
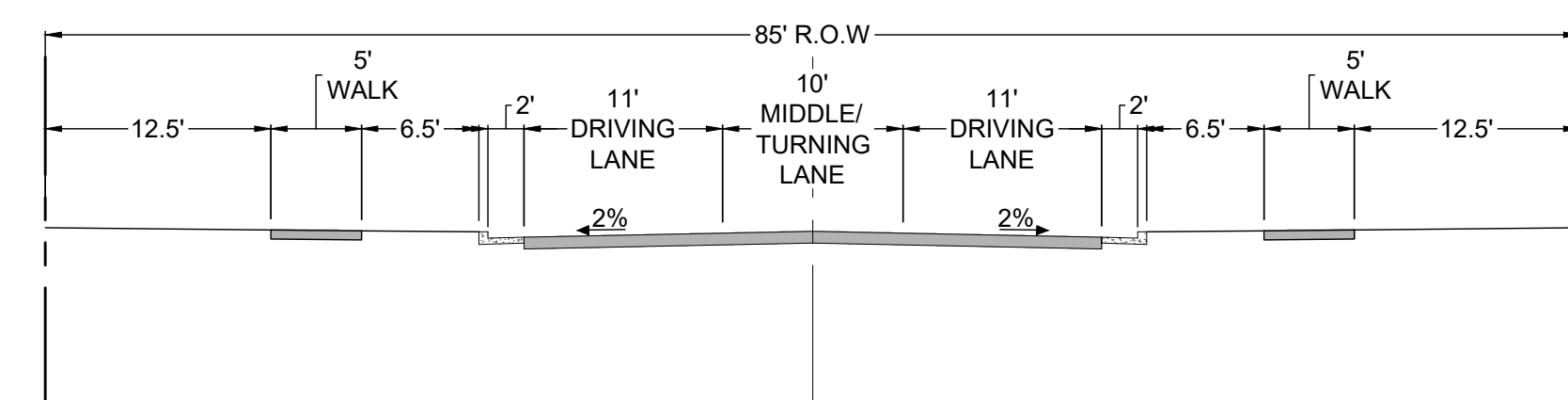
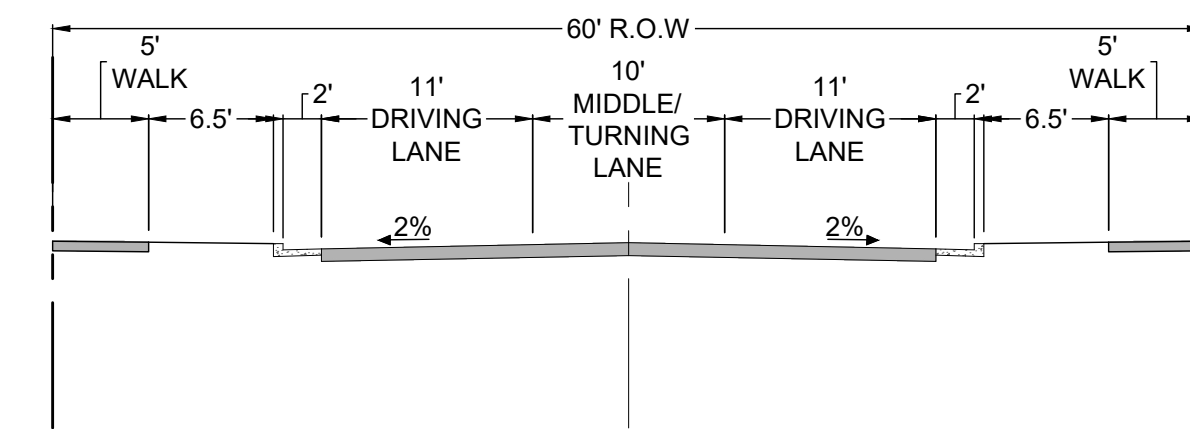
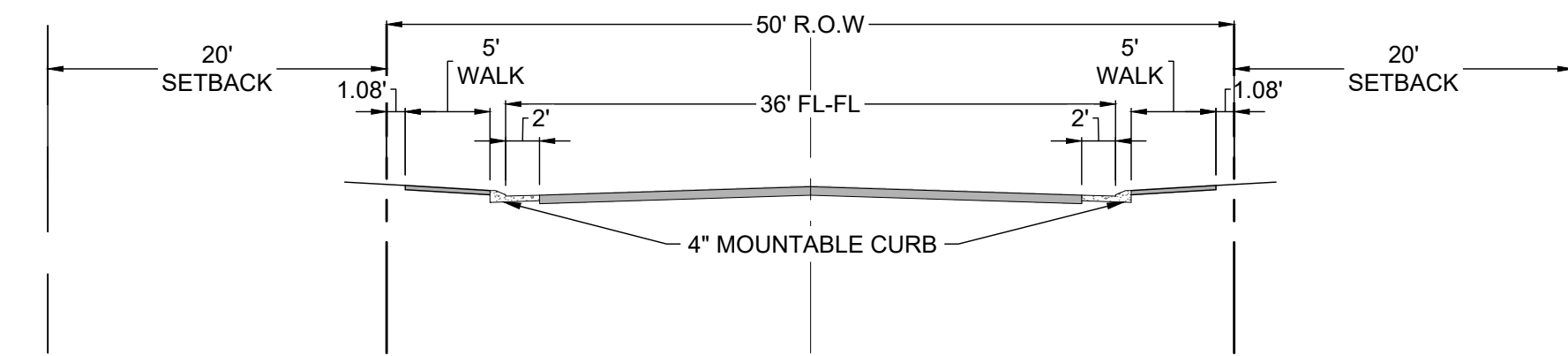
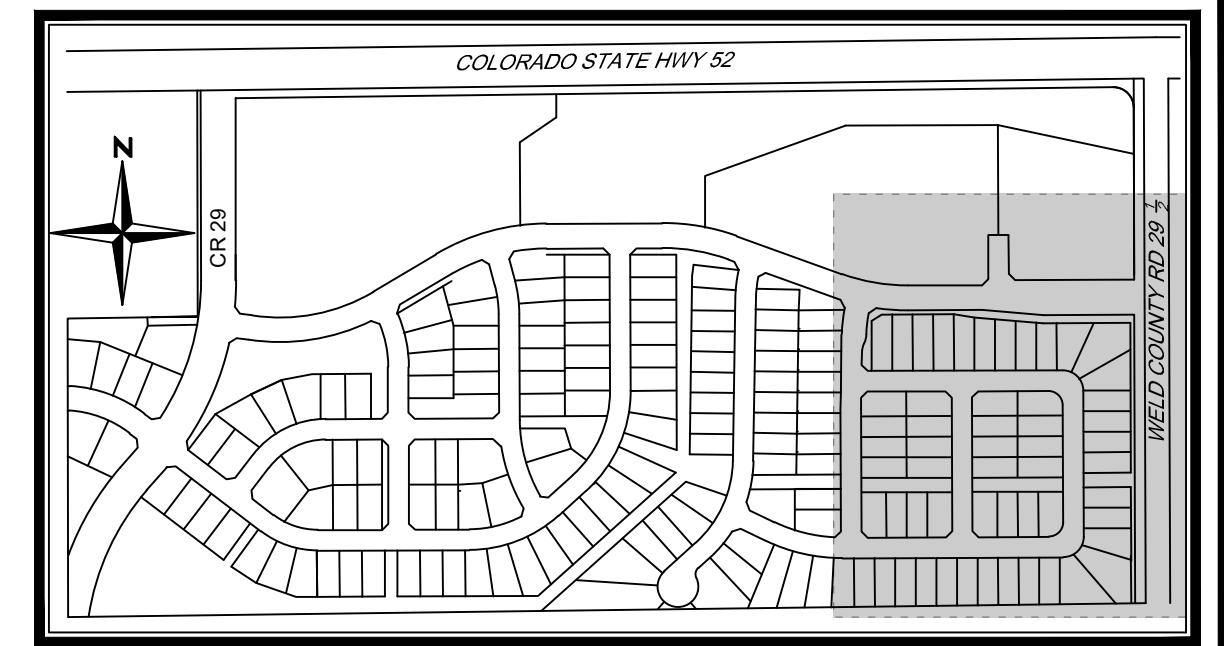
LANDSCAPE ARCHITECT / PLANNER:
henry
design
group

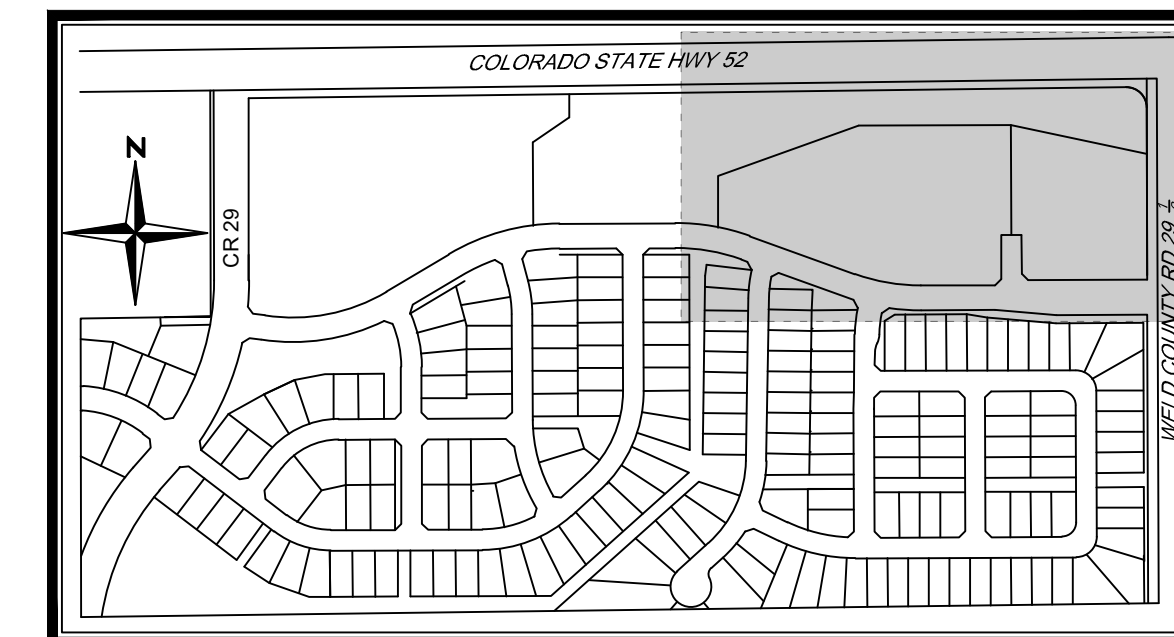
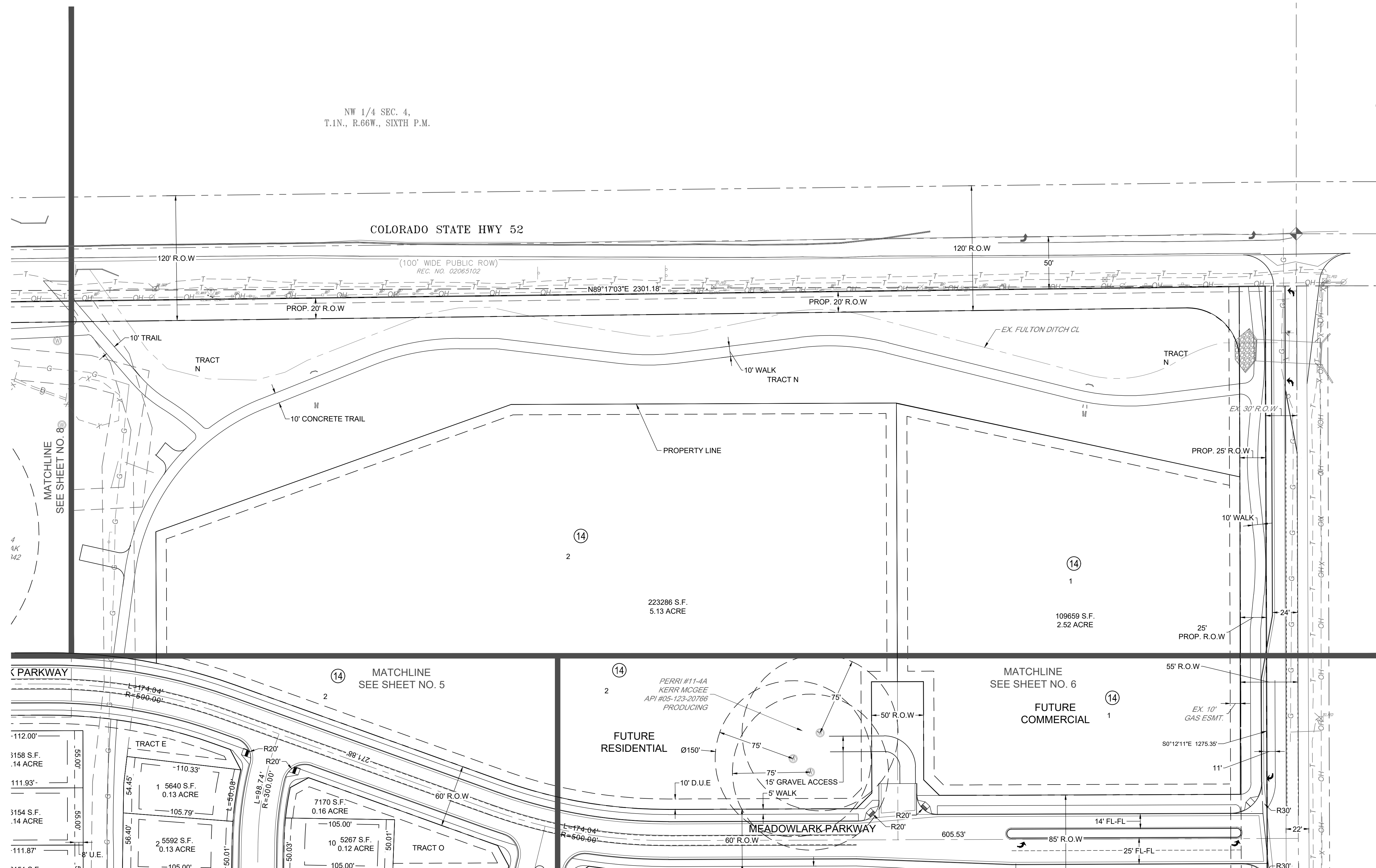
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- ## EXISTING LEGEND
- | | |
|---|------------------------|
|  | EXISTING PROPERTY LINE |
|  | EXISTING R.O.W. |
|  | EXISTING LOT LINE |
|  | EXISTING EASEMENT |
|  | SECTION LINE |
|  | ROAD CENTERLINE |
|  | EDGE OF PAVEMENT |
|  | CURB AND GUTTER |
|  | CONCRETE |

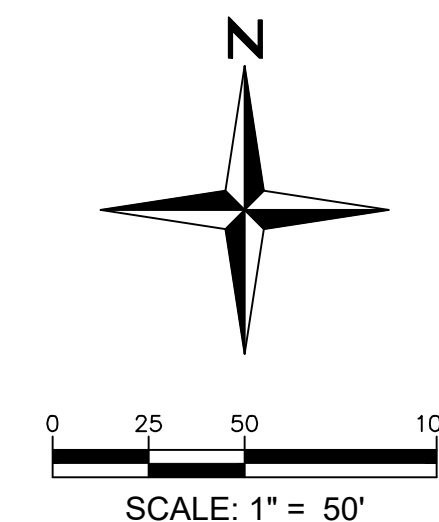
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- | | |
|---|--------------------------|
|  | PROPOSED PROPERTY LINE |
|  | PROPOSED R.O.W. |
|  | PROPOSED LOT LINE |
|  | PROPOSED SETBACK |
|  | PROPOSED EASEMENT |
|  | PROPOSED ROAD CENTERLINE |
|  | PROPOSED CURB AND GUTTER |
|  | PROPOSED SIDEWALK |



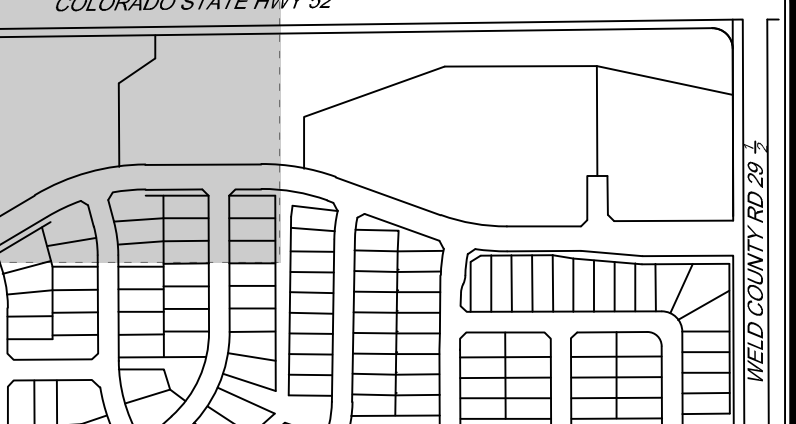
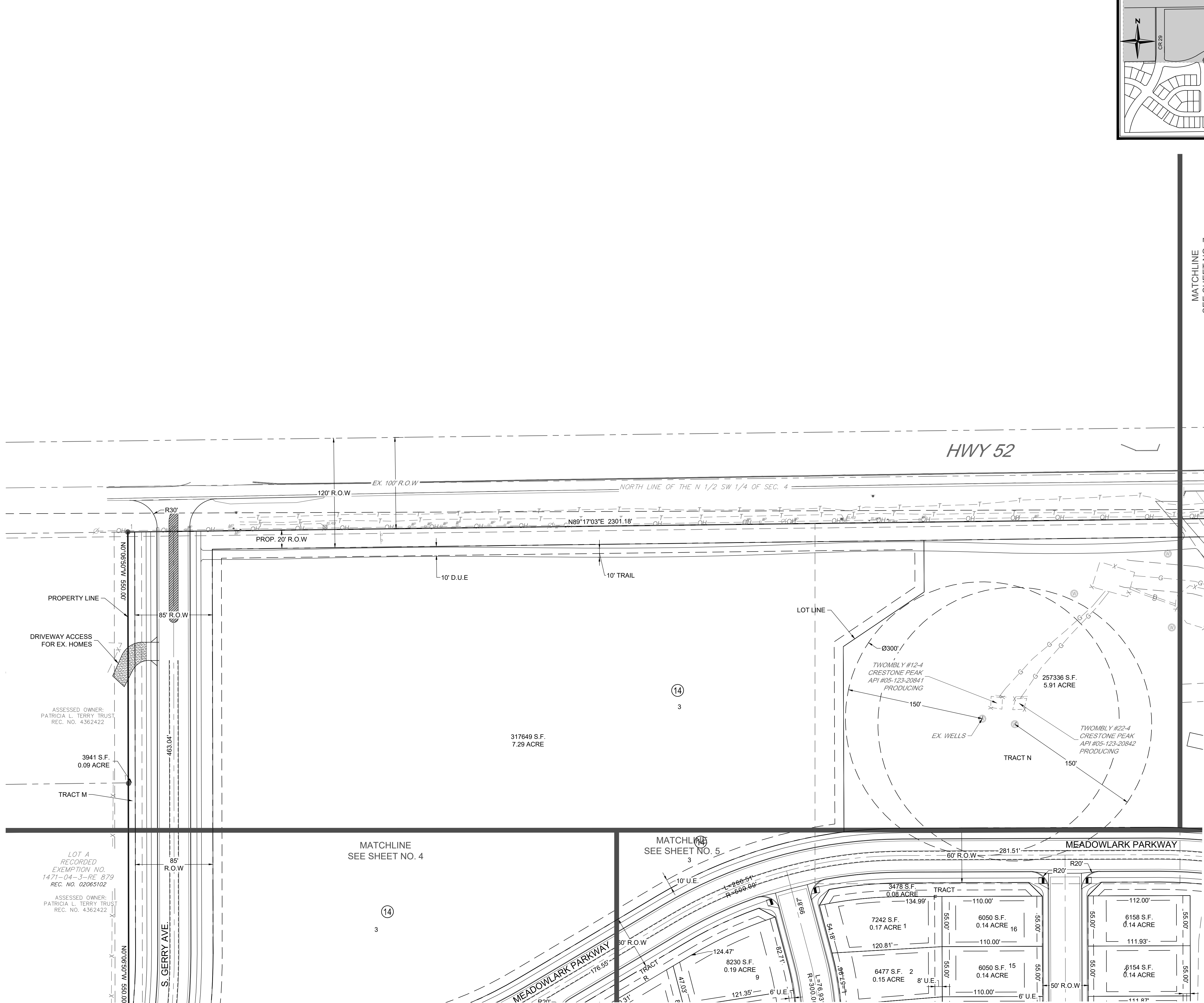


KEYMAP
N.T.S

- | | |
|---|------------------------|
|  | EXISTING PROPERTY LINE |
|  | EXISTING R.O.W. |
|  | EXISTING LOT LINE |
|  | EXISTING EASEMENT |
|  | SECTION LINE |
|  | ROAD CENTERLINE |
|  | EDGE OF PAVEMENT |
|  | CURB AND GUTTER |
|  | CONCRETE |



L:\2019\19032 - Murata Farms\CADD\Sheet Sets\Preliminary Plan\19032 - Site Plan.dwg, tab: 8 SITE PLAN, May 07, 2024 - 1:27pm, jgarniez



EXISTING LEGEND

- EXISTING PROPERTY LINE
- EXISTING R.O.W.
- EXISTING LOT LINE
- EXISTING EASEMENT
- SECTION LINE
- ROAD CENTERLINE
- EDGE OF PAVEMENT
- CURB AND GUTTER
- CONCRETE

PROPOSED LEGEND

- PROPOSED PROPERTY LINE
- PROPOSED R.O.W.
- PROPOSED LOT LINE
- PROPOSED SETBACK
- PROPOSED EASEMENT
- PROPOSED ROAD CENTERLINE
- PROPOSED CURB AND GUTTER
- PROPOSED SIDEWALK

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

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DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

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DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

LANDSCAPE ARCHITECT / PLANNER

henry design group

Landscaping Architecture • Planning • Entitlements

1501 W. 2nd Street Suite 1-C, Denver, Colorado 80202

303.446.2368 • henydesigngroup.com

ENGINEER:

Redland

WHERE GREAT PLACES BEGIN

770.283.2973 OFFICE

1501 W. 2nd Street Suite 1-C

Denver, Colorado 80202

REDLAND.COM

APPLICANT:

CORONADO WEST

Coronado West, LLC

8655 S. Priest Drive

Tempe, AZ 85284

DRAWN JLR

CHECKED T/F

APPROVED T/F

PROJECT NO. 10032

HORIZ. SCALE

VERT. SCALE

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

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2023-02-22 2023-05-06

DATE NO. 1 1st Submit 2 2nd Submit

2023-02-22 2023-05-06

MURATA FARMS

PRELIMINARY PLAT / PUD

SITE PLAN

SHEET

8



UNPLATTED

ASSESSED OWNER:
PATRICIA L. TERRY TRUST
REC. NO. 4362422

LOT A
RECORDED
EXEMPTION NO.
1471-04-3-RE 879
REC. NO. 02065102

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

ASSESSED OWNER:
APPEL FARMS HOA
REC. NO. 3922065

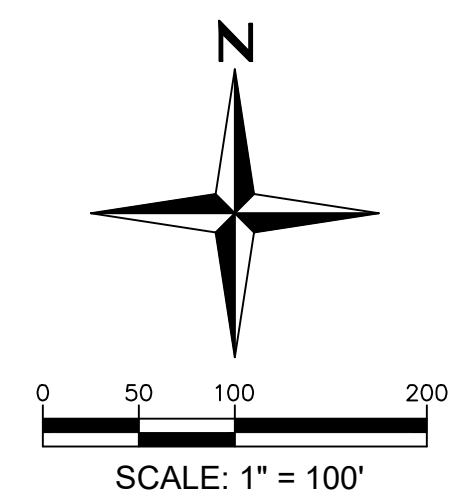
ALL DETENTION POND
IMPROVEMENTS IN PHASE 1

MOUNTAIN SKY FILING NO. 1

MOUNTAIN SKY FILING NO. 1

LOT SITE TABULATION		
	25	65' WIDE LOT (PHASE 1)
	58	55' WIDE LOT (PHASE 1)
TOTAL	83	UNITS
	97	50' WIDE LOT (PHASE 2)
TOTAL	180	UNITS

PROPERTY LINE
R.O.W.
LOT LINE
SETBACK
EASEMENT
ROAD CENTERLINE
CURB AND GUTTER
SIDEWALK
STORM SEWER
SANITARY SEWER
TRENCH DRAIN
WATER LINE



MURATA FARMS
PRELIMINARY PLAT / PUD

PHASING PLAN

SHEET

9

APPLICANT:

TJF

TJF
1903

HOR

1

1

APPLICANT:

CORONADO



CORONADO
WEST

Coronado West, LLC

8655 S. Priest Drive
Tampa, FL 33629

TELLIPS, AZ 03204

ENGINEER:

1

2

5

5

1

LANDSCAPE ARCHITECT / PLANNER:

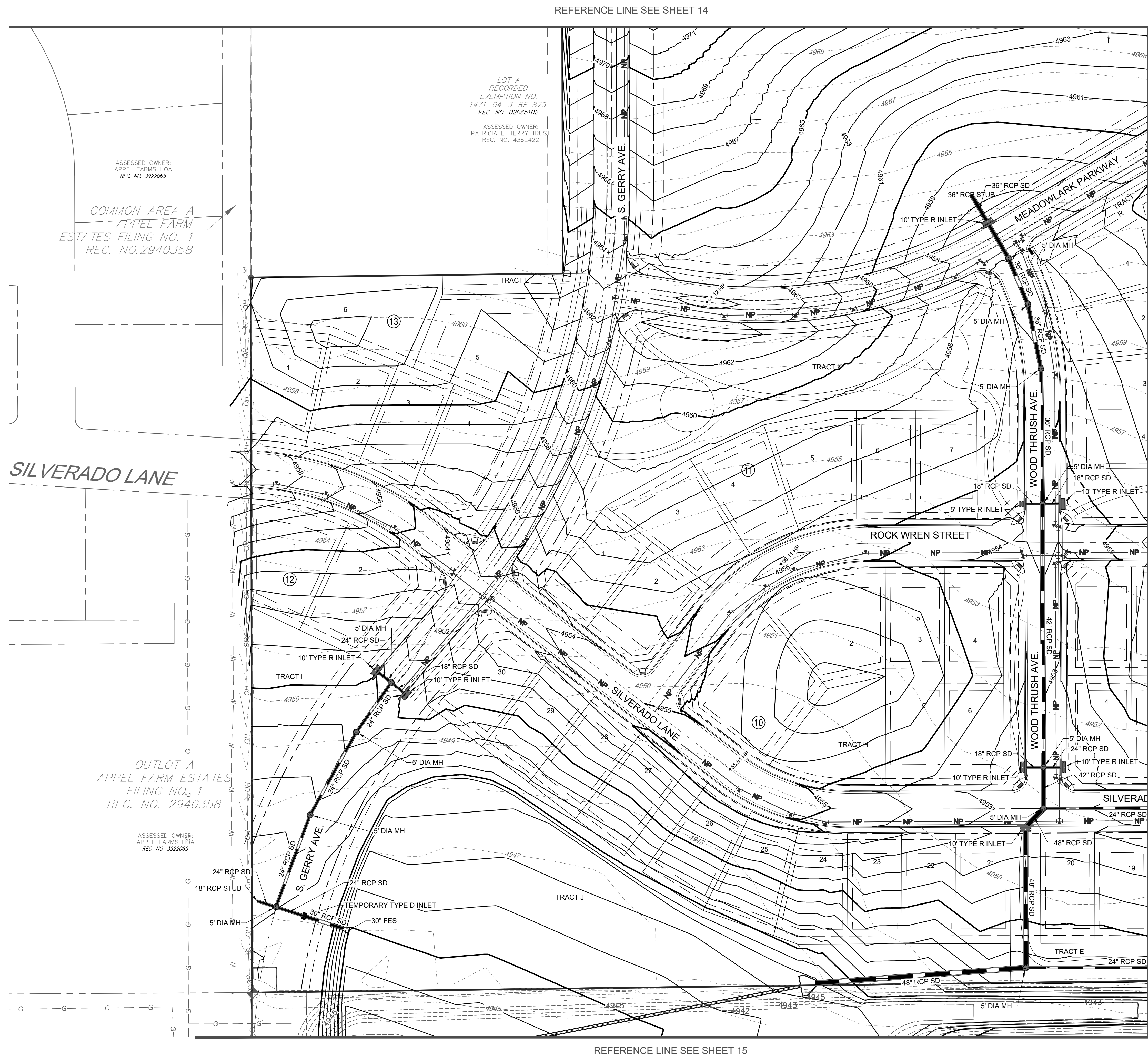
henry



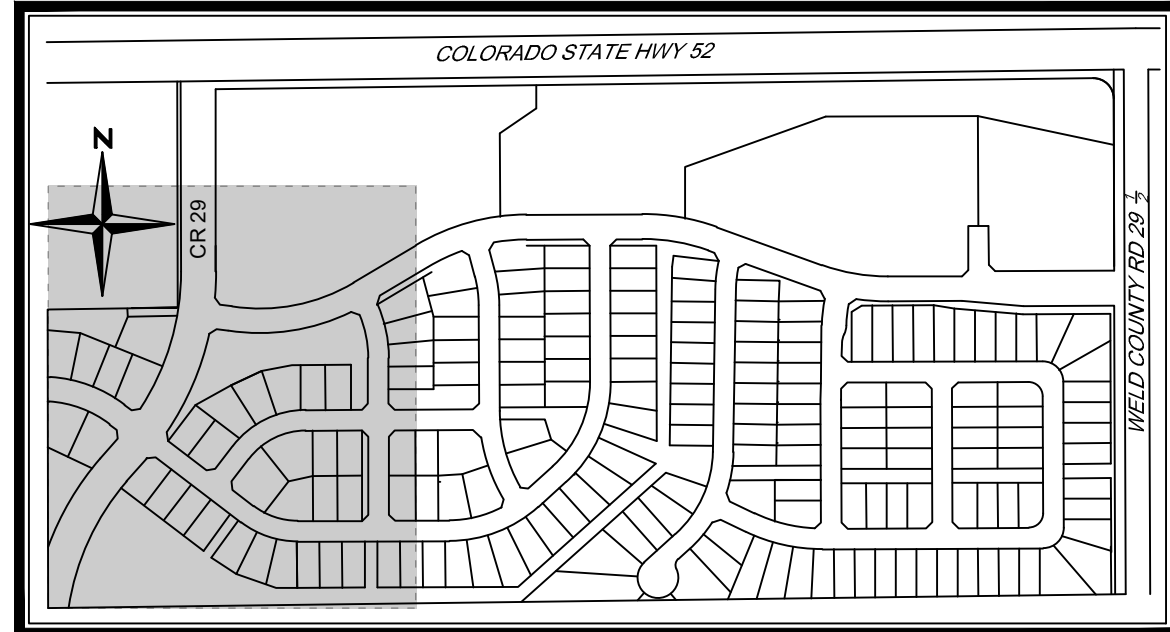
Landscape Architecture • Planning • Entitled

1501 Wazee Street Suite 1-C, Denver, Colorado
303.446.2368 • ben@designdrop.com

000.110.2000 • manufacturinggroup.com



REFERENCE LINE SEE SHEET 11



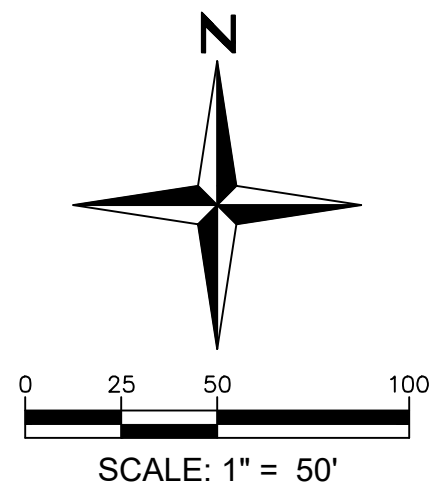
KEYMAP
N.T.S

NOTES:

1. ALL SLOPES ARE MAXIMUM OF 4H:1V UNLESS OTHERWISE NOTED.
2. GRADES SHOWN FOR ROADS, TRACTS AND OPEN SPACE AREAS ARE FINISHED GRADE.
3. REFER TO MOUNTAIN SKY FILING NO 1 PLANS FOR WCR 29 ½ GRADING AND REGIONAL CHANNEL.

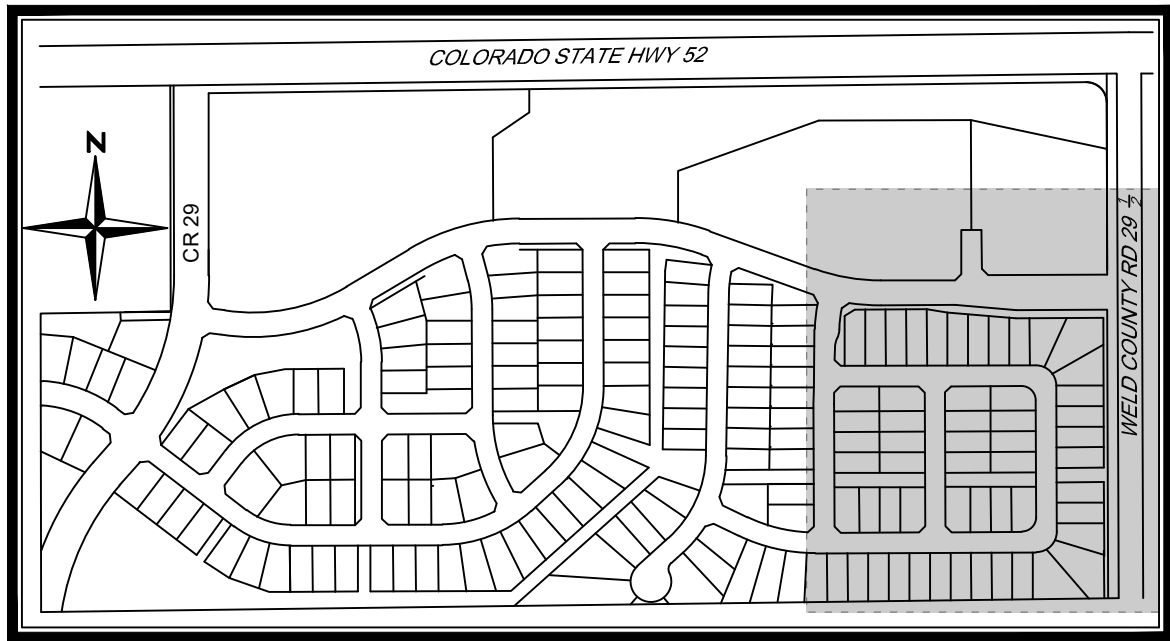
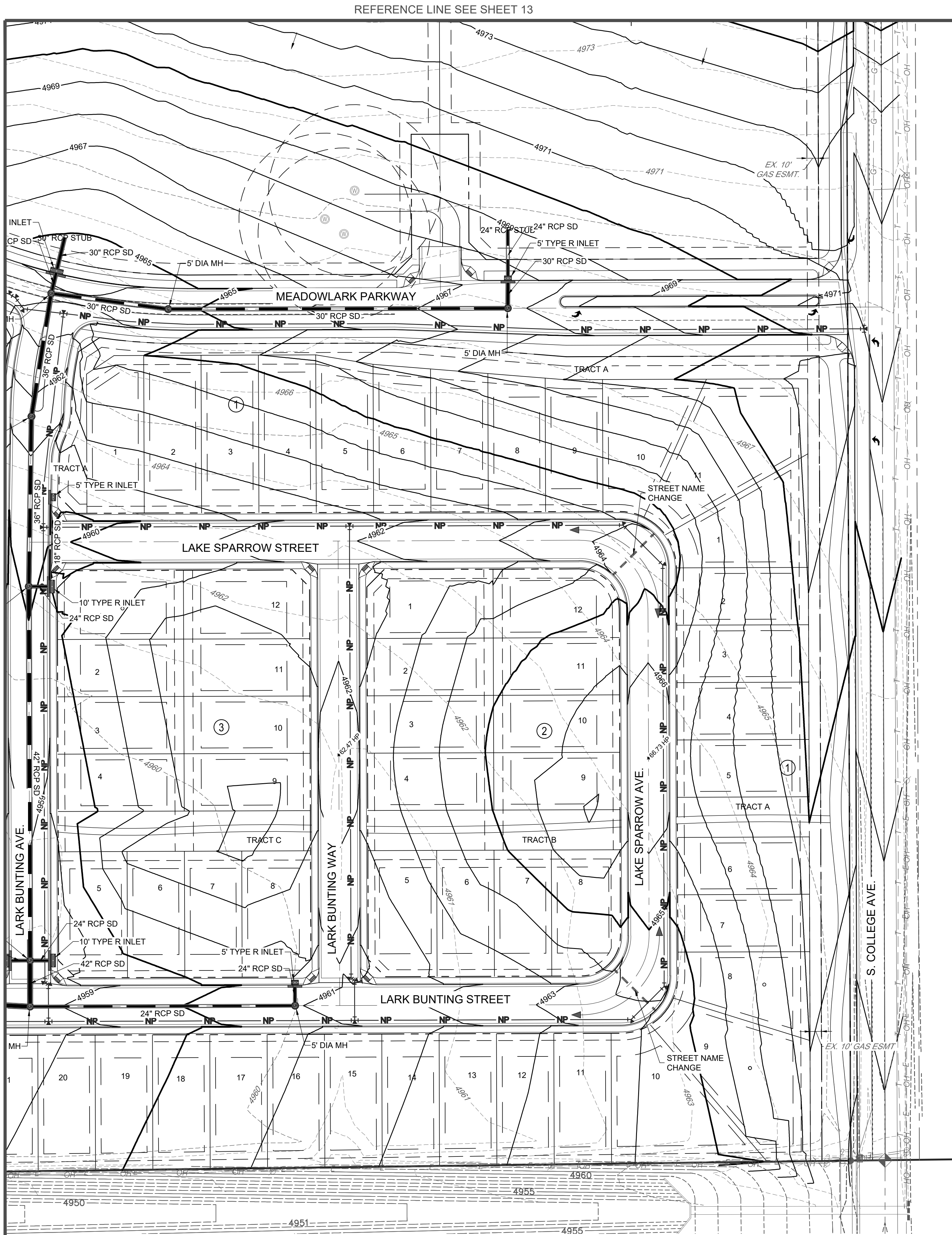
LEGEND

-
- EXISTING MINOR CONTOUR
 - EXISTING MAJOR CONTOUR
 - PROPOSED MINOR CONTOUR
 - PROPOSED MAJOR CONTOUR
 - PROPOSED STORM SEWER LINE
 - PROPOSED MANHOLE
 - PROPOSED BOX BASE MANHOLE
 - PROPOSED INLET
 - PROPOSED FLARED END SECTION



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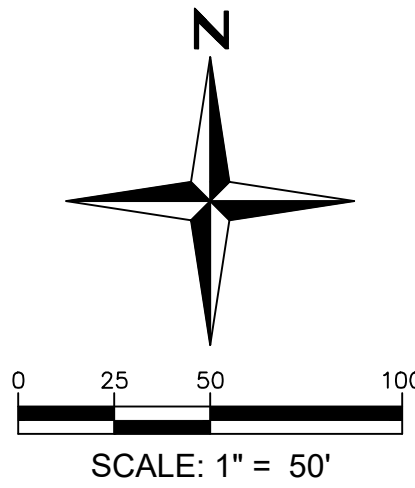
REFERENCE LINE SEE SHEET 11



- NOTES:
1. ALL SLOPES ARE MAXIMUM OF 4H:1V UNLESS OTHERWISE NOTED.
 2. GRADES SHOWN FOR ROADS, TRACTS AND OPEN SPACE AREAS ARE FINISHED GRADE.
 3. REFER TO MOUNTAIN SKY FILING NO 1 PLANS FOR WCR 29 1/2 GRADING AND REGIONAL CHANNEL.

LEGEND

---	EXISTING MINOR CONTOUR
---	EXISTING MAJOR CONTOUR
---	PROPOSED MINOR CONTOUR
---	PROPOSED MAJOR CONTOUR
---	PROPOSED STORM SEWER LINE
○	PROPOSED MANHOLE
□	PROPOSED BOX BASE MANHOLE
△	PROPOSED INLET
---	PROPOSED FLARED END SECTION



MURATA FARMS
PRELIMINARY PLAT / PUD
GRADING PLAN

SHEET

12

APPLICANT:

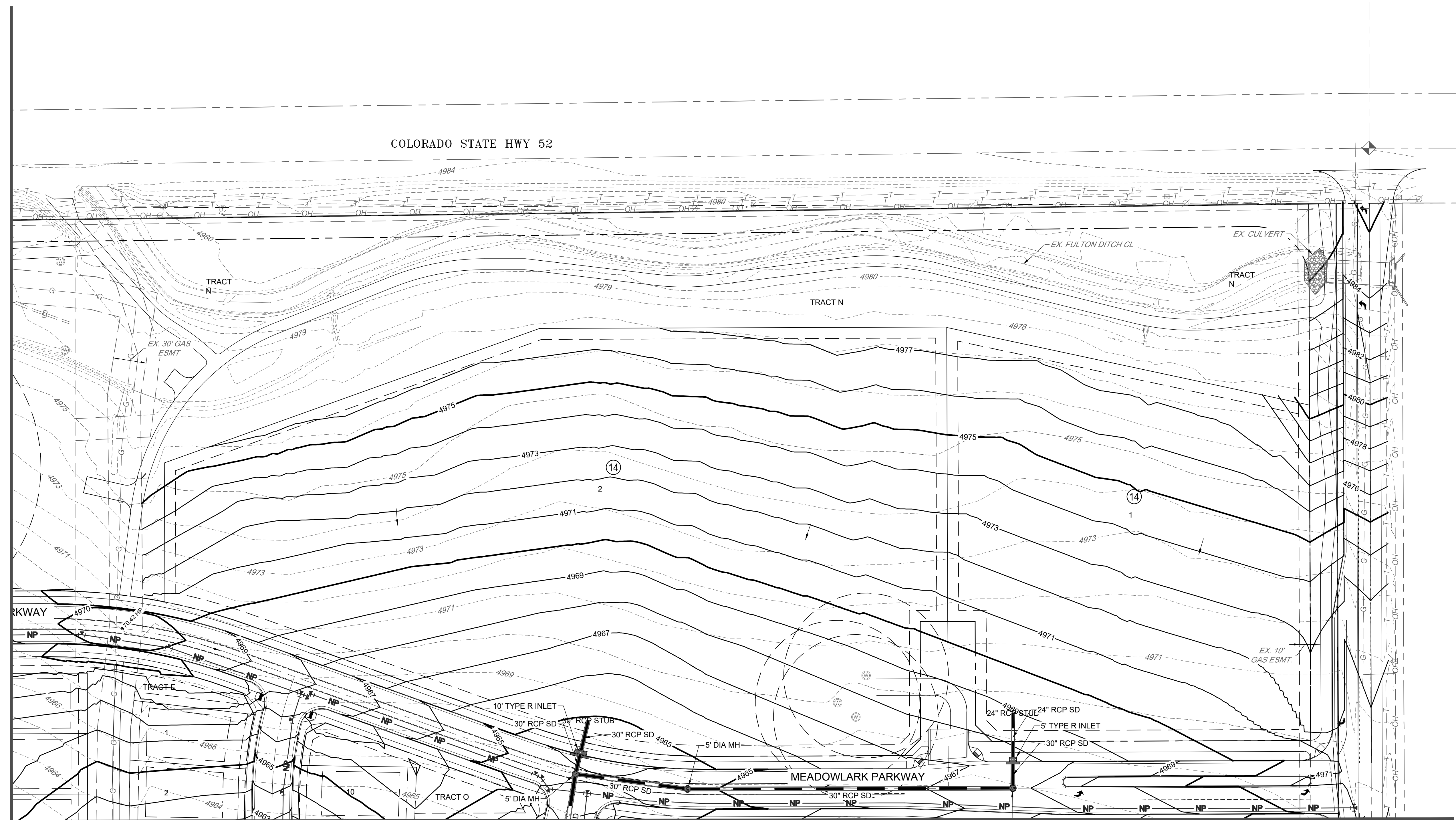
CORONADO WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

ENGINEER:

Redland
WHERE GREAT PLACES BEGIN

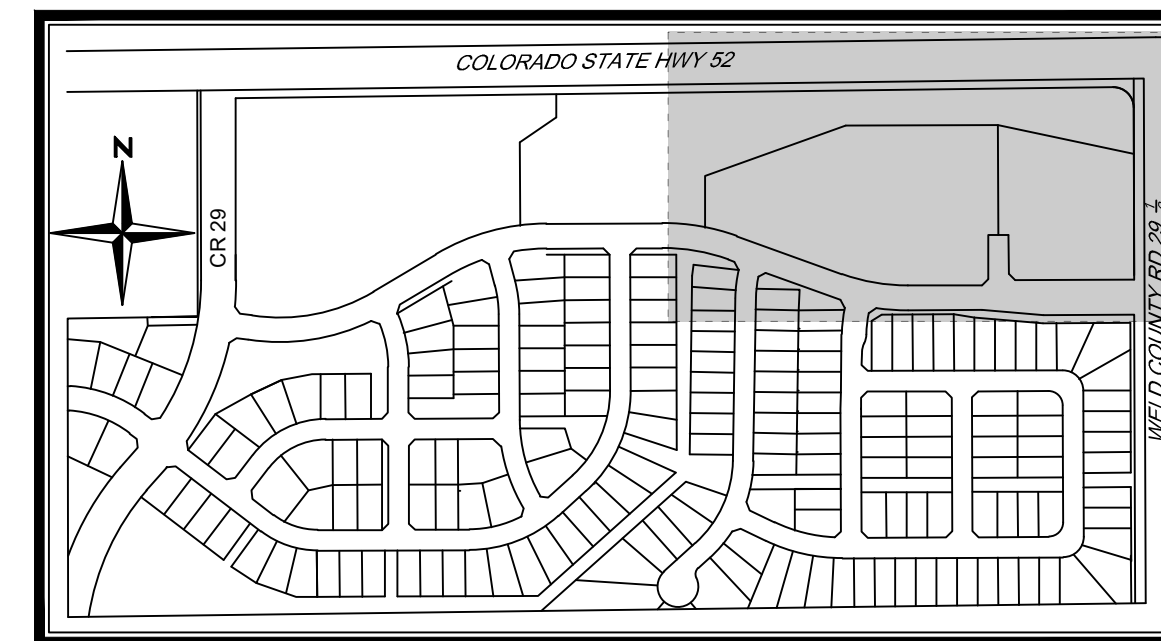
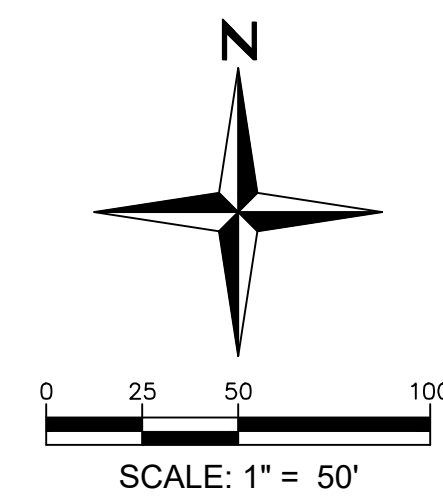
LANDSCAPE ARCHITECT / PLANNER:

henry design group
Landscape Architecture • Planning • Entitlements
1501 W. 29th Street Suite 1-C, Denver, Colorado 80202
303.446.2368 • henrydesigngroup.com



REFERENCE LINE SEE SHEET 14

REFERENCE LINE SEE SHEET 12



KEYMAP
N.T.S

LEGEND

- 5281--- EXISTING MINOR CONTOUR
- 5280--- EXISTING MAJOR CONTOUR
- 5281--- PROPOSED MINOR CONTOUR
- 5280--- PROPOSED MAJOR CONTOUR
- PROPOSED STORM SEWER LINE
- PROPOSED MANHOLE
- PROPOSED BOX BASE MANHOLE
- PROPOSED INLET
- ▤ PROPOSED FLARED END SECTION

NOTES:

1. ALL SLOPES ARE MAXIMUM OF 4H:1V UNLESS OTHERWISE NOTED.
2. GRADES SHOWN FOR ROADS, TRACTS AND OPEN SPACE AREAS ARE FINISHED GRADE.
3. REFER TO MOUNTAIN SKY FILING NO 1 PLANS FOR WCR 29 ½ GRADING AND REGIONAL CHANNEL.

	DATE	NO.	NOTES	
	2021-02-22	1	1st submittal	DRAWN JLR
	2021-06-06	2	2nd Submittal	CHECKED TJF
				APPROVED TJF
				PROJECT NO. 19032
				HORIZ SCALE
				VERT SCALE

MURATA FARMS
PRELIMINARY PLAT / PUD

GRADING PLAN

SHEET

13

APPLICANT:

 **CORONADO
WEST**

Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

ENGINEER:

Redland
WHERE GREAT PLACES BEGIN
720.283.6783 Office
1500 West Canal Court
Littleton, Colorado 80120

AND SCARLETT ARCHITECT / BIRMINGHAM, ALABAMA

henry
design
group



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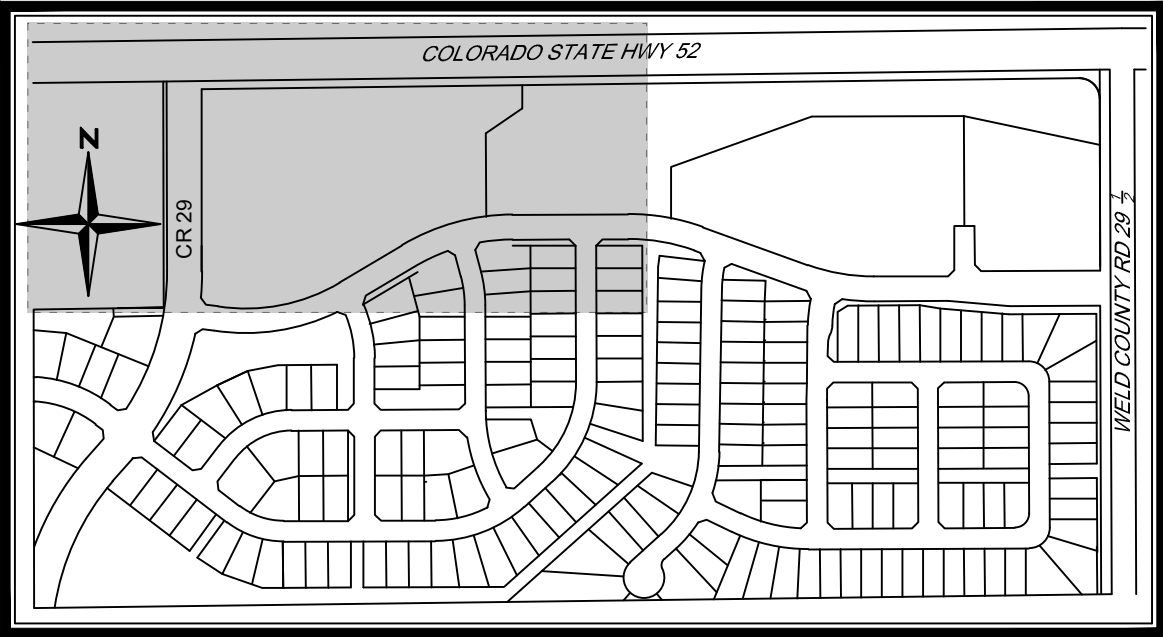
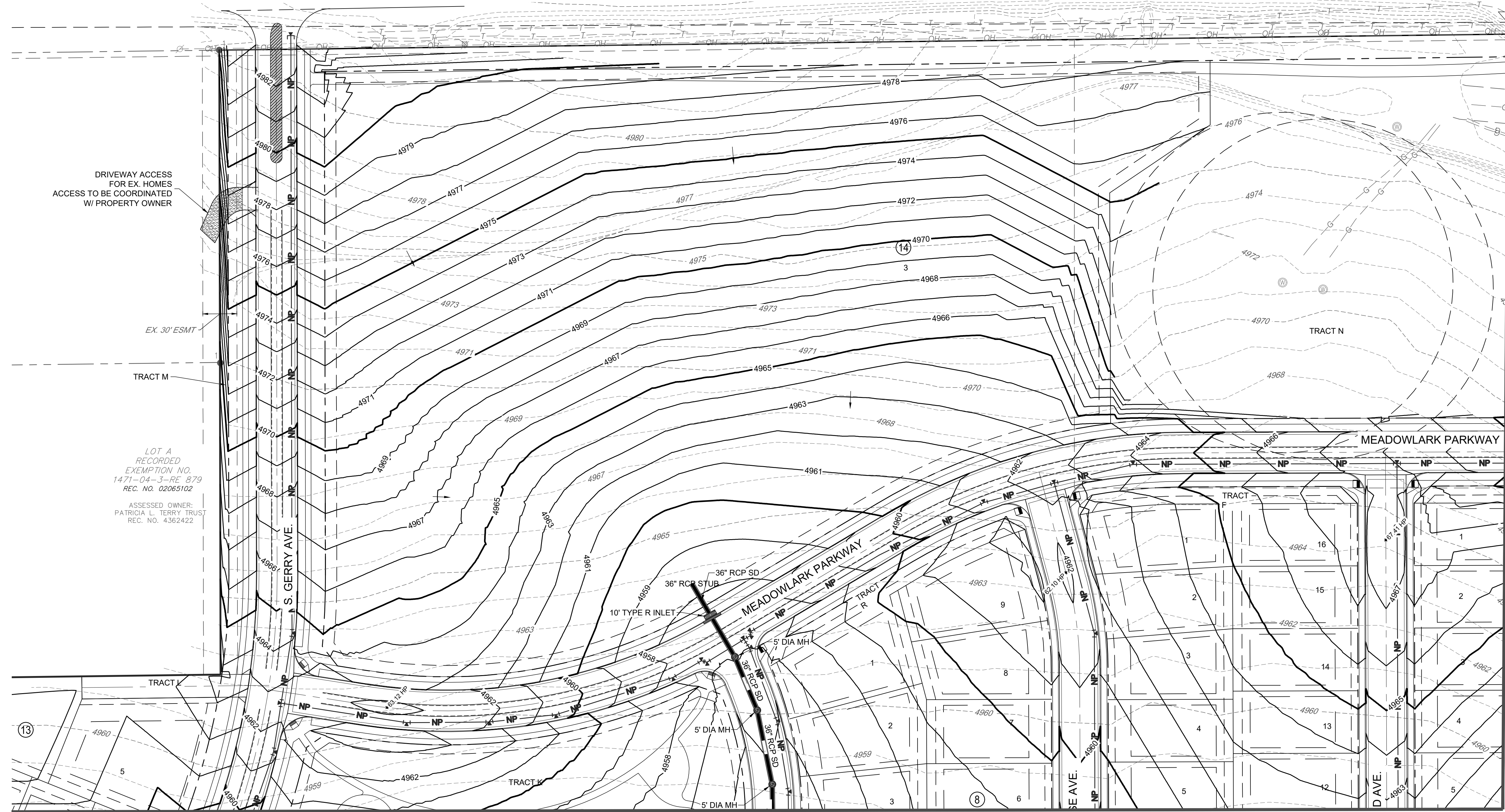
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NOTES:

1. ALL SLOPES ARE MAXIMUM OF 4H:1V UNLESS OTHERWISE NOTED.
2. GRADES SHOWN FOR ROADS, TRACTS AND OPEN SPACE AREAS ARE FINISHED GRADE.
3. REFER TO MOUNTAIN SKY FILING NO 1 PLANS FOR WCR 29 1/2 GRADING AND REGIONAL CHANNEL.

LEGEND

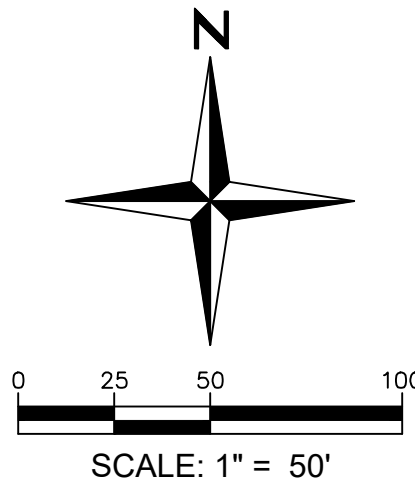
- 5281--- EXISTING MINOR CONTOUR
- 5280--- EXISTING MAJOR CONTOUR
- 5281— PROPOSED MINOR CONTOUR
- 5280— PROPOSED MAJOR CONTOUR
- PROPOSED STORM SEWER LINE
- PROPOSED MANHOLE
- PROPOSED BOX BASE MANHOLE
- PROPOSED INLET
- △ PROPOSED FLARED END SECTION



KEYMAP
N.T.S

REFERENCE LINE SEE SHEET 13

REFERENCE LINE SEE SHEET 10



MURATA FARMS
PRELIMINARY PLAT / PUD
GRADING PLAN

SHEET

14

APPLICANT:

CORONADO WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

ENGINEER:

Redland
WHERE GREAT PLACES BEGIN
793.983.2878 OFFICE
1501 W. Camelback Rd.
Suite 100, Phoenix, AZ 85015
REDLAND.COM

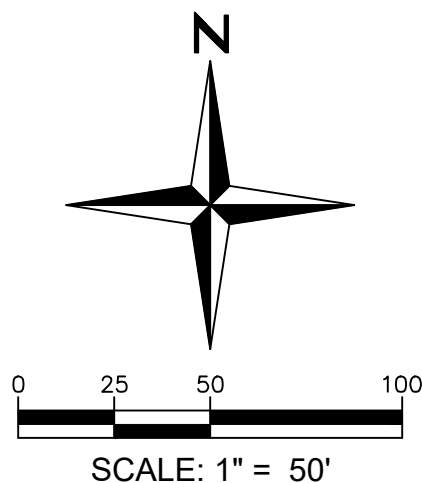
LANDSCAPE ARCHITECT / PLANNER:

henry design group
Landscape Architecture • Planning • Entitlements
1501 W. Camelback Rd.
Suite 100, Phoenix, AZ 85015
303.446.2368 • henrydesigngroup.com

NOTES

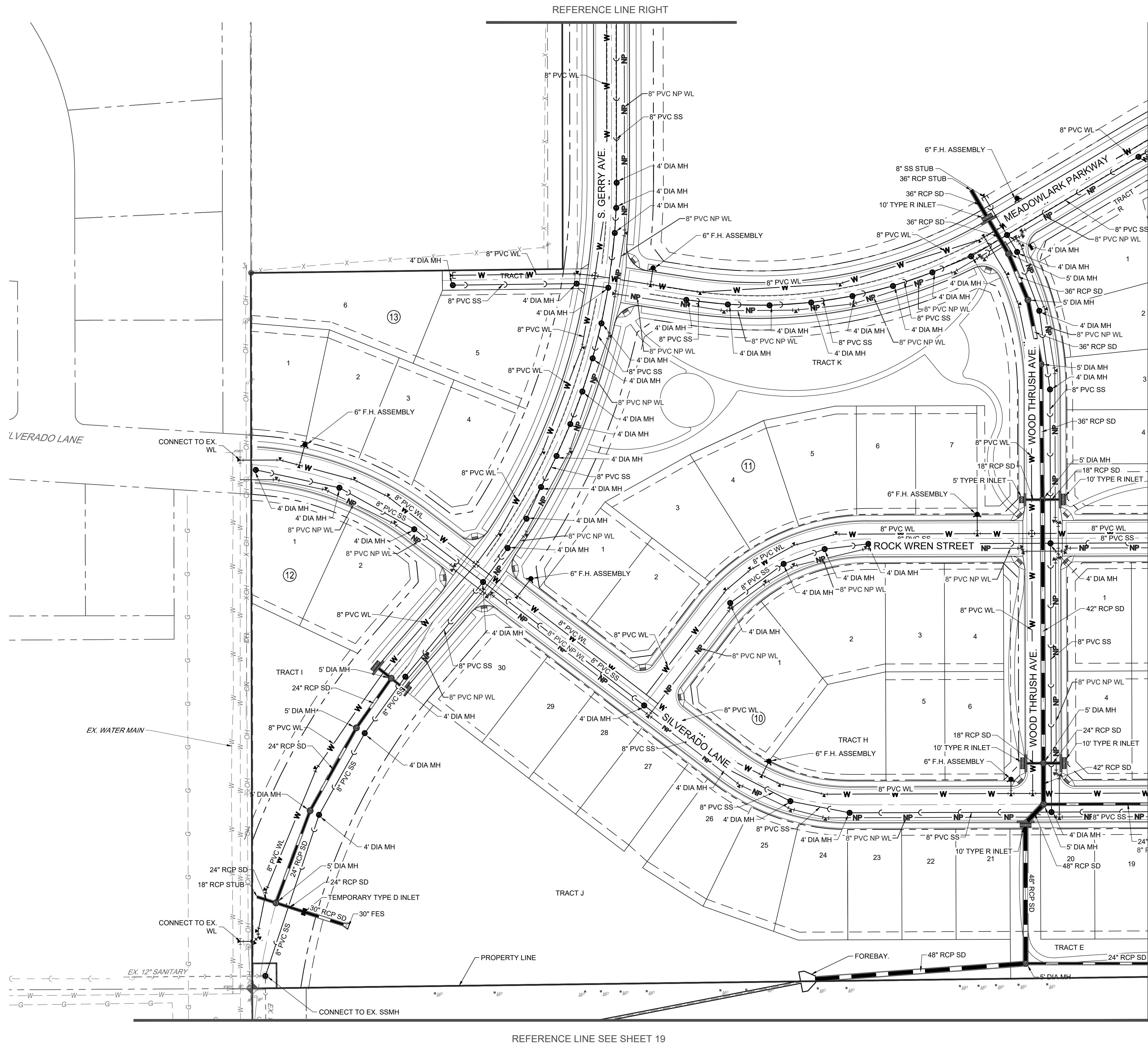
DATE	NO.	NOTES
2021-02-22	1	1st Submittal
2021-05-06	2	2nd Submittal

1. ALL SLOPES ARE MAXIMUM OF 4H:1V UNLESS OTHERWISE NOTED.
2. GRADES SHOWN FOR ROADS, TRACTS AND OPEN SPACE AREAS ARE FINISHED GRADE.
3. REFER TO MOUNTAIN SKY FILING NO 1 PLANS FOR WCR 29 ½ GRADING AND REGIONAL CHANNEL.

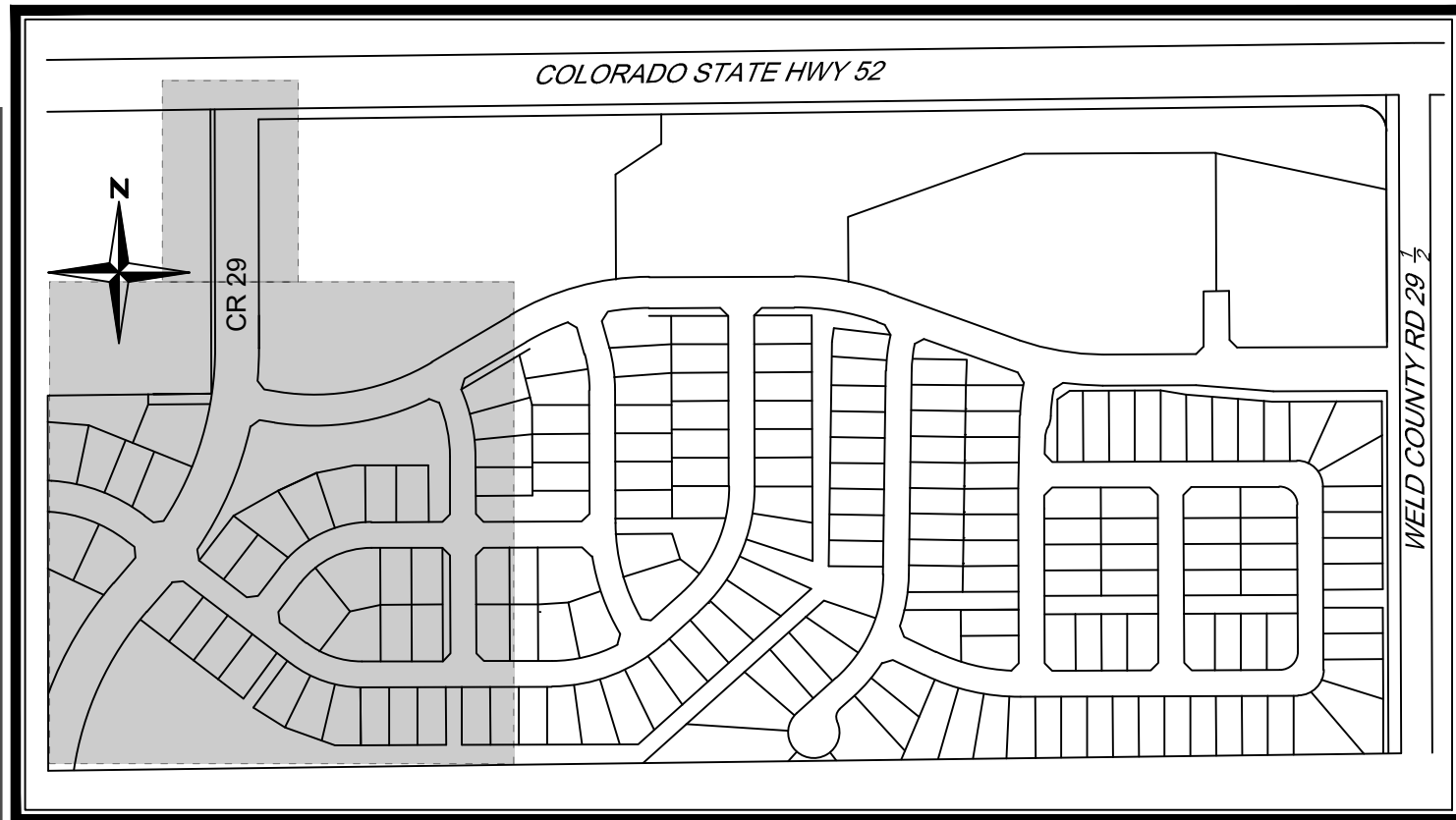


MURATA FARMS
PRELIMINARY PLAT / PUD
GRADING PLAN

15



REFERENCE LINE SEE SHEET 17



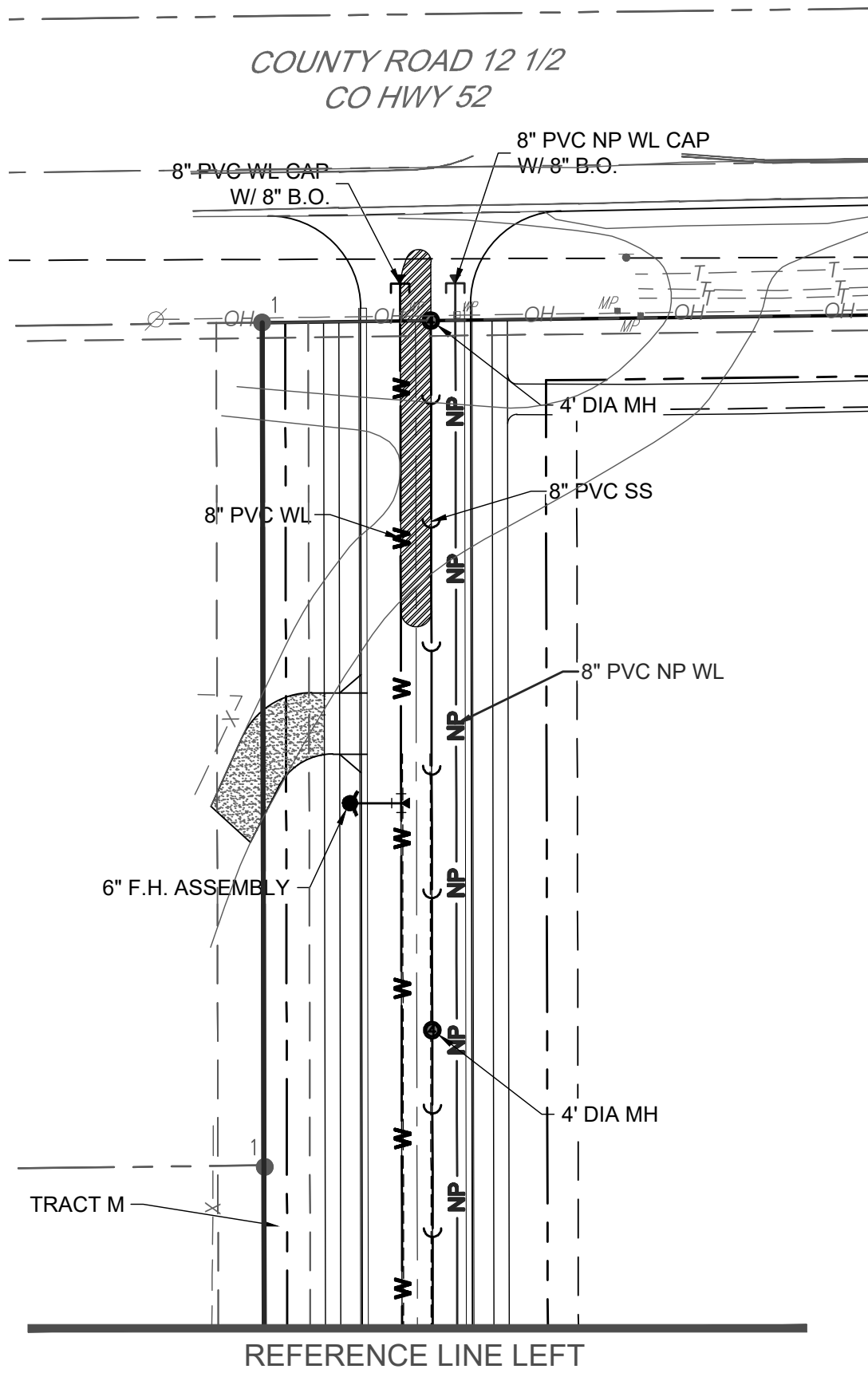
KEYMAP
N.T.S.

NOTES:

1. WATER LINE APPURTENANCES ARE SHOWN FOR GRAPHIC REPRESENTATION ONLY AND DO NOT REFLECT ACTUAL SIZE (TYP.)
2. NO STRUCTURE OR APPURTENANCE ASSOCIATED WITH WET UTILITY INSTALLATION MAY BE LOCATED WITHIN THE CURB, GUTTER, AT THE LIP OF GUTTER OR IN CROSSPANS.
3. UTILITY SIZES ARE APPROXIMATE AND WILL BE FINALIZED WITH CONSTRUCTION DOCUMENTS
4. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 10-FEET BETWEEN WATER MAINS AND SANITARY SEWER MAINS AND 5-FEET BETWEEN IRRIGATION WATER AND SEWER MAINS.

UTILITY LEGEND

- OH— EXISTING OVERHEAD ELECTRIC
- G— EXISTING GAS
- FO— EXISTING FIBER OPTIC
- S— EXISTING STORM CULVERT
- SS— EXISTING SANITARY SEWER LINE
- W— EXISTING WATER LINE
- S— PROPOSED SANITARY SEWER LINE
- W— PROPOSED WATER LINE
- S— PROPOSED STORM SEWER LINE
- PROPOSED MANHOLE
- PROPERTY LINE
- — — PROPOSED RIGHT OF WAY LINE
- — — PROPOSED LOT LINE
- — — PROPOSED EASEMENT



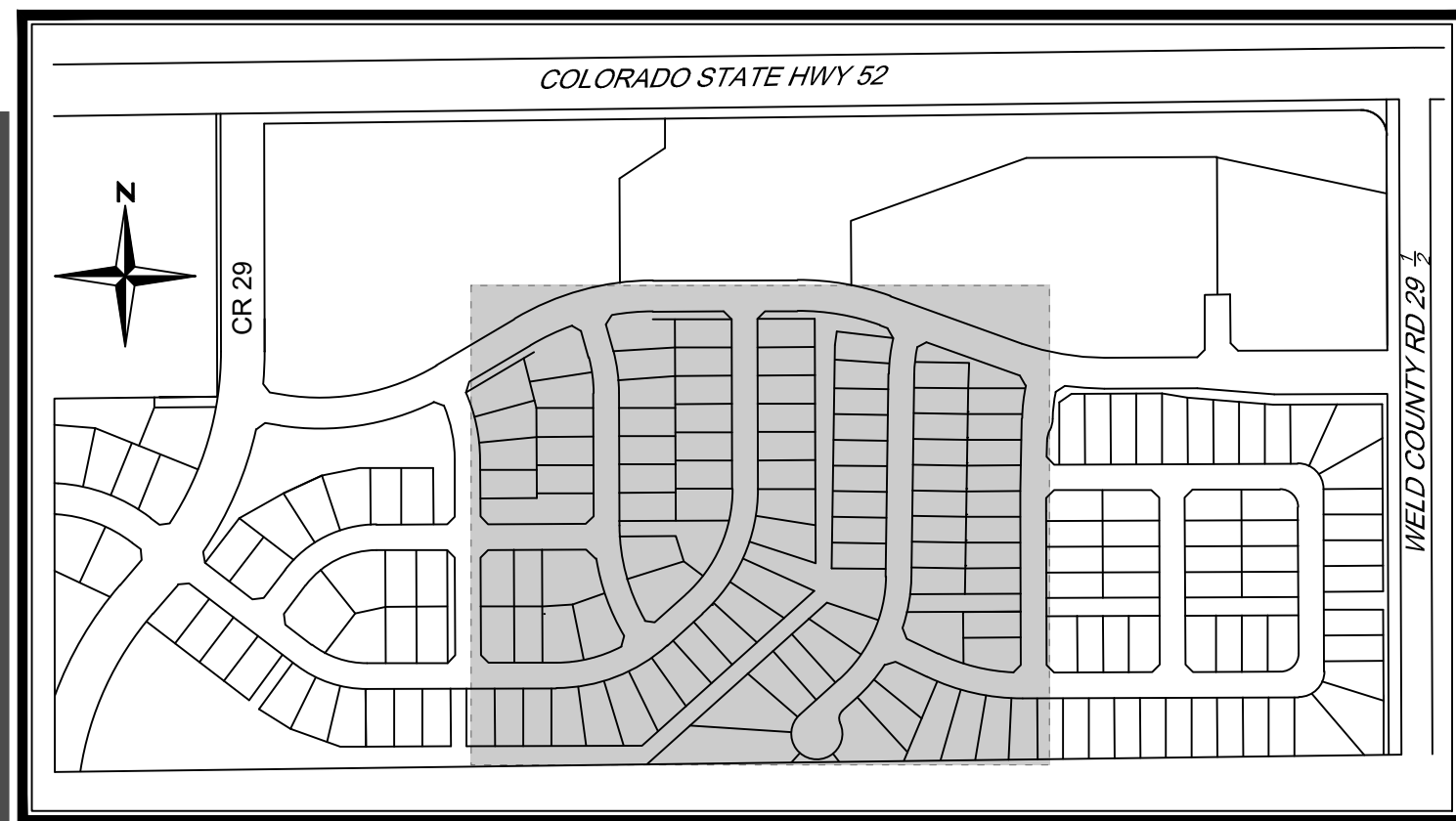
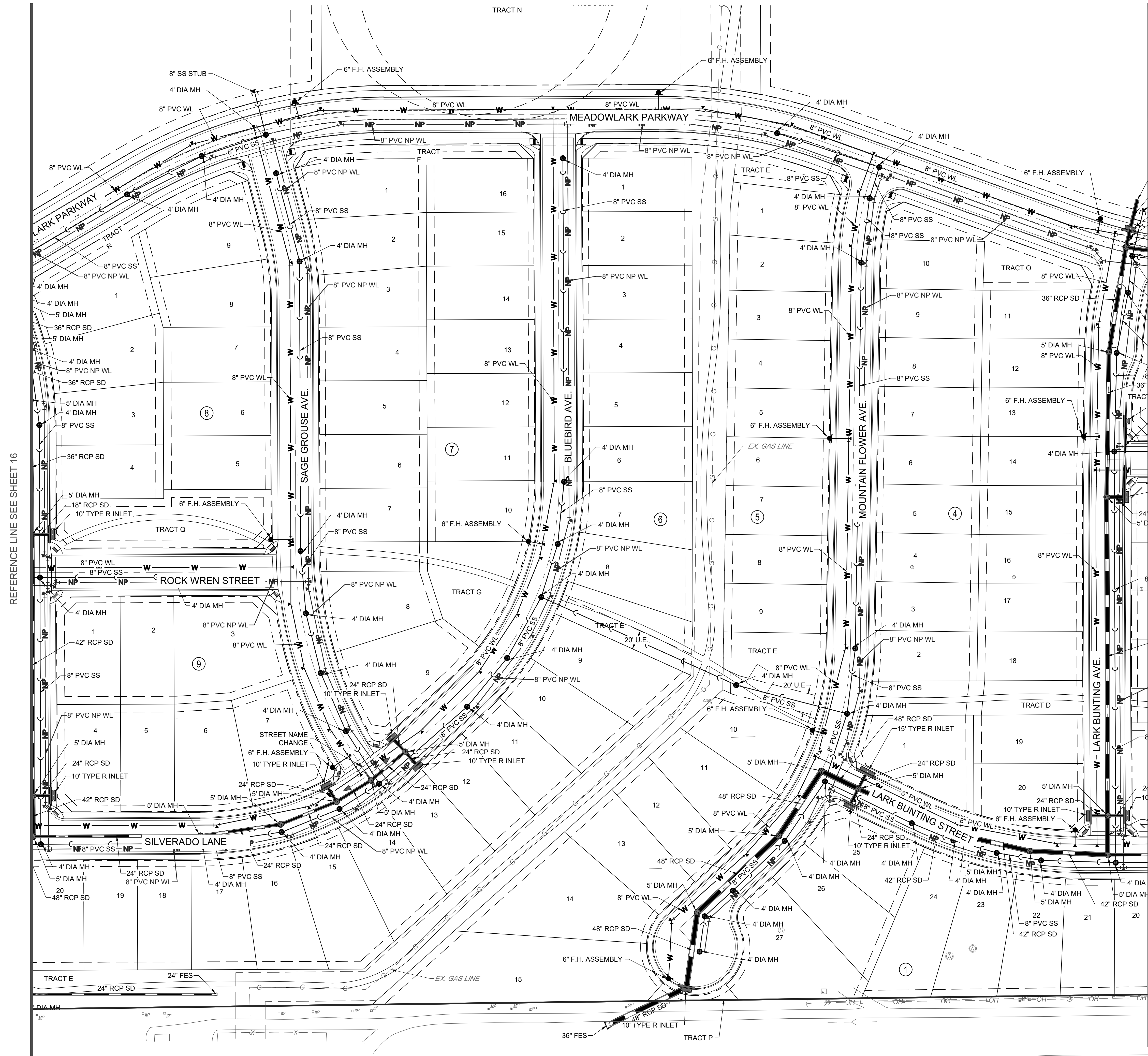
MURATA FARMS
PRELIMINARY PLAT / PUD

UTILITY PLAN

16

DATE	NO.	NOTES
2021-02-22	1	1st Submittal
2021-05-06	2	2nd Submittal

DRAWN	JLR	CHECKED	TJF	APPROVED	TJF	PROJECT NO.	19032	HORIZ. SCALE	VERT. SCALE

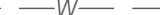


KEYMAP
N.T.S

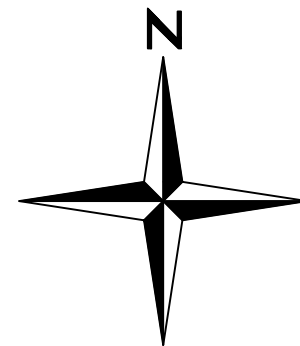
- NOTES:

1. WATER LINE APPURTENANCES ARE SHOWN FOR GRAPHIC REPRESENTATION ONLY AND DO NOT REFLECT ACTUAL SIZE (TYP.)
2. NO STRUCTURE OR APPURTENANCE ASSOCIATED WITH WET UTILITY INSTALLATION MAY BE LOCATED WITHIN THE CURB, GUTTER, AT THE LIP OF GUTTER OR IN CROSSPANS.
3. UTILITY SIZES ARE APPROXIMATE AND WILL BE FINALIZED WITH CONSTRUCTION DOCUMENTS
4. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 10- FEET BETWEEN WATER MAINS AND SANITARY SEWER MAINS AND 5- FEET BETWEEN IRRIGATION WATER AND SEWER MAINS.

UTILITY LEGEND

	EXISTING OVERHEAD ELECTRIC
	EXISTING GAS
	EXISTING FIBER OPTIC
	EXISTING STORM CULVERT
	EXISTING SANITARY SEWER LINE
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER LINE
	PROPOSED WATER LINE
	PROPOSED STORM SEWER LINE
	PROPOSED MANHOLE
	PROPERTY LINE
	PROPOSED RIGHT OF WAY LINE
	PROPOSED LOT LINE
	PROPOSED EASEMENT

REFERENCE LINE SEE SHEET 18



MURATA FARMS
PRELIMINARY PLAT / PUD

PRELIMINARY PLAT / PUD

UTILITY PLAN

SHEET

17

ENGINEER: LANDSCAPE ARCHITECT / PLANNER:

henry
design
group

Landscape Architecture • Planning • Entitlements
 1501 Wazee Street Suite 1-C, Denver, Colorado 80202
303.446.2368 • henrydesigngroup.com

Landscape Architecture • Planning • Entitlements
 1501 Wazee Street Suite 1-C, Denver, Colorado 80202
303.446.2368 • henrydesigngroup.com

Landscape Architecture • Planning • Entitlements
 1501 Wazee Street Suite 1-C, Denver, Colorado 80202
303.446.2368 • henrydesigngroup.com

ENGINEER:

CORONADO
WEST

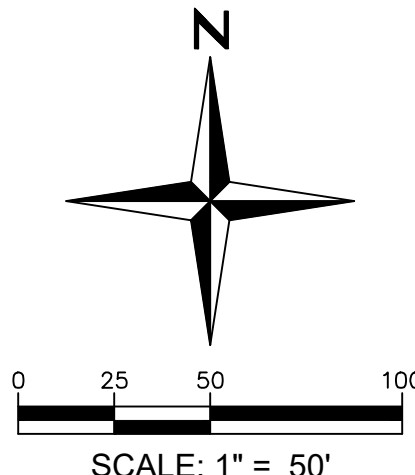
Coronado West, LLC
1655 S. Priest Drive
Tempe, AZ 85284

Coronado West, LLC
1655 S. Priest Drive
Tempe, AZ 85284

Coronado West, LLC
1655 S. Priest Drive
Tempe, AZ 85284

APPLICANT:

DATE	NO.	NOTES	J/LR
2021-02-22	1	1st submittal	DRAWN
2021-05-06	2	2nd Submittal	CHECKED
			APPROVED
			PROJECT NO. 10032
			HORIZ SCALE
			VERT SCALE



- ## UTILITY LEGEND

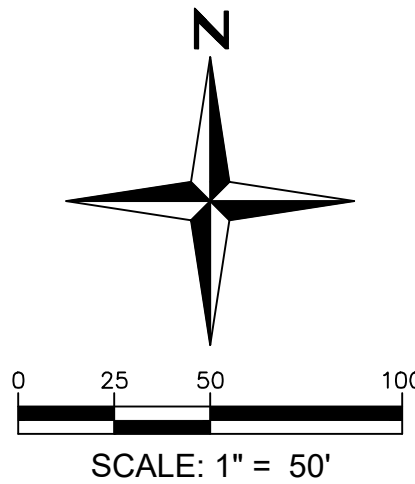
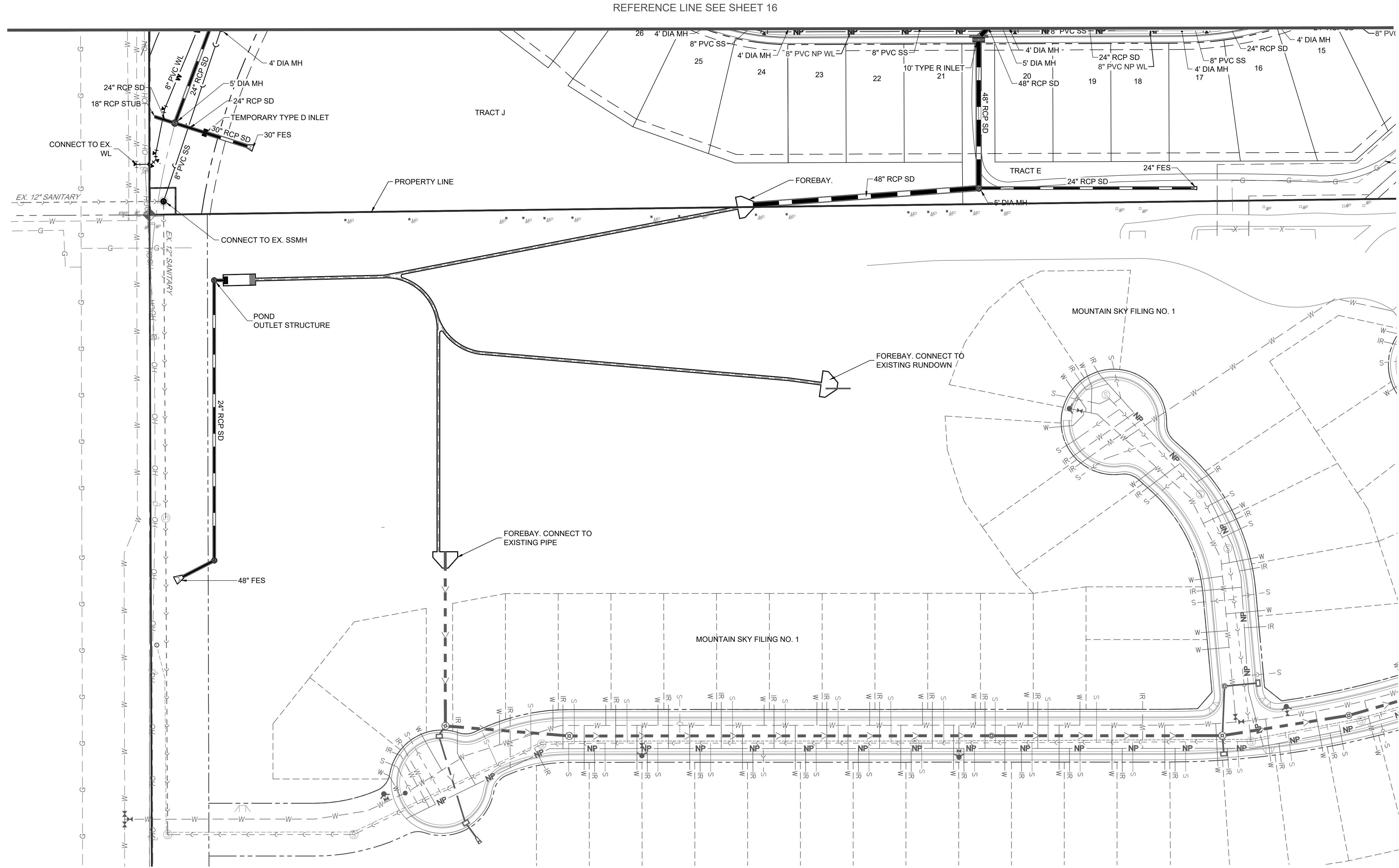
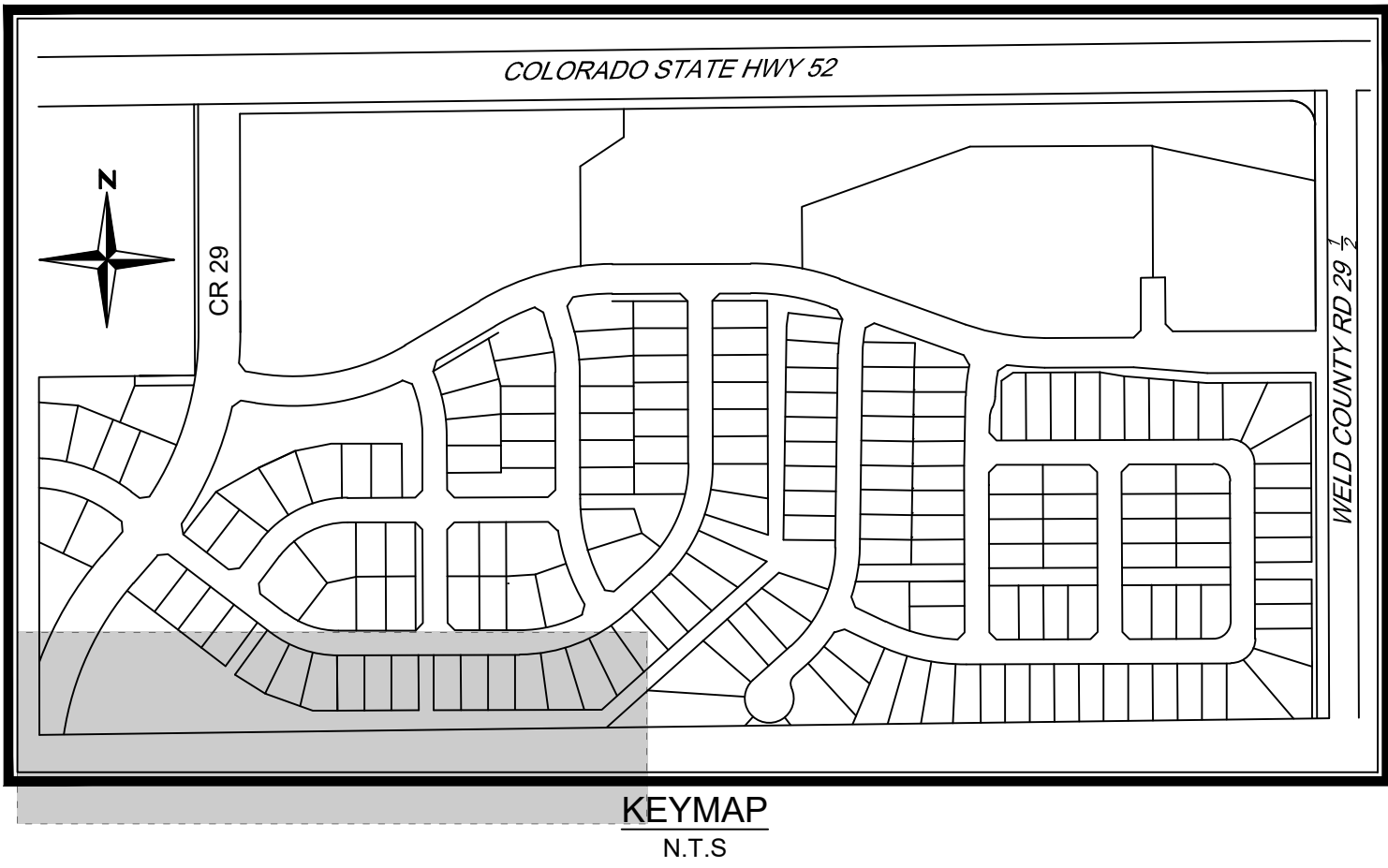
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|  | EXISTING FIBER OPTIC |
|  | EXISTING STORM CULVERT |
|  | EXISTING SANITARY SEWER LINE |
|  | EXISTING WATER LINE |
|  | PROPOSED SANITARY SEWER LINE |
|  | PROPOSED WATER LINE |
|  | PROPOSED STORM SEWER LINE |
|  | PROPOSED MANHOLE |
|  | PROPERTY LINE |
|  | PROPOSED RIGHT OF WAY LINE |
|  | PROPOSED LOT LINE |
|  | PROPOSED EASEMENT |

UTILITY LEGEND

- OH— EXISTING OVERHEAD ELECTRIC
- G— EXISTING GAS
- FO— EXISTING FIBER OPTIC
- >— EXISTING STORM CULVERT
- SS— EXISTING SANITARY SEWER LINE
- W— EXISTING WATER LINE
- >— PROPOSED SANITARY SEWER LINE
- W— PROPOSED WATER LINE
- >— PROPOSED STORM SEWER LINE
- PROPOSED MANHOLE
- — — — — PROPERTY LINE
- — — — — PROPOSED RIGHT OF WAY LINE
- — — — — PROPOSED LOT LINE
- — — — — PROPOSED EASEMENT

NOTES:

1. WATER LINE APPURTENANCES ARE SHOWN FOR GRAPHIC REPRESENTATION ONLY AND DO NOT REFLECT ACTUAL SIZE (TYP.)
2. NO STRUCTURE OR APPURTENANCE ASSOCIATED WITH WET UTILITY INSTALLATION MAY BE LOCATED WITHIN THE CURB, GUTTER, AT THE LIP OF GUTTER OR IN CROSSPANS.
3. UTILITY SIZES ARE APPROXIMATE AND WILL BE FINALIZED WITH CONSTRUCTION DOCUMENTS
4. MAINTAIN A MINIMUM HORIZONTAL SEPARATION OF 10-FEET BETWEEN WATER MAINS AND SANITARY SEWER MAINS AND 5-FEET BETWEEN IRRIGATION WATER AND SEWER MAINS.



MURATA FARMS
PRELIMINARY PLAT / PUD
UTILITY PLAN

SHEET

19

APPLICANT:

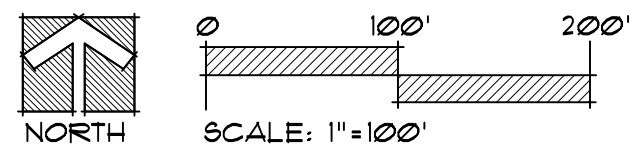
CORONADO WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

ENGINEER:

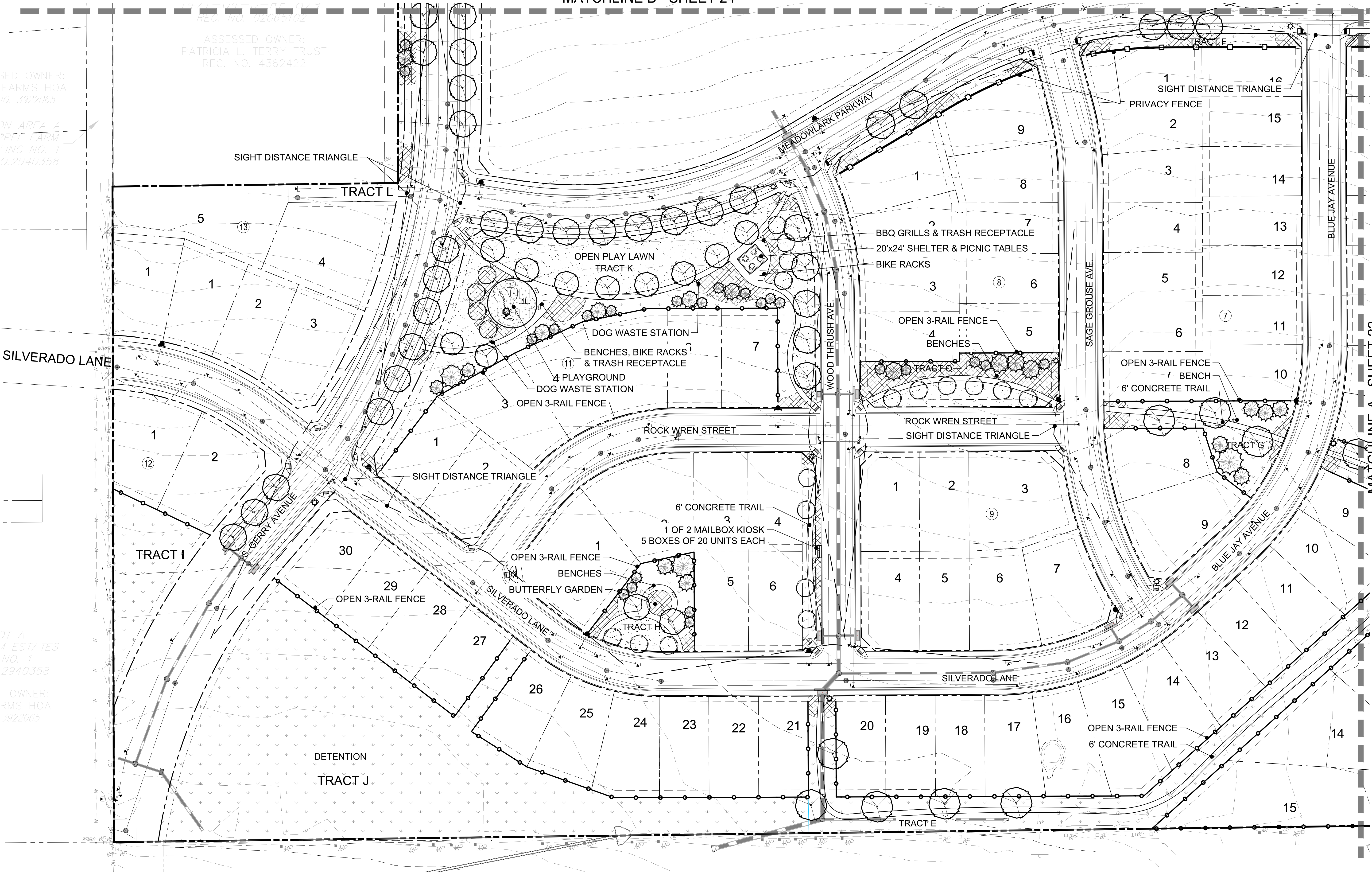
Redland
WHERE GREAT PLACES BEGIN
793.983.9793 OFFICE
1501 W. W. Colorado Blvd.
DENVER, CO 80202
REDLAND.COM

LANDSCAPE ARCHITECT / PLANNER:

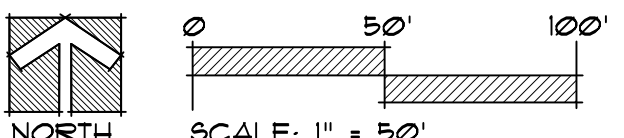
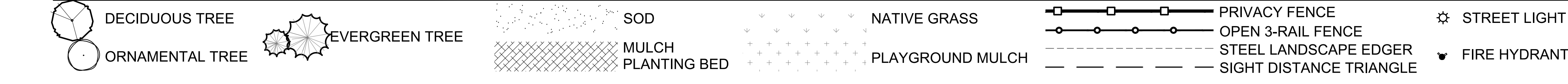
henry design group
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DENVER, CO 80202
303.446.2368 • henrydesigngroup.com



MATCHLINE B - SHEET 24



LEGEND



LANDSCAPE ARCHITECT / PLANNER:
henry design group
Landscape Architecture • Planning • Entitlements
1501 House Street Suite 100 Denver, Colorado 80202
303.444.2348 • henydesigngroup.com

ENGINEER:
Redland
WHERE GREAT PLACES BEGIN
720.383.0700 Office
1500 West 10th Avenue Suite 200
Denver, Colorado 80202
REDLAND.COM

APPLICANT:
CORONADO WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

DATE	NO.	NOTES
3-25-2021	1	
5-10-2021	2	

SHEET
PRELIMINARY
LANDSCAPE
PLAN
21 of 27

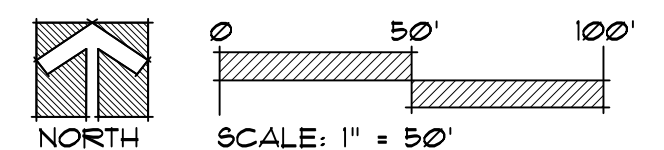
MURATA FARMS
PRELIMINARY PLAT / PUD
FORT LUPTON, COLORADO

This is a detailed site plan for Tract A, Sheet 21. The plan shows a residential development with several streets: Meadowlark Parkway at the top, Lake Sparrow Street and Lark Bunting Street running horizontally across the middle, and Lark Bunting Avenue and Mountain Flower Avenue running vertically. A large road, S. College Avenue, is on the right. The plan includes numerous numbered lots (1-27) and specific areas labeled as Tract A, Tract B, Tract C, Tract D, and Tract E. Amenities and features include:

- Trails:** 6' concrete trails and open 3-rail fences are shown throughout the development.
- Privacy Fences:** Indicated in several areas, including near the top right and bottom right.
- Landscaping:** Includes Colorado Blooms Garden, dog waste stations, benches, and various tree symbols.
- Infrastructure:** Features sight distance triangles at intersections, an entry monument, and a 2-of-2 mailbox kiosk with 5 boxes of 20 units each.
- Other Labels:** Matchline A - Sheet 21, Lark Bunting Way, and various lot numbers (1-27) are also present.

☀ STREET LIGHT

🔥 FIRE HYDRANT



PRELIMINARY
LANDSCAPE
PLAN
2 of 27

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Tempe, AZ 85284

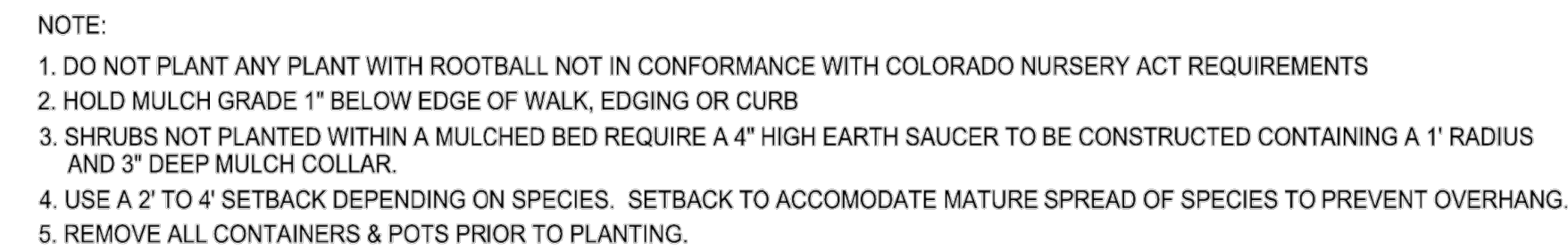
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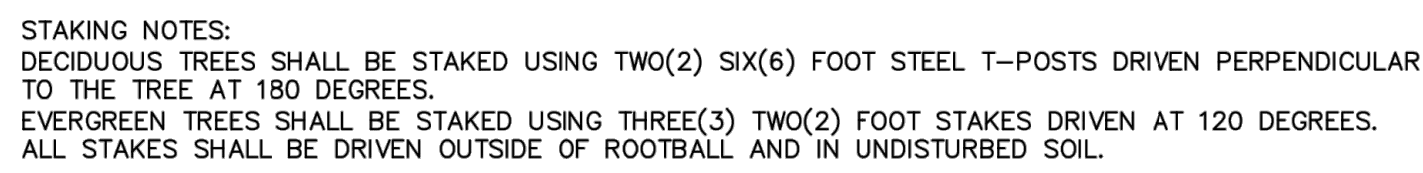
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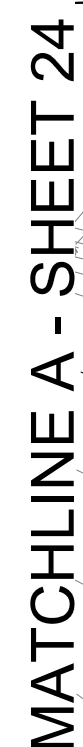
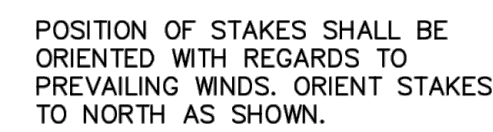
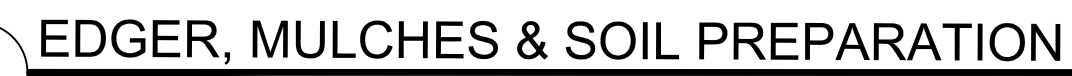
SHRUB & PERENNIAL PLANTING STANDARD DETAIL

NOT TO SCALE



TREE PLANTING STANDARD DETAIL

NOT TO SCALE



HWY 52

TRACT N

S. COLLEGE AVENUE

MATCHLINE B - SHEET 22

 DECIDUOUS TREE
 EVERGREEN TREE

 ORNAMENTAL TREE

MULCH
PLANTING BED

PLAYGROUND MULCH

 OPEN 3-RAIL FENCE

----- STEEL LANDSCAPE EDGER
— — — — — SIGHT DISTANCE TRIANGLE

 FIRE HYDRANT



50' 100'

SCALE: 1" = 50'

[illegible]

**MURATA FARMS
PRELIMINARY PLAT / PUD
FORT LUPTON, COLORADO**

PRELIMINARY LANDSCAPE PLAN

23 of 27

COMMON HACKBERRY
ENGLISH OAK
GREENSPIRE LINDEN
NORWEGIAN SUNSET MAPLE
SKYLINE HONEYLOCUST

CELTIS OCCIDENTALIS
QUERCUS ROBUR
TILIA CORDATA GREENSPIRE
ACER PLATANOIDES 'NORWEGIAN SUNSET'
GLEDITSIA TRIACANTHOS INERMIS SKYLINE

CHANTICLEER PEAR
CRIMSON SPIRE OAK
GOLDEN RAINTREE

PYRUS CALLERYANA
QUERCUS CRIMSON SPIRE
KOELREUTERIA PANICULATA

AUSTRIAN PINE
BRISTLECONE PINE
VANDERWOLF'S PYRAMID PINE

PINUS NIGRA
PINUS ARISTATA
PINUS FLEXILIS 'VANDERWOLF'S PYRAMID'

BLUE BUTTERFLY BUSH
CHEYENNE MOCKORANGE
DWARF BLACK CHOKEBERRY
GRO LOW SUMAC
LITTLE LEAF MAHOGANY
SPANISH GOLD BROOM
SASKATOON SERVICEBERRY
WESTERN SAND CHERRY

BUDDLEJA DAVIDII 'ELLEN'S BLUE'
PHILADELPHUS LEWISII 'CHEYENNE'
ARONIA MELANOCARPA IROQUOIS BEAUTY
RHUS AROMATICA 'GRO-LOW'
CERCOCARPUS INTRICATUS
CYTISUS PURGANS SPANISH GOLD
AMERLANCHIER ALNIFOLIA
PRUNUS BESSEYI



Vinyl fencing shall be of an "off-white" or "tan" color. Wood shall be stained to complement the primary color of the homes within the neighborhood.

Not to Scale

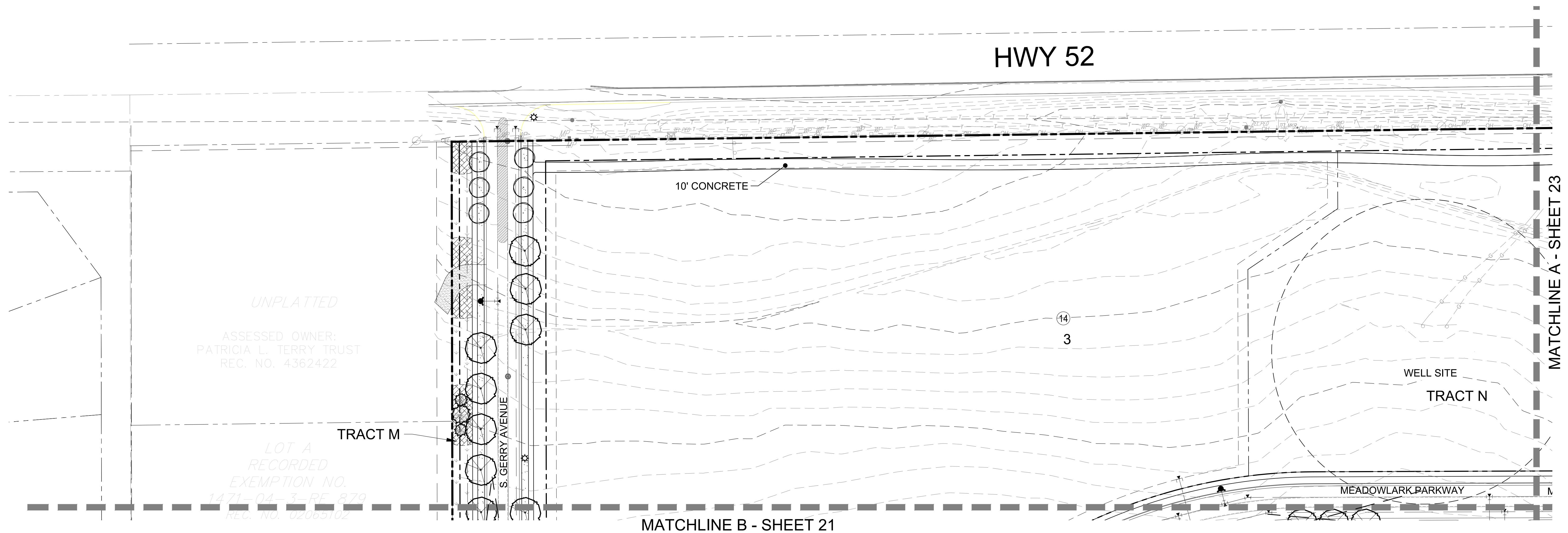


Not to Scale



Vinyl fencing shall be of an "off-white" or "tan" color. Wood shall be stained to complement the primary color of the homes within the neighborhood.

Not to Scale



DECIDUOUS TREE

ORNAMENTAL TREE

 EVERGREEN TREE

SOD

MULCH
PLANTING BED

NATIVE GRASS

PLAYGROUND MULCH

PRIVACY FENCE

—○—○—○—○— OPEN 3-RAIL FENCE

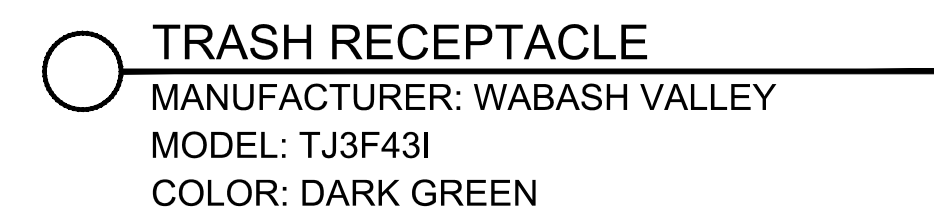
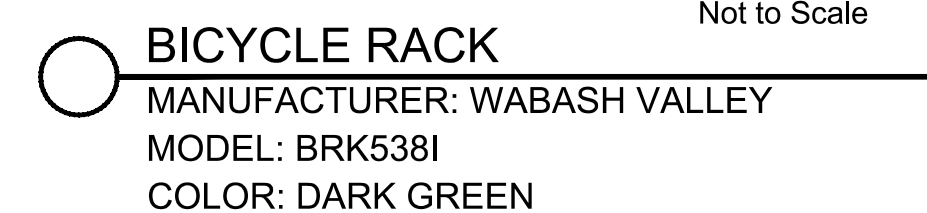
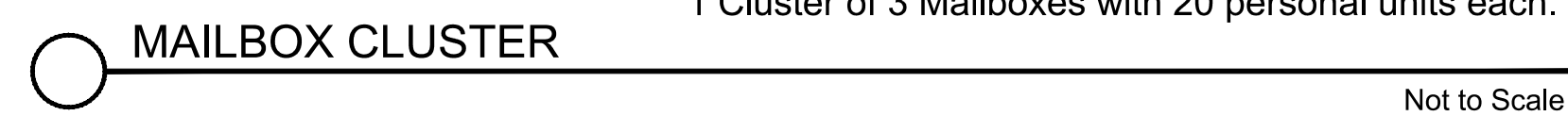
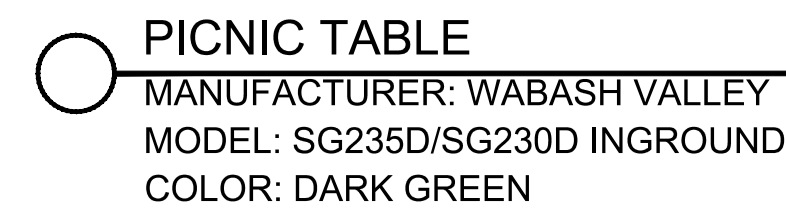
----- STEEL LANDSCAPE EDGER
 — — — — — SIGHT DISTANCE TRIANGLE

☀ STREET LIGHT

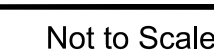
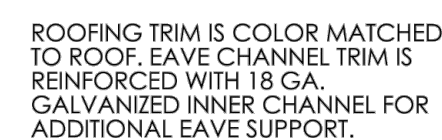
 FIRE HYDRANT

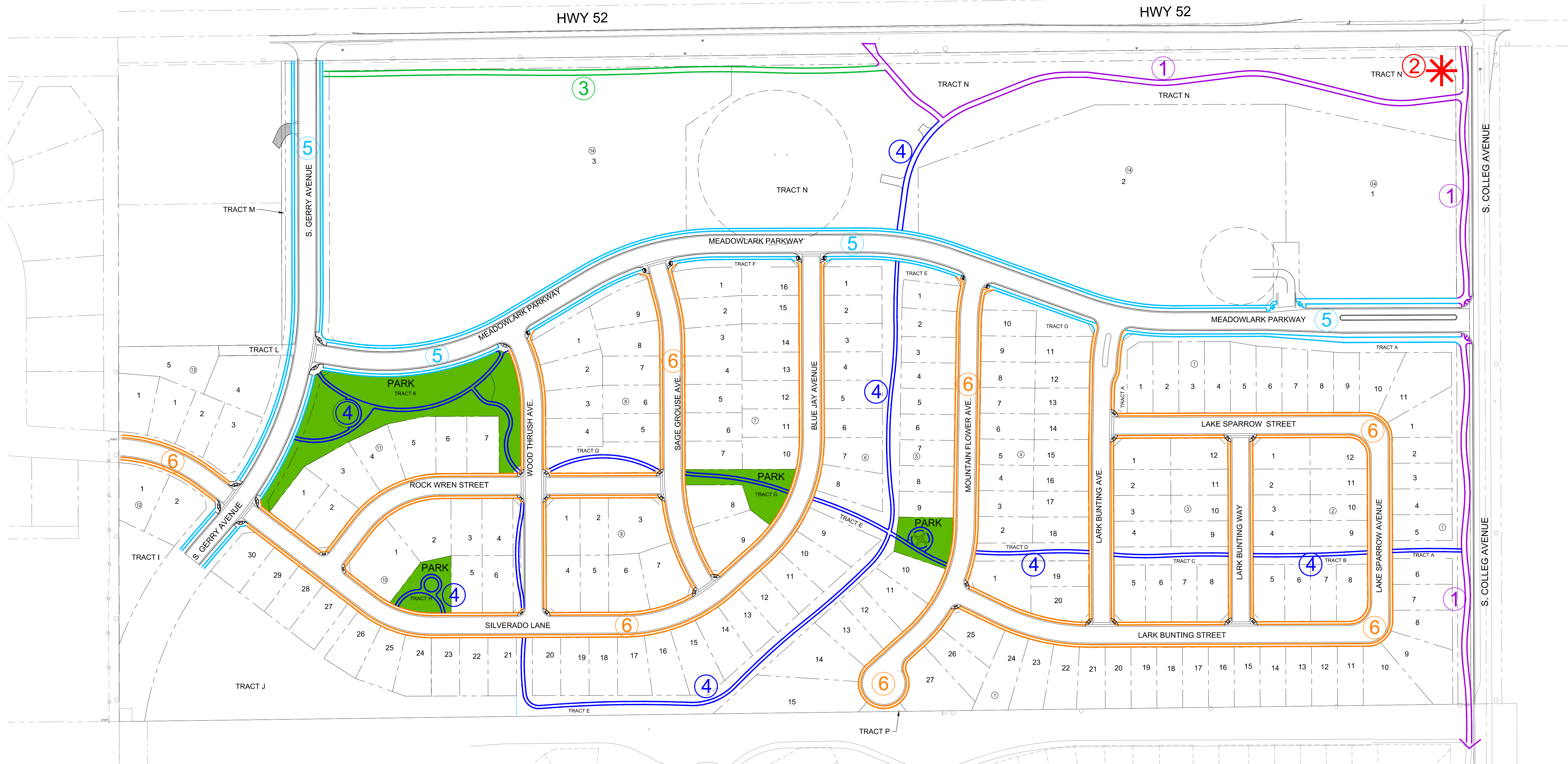
0 50' 100'

SCALE: 1" = 50'



○ STREET LIGHT





1 CONNECTOR TRAIL: County Road 29-1/2 trail provides a 10-foot-wide concrete trail within a tract on the west side of County Road 29-1/2. Potential connectivity includes access to the Trailhead and matches the trail along County Road 29-1/2 provide by Mountain Sky Subdivision. Also, trail along the Fulton Ditch provides a 10-foot-wide concrete trail with potential future connection (by others) north to trail running south from the Town of Platteville. Potential future connection (by others) south to the trail running north from the City of Brighton at County Road 6.

2 TRAILHEAD: Located at southwest corner of Hwy. 52 and County Road 29-1/2.

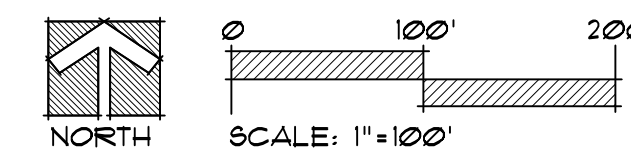


3 CONNECTOR TRAIL: HWY 52 connector trail provides a 10-foot-wide concrete trail located south of the right-of-way for Hwy 52. Potential future connectivity (by others) includes a connection to the Fulton Ditch Trail; the Trailhead at HWY. 52 and County Road 29-1/2 to the east and the Fort Lupton Trail to the west.

4 NEIGHBORHOOD TRAILS: Trails within open space tracts and pocket parks provides a 6-foot-wide concrete trail connecting the neighborhood to the community trail system and pocket parks within the Murata Farms neighborhood.

5 SIDEWALKS: Five (5) foot wide detached sidewalks are provided on all collector streets. The detached sidewalk provides a walk connection to the Mountain Sky neighborhood to the south. The sidewalks also provide connectivity for the residents to the Connector, Neighborhood and Fulton Ditch Trails.

6 SIDEWALKS: Five (5) foot wide sidewalks are attached to the curb on all local streets. The sidewalk system provides connectivity to the adjacent Appel Farms neighborhood along Silverado Lane to the west. The sidewalks also provide connectivity for the residents to the Connector, Neighborhood and Fulton Ditch Trails.



LANDSCAPE ARCHITECT / PLANNER:
henry design group
Landscape Architecture • Planning • Entitlements
1501 W. 2nd Street Suite 100, Denver, Colorado 80202
303.444.2340 • henydesigngroup.com

ENGINEER:
Redland
WHERE GREAT PLACES BEGIN
730.283.0750 Office
1000 West Colfax Avenue Suite 200
DENVER, CO 80202
REDLAND.COM

APPLICANT:
CORONADO WEST
Coronado West, LLC
8655 S. Priest Drive
Tempe, AZ 85284

DATE NO. NO. NOTES
3-25-2021 1
5-10-2021 2

MURATA FARMS
PRELIMINARY PLAT / PUD
FORT LUPTON, COLORADO

SHEET
TRAILS PLAN
26 of 27



SINGLE FAMILY DETACHED HOMES

NOT TO SCALE



PAIRED HOMES

NOT TO SCALE



TOWNHOMES

NOT TO SCALE

THE ABOVE IMAGES ARE REPRESENTATIVE OF THE PROPOSED CHARACTER AND DESIGN OF THE ARCHITECTURE OF THE HOMES AND ARE SUBJECT TO CHANGES AND REFINEMENT PER THE HOMEBUILDERS WITHIN MURATA FARMS. THE HOME DESIGNS WILL BE IN COMPLIANCE WITH FORT LUPTON'S RESIDENTIAL DESIGN STANDARDS. THESE IMAGES ARE "CONCEPTUAL ONLY" TO ILLUSTRATE DESIGN INTENT AND DO NOT REPRESENT ANY FINAL PROPOSED COMMITMENT OR CONDITION. ALL IMAGES ARE USED FOR ILLUSTRATIVE PURPOSES ONLY, ARE FOUND FROM DIFFERENT SOURCES, ARE ASSUMED TO BE PUBLIC DOMAIN, AND ARE DISPLAYED UNDER THE FAIR USE PRINCIPLE.

Preliminary Drainage Report

Murata Farms Filing No. 1

Prepared for:

Coronado West
8655 S. Priest Dr,
Tempe, AZ 85284
(303) 285-1110 voice
Contact: Eric Eckberg

Prepared by:



February 2021
Project No. 19036

ENGINEER'S CERTIFICATION

"This Preliminary Drainage Report for Murata Farms Filing No. 1 was prepared by me (or under my direct supervision) in accordance with the provisions of the *City of Fort Lupton Storm Drainage Design and Technical Criteria* and was designed to comply with the provisions thereof.

Travis Frazier, P.E.
Registered Professional Engineer
State of Colorado No. 45342

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Introduction

INTRODUCTION

This drainage report presents an analysis for the proposed storm drainage system and patterns of Murata Farms Filing No. 1, hereafter referred to as the Site.

Site Location

The Site is located in the northern section of the southwest quarter of Section 4, Township 1 North, Range 66 West of the 6th Principal Meridian, City of Fort Lupton and County of Weld, Colorado. The Site is located to the south of County Road 12 1/2, also known as Colorado Highway 52 and west of County Road 29 1/2. To the west of the site is an existing development of Appel Farms. To the south of the site is the Mountain Sky Filing No. 1 development.

Site Description

The existing site encompasses approximately 72.71 acres and is largely undeveloped with the exception of existing farm buildings and existing oil wells. The site generally slopes from north to south. There is an existing detention pond off-site in the southwest corner and directly south of the project on the eastern half lies a drainage channel. The existing Fulton Irrigation Ditch crosses the northeast corner of the site. The site is actively being farmed at the time of this report.

Proposed Project Description

The property is proposed to be a planned residential development which will include single family homes, townhomes, a commercial lot and park areas. A total of 180 single family residential units will be constructed with the project. Runoff from the site will be treated in a full-spectrum detention pond.

Flood Hazard and Drainage Studies Relevant to the Site

The site is contained within FIRM Map No. 08123C2110E, with a revised date of January 20, 2016. The site lies entirely within Zone X.

Soil Type

The NRCS soil survey indicates that the soil on site is primarily sandy loams, whose hydrologic soil group is Type B. A soil map has been included in the appendix for reference.

Historic Drainage System

The existing site is primarily farmland. Historically, the site flows from North to South at a slope of 2.6%. South of the existing site is the development known as Mountain Sky which has a drainage swale along Mountain Sky's northern edge. The Site partially drains into the swale and into the existing pond as well.

Proposed Drainage System and Basins

Criteria

This report has been prepared in accordance with the *City of Fort Lupton Storm Drainage Design and Technical Criteria* and the *Urban Drainage and Flood Control District Criteria Manual*.

The hydrologic design was computed using the Rational Method as defined by Mile Flood Control District. The 5-year storm was used as the minor storm event, while the 100-year storm was used as the major event. The one-hour point rainfall depth used for the 5-year storm was 1.11 inches and 2.71 inches for the 100-year event. The Rational Method was used to analyze fully developed conditions. Roads interior to the site are designed to use mountable curb whereas the major east to west Road on the northern end of the site and the road running north to south of the west end of the site is vertical curb.

Erosion control shall be utilized throughout the site. BMP's shall be installed and maintained during the project duration per Urban Drainage Flood Control District and *City of Fort Lupton Storm Drainage Design and Technical Criteria*.

Runoff / Proposed Basin Description

Major Basins

The proposed development has been divided into six Major Basins. Major Basins A, B and C (majority of the site) will be captured and treated in a full spectrum detention pond and released at the historic rate. These Major Basins have an overall imperviousness of 49%. Major Basins D, E, F and OS (offsite) will follow historic flow patterns.

Sub-basins

Basin A

Basin A consists of single-family lots, parks and roadways primarily along the western half of the site. Basin A will be collected by on-site storm sewer and routed to the full-spectrum detention pond.

Basin A1 (5.41 Acres)

Basin A1 is half of a road section of Colorado State Highway 52 and the area surrounding an existing well setback. Flows from Basin A1 will reach Design Point A1 and will spill over the curb into Basin A2 where the flow will follow the gutter and be routed to a 10' Type R Inlet in a sump condition. Approximately 0.9 cfs in the minor storm and 10.9 cfs of the major storm will be routed to the inlet through A2. This basin has an overall imperviousness of 13%.

$$C_5 = 0.08 \quad C_{100} = 0.49$$

$$Q_5 = 0.9 \text{ CFS} \quad Q_{100} = 10.9 \text{ CFS}$$

Basin A2 (0.75 Acres)

Basin A2 consists of a road section, adjacent sidewalk, and tree lawn. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R Inlet in a sump condition at Design Point A2. This basin has an overall imperviousness of 76%.

$$C_5 = 0.61 \quad C_{100} = 0.78$$

$$Q_5 = 1.7 \text{ CFS} \quad Q_{100} = 5.0 \text{ CFS}$$

Basin A3 (7.29 Acres)

Basin A3 consists of future single-family attached lots, associated road, and landscape. Flows will sheet flow and collect into a 36" RCP storm stub located at Design Point A3. This basin has an overall imperviousness of 75%.

$$C_5 = 0.60 \quad C_{100} = 0.78$$

$$Q_5 = 13.9 \text{ CFS} \quad Q_{100} = 42.1 \text{ CFS}$$

Basin A4 (1.88 Acres)

Basin A4 consists of single-family detached lot, park areas and associated roads and landscape. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 5' Type R inlet in an on-grade condition located at Design Point B4. Approximately 0.1 cfs of the minor storm and 4.0 cfs of the major storm will bypass to Basin A6. This basin has an overall imperviousness of 48%.

$$C_5 = 0.35 \quad C_{100} = 0.69$$

$$Q_5 = 1.8 \text{ CFS} \quad Q_{100} = 7.5 \text{ CFS.}$$

Basin A5 (2.36 Acres)

Basin A5 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in an on-grade condition located at Design Point A5. Approximately 3.0 cfs of the major storm will bypass to Basin A7. This basin has an overall imperviousness of 57%.

$$C_5 = 0.44 \quad C_{100} = 0.69$$

$$Q_5 = 2.9 \text{ CFS} \quad Q_{100} = 10.5 \text{ CFS.}$$

Basin A6 (1.54 Acres)

Basin A6 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point A6. This basin has an overall imperviousness of 50%.

$$C_5 = 0.37 \quad C_{100} = 0.66$$

$$Q_5 = 1.7 \text{ CFS} \quad Q_{100} = 6.9 \text{ CFS.}$$

Basin A7 (1.50 Acres)

Basin A7 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point A8. This basin has an overall imperviousness of 59%.

$$C_5 = 0.45 \quad C_{100} = 0.70$$

$$Q_5 = 2.2 \text{ CFS} \quad Q_{100} = 7.8 \text{ CFS}$$

Basin A8 (3.26 Acres)

Basin A7 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type

R inlet in a sump condition located at Design Point A7. Approximately 7.9 cfs of the major storm from Basin A8 will bypass to Basin A7. This basin has an overall imperviousness of 54%.

$$C_5 = 0.41 \quad C_{100} = 0.70$$

$$Q_5 = 4.0 \text{ CFS} \quad Q_{100} = 15 \text{ CFS}$$

Basin A9 (1.15 Acres)

Basin A9 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point A9. Approximately 2.4 cfs of the major storm from Basin A9 will bypass to Basin A7. This basin has an overall imperviousness of 54%.

$$C_5 = 0.41 \quad C_{100} = 0.68$$

$$Q_5 = 1.5 \text{ CFS} \quad Q_{100} = 5.5 \text{ CFS}$$

Basin A10 (1.29 Acres)

Basin A10 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in an on-grade condition located at Design Point A10. Approximately 0.1 cfs of the minor storm and 3.0 cfs of the major storm from Basin A10 will be routed to a 10' Type R Inlet in a sump condition at Design Point A11. This basin has an overall imperviousness of 58%.

$$C_5 = 0.45 \quad C_{100} = 0.7$$

$$Q_5 = 1.8 \text{ CFS} \quad Q_{100} = 6.3 \text{ CFS}$$

Basin A11 (2.65 Acres)

Basin A11 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point A11. This basin has an overall imperviousness of 58%.

$$C_5 = 0.45 \quad C_{100} = 0.70$$

$$Q_2 = 3.4 \text{ CFS} \quad Q_{100} = 14.0 \text{ CFS}$$

Basin A12 (4.35 Acres)

Basin A12 consists of single-family detached lots, landscape areas, and walks. Flows will sheet flow and collect into a grass swale within Basin A12. The flows will channel along the grass swale down to Design Point A12 where they will flow into a 24" FES. This basin has an overall imperviousness of 34%.

$$C_5 = 0.24 \quad C_{100} = 0.59$$

$$Q_5 = 2.9 \text{ CFS} \quad Q_{100} = 15.5 \text{ CFS}$$

Basin B

Basin B consists of single-family lots, and roadways primarily along the eastern half of the site. Basin B will be collected by on-site storm sewer and routed an existing swale along the southern edge of the Site.

Basin B1 (5.13 Acres)

Basin B1 consists of future single-family attached lots, park areas and associated roads, alleys and landscape. Flows will sheet flow and collect where they will be collected into a 30" RCP Storm Stub. This basin has an overall imperviousness of 75%.

$$C_5 = 0.60 \quad C_{100} = 0.78$$

$$Q_5 = 11.4 \text{ CFS} \quad Q_{100} = 34.4 \text{ CFS}$$

Basin B2 (2.52 Acres)

Basin B2 consists of future commercial. Flows will sheet flow and collect where they will be collected into a 24" RCP Storm Stub. The commercial area has an assumed imperviousness of 90%, consistent with alleys and sidewalk areas.

$$C_5 = 0.74 \quad C_{100} = 0.85$$

$$Q_5 = 7.2 \text{ CFS} \quad Q_{100} = 19.4 \text{ CFS}$$

Basin B3 (1.03 Acres)

Basin B3 consists of a road section, adjacent sidewalk to it, and tree lawn. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 5' Type R Inlet in an on-grade condition at Design Point B3. Approximately 0.3 cfs of the minor storm and 3.4 cfs of

the major storm will bypass the inlet and carry over to Basin B4. This basin has an overall imperviousness of 67%.

$$C_5 = 0.52 \quad C_{100} = 0.74$$

$$Q_5 = 2.0 \text{ CFS} \quad Q_{100} = 6.4 \text{ CFS}$$

Basin B4 (0.60 Acres)

Basin B4 consists of a road section, adjacent sidewalk to it, and tree lawn. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R Inlet in a sump condition at Design Point B4. This basin has an overall imperviousness of 72%.

$$C_5 = 0.58 \quad C_{100} = 0.77$$

$$Q_5 = 2.6 \text{ CFS} \quad Q_{100} = 9.5 \text{ CFS}$$

Basin B5 (2.18 Acres)

Basin B5 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point B5. This basin has an overall imperviousness of 56%.

$$C_5 = 0.43 \quad C_{100} = 0.69$$

$$Q_5 = 2.6 \text{ CFS} \quad Q_{100} = 9.5 \text{ CFS}$$

Basin B6 (1.97 Acres)

Basin B6 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 15' Type R inlet in a sump condition located at Design Point B6. This basin has an overall imperviousness of 54%.

$$C_5 = 0.41 \quad C_{100} = 0.68$$

$$Q_5 = 2.5 \text{ CFS} \quad Q_{100} = 9.4 \text{ CFS}$$

Basin B7 (1.96 Acres)

Basin B7 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in an on-grade condition located at Design Point B7. Approximately 1.9 cfs of the major storm will bypass to Basin B6. This basin has an overall imperviousness of 52%.

$$C_5 = 0.39 \quad C_{100} = 0.67$$

$$Q_5 = 2.2 \text{ CFS} \quad Q_{100} = 8.5 \text{ CFS}$$

Basin B8 (0.80 Acres)

Basin B8 consists of a road section, adjacent sidewalk to it, and tree lawn. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in an on-grade condition located at Design Point B8. Approximately 0.1 cfs of the minor storm and 2.0 cfs of the major storm will bypass to Basin B10. This basin has an overall imperviousness of 77%.

$$C_5 = 0.62 \quad C_{100} = 0.79$$

$$Q_5 = 1.7 \text{ CFS} \quad Q_{100} = 5.0 \text{ CFS}$$

Basin B9 (3.11 Acres)

Basin B9 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected at Design Point B9 after which the flows will enter a cross pan and go into the Inlet at Design Point B10. This basin has an overall imperviousness of 47%.

$$C_5 = 0.35 \quad C_{100} = 0.65$$

$$Q_5 = 3.0 \text{ CFS} \quad Q_{100} = 12.8 \text{ CFS}$$

Basin B10 (1.89 Acres)

Basin B10 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in an on-grade condition located at Design Point B10. Approximately 0.4 cfs of the minor storm and 13.3 cfs of the major storm will bypass to Basin B10. This basin has an overall imperviousness of 60%.

$$C_5 = 0.46 \quad C_{100} = 0.71$$

$$Q_5 = 2.6 \text{ CFS} \quad Q_{100} = 9.2 \text{ CFS}$$

Basin B11(1.48 Acres)

Basin B11 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point B10. This basin has an overall imperviousness of 53%.

$$C_5 = 0.40 \quad C_{100} = 0.68$$

$$Q_5 = 1.8 \text{ CFS} \quad Q_{100} = 7.0 \text{ CFS}$$

Basin B12 (1.61 Acres)

Basin B12 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 5' Type R inlet in an on-grade condition located at Design Point B12. Approximately 0.2 cfs of the minor storm and 3.9 cfs of the major storm will bypass to Basin B10. This basin has an overall imperviousness of 54%.

$$C_5 = 0.41 \quad C_{100} = 0.68$$

$$Q_5 = 2.0 \text{ CFS} \quad Q_{100} = 7.7 \text{ CFS}$$

Basin B13 (2.90 Acres)

Basin B13 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point B13.. This basin has an overall imperviousness of 52%.

$$C_5 = 0.39 \quad C_{100} = 0.67$$

$$Q_5 = 3.0 \text{ CFS} \quad Q_{100} = 11.5 \text{ CFS}$$

Basin B14 (1.27 Acres)

Basin B14 consists of single-family detached lots. Flows will sheet flow to the swale to the south of the Site. This basin has an overall imperviousness of 45%.

$$C_5 = 0.33 \quad C_{100} = 0.64$$

$$Q_5 = 1.7 \text{ CFS} \quad Q_{100} = 7.4 \text{ CFS}$$

Basin C

Basin C consists of single-family lots, and roadways primarily along the western edge of the site. Basin C will be collected by on-site storm sewer and routed to the full-spectrum detention pond.

Basin C1 (1.37 Acres)

Basin C1 consists of park area, walks, road, and associated landscape area. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected at Design Point C1 after which the flows will enter a cross pan and go into the Inlet at Design Point C4. This basin has an overall imperviousness of 51%.

$$C_5 = 0.38 \quad C_{100} = 0.66$$

$$Q_5 = 1.8 \text{ CFS} \quad Q_{100} = 7.1 \text{ CFS}$$

Basin C2 (2.92 Acres)

Basin C2 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point C2. This basin has an overall imperviousness of 50%.

$$C_5 = 0.38 \quad C_{100} = 0.66$$

$$Q_5 = 3.3 \text{ CFS} \quad Q_{100} = 13.1 \text{ CFS}$$

Basin C3 (1.91 Acres)

Basin C3 consists of single-family detached lots, associated landscape area, and road. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a 10' Type R inlet in a sump condition located at Design Point C3. This basin has an overall imperviousness of 59%.

$$C_5 = 0.45 \quad C_{100} = 0.70$$

$$Q_5 = 2.6 \text{ CFS} \quad Q_{100} = 9.2 \text{ CFS}$$

Basin C4 (0.47 Acres)

Basin C4 consists of future roadway and landscape area. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into a temporary Type D inlet located at Design Point C4. It is assumed that this would become a 10' Type D inlet when the road is developed. This basin has an overall imperviousness of 77%.

$$C_5 = 0.62 \quad C_{100} = 0.79$$

$$Q_5 = 0.8 \text{ CFS} \quad Q_{100} = 2.3 \text{ CFS}$$

Basin C5 (0.68 Acres)

Basin C5 consists of future roadway. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected into an 18" Storm Stub at design point C5. This basin has an overall imperviousness of 36%.

$$C_5 = 0.25 \quad C_{100} = 0.59$$

$$Q_5 = 0.5 \text{ CFS} \quad Q_{100} = 2.3 \text{ CFS}$$

Basin C6 (2.94 Acres)

Basin C6 consists of single-family detached lots and landscape area. Flows will sheet flow directly into the full-spectrum detention pond. This basin has an overall imperviousness of 14%.

$$C_5 = 0.08 \quad C_{100} = 0.49$$

$$Q_5 = 0.8 \text{ CFS} \quad Q_{100} = 9.1 \text{ CFS}$$

Basin D

Basin D consists of the existing roadway that runs along the eastern edge of the Site, the walk alongside it and associated landscaping. Basin D will follow historic drainage patterns and will not be treated in the full-spectrum detention facility.

Basin D1 (0.89 Acres)

Basin D1 consists of the western half of Weld County Road 29 1/2, proposed walk, and associated landscaping. Flows will sheet flow and collect in the on-site curb and gutter where they will be collected in an existing inlet off-site. This basin has an overall imperviousness of 61%.

$$C_5 = 0.47 \quad C_{100} = 0.71$$

$$Q_5 = 1.1 \text{ CFS} \quad Q_{100} = 4.5 \text{ CFS}$$

Off-site Basins

The off-site basins consist of portions of the project that will discharge off-site and typically follow historic drainage patterns. Portions of these basins are considered undeveloped because the areas will not be developed with this project or they match the historical imperviousness of the area. The Fulton Irrigation Ditch along the northern end of the site will not have any flows directed towards the ditch. There is no proposed development on the north side of the ditch. Since these basins are not tributary to the full-spectrum detention facility, they will not be treated.

Basin OS-B1 (0.97 Acres)

Basin OS-B1 consists of a landscaping area north of Basin B1. Flows will sheet flow onto Basin B1. This basin has an overall imperviousness of 15%.

$$C_5 = 0.09 \quad C_{100} = 0.50$$

$$Q_5 = 0.1 \text{ CFS} \quad Q_{100} = 1.2 \text{ CFS}$$

Basin OS-B2 (0.49 Acres)

Basin OS-B2 consists of a landscaping area north of Basin B2. Flows will sheet flow onto Basin B2. This basin has an overall imperviousness of 16%.

$$C_5 = 0.10 \quad C_{100} = 0.50$$

$$Q_5 = 0.1 \text{ CFS} \quad Q_{100} = 0.9 \text{ CFS}$$

Proposed Full-Spectrum Detention Area

The Site will utilize a full-spectrum extended detention basin (EDB) for on-site water quality and detention requirements. The proposed storm infrastructure will capture the runoff from Basins A, B, C and D and route them to the pond. Tributary basins make up approximately 70.88 acres with an imperviousness of 53%.

The proposed EDB will modify an existing pond located south of the site in the Mountain Sky Subdivision. This pond, as discussed in the Mountain Sky Drainage Report, has a restricted release rate to the 5-year storm due to lack of downstream infrastructure. The proposed pond

will be sized for both developments and will release at the 10-year historical release rate. The improvements to the existing pond will include additional volume, outlet structure, micropool, trickle channels, forebays and an emergency overflow. The pond will have a total volume of approximately 17.59 ac-ft. It was sized using the Mile High Flood District spreadsheet MHFD-Detention_v4.03. There will be a 2' concrete channel at the bottom of the pond for low flows. The pond has been sized for Water Quality, Excess Urban Runoff Volume and 100-year detention. Excess Urban Runoff Volume is defined as the difference between the developed condition runoff volume and the pre-development volume. Orifice plates will keep the 100-year release rate below historical runoff for the site. See Appendix for detention calculations.

There is an existing offsite basin OS-N, as described in the Mountain Sky Drainage Report, consisting of 825 acres that flows into the Mountain Sky Subdivision. This flow is routed through Mountain Sky in a channel and into the proposed pond. Following the Mountain Sky Drainage Report, this flow will be routed through the pond and will not be treated. The emergency overflow will be sized to convey this offsite flow.

The pond will outfall, per the Mountain Sky Drainage Report, to the property to the west.

The pond and the outlet structure shall be owned and maintained by the Murata Farms Metropolitan District. The pond and outlet structure will have maintenance access from the northwest corner of the pond.

Water Quality Enhancement Best Management Practices

The pond discussed in the previous section has been designed in accordance with the *City of Fort Lupton Storm Drainage and Technical Criteria*, and the *MHFD Urban Storm Drainage Criteria Manual Volumes 1, 2 and 3*. The pond was designed to detain the Excess Urban Runoff Volume and the 100-year Detention Volume.

Conclusion

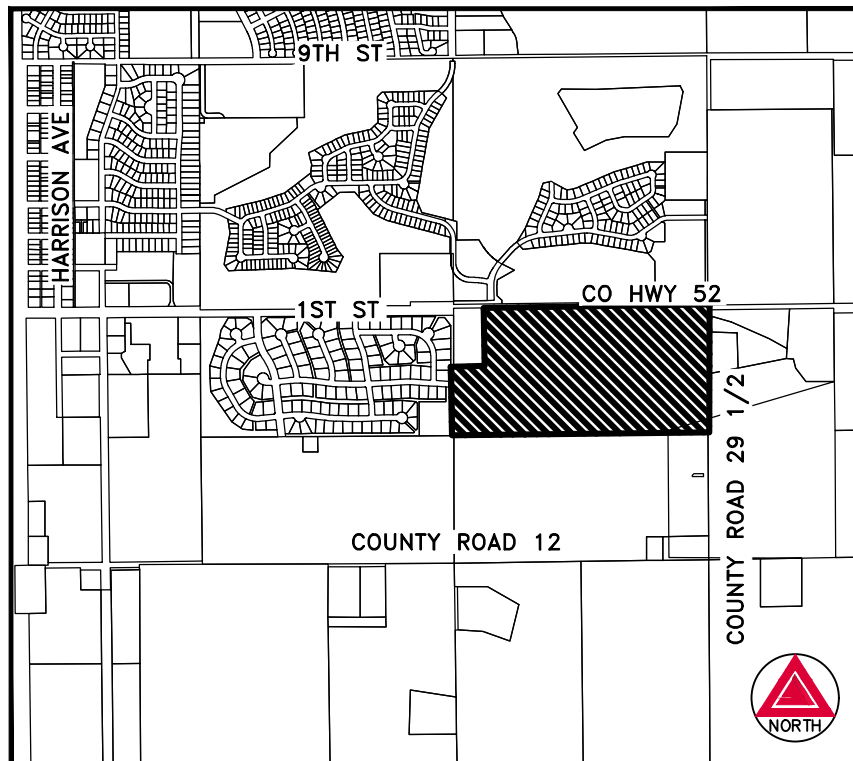
The Site will follow existing drainage patterns towards a full spectrum detention pond located in the southwestern corner of the Site that is to be resized to accommodate the increased flow rates. The flows from the detention pond are to be released at the historical 10-year rate as there is no formal down-stream infrastructure. The existing channel along the southern edge of the site will be used as a drainage channel for Basins B and D that will continue to release into the detention pond. Since there the proposed pond will be releasing at the historic 10-year release rate, there will be no negative downstream impacts.

References

REFERENCES

1. *City of Fort Lupton Storm Drainage Design and Technical Criteria.*
2. *Urban Drainage and Flood Control District, Denver, Colorado, Urban Storm Drainage Criteria Manual, Volume 1-3, latest online addition.*
3. *Mountain Sky Subdivision, – Filing No. 1 with +/- 45 Residential Lots, Final Drainage Report,* prepared by Calibre Engineering Inc. and dated June, 2016.

Appendix A - Vicinity Map, FIRM Map, Soils Map



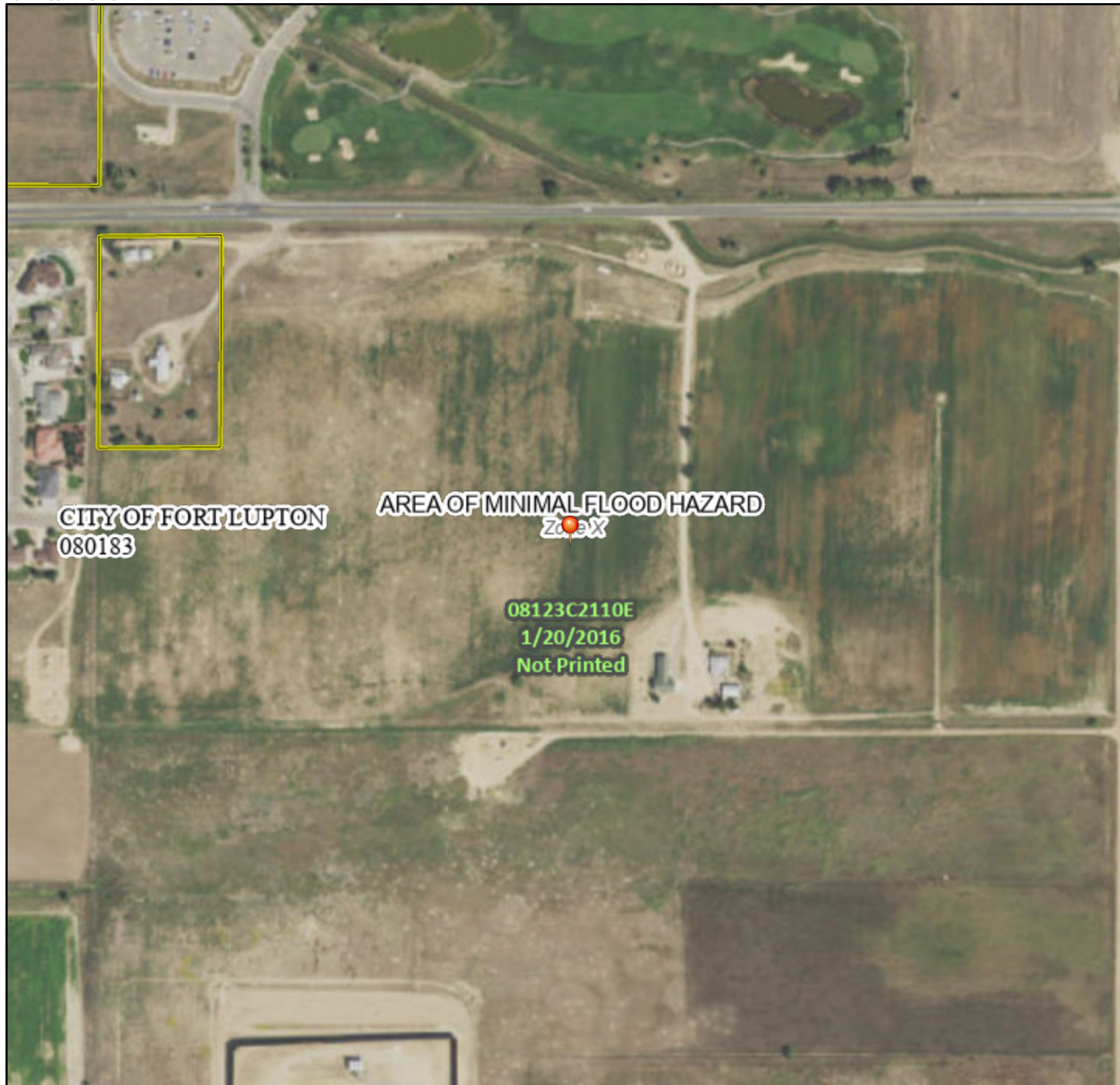
VICINITY MAP

SCALE 1" = 2,000'

National Flood Hazard Layer FIRMette



104°47'33"W 40°4'54"N



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

1:6,000

104°46'56"W 40°4'27"N

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

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 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
MAP PANELS		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



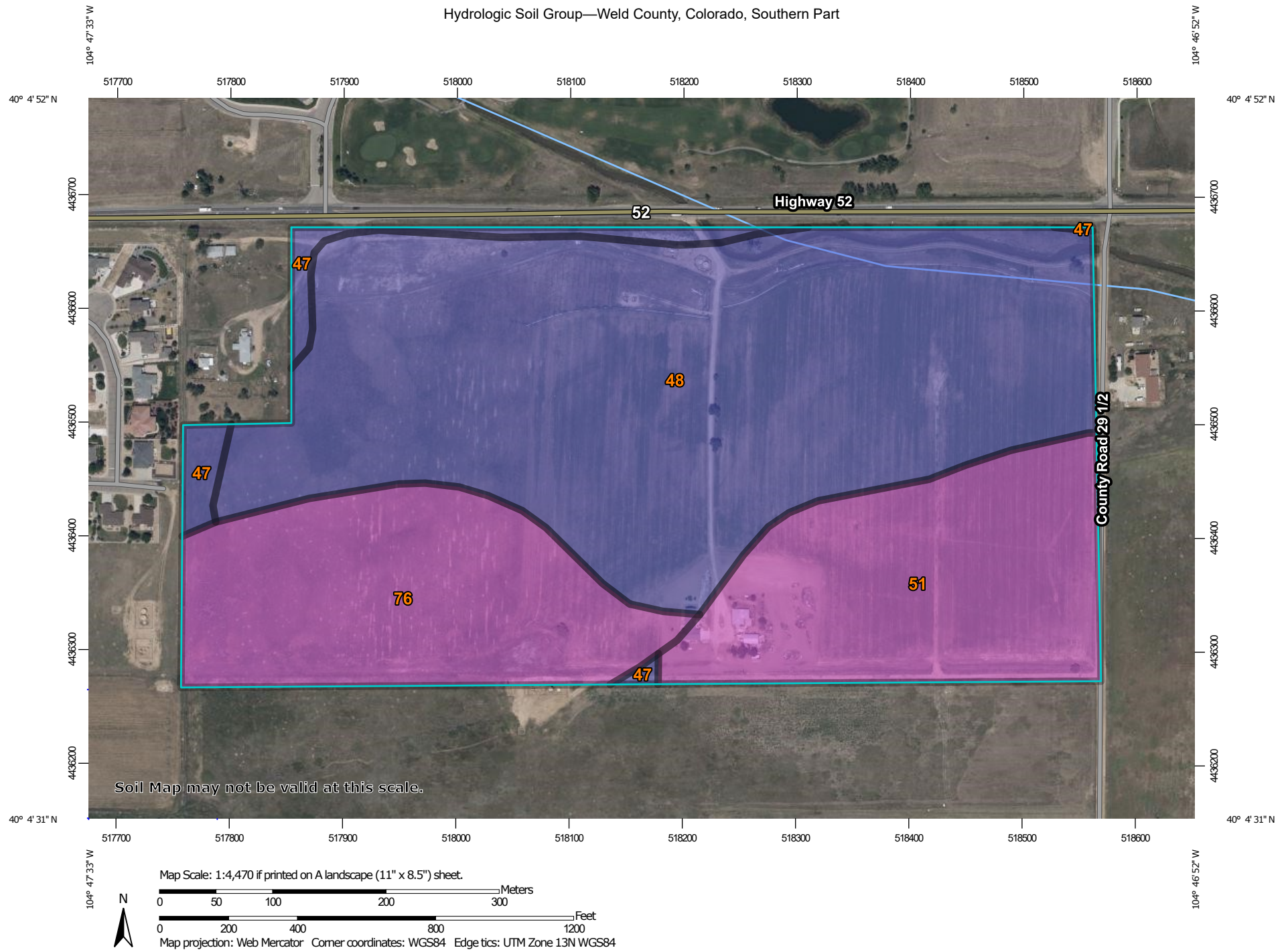
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 **2/22/2021 at 4:28 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.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Hydrologic Soil Group—Weld County, Colorado, Southern Part



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

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 19, Jun 5, 2020

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

Date(s) aerial images were photographed: Jul 19, 2018—Aug 10, 2018

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
47	Olney fine sandy loam, 1 to 3 percent slopes	B	2.3	3.0%
48	Olney fine sandy loam, 3 to 5 percent slopes	B	43.6	57.0%
51	Otero sandy loam, 1 to 3 percent slopes	A	15.2	19.9%
76	Vona sandy loam, 1 to 3 percent slopes	A	15.3	20.1%
Totals for Area of Interest			76.4	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

Appendix B - Hydrologic Calculation



SF-1

RUNOFF COEFFICIENTS - DEVELOPED

PROJECT NAME:

Murata Farms

PROJECT NUMBER:

19032

CALCULATED BY:

WPC

CHECKED BY:

TJF

DATE:

2/22/2021

LAND USE:		Paved Area	Park Area	Landscape Area	SF Detached Area	SF Attached Area	Alley / Commercial/ Walk Area	Calculations assume Type C soils per NRCS					
IMPERVIOUS %		100%	10%	2%	45%	75%	90%						

OVERALL SITE STUDY AREA													
DESIGN BASIN	DESIGN POINT	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	TOTAL AREA (AC)	Cd(2)	Cd(5)	Cd(10)	Cd(100)	Impervious %
A1	A1	0.52		4.80			0.09	5.41	0.08	0.09	0.16	0.49	13%
A2	A2	0.45		0.17			0.13	0.75	0.61	0.64	0.67	0.78	76%
A3	A3					7.29		7.29	0.60	0.63	0.66	0.78	75%
A4	A4	0.37	0.69		0.58		0.19	1.83	0.35	0.38	0.44	0.65	48%
A5	A5	0.66	0.19	0.21	1.13		0.17	2.36	0.44	0.47	0.52	0.69	57%
A6	A6	0.34		0.33	0.81		0.06	1.54	0.37	0.40	0.46	0.66	50%
A7	A7	0.32		0.02	1.08		0.08	1.50	0.45	0.48	0.53	0.70	59%
A8	A8	0.58	0.06	0.18	2.28		0.16	3.26	0.41	0.44	0.49	0.68	54%
A9	A9	0.28		0.20	0.59		0.08	1.15	0.41	0.44	0.49	0.68	54%
A10	A10	0.28		0.06	0.86		0.09	1.29	0.45	0.48	0.53	0.70	58%
A11	A11	0.31		0.05	0.96		0.08	1.40	0.45	0.48	0.53	0.70	58%
A12	A12	0.00	0.00	1.32	2.82		0.21	4.35	0.24	0.27	0.33	0.59	34%
BASIN A		4.11	0.94	7.34	11.11	7.29	1.34	32.13	0.37	0.40	0.46	0.66	50%
		12.8%	2.9%	22.8%	34.6%	22.7%	4.2%	100.0%					
B1	B1					5.13		5.13	0.60	0.63	0.66	0.78	75%
B2	B2						2.52	2.52	0.74	0.77	0.79	0.85	90%
B3	B3	0.52		0.33			0.18	1.03	0.52	0.55	0.60	0.74	67%
B4	B4	0.35		0.16			0.09	0.60	0.58	0.60	0.64	0.77	72%
B5	B5	0.64		0.39	1.02		0.13	2.18	0.43	0.46	0.51	0.69	56%
B6	B6	0.38		0.18	1.29		0.12	1.97	0.41	0.44	0.50	0.68	54%
B7	B6.1	0.35		0.24	1.27		0.10	1.96	0.39	0.42	0.48	0.67	52%
B8	B7	0.49		0.17			0.14	0.80	0.62	0.65	0.68	0.79	77%
B9	B8	0.31		0.35	2.37		0.08	3.11	0.35	0.38	0.44	0.65	47%
B10	B9	0.45		0.02	1.31		0.11	1.89	0.46	0.50	0.55	0.71	60%
B11	B10	0.25		0.13	1.01		0.09	1.48	0.40	0.43	0.49	0.68	53%
B12	B10.1	0.39		0.30	0.80		0.12	1.61	0.41	0.44	0.49	0.68	54%
B13	B13	0.48		0.27	2.01		0.14	2.90	0.39	0.42	0.48	0.67	52%
B14	B14			0.01	1.26			1.27	0.33	0.36	0.42	0.64	45%
BASIN B		4.61	0.00	2.55	12.34	5.13	3.82	28.45	0.48	0.51	0.56	0.72	62%
		16.2%	0.0%	9.0%	43.4%	18.0%	13.4%	100.0%					
C1	C1	0.45	0.40	0.30			0.22	1.37	0.38	0.41	0.47	0.66	51%
C2	C2	0.65		0.64	1.47		0.16	2.92	0.38	0.41	0.46	0.66	50%
C3	C3	0.51		0.12	1.32		0.12	2.07	0.45	0.48	0.53	0.70	59%
C4	C4	0.21		0.07			0.04	0.32	0.62	0.65	0.68	0.79	77%
C5	C5	0.15		0.37	0.14		0.03	0.69	0.25	0.28	0.35	0.59	36%
C6	C6			2.13	0.79			2.92	0.08	0.10	0.17	0.49	14%
BASIN C		1.97	0.40	3.63	3.72	0.00	0.57	10.29					41%
		19.1%	3.9%	35.3%	36.1%	0.0%	5.5%	100.0%					
D1	D1	0.39		0.34			0.16	0.89	0.47	0.50	0.55	0.71	61%
BASIN D		0.39	0.00	0.34	0.00	0.00	0.16	0.89					61%
		43.8%	0.0%	38.2%	0.0%	0.0%	18.0%	100.0%					
OVERALL STUDY AREA		10.69	1.34	13.52	27.17	12.42	5.73	70.88	0.40	0.43	0.49	0.68	53%
		15.1%	1.9%	19.1%	38.3%	17.5%	8.1%	100.0%					
OS-B1	OS-B1			0.83			0.14	0.97	0.09	0.11	0.18	0.50	15%
OS-B2	OS-B2			0.41			0.08	0.49	0.10	0.12	0.19	0.50	16%
Offsite - OS BASINS		0.00	0.00	1.24	0.00	0.00	0.22	1.46	0.09	0.11	0.18	0.50	15%
		0.0%	0.0%	84.9%	0.0%	0.0%	15.1%	100.0%					

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 = 0.84 <i>i</i> ^{1.302}	C _A = 0.86 <i>i</i> ^{1.276}	C _A = 0.87 <i>i</i> ^{1.232}	C _A = 0.88 <i>i</i> ^{1.124}	C _A = 0.85 <i>i</i> +0.025	C _A = 0.78 <i>i</i> +0.110	C _A = 0.65 <i>i</i> +0.254
B	C _B = 0.84 <i>i</i> ^{1.169}	C _B = 0.86 <i>i</i> ^{1.088}	C _B = 0.81 <i>i</i> +0.057	C _B = 0.63 <i>i</i> +0.249	C _B = 0.56 <i>i</i> +0.328	C _B = 0.47 <i>i</i> +0.426	C _B = 0.37 <i>i</i> +0.536
C/D	C _{C/D} = 0.83 <i>i</i> ^{1.122}	C _{C/D} = 0.82 <i>i</i> +0.035	C _{C/D} = 0.74 <i>i</i> +0.132	C _{C/D} = 0.56 <i>i</i> +0.319	C _{C/D} = 0.49 <i>i</i> +0.393	C _{C/D} = 0.41 <i>i</i> +0.484	C _{C/D} = 0.32 <i>i</i> +0.588

Where:

i = % imperviousness (expressed as a decimal)

C_A = Runoff coefficient for Natural Resources Conservation Service (NRCS) HSG A soils

C_B = Runoff coefficient for NRCS HSG B soils

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



STANDARD FORM SF-2 - DEVELOPED
Time of Concentration

PROJECT NAME: Murata Farms
PROJECT NUMBER: 19032
CALCULATED BY: WPC
CHECKED BY: TJF

DATE: 2/22/2021

SUB-BASIN DATA			INITIAL TIME (T _i)			TRAVEL TIME (T _t)					tc CHECK (URBANIZED BASINS)				FINAL tc		
DESIGN BASIN (1)	AREA Ac (2)	C _s (3)	LENGTH Ft* (4)	SLOPE % (5)	T _i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C _t (9)	Land Surface (10)	VEL fps (11)	T _t Min. (12)	COMP. tc (13)	TOTAL LENGTH (14)	T _{tc} =(18-15t) ⁺ $\frac{L}{60(24+12)S_0^{1/2}}$ (15)	Min.	C10	C100
A1	5.41	0.09	25	2.0%	7.3	1100	1.2%	7.0	Short Pasture/Lawn	0.8	23.9	31.2	1125	16.6	31.2	0.16	0.49
A2	0.75	0.64	10	2.0%	2.1	760	1.8%	20.0	Paved Areas	2.7	4.7	6.8	770	6.9	6.8	0.67	0.78
A3	7.29	0.63	100	4.4%	5.3	390	4.4%	7.0	Short Pasture/Lawn	1.5	4.4	9.7	490	6.9	9.7	0.66	0.78
A4	1.83	0.38	100	2.0%	10.4	570	1.7%	20.0	Paved Areas	2.6	3.6	14.1	670	11.1	14.1	0.44	0.65
A5	2.36	0.47	50	2.0%	6.5	1,050	1.5%	20.0	Paved Areas	2.4	7.1	13.7	1100	9.9	13.7	0.52	0.69
A6	1.54	0.40	60	2.0%	7.9	450	0.8%	20.0	Paved Areas	1.8	4.2	12.1	510	10.8	12.1	0.46	0.66
A7	1.50	0.48	60	2.0%	7.0	380	1.2%	20.0	Paved Areas	2.2	2.9	9.9	440	9.4	9.9	0.53	0.70
A8	3.26	0.44	60	2.0%	7.4	590	1.1%	20.0	Paved Areas	2.1	4.7	12.1	650	10.2	12.1	0.49	0.68
A9	1.15	0.44	60	2.0%	7.4	610	1.8%	20.0	Paved Areas	2.7	3.8	11.2	670	10.1	11.2	0.49	0.68
A10	1.29	0.48	60	2.0%	7.0	640	1.7%	20.0	Paved Areas	2.6	4.1	11.1	700	9.6	11.1	0.53	0.70
A11	1.40	0.48	60	2.0%	7.0	420	0.9%	20.0	Paved Areas	1.9	3.7	10.7	480	9.5	10.7	0.53	0.70
A12	4.35	0.27	20	1.7%	5.7	1,140	1.7%	15.0	Grassed Waterway	2.0	9.7	15.4	1160	13.4	15.4	0.33	0.59
B1	5.13	0.63	80	3.4%	5.1	260	3.4%	20.0	Paved Areas	3.7	1.2	6.3	340	6.8	6.3	0.66	0.78
B2	2.52	0.77	80	2.7%	3.9	260	2.5%	20.0	Paved Areas	3.2	1.4	5.3	340	4.6	5.3	0.79	0.85
B3	1.03	0.55	10	2.0%	2.5	780	2.2%	20.0	Paved Areas	3.0	4.4	6.9	790	8.3	6.9	0.60	0.74
B4	0.60	0.60	10	2.0%	2.3	450	1.3%	20.0	Paved Areas	2.3	3.3	5.6	460	7.4	5.6	0.64	0.77
B5	2.18	0.46	60	2.0%	7.2	1,010	1.5%	20.0	Paved Areas	2.4	6.9	14.1	1070	10.0	14.1	0.51	0.69
B6	1.97	0.44	60	2.0%	7.4	630	1.9%	20.0	Paved Areas	2.8	3.8	11.2	690	10.1	11.2	0.50	0.68
B7	1.96	0.42	60	2.0%	7.7	770	1.2%	20.0	Paved Areas	2.2	5.9	13.5	830	10.6	13.5	0.48	0.67
B8	0.80	0.65	10	2.0%	2.1	840	1.3%	20.0	Paved Areas	2.3	6.1	8.2	850	6.8	8.2	0.68	0.79
B9	3.11	0.38	60	2.0%	8.2	700	1.0%	20.0	Paved Areas	2.0	5.8	14.0	760	11.4	14.0	0.44	0.65
B10	1.89	0.50	60	2.0%	6.8	620	1.1%	20.0	Paved Areas	2.1	4.9	11.7	680	9.3	11.7	0.55	0.71
B11	1.48	0.43	60	2.0%	7.5	330	0.5%	20.0	Paved Areas	1.4	3.9	11.4	390	10.3	11.4	0.49	0.68
B12	1.61	0.44	60	2.0%	7.5	470	1.3%	20.0	Paved Areas	2.3	3.4	10.9	530	10.2	10.9	0.49	0.68
B13	2.90	0.42	60	2.0%	7.6	1,050	1.0%	20.0	Paved Areas	2.0	8.8	16.4	1110	10.7	16.4	0.48	0.67
B14	1.27	0.36	20	2.0%	4.8	60	2.0%	20.0	Paved Areas	2.8	0.4	5.2	80	11.3	5.2	0.42	0.64
C1	1.37	0.41	20	2.0%	4.5	850	3.2%	20.0	Paved Areas	3.6	4.0	8.4	870	10.7	8.4	0.47	0.66
C2	2.92	0.41	20	2.0%	4.5	990	1.2%	20.0	Paved Areas	2.2	7.5	12.0	1010	11.0	12.0	0.46	0.66
C3	2.07	0.48	100	2.0%	9.0	500	0.7%	20.0	Paved Areas	1.7	5.0	14.0	600	9.5	14.0	0.53	0.70
C4	0.32	0.65	10	2.0%	2.1	250	1.7%	20.0	Paved Areas	2.6	1.6	3.7	260	6.5	5.0	0.68	0.79
C5	0.69	0.28	100	2.0%	11.9	250	1.3%	20.0	Paved Areas	2.3	1.8	13.8	350	12.8	13.8	0.35	0.59
C6	2.92	0.10	50	2.0%	10.3	220	1.9%	7.0	Short Pasture/Lawn	1.0	3.8	14.1	270	16.0	14.1	0.17	0.49
D1	0.89	0.50	10	2.0%	2.8	700	0.5%	20.0	Paved Areas	1.4	8.2	11.0	710	9.4	11.0	0.55	0.71
OS-B1	0.97	0.11	20	5.0%	65.0	5	5.0%	7.0	Short Pasture/Lawn	1.6	0.1	65.1	25	15.8	65.1	0.18	0.50
OS-B2	0.49	0.12	20	1.2%	40.0	1	1.2%	7.0	Short Pasture/Lawn	0.8	0.0	40.0	21	15.5	40.0	0.19	0.50

* L = 500' max for non-urban land uses and 300' max for urban land uses

Table RO-2—Conveyance Coefficient, C_v

Type of Land Surface	Conveyance Coefficient, C _v
Heavy meadow	2.5
Tillagefield	5
Short pasture and lawns	7
Nearly bare ground	10
Grassed waterway	15
Paved areas and shallow paved swales	20

$$T_i = \frac{0.395(1.1 - C) L^{1/2}}{S^{1/3}} \quad T_t = \frac{L}{60V} \quad t_c = \frac{L}{180} + 10 \quad V = C_v S_w^{0.5}$$



STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT

PROJECT NAME: Murata Farms
PROJECT NUMBER: 19032
CALCULATED BY: WPC
CHECKED BY: TJF

P₁ (1-Hour Rainfall) = 1.11

DATE: 2/22/2021

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C _S	t _c (min)	C*A(ac)	I (in/hr)	Q (cfs)	t _c (min)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t _t (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	5.41	0.09	31.24	0.50	1.70	0.85													
	A2	A2	0.75	0.64	6.84	0.48	3.44	1.66													
	A3	A3	7.29	0.63	9.70	4.58	3.04	13.93													
	A4	A4	1.83	0.38	14.07	0.70	2.60	1.82													
	A5	A5	2.36	0.47	13.66	1.10	2.63	2.90													
	A6	A6	1.54	0.40	12.06	0.62	2.78	1.72													
	A7	A7	1.50	0.48	9.87	0.72	3.02	2.17													
	A8	A8	3.26	0.44	12.13	1.43	2.77	3.98													
	A9	A9	1.15	0.44	11.23	0.51	2.87	1.45													
	A10	A10	1.29	0.48	11.12	0.61	2.88	1.77													
	A11	A11	1.40	0.48	10.71	0.67	2.92	1.95													
	A12	A12	4.35	0.27	15.44	1.16	2.49	2.89													
	B1	B1	5.13	0.63	6.31	3.23	3.52	11.37													
	B2	B2	2.52	0.77	5.29	1.93	3.71	7.17													
	B3	B3	1.03	0.55	6.89	0.57	3.43	1.96													
	B4	B4	0.60	0.60	5.57	0.36	3.66	1.33													
	B5	B5	2.18	0.46	14.10	1.00	2.59	2.59													
	B6	B6	1.97	0.44	11.21	0.87	2.87	2.51													
	B7	B7	1.96	0.42	13.51	0.82	2.64	2.18													
	B8	B8	0.80	0.65	8.21	0.52	3.23	1.68													
	B9	B9	3.11	0.38	13.99	1.17	2.60	3.05													
	B10	B10	1.89	0.50	11.74	0.94	2.81	2.63													
	B11	B11	1.48	0.43	11.40	0.64	2.85	1.83													
	B12	B12	1.61	0.44	10.91	0.70	2.90	2.04													
	B13	B13	2.90	0.42	16.36	1.23	2.42	2.98													
	B14	B14	1.27	0.36	5.18	0.45	3.73	1.69													
	C1	C1	1.37	0.41	8.45	0.56	3.20	1.80													
	C2	C2	2.92	0.41	12.04	1.19	2.78	3.31													
	C3	C3	2.07	0.48	13.98	1.00	2.60	2.59													
	C4	C4	0.32	0.65	5.00	0.21	3.76	0.78													
	C5	C5	0.69	0.28	13.76	0.19	2.62	0.51													
	C6	C6	2.92	0.10	14.11	0.29	2.59	0.74													
	D1	D1	0.89	0.50	11.01	0.45	2.89	1.29													
	OS-B1	OS-B1	0.97	0.11	65.05	0.10	1.06	0.11													
	OS-B2	OS-B2	0.49	0.12	40.03	0.06	1.46	0.09													
Total at Design Point A2 (A1 & A2)	A1								31.2	0.98	1.70	1.7									
Total at Design Point A4 (A4, A6)	A4								14.1	1.32	2.60	3.4									



STANDARD FORM SF-3 - DEVELOPED
STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Murata Farms
PROJECT NUMBER: 19032
CALCULATED BY: WPC
CHECKED BY: TJF

P₁ (1-Hour Rainfall) = 2.71

DATE: 2/22/2021

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF C ₁₀₀	t _c (min)	C*A(ac)	I (in/hr)	Q (cfs)	t _c (min)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs)	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY (fps)	t (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	A1	A1	5.41	0.49	31.24	2.63	4.15	10.9													
	A2	A2	0.75	0.78	6.84	0.59	8.39	5.0													
	A3	A3	7.29	0.78	9.70	5.68	7.42	42.1													
	A4	A4	1.83	0.65	14.07	1.19	6.34	7.5													
	A5	A5	2.36	0.69	13.66	1.64	6.42	10.5													
	A6	A6	1.54	0.66	12.06	1.02	6.79	6.9													
	A7	A7	1.50	0.70	9.87	1.05	7.37	7.8													
	A8	A8	3.26	0.68	12.13	2.22	6.77	15.0													
	A9	A9	1.15	0.68	11.23	0.78	7.00	5.5													
	A10	A10	1.29	0.70	11.12	0.90	7.02	6.3													
	A11	A11	1.40	0.70	10.71	0.98	7.13	7.0													
	A12	A12	4.35	0.59	15.44	2.55	6.07	15.5													
	B1	B1	5.13	0.78	6.31	3.99	8.61	34.4													
	B2	B2	2.52	0.85	5.29	2.14	9.05	19.4													
	B3	B3	1.03	0.74	6.89	0.76	8.37	6.4													
	B4	B4	0.60	0.77	5.57	0.46	8.93	4.1													
	B5	B5	2.18	0.69	14.10	1.50	6.33	9.5													
	B6	B6	1.97	0.68	11.21	1.34	7.00	9.4													
	B7	B7	1.96	0.67	13.51	1.31	6.46	8.5													
	B8	B8	0.80	0.79	8.21	0.63	7.89	5.0													
	B9	B9	3.11	0.65	13.99	2.01	6.36	12.8													
	B10	B10	1.89	0.71	11.74	1.34	6.87	9.2													
	B11	B11	1.48	0.68	11.40	1.00	6.95	7.0													
	B12	B12	1.61	0.68	10.91	1.09	7.08	7.7													
	B13	B13	2.90	0.67	16.36	1.95	5.90	11.5													
	B14	B14	1.27	0.64	5.18	0.81	9.10	7.4													
	C1	C1	1.37	0.66	8.45	0.91	7.81	7.1													
	C2	C2	2.92	0.66	12.04	1.93	6.79	13.1													
	C3	C3	2.07	0.70	13.98	1.45	6.36	9.2													
	C4	C4	0.32	0.79	5.00	0.25	9.19	2.3													
	C5	C5	0.69	0.59	13.76	0.41	6.40	2.6													
	C6	C6	2.92	0.49	14.11	1.43	6.33	9.1													
	D1	D1	0.89	0.71	11.01	0.63	7.05	4.5													
	OS-B1	OS-B1	0.97	0.50	65.05	0.48	2.59	1.2													
	OS-B2	OS-B2	0.49	0.50	40.03	0.25	3.57	0.9													
Total at Design Point A2 (A2 & A3)	A2								31.2	3.22	4.15	13.4									
INLET A6 (Basin A2, A6)									11.1	6.58	7.02	46.2									

Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
A1	5.41	0.08	0.49	13%	0.9	10.9
A2	0.75	0.61	0.78	76%	1.7	5.0
A3	7.29	0.60	0.78	75%	13.9	42.1
A4	1.83	0.35	0.65	48%	1.8	7.5
A5	2.36	0.44	0.69	57%	2.9	10.5
A6	1.54	0.37	0.66	50%	1.7	6.9
A7	1.50	0.45	0.70	59%	2.2	7.8
A8	3.26	0.41	0.68	54%	4.0	15.0
A9	1.15	0.41	0.68	54%	1.5	5.5
A10	1.29	0.45	0.70	58%	1.8	6.3
A11	1.40	0.45	0.70	58%	2.0	7.0
A12	4.35	0.24	0.59	34%	2.9	15.5
Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
B1	5.13	0.60	0.78	75%	11.4	34.4
B2	2.52	0.74	0.85	90%	7.2	19.4
B3	1.03	0.52	0.74	67%	2.0	6.4
B4	0.60	0.58	0.77	72%	1.3	4.1
B5	2.18	0.43	0.69	56%	2.6	9.5
B6	1.97	0.41	0.68	54%	2.5	9.4
B7	1.96	0.39	0.67	52%	2.2	8.5
B8	0.80	0.62	0.79	77%	1.7	5.0
B9	3.11	0.35	0.65	47%	3.0	12.8
B10	1.89	0.46	0.71	60%	2.6	9.2
B11	1.48	0.40	0.68	53%	1.8	7.0
B12	1.61	0.41	0.68	54%	2.0	7.7
B13	2.90	0.39	0.67	52%	3.0	11.5
B14	1.27	0.33	0.64	45%	1.7	7.4
Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
C1	1.37	0.38	0.66	51%	1.8	7.1
C2	2.92	0.38	0.66	50%	3.3	13.1
C3	2.07	0.45	0.70	59%	2.6	9.2
C4	0.32	0.62	0.79	77%	0.8	2.3
C5	0.69	0.25	0.59	36%	0.5	2.6
C6	2.92	0.08	0.49	14%	0.7	9.1
D1	0.89	0.47	0.71	61%	1.1	4.5
OS-B1	0.97	0.09	0.50	15%	0.1	1.2
OS-B2	0.49	0.10	0.50	16%	0.1	0.9

Appendix C - Hydraulic Calculations

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

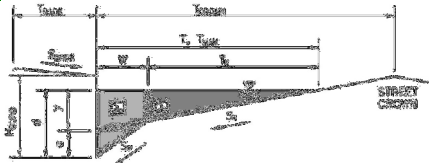
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A2

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 18.5$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.5$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

	Minor Storm	Major Storm	
$d_{MAX} =$	6.0	8.0	inches

Check boxes are not applicable in SUMP conditions

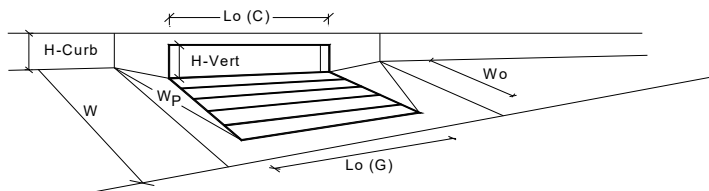
☐☐**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		$a_{local} =$	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		$L_o (G) =$	N/A	N/A	feet
Width of a Unit Grate		$W_o =$	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		$A_{ratio} =$	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		$C_r (G) =$	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		$C_w (G) =$	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		$C_o (G) =$	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		$L_o (C) =$	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		$H_{vert} =$	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		$H_{throat} =$	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		$W_p =$	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		$C_r (C) =$	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		$C_w (C) =$	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		$C_o (C) =$	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		$d_{Grate} =$	N/A	N/A	ft
Depth for Curb Opening Weir Equation		$d_{Curb} =$	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		$RF_{Combination} =$	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		$RF_{Curb} =$	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		$RF_{Grate} =$	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		$Q_a =$	10.5	19.3	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		$Q_{PEAK REQUIRED} =$	2.8	15.9	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

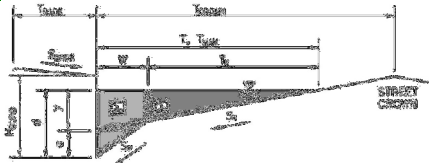
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A4

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.008$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	3.7	15.1	cfs

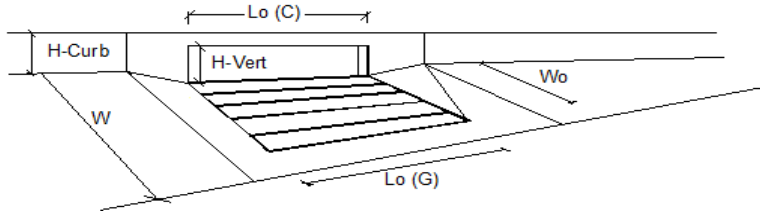
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_{r-G} =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_{r-C} =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.7	3.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.1	4.0	cfs
Capture Percentage = Q_i/Q_o =		C% =	94	47	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

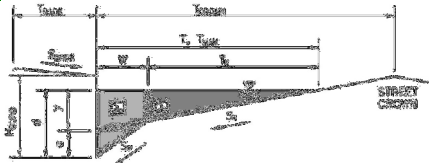
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A5

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.008$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	3.7	15.1	cfs

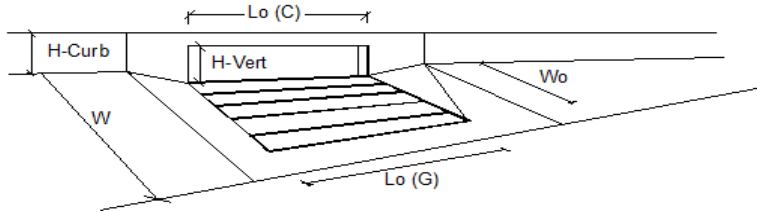
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	2.9	7.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	3.0	cfs
Capture Percentage = Q_i/Q_o =		C% =	100	71	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

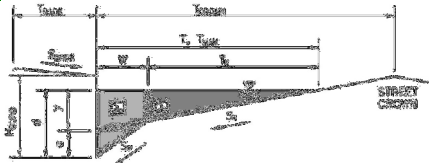
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A6

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

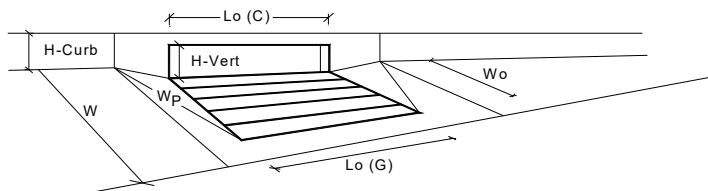
**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

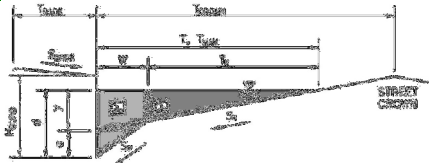


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	5.00	5.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a =	10.5	20.4	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} =	1.8	10.9	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: _____
 Inlet ID: _____
 Enter Your Project Name Here
 Inlet A7

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK} = 7.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 18.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.000$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches
	☐	☐	

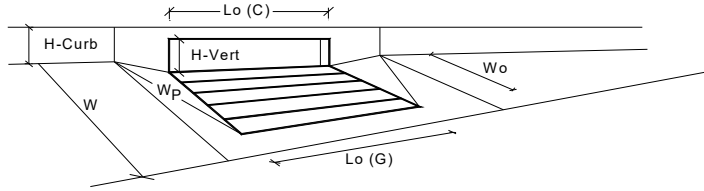
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Warning 1

Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} = 5.00	5.00	inches	
Number of Unit Inlets (Grate or Curb Opening)		No = 2	2		
Water Depth at Flowline (outside of local depression)		Ponding Depth = 6.0	8.0	inches	
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) = N/A	N/A	feet	
Width of a Unit Grate		W _o = N/A	N/A	feet	
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} = N/A	N/A		
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) = N/A	N/A		
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) = N/A	N/A		
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) = N/A	N/A		
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _o (C) = 5.00	5.00	feet	
Height of Vertical Curb Opening in Inches		H _{vert} = 6.00	6.00	inches	
Height of Curb Orifice Throat in Inches		H _{throat} = 6.00	6.00	inches	
Angle of Throat (see USDCM Figure ST-5)		Theta = 63.40	63.40	degrees	
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p = 2.00	2.00	feet	
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) = 0.10	0.10		
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) = 3.60	3.60		
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) = 0.67	0.67		
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} = N/A	N/A	ft	
Depth for Curb Opening Weir Equation		d _{Curb} = 0.33	0.50	ft	
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} = 0.57	0.75		
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} = 0.93	1.00		
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} = N/A	N/A		
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a = 10.5	20.4	cfs	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} = 2.2	18.7	cfs	

Warning 1: Dimension entered is not a typical dimension for inlet type specified.

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

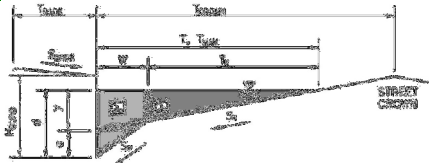
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A8

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.010$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	4.2	16.8	cfs

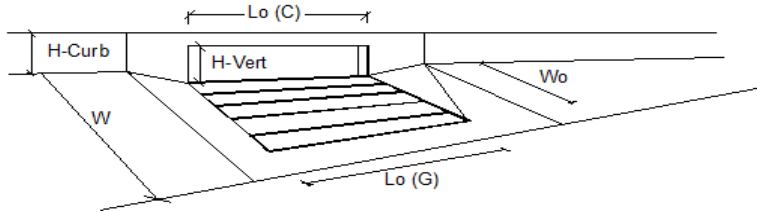
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_{r-G} =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_{r-C} =	0.10	0.10	
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MAJOR STORM					
Total Inlet Interception Capacity		Q =	4.0	9.5	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	7.9	cfs
Capture Percentage = Q_i/Q_o =		C% =	100	55	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

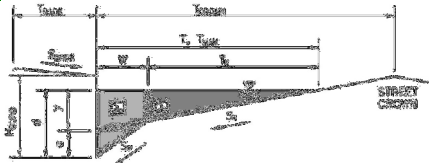
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A9

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.010$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	4.2	16.8	cfs

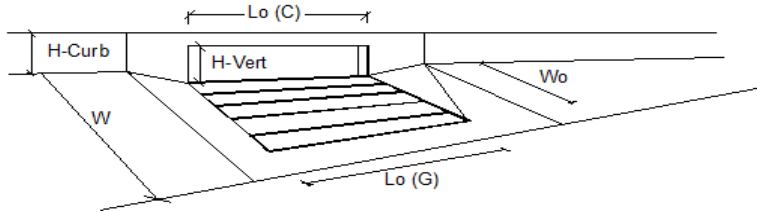
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_{r-G} =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_{r-C} =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.5	3.1	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	2.4	cfs
Capture Percentage = Q_i/Q_o =		C% =	98	57	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

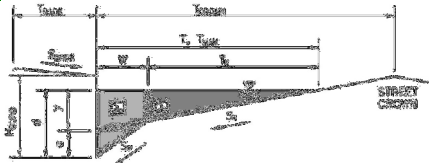
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet A10

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.010$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	4.2	16.8	cfs

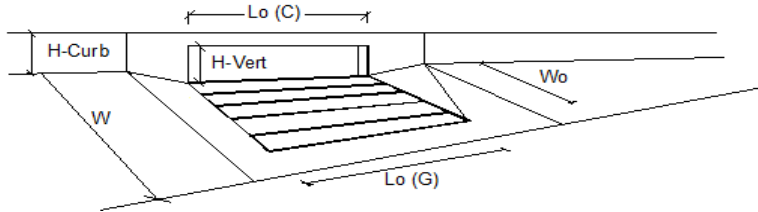
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018

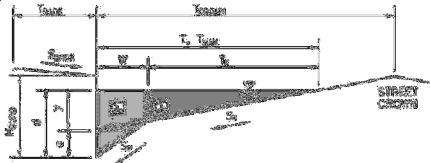


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.7	3.3	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.1	3.0	cfs
Capture Percentage = Q_i/Q_o =		C% =	94	53	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: _____
 Inlet ID: _____
 Enter Your Project Name Here
 Inlet A11

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK} = 7.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB} = 4.00$ inches
 $T_{CROWN} = 18.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.000$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches
	☐	☐	

MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

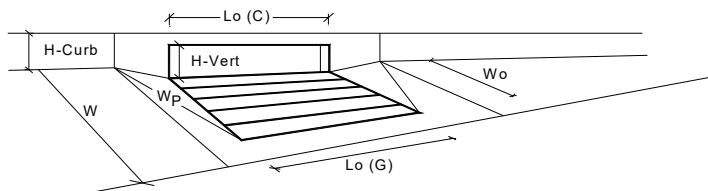
$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

Warning 02

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} = 5.00	5.00	inches	
Number of Unit Inlets (Grate or Curb Opening)		No = 2	2		
Water Depth at Flowline (outside of local depression)		Ponding Depth = 6.0	8.0	inches	
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) = N/A	N/A	feet	
Width of a Unit Grate		W _o = N/A	N/A	feet	
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} = N/A	N/A		
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) = N/A	N/A		
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) = N/A	N/A		
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) = N/A	N/A		
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _o (C) = 5.00	5.00	feet	
Height of Vertical Curb Opening in Inches		H _{vert} = 6.00	6.00	inches	
Height of Curb Orifice Throat in Inches		H _{throat} = 6.00	6.00	inches	
Angle of Throat (see USDCM Figure ST-5)		Theta = 63.40	63.40	degrees	
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p = 2.00	2.00	feet	
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) = 0.10	0.10		
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) = 3.60	3.60		
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) = 0.67	0.67		
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} = N/A	N/A	ft	
Depth for Curb Opening Weir Equation		d _{Curb} = 0.33	0.50	ft	
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} = 0.57	0.75		
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} = 0.93	1.00		
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} = N/A	N/A		
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a = 10.5	20.4	cfs	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} = 2.1	10.0	cfs	

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

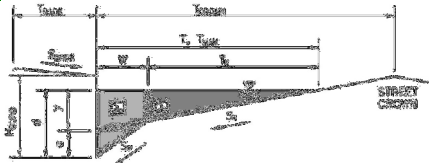
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet C3

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 24.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	16.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

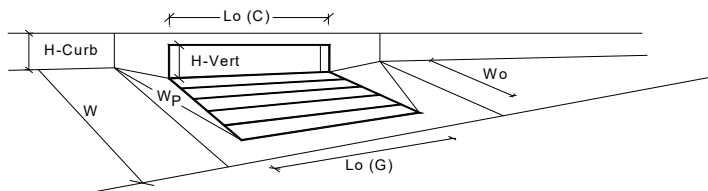
**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a =	10.5	19.3	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} =	4.4	16.3	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

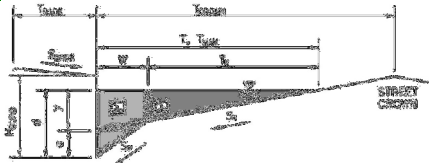
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet C5

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 24.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

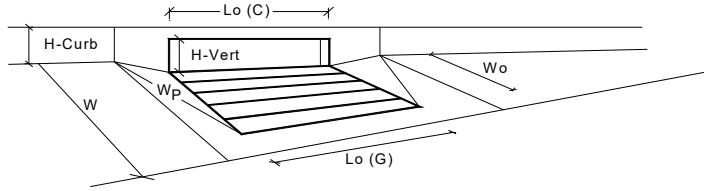
**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	3	3	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☒ Override Depths
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L _o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.79	0.89	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)			MINOR	MAJOR	
		Q _a =	13.5	27.9	cfs
		Q _{PEAK REQUIRED} =	#VALUE!	#VALUE!	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

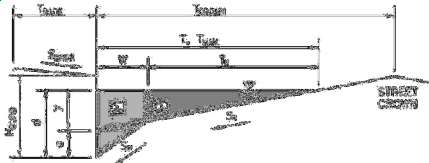
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet C4

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 18.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

	Minor Storm	Major Storm	
$d_{MAX} =$	6.0	8.0	inches

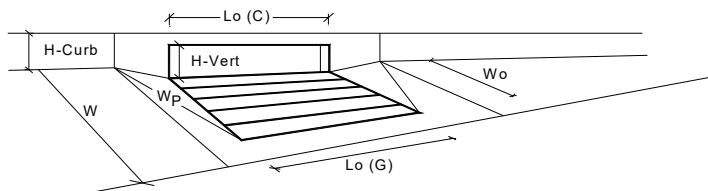
Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion****MAJOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

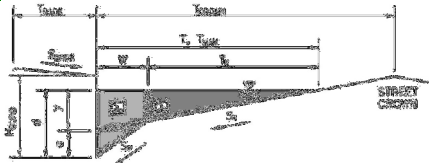


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a =	10.5	19.3	cfs
	#VALUE!	Q _{PEAK REQUIRED} =	#VALUE!	#VALUE!	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: _____
 Inlet ID: _____
 Enter Your Project Name Here
 Inlet C2

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK} = 18.5$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 18.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.000$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	16.0	ft
$d_{MAX} =$	6.0	8.0	inches
	☐	☐	

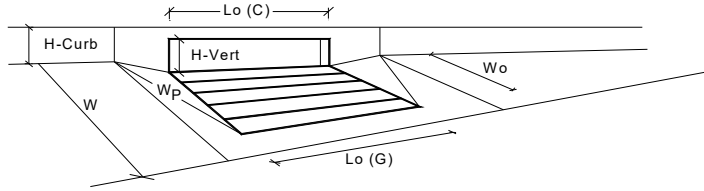
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☒ Override Depths
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L _c (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)			MINOR	MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _a =	10.5	19.3	cfs
		Q _{PEAK REQUIRED} =	3.3	13.1	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

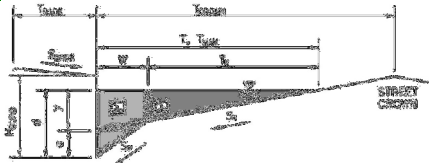
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B3

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 18.5$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.015$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Spread Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	7.1	18.9	cfs

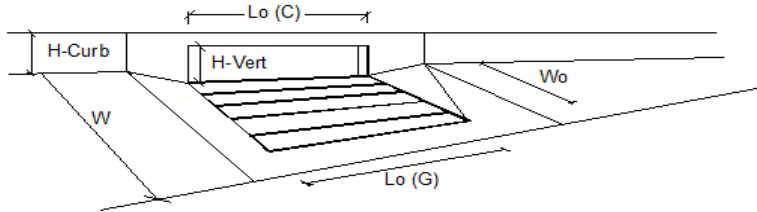
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	3.0	3.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.7	3.0	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.3	3.4	cfs
Capture Percentage = Q_i/Q_o =		C% =	84	47	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

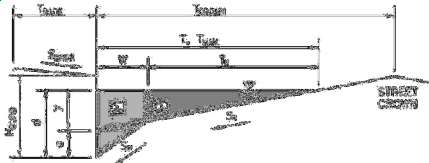
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B4

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 18.5$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

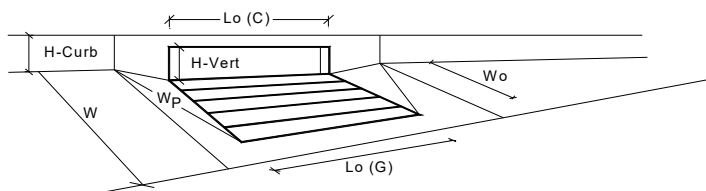
**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	1	1	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☒ Override Depths
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L _o (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.77	1.00	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	1.00	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)			MINOR	MAJOR	
		Q _a =	5.4	9.3	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} =	1.6	7.5	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

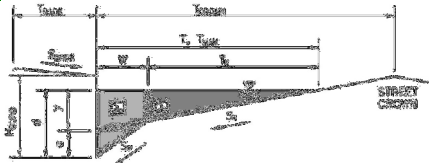
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B8

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.008$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	3.7	15.1	cfs

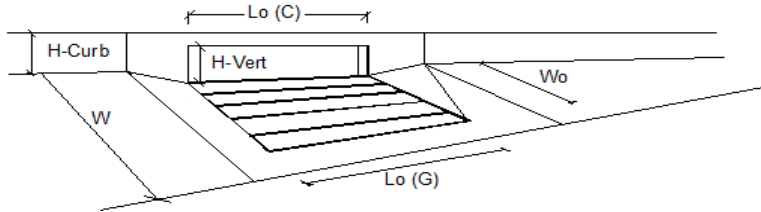
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018

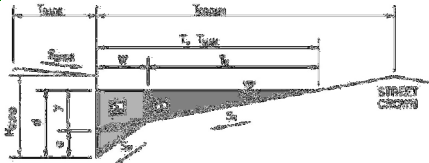


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.6	3.0	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.1	2.0	cfs
Capture Percentage = Q_i/Q_o =		C% =	95	60	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: _____
 Inlet ID: _____
 Enter Your Project Name Here
 Inlet B10

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK} = 7.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB} = 4.00$ inches
 $T_{CROWN} = 18.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.008$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Allow Flow Depth at Street Crown (leave blank for no)

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches
	☐	☐	check = yes

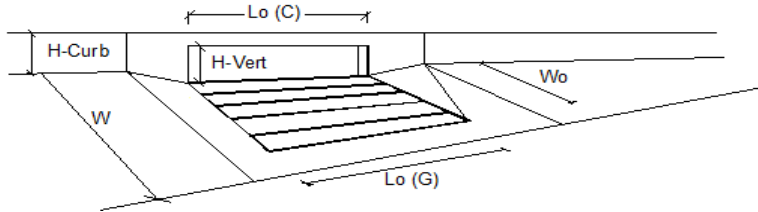
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Spread Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	3.7	15.1	cfs

WARNING: MINOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'
WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_{r-G} =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_{r-C} =	0.10	0.10	
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MINOR & MAJOR STORM					
Total Inlet Interception Capacity		Q =	5.3	10.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.4	13.3	cfs
Capture Percentage = Q_i/Q_o =		C% =	93	45	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

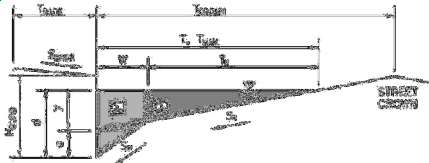
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B12

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.005$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	2.9	11.9	cfs

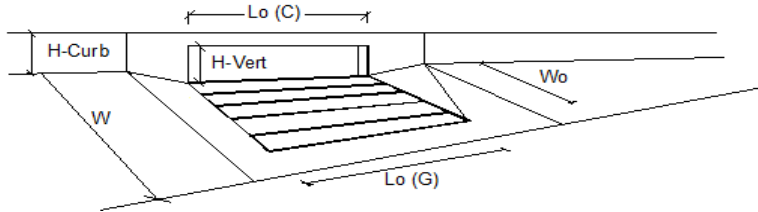
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: WARNING: Q > ALLOWABLE Q FOR MAJOR STORM					
Total Inlet Interception Capacity		Q =	2.4	10.7	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	13.7	cfs
Capture Percentage = Q_i/Q_o =		C% =	100	44	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

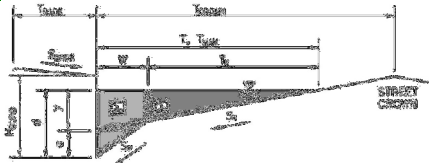
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B11

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.095$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	12.8	13.9	cfs

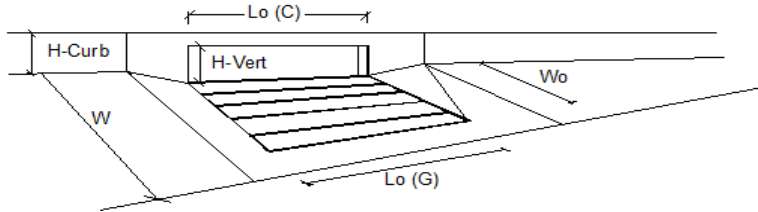
MAJOR STORM Allowable Capacity is based on Depth Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	1	1	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_r-G =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_r-C =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	1.8	3.8	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.2	3.9	cfs
Capture Percentage = Q_i/Q_o =		C% =	90	49	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

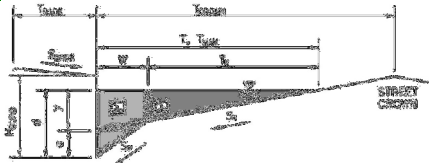
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B7

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 4.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.005$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	4.0	6.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Allow Flow Depth at Street Crown (leave blank for no)

☐ ☐ check = yes
MINOR STORM Allowable Capacity is based on Depth Criterion

	Minor Storm	Major Storm	
$Q_{allow} =$	2.9	11.9	cfs

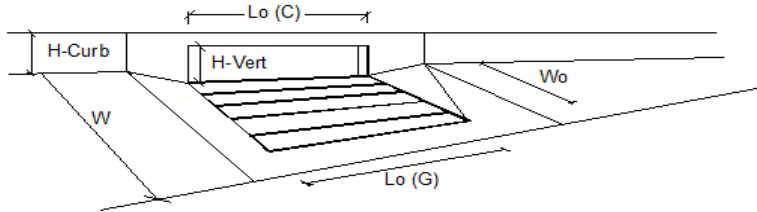
MAJOR STORM Allowable Capacity is based on Spread Criterion

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

INLET ON A CONTINUOUS GRADE

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a')		a_{LOCAL} =	5.0	5.0	inches
Total Number of Units in the Inlet (Grate or Curb Opening)		N_o =	2	2	
Length of a Single Unit Inlet (Grate or Curb Opening)		L_o =	5.00	5.00	ft
Width of a Unit Grate (cannot be greater than W, Gutter Width)		W_o =	N/A	N/A	ft
Clogging Factor for a Single Unit Grate (typical min. value = 0.5)		C_{r-G} =	N/A	N/A	
Clogging Factor for a Single Unit Curb Opening (typical min. value = 0.1)		C_{r-C} =	0.10	0.10	
Street Hydraulics: OK - Q < Allowable Street Capacity					
Total Inlet Interception Capacity		Q =	2.2	6.6	cfs
Total Inlet Carry-Over Flow (flow bypassing inlet)		Q_b =	0.0	1.9	cfs
Capture Percentage = Q_i/Q_o =		C% =	100	78	%

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

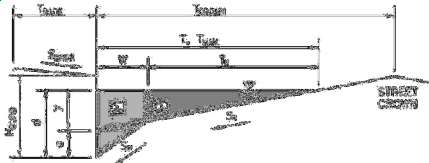
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B6

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

Check boxes are not applicable in SUMP conditions

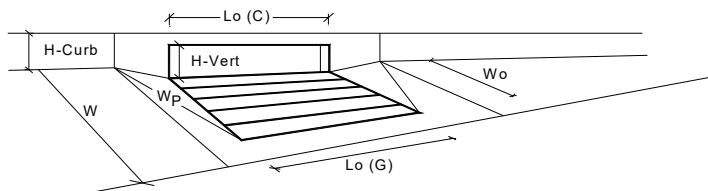
**MINOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

MAJOR STORM Allowable Capacity is based on Depth Criterion

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	3	3	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _c (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.79	0.89	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a =	13.5	27.9	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} =	2.5	25.0	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

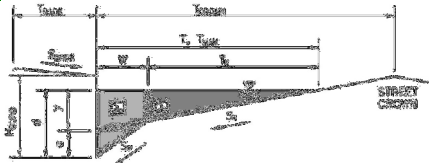
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet B13

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 7.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.020$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 18.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

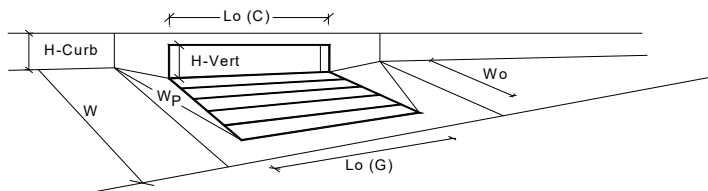
Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion****MAJOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018

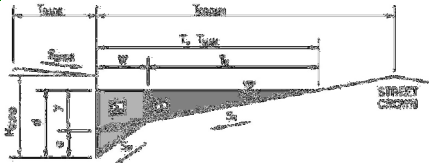


Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	CDOT Type R Curb Opening			
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information		MINOR		MAJOR	
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information		MINOR		MAJOR	
Length of a Unit Curb Opening		L _c (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)		MINOR		MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)		MINOR		MAJOR	
		Q _a =	10.5	19.3	cfs
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _{PEAK REQUIRED} =	3.0	11.5	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: _____
 Inlet ID: _____ Enter Your Project Name Here
 Inlet B5

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb
 Side Slope Behind Curb (leave blank for no conveyance credit behind curb)
 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

$T_{BACK} = 7.0$ ft
 $S_{BACK} = 0.020$ ft/ft
 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line
 Distance from Curb Face to Street Crown
 Gutter Width
 Street Transverse Slope
 Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)
 Street Longitudinal Slope - Enter 0 for sump condition
 Manning's Roughness for Street Section (typically between 0.012 and 0.020)

$H_{CURB} = 6.00$ inches
 $T_{CROWN} = 18.0$ ft
 $W = 2.00$ ft
 $S_X = 0.020$ ft/ft
 $S_W = 0.083$ ft/ft
 $S_O = 0.000$ ft/ft
 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm
 Max. Allowable Depth at Gutter Flowline for Minor & Major Storm
 Check boxes are not applicable in SUMP conditions

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches
	☐	☐	

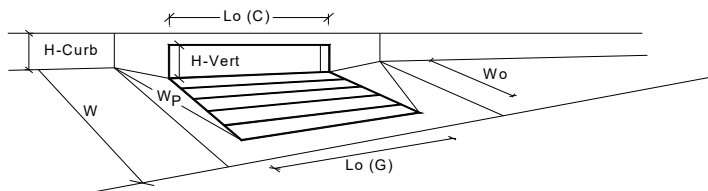
MINOR STORM Allowable Capacity is based on Depth Criterion
MAJOR STORM Allowable Capacity is based on Depth Criterion

$Q_{allow} =$

Minor Storm	Major Storm	
SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)		MINOR		MAJOR	
Type of Inlet	CDOT Type R Curb Opening	Type =	CDOT Type R Curb Opening		
Local Depression (additional to continuous gutter depression 'a' from above)		a _{local} =	3.00	3.00	inches
Number of Unit Inlets (Grate or Curb Opening)		No =	2	2	
Water Depth at Flowline (outside of local depression)		Ponding Depth =	6.0	8.0	inches
Grate Information			MINOR	MAJOR	☒ Override Depths
Length of a Unit Grate		L _g (G) =	N/A	N/A	feet
Width of a Unit Grate		W _o =	N/A	N/A	feet
Area Opening Ratio for a Grate (typical values 0.15-0.90)		A _{ratio} =	N/A	N/A	
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)		C _r (G) =	N/A	N/A	
Grate Weir Coefficient (typical value 2.15 - 3.60)		C _w (G) =	N/A	N/A	
Grate Orifice Coefficient (typical value 0.60 - 0.80)		C _o (G) =	N/A	N/A	
Curb Opening Information			MINOR	MAJOR	
Length of a Unit Curb Opening		L _c (C) =	5.00	5.00	feet
Height of Vertical Curb Opening in Inches		H _{vert} =	6.00	6.00	inches
Height of Curb Orifice Throat in Inches		H _{throat} =	6.00	6.00	inches
Angle of Throat (see USDCM Figure ST-5)		Theta =	63.40	63.40	degrees
Side Width for Depression Pan (typically the gutter width of 2 feet)		W _p =	2.00	2.00	feet
Clogging Factor for a Single Curb Opening (typical value 0.10)		C _r (C) =	0.10	0.10	
Curb Opening Weir Coefficient (typical value 2.3-3.7)		C _w (C) =	3.60	3.60	
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)		C _o (C) =	0.67	0.67	
Low Head Performance Reduction (Calculated)			MINOR	MAJOR	
Depth for Grate Midwidth		d _{Grate} =	N/A	N/A	ft
Depth for Curb Opening Weir Equation		d _{Curb} =	0.33	0.50	ft
Combination Inlet Performance Reduction Factor for Long Inlets		RF _{Combination} =	0.57	0.75	
Curb Opening Performance Reduction Factor for Long Inlets		RF _{Curb} =	0.93	1.00	
Grated Inlet Performance Reduction Factor for Long Inlets		RF _{Grate} =	N/A	N/A	
Total Inlet Interception Capacity (assumes clogged condition)			MINOR	MAJOR	
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)		Q _a =	10.5	19.3	cfs
		Q _{PEAK REQUIRED} =	2.6	9.5	cfs

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

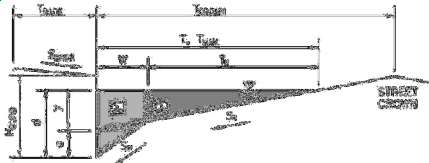
(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project:

Enter Your Project Name Here

Inlet ID:

Inlet D1

**Gutter Geometry (Enter data in the blue cells)**

Maximum Allowable Width for Spread Behind Curb

 $T_{BACK} = 33.0$ ft

Side Slope Behind Curb (leave blank for no conveyance credit behind curb)

 $S_{BACK} = 0.010$ ft/ft

Manning's Roughness Behind Curb (typically between 0.012 and 0.020)

 $n_{BACK} = 0.013$

Height of Curb at Gutter Flow Line

 $H_{CURB} = 6.00$ inches

Distance from Curb Face to Street Crown

 $T_{CROWN} = 24.0$ ft

Gutter Width

 $W = 2.00$ ft

Street Transverse Slope

 $S_X = 0.020$ ft/ft

Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)

 $S_W = 0.083$ ft/ft

Street Longitudinal Slope - Enter 0 for sump condition

 $S_O = 0.000$ ft/ft

Manning's Roughness for Street Section (typically between 0.012 and 0.020)

 $n_{STREET} = 0.013$

Max. Allowable Spread for Minor & Major Storm

	Minor Storm	Major Storm	
$T_{MAX} =$	12.0	18.0	ft
$d_{MAX} =$	6.0	8.0	inches

Max. Allowable Depth at Gutter Flowline for Minor & Major Storm

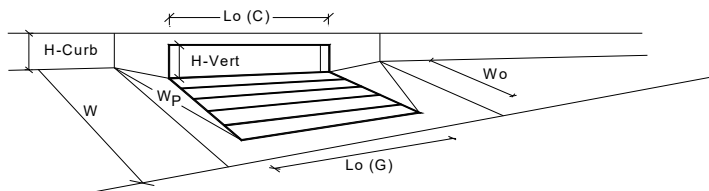
Check boxes are not applicable in SUMP conditions

**MINOR STORM Allowable Capacity is based on Depth Criterion****MAJOR STORM Allowable Capacity is based on Depth Criterion**

	Minor Storm	Major Storm	
$Q_{allow} =$	SUMP	SUMP	cfs

INLET IN A SUMP OR SAG LOCATION

Version 4.06 Released August 2018



Design Information (Input)

Type of Inlet
Local Depression (additional to continuous gutter depression 'a' from above)
Number of Unit Inlets (Grate or Curb Opening)
Water Depth at Flowline (outside of local depression)

Grate Information

Length of a Unit Grate
Width of a Unit Grate
Area Opening Ratio for a Grate (typical values 0.15-0.90)
Clogging Factor for a Single Grate (typical value 0.50 - 0.70)
Grate Weir Coefficient (typical value 2.15 - 3.60)
Grate Orifice Coefficient (typical value 0.60 - 0.80)

Curb Opening Information

Length of a Unit Curb Opening
Height of Vertical Curb Opening in Inches
Height of Curb Orifice Throat in Inches
Angle of Throat (see USDCM Figure ST-5)
Side Width for Depression Pan (typically the gutter width of 2 feet)
Clogging Factor for a Single Curb Opening (typical value 0.10)
Curb Opening Weir Coefficient (typical value 2.3-3.7)
Curb Opening Orifice Coefficient (typical value 0.60 - 0.70)

Low Head Performance Reduction (Calculated)

Depth for Grate Midwidth
Depth for Curb Opening Weir Equation
Combination Inlet Performance Reduction Factor for Long Inlets
Curb Opening Performance Reduction Factor for Long Inlets
Grated Inlet Performance Reduction Factor for Long Inlets

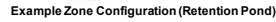
Total Inlet Interception Capacity (assumes clogged condition)

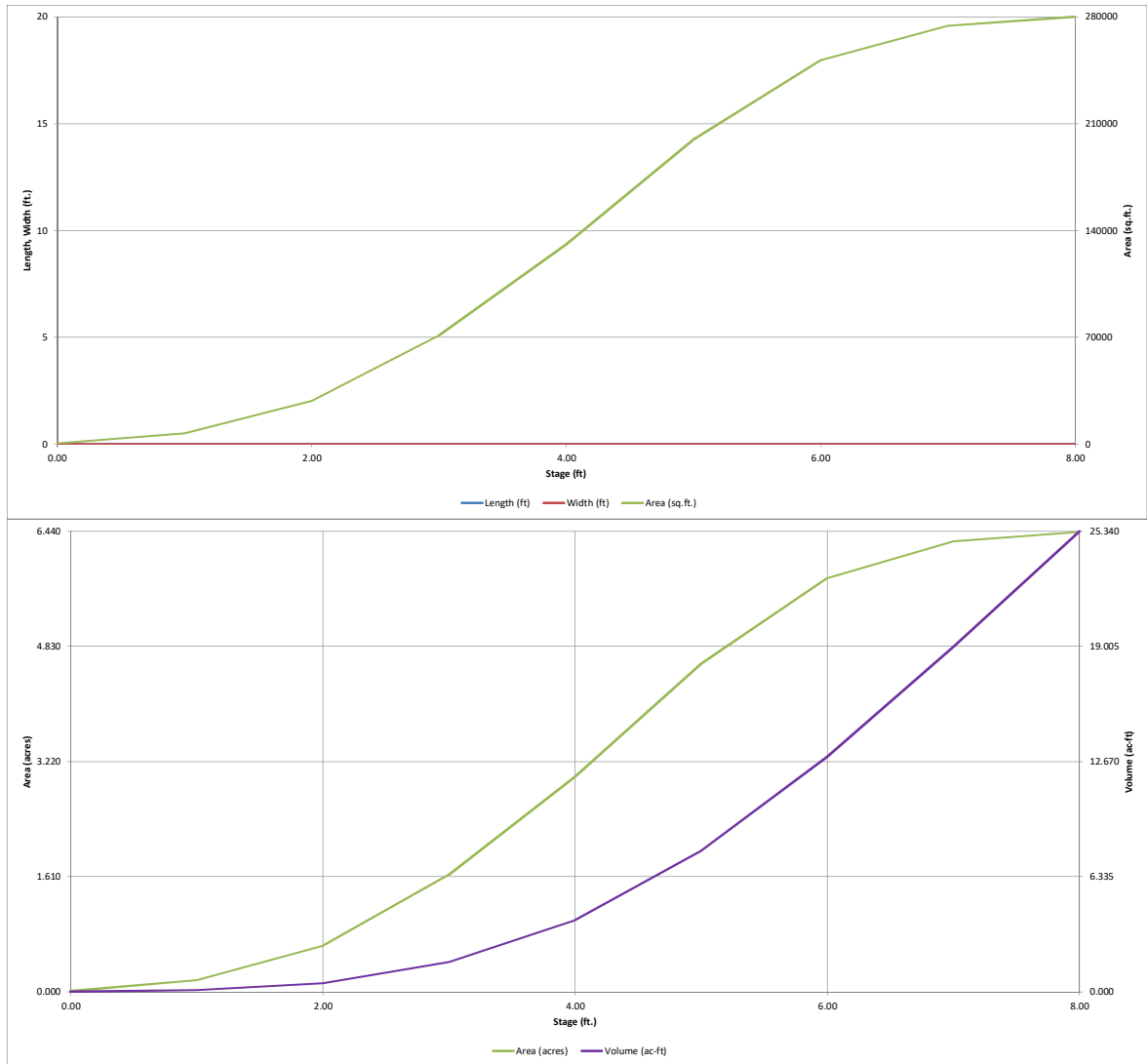
Inlet Capacity IS GOOD for Minor and Major Storms(>Q PEAK)

	MINOR	MAJOR	
Type =	CDOT Type R Curb Opening		
a_{local} =	3.00	3.00	inches
No =	1	1	
Ponding Depth =	6.0	8.0	inches
	MINOR	MAJOR	☒ Override Depths
$L_o (G)$ =	N/A	N/A	feet
W_o =	N/A	N/A	feet
A_{ratio} =	N/A	N/A	
$C_r (G)$ =	N/A	N/A	
$C_w (G)$ =	N/A	N/A	
$C_o (G)$ =	N/A	N/A	
	MINOR	MAJOR	
$L_o (C)$ =	5.00	5.00	feet
H_{vert} =	6.00	6.00	inches
H_{throat} =	6.00	6.00	inches
Theta =	63.40	63.40	degrees
W_p =	2.00	2.00	feet
$C_r (C)$ =	0.10	0.10	
$C_w (C)$ =	3.60	3.60	
$C_o (C)$ =	0.67	0.67	
	MINOR	MAJOR	
d_{Grate} =	N/A	N/A	ft
d_{Curb} =	0.33	0.50	ft
$RF_{Combination}$ =	0.77	1.00	
RF_{Curb} =	1.00	1.00	
RF_{Grate} =	N/A	N/A	
	MINOR	MAJOR	
Q_a =	5.4	9.3	cfs
$Q_{PEAK REQUIRED}$ =	1.1	4.5	cfs

MHFD-Detention, Version 4.03 (May 2020)

Basin ID:

[illegible]



Appendix D - Reference Documents

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45
RESIDENTIAL LOTS
FINAL DRAINAGE REPORT
Page 1 of 12

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/-
45 RESIDENTIAL LOTS
FINAL DRAINAGE REPORT

JUNE 2016

For:

**Rokeh Consulting, LLC
89 King Road
Chichester, NH 03258**

**Contact: Jon Rokeh, P.E.
Phone: 603.387.8688
jon@rokehconsulting.com**

Prepared By:

**Calibre Engineering, Inc.
9090 S. Ridgeline Blvd. Suite 105
Highlands Ranch, CO 80129**

**Contact: Russell L Burrows, P.E.
Phone: 303.339.5392
RBurrows@calibre-engineering.com**

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45 RESIDENTIAL LOTS FINAL DRAINAGE REPORT

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APPENDICIES

- A. Maps and Exhibits
- B. Hydrologic Computations
- C. Hydraulic Computations
- D. Referenced Criteria

SCOPE

The purpose of this report is to determine the drainage infrastructure for the proposed project with +/- 45 Residential Lots and the detailed concept for the portion of the site which is being developed in Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots. The scope of this report is limited to hydrologic and hydraulic calculations for the major tributary basins, on-site detention pond, on-site infrastructure for Filing No. 1 and a bypass channel for off-site flows which drain to and through the site along the north property line. The infrastructure within Filing No. 1 was sized to convey flows from the ultimate buildout condition for the Mountain Sky subdivision.

1.0 GENERAL LOCATION AND DESCRIPTION

1.1 Location

The project is located as follows:

- Within the southwest quarter of Section 4, Township 1 North, Range 66 West of the 6th Principal Meridian
- Adjacent to the southern and eastern perimeter of Fort Lupton's city limits
- North of Weld CR 12
- South of undeveloped land located south of State Highway 52
- East of Shortline Ditch (runoff from this site currently enters the ditch)
- West of CR 29 ½
- West of an existing levee which passes under W CR 12 and SH 52
- North and west of a single family home, south of a single family home and southeast of a housing sub-division
- See Vicinity Map located in Appendix A

1.2 Description of Property

The following are characteristics of the site:

- As currently platted, the parcel consists of 76.95 acres
- Anadarko will utilize 15.75 acres of the parcel for future oil/gas development which includes 1.25 acres of W CR12 and W CR 29 roads adjacent to the Anadarko Parcel
- Mountain Sky Subdivision proposes to utilize the remaining 61.2 acres of the parcel

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45 RESIDENTIAL LOTS FINAL DRAINAGE REPORT

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- Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots will develop approximately 22 acres including an on-site detention/ water quality pond and a channel to bypass upstream offsite flows
- Site is existing farm land
- Site drains east to the west with existing ground slopes ranging between 1% and 4%
- Site contains soils predominantly in Hydrologic Group B, Sandy Plains (see Soils Map located in Appendix A)
- Roadside drainage ditches are located on the south side of the site adjacent to WCR 12
- An oil and gas well site located along the north property line
- The proposed land use for the site is primarily single family residential
- The project includes the development of land, roadways, parks and utilities within the site, as well as the construction of a drainage system which will include detention and water quality facilities to meet the City of Fort Lupton's onsite drainage requirements
- A Natural Resources Assessment was completed by ERO Resources Corporation on September 30, 2014 which stated ditches and wetland vegetation are potential waters of the U.S. but "because the ditches do not have a surface connection to a known water of the U.S., it is unlikely the Corps would take jurisdiction over the ditches; however, the Corp must make that determination."

2.0 DRAINAGE BASINS AND SUB-BASINS

2.1 Major Basin Description

- The project falls within the study area of the Master Drainage Plan of:
 - a) the *City of Fort Lupton Water, Wastewater and Storm Drainage Master Plan, Section 6 Storm Drainage System*
 - b) the *DRAFT copy of the City of Fort Lupton Comprehensive Plan* prepared by Clear Water Solutions, Inc.
- Storm runoff from the tributary basins generally flows east to west across the subject site
- Site runoff is ultimately conveyed to South Platte River via downstream ditches, streets, and storm sewer conveyance facilities

2.2 Sub-Basin Description

- According to the *Storm Drainage Master Plan*, the project site is located in the South Drainage Basin which included portions of sections 3, 4, and 5, T. 1N., R66W of 6th P.M.
- According to the *DRAFT copy of the City of Fort Lupton Comprehensive Plan, Section 8.0 STORM DRAINAGE SYSTEM* (a copy of pertinent sections of the *DRAFT* report is located in Appendix D), the project site is located within sub-basin S6. The project site received runoff from sub-basins S6.1 and S6.3 and portions of sub-basins S6.2 and S8 for a total of approximately 1700 acres

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45 RESIDENTIAL LOTS FINAL DRAINAGE REPORT

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- An existing irrigation ditch, Fulton Ditch, located east of the site running in a south-to-north direction, receives runoff from the South, East, and OS Basins. It is assumed that the ditch is running full and that all runoff from the basin flows over the ditch embankment continuing in a westerly direction towards the subject site
- Shortline Ditch, located immediately west of the proposed development, currently receives runoff from all five sub-basins, including the subject site
- Approximately 3 acres consisting of single-family residences, located southeasterly and offsite, historically flows northwesterly onto the proposed site
- The development is within FEMA Flood Insurance Rate Map panels 0802660981C, revised September 28, 1982, and 0802660982C, which is not available for printing. The project is located in Zone C and no mapped 100-year floodplains exist on the site. See FEMA Map Community Panel 080266 0981C in Appendix A
- There are no existing major irrigation facilities located on the Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots property.
- The downstream drainage flow patterns are not anticipated to affect the development of Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots

3.0 DRAINAGE DESIGN CRITERIA

3.1 Development Criteria References and Constraints

- Research was completed in an effort to obtain the DRAFT copy of the *City of Fort Lupton Comprehensive Plan, Section 8.0 STORM DRAINAGE SYSTEM*. The study is currently in progress and calculations are not available at this time
- *City of Fort Lupton Water, Wastewater and Storm Drainage Master Plan, Section 6 Storm Drainage System*, prepared by Rothberg, Tamburini & Winsor, Inc. in 1999, provided major basin and irrigation information as well as future concepts for the project area
- The *City of Fort Lupton Standards and Specifications for the Design and Construction of Public Improvements, 2014 Edition, Chapter 5 Storm Sewer System* provided local criteria
- The *City of Fort Lupton Storm Drainage Design and Technical Criteria (CRITERIA)* shall be the design criteria for the analysis and design of onsite storm drainage facilities
- The *Urban Drainage and Flood Control District's (UDFDC) Urban Storm Drainage Criteria Manual* was also used as a reference and guide for regional criteria
- The *Wastewater and Storm Drainage Master Plan, Section 6, South Drainage Basin* has proposed that all developments within the subject area of the City release storm water only at the 5-year historic level, including the storm generated by the 100-year event

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45
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3.2 Hydrologic Criteria

- Design rainfall is from *City of Fort Lupton Storm Drainage Design and Technical Criteria, Section 5 RAINFALL*

Event Occurrence	2 YR	5 YR	10 YR	50 YR	100 YR
1-hr. Rainfall Intensity (in/hr)	1.00	1.42	1.68	2.35	2.71

- Peak runoff rates for the final design of the Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots utilize the Rational Method Procedure
- Offsite runoff calculations utilized CUHP/SWMM as presented in the *Mountain Sky Subdivision Preliminary Drainage Report*
- The 5-year storm is the minor event for the development
- The 100-year storm is the major event for the development

3.3 Hydraulic Criteria

- The capacities of existing downstream storm sewer pipes or natural drainage ways should not be impacted by this development once local detention and storm sewer water quality pond facilities are constructed
- Upstream-offsite drainage basin will require similar detention/W.Q. ponds to attenuate peak flows to the 5-year historic release rate
- CUHP/SWMM modeling was used in the *Preliminary Drainage Report* to determine the peak runoff to the proposed onsite bypass channel
- Imperviousness for the future Site Basin was determined at 40% by interpolating the runoff coefficients 5-yr $c=0.45$ and 100-yr $c=0.60$
- Per the City of Fort Lupton's CRITERIA, the FAA method for Minor and Major Storm Storage Volumes was utilized to determine onsite detention
- On-site detention design is based upon the 5-year and 100-year storm frequencies with a 5 year historic release rate
- From the *Wastewater and Storm Drainage Master Plan*, the release rate for the major storm of the on-site detention pond has been restricted to the 5-year historic storm peak flow as shown in the *Preliminary Drainage Report*
- The proposed outlet structure constructed during Filing No. 1 will be sized for final build-out conditions for the minor and major storms but the vertical water quality outlet pipe shall be resized and replaced as each filing is constructed
- Since the runoff from the surface area of the proposed bypass channel cannot be captured and treated in the on-site detention pond, the minor and major storm release rates have been reduced proportionally

3.4 Adaptations or Variations of Criteria

- Maximum design depth of ponding in the major storm is greater than the CRITERIA requirement of 5 feet since the major storm is being restricted to the 5-year release rate (maximum ponding depth of one foot is needed to meet the required detention ponding needs for the site)

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45
RESIDENTIAL LOTS
FINAL DRAINAGE REPORT

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- Pond bottom sloped at 2% as opposed to CRITERIA's requirement of 3% slope (NOTE: could not achieve desired volume with the 3% criteria)

4.0 DRAINAGE FACILITY DESIGN

4.1 General Concept

- The proposed drainage system will continue to drain the project site from southeast to northwest following the existing drainage pattern
- As described in the *Preliminary Drainage Report*, it is not possible to create a regional detention pond on this site as proposed in the *Wastewater and Storm Drainage Master Plan*
- An on-site detention pond for the project and a bypass channel for offsite runoff considerations is being proposed for final buildout conditions to be installed during the construction of Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots (NOTE: additional ponding and water quality facilities will need to be constructed within upstream reaches as land development occurs)
- Excerpts from referenced criteria and reports are included in Appendix D

4.2 Specific Details

Site Runoff

- Six offsite sub-basins will affect the development of the site
 - o OS-E, East Basin (east of site)
 - o OS-N, North Basin (north of site)
 - o OS, OS Basin (north of Highway 52)
 - o OS-S, South Basin (south of CR 12)
 - o OS-1, Tributary Area (single family homes southeast of site)
 - o OS-2, Future Oil/Gas Development by Anadarko Petroleum Corporation (southwest of site)
- CUHP/SWMM was used in the *Preliminary Drainage Report* to determine the runoff from the larger offsite basins. OS-E, OS-N, OS and OS-S
- Rational Method was used to determine the smaller off-site basins, OS-1 and OS-2
- The offsite basin area and contributing flow is summarized in the following table:

Basin Name	Area (acres)	5-YR Runoff (cfs)	100-YR Runoff (cfs)
OS-E	825	90	643
OS-N	78.4	24	138
OS	110	43	239
OS-S	616	88	603
OS-1	2.66	4.1	10.3
OS-2	13.38	6.1	38.8

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45 RESIDENTIAL LOTS FINAL DRAINAGE REPORT

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- Seven onsite basins:
 - o Basin A, developed portion of Filing No. 1
 - o Basin B, future filing south of Filing No. 1 draining to park area then pond
 - o Basin C, future filing west of Filing No. 1 draining overland to pond
 - o Basin D, future filing west of Basin C draining overland to pond
 - o Basin E, onsite detention pond area
 - o Basin F, onsite channel and drainage to channel to bypass detention pond
 - o Basin R, roadside areas along CR12 and CR29 ½
- The onsite sub-basin area and contributing flow is summarized in the following table:

Basin Name	Area (acres)	5-YR Runoff (cfs)	100-YR Runoff (cfs)
A1	2.81	3.7	9.5
A2	0.64	1.1	2.9
A3	3.17	4.5	11.4
A4	1.29	2.3	5.9
A5	0.93	1.7	4.2
B1	0.76	1.9	4.6
B2	3.42	6.2	15.7
B3	0.74	1.3	3.4
B4	1.50	1.4	5.0
B5	1.61	2.5	6.4
B6	2.96	5.0	12.8
B7	2.73	4.2	10.6
B8	1.99	2.9	7.3
B9	3.32	2.9	10.1
C1	1.24	2.3	5.8
C2	2.14	3.6	8.9
C3	1.41	2.3	5.8
C4	2.83	3.9	10.4
D1	1.45	2.7	7.0
D2	3.48	3.2	10.4
D3	1.14	1.9	4.8
D4	1.29	2.1	5.5
E1	0.39	0.8	2.0
E2	2.56	4.0	10.1
F1	0.48	1.2	2.9
F2	8.69	5.9	20.4
P1	6.38	11.7	28.2
R1	0.73	1.9	4.1

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45
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R2	0.79	1.7	4.1
R3	0.79	1.9	4.5
R4	0.48	1.3	3.1
R5	1.24	1.1	4.0

- Runoff from the onsite and offsite basins drains either directly or indirectly to the lowpoint of the site at DP34, totalling the above mentioned 1700 acres.
- Sub-basins OS-E, OS-N, OS and OS-S contribute off-site drainage as calculated in the *Mountain Sky Subdivision Preliminary Drainage Report* as displayed in the Overall Drainage Exhibit located in Appendix A of this report
- See Appendix B for composite c-factors, times of concentration and rational method calculations for Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots

Street and Inlet Capacities

- Road capacities for CR29 ½, the entry drive from CR29 ½ and residential streets are enclosed is Appendix C
- Inlet capacity and carry-over calculations can be found in Appendix C

Storm Drain System

- The storm drainage system for Mountain Sky Subdivision, Filing No. 1 with +/- 45 Residential Lots will consist of storm sewer for onsite runoff, a bypass channel for offsite runoff, and culverts under CR29 ½ for the Fulton Ditch and runoff from off-site basin OS-E
- One flared end section (FES) will be installed at DP 25 which ties into one the two inlets (DP 26 and DP 27) not being utilized during this phase
- The FES at DP 25 will capture stormwater runoff from onsite undeveloped areas and route runoff to the pond for water quality and detention
- There will be a storm stub at the Filing No. 1 phase line at DP 17 that will also capture stormwater runoff from the onsite undeveloped areas from the southeastern portion of the site
- The onsite bypass channel is sized to carry the 100-yr undeveloped runoff from off-site basins as determined by the CUHP/SWMM model presented in the *Preliminary Drainage Report*
- Two culverts under CR29 ½ will be constructed during Filing No. 1 (culvert for Fulton Ditch and culvert for the Off-Site East Basin Drainage)
- Flows for the Fulton Ditch were not made available to Calibre – the culvert was sized to match the hydraulic capacity of the existing ditch section
- The Fulton Ditch culvert shall be sized for the current ditch cross section and slope
- The culvert for the OS-E basin runoff is sized to carry the 100-yr undeveloped flow as determined by the CUHP/SWMM model presented in the *Preliminary Drainage Report*

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45 RESIDENTIAL LOTS FINAL DRAINAGE REPORT

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Detention Pond

- The Detention Pond is being constructed for water quality and detention purposes for on-site basins only using the FAA method per the City of Fort Lupton's CRITERIA
- A 3-stage outlet structure and emergency overflow weir will be constructed in the pond (water quality, 5-year release and 100-yr release)
- A 5-year orifice will be constructed for final build-out conditions within the structure to release the 5-year developed runoff at the 5-year historic rate
 - o The release rate for the 100-yr runoff is restricted to 5-yr historic flow for captured stormwater by installing a restrictor plate in the outlet structure
 - o Even though the 5-year orifice will not be necessary since the restrictor plate is utilized to release runoff at the 5-year historic rate, it is being installed so the restrictor plate can be adjusted during future filing before final buildout conditions
- To avoid multiple modifications to the pond, it has been sized for the future buildout of the entire Mountain Sky Subdivision.
- During the construction of future filings, the water quality outlet pipe and restrictor plate will be replaced for interim conditions until full buildout conditions have been achieved
- Anadarko will be responsible for water quality and detention for their 15.7-acre parcel including half of CR 29 to their parcel. Runoff from Basin OS-2, (future development of Parcel F), will not be captured or treated for water quality
- The Mountain Sky Subdivision parcel consists of 61.2 acres (76.9 acres platted area less Anadarko's 15.7-acre parcel)
- The pond can only capture runoff from 55.25 acres due to grading restrictions related to the 6.4-acre grass-lined bypass channel (Note: 55.25 acres of captured runoff + 6.4 acres of bypass channel is greater than the 61.2-acre subdivision parcel due to capturing stormwater runoff from Basins OS-1, a developed single-family lot currently in use)
- The pond's release rate has been adjusted to reduce the runoff rate below the 5-year historic rate of 0.13 cfs/acre since runoff from the entire Mountain Sky Subdivision cannot be completely captured in the onsite detention pond
- See Appendix C for pond and outlet structure calculations

5.0 SUMMARY

5.1 Compliance with Standards

- This report is in general accordance with the *City of Fort Lupton Storm Drainage Design and Technical Criteria*
- This report is in general accordance, where applicable and not superseded by other criteria, to the *Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual (USDCM)*

MOUNTAIN SKY SUBDIVISION, FILING NO. 1 WITH +/- 45
RESIDENTIAL LOTS
FINAL DRAINAGE REPORT

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- This report is in general accordance with FEMA; there are no known regulatory floodplains within the site boundary

5.2 Drainage Concept

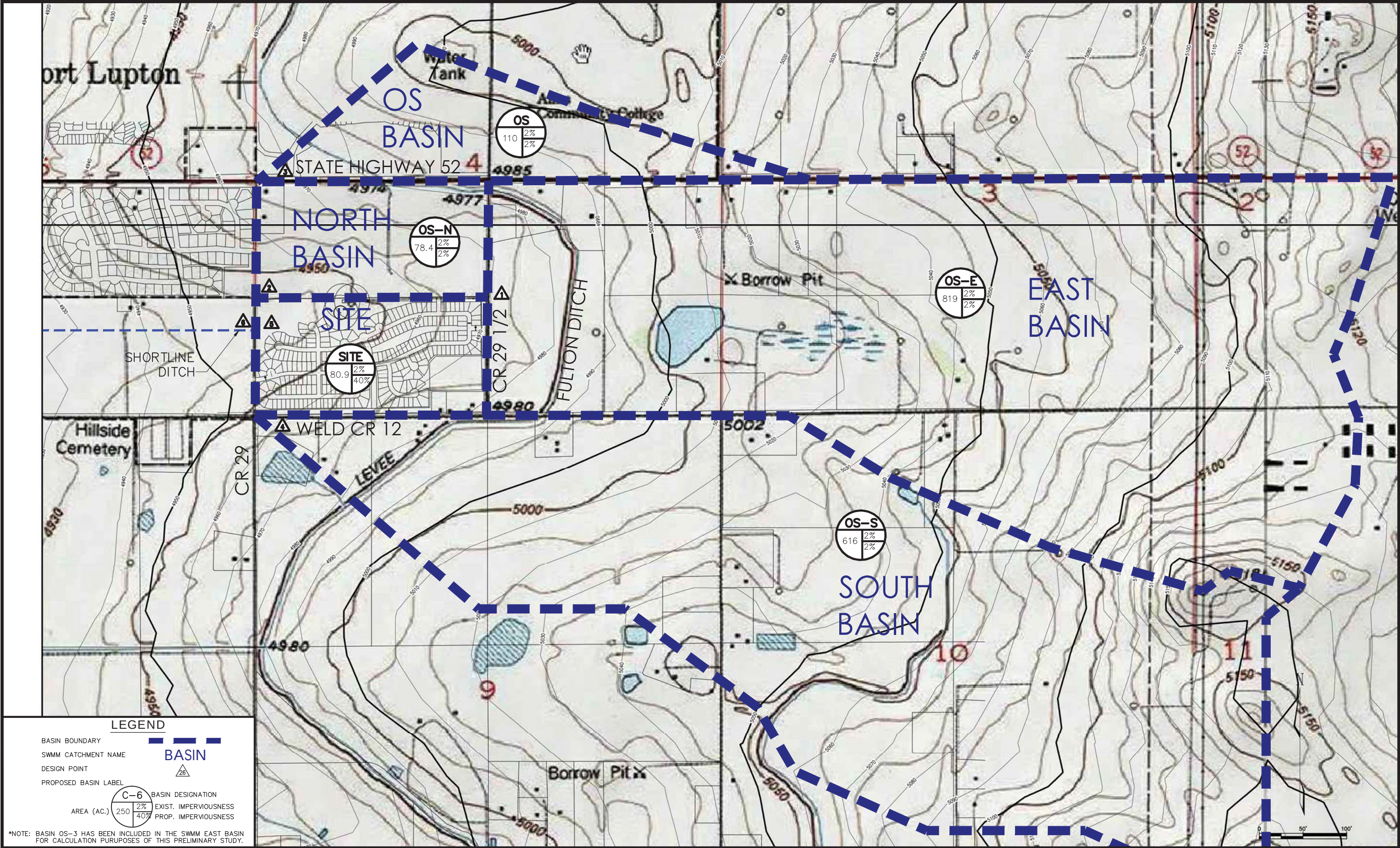
- Runoff from the site will be conveyed via onsite drainage swales, a street curb, gutter, and paving, and a storm sewer system to the proposed detention pond
- Runoff from off-site will be directed around or through the site via swales, ditches and channels to the Shortline Ditch which currently receives this upstream runoff
- During future development, it will be possible to pipe the runoff from the proposed channel in a southerly direction to connect to proposed storm sewer in CR12
- Downstream properties should not be affected by the development of the proposed site; the detention pond will provide the appropriate onsite detention to control the major and minor storm releases from the development

5.3 Standard Statement 1

The developer, vis contractual agreements with his consultant(s) is responsible for obtaining any and all permits, licenses, and any other documentation/correspondence that are necessary to address any additional issues such as wetlands, floodplains, irrigation facilities, groundwater dewatering, and protection of existing utilities. See Page 2 for Engineer's signed statement.

6.0 LIST OF REFERENCES

1. *City of Fort Lupton Storm Drainage Design and Technical Criteria (CRITERIA)*
2. DRAFT copy of the *City of Fort Lupton Comprehensive Plan, Section 8.0 STORM DRAINAGE SYSTEM*, prepared by Clear Water Solutions, Inc., 2014
3. *City of Fort Lupton Water, Wastewater and Storm Drainage Master Plan, Section 6 Storm Drainage System*, prepared by Rothberg, Tamburini & Winsor, Inc., 1999
4. *City of Fort Lupton Standards and Specifications for the Design and Construction of Public Improvements, 2014 Edition, Chapter 5 Storm Sewer System*
5. *Urban Storm Drainage Criteria Manual, Volumes 1, 2 & 3*, Urban Drainage Flood Control District



PATH: P:\EQUINOX MTN SKY\CADD\110D\110D.DWG
PLOT DATE: 2/19/2016 12:04 PM
PLOT BY: Tracey Wise
XREFS: w-survey, w-base,

LEGEND

BASIN BOUNDARY

SWMM CATCHMENT NAME

DESIGN POINT

PROPOSED BASIN LABEL

C-6 BASIN DESIGNATION

AREA (AC.)

EXIST. IMPERVIOUSNESS

PROP. IMPERVIOUSNESS

*NOTE: BASIN OS-3 HAS BEEN INCLUDED IN THE SWMM EAST BASIN FOR CALCULATION PURPOSES OF THIS PRELIMINARY STUDY.

DATE	REVISION	DESCRIPTION
	1	
	2	
	3	
	4	
	5	
	6	

Drawing Name	110D.dwg
Job Number	
Prepared For	ROKEH CONSULTING, LLC

Designer	TAW
Drafter	TAW
Checked	GVM



Calibre

Calibre Engineering, Inc.
9090 South Ridgeline Boulevard, Suite 105
Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com

Construction Management Civil Engineering Surveying

MOUNTAIN SKY SUBDIVISION

DRAINAGE ANALYSIS

OVERALL DRAINAGE MAP

Sheet

E-OD

Date

23 FEBRUARY 2016

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OS BASIN (HISTORIC)
TO BYPASS PROPOSED
CHANNEL
A = 110 ACRES
Q5 = 43 CFS
Q100 = 239 CFS

NORTH BASIN (HISTORIC)
A=78.4 ACRES
Q5 = 24 CFS
Q100 = 138 CFS

BASIN BOUNDARY

PROPOSED STORM DRAIN PIPE

PROPOSED SWALE

PROPERTY LINE

FLOW ARROW

PROPOSED MAJOR CONTOUR (5')

PROPOSED MINOR CONTOUR (1')

EXISTING MINOR CONTOUR (1')

EXISTING MAJOR CONTOUR (5')

DESIGN POINT

PROPOSED BASIN LABEL

BASIN DESIGNATION

5YR C-VALUE

100YR C-VALUE

AREA (AC.)

250

.45

.60

EAST BASIN (HISTORIC)
A = 819 ACRES
Q5 = 90 CFS
Q100 = 643 CFS
TO CULVERT UNDER
CR 29 1/2

NOTE:
NO DETENTION STORAGE FOR UNDEVELOPED
BASIN OS-2. FUTURE DEVELOPMENT OF THIS
SITE WILL REQUIRE A REDESIGN OF EXISTING
DETENTION POND OR THE DESIGN OF A NEW
DETENTION/WATER QUALITY POND FACILITY.

ASSUMED ULTIMATE SOUTH BASIN (HISTORIC)
• A = 616 ACRES
Q5 = 88 CFS
Q100 = 603 CFS
ULTIMATELY CONTROL 100% OF THIS FLOW
TO BE CARRIED WEST ALONG WELD CR12

PATH: P:\EQUINOX MTN SKY\CADD\CIVIL\DRN\20DR-P-OD.DWG
 PLOTTED BY: Tyler Robinson PLOT DATE: 6/29/2016 3:01 PM
 XREFS: w-PUT-Full Buildout, 10PPN, 10PUT, 10EUT, 10EPN, 10PCN, 10BASE,

	6	
	5	
	4	
	3	
	2	
DATE	1	REVISION DESCRIPTION

Drawing Name 20DR-P-OD.dwg			
Job Number EQNX MTN SKY		1 inch = 100 ft. Horizontal 1 inch = 0 ft Vertical	
Prepared For EQUINOX LAND GROUP	Designer TAW	Drafter TAW	Checked GLP

Calibre
 Calibre Engineering, Inc.
 9090 South Ridgeline Boulevard, Suite 105
 Highlands Ranch, CO 80129 (303) 730-0434
www.calibre-engineering.com
Construction Management Civil Engineering Surveying

MOUNTAIN SKY SUBDIVISION

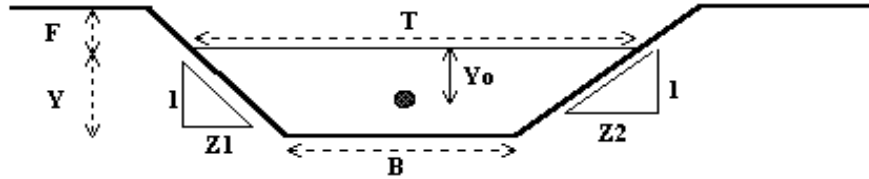
DRAINAGE ANALYSIS

PROPOSED OVERALL SITE DRAINAGE

Sheet	<u>2</u>
P-OD	of
	<u>2</u>
Date	
12 FEBRUARY 2016	

Critical Flow Analysis - Trapezoidal Channel

Project: **Mountain Sky Subdivision**
Channel ID: **Channel along North PL: 5-yr Storm**



Design Information (Input)

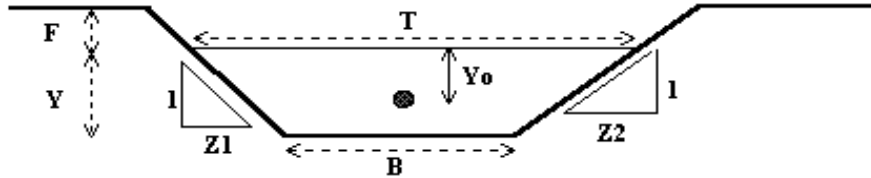
Bottom Width	$B =$	15.00 ft
Left Side Slope	$Z1 =$	3.00 ft/ft
Right Side Slope	$Z2 =$	3.00 ft/ft
Design Discharge	$Q =$	114.00 cfs

Critical Flow Condition (Calculated)

Critical Flow Depth	$Y =$	1.12 ft
Critical Flow Area	$A =$	20.56 sq ft
Critical Top Width	$T =$	21.72 ft
Critical Hydraulic Depth	$D =$	0.95 ft
Critical Flow Velocity	$V =$	5.54 fps
Froude Number	$Fr =$	1.00
Critical Wetted Perimeter	$P =$	22.08 ft
Critical Hydraulic Radius	$R =$	0.93 ft
Critical (min) Specific Energy	$Esc =$	1.60 ft
Centroid on the Critical Flow Area	$Yoc =$	0.49 ft
Critical (min) Specific Force	$Fsc =$	1.86 kip

Normal Flow Analysis - Trapezoidal Channel

Project: **Mountain Sky Subdivision**
Channel ID: **Channel along North PL: 100-year Storm**



Design Information (Input)

Channel Invert Slope	$S_o =$	0.0060 ft/ft
Manning's n	$n =$	0.035
Bottom Width	$B =$	15.00 ft
Left Side Slope	$Z1 =$	3.00 ft/ft
Right Side Slope	$Z2 =$	3.00 ft/ft
Freeboard Height	$F =$	1.00 ft
Design Water Depth	$Y =$	4.27 ft

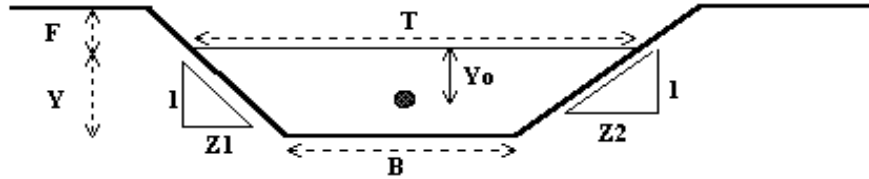
Normal Flow Condition (Calculated)

Discharge	$Q =$	781.05 cfs
Froude Number	$Fr =$	0.68
Flow Velocity	$V =$	6.59 fps
Flow Area	$A =$	118.55 sq ft
Top Width	$T =$	40.59 ft
Wetted Perimeter	$P =$	41.97 ft
Hydraulic Radius	$R =$	2.82 ft
Hydraulic Depth	$D =$	2.92 ft
Specific Energy	$E_s =$	4.94 ft
Centroid of Flow Area	$Y_o =$	1.80 ft
Specific Force	$F_s =$	23.29 kip

$Q = OS-E + OS-N$
 $Q = 643 + 138 \text{ cfs}$
 $Q = 781 \text{ cfs}$
 $Fr < 0.8$
 $V < 7 \text{ fps}$

Critical Flow Analysis - Trapezoidal Channel

Project: **Mountain Sky Subdivision**
Channel ID: **Channel along North PL: 100-yr Storm**



Design Information (Input)

Bottom Width	B =	15.00	ft
Left Side Slope	Z1 =	3.00	ft/ft
Right Side Slope	Z2 =	3.00	ft/ft
Design Discharge	Q =	722.87	cfs

Critical Flow Condition (Calculated)

Critical Flow Depth	Y =	3.31	ft
Critical Flow Area	A =	82.69	sq ft
Critical Top Width	T =	34.89	ft
Critical Hydraulic Depth	D =	2.37	ft
Critical Flow Velocity	V =	8.74	fps
Froude Number	Fr =	1.00	
Critical Wetted Perimeter	P =	35.97	ft
Critical Hydraulic Radius	R =	2.30	ft
Critical (min) Specific Energy	Esc =	4.50	ft
Centroid on the Critical Flow Area	Yoc =	1.22	ft
Critical (min) Specific Force	Fsc =	18.54	kip

Worksheet for OS-E Swale - 5YR Storm

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00800	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	5.20	ft
Discharge	90.00	ft³/s

Results

Normal Depth	1.77	ft
Flow Area	18.66	ft²
Wetted Perimeter	16.42	ft
Hydraulic Radius	1.14	ft
Top Width	15.84	ft
Critical Depth	1.56	ft
Critical Slope	0.01347	ft/ft
Velocity	4.82	ft/s
Velocity Head	0.36	ft
Specific Energy	2.14	ft
Froude Number	0.78	
Flow Type	Subcritical	

Minor Storm
 Q = 90 cfs
 D = 1.77 ft
 V < 5 fps
 Fr < 0.8

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.77	ft
Critical Depth	1.56	ft
Channel Slope	0.00800	ft/ft

Worksheet for OS-E Swale - 100YR Storm

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00800	ft/ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Bottom Width	5.20	ft
Discharge	321.50	ft³/s

Results

Normal Depth	3.22	ft
Flow Area	47.81	ft²
Wetted Perimeter	25.55	ft
Hydraulic Radius	1.87	ft
Top Width	24.51	ft
Critical Depth	2.97	ft
Critical Slope	0.01134	ft/ft
Velocity	6.73	ft/s
Velocity Head	0.70	ft
Specific Energy	3.92	ft
Froude Number	0.85	
Flow Type	Subcritical	

Major Storm
 $Q = 643/2$
 $Q = 321.5 \text{ cfs}$
 $D = 3.22 \text{ ft}$
 $V < 7 \text{ fps}$
 $Fr = 0.85$

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	3.22	ft
Critical Depth	2.97	ft
Channel Slope	0.00800	ft/ft



FULL BUILDOUT CONDITIONS

Design Area = 61.22 acres
 Actual Basin Area = 55.27 acres
 Weighted Runoff Coefficient C_s (5-year) = 0.45 Adjusted 5yr Release = 0.12 cfs / acre Actual Release Rate = Actual Area / Design Area * Design Release Rate
 Weighted Runoff Coefficient C_{100} (100-year) = 0.60 Adjusted 100yr Release = 0.12 cfs / acre Design Release Rate = 0.13 cfs / acre

DETENTION POND - FAA METHOD														
LOCATION: EQUINOX MTN SKY				CITY OF: CITY OF FORT LUPTON						DATE: 2/19/2016				
TIME (MIN)	RAINFALL INTENSITY (IN/HR)		C x A		INFLOW VOLUME (FT ³)		RELEASE RATE (CFS)		OUTFLOW VOLUME (FT ³)		REQUIRED VOLUME (FT ³)		REQUIRED VOLUME (AC-FT)	
	5YR	100YR	5 YR	100 YR	5 YR	100 YR	5 YR	100 YR	5YR	100YR	5 YR	100 YR	5 YR	100 YR
(1)	(2)	(2)	(3)	(3)	(4)	(4)	(5)	(5)	(6)	(6)	(7)	(7)	(8)	(8)
5	4.92	9.48	24.87	33.16	36,710	94,313	6.49	6.49	1,946	1,946	34,765	92,367	0.80	2.12
10	3.84	7.32	24.87	33.16	57,304	145,648	6.49	6.49	3,891	3,891	53,413	141,756	1.23	3.25
15	3.24	6.16	24.87	33.16	72,525	183,850	6.49	6.49	5,837	5,837	66,688	178,013	1.53	4.09
20	2.80	5.45	24.87	33.16	83,568	216,879	6.49	6.49	7,783	7,783	75,785	209,097	1.74	4.80
25	2.50	4.85	24.87	33.16	93,268	241,254	6.49	6.49	9,729	9,729	83,540	231,525	1.92	5.32
30	2.24	4.28	24.87	33.16	100,282	255,480	6.49	6.49	11,674	11,674	88,608	243,806	2.03	5.60
35	2.08	3.95	24.87	33.16	108,639	275,079	6.49	6.49	13,620	13,620	95,019	261,459	2.18	6.00
40	1.91	3.70	24.87	33.16	114,011	294,479	6.49	6.49	15,566	15,566	98,445	278,913	2.26	6.40
45	1.78	3.45	24.87	33.16	119,532	308,904	6.49	6.49	17,511	17,511	102,021	291,393	2.34	6.69
50	1.65	3.22	24.87	33.16	123,114	320,345	6.49	6.49	19,457	19,457	103,657	300,888	2.38	6.91
55	1.54	3.00	24.87	33.16	126,397	328,304	6.49	6.49	21,403	21,403	104,994	306,901	2.41	7.05
60	1.42	2.71	24.87	33.16	127,143	323,528	6.49	6.49	23,349	23,349	103,795	300,180	2.38	6.89

(4) = (3) x (2) x (1) x 60

(5) = allowable detention pond release rate

(6) = (5) x (1) x 60

(7) = (4) - (6)

Pond to be constructed for full build-out conditions
w/ reduced release rate, Volume = 7.05 ac-ft



FILING NO. 1

Design Area = 61.22 acres
 Actual Basin Area = 55.25 acres
 Weighted Runoff Coefficient C_5 (5-year) = 0.22 Adjusted 5yr Release = 0.12 cfs / acre Actual Release Rate = Actual Area / Design Area * Design Release Rate
 Weighted Runoff Coefficient C_{100} (100-year) = 0.52 Adjusted 100yr Release = 0.12 cfs / acre Design Release Rate = 0.13 cfs / acre

DETENTION POND - FAA METHOD														
LOCATION: EQUINOX MTN SKY			CITY OF: CITY OF FORT LUPTON						DATE: 2/19/2016					
TIME (MIN)	RAINFALL INTENSITY (IN/HR)		C x A		INFLOW VOLUME (FT³)		RELEASE RATE (CFS)		OUTFLOW VOLUME (FT³)		REQUIRED VOLUME (FT³)		REQUIRED VOLUME (AC-FT)	
	5YR	100YR	5 YR	100 YR	5 YR	100 YR	5 YR	100 YR	5YR	100YR	5 YR	100 YR	5 YR	100 YR
(1)	(2)	(2)	(3)	(3)	(4)	(4)	(5)	(5)	(6)	(6)	(7)	(7)	(8)	(8)
5	4.92	9.48	12.07	28.50	17,821	81,060	6.48	6.48	1,945	1,945	15,876	79,114	0.36	1.82
10	3.84	7.32	12.07	28.50	27,819	125,181	6.48	6.48	3,891	3,891	23,928	121,290	0.55	2.78
15	3.24	6.16	12.07	28.50	35,208	158,015	6.48	6.48	5,836	5,836	29,372	152,179	0.67	3.49
20	2.80	5.45	12.07	28.50	40,569	186,403	6.48	6.48	7,781	7,781	32,788	178,622	0.75	4.10
25	2.50	4.85	12.07	28.50	45,278	207,352	6.48	6.48	9,727	9,727	35,551	197,625	0.82	4.54
30	2.24	4.28	12.07	28.50	48,683	219,579	6.48	6.48	11,672	11,672	37,011	207,907	0.85	4.77
35	2.08	3.95	12.07	28.50	52,740	236,424	6.48	6.48	13,617	13,617	39,122	222,807	0.90	5.11
40	1.91	3.70	12.07	28.50	55,348	253,098	6.48	6.48	15,563	15,563	39,785	237,535	0.91	5.45
45	1.78	3.45	12.07	28.50	58,028	265,496	6.48	6.48	17,508	17,508	40,520	247,988	0.93	5.69
50	1.65	3.22	12.07	28.50	59,767	275,329	6.48	6.48	19,453	19,453	40,314	255,876	0.93	5.87
55	1.54	3.00	12.07	28.50	61,361	282,170	6.48	6.48	21,399	21,399	39,962	260,771	0.92	5.99
60	1.42	2.71	12.07	28.50	61,723	278,066	6.48	6.48	23,344	23,344	38,379	254,722	0.88	5.85

(4) = (3) x (2) x (1) x 60

(5) = allowable detention pond release rate

(6) = (5) x (1) x 60

(7) = (4) - (6)

Filing No. 1 required volume w/ reduced release rate, Volume = 5.99 ac-ft

FULL BUILDOUT CONDITIONS

PROJECT: EQUINOX MOUNTIAN SKY
SUBJECT: PROPOSED POND VOLUME

DATE: 2/19/2016
BY: TAW

Volume Equation:

$$Vol = 1/3h(A1+A2+(A1 \times A2)^{1/2})$$

V = Volume in cubic feet (cu-ft)
h = Contour Interval in feet (ft.)
A1,A2 = Area enclosed by successive
Contours in square feet (sq-ft)

Required Detention Volume:

Area =	55.27 acres	WQCV =	1.0 (0.91/ ³ - 1.19/ ² + 0.78/)
Imperviousness, / =	40%	WQ Design Volume =	(WQCV / 12 * Area * 1.2)
WQCV =	0.180 watershed inches	WQ Inv. In =	4937.52
WQ Design Volume =	0.99 ac-ft'		
V(5yr Stm)=	2.41 ac-ft		
V(100yr Stm)=	4.18 ac-ft	with release rate at 100yr Historic Rate Pond Height =	4.90 feet
V(100yr Stm)=	7.05 ac-ft	with release rate at 5yr Historic Rate Pond Height =	6.13 feet

Contour Elev. (ft.)	Area (sf)	Area (ac)	A1+A2 (ac)	(A1xA2) ^{1/2} (ac)	(A1+A2) + (A1xA2) ^{1/2} (ac)	h (ft)	h/3 (ft)	Volume (ac-ft)	Accumul. Volume (ac-ft)
4938	1437	0.03							0.00
			0.32	0.10	0.41	1.00	0.33	0.14	
4939	12395	0.28							0.14
			1.01	0.46	1.47	1.00	0.33	0.49	
4940	31816	0.73							0.63
			2.07	0.99	3.06	1.00	0.33	1.02	
4941	58520	1.34							1.65
			3.30	1.62	4.92	1.00	0.33	1.64	
4942	85057	1.95							3.29
			4.30	2.14	6.44	1.00	0.33	2.15	
4943	102229	2.35							5.44
			4.99	2.49	7.48	1.00	0.33	2.49	
4944	115081	2.64							7.93
			5.50	2.75	8.25	1.00	0.33	2.75	
4945	124433	2.86							10.68
			Water Quality Water Surface Elevation =				4941.46		
			Minor Storm Water Surface Elevation =				4942.42		
			Major Storm Water Surface Elevation =				4943.65		

FILING NO. 1 ONLY

PROJECT: EQUINOX MOUNTIAN SKY
SUBJECT: PROPOSED POND VOLUME

DATE: 2/19/2016
BY: TAW

Volume Equation:

$$Vol = 1/3h(A1+A2+(A1 \times A2)^{1/2})$$

V = Volume in cubic feet (cu-ft)
h = Contour Interval in feet (ft.)
A1,A2 = Area enclosed by successive
Contours in square feet (sq-ft)

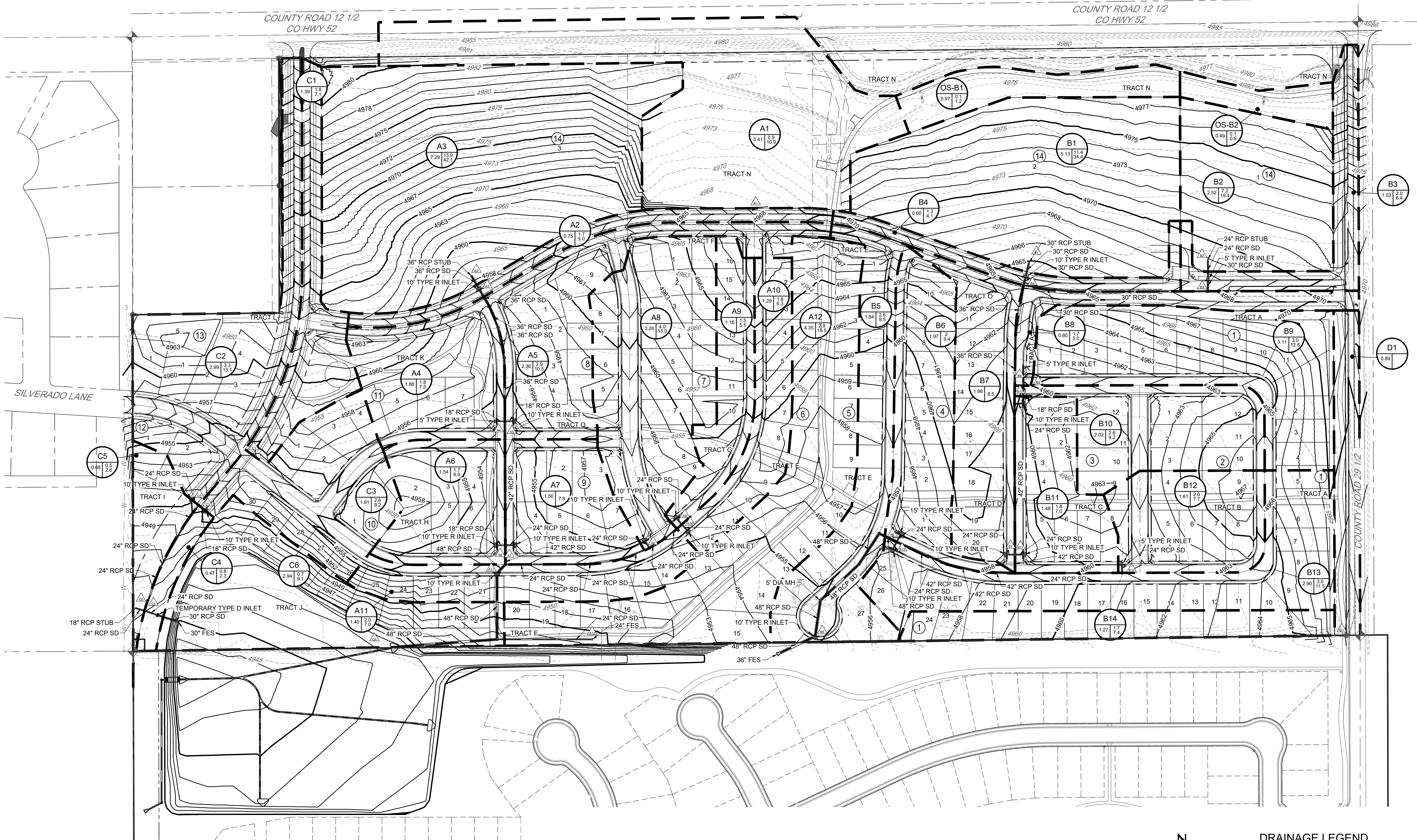
Required Detention Volume:

Area =	55.25 acres	WQCV =	1.0 (0.91/ ³ - 1.19/ ² + 0.78/)
Imperviousness, / =	11%	WQ Design Volume =	(WQCV / 12 * Area * 1.2)
WQCV =	0.072 watershed inches		
WQ Design Volume =	0.40 ac-ft'	Inv. In =	4937.52
V(5yr Stm)=	0.92 ac-ft		
V(100yr Stm)=	2.94 ac-ft	with release rate at 100yr Historic Rate Pond Height =	4.47 feet
V(100yr Stm)=	5.99 ac-ft	with release rate at 5yr Historic Rate Pond Height =	5.70 feet

Contour Elev. (ft.)	Area (sf)	Area (ac)	A1+A2 (ac)	(A1x A2) ^{1/2} (ac)	(A1+A2) + (A1x A2) ^{1/2} (ac)	h (ft)	h/3 (ft)	Volume (ac-ft)	Accumul. Volume (ac-ft)
4938	1437	0.03							0.00
			0.32	0.10	0.41	1.00	0.33	0.14	
4939	12395	0.28							0.14
			1.01	0.46	1.47	1.00	0.33	0.49	
4940	31816	0.73							0.63
			2.07	0.99	3.06	1.00	0.33	1.02	
4941	58520	1.34							1.65
			3.30	1.62	4.92	1.00	0.33	1.64	
4942	85057	1.95							3.29
			4.30	2.14	6.44	1.00	0.33	2.15	
4943	102229	2.35							5.44
			4.99	2.49	7.48	1.00	0.33	2.49	
4944	115081	2.64							7.93
			5.50	2.75	8.25	1.00	0.33	2.75	
4945	124433	2.86							10.68
			Water Quality Water Surface Elevation =				4940.55		
			Minor Storm Water Surface Elevation =				4941.84		
			Major Storm Water Surface Elevation =				4943.22		

Appendix E - Drainage Maps

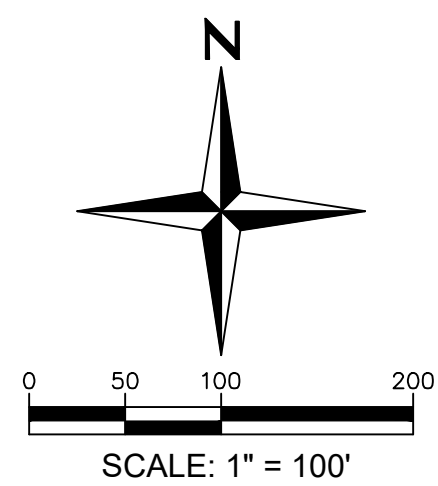
I:\2019\19032 - Murata Farms\Engineering Reports\Drainage\19032 Drainage Plan.dwg Tab: Layout1 Feb 22, 2021 - 2:02pm roglesby



Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
A1	5.41	0.08	0.49	13%	0.9	10.9
A2	0.75	0.61	0.78	76%	1.7	5.0
A3	7.29	0.60	0.78	75%	13.9	42.1
A4	1.83	0.35	0.65	48%	1.8	7.5
A5	2.36	0.44	0.69	57%	2.9	10.5
A6	1.54	0.37	0.66	50%	1.7	6.9
A7	1.50	0.45	0.70	59%	2.2	7.8
A8	3.26	0.41	0.68	54%	4.0	15.0
A9	1.15	0.41	0.68	54%	1.5	5.5
A10	1.29	0.45	0.70	58%	1.8	6.3
A11	1.40	0.45	0.70	58%	2.0	7.0
A12	4.35	0.24	0.59	34%	2.9	15.5

Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
B1	5.13	0.60	0.78	75%	11.4	34.4
B2	2.52	0.74	0.85	90%	7.2	19.4
B3	1.03	0.52	0.74	67%	2.0	6.4
B4	0.60	0.58	0.77	72%	1.3	4.1
B5	2.18	0.43	0.69	56%	2.6	9.5
B6	1.97	0.41	0.68	54%	2.5	9.4
B7	1.96	0.39	0.67	52%	2.2	8.5
B8	0.80	0.62	0.79	77%	1.7	5.0
B9	3.11	0.35	0.65	47%	3.0	12.8
B10	1.89	0.46	0.71	60%	2.6	9.2
B11	1.48	0.40	0.68	53%	1.8	7.0
B12	1.61	0.41	0.68	54%	2.0	7.7
B13	2.90	0.39	0.67	52%	3.0	11.5
B14	1.27	0.33	0.64	45%	1.7	7.4

Basin Summary Table						
Basin	Area (AC)	Runoff Coefficients		I (%)	Peak Flows (cfs)	
		C5	C100		Q5	Q100
C1	1.37	0.38	0.66	51%	1.8	7.1
C2	2.92	0.38	0.66	50%	3.3	13.1
C3	2.07	0.45	0.70	59%	2.6	9.2
C4	0.32	0.62	0.79	77%	0.8	2.3
C5	0.69	0.25	0.59	36%	0.5	2.6
C6	2.92	0.08	0.49	14%	0.7	9.1
D1	0.89	0.47	0.71	61%	1.1	4.5
OS-B1	0.97	0.09	0.50	15%	0.1	1.2
OS-B2	0.49	0.10	0.50	18%	0.1	0.9



- DRAINAGE LEGEND**
- 5281 --- EXISTING MINOR CONTOUR
 - 5280 --- EXISTING MAJOR CONTOUR
 - 5281 --- PROPOSED MINOR CONTOUR
 - 5280 --- PROPOSED MAJOR CONTOUR
 - PROPOSED STORM SEWER LINE
 - PROPOSED BASIN BOUNDARY
 - A1 BASIN ID
 - 0.000 0.00 5 YEAR RUNOFF
 - 0.000 0.00 100 YEAR RUNOFF
 - 0.000 0.00 BASIN AREA (ACRES)
 - 00 PROPOSED DESIGN POINT
 - FLOW ARROW

MURATA FARMS

DRAIANCE PLAN

SHEET

DNG

MURATA FARMS

Traffic Impact Study



Date: February 18, 2021

Submitted To:

Redland
1500 West Canal Court
Littleton, CO 80120

Submitted By:

Fox Tuttle Transportation Group, LLC
1624 Market Street, Suite 202
Denver, CO 80202

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APPENDIX

Level of Service Definitions
Intersection Capacity Worksheets
Traffic Count Data Sheets

MURATA FARMS TRAFFIC IMPACT STUDY

1.0 INTRODUCTION

This traffic impact study has been prepared by the Fox Tuttle Transportation Group for the Murata Farms mixed-use project. The project proposes to develop 181 single-family residential lots, ±119 paired and attached homes, and ±2.4-acres of commercial use on primarily vacant land located at the southwest corner of the State Highway (SH) 52 and Weld County Road (WCR) 29.5 intersection in the City of Fort Lupton.

The purpose of this study is to assist in identifying potential traffic impacts within the study area with buildout of this project in the short and long-term scenarios. The traffic study addresses morning and evening peak hour intersection conditions in the study area without and with the project-added traffic. The information contained in this study is anticipated to be used by the City and Colorado Department of Transportation (CDOT) in identifying any intersection or roadway deficiencies and potential improvements for both the near term and long-term future scenarios necessary to service project-added traffic volumes.

2.0 PROJECT DESCRIPTION

The Murata Farms project proposes to develop single-family detached, single-family paired homes, attached dwelling units, and retail uses, as described below:

- Initial Development = 181 single-family, detached residential homes
- Short-Term = single-family, paired homes on a ±7.3-acre parcel (approx. 58 homes)
- Short-Term = single-family, attached homes on a ±5.1-acre parcel (approx. 61 homes)
- Short-Term = development of ±2.4-acre to include neighborhood retail/commercial use

A vicinity map is shown on **Figure 1**. Existing adjacent land uses include single-family residential, institutional, agricultural, and recreational uses.

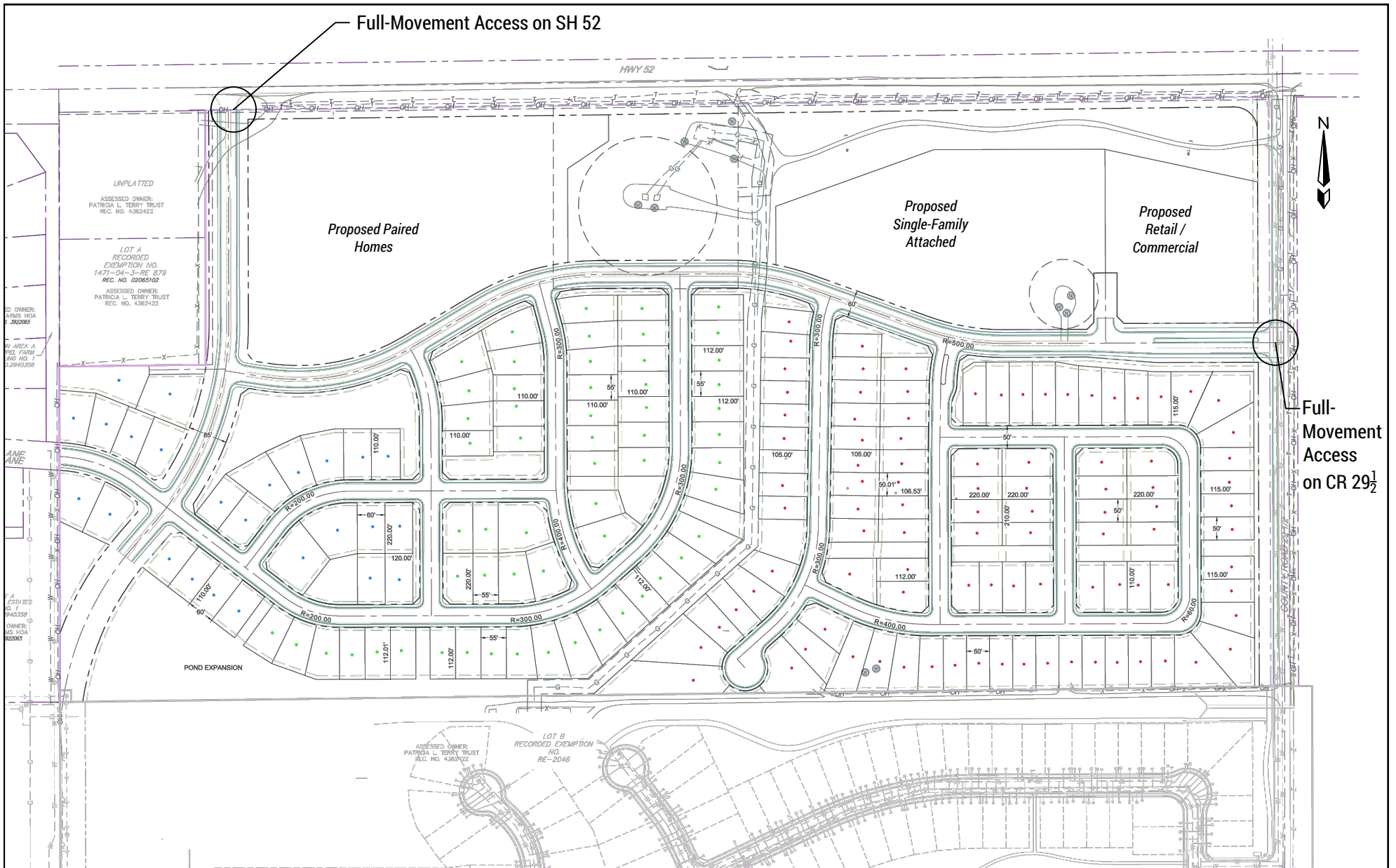
The site plan illustrating proposed access locations are provided on **Figure 2**. The access plan includes a $\frac{3}{4}$ -access along SH 52 towards the west end of the project (aligning with Coyote Creek Drive to the north), a new full-movement access located along WCR 29.5 south of SH 52, and local/collector roadway interconnectivity to Silverado Lane to the west and the Mountain Sky residential development to the south.



FOX TUTTLE
TRANSPORTATION GROUP

MURATA FARMS TRAFFIC IMPACT STUDY
VICINITY MAP

FT Project #	20065	Original Scale	NTS	Date	2/18/21	Drawn by	SGT	Figure #	1
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3.0 EXISTING TRAFFIC CONDITIONS

3.1 Study Area and Circulation Network

The study area boundaries took into consideration the amount of traffic to be generated by the project and potential impact to the existing and proposed roadway network.

The existing study area street network consists of arterial, collector and local streets. The primary public roadways that serve the project site are discussed in the following text. Roadway classifications discussed are consistent with the Fort Lupton Transportation Plan¹. The existing study area roadway network is illustrated on **Figure 1**.

State Highway (SH) 52 is a two-lane (future four lane) regional arterial roadway that provides east-west access through Fort Lupton and connects between Weld County to the east and Boulder County to the west. This roadway is categorized by CDOT as a Non-Rural Arterial (NR-B) roadway within the project vicinity. The posted speed limit is 55 miles per hour (mph).

Weld County Road 29.5 is a two-lane collector roadway that provides north-south access between WCR 14 to the north and WCR 12 to the south (a distance of one mile).

3.2 Existing Traffic Volumes

Weekday AM and PM peak period turning-movement were collected at the SH 52 & WCR 29.5 intersection in August 2020. Due to the impacts of the COVID-19 pandemic during this period, these raw counts were factored up to represent normal conditions based on a comparison of pre-COVID (2019) daily roadway volumes and COVID-impacted volumes (2020) contained in the CDOT Traffic Data Management System (TDMS) database. Per the CDOT data, the 2019 (pre-COVID) counts were 15% higher than 2020 data just to the west of this site. In addition, traffic projections specific to the Aims Community College located at the northwest corner of the intersection were added, using ITE trip generation for a community college and existing volume distribution, to represent conditions as if the college were in normal class session and operation.

The existing traffic volumes, including both the raw intersection count data and COVID-adjusted volumes, are illustrated on **Figure 3**. The existing intersection geometry is also shown on the traffic volume figure. Count data sheets are provided in the Appendix.

3.3 Existing Intersection Capacity Analysis

In determining the operational characteristics of an intersection, “Levels of Service” (LOS) A through F are applied, with LOS A indicating very good operations and LOS F indicating congested operations. The intersection LOS is represented as a delay in seconds per vehicle for the intersection as a whole and for each turning movement. A more detailed discussion of

¹ Fort Lupton Transportation Plan. JR Engineering, Houseal Lavigne Assoc., June 2018.

LOS methodology is contained in the Appendix for reference. Criteria contained in the Highway Capacity Manual (HCM)² was applied for these analyses in order to determine existing levels of service and 95th-percentile queues during peak hour periods.

The results of the LOS and queue calculations for the intersections are summarized in **Table 1** for existing conditions (and future background conditions, as discussed in subsequent sections). The intersection level of service and queue worksheets are attached in the Appendix. The data in the tables shows that all study intersections are operating acceptably overall and for individual movements (LOS D or better) in both peak hours.

Table 1 - Intersection LOS Summary (Existing and Future-Year Background)

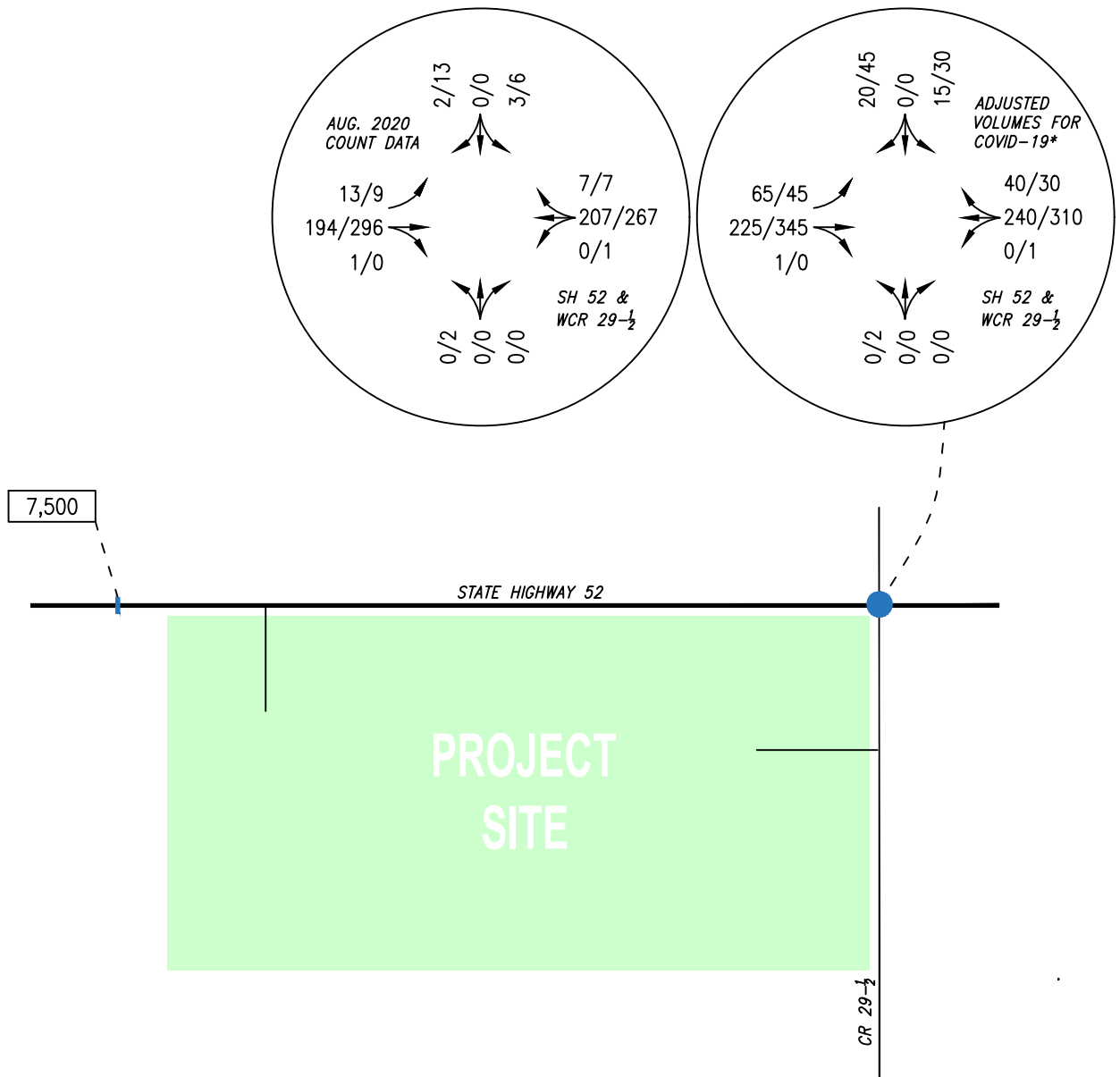
Int.	Lane	Existing (Adjusted*)				Year 2025 Background				Year 2040 Background			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
SH 52 & WCR 29.5 (Stop Controlled)	EB LT	8	A	8	A	8	A	8	A	9	A	9	A
	WB LT+TH+RT	0	A	0	A								
	WB LT					8	A	9	A	8	A	10	A
	NB LT+TH+RT	0	A	0	A	37	E	72	F				
	NB LT									74	F	152	F
	NB TH+RT									13	B	18	C
	SB LT+TH+RT	13	B	17	C	11	B	28	D	23	C	50	F
SH 52 & WCR 29.5 (Signal Controlled)	Overall (Signal)									20	B	20	B
	EB LT	See Stop Controlled Analysis				See Stop Controlled Analysis				11	B	11	B
	EB TH									17	B	18	B
	EB RT									15	B	16	B
	WB LT									14	B	12	B
	WB TH									23	C	20	B
	WB RT									20	B	17	B
	NB LT									23	C	28	C
	NB TH+RT									21	C	25	C
	SB LT+TH+RT									22	C	29	C

* August 2020 counts factored up for COVID-19 travel impacts using CDOT data and Aims CC trip data.

Note: Delay represented in average seconds per vehicle. Delays calculated using Synchro v10 and HCM6 methodology.

² Highway Capacity Manual, Sixth Edition, Transportation Research Board, National Research Council, 2016. Synchro v10 software utilized.

* INCREASES MADE PER CDOT PRE- VS. POST-COVID-19 TRAFFIC PATTERN DISRUPTION FACTORS AND AIMS CC TRIP GEN DATA FOR NORMAL CLASS CONDITIONS



KEY



XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME

FOX TUTTLE

TRANSPORTATION GROUP

MURATA FARMS TRAFFIC IMPACT STUDY
 EXISTING TRAFFIC VOLUMES

FT #	20065	Original Scale	NTS	Date	2/18/21	Drawn by	SGT	Figure #	3
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4.0 FUTURE TRAFFIC CONDITIONS WITHOUT PROJECT

4.1 Annual Growth Factor and Future Volume Methodology

Potential for background (non-project) traffic growth in the project vicinity was considered based on CDOT traffic projections, the City Transportation Plan projections, and planned development within the project vicinity. Based on the CDOT 20-year growth data, a 2.66% annual background growth rate was applied to existing volumes within the study area to project to future years. In addition, traffic projections specific to the following developments were added at the SH 52 & WCR 29.5 intersection, per the noted documents:

- Mountain Sky – 200 single-family residential units, located directly south of the project³
- Villagio Classical – 81 single-family residential units + gas-station/convenience store, located to the south and east of the project (east side of WCR 29.5)⁴

The Murata Farms project is anticipated to be fully built and occupied within the next 5 years. Thus, the Year 2025 planning horizon was assumed for the build-out or “opening day” scenario, with Year 2040 as the long-term planning scenario. It was assumed that both of the adjacent developments discussed above would be also built out and occupied within this timeframe. Using the above growth rates and adjacent development projections, the projected Year 2025 background traffic volumes are provided on **Figure 4** with the projected Year 2040 background traffic volumes on **Figure 5**.

4.2 Future Year Background (without Project) Capacity Analysis

The level of service criteria discussed Section 3.3 was applied to the study area intersections to determine baseline operations for the Year 2025 and Year 2040 background traffic scenarios. The results of the LOS calculations are summarized on **Table 1** on the previous page. The intersection level of service and queue worksheets are attached in the Appendix.

Consistent with the recommendations of the Mountain Sky Traffic Impact Study, it was assumed that an eastbound right-turn deceleration and westbound left-turn deceleration would be built at the SH 52 & WCR 29.5 intersection to support that development and would be in place for the Year 2025 background scenario.

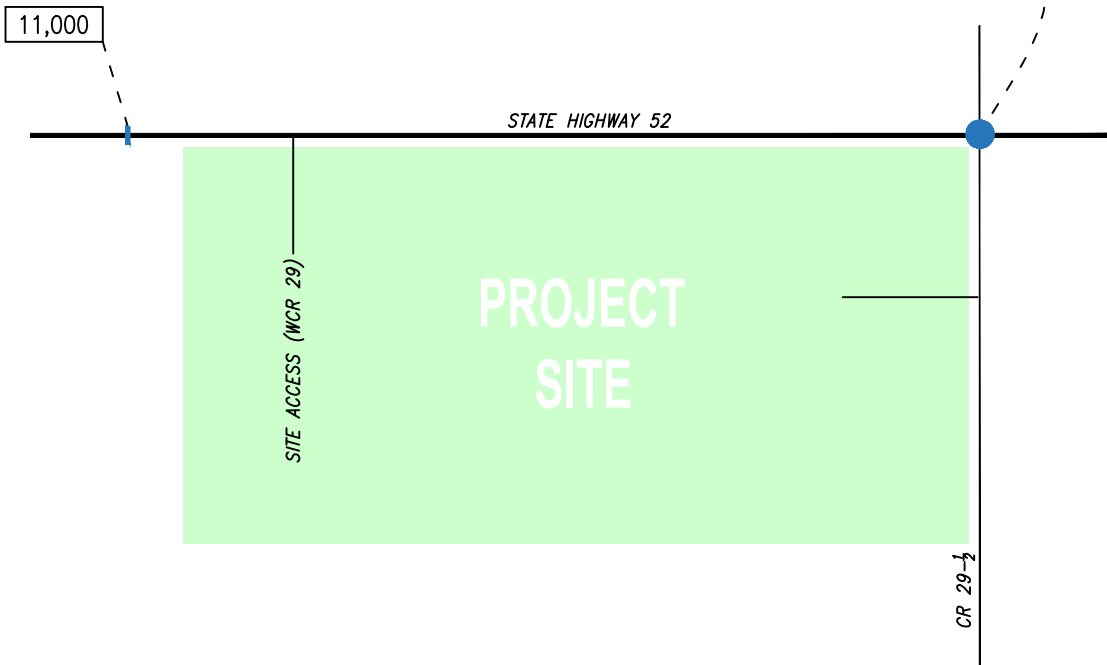
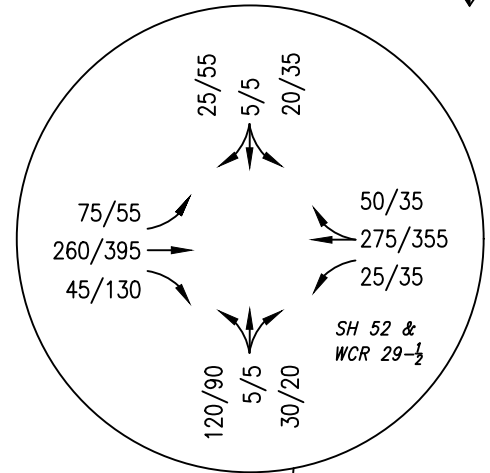
The data on **Table 1** shows that the SH 52 & WCR 29.5 intersection is projected to operate acceptably for individual movements (LOS D or better) in both peak hours, with the exception of the northbound approach on WCR 29.5 (LOS E in AM and LOS F in PM). A peak hour signal warrant analysis (discussed later in this report) shows that the intersection would likely meet signal warrant volume thresholds in the PM peak hour and signalization would be needed to mitigate these delays in the short-term, background planning horizon.

³ Mountain Sky Traffic Impact Study, Aldridge Transportation Consultants, March 2016

⁴ Trip Generation Estimate for the Villagio Classical Development in Fort Lupton, Sustainable Traffic Solutions, July 2019.

KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME



FOX TUTTLE

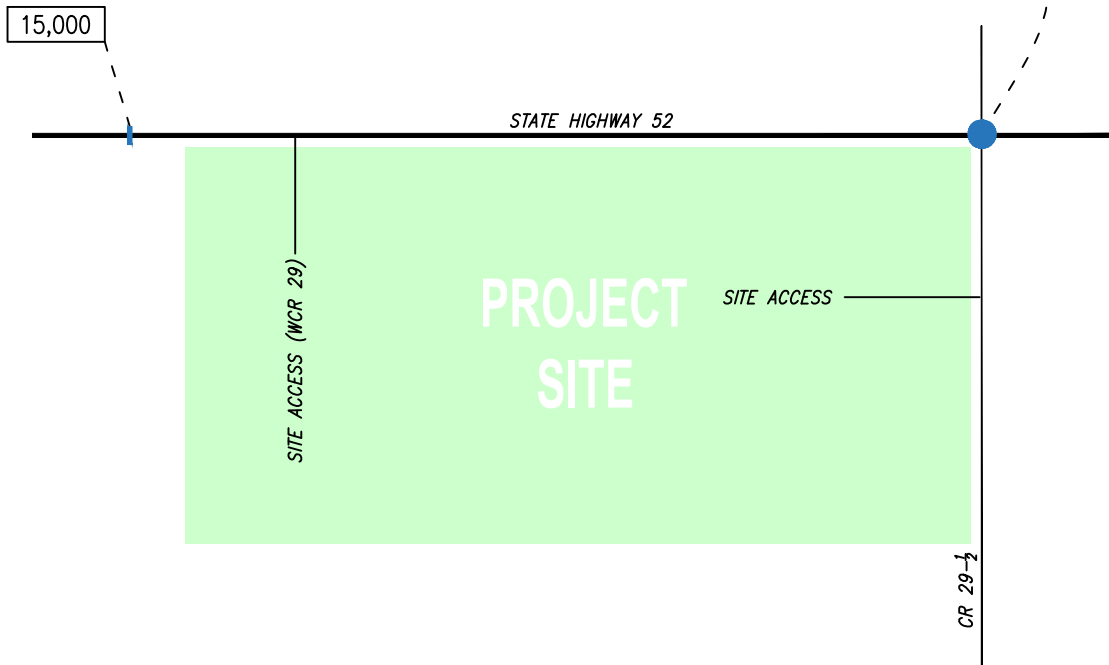
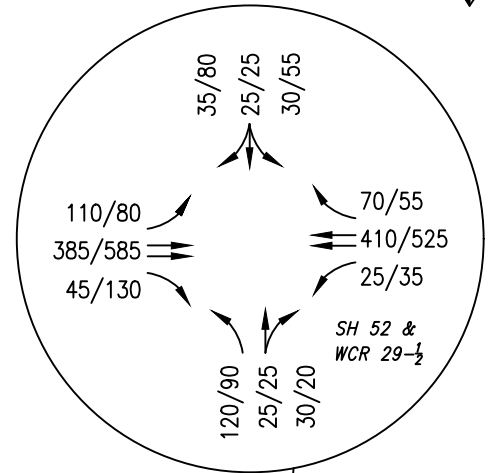
TRANSPORTATION GROUP

MURATA FARMS TRAFFIC IMPACT STUDY YEAR 2025 BACKGROUND TRAFFIC VOLUMES

FT #	20065	Original Scale	NTS	Date	2/18/21	Drawn by	SGT	Figure #	4
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KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME



5.0 PROPOSED DEVELOPMENT TRAFFIC

5.1 Trip Generation

In order to estimate the anticipated volume of trips generated by the site at build-out, trip rates contained in the Institute of Transportation Engineers (ITE) Trip Generation manual⁵ for the appropriate land use categories were applied. For the retail development, a gas station, fast casual restaurant, and general retail use were assumed. The resulting existing trip estimates for each parcel are summarized on **Table 2** on the following page.

As shown, the initial 181-unit development is anticipated to generate approximately 1,709 daily, 134 AM peak hour, and 179 PM peak hour trips. The future paired/attached homes and retail development would add an additional 4,454 daily, 223 AM peak hour, and 325 PM peak hour trips at full buildout.

A portion of the retail trips will be “pass-by” trips, which are trips that are already occurring on the adjacent roadway (going to and from places not part of this site) but are diverted into the site. An example of a pass-by trip for this site would be someone who stops at the gas station on site while driving SH 52 to or from work. Pass-by rates were assumed based on ITE averages. These trips are thus not “new” trips to the external roadway system but do count as new trips to the site driveways and internal roadways. The breakdown of primary vs. pass-by trips is provided on **Table 3**.

5.2 Trip Distribution and Assignment

The estimated trip volumes were distributed onto the study area street network based on existing traffic characteristics and land uses in the area. The overall assumed distribution percentages are listed below:

- 65% to/from the west on SH 52
- 15% to/from the east on SH 52
- 10% to/from the north on WCR 29.5
- 10% to/from the south on WCR 29.5

At the intersection level, the retail trips (primary and pass-by) are anticipated to have primary access from the SH 52 intersection at WCR 29.5 and the residential trips would also be oriented to/from the ¾-movement access along SH 52.

⁵ Trip Generation 10th Edition, Institute of Transportation Engineers, 2016.

Table 2 – Trip Generation Estimate

Land Use	Size	Unit	Average Weekday Trips		Weekday AM Peak Hour Trips				Weekday PM Peak Hour Trips			
			Rate	Total	Rate	Total	In	Out	Rate	Total	In	Out
#210 Single Family Detached Homes	181	D.U.	9.44	1709	0.74	134	34	100	0.99	179	113	66
#210 Single Family Detached Homes - Paired Homes	58	D.U.	9.44	548	0.74	43	11	32	0.99	57	36	21
#210 Single Family Detached Homes - Attached	61	D.U.	9.44	576	0.74	45	11	34	0.99	60	38	22
#820 Shopping Center	3.5	1,000 SF	37.75	119	0.94	3	2	1	3.81	12	6	6
#930 Fast Casual Restaurant	3.5	1,000 SF	315.17	993	2.07	7	5	2	14.13	45	25	20
#945 Gasoline/Service Station with Convenience	12.0	vfp ⁽¹⁾	205.36	2218	12.47	135	69	66	13.99	151	77	74
Total				6163		367	132	235		504	295	209

Source: ITE Trip Generation Handbook, 10th Edition (2017).

⁽¹⁾ Vehicle fueling positions (vfp)

Table 3 – Trip Type Breakdown

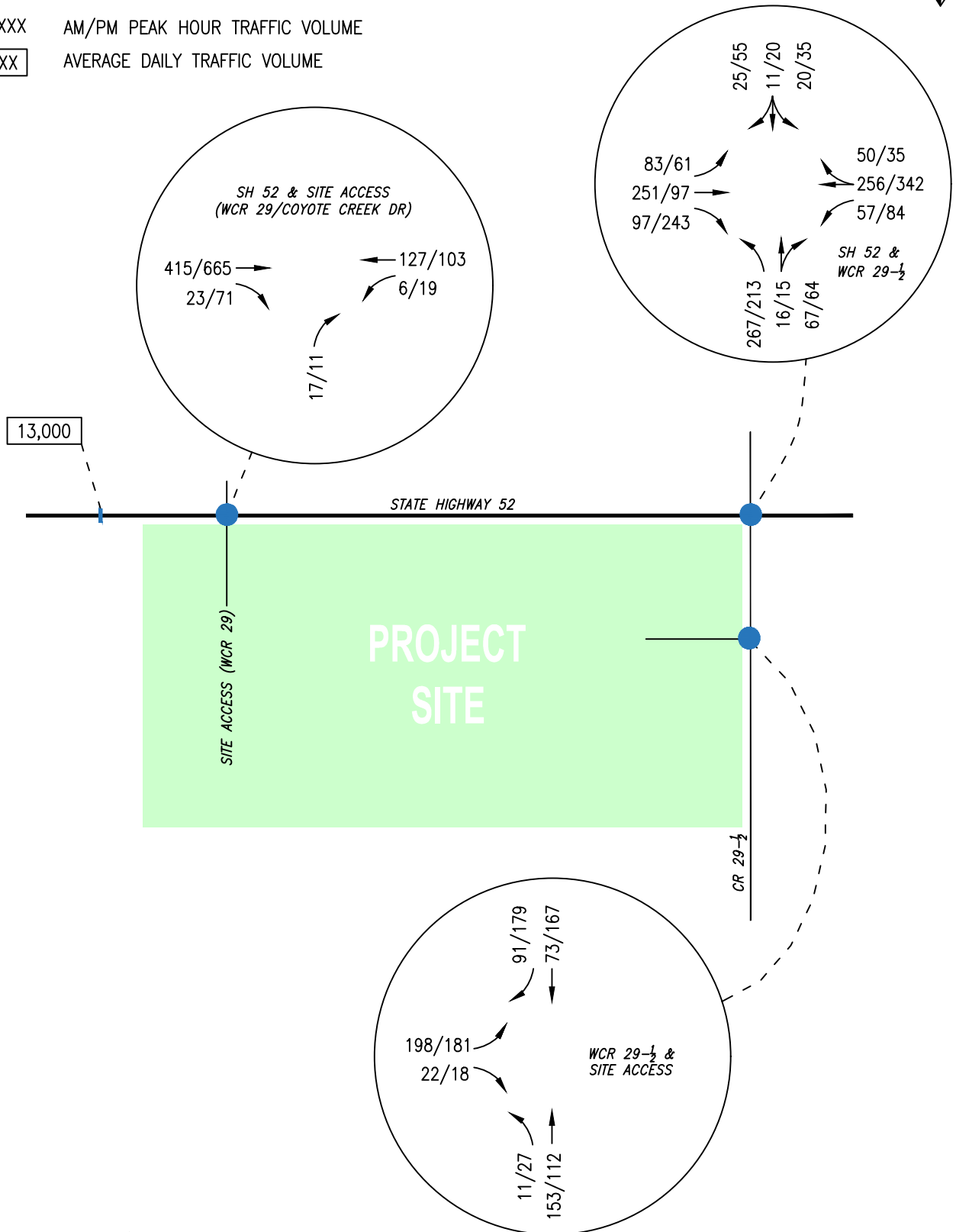
Land Use	Trip Type % ⁽¹⁾				PRIMARY Trips						PASS-BY Trips					
	AM Primary	AM Pass-By	PM Primary	PM Pass-By	Daily In	Daily Out	AM In	AM Out	PM In	PM Out	Daily In	Daily Out	AM In	AM Out	PM In	PM Out
#210 Single Family Detached Homes	100%	0%	100%	0%	855	855	34	100	113	66	0	0	0	0	0	0
#210 Single Family Detached Homes - Paired Homes	100%	0%	100%	0%	274	274	11	32	36	21	0	0	0	0	0	0
#210 Single Family Detached Homes - Attached	100%	0%	100%	0%	288	288	11	34	38	22	0	0	0	0	0	0
#820 Shopping Center	100%	0%	66%	34%	49	49	2	1	4	4	10	10	0	0	2	2
#930 Fast Casual Restaurant	100%	0%	57%	43%	390	390	5	2	14	11	107	107	0	0	11	9
#945 Gasoline/Service Station with Convenience	38%	62%	44%	56%	455	455	26	25	34	33	654	654	43	41	43	41
TOTAL					2310	2310	89	194	239	157	771	771	43	41	56	52

Source: ITE Trip Generation Handbook, 10th Edition (2017).

⁽¹⁾ Supported by ITE average data for each land use or comparable land use.⁽²⁾ Pass-by percentages not available for #932 Fast Casual Restaurant; #932 High Turnover Restaurant utilized.

KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME



6.0 FUTURE TRAFFIC CONDITIONS WITH PROJECT

This analysis has been conducted in order to determine impacts associated with full development and occupancy of the project in the short-term (build-out) and long-term scenarios.

6.1 Intersection Capacity Analysis for Year 2025 + Project Scenario

The site-generated traffic volumes were added to the Year 2025 background traffic volumes to analyze potential site impacts in the short-term, build-out scenario. The Year 2025 total traffic volumes are illustrated on **Figure 7**. The LOS criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of project build-out traffic volumes in the short-term. The results of the LOS calculations for the intersections are summarized for each scenario in **Table 4**. The intersection LOS worksheets are attached in the Appendix.

Per the discussion in Section 4.2 a traffic signal is warranted and necessary to mitigate delays associated with buildout of the adjacent Mountain Sky and Villagio Classical developments and thus a traffic signal is assumed to be installed with initial development of Murata Farms for this scenario. In addition, eastbound right-turn and westbound left-turn lanes on SH 52 are assumed to be in place, as warranted by the Mountain Sky development and would be warranted by the Murata Farms project on it's own, with the installation of these lanes by whichever development is developed first. Based on the projected volumes and operations, a separate northbound left-turn lane on WCR 29.5 approaching SH 52 was also assumed.

The data contained in **Table 4** illustrates that the study area intersections and proposed accesses will operate acceptably with the addition of project traffic at build-out in the short-term, build out scenario, with the improvements discussed above in place. With these improvements in place, **no additional mitigation measures were identified as necessary to support project added traffic in the short-term planning horizon.**

6.2 Intersection Capacity Analysis for Year 2040 + Project Scenario

The site-generated traffic volumes were added to the Year 2040 background traffic volumes to analyze potential site impacts in the long-term, build-out scenario. The Year 2040 total traffic volumes are illustrated on **Figure 8**. The LOS criteria discussed in prior sections was applied to the study area intersections to determine impacts with the addition of project build-out traffic volumes in the long-term. The results of the LOS calculations for the intersections are summarized for each scenario in **Table 4**. The intersection LOS worksheets are attached.

The data contained in **Table 4** illustrates that the study area intersections and proposed accesses will operate acceptably with the addition of project traffic at build-out in the long-term. Other than the improvements detailed in Section 6.1, **no additional mitigation measures were identified as necessary to support project added traffic in the long-term planning horizon.**

KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME

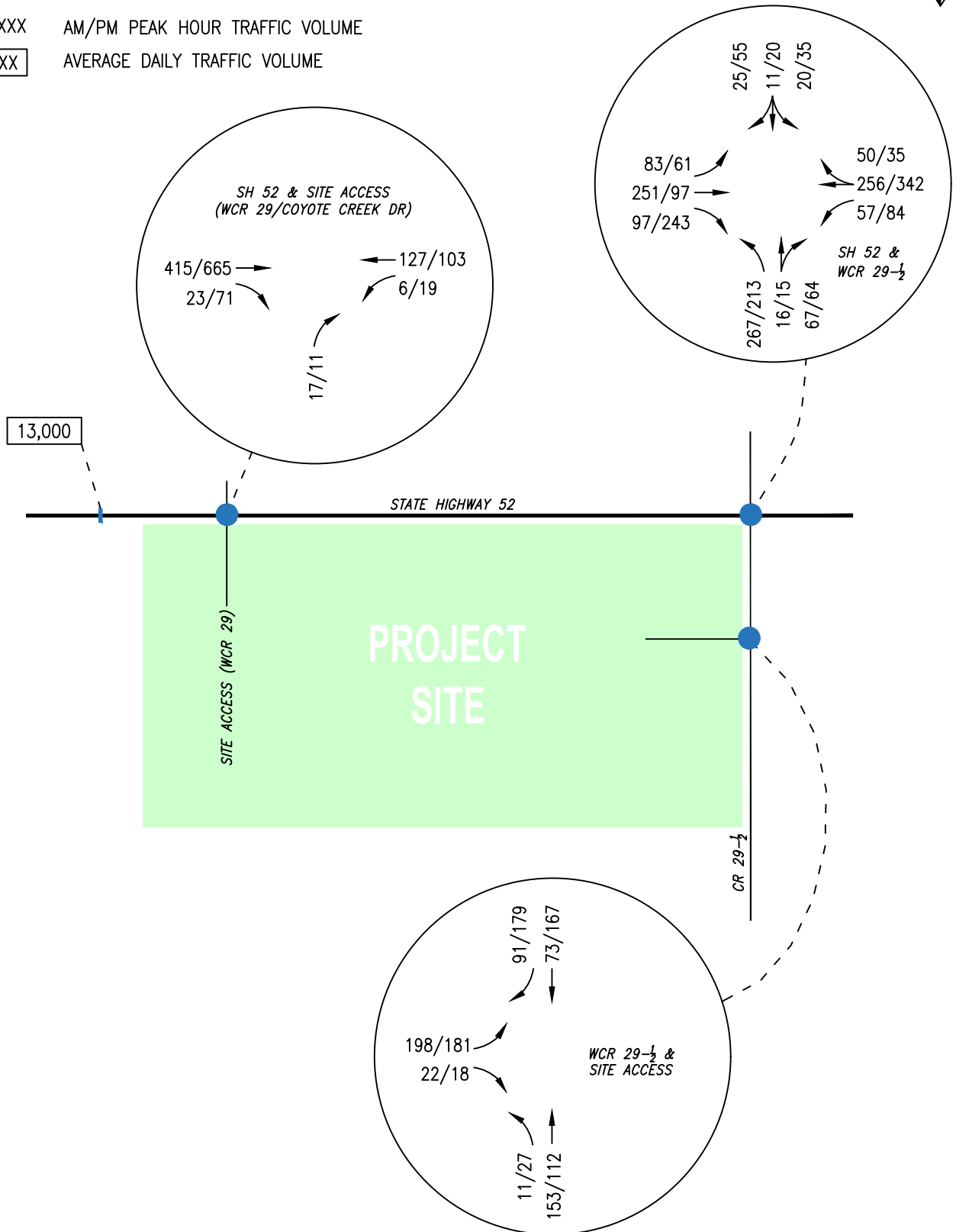


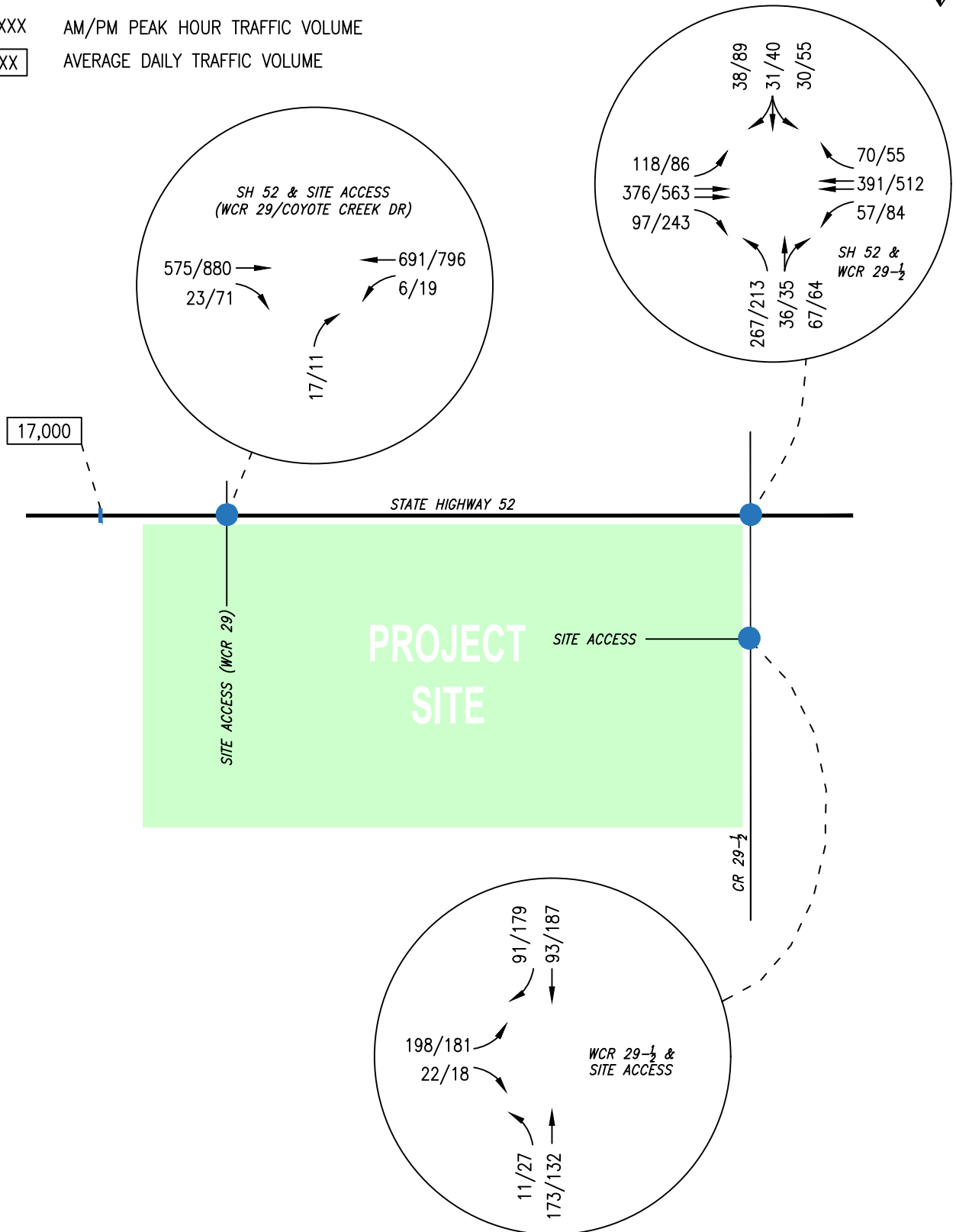
Table 4 - Intersection LOS Summary (w/Project Build Out)

Int.	Lane	Year 2025 w/Project Build Out				Year 2040 w/Project Build Out			
		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
SH 52 & WCR 29.5 (Signal Controlled)	Overall (Signal)	21	C	21	C	21	C	21	C
	EB LT	14	B	13	B	14	B	13	B
	EB TH	18	B	19	B	18	B	18	B
	EB RT	16	B	18	B	17	B	19	B
	WB LT	14	B	13	B	14	B	13	B
	WB TH+RT	21	C	19	B				
	WB TH					19	B	17	B
	WB RT					18	B	14	B
	NB LT	27	C	30	C	39	D	31	C
	NB TH+RT	20	B	22	C	21	C	22	C
	SB LT+TH+RT	31	C	34	C	33	C	39	D
SH 52 & Site Access	NB LT	11	B	14	B	10	A	12	B
	WB LT	8	A	10	A	9	A	11	B
WCR 29.5 & Site Access	EB LT	13	B	14	B	14	B	15	B
	EB RT	9	A	9	A	9	A	10	A
	NB LT	8	A	8	A	8	A	8	A

Note: Delay represented in average seconds per vehicle. Delays calculated using Synchro v10 and HCM6 methodology.

KEY

XXX/XXX AM/PM PEAK HOUR TRAFFIC VOLUME
 XX,XXX AVERAGE DAILY TRAFFIC VOLUME



FOX TUTTLE

TRANSPORTATION GROUP

MURATA FARMS TRAFFIC IMPACT STUDY YEAR 2025 TOTAL TRAFFIC VOLUMES

FT #	20065	Original Scale	NTS	Date	2/18/21	Drawn by	SGT	Figure #	8
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6.3 Site Access and Circulation

The project proposes the following access points and configurations:

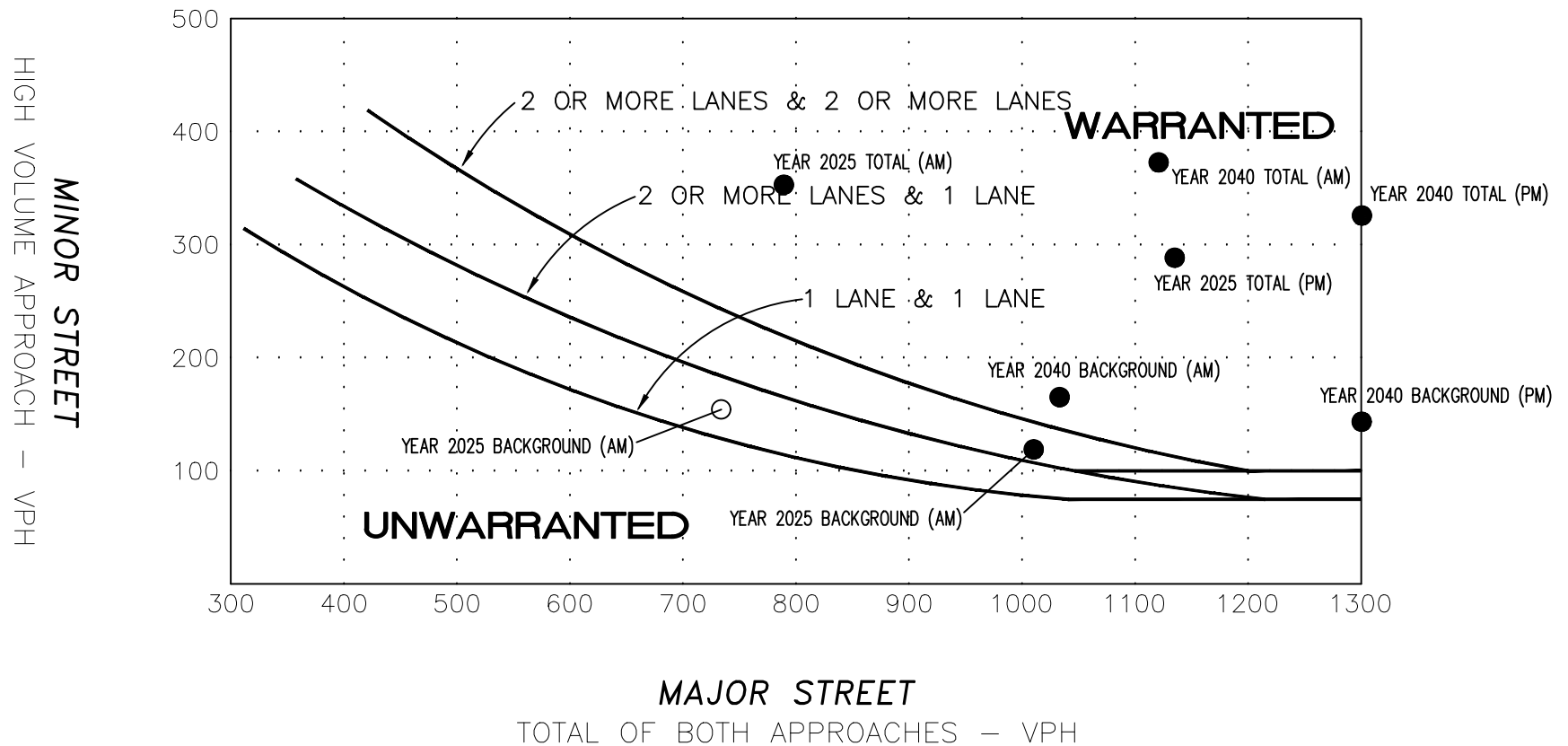
- 1) **¾-Access along SH 52.** This access point is located approximately 2,275 feet east of WCR 29.5 and is proposed as a ¾-access restriction at build out, with no left-turns permitted onto SH 52. Left-turns from westbound SH 52 into the site would be allowed with a left-turn deceleration built to CDOT Access Code criteria (600' total lane length inclusive of a 18.5:1 bay taper).
- 2) **Full-movement access along WCR 29.5.** This access point is located approximately 575' south of SH 52. Based on the build out traffic analysis, the project should build this access to include a northbound left-turn deceleration lane on WCR 29.5 and a southbound right-turn deceleration lane on WCR 29.5.
- 3) **Neighborhood Interconnectivity.** The project proposes an extension of Silverado Lane to the west and connection via an internal, north-south collector roadway to Mountain Sky to the south. Neither connection would be anticipated to service a significant volume of trips from the adjacent developments given more direct options via the surrounding roadway network (i.e.: WCR 29.5, WCR 12 and Purman Ave.). However, provision of the connections allows for trip choices, walking/biking connections, and internal trips without using the external roadway network.
- 4) **SH 52 & WCR 29.5 Auxiliary Lane Improvements.** The project will warrant the need for an eastbound right-turn deceleration lane and westbound left-turn deceleration lane on SH 52 at WCR 29.5 (both lanes 600' total lane length inclusive of a 18.5:1 taper per CDOT Access Code criteria). The Mountain Sky project was also shown to warrant these lanes; thus, whichever project is developed first may be required to install these lanes, and the developers may seek to share the cost of these improvements. The Villagio Classical development would also contribute traffic to this need. In addition, the project would warrant an eastbound right-turn deceleration lane on SH 52 at WCR 29.5 (960' total length inclusive of an 18.5:1 taper) at full buildout with the other two developments built and full occupied. All three developments will create this need together, while none would warrant this improvement individually.
- 5) **SH 52 & WCR 29.5 Traffic Signal.** MUTCD Peak Hour signal warrant analysis was performed as a planning-level assessment of the need for a signal with each scenario and planning horizon. The warrant analysis is summarized on **Figure 9**. This analysis shows that a signal would be warranted either with full development of both the Mountain Sky and Villagio Classical developments (in the Year 2025 background PM peak hour) or with build out of the full Murata Farms project. In interim years, with only partial buildout of these developments, a signal warrant may not yet be met. Thus, the timing of the need for a signal will be a moving target based on rate of development for each project. With respect to a potential cost-share/responsibility assessment, at full build out the Murata Farms project would generate approximately 50% of the projected

traffic volume to the northbound approach which would dictate the need for this traffic signal.

Pedestrian and bicycle traffic is anticipated to be accommodated via the internal roadway network and system of sidewalks built per City standard cross-sections. Connectivity to the existing neighborhood to the west and future residential to the south will be provided, as well.

PEAK HOUR VOLUME WARRANT

(COMMUNITY LESS THAN 10,000 POPULATION
OR ABOVE 40 MPH ON MAJOR STREET)



NOTE: 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES
AND 75 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

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TRANSPORTATION GROUP

MURATA FARMS TRAFFIC IMPACT STUDY
PEAK HOUR SIGNAL WARRANT

FT Project #	20065	Original Scale	NTS	Date	2/18/21	Drawn by	SGT	Figure #	9
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7.0 CONCLUSIONS

This traffic impact study has been prepared by the Fox Tuttle Transportation Group for the Murata Farms mixed project. The project proposes to develop 300 single-family residences and a ±2.4-acre retail parcel with 181 residential uses with initial development. The project site is located at the southwest corner of the SH 52 and WCR 29.5 intersection. Access is proposed via a new $\frac{3}{4}$ -access located along SH 52 approximately 2,275' west of WCR 29.5 and a new full-movement access along WCR 29.5 located approximately 575' south of SH 52. The purpose of this study is to assist in identifying potential traffic impacts within the study area with buildout of this project in the short and long-term scenarios. The traffic study addresses AM and PM peak hour intersection conditions in the study area without and with the project added traffic.

The project is anticipated to generate a total of approximately 6,163 daily, 367 AM peak hour and 504 PM peak hour driveway trips at full build-out and occupancy. It was determined that the project-added traffic can be accommodated on the existing and future roadway and intersection network with minimal impacts.

The following improvements are recommended to be implemented by the project to service project-added traffic:

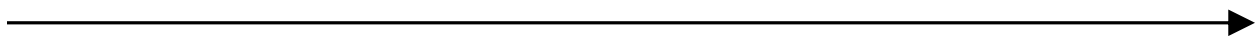
- Construct an eastbound right-turn deceleration lane and westbound left-turn deceleration lane on SH 52 at the proposed $\frac{3}{4}$ -movement access (both lanes 600' total lane length inclusive of a 18.5:1 taper per CDOT Access Code criteria).
- If not already constructed by adjacent development, which also warrants this need, construct (or share in the cost of) an eastbound right-turn deceleration lane and westbound left-turn deceleration lane on SH 52 at WCR 29.5 (both lanes 600' total lane length inclusive of a 18.5:1 taper per CDOT Access Code criteria).
- Construct, or share in the cost of, an eastbound right-turn acceleration lane on SH 52 at WCR 29.5 (960' total length inclusive of an 18.5:1 taper per CDOT Access Code criteria)
- Construct, or share in the cost of, a traffic signal at the SH 52 & WCR 29.5 intersection. The Murata Farms project would generate approximately 50% of the projected traffic volume to the northbound approach which would dictate the need for this traffic signal.
- Depending upon the rate of development of this and other, adjacent project, these improvements may be phased or tied to specific triggers (i.e.: development of initial residential, later shared home and attached residential, or development of the retail uses.

APPENDIX

Level of Service Definitions
Intersection Capacity Worksheets
Traffic Count Data Sheets



Level of Service Definitions



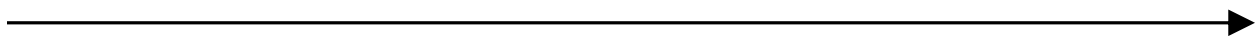
LEVEL OF SERVICE DEFINITIONS

In rating roadway and intersection operating conditions with existing or future traffic volumes, “Levels of Service” (LOS) A through F are used, with LOS A indicating very good operation and LOS F indicating poor operation. Levels of service at signalized and unsignalized intersections are closely associated with vehicle delays experienced in seconds per vehicle. More complete level of service definitions and delay data for signal and stop sign controlled intersections are contained in the following table for reference.

Level of Service Rating	Delay in seconds per vehicle (a)		Definition
	Signalized	Unsignalized	
A	0.0 to 10.0	0.0 to 10.0	Low vehicular traffic volumes; primarily free flow operations. Density is low and vehicles can freely maneuver within the traffic stream. Drivers are able to maintain their desired speeds with little or no delay.
B	10.1 to 20.0	10.1 to 15.0	Stable vehicular traffic volume flow with potential for some restriction of operating speeds due to traffic conditions. Vehicle maneuvering is only slightly restricted. The stopped delays are not bothersome and drivers are not subject to appreciable tension.
C	20.1 to 35.0	15.1 to 25.0	Stable traffic operations, however the ability for vehicles to maneuver is more restricted by the increase in traffic volumes. Relatively satisfactory operating speeds prevail, but adverse signal coordination or longer vehicle queues cause delays along the corridor.
D	35.1 to 55.0	25.1 to 35.0	Approaching unstable vehicular traffic flow where small increases in volume could cause substantial delays. Most drivers are restricted in ability to maneuver and selection of travel speeds due to congestion. Driver comfort and convenience are low, but tolerable.
E	55.1 to 80.0	35.1 to 50.0	Traffic operations characterized by significant approach delays and average travel speeds of one-half to one-third the free flow speed. Vehicular flow is unstable and there is potential for stoppages of brief duration. High signal density, extensive vehicle queuing, or corridor signal progression/timing are the typical causes of vehicle delays at signalized corridors.
F	> 80.0	> 50.0	Forced vehicular traffic flow and operations with high approach delays at critical intersections. Vehicle speeds are reduced substantially, and stoppages may occur for short or long periods of time because of downstream congestion.

(a) Delay ranges based on Highway Capacity Manual (6th Edition, 2016) criteria.

Intersection Capacity Worksheets



Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	65	225	5	0	240	40	0	0	0	15	0	20
Future Vol, veh/h	65	225	5	0	240	40	0	0	0	15	0	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	320	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	92	92	92	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	81	281	6	0	261	43	0	0	0	20	0	27
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	304	0	0	287	0	0	742	750	284	729	732	283
Stage 1	-	-	-	-	-	-	446	446	-	283	283	-
Stage 2	-	-	-	-	-	-	296	304	-	446	449	-
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	1257	-	-	1275	-	-	332	340	755	338	348	756
Stage 1	-	-	-	-	-	-	591	574	-	724	677	-
Stage 2	-	-	-	-	-	-	712	663	-	591	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1257	-	-	1275	-	-	304	318	755	321	326	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	304	318	-	321	326	-
Stage 1	-	-	-	-	-	-	553	537	-	678	677	-
Stage 2	-	-	-	-	-	-	687	663	-	553	535	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0			0			13.3		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	-	1257	-	-	1275	-	-	478				
HCM Lane V/C Ratio	-	0.065	-	-	-	-	-	0.098				
HCM Control Delay (s)	0	8.1	-	-	0	-	-	13.3				
HCM Lane LOS	A	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	0.3				

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	345	0	1	310	30	2	0	0	30	0	45
Future Vol, veh/h	45	345	0	1	310	30	2	0	0	30	0	45
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	320	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	81	81	81	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	375	0	1	383	37	3	0	0	40	0	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	420	0	0	375	0	0	907	895	375	877	877	402
Stage 1	-	-	-	-	-	-	473	473	-	404	404	-
Stage 2	-	-	-	-	-	-	434	422	-	473	473	-
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	1139	-	-	1183	-	-	257	280	671	269	287	648
Stage 1	-	-	-	-	-	-	572	558	-	623	599	-
Stage 2	-	-	-	-	-	-	600	588	-	572	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1139	-	-	1183	-	-	225	268	671	260	274	648
Mov Cap-2 Maneuver	-	-	-	-	-	-	225	268	-	260	274	-
Stage 1	-	-	-	-	-	-	547	534	-	596	598	-
Stage 2	-	-	-	-	-	-	544	587	-	547	534	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1			0			21.2			16.7		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	225	1139	-	-	1183	-	-	406
HCM Lane V/C Ratio	0.012	0.043	-	-	0.001	-	-	0.246
HCM Control Delay (s)	21.2	8.3	-	-	8	0	-	16.7
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	1

Intersection												
Int Delay, s/veh	7.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	260	45	25	275	50	120	5	30	20	5	25
Future Vol, veh/h	75	260	45	25	275	50	120	5	30	20	5	25
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	320	-	375	375	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	82	283	49	27	299	54	141	6	35	24	6	29
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	353	0	0	332	0	0	845	854	283	872	876	326
Stage 1	-	-	-	-	-	-	447	447	-	380	380	-
Stage 2	-	-	-	-	-	-	398	407	-	492	496	-
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	1206	-	-	1227	-	-	283	296	756	271	287	715
Stage 1	-	-	-	-	-	-	591	573	-	642	614	-
Stage 2	-	-	-	-	-	-	628	597	-	558	545	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1206	-	-	1227	-	-	249	270	756	237	261	715
Mov Cap-2 Maneuver	-	-	-	-	-	-	249	270	-	237	261	-
Stage 1	-	-	-	-	-	-	551	534	-	598	600	-
Stage 2	-	-	-	-	-	-	583	584	-	490	508	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.6			31.1			16.9		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	249	601	1206	-	-	1227	-	-	361			
HCM Lane V/C Ratio	0.567	0.069	0.068	-	-	0.022	-	-	0.163			
HCM Control Delay (s)	36.8	11.4	8.2	-	-	8	-	-	16.9			
HCM Lane LOS	E	B	A	-	-	A	-	-	C			
HCM 95th %tile Q(veh)	3.2	0.2	0.2	-	-	0.1	-	-	0.6			

Intersection												
Int Delay, s/veh	9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	395	130	55	355	35	90	5	20	35	5	55
Future Vol, veh/h	55	395	130	55	355	35	90	5	20	35	5	55
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	320	-	375	375	-	-	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	60	429	141	60	386	38	106	6	24	41	6	65
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	424	0	0	570	0	0	1110	1093	429	1160	1215	405
Stage 1	-	-	-	-	-	-	549	549	-	525	525	-
Stage 2	-	-	-	-	-	-	561	544	-	635	690	-
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	1135	-	-	1002	-	-	187	214	626	172	181	646
Stage 1	-	-	-	-	-	-	520	516	-	536	529	-
Stage 2	-	-	-	-	-	-	512	519	-	467	446	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1135	-	-	1002	-	-	150	190	626	148	161	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	150	190	-	148	161	-
Stage 1	-	-	-	-	-	-	492	489	-	508	497	-
Stage 2	-	-	-	-	-	-	428	488	-	421	422	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			1.1			59.7			27.6		
HCM LOS							F			D		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	150	429	1135	-	-	1002	-	-	269			
HCM Lane V/C Ratio	0.706	0.069	0.053	-	-	0.06	-	-	0.415			
HCM Control Delay (s)	72.4	14	8.3	-	-	8.8	-	-	27.6			
HCM Lane LOS	F	B	A	-	-	A	-	-	D			
HCM 95th %tile Q(veh)	4.1	0.2	0.2	-	-	0.2	-	-	1.9			

Timings
1: CR 29.5 & SH 52

Year 2025 w/Project
AM

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	83	251	97	57	256	267	16	20	11
Future Volume (vph)	83	251	97	57	256	267	16	20	11
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	11.0	43.0	43.0	10.0	42.0	14.0	37.0	23.0	23.0
Total Split (%)	12.2%	47.8%	47.8%	11.1%	46.7%	15.6%	41.1%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	Max	C-Max	C-Max	Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	45.0	38.5	38.5	43.0	37.5	32.5	32.5		18.5
Actuated g/C Ratio	0.50	0.43	0.43	0.48	0.42	0.36	0.36		0.21
v/c Ratio	0.19	0.34	0.14	0.12	0.43	0.63	0.15		0.20
Control Delay	11.2	18.8	2.5	10.7	20.1	29.4	7.2		19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	11.2	18.8	2.5	10.7	20.1	29.4	7.2		19.8
LOS	B	B	A	B	C	C	A		B
Approach Delay		13.7			18.6		24.1		19.8
Approach LOS		B			B		C		B

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 18.7

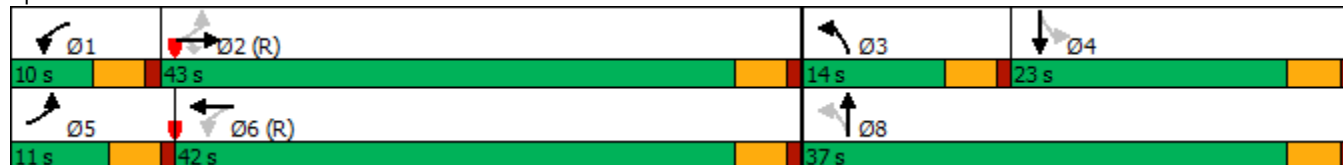
Intersection LOS: B

Intersection Capacity Utilization 53.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

Year 2025 w/Project
AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	251	97	57	256	50	267	16	67	20	11	28
Future Volume (veh/h)	83	251	97	57	256	50	267	16	67	20	11	28
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	90	273	105	62	278	54	314	19	79	24	13	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	509	800	678	520	634	123	583	114	475	139	84	151
Arrive On Green	0.07	0.43	0.43	0.06	0.42	0.42	0.11	0.36	0.36	0.21	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1522	296	1781	317	1317	413	409	733
Grp Volume(v), veh/h	90	273	105	62	0	332	314	0	98	70	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1817	1781	0	1633	1556	0	0
Q Serve(g_s), s	2.4	8.8	3.7	1.7	0.0	11.7	9.5	0.0	3.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.4	8.8	3.7	1.7	0.0	11.7	9.5	0.0	3.7	3.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.16	1.00		0.81	0.34		0.47
Lane Grp Cap(c), veh/h	509	800	678	520	0	757	583	0	590	373	0	0
V/C Ratio(X)	0.18	0.34	0.15	0.12	0.00	0.44	0.54	0.00	0.17	0.19	0.00	0.00
Avail Cap(c_a), veh/h	509	800	678	520	0	757	583	0	590	373	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.2	17.3	15.8	13.1	0.0	18.7	24.4	0.0	19.5	29.6	0.0	0.0
Incr Delay (d2), s/veh	0.8	1.2	0.5	0.5	0.0	1.8	3.6	0.0	0.6	1.1	0.0	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	0.9	3.5	1.3	0.6	0.0	4.7	5.8	0.0	1.4	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	18.4	16.3	13.5	0.0	20.6	27.9	0.0	20.1	30.7	0.0	0.0
LnGrp LOS	B	B	B	B	A	C	C	A	C	C	A	A
Approach Vol, veh/h		468			394			412			70	
Approach Delay, s/veh		17.1			19.5			26.1			30.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	43.0	14.0	23.0	11.0	42.0		37.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	38.5	9.5	18.5	6.5	37.5		32.5				
Max Q Clear Time (g_c+I1), s	3.7	10.8	11.5	5.0	4.4	13.7		5.7				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.2	0.0	1.7		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			21.2									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	415	23	6	546	0	17
Future Vol, veh/h	415	23	6	546	0	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	-	375	375	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	451	25	7	593	0	20
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	476	0	-	451
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	1086	-	0	608
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1086	-	-	608
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		11.1	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	608	-	-	1086	-	
HCM Lane V/C Ratio	0.033	-	-	0.006	-	
HCM Control Delay (s)	11.1	-	-	8.3	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Intersection						
Int Delay, s/veh	5.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	198	22	11	153	73	92
Future Vol, veh/h	198	22	11	153	73	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	60	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	233	26	13	180	86	108
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	292	86	194	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	206	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	699	973	1379	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	693	973	1379	-	-	-
Mov Cap-2 Maneuver	693	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.4	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1379	-	693	973	-	-
HCM Lane V/C Ratio	0.009	-	0.336	0.027	-	-
HCM Control Delay (s)	7.6	-	12.8	8.8	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	1.5	0.1	-	-

Timings
1: CR 29.5 & SH 52

Year 2025 w/Project
PM

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	61	373	243	84	342	213	15	35	20
Future Volume (vph)	61	373	243	84	342	213	15	35	20
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6	3	8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	3	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	10.0	45.0	45.0	11.0	46.0	11.0	34.0	23.0	23.0
Total Split (%)	11.1%	50.0%	50.0%	12.2%	51.1%	12.2%	37.8%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	Max	C-Max	C-Max	Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	46.0	40.5	40.5	48.0	41.5	29.5	29.5		18.5
Actuated g/C Ratio	0.51	0.45	0.45	0.53	0.46	0.33	0.33		0.21
v/c Ratio	0.15	0.48	0.31	0.20	0.48	0.66	0.16		0.39
Control Delay	9.6	19.8	3.0	9.9	18.8	34.1	8.1		22.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	9.6	19.8	3.0	9.9	18.8	34.1	8.1		22.0
LOS	A	B	A	A	B	C	A		C
Approach Delay		12.9			17.2		27.1		22.0
Approach LOS		B			B		C		C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.66

Intersection Signal Delay: 17.7

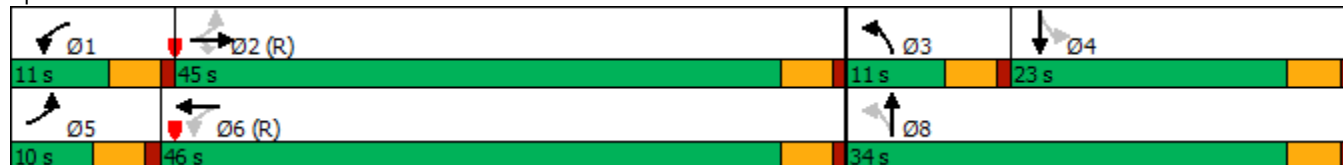
Intersection LOS: B

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

Year 2025 w/Project
PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	373	243	84	342	35	213	15	64	35	20	64
Future Volume (veh/h)	61	373	243	84	342	35	213	15	64	35	20	64
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	66	405	264	91	372	38	251	18	75	41	24	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	488	842	713	437	770	79	473	104	432	121	81	173
Arrive On Green	0.06	0.45	0.45	0.07	0.46	0.46	0.07	0.33	0.33	0.21	0.21	0.21
Sat Flow, veh/h	1781	1870	1585	1781	1669	171	1781	316	1317	335	395	843
Grp Volume(v), veh/h	66	405	264	91	0	410	251	0	93	140	0	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1840	1781	0	1633	1573	0	0
Q Serve(g_s), s	1.7	13.7	9.9	2.3	0.0	13.9	6.5	0.0	3.7	2.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	13.7	9.9	2.3	0.0	13.9	6.5	0.0	3.7	6.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.09	1.00		0.81	0.29		0.54
Lane Grp Cap(c), veh/h	488	842	713	437	0	848	473	0	535	375	0	0
V/C Ratio(X)	0.14	0.48	0.37	0.21	0.00	0.48	0.53	0.00	0.17	0.37	0.00	0.00
Avail Cap(c_a), veh/h	488	842	713	437	0	848	473	0	535	375	0	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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.2	17.4	16.3	12.0	0.0	16.8	26.2	0.0	21.6	31.0	0.0	0.0
Incr Delay (d2), s/veh	0.6	2.0	1.5	1.1	0.0	2.0	4.2	0.0	0.7	2.8	0.0	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	0.6	5.5	3.7	0.9	0.0	5.4	4.9	0.0	1.5	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	19.3	17.8	13.1	0.0	18.8	30.4	0.0	22.3	33.8	0.0	0.0
LnGrp LOS	B	B	B	B	A	B	C	A	C	C	A	A
Approach Vol, veh/h		735			501			344			140	
Approach Delay, s/veh		18.2			17.7			28.2			33.8	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	45.0	11.0	23.0	10.0	46.0		34.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	40.5	6.5	18.5	5.5	41.5		29.5				
Max Q Clear Time (g_c+I1), s	4.3	15.7	8.5	8.6	3.7	15.9		5.7				
Green Ext Time (p_c), s	0.0	3.0	0.0	0.5	0.0	2.1		0.4				
Intersection Summary												
HCM 6th Ctrl Delay			21.3									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑		↗
Traffic Vol, veh/h	665	71	19	601	0	11
Future Vol, veh/h	665	71	19	601	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	375	375	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	723	77	21	653	0	13
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	800	0	-	723
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.12	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.218	-	-	3.318
Pot Cap-1 Maneuver	-	-	823	-	0	426
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	823	-	-	426
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		13.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	426	-	-	823	-	
HCM Lane V/C Ratio	0.03	-	-	0.025	-	
HCM Control Delay (s)	13.7	-	-	9.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	181	18	27	112	167	179
Future Vol, veh/h	181	18	27	112	167	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	60	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	21	32	132	196	211
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	392	196	407	0	-	0
Stage 1	196	-	-	-	-	-
Stage 2	196	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	612	845	1152	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	595	845	1152	-	-	-
Mov Cap-2 Maneuver	595	-	-	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	837	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	1.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1152	-	595	845	-	-
HCM Lane V/C Ratio	0.028	-	0.358	0.025	-	-
HCM Control Delay (s)	8.2	-	14.4	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	1.6	0.1	-	-

Intersection												
Int Delay, s/veh	10											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	385	45	25	410	70	120	5	30	30	5	35
Future Vol, veh/h	110	385	45	25	410	70	120	5	30	30	5	35
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	320	-	375	375	-	375	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	120	418	49	27	446	76	141	6	35	35	6	41
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	522	0	0	467	0	0	938	1234	209	952	1207	223
Stage 1	-	-	-	-	-	-	658	658	-	500	500	-
Stage 2	-	-	-	-	-	-	280	576	-	452	707	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
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	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1041	-	-	1091	-	-	219	175	797	214	182	780
Stage 1	-	-	-	-	-	-	420	459	-	521	541	-
Stage 2	-	-	-	-	-	-	703	500	-	557	436	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1041	-	-	1091	-	-	180	151	797	178	157	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	180	151	-	178	157	-
Stage 1	-	-	-	-	-	-	372	406	-	461	527	-
Stage 2	-	-	-	-	-	-	642	488	-	464	386	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.8			0.4			59.8			22.7		
HCM LOS							F			C		
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	180	495	1041	-	-	1091	-	-	285			
HCM Lane V/C Ratio	0.784	0.083	0.115	-	-	0.025	-	-	0.289			
HCM Control Delay (s)	73.5	12.9	8.9	-	-	8.4	-	-	22.7			
HCM Lane LOS	F	B	A	-	-	A	-	-	C			
HCM 95th %tile Q(veh)	5.2	0.3	0.4	-	-	0.1	-	-	1.2			

Timings
1: CR 29.5 & SH 52

Year 2040 Background
AM

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	110	385	45	25	410	70	120	5	30	5
Future Volume (vph)	110	385	45	25	410	70	120	5	30	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	20.0	43.0	43.0	13.0	36.0	36.0	34.0	34.0	34.0	34.0
Total Split (%)	22.2%	47.8%	47.8%	14.4%	40.0%	40.0%	37.8%	37.8%	37.8%	37.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	51.5	38.5	38.5	40.0	31.5	31.5	29.5	29.5		29.5
Actuated g/C Ratio	0.57	0.43	0.43	0.44	0.35	0.35	0.33	0.33		0.33
v/c Ratio	0.21	0.28	0.07	0.05	0.36	0.12	0.31	0.07		0.15
Control Delay	9.8	17.3	2.2	9.4	22.8	1.4	25.1	9.1		13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	9.8	17.3	2.2	9.4	22.8	1.4	25.1	9.1		13.1
LOS	A	B	A	A	C	A	C	A		B
Approach Delay		14.5			19.2			21.5		13.1
Approach LOS		B			B			C		B

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.36

Intersection Signal Delay: 17.2

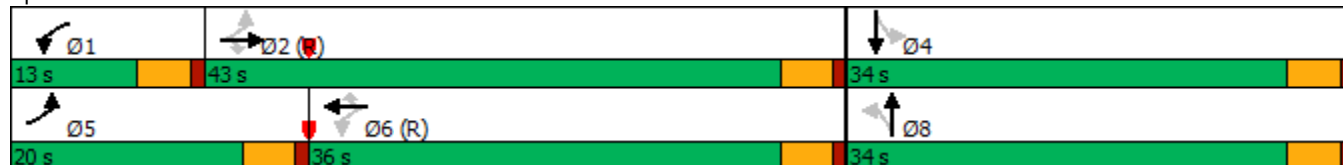
Intersection LOS: B

Intersection Capacity Utilization 42.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

Year 2040 Background
AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	385	45	25	410	70	120	5	30	30	5	35
Future Volume (veh/h)	110	385	45	25	410	70	120	5	30	30	5	35
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	120	418	49	27	446	76	141	6	35	35	6	41
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	613	1520	678	572	1244	555	540	78	454	248	58	249
Arrive On Green	0.17	0.43	0.43	0.09	0.35	0.35	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1359	237	1384	582	178	759
Grp Volume(v), veh/h	120	418	49	27	446	76	141	0	41	82	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1359	0	1621	1519	0	0
Q Serve(g_s), s	3.0	6.9	1.6	0.8	8.4	2.9	2.8	0.0	1.6	0.4	0.0	0.0
Cycle Q Clear(g_c), s	3.0	6.9	1.6	0.8	8.4	2.9	5.9	0.0	1.6	3.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.85	0.43		0.50
Lane Grp Cap(c), veh/h	613	1520	678	572	1244	555	540	0	531	555	0	0
V/C Ratio(X)	0.20	0.27	0.07	0.05	0.36	0.14	0.26	0.00	0.08	0.15	0.00	0.00
Avail Cap(c_a), veh/h	613	1520	678	572	1244	555	540	0	531	555	0	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	0.00	0.00
Uniform Delay (d), s/veh	10.7	16.7	15.2	14.1	21.7	20.0	22.2	0.0	20.9	21.4	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.4	0.2	0.2	0.8	0.5	1.2	0.0	0.3	0.6	0.0	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	1.1	2.5	0.6	0.3	3.3	1.1	2.3	0.0	0.6	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.4	17.1	15.4	14.3	22.5	20.5	23.4	0.0	21.1	21.9	0.0	0.0
LnGrp LOS	B	B	B	B	C	C	C	A	C	C	A	A
Approach Vol, veh/h		587			549			182			82	
Approach Delay, s/veh		15.8			21.9			22.9			21.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	43.0		34.0	20.0	36.0		34.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	8.5	38.5		29.5	15.5	31.5		29.5				
Max Q Clear Time (g_c+I1), s	2.8	8.9		5.1	5.0	10.4		7.9				
Green Ext Time (p_c), s	0.0	2.6		0.4	0.2	2.6		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			19.5									
HCM 6th LOS			B									

Intersection												
Int Delay, s/veh	14.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	585	130	35	525	55	90	5	20	55	5	80
Future Vol, veh/h	80	585	130	35	525	55	90	5	20	55	5	80
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	320	-	375	375	-	375	190	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	636	141	38	571	60	106	6	24	65	6	94

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	631	0	0	777	0	0	1175	1517	318	1142	1598	286
Stage 1	-	-	-	-	-	-	810	810	-	647	647	-
Stage 2	-	-	-	-	-	-	365	707	-	495	951	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
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	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	947	-	-	835	-	-	147	118	678	155	105	711
Stage 1	-	-	-	-	-	-	340	391	-	426	465	-
Stage 2	-	-	-	-	-	-	627	436	-	525	336	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	947	-	-	835	-	-	109	102	678	128	91	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	109	102	-	128	91	-
Stage 1	-	-	-	-	-	-	309	355	-	387	444	-
Stage 2	-	-	-	-	-	-	512	416	-	453	305	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.5	122.7	50.3
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	109	318	947	-	-	835	-	-	234
HCM Lane V/C Ratio	0.971	0.092	0.092	-	-	0.046	-	-	0.704
HCM Control Delay (s)	151.9	17.5	9.2	-	-	9.5	-	-	50.3
HCM Lane LOS	F	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	6.1	0.3	0.3	-	-	0.1	-	-	4.6

Timings
1: CR 29.5 & SH 52

Year 2040 Background
PM

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	80	585	130	35	525	55	90	5	55	5
Future Volume (vph)	80	585	130	35	525	55	90	5	55	5
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	NA
Protected Phases	5	2		1	6			8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	8	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	22.5	22.5	22.5	22.5
Total Split (s)	17.0	51.0	51.0	14.0	48.0	48.0	35.0	35.0	35.0	35.0
Total Split (%)	17.0%	51.0%	51.0%	14.0%	48.0%	48.0%	35.0%	35.0%	35.0%	35.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes				
Recall Mode	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
Act Effect Green (s)	59.0	46.5	46.5	53.0	43.5	43.5	30.5	30.5		30.5
Actuated g/C Ratio	0.59	0.46	0.46	0.53	0.44	0.44	0.30	0.30		0.30
v/c Ratio	0.17	0.39	0.17	0.08	0.37	0.08	0.30	0.06		0.32
Control Delay	9.0	18.3	3.2	8.7	19.9	4.3	29.5	12.0		17.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	9.0	18.3	3.2	8.7	19.9	4.3	29.5	12.0		17.4
LOS	A	B	A	A	B	A	C	B		B
Approach Delay		14.9			17.9			25.7		17.4
Approach LOS		B			B			C		B

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.39

Intersection Signal Delay: 17.0

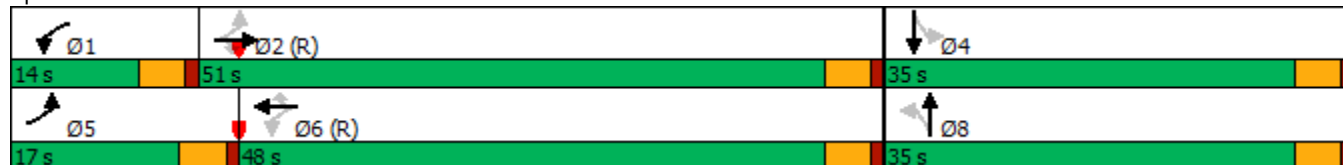
Intersection LOS: B

Intersection Capacity Utilization 46.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

Year 2040 Background
PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	585	130	35	525	55	90	5	20	55	5	80
Future Volume (veh/h)	80	585	130	35	525	55	90	5	20	55	5	80
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	87	636	141	38	571	60	106	6	24	65	6	94
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	555	1652	737	483	1546	689	450	100	399	213	37	265
Arrive On Green	0.13	0.47	0.47	0.09	0.44	0.44	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1295	327	1308	533	123	868
Grp Volume(v), veh/h	87	636	141	38	571	60	106	0	30	165	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1295	0	1635	1524	0	0
Q Serve(g_s), s	2.2	11.7	5.2	1.0	10.8	2.2	0.0	0.0	1.3	5.0	0.0	0.0
Cycle Q Clear(g_c), s	2.2	11.7	5.2	1.0	10.8	2.2	7.5	0.0	1.3	8.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.80	0.39		0.57
Lane Grp Cap(c), veh/h	555	1652	737	483	1546	689	450	0	499	515	0	0
V/C Ratio(X)	0.16	0.38	0.19	0.08	0.37	0.09	0.24	0.00	0.06	0.32	0.00	0.00
Avail Cap(c_a), veh/h	555	1652	737	483	1546	689	450	0	499	515	0	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	0.00	0.00
Uniform Delay (d), s/veh	10.7	17.4	15.7	11.7	19.0	16.6	26.8	0.0	24.6	26.9	0.0	0.0
Incr Delay (d2), s/veh	0.6	0.7	0.6	0.3	0.7	0.2	1.2	0.0	0.2	1.6	0.0	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	4.4	1.8	0.4	4.1	0.8	2.1	0.0	0.5	3.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	18.1	16.3	12.0	19.7	16.8	28.0	0.0	24.8	28.5	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	C	C	A	A
Approach Vol, veh/h	864			669			136			165		
Approach Delay, s/veh	17.1			19.0			27.3			28.5		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	51.0		35.0	17.0	48.0		35.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	46.5		30.5	12.5	43.5		30.5				
Max Q Clear Time (g_c+I1), s	3.0	13.7		10.1	4.2	12.8		9.5				
Green Ext Time (p_c), s	0.0	4.5		0.8	0.1	3.7		0.4				
Intersection Summary												
HCM 6th Ctrl Delay				19.6								
HCM 6th LOS				B								

Timings
1: CR 29.5 & SH 52

Year 2040 w/Project
AM

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	118	376	97	57	391	70	267	36	30	31
Future Volume (vph)	118	376	97	57	391	70	267	36	30	31
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6		3	8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	13.0	42.0	42.0	11.0	40.0	40.0	14.0	37.0	23.0	23.0
Total Split (%)	14.4%	46.7%	46.7%	12.2%	44.4%	44.4%	15.6%	41.1%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	Max	C-Max	C-Max	Max	C-Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	46.0	37.5	37.5	42.0	35.5	35.5	32.5	32.5		18.5
Actuated g/C Ratio	0.51	0.42	0.42	0.47	0.39	0.39	0.36	0.36		0.21
v/c Ratio	0.25	0.28	0.14	0.12	0.30	0.11	0.69	0.18		0.34
Control Delay	11.8	18.0	2.6	10.9	19.5	1.2	31.9	8.9		25.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	11.8	18.0	2.6	10.9	19.5	1.2	31.9	8.9		25.2
LOS	B	B	A	B	B	A	C	A		C
Approach Delay		14.2			16.1			25.5		25.2
Approach LOS		B			B			C		C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 18.3

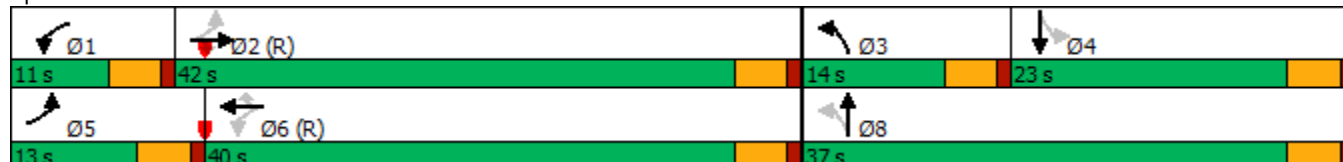
Intersection LOS: B

Intersection Capacity Utilization 50.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

Year 2040 w/Project
AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	376	97	57	391	70	267	36	67	30	31	38
Future Volume (veh/h)	118	376	97	57	391	70	267	36	67	30	31	38
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	128	409	105	62	425	76	314	42	79	35	36	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	1481	660	511	1402	625	551	210	395	125	128	127
Arrive On Green	0.09	0.42	0.42	0.07	0.39	0.39	0.11	0.36	0.36	0.21	0.21	0.21
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	581	1093	353	621	618
Grp Volume(v), veh/h	128	409	105	62	425	76	314	0	121	116	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	0	1674	1592	0	0
Q Serve(g_s), s	3.6	6.8	3.7	1.7	7.4	2.7	9.5	0.0	4.5	0.7	0.0	0.0
Cycle Q Clear(g_c), s	3.6	6.8	3.7	1.7	7.4	2.7	9.5	0.0	4.5	5.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	0.30		0.39
Lane Grp Cap(c), veh/h	528	1481	660	511	1402	625	551	0	604	379	0	0
V/C Ratio(X)	0.24	0.28	0.16	0.12	0.30	0.12	0.57	0.00	0.20	0.31	0.00	0.00
Avail Cap(c_a), veh/h	528	1481	660	511	1402	625	551	0	604	379	0	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	0.00	0.00
Uniform Delay (d), s/veh	13.0	17.3	16.4	13.4	18.7	17.3	24.5	0.0	19.8	30.4	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.5	0.5	0.5	0.6	0.4	4.2	0.0	0.7	2.1	0.0	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	1.4	2.5	1.4	0.7	2.8	1.0	5.9	0.0	1.8	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	17.8	16.9	13.9	19.3	17.7	28.8	0.0	20.5	32.5	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	C	C	A	A
Approach Vol, veh/h		642			563			435			116	
Approach Delay, s/veh		16.9			18.5			26.5			32.5	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	42.0	14.0	23.0	13.0	40.0		37.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	37.5	9.5	18.5	8.5	35.5		32.5				
Max Q Clear Time (g_c+I1), s	3.7	8.8	11.5	7.2	5.6	9.4		6.5				
Green Ext Time (p_c), s	0.0	2.7	0.0	0.4	0.1	2.6		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			20.8									
HCM 6th LOS			C									

Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↗	↘	↑↑		↗
Traffic Vol, veh/h	575	23	6	691	0	17
Future Vol, veh/h	575	23	6	691	0	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	-	375	375	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	625	25	7	751	0	20
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	650	0	-	313
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	932	-	0	683
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	932	-	-	683
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	683	-	-	932	-	
HCM Lane V/C Ratio	0.029	-	-	0.007	-	
HCM Control Delay (s)	10.4	-	-	8.9	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	198	22	11	173	93	92
Future Vol, veh/h	198	22	11	173	93	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	60	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	233	26	13	204	109	108
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	339	109	217	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	657	945	1353	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	650	945	1353	-	-	-
Mov Cap-2 Maneuver	650	-	-	-	-	-
Stage 1	907	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.1	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1353	-	650	945	-	-
HCM Lane V/C Ratio	0.01	-	0.358	0.027	-	-
HCM Control Delay (s)	7.7	-	13.6	8.9	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0	-	1.6	0.1	-	-

Timings
1: CR 29.5 & SH 52

Year 2040 w/Project
PM

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	86	563	243	84	512	55	213	35	55	40
Future Volume (vph)	86	563	243	84	512	55	213	35	55	40
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	NA
Protected Phases	5	2		1	6		3	8		4
Permitted Phases	2		2	6		6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5	22.5	9.5	22.5	22.5	9.5	22.5	22.5	22.5
Total Split (s)	10.0	44.0	44.0	11.0	45.0	45.0	12.0	35.0	23.0	23.0
Total Split (%)	11.1%	48.9%	48.9%	12.2%	50.0%	50.0%	13.3%	38.9%	25.6%	25.6%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	Max	C-Max	C-Max	Max	C-Max	C-Max	Max	Max	Max	Max
Act Effect Green (s)	45.0	39.5	39.5	47.0	40.5	40.5	30.5	30.5		18.5
Actuated g/C Ratio	0.50	0.44	0.44	0.52	0.45	0.45	0.34	0.34		0.21
v/c Ratio	0.22	0.39	0.31	0.22	0.35	0.08	0.70	0.19		0.63
Control Delay	10.7	18.1	3.2	10.6	16.9	0.2	36.0	9.7		34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	10.7	18.1	3.2	10.6	16.9	0.2	36.0	9.7		34.3
LOS	B	B	A	B	B	A	D	A		C
Approach Delay		13.3			14.7			27.7		34.3
Approach LOS		B			B			C		C

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 18.1

Intersection LOS: B

Intersection Capacity Utilization 57.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: CR 29.5 & SH 52



HCM 6th Signalized Intersection Summary

1: CR 29.5 & SH 52

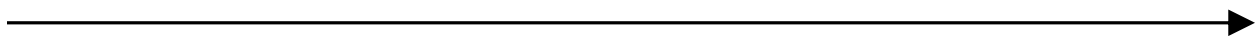
Year 2040 w/Project
PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	563	243	84	512	55	213	35	64	55	40	89
Future Volume (veh/h)	86	563	243	84	512	55	213	35	64	55	40	89
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	93	612	264	91	557	60	251	41	75	65	47	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	469	1560	696	413	1599	713	440	201	367	127	91	156
Arrive On Green	0.06	0.44	0.44	0.07	0.45	0.45	0.08	0.34	0.34	0.21	0.21	0.21
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	592	1083	364	444	757
Grp Volume(v), veh/h	93	612	264	91	557	60	251	0	116	217	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	0	1675	1565	0	0
Q Serve(g_s), s	2.5	10.5	10.1	2.4	9.2	1.9	7.5	0.0	4.4	7.5	0.0	0.0
Cycle Q Clear(g_c), s	2.5	10.5	10.1	2.4	9.2	1.9	7.5	0.0	4.4	11.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.65	0.30		0.48
Lane Grp Cap(c), veh/h	469	1560	696	413	1599	713	440	0	568	374	0	0
V/C Ratio(X)	0.20	0.39	0.38	0.22	0.35	0.08	0.57	0.00	0.20	0.58	0.00	0.00
Avail Cap(c_a), veh/h	469	1560	696	413	1599	713	440	0	568	374	0	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	0.00	0.00
Uniform Delay (d), s/veh	12.3	17.1	17.0	12.1	16.1	14.1	25.3	0.0	21.1	32.7	0.0	0.0
Incr Delay (d2), s/veh	0.9	0.7	1.6	1.2	0.6	0.2	5.3	0.0	0.8	6.5	0.0	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	0.9	3.9	3.8	0.9	3.4	0.7	4.9	0.0	1.8	4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	17.9	18.6	13.3	16.7	14.4	30.6	0.0	21.9	39.2	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	C	D	A	A
Approach Vol, veh/h		969			708			367			217	
Approach Delay, s/veh		17.6			16.1			27.9			39.2	
Approach LOS		B			B			C			D	
Timer - Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	44.0	12.0	23.0	10.0	45.0		35.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	6.5	39.5	7.5	18.5	5.5	40.5		30.5				
Max Q Clear Time (g_c+I1), s	4.4	12.5	9.5	13.3	4.5	11.2		6.4				
Green Ext Time (p_c), s	0.0	4.6	0.0	0.5	0.0	3.5		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			20.9									
HCM 6th LOS			C									

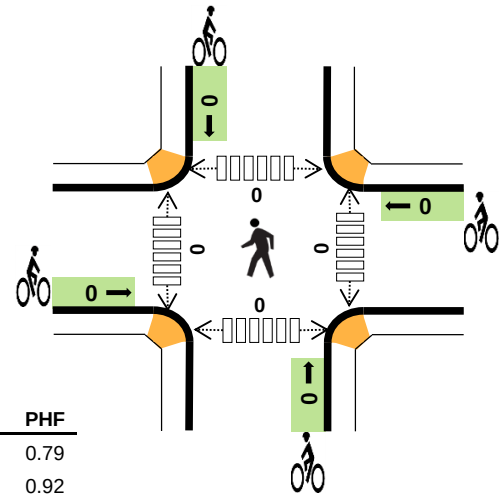
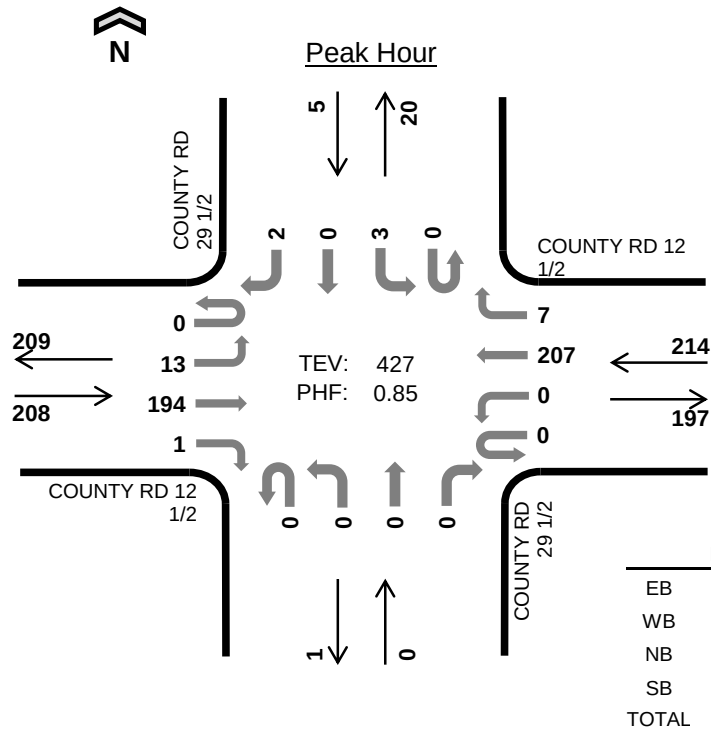
Intersection						
Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑		↑
Traffic Vol, veh/h	880	71	19	796	0	11
Future Vol, veh/h	880	71	19	796	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	375	375	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	957	77	21	865	0	13
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1034	0	-	479
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	668	-	0	533
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	668	-	-	533
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		11.9	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	533	-	-	668	-	
HCM Lane V/C Ratio	0.024	-	-	0.031	-	
HCM Control Delay (s)	11.9	-	-	10.6	-	
HCM Lane LOS	B	-	-	B	-	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	181	18	27	132	187	179
Future Vol, veh/h	181	18	27	132	187	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	60	0	100	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	213	21	32	155	220	211
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	439	220	431	0	-	0
Stage 1	220	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	575	820	1129	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	559	820	1129	-	-	-
Mov Cap-2 Maneuver	559	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.8	1.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1129	-	559	820	-	-
HCM Lane V/C Ratio	0.028	-	0.381	0.026	-	-
HCM Control Delay (s)	8.3	-	15.3	9.5	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	1.8	0.1	-	-

Traffic Count Data Sheets



COUNTY RD 29 1/2 COUNTY RD 12 1/2



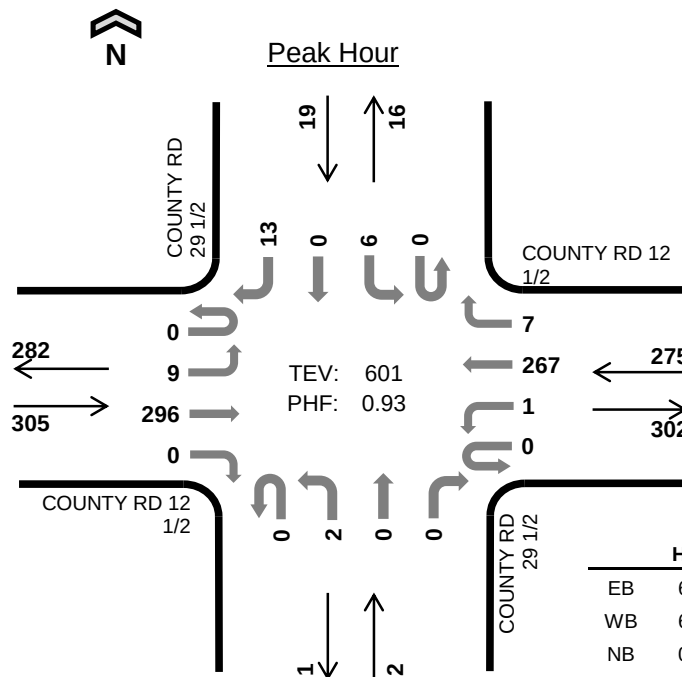
Two-Hour Count Summaries

Interval Start	COUNTY RD 12 1/2 Eastbound				COUNTY RD 12 1/2 Westbound				COUNTY RD 29 1/2 Northbound				COUNTY RD 29 1/2 Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	43	0	0	0	58	0	0	0	0	0	0	0	0	0	102	0
7:15 AM	0	1	39	0	0	0	46	3	0	0	0	0	0	2	0	1	92	0
7:30 AM	0	3	55	0	0	0	48	1	0	0	0	0	0	0	0	1	108	0
7:45 AM	0	8	57	1	0	0	55	3	0	0	0	0	0	1	0	0	125	427
8:00 AM	0	5	38	0	0	0	50	3	0	0	0	0	0	1	0	1	98	423
8:15 AM	0	1	30	0	0	0	50	0	0	0	0	0	0	3	0	1	85	416
8:30 AM	1	1	34	0	0	0	50	0	0	0	0	0	0	2	0	0	88	396
8:45 AM	0	2	44	0	0	0	43	1	0	0	0	0	0	1	0	0	91	362
Count Total	1	22	340	1	0	0	400	11	0	0	0	0	0	10	0	4	789	0
Peak Hour	0	13	194	1	0	0	207	7	0	0	0	0	0	3	0	2	427	0

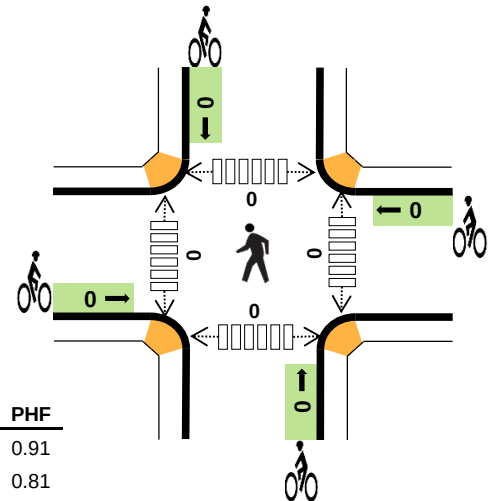
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	8	0	0	9	0	0	0	0	0	0	0	0	0	0
7:15 AM	4	11	0	0	15	0	0	0	0	0	0	0	0	0	0
7:30 AM	5	8	0	0	13	0	0	0	0	0	0	0	0	0	0
7:45 AM	6	12	0	0	18	0	0	0	0	0	0	0	0	0	0
8:00 AM	7	4	0	1	12	0	0	0	0	0	0	0	0	0	0
8:15 AM	7	7	0	1	15	0	0	0	0	0	0	0	0	0	0
8:30 AM	4	13	0	0	17	0	0	0	0	0	0	0	0	0	0
8:45 AM	7	4	0	1	12	0	0	0	0	0	0	0	0	0	0
Count Total	41	67	0	3	111	0	0	0	0	0	0	0	0	0	0
Peak Hour	16	39	0	0	55	0	0	0	0	0	0	0	0	0	0

COUNTY RD 29 1/2 COUNTY RD 12 1/2



Date: Tue, Aug 25, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	6.6%	0.91
WB	6.9%	0.81
NB	0.0%	0.25
SB	10.5%	0.68
TOTAL	6.8%	0.93

Two-Hour Count Summaries

Interval Start	COUNTY RD 12 1/2				COUNTY RD 12 1/2				COUNTY RD 29 1/2				COUNTY RD 29 1/2				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	76	0	0	0	58	1	0	0	0	0	0	0	0	2	138	0
4:15 PM	0	0	69	1	0	0	71	0	0	0	0	0	0	2	0	4	147	0
4:30 PM	0	3	81	0	0	0	58	2	0	0	0	0	0	2	0	1	147	0
4:45 PM	0	2	68	0	0	0	66	1	0	0	0	0	0	1	0	5	143	575
5:00 PM	0	2	67	0	0	0	84	1	0	0	0	0	0	3	0	4	161	598
5:15 PM	0	2	80	0	0	1	59	3	0	2	0	0	0	0	0	3	150	601
5:30 PM	0	2	81	0	0	0	60	0	0	0	0	0	0	0	0	0	143	597
5:45 PM	0	1	60	0	0	0	45	1	0	1	0	0	0	3	0	0	111	565
Count Total	0	13	582	1	0	1	501	9	0	3	0	0	0	11	0	19	1,140	0
Peak Hour	0	9	296	0	0	1	267	7	0	2	0	0	0	6	0	13	601	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	2	0	0	7	0	0	0	0	0	0	0	0	0	0
4:15 PM	5	9	0	0	14	0	0	0	0	0	0	0	0	0	0
4:30 PM	6	5	0	0	11	0	0	0	0	0	0	0	0	0	0
4:45 PM	6	3	0	2	11	0	0	0	0	0	0	0	0	0	0
5:00 PM	5	8	0	0	13	0	0	0	0	0	0	0	0	0	0
5:15 PM	3	3	0	0	6	0	0	0	0	0	0	0	0	0	0
5:30 PM	6	3	0	0	9	0	0	0	0	0	0	0	0	0	0
5:45 PM	6	8	0	0	14	0	0	0	0	0	0	0	0	0	0
Count Total	42	41	0	2	85	0	0	0	0	0	0	0	0	0	0
Peak Hour	20	19	0	2	41	0	0	0	0	0	0	0	0	0	0

**PRELIMINARY GEOTECHNICAL INVESTIGATION
MURATA FARMS (MURACO SUBDIVISION)
SOUTHWEST OF HIGHWAY 52 AND
COUNTY ROAD 29 ½
FORT LUPTON, COLORADO**

Prepared For:

**CORONADO WEST
c/o JE HOME
2696 South Colorado Boulevard, Suite 329
Denver, Colorado 80222**

Attention: Eric Eckberg

Project No. DN50,219-115-R1

October 31, 2019



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APPENDIX D – GUIDELINE SUB-EXCAVATION SPECIFICATIONS



SCOPE

This report presents the results of our Preliminary Geotechnical Investigation of Murata Farms (Muraco Subdivision) located southwest of Highway 52 and County Road 29½ in Fort Lupton, Colorado (Fig. 1). The purpose of our investigation was to evaluate the subsurface conditions to assist in due diligence and planning of site development and residential/commercial construction. The scope was described in a Service Agreement (DN 19-0464) dated August 23, 2019.

This report is based on subsurface conditions found in our exploratory borings, results of field and laboratory tests, engineering analysis of field and laboratory data, and our experience. The report contains descriptions of the soil, bedrock and groundwater found in exploratory borings, site geology and geologic hazards, preliminary discussions of foundation and floor support alternatives, and preliminary design and construction criteria for site development, pavements, and surface and subsurface drainage. The discussions of foundation and floor system alternatives are intended for planning purposes only. Additional investigation will be necessary to delineate areas of sub-excavation (if selected). Site-specific investigations will be necessary to design structures and improvements. A brief summary of our conclusions and recommendations follows, with more detailed discussion in the report.

SUMMARY OF CONCLUSIONS

1. We found no geologic hazards or geotechnical concerns which will preclude development of the site. The primary geotechnical concerns are shallow groundwater and expansive soil and bedrock.
2. Strata encountered in exploratory borings consisted of 4 to 25 feet of sandy clay and clean to clayey sand underlain in seven borings by weathered and comparatively unweathered claystone and interbedded claystone/sandstone bedrock. Claystone is predominant. The clay and claystone are expansive and we judge the sand is non-expansive.
3. Groundwater was measured at depths of about 5 to 21 feet below existing grades, or approximate elevations 4937 to 4966 feet (Fig. 4). Groundwater



will likely be encountered during deep utility installation. We recommend providing at least 3 feet, and preferably 5 feet of separation between groundwater and foundation excavations. Groundwater will fluctuate seasonally and may rise in response to irrigation, precipitation, land-use changes, and flow in Fulton Ditch.

4. We estimated total potential ground heave may range from less than 0.5 up to about 6.1 inches considering a depth of wetting of 24 feet below existing grade. The estimates are conservative (high). Footing foundations will be appropriate where the underlying soil and bedrock are low swelling or non-expansive, or if sub-excavation of expansive material is performed. Sub-excavation appears merited for about 40 percent of the site. Measures to control groundwater will be needed if sub-excavation is used. Additional investigation is recommended to delineate sub-excavation extent.
5. Pavement subgrade will likely consist of non-expansive sand or expansive clay or claystone or fill of similar composition. Clay and claystone have poor pavement support characteristics. Sand is considered better subgrade material. Mitigation of expansive subgrade consisting of sub-excavation may be necessary. The Town of Fort Lupton requires full-depth asphalt pavement sections for all public streets. We anticipate a minimum section of at least 5 to 6 inches of asphalt for local streets and 7 to 8 inches for residential collectors. Thicker asphalt may be necessary. Subgrade investigations should be performed after site grading.
6. Control of surface and subsurface drainage will be critical to the performance of foundations, slabs-on-grade and pavements. Overall surface drainage should be designed to provide rapid run-off of surface water away from structures, pavements and flatwork.

SITE CONDITIONS

Murata Farms is located southwest of State Highway 52 and County Road 29½ in Fort Lupton, Colorado (Fig. 1 and Photo 1). The site contains about 70-acres and is bordered by single-family residences to the west, Highway 52 to the north, County Road 29½ to the east, and vacant land to the south. Two existing single-family residences are present in the northwestern and south-central portions of the parcel. The ground surface slopes gently to the south with overall relief of about 35 feet. Ground cover consists primarily of grasses, weeds, and crop remnants. Fulton Ditch runs through the northeastern portion of the site. Multiple oil/gas wells are present in the northern portion.



Review of historical aerial photos indicate the property has been used primarily as farmland.

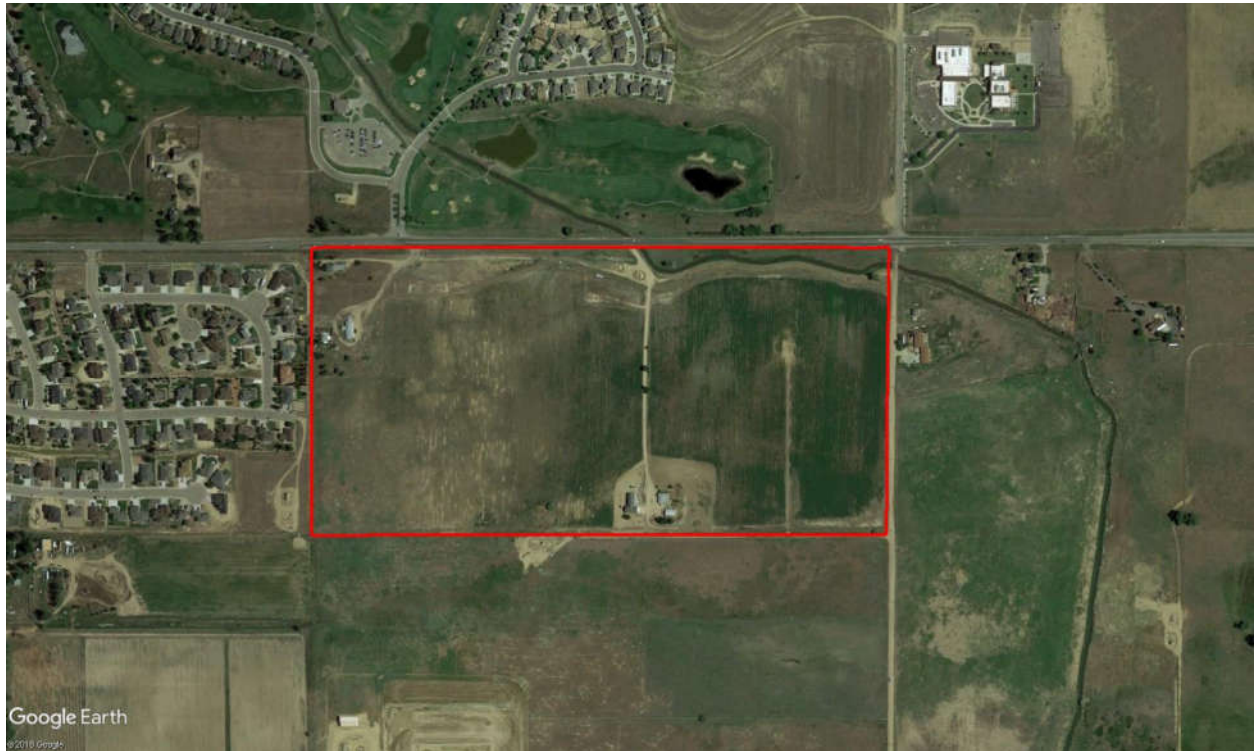


Photo 1 – Google Earth® Aerial Site Photo, May 2018

PROPOSED DEVELOPMENT

A conceptual site plan prepared by Henry Design Group indicates the parcel is being considered for primarily residential development (Fig. 2). A small commercial portion is shown in the northeastern corner. Residential areas may include single-family detached residences, paired homes, and townhomes. We anticipate residential structures will consist of one or two-story wood-framed structures with crawl spaces and/or basements. Several parks, open space, and a trail system may also be included.



INVESTIGATION

We investigated subsurface conditions by drilling 8 widely-spaced exploratory borings at the approximate locations shown on Fig. 1. The boring locations were surveyed by a representative of our firm using a Leica GS18 GPS unit referencing the North American Vertical Datum of 1988 (NAVD88). Prior to drilling, we contacted the Utility Notification Center of Colorado and local sewer and water districts to clear drilling locations for conflicts with buried utilities. The borings were advanced to 25 feet below the existing ground surface using 4-inch diameter, continuous-flight solid-stem auger and a truck-mounted CME-55 drill rig. Samples of the soil and bedrock were obtained at 5 feet intervals using 2.5-inch diameter (O.D.) modified California barrel samplers driven by an automatic 140-pound hammer falling 30 inches. Our representative observed drilling, logged the soil and bedrock encountered, and obtained samples. Summary logs of the exploratory borings are presented in Appendix A.

The samples were returned to our laboratory where they were examined by our engineer. Laboratory tests included dry density, moisture content, percent silt and clay-sized particles (passing the No. 200 sieve), Atterberg limits, swell-consolidation, and water-soluble sulfate concentration. Swell-consolidation tests were performed by wetting the samples under approximate overburden pressures (the pressure exerted by the overlying soil). Results of laboratory tests are presented in Appendix B.

SITE GEOLOGY AND GEOLOGIC HAZARDS

According to the Geologic Map of the Fort Lupton Quadrangle, Weld and Adams Counties (Soister, P.E.: Map GQ-397, 1965), the site is underlain by windblown, alluvial, and colluvial deposits of clay, silt, and sand underlain by sedimentary bedrock of the lower portion of the Dawson formation. The soil includes expansive clay. The bedrock includes expansive claystone.



Site geology and geologic hazards were evaluated through review of geologic maps, field observations, conditions found in our exploratory borings, and our experience with similar projects. No geologic hazards were identified which would preclude development of this site. The hazards identified are:

- Shallow groundwater
- Expansive soil and bedrock, and
- Regional issues of seismicity and radioactivity.

These hazards can be mitigated with proper planning, engineering, design and construction.

Shallow Groundwater

Groundwater was measured at depths of about 9.5 feet or less below existing grade in a majority of the borings. Shallow groundwater could limit use of basement residences. We recommend at least 3 feet, and preferably 5 feet of separation between foundation excavations and groundwater. Where basements are within 5 feet of groundwater, we advocate use of vapor retarders over a gravel layer below basement floor slabs. An option would be to raise site grades. Import fill may be needed. One alternative would be to plan non-basement residences in areas with shallow groundwater.

Shallow groundwater may also complicate site development such as utility installation. Contractors should be prepared to deal with wet soils, flat excavation slopes below groundwater, and temporary dewatering.

Expansive Soil and Bedrock

The clay and claystone bedrock encountered in our borings are expansive. There is risk that ground heave will damage pavements, slabs-on-grade and foundations.



Engineered design of grading, pavements, foundations, slabs-on-grade, and surface drainage can mitigate, but not eliminate, the potential risk.

Seismicity

Based on available mapping, we found no active faults within or near the site. The soil and bedrock units are not expected to respond unusually to seismic activity. According to the International Residential Code (IRC) for seismic design, we believe the site classifies as Site Class C or D.

Radioactivity

It is normal in the Front Range of Colorado and nearby eastern plains to measure radon gas in poorly ventilated spaces in contact with soil or bedrock. Radon 222 gas is considered a health hazard and is just one of several radioactive products in the chain of the natural decay of uranium into lead. Radioactive nuclides are common in the soil and bedrock underlying the subject site. Because these sources exist or will exist on most sites in the area, there is a potential for radon gas accumulation in poorly ventilated spaces. The amount of soil gas that can accumulate is a function of many factors, including the radionuclide activity of the soil and bedrock, construction methods and materials, soil gas pathways, and accumulation areas. The only reliable method to determine if a hazard exists is to perform radon testing of completed structures to determine the level of radon gas accumulation. Typical mitigation methods consist of sealing soil gas entry areas and ventilation of below-grade spaces. We recommend provisions for ventilation of foundation drain systems if a radon problem is discovered.

Other Considerations

We observed no evidence of unstable slopes. Erosion potential on the site is considered low due to gentle slopes and existing vegetation. The potential will increase during construction but should return to pre-construction rates or less if proper grading



practices, surface drainage design, and re-vegetation efforts are implemented. We did not identify significant economically recoverable, high quality aggregate or rare earth materials in our borings.

SUBSURFACE CONDITIONS

Strata encountered in our borings consisted of 4 to 25 feet of sandy clay and clean to clayey sand underlain in seven borings by weathered and comparatively unweathered claystone and interbedded claystone/sandstone bedrock. Pertinent engineering characteristics of the soil and bedrock are described in the following paragraphs.

Clay

Sandy, silty clay was encountered from the ground surface or within the sand in four borings. The clay was relatively moist and soft to stiff based on field penetration resistance test results. One sample swelled 0.2 percent when wetted. Two samples contained 56 and 65 percent silt and clay-sized particles, with the latter sample exhibiting moderate plasticity.

Sand

At least 4.5 feet of sand was found from the ground surface in six borings. The clean to silty sand was medium dense to dense and the clayey sand was very loose to medium dense. One sample of clayey sand compressed slightly when wetted. Five samples contained 12 to 49 percent silt and clay-sized particles. One clayey sand sample exhibited low plasticity. We judge the sand is non-expansive.

Bedrock

Bedrock consisted primarily of weathered and comparatively unweathered claystone and was encountered in seven borings at depths of about 4 to 19.5 feet, or



approximate elevations 4932 to 4966 feet (Fig. 3). Interbedded claystone/sandstone was encountered in TH-6 only. Weathered zones encountered in six borings ranged in thickness from about 1.5 to 8.5 feet. The unweathered bedrock is medium hard to very hard. Seven claystone samples swelled 1.6 to 10 percent when wetted. The average swell of the claystone was 3.6 percent. One sample of claystone contained 92 percent silt and clay-sized particles exhibited high plasticity. One interbedded claystone/sandstone sample contained 42 silt and clay-sized particles.

Groundwater

Groundwater was encountered during drilling in four borings at depths of about 13 to 15 feet. When checked 10 days after drilling on October 19, 2019, water was measured at depths of about 5 to 21 feet, or approximate elevations 4937 to 4966 feet (Fig. 4). Groundwater was generally shallower in borings adjacent to Fulton Ditch and on the central and eastern portions of the parcel where flood irrigation appeared to have occurred. Groundwater will likely be encountered during deep utility installation. We recommend providing at least 3 feet, and preferably 5 feet of separation between groundwater and foundation excavations. It is possible that groundwater levels may dip once flood irrigation on the parcel has stopped. Groundwater will fluctuate seasonally and may rise in response to irrigation, precipitation, land-use changes, and flow in Fulton Ditch.

ESTIMATED POTENTIAL HEAVE

Based on the subsurface profiles, swell-consolidation test results and our experience, we estimated the potential heave at the existing ground surface for each test hole location as shown in the table below. A depth of wetting of 24 feet was considered for the analysis. The estimates are conservative (high) because they assume full wetting and potential heave of material below groundwater. Due to widely spaced borings, variations from our estimates should be anticipated. It is not certain these movements will occur.



TABLE I
ESTIMATED POTENTIAL GROUND HEAVE
BASED ON 24-FEET DEPTH OF WETTING

Boring No.	Estimated Potential Heave at Existing Ground Surface (inches)
TH-1	1.5
TH-2	6.1
TH-3	4.6
TH-4	3.5
TH-5	<0.5
TH-6	<0.5
TH-7	1.0
TH-8	1.6

SITE DEVELOPMENT

The primary geotechnical concerns that we believe will influence development and building construction on this site are shallow groundwater and expansive soil and bedrock. These concerns can be mitigated with proper planning, engineering, design and construction. We believe there are no geologic or geotechnical constraints at this site that would preclude development. The following sections discuss site development recommendations.

Excavation

We believe the soil and bedrock penetrated by our exploratory borings can be excavated with typical heavy-duty equipment. Contractors should be familiar with applicable local, state and federal safety regulations, including the current Occupational Safety and Health Administration (OSHA) Excavation and Trench Safety Standards. Based on our investigation and OSHA standards, we anticipate the sandy clay and bedrock may classify as Type B soil and the sand as Type C. Type B and Type C soils require maximum slope inclinations of 1H:1V (horizontal to vertical) and 1.5H:1V for excavations in dry conditions, respectively. Flatter slopes will be necessary below groundwater. Contractors are required to identify the soils encountered in excavations



and refer to OSHA standards to determine appropriate slopes. Excavations deeper than 20 feet should be designed by a professional engineer.

Dewatering

Groundwater may be encountered in utility excavations. Temporary construction dewatering systems will probably be needed to properly install deep utilities for some areas of the site. We believe that dewatering for excavations which penetrate less than 3 to 5 feet below groundwater may be accomplished using conventional sump and pump methods in utility trenches. Deeper excavations may require more elaborate dewatering (such as well points).

The Town of Fort Lupton and/or the Colorado Department of Public Health may require dewatering permits. Our experience indicates periodic environmental testing is usually required with these permits, with reporting. Permitting requirements may also influence the construction schedule.

Site Grading

The on-site soils free of vegetation are suitable for use as site grading fill. Fill should be placed in thin loose lifts (8-inches or less), and be moisture-conditioned and compacted prior to placement of the next lift. Clay fill should be moisture-conditioned between optimum and 3 percent above optimum moisture content and compacted to at least 95 percent of maximum standard Proctor dry density (ASTM D 698). Sand fill should be moisture-conditioned within 2 percent of optimum moisture content and compacted similarly. A representative of our firm should observe and test compaction of the fill during placement. Guidelines for site grading are presented in Appendix C.



Sub-Excavation

Our investigation indicates non-expansive sand and expansive clay and clay-stone bedrock are present at depths likely to influence performance of shallow foundations and slabs-on-grade. We calculated potential heave could range from less than 0.5 up to about 6.1 inches for an assumed depth of wetting of 24 feet. About 60 percent of the heave estimates were less than 2 inches. Figure 5 presents our interpretation of risk due to expansive soils and bedrock at each boring location. Based on the data and our evaluation, low risk conditions are present at 5 borings. Shallow foundations can likely be used without sub-excavation in low risk areas. We judge there is moderate risk due to expansive soils and bedrock at TH-4 and high risk at TH-2 and TH-3. If shallow foundations (footings) are desired, sub-excavation should be anticipated at the moderate and high risk locations. Measures to control groundwater will likely be needed if sub-excavation is used. Additional investigation will be necessary once plans are developed to better assess soil conditions and delineate areas that merit sub-excavation.

Many builder/developers choose to perform sub-excavation to reduce potential heave and provide a relatively uniform fill layer that is likely suitable for footings and slab-on-grade basement floors. Deep foundations (drilled piers) and structurally supported basement floor systems are also used on sites where sub-excavation is impractical..

The sub-excavation contractors should be chosen carefully to assure they have experience with fill placement at over-optimum moisture and have the necessary equipment. The contractors should provide a construction disc to break down fill materials and anticipate use of push-pull scraper operations and dozer assistance. The operation will be relatively slow. The presence of shallow groundwater will complicate sub-excavation. In order for the procedure to be performed properly, close contractor control of fill placement to specifications is required. Special precautions should be taken for compaction of fill at corners, access ramps, and along the perimeters of the sub-excavation as large compaction equipment cannot easily reach these areas. Clay fill



should be moisture-conditioned between optimum and 4 percent above optimum moisture content. Sand fill should have a moisture content within 2 percent of optimum. Fill should be compacted to at least 95 percent of maximum standard Proctor dry density (ASTM D 698). Guideline specifications are presented in Appendix D. A representative of our firm should observe placement and test compaction of the fill. The fill should be tested to evaluate swell after placement to verify whether footing or pad-type foundations and slab-on-grade basement floors can be used.

Slopes

We recommend permanent cut and fill slopes be designed with a maximum slope of 3:1 (horizontal to vertical). Use of 4:1 slopes would be better to control erosion. If site constraints (property boundaries and streets) do not permit construction with recommended slopes, we should be contacted to evaluate the subsurface soils and steeper slopes.

Utilities

Water and sewer lines are usually constructed beneath paved roads. Compaction of trench backfill can have a significant effect on the life and serviceability of pavements. Trench backfill should be placed in thin, loose lifts (8 inches or less) and be moisture-conditioned and compacted as described in Site Grading. The placement and compaction of trench backfill should be observed and tested by a representative of our firm during construction.

Underdrain

With long-term development and subsequent irrigation, groundwater could rise. The water could lead to expansive soil related problems and frequent pumping of basement foundation drains in residential portions of the development. We advocate use of underdrains incorporated into the design of sanitary sewer systems in portions of



the development where basements are planned to provide a means to control water and allow gravity discharge from basement foundation drains. Conceptual sewer underdrain details are provided on Figs. 6 through 8. If the underdrains discharge to a detention pond or drainage, the potential for backflow of water from the discharge point into the underdrain and building foundation drains should be evaluated.

Pavements

Pavement subgrade soils will likely consist of non-expansive sand, expansive clay or claystone or fill of similar composition. Clay and claystone have poor pavement support characteristics. Sand is considered better subgrade material. Depending on site grading, mitigation of expansive subgrade consisting of sub-excavation may be necessary. Sub-excavation locations and depths should be based on additional investigation. The Town of Fort Lupton requires full-depth asphalt pavement sections for all public streets. We anticipate a minimum section of at least 5 to 6 inches of asphalt for local streets and 7 to 8 inches of asphalt for residential collectors. Thicker asphalt may be necessary. Subgrade investigation and pavement designs should be performed after grading is complete.

BUILDING CONSTRUCTION CONSIDERATIONS

The following discussions are preliminary and not intended for design or construction. After grading is completed, design-level investigations should be performed on a building-specific basis.

Foundations

Our investigation indicates non-expansive sand and expansive clay and claystone bedrock are present at depths likely to influence performance of shallow foundations and slabs-on-grade. Footing foundations are suitable where low swelling soils and bedrock are present, or if sub-excavation of expansive material is performed. Alterna-



tively, a deep foundation system such as drilled piers can be considered for areas with moderate to high swelling soils or bedrock. Post-tensioned slab-on-grade foundations may be considered where basements are not planned. Additional investigations should be conducted to more fully assess soil conditions.

Slab-On-Grade Construction

Structurally supported floors should be anticipated in all non-basement finished living space in residences unless post-tensioned slab-on-grade foundations are used. Slab-on-grade basement floors may be considered on low and moderate risk sites where potential heave is acceptable to builders and home buyers. Structurally-supported basement floors should be used on sites with high or very high risk of poor basement slab performance. Based on our widely-spaced borings, moderate to high risk conditions appear to be present for about 40 percent of the site.

Floor systems in commercial and retail buildings largely depend on the building use, size, and owner/operator's tolerance of floor movement. On high and some moderate risk sites owner-operators typically elect to over-excavate expansive soil to reduce potential floor movement and enhance floor performance versus using a structurally supported floor. In rare instances, structurally supported floors are used.

The performance of surface flatwork may be poor at this site where higher swell materials are present, unless sub-excavation is performed below these improvements. The following precautions will be required to reduce the potential for damage due to movement of conventional slab-on-grade floors:

1. Isolation of the slabs from foundation walls, columns or other slab penetrations using a slip-joint;
2. Voiding of interior partition walls at the top or bottom to allow slab movement to occur without transferring movement to the structure; and



3. Flexible water and gas connections to allow for slab movement. A flexible plenum above furnaces will be required.

Below-Grade Areas

Surface water can penetrate relatively permeable loose backfill soils located adjacent to structures and collect at the bottom of relatively impermeable excavations causing wet or moist conditions. If basements are not used in residences, crawl space drains should be planned. Foundation drains are not common for commercial and retail buildings with no below-grade areas. Below grade walls should be designed for lateral earth pressures. Foundation drains should ideally be connected to an underdrain system to provide a gravity outlet. The drains can be connected to a sump pit where water is removed by pumping if an underdrain is not provided.

Surface Drainage

The performance of improvements will be influenced by surface drainage. When developing an overall drainage scheme, consideration should be given to drainage around each building. The ground surface around buildings should be sloped to provide positive drainage away from the foundations. We typically recommend a slope of at least 10 percent for the first 10 feet surrounding residences with basements, where practical, and slopes of at least 5 percent for structures without basements. Where possible, drainage swales should slope at least 2 percent. Roof downspouts and other water collection systems should discharge well beyond the limits of backfill around structures.

For commercial and retail buildings, it may be more difficult to adhere to the aforementioned drainage criteria; particularly where surface flatwork connects to buildings. In this instance, provide as much slope as practical. ADA requirements may limit slope. Surface drainage should be considered when setting finished floor elevations.



Proper control of surface runoff is also important to control the erosion of surface soils. Concentrated sheet flow should not be directed over unprotected slopes. Water should not be allowed to pond at the crest of slopes. Permanent slopes should be prepared to reduce erosion.

Attention should be paid to compact the soils behind curb and gutter adjacent to streets and in utility trenches during the development. If surface drainage between preliminary development and construction phases is neglected, performance of the roadways, flatwork and foundations may be poor.

Concrete

Concrete in contact with soil can be subject to sulfate attack. We measured a water-soluble sulfate concentration of 0.19 percent in one sample from this site. For concentrations between 0.1 and 0.2 percent, ACI 332-08 *Code Requirements for Residential Concrete* indicates concrete shall be made with an ASTM C150 Type II cement, or an ASTM C595 or C1157 hydraulic cement meeting moderate sulfate-resistant hydraulic cement (MS) designation. We recommend additional testing during subsequent investigations.

Superficial damage may occur to the exposed surfaces of highly permeable concrete. To control this risk and to resist freeze-thaw deterioration, the water-to-cementitious materials ratio should not exceed 0.50 for concrete in contact with soils that are likely to stay moist due to surface drainage or shallow groundwater. Concrete should have a total air content of 6 percent $\pm$ 1.5 percent.

RECOMMENDED FUTURE INVESTIGATIONS

We recommend the following investigations and services:

1. Additional investigations to delineate potential sub-excavation extent;



2. Construction testing and observation during site development, including compaction testing of grading fill, utility trench backfill, and pavements;
3. Subgrade investigation and pavement designs after grading;
4. Design-level investigations for structures; and
5. Foundation installation observations.

GEOTECHNICAL RISK

The concept of risk is an important aspect with any geotechnical evaluation primarily because the methods used to develop geotechnical recommendations do not comprise an exact science. We never have complete knowledge of subsurface conditions. Our analysis must be tempered with engineering judgment and experience. Therefore, the recommendations presented in any geotechnical evaluation should not be considered risk-free. Our recommendations represent our judgment of those measures that are necessary to increase the chances that the development will perform satisfactorily. It is critical that all recommendations in this report are followed during construction.

LIMITATIONS

Our borings were widely spaced to provide a preliminary picture of subsurface conditions for planning. We believe this investigation was conducted in a manner consistent with the level of care and skill ordinarily used by geotechnical engineers practicing under similar conditions. No warranty, express or implied, is made.



If we can be of further service in discussing either the contents of this report or the analysis of the influence of subsurface conditions on the design of the proposed development, please call.

CTL | THOMPSON, INC.

Chris Fitzsimmons, E.I.T.
Staff Engineer

Reviewed by:

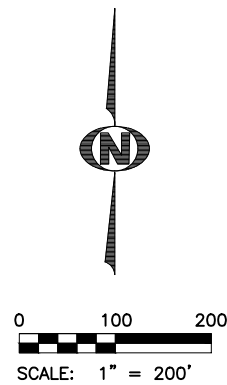
Ronald M. McOmber, P.E.
Chairman, Senior Principal

CF:RMM/cf/nn

Via e-mail: eric@jehome.com

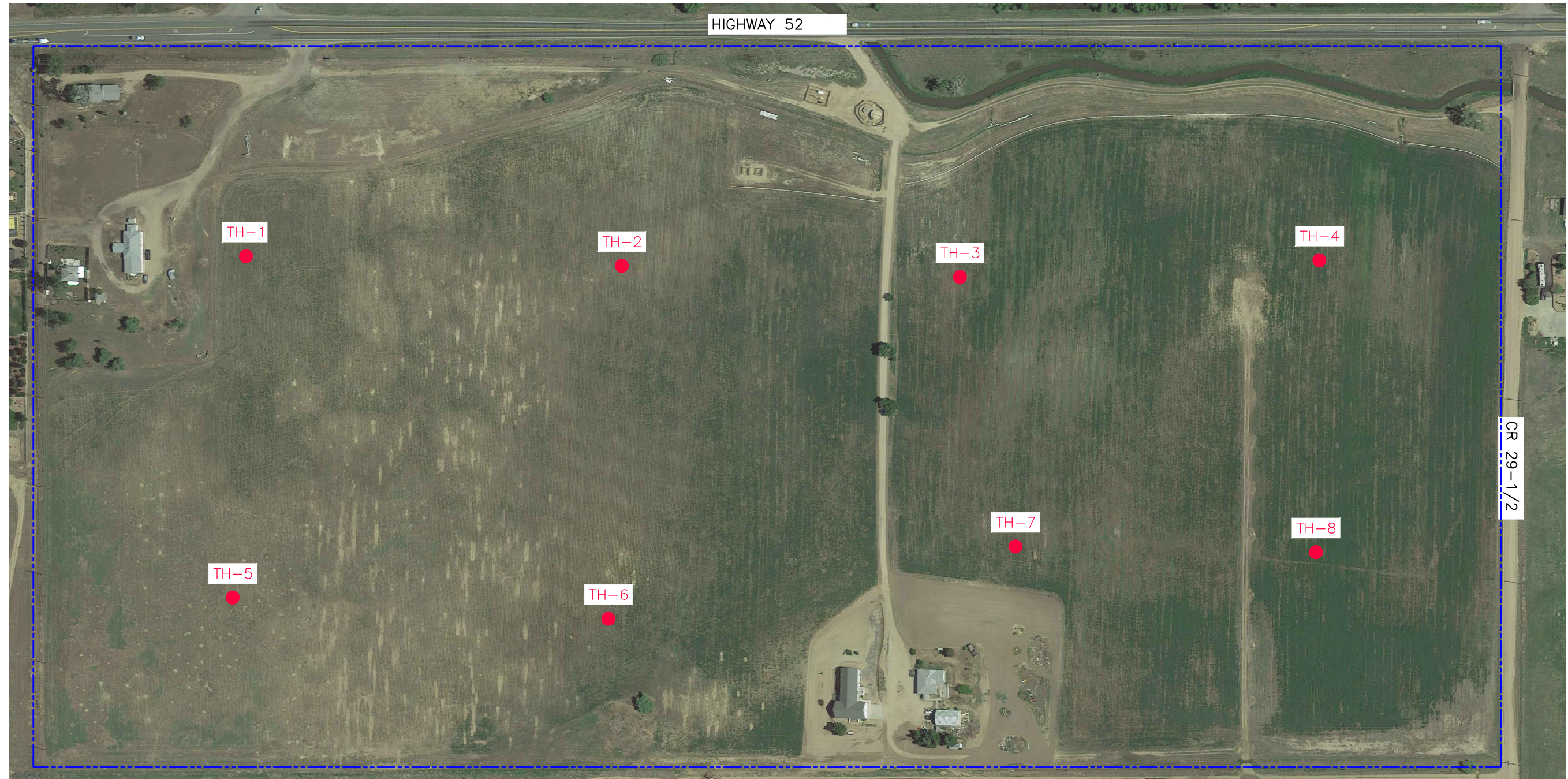
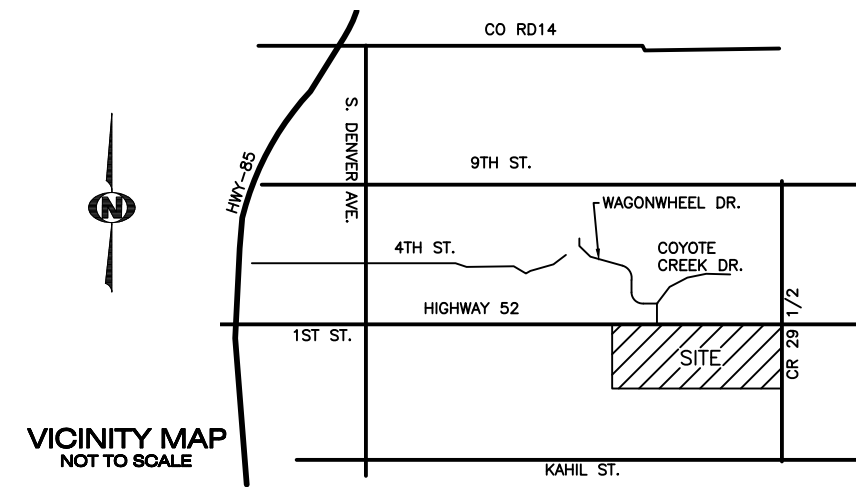


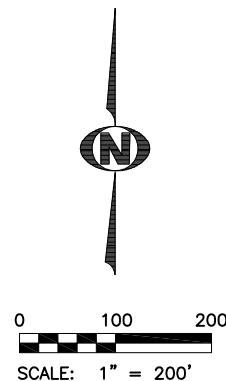
Ronald M. McOmber
Oct 31 2019



LEGEND:

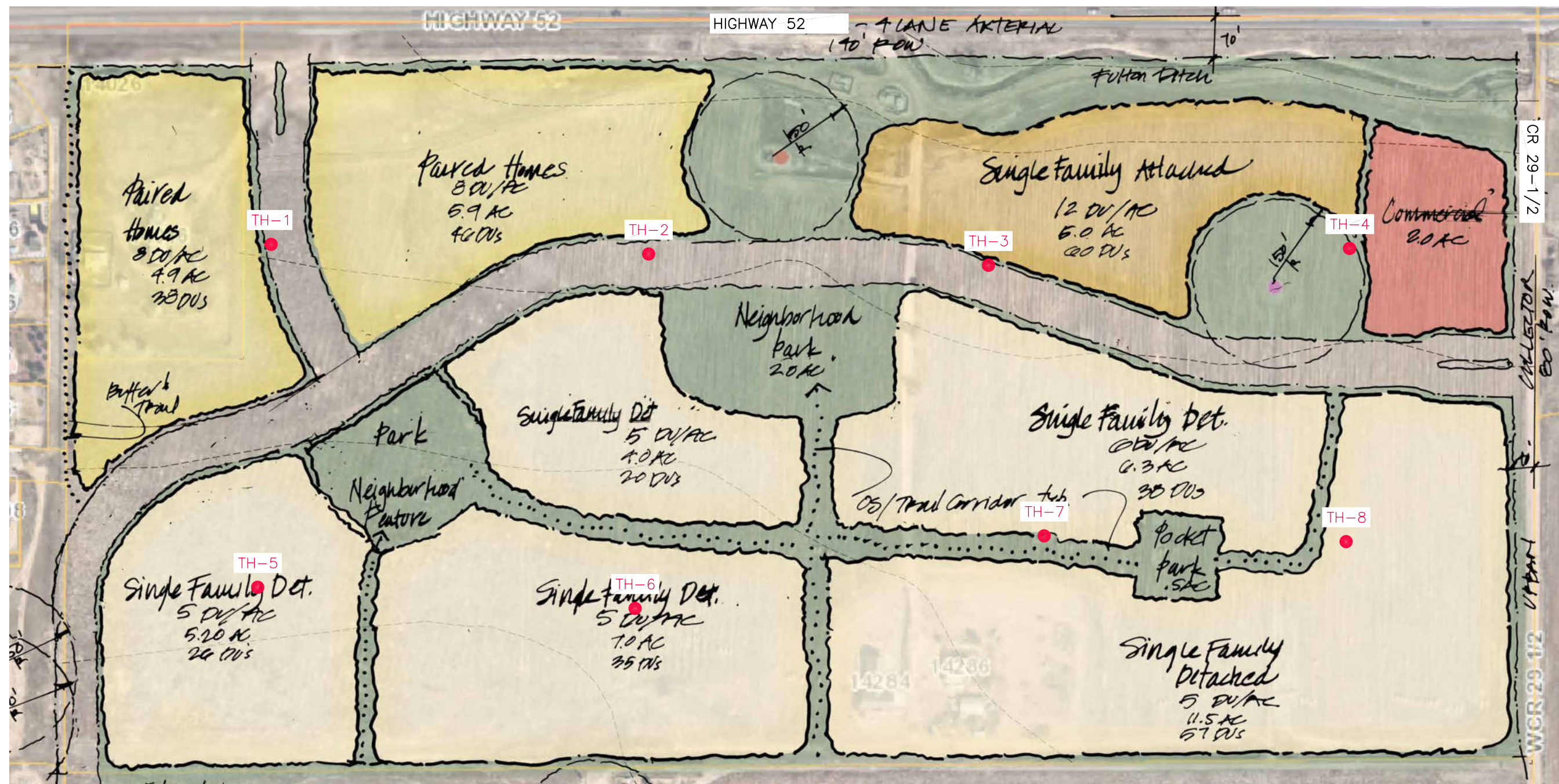
- TH-1 APPROXIMATE LOCATION OF EXPLORATORY BORING
- INDICATES SITE BOUNDARY

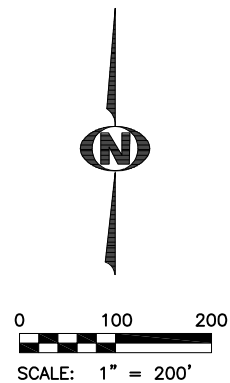




LEGEND:

- TH-1 APPROXIMATE LOCATION OF
EXPLORATORY BORING



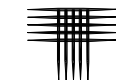


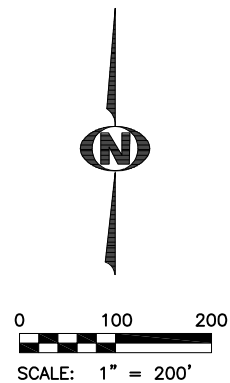
LEGEND:

- TH-1
● APPROXIMATE LOCATION OF EXPLORATORY BORING
- INDICATES SITE BOUNDARY

- (17) INDICATES APPROXIMATE DEPTH TO BEDROCK BELOW EXISTING GRADE (FEET)
- [4951.5] INDICATES BEDROCK ELEVATION (FEET)
- BNE INDICATES BEDROCK WAS NOT ENCOUNTERED

- NOTES: 1) THIS ESTIMATE WAS BASED UPON A SUBJECTIVE ANALYSIS OF DRILL HOLE DATA AND MAY NOT REFLECT LOCAL VARIATIONS.
- 2) "BEDROCK" REPRESENTS TOP OF WEATHERED OR COMPARATIVELY UNWEATHERED MATERIAL.



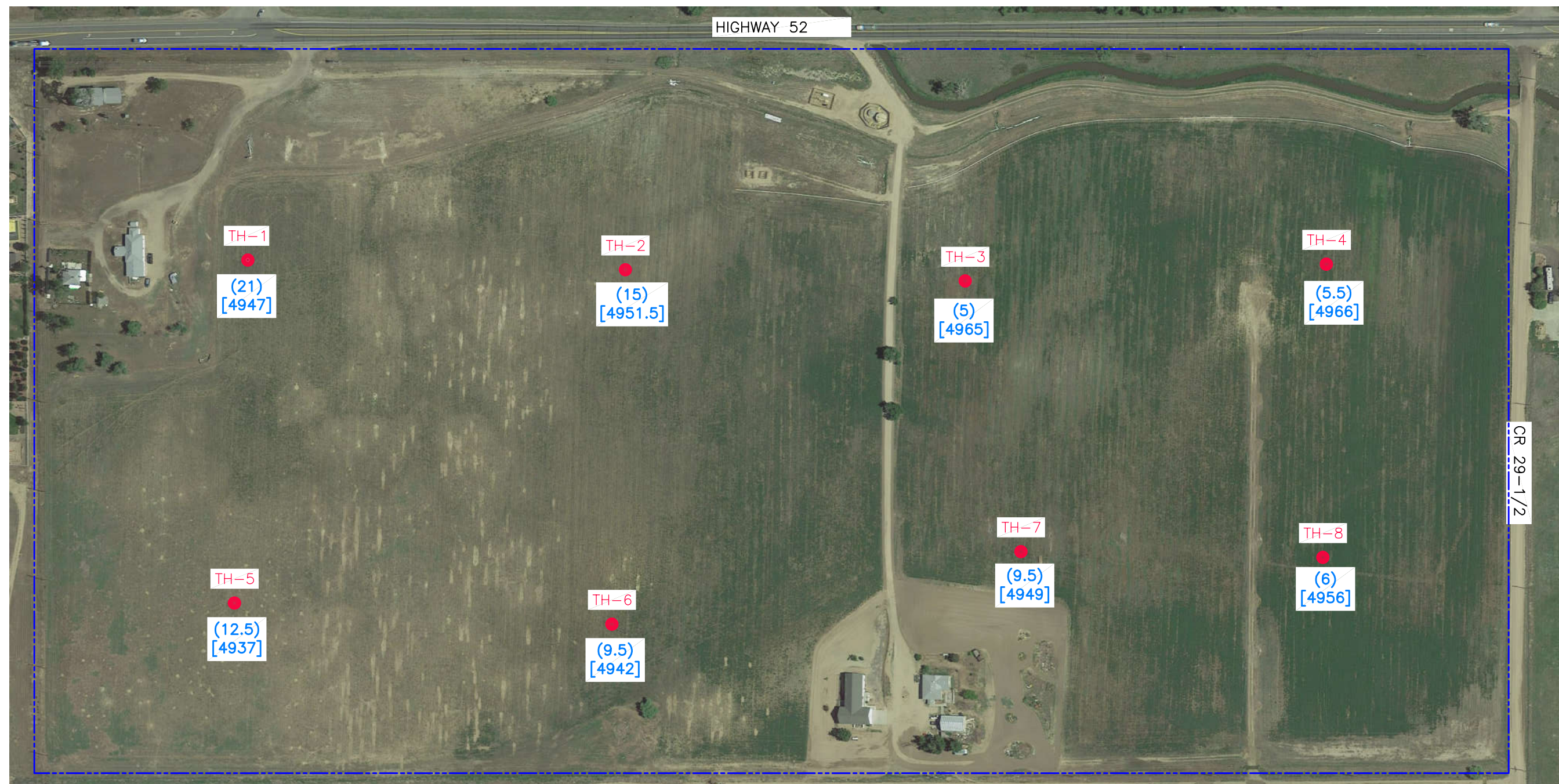
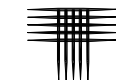


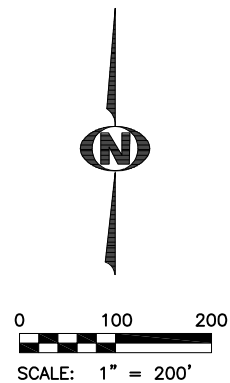
LEGEND:

- TH-1
● APPROXIMATE LOCATION OF EXPLORATORY BORING
- INDICATES SITE BOUNDARY

- (21) INDICATES MEASURED DEPTH TO GROUNDWATER (FEET)
- [4947] INDICATES APPROXIMATE GROUNDWATER ELEVATION (FEET)

NOTE: THIS ESTIMATE WAS BASED UPON A SUBJECTIVE ANALYSIS OF DRILL HOLE DATA AND MAY NOT REFLECT LOCAL VARIATIONS AND SEASONAL FLUCTUATIONS.



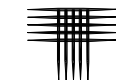


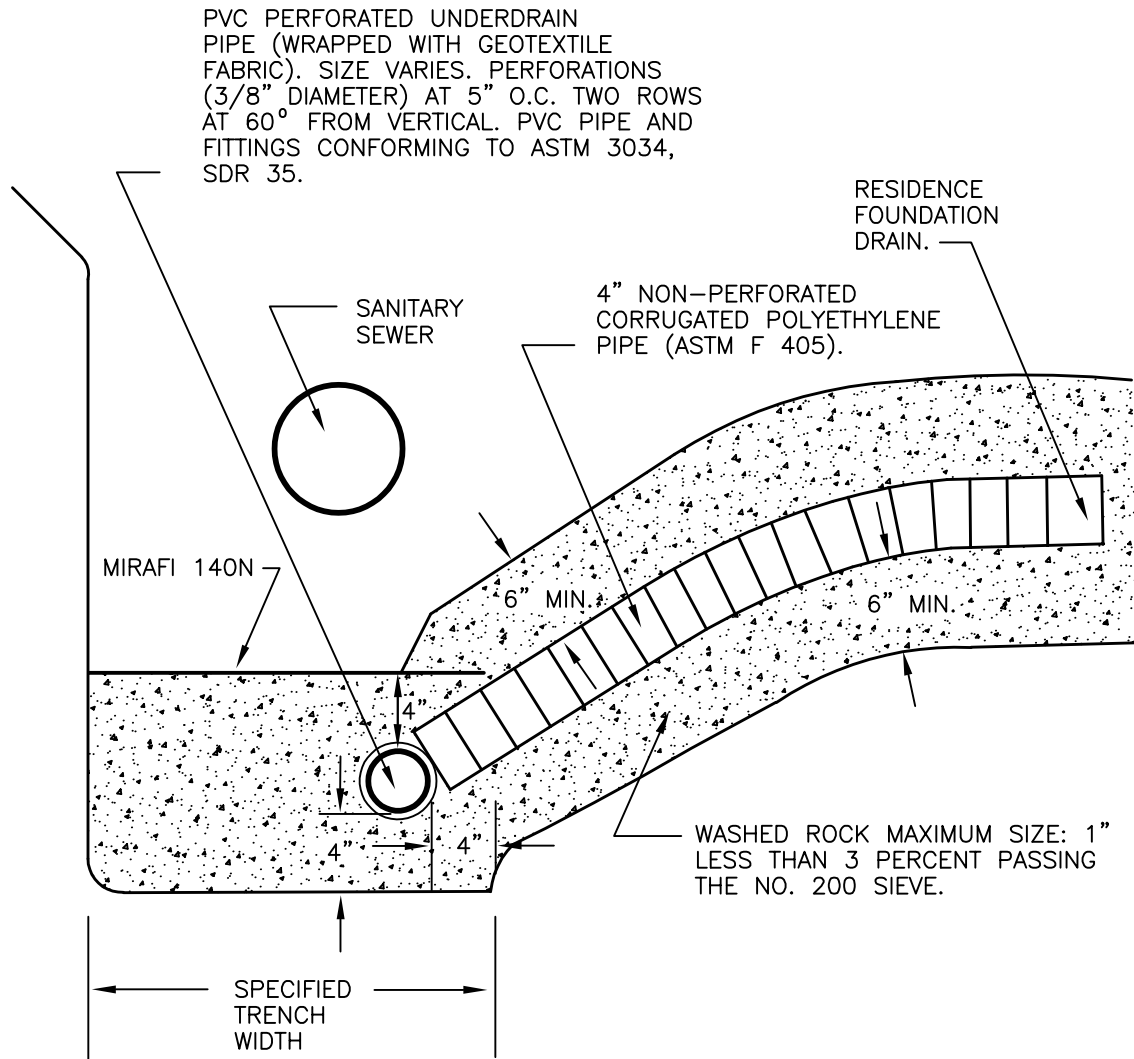
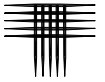
LEGEND:

- TH-1 ● APPROXIMATE LOCATION OF EXPLORATORY BORING
- INDICATES SITE BOUNDARY

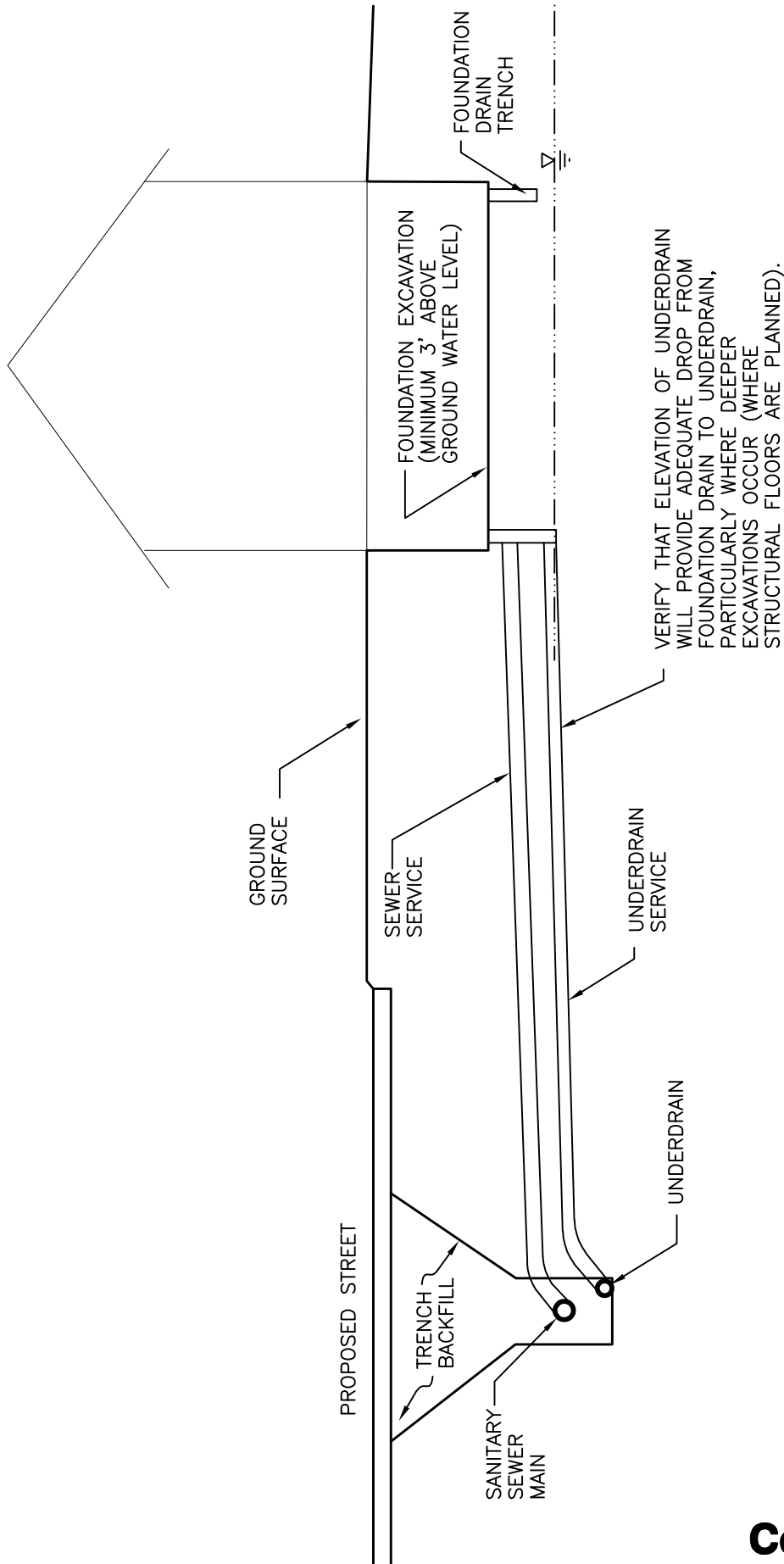
- LOW RISK
- MODERATE RISK
- HIGH RISK

NOTE: THIS ESTIMATE WAS BASED UPON A SUBJECTIVE ANALYSIS OF LABORATORY TEST RESULTS AND DRILL HOLE DATA.





NOTE: NOT TO SCALE.

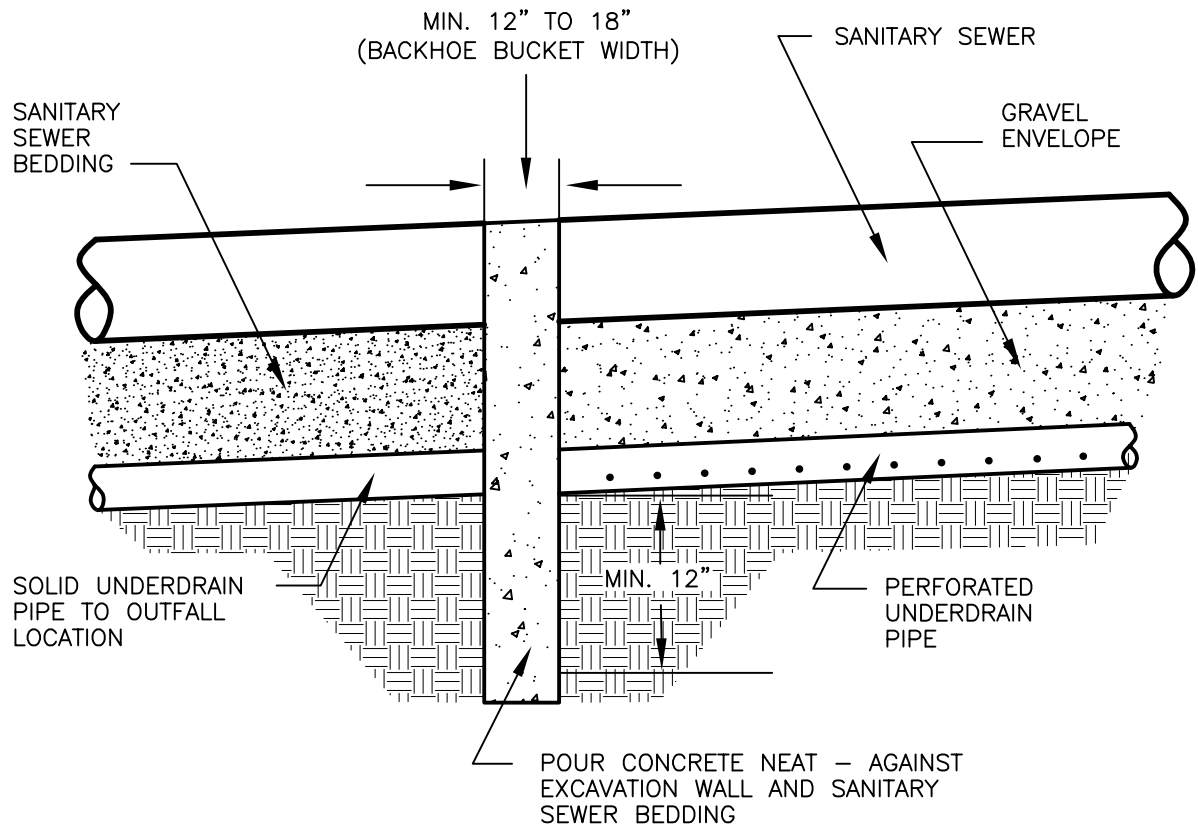
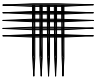


NOT TO SCALE

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTL\T Project No. DN50,219-115-R1

Conceptual Underdrain Service Profile

Fig. 7

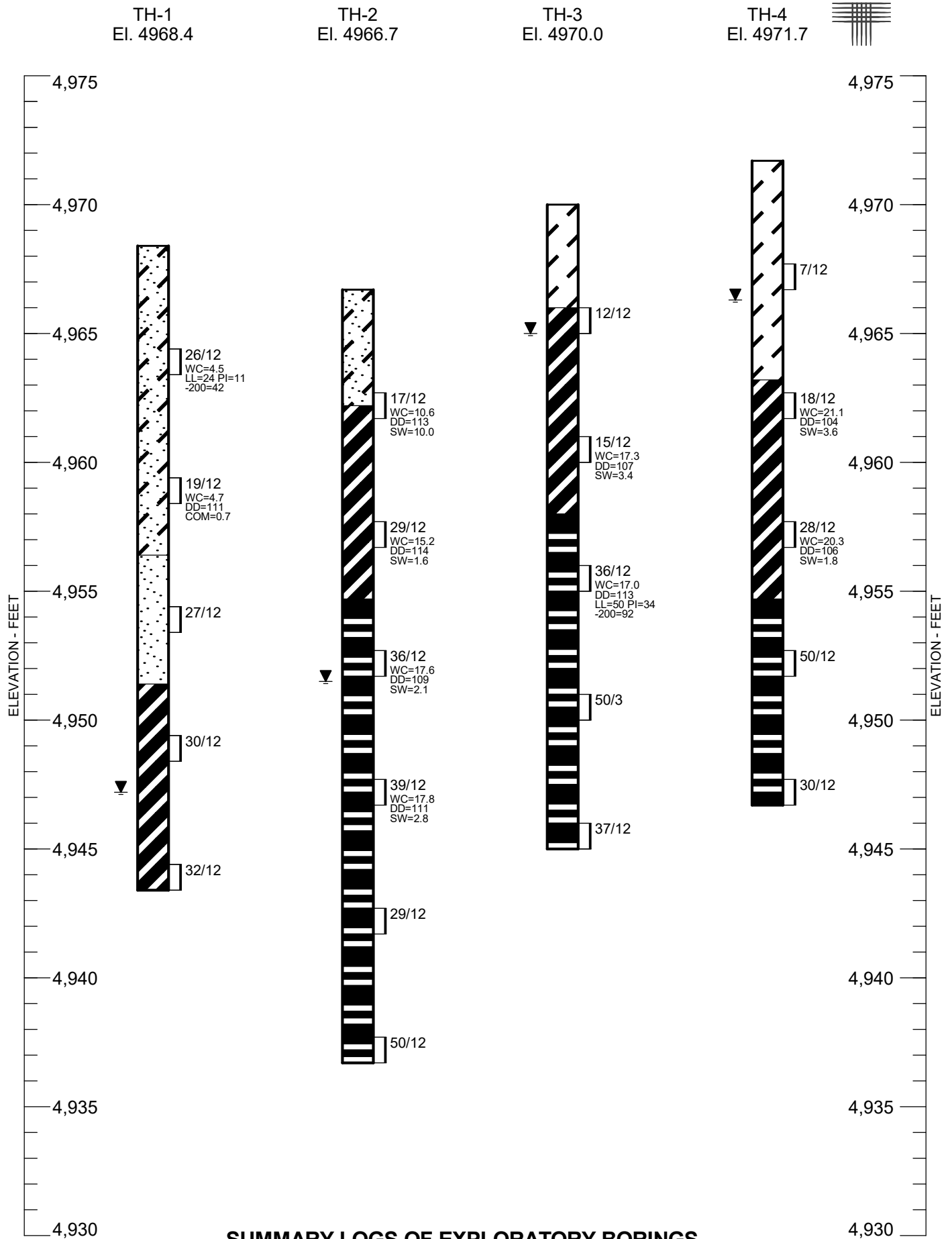


NOTE:
THE CONCRETE CUTOFF WALL SHOULD EXTEND INTO THE UNDISTURBED
SOILS OUTSIDE THE UNDERDRAIN AND SANITARY SEWER TRENCH A
MINIMUM DISTANCE OF 12 INCHES.



APPENDIX A

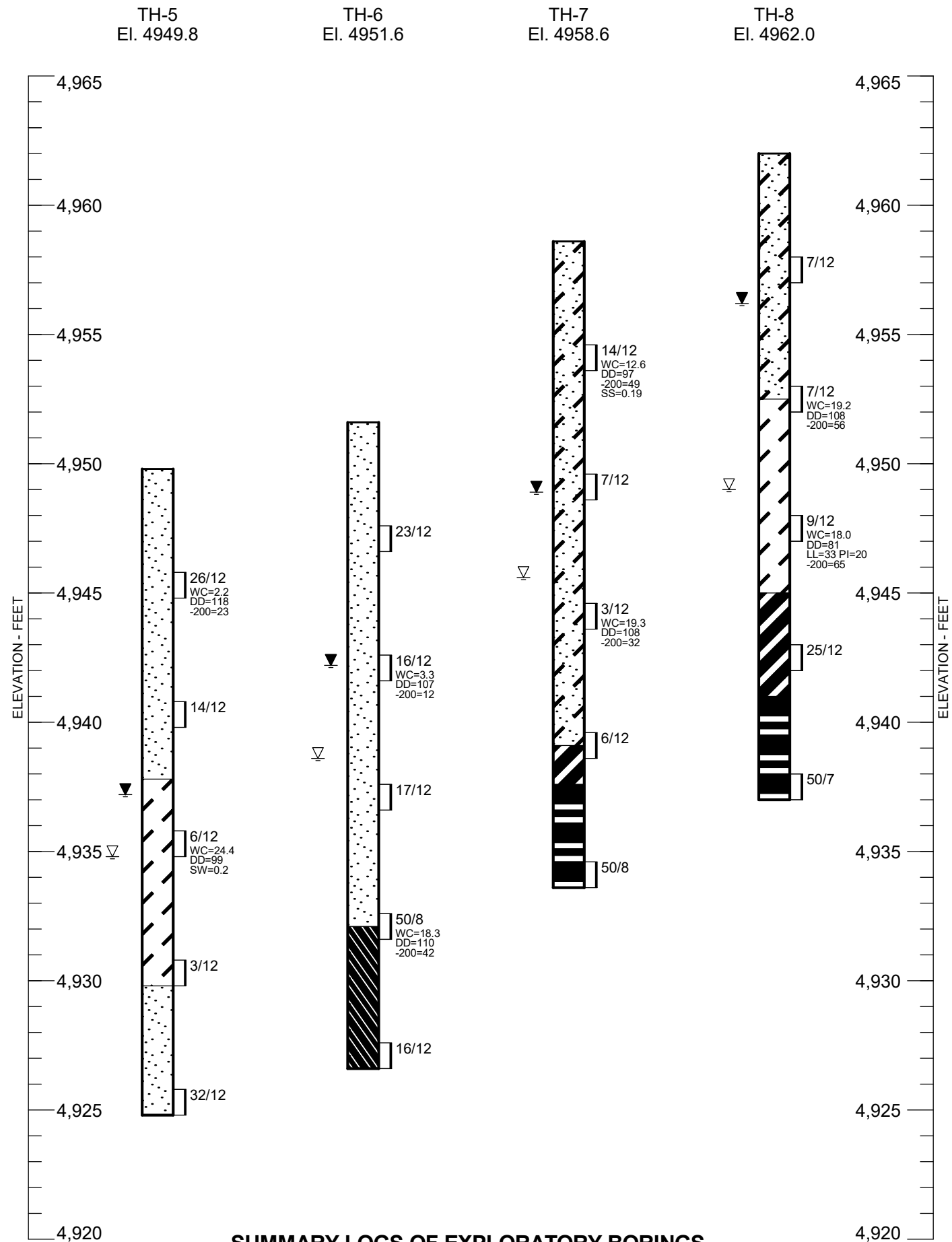
SUMMARY LOGS OF EXPLORATORY BORINGS



SUMMARY LOGS OF EXPLORATORY BORINGS

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTL/T PROJECT NO. DN50,219-115-R1

FIG. A- 1



SUMMARY LOGS OF EXPLORATORY BORINGS

LEGEND:

- CLAY, SANDY TO VERY SANDY, SILTY, SOFT TO STIFF, MOIST TO VERY MOIST, BROWN, LIGHT BROWN, TAN (CL).
- SAND, CLAYEY, VERY LOOSE TO MEDIUM DENSE, MOIST TO VERY MOIST, BROWN, TAN, GRAY, LIGHT BROWN (SC).
- SAND, CLEAN TO SILTY, OCCASIONAL GRAVEL, MEDIUM DENSE TO DENSE, SLIGHTLY MOIST TO WET, BROWN, TAN, WHITE, GRAY (SP, SP-SM, SM).
- WEATHERED CLAYSTONE, HIGHLY PLASTIC, SLIGHTLY MOIST, BROWN, RUST, GRAY.
- BEDROCK, CLAYSTONE, SILTY AT TIMES, MEDIUM HARD TO VERY HARD, SLIGHTLY MOIST, BROWN, GRAY, RUST, TAN.
- BEDROCK, INTERBEDDED CLAYSTONE/SANDSTONE, SILTY, MEDIUM HARD TO VERY HARD, SLIGHTLY MOIST, GRAY, TAN, RUST.
- DRIVE SAMPLE. THE SYMBOL 26/12 INDICATES 26 BLOWS OF AN AUTOMATIC 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE A 2.5-INCH O.D. SAMPLER 12 INCHES.
- WATER LEVEL MEASURED AT TIME OF DRILLING.
- WATER LEVEL MEASURED AFTER DRILLING ON OCTOBER 19, 2019.

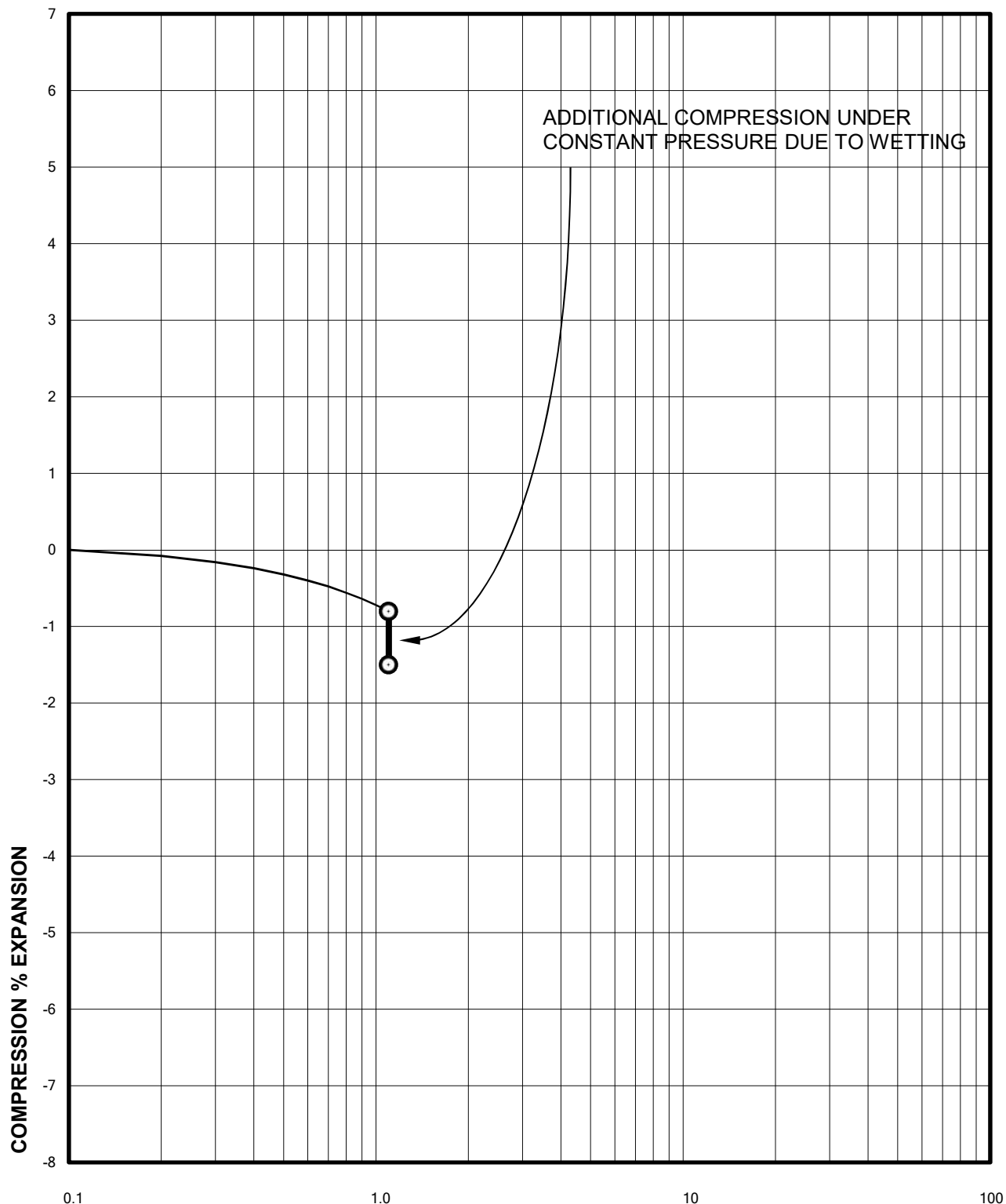
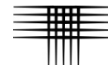
NOTES:

- THE BORINGS WERE DRILLED ON OCTOBER 9, 2019 USING 4-INCH DIAMETER, CONTINUOUS-FLIGHT SOLID-STEM AUGER AND TRUCK-MOUNTED CME-55 DRILL RIG.
- BORING LOCATIONS AND ELEVATIONS ARE APPROXIMATE AND WERE SURVEYED BY A REPRESENTATIVE OF OUR FIRM USING A LEICA GS18 GPS UNIT REFERENCING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
- WC - INDICATES MOISTURE CONTENT (%).
DD - INDICATES DRY DENSITY (PCF).
SW - INDICATES SWELL WHEN WETTED UNDER APPROXIMATE OVERBURDEN PRESSURE (%).
COM- INDICATES COMPRESSION WHEN WETTED UNDER APPROXIMATE OVERBURDEN PRESSURE (%).
LL - INDICATES LIQUID LIMIT.
PI - INDICATES PLASTICITY INDEX.
-200 - INDICATES PASSING NO. 200 SIEVE (%).
SS - INDICATES WATER-SOLUBLE SULFATE CONTENT (%).
- THESE LOGS ARE SUBJECT TO THE EXPLANATIONS, LIMITATIONS AND CONCLUSIONS CONTAINED IN THIS REPORT.



APPENDIX B

LABORATORY TEST RESULTS AND TABLE B-I



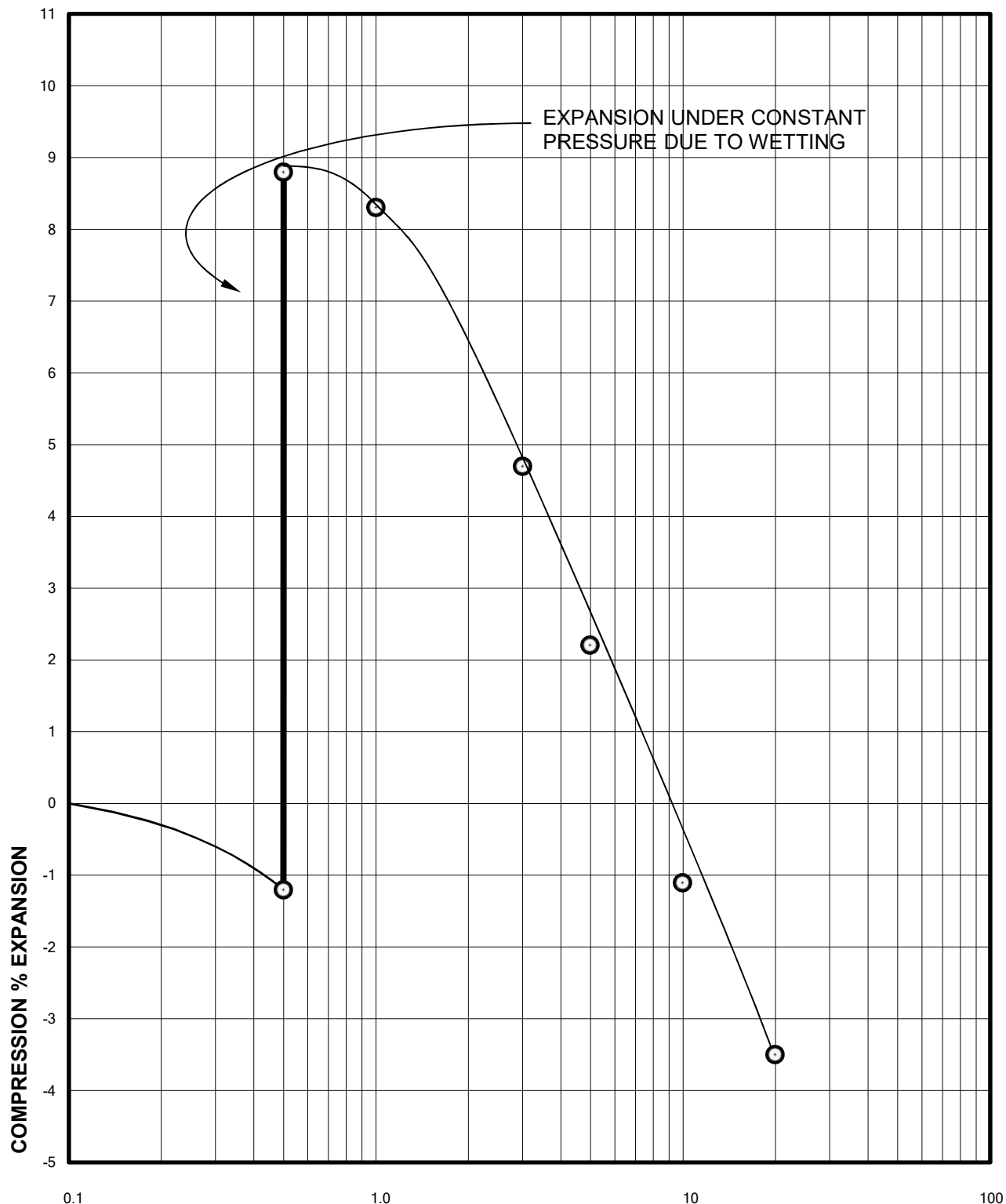
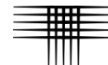
APPLIED PRESSURE - KSF
Sample of SAND, CLAYEY (SC)
From TH-1 AT 9 FEET

DRY UNIT WEIGHT= 111 PCF
MOISTURE CONTENT= 4.7 %

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

Swell Consolidation Test Results

FIG. B-1



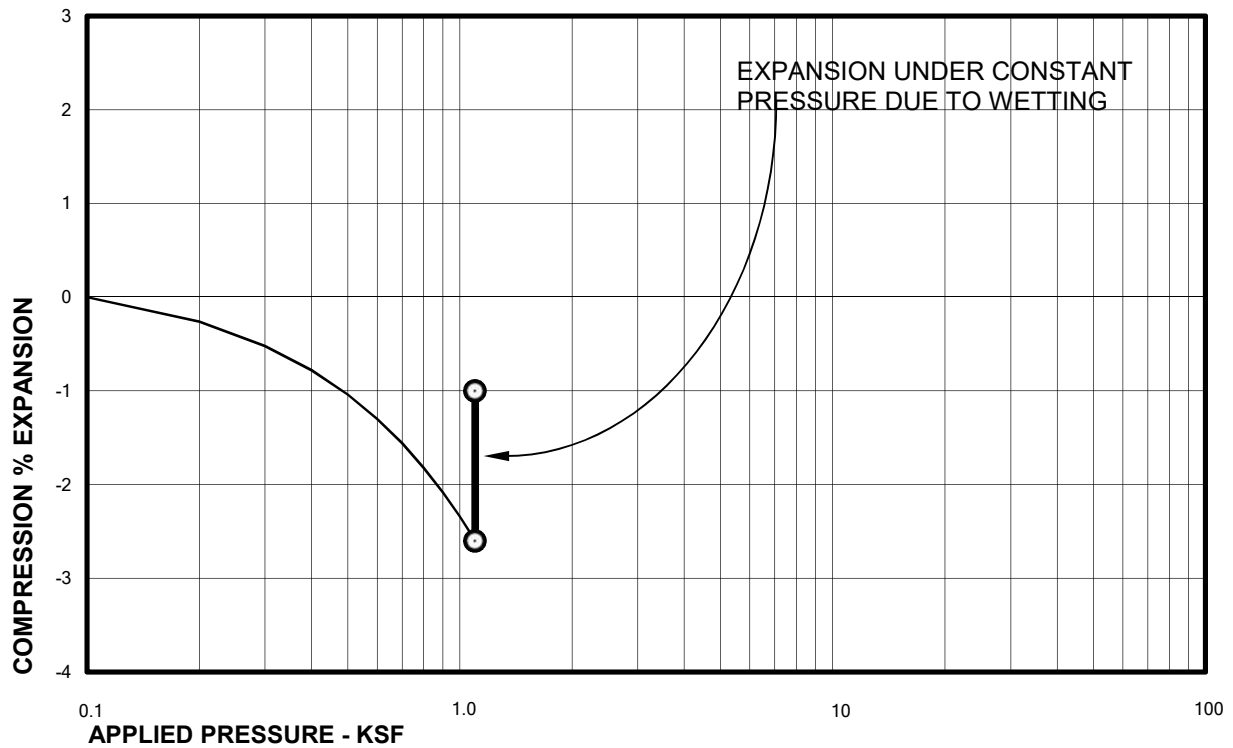
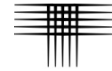
APPLIED PRESSURE - KSF
Sample of WEATHERED CLAYSTONE
From TH-2 AT 4 FEET

DRY UNIT WEIGHT= 113 PCF
MOISTURE CONTENT= 10.6 %

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

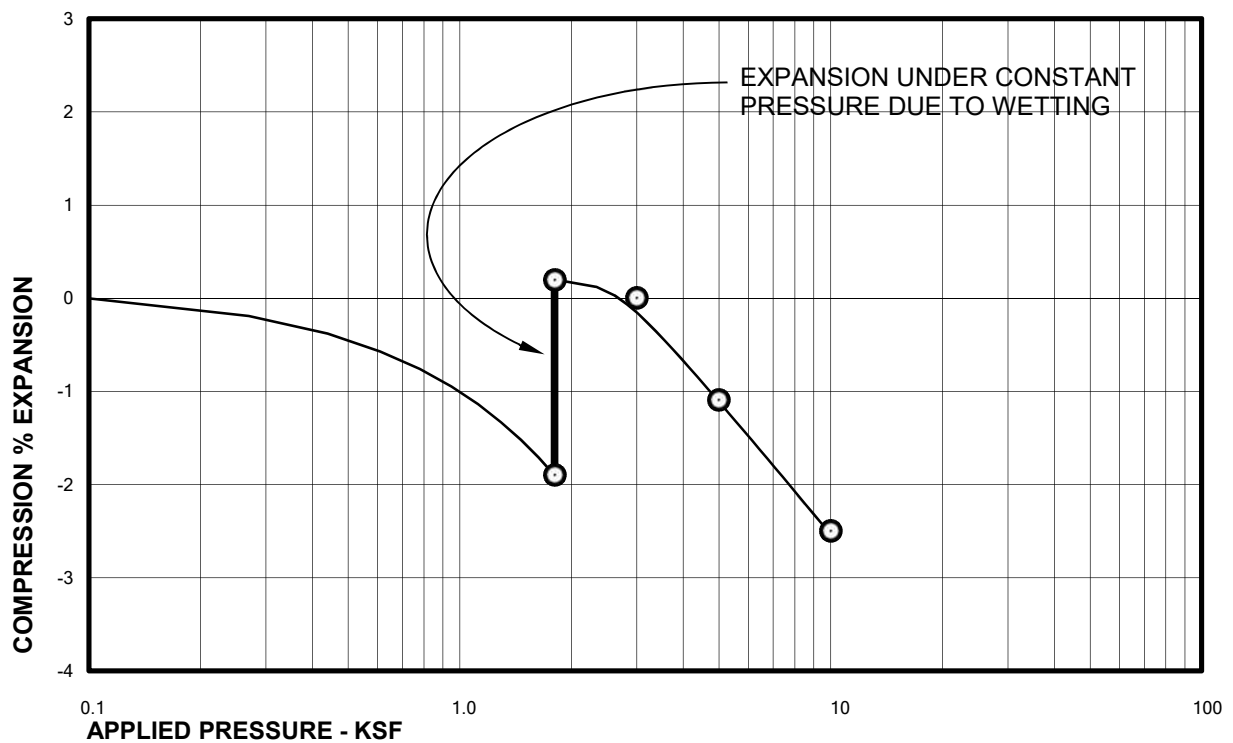
Swell Consolidation Test Results

FIG. B-2



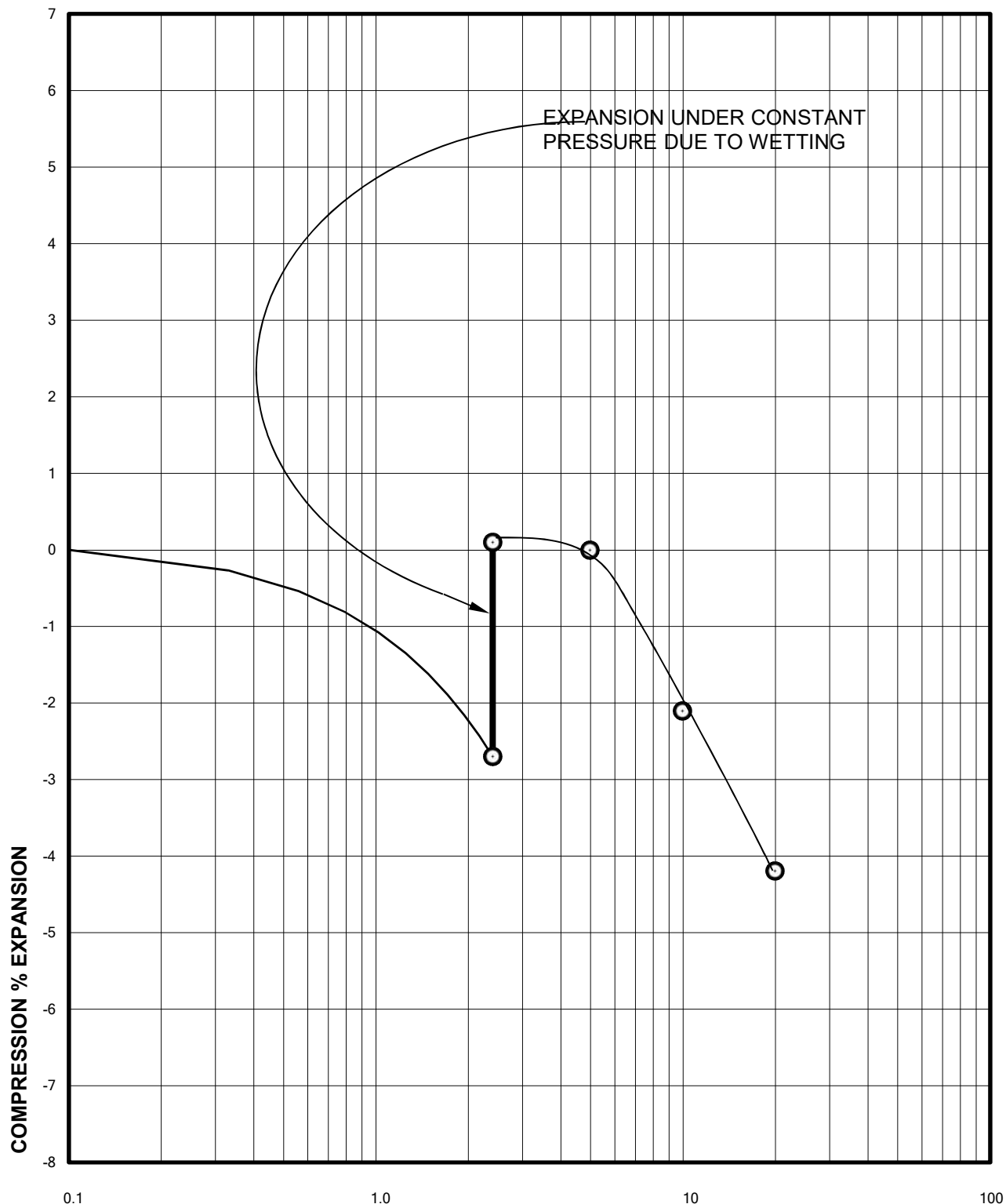
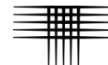
Sample of WEATHERED CLAYSTONE
From TH-2 AT 9 FEET

DRY UNIT WEIGHT= 114 PCF
MOISTURE CONTENT= 15.2 %



Sample of CLAYSTONE
From TH-2 AT 14 FEET

DRY UNIT WEIGHT= 109 PCF
MOISTURE CONTENT= 17.6 %



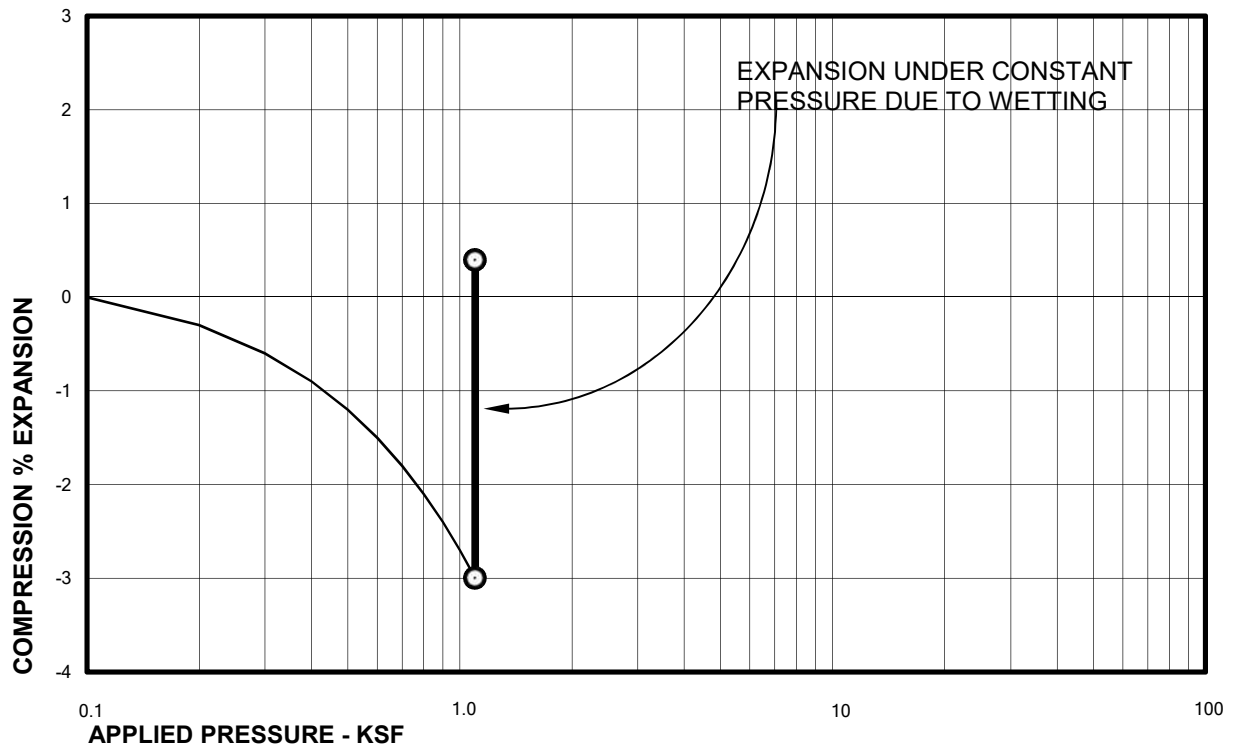
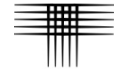
APPLIED PRESSURE - KSF
Sample of CLAYSTONE
From TH-2 AT 19 FEET

DRY UNIT WEIGHT= 111 PCF
MOISTURE CONTENT= 17.8 %

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

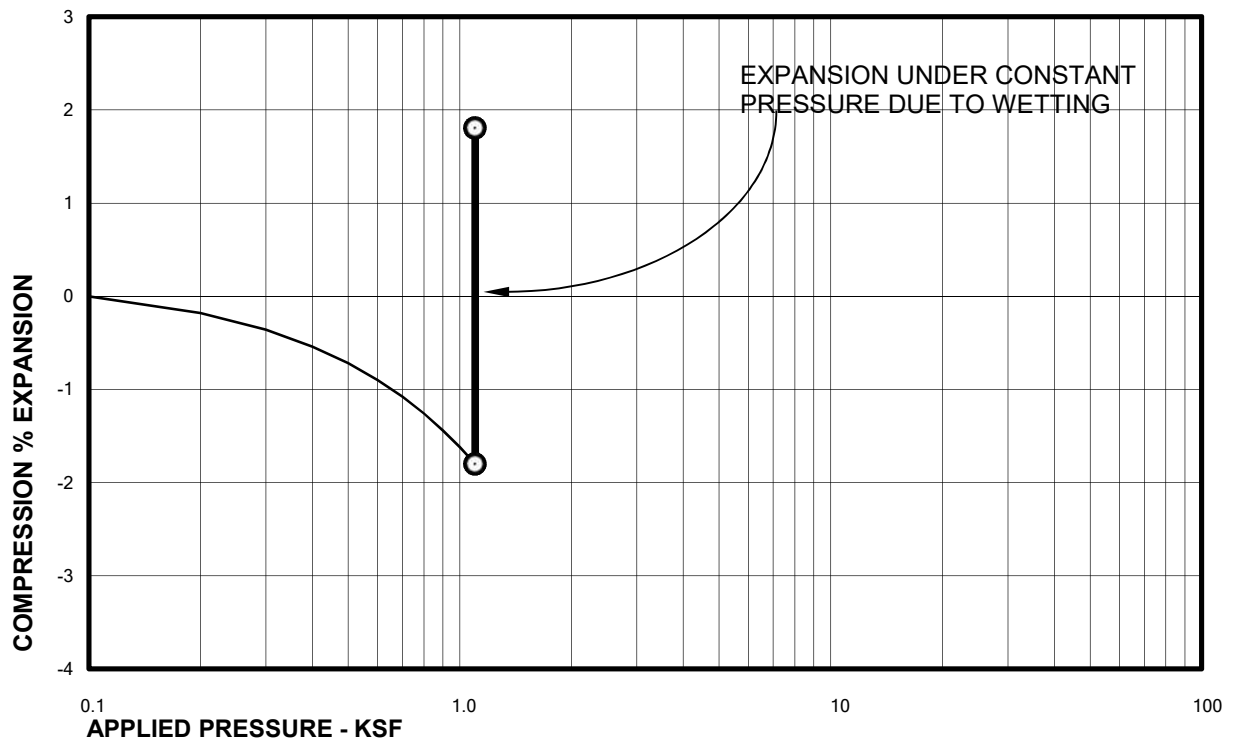
Swell Consolidation Test Results

FIG. B-4



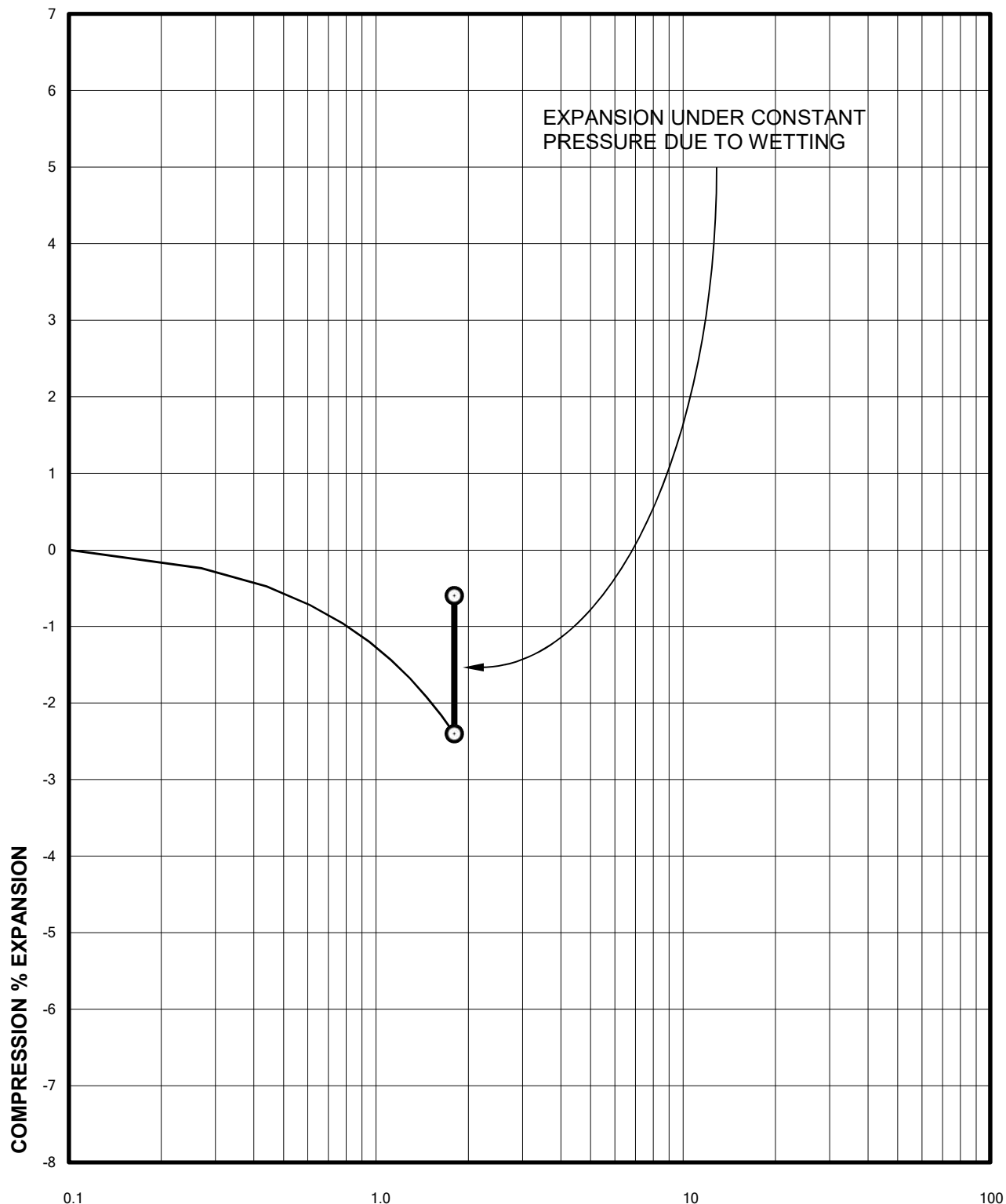
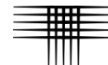
Sample of WEATHERED CLAYSTONE
From TH-3 AT 9 FEET

DRY UNIT WEIGHT= 107 PCF
MOISTURE CONTENT= 17.3 %



Sample of WEATHERED CLAYSTONE
From TH-4 AT 9 FEET

DRY UNIT WEIGHT= 104 PCF
MOISTURE CONTENT= 21.1 %



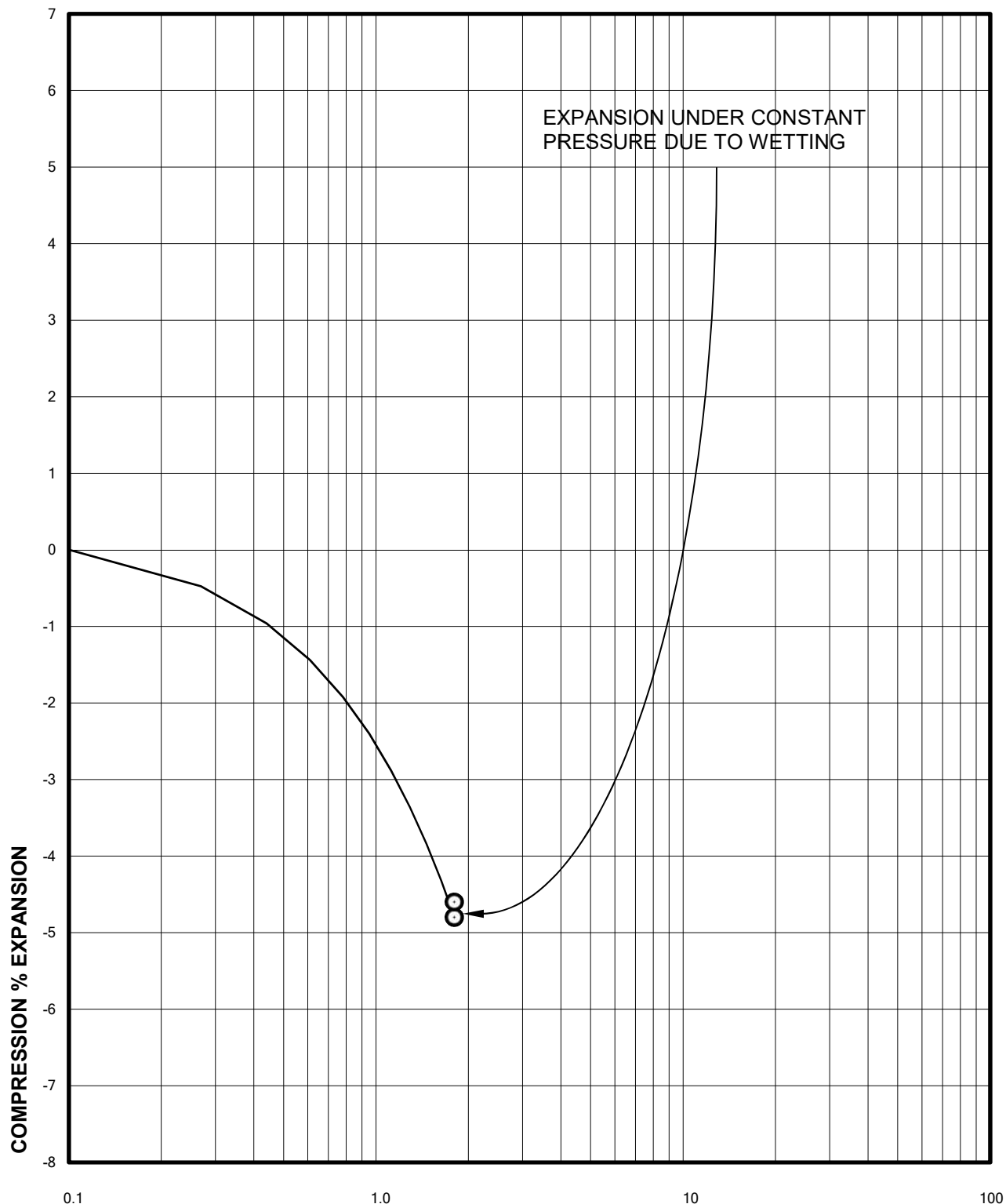
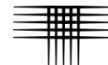
APPLIED PRESSURE - KSF
Sample of WEATHERED CLAYSTONE
From TH-4 AT 14 FEET

DRY UNIT WEIGHT= 106 PCF
MOISTURE CONTENT= 20.3 %

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

Swell Consolidation Test Results

FIG. B-6



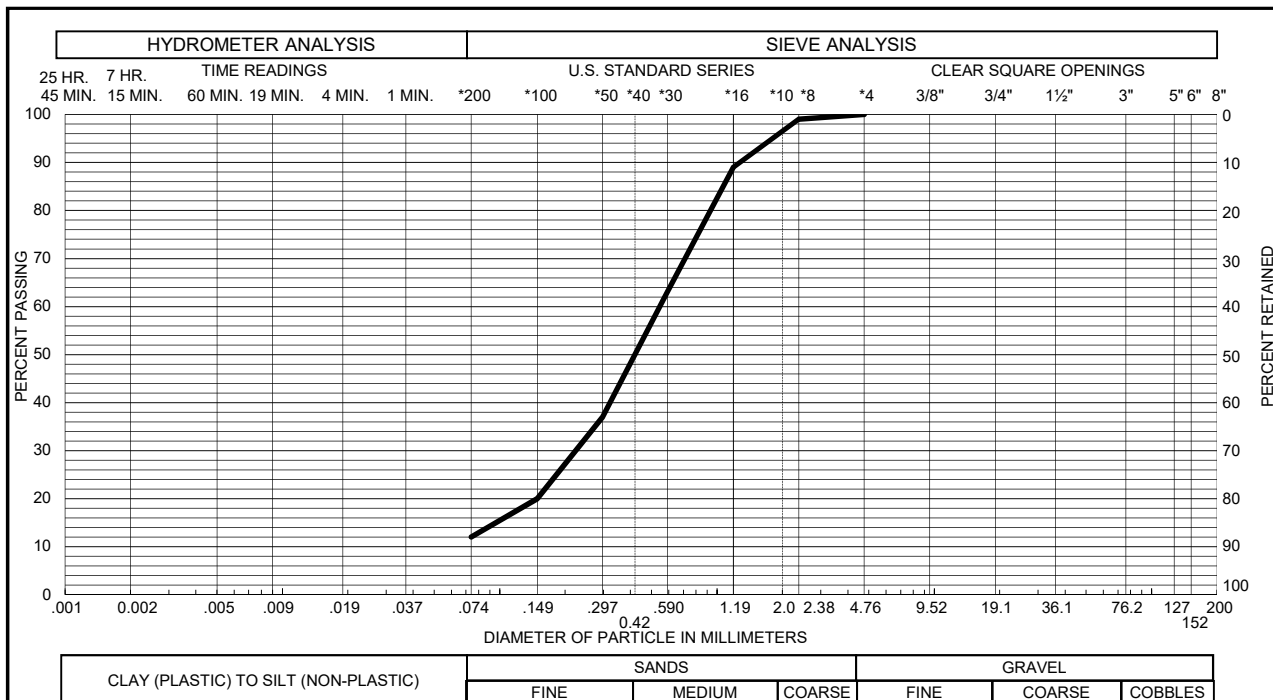
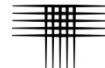
APPLIED PRESSURE - KSF
Sample of CLAY, SANDY (CL)
From TH-5 AT 14 FEET

DRY UNIT WEIGHT= 99 PCF
MOISTURE CONTENT= 24.4 %

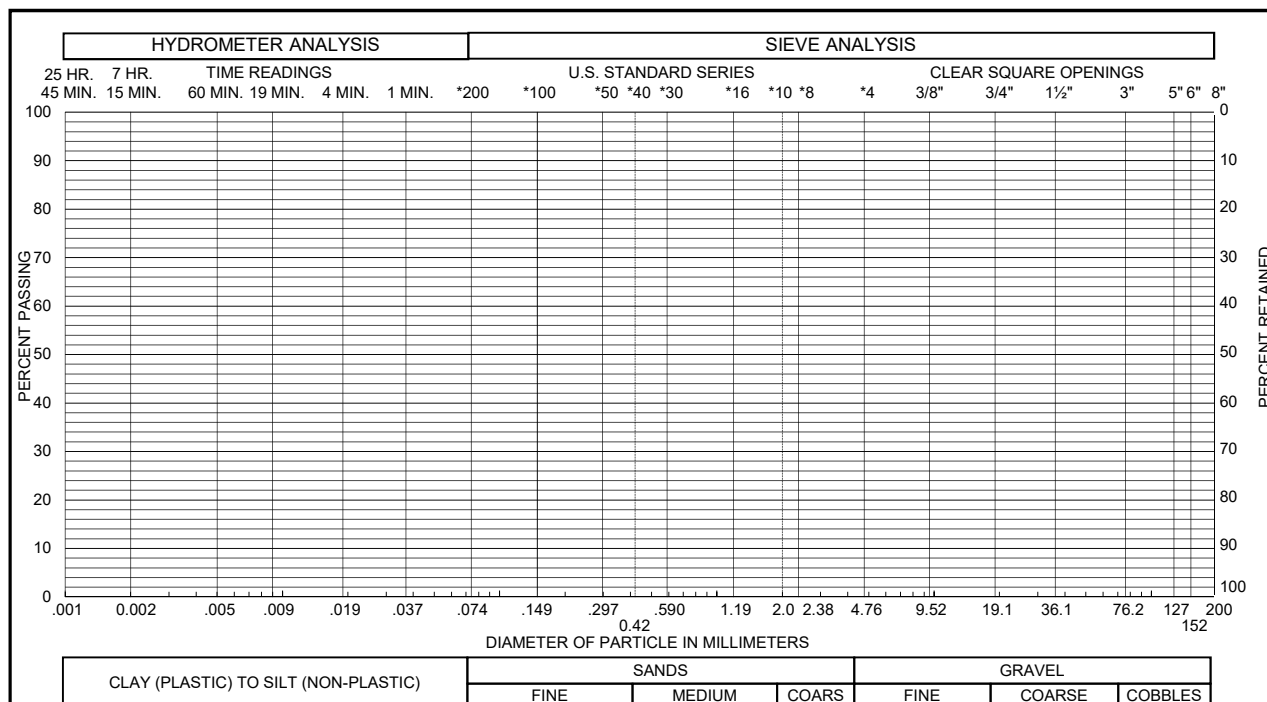
CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

Swell Consolidation Test Results

FIG. B-7



Sample of SAND, SLIGHTLY SILTY (SP-SM) GRAVEL 0 % SAND 88 %
From TH - 6 AT 9 FEET SILT & CLAY 12 % LIQUID LIMIT _____
PLASTICITY INDEX _____



Sample of _____ GRAVEL _____ % SAND _____ %
From _____ SILT & CLAY _____ % LIQUID LIMIT _____
PLASTICITY INDEX _____

Gradation Test Results

FIG. B-8

CORONADO WEST
c/o JE HOME
MURATA FARMS (MURACO SUBDIVISION)
CTLJT PROJECT NO. DN50,219-115-R1

TABLE B - I



SUMMARY OF LABORATORY TEST RESULTS

BORING	DEPTH (ft)	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	SWELL TEST DATA				ATTERBERG LIMITS		SOLUBLE SULFATE CONTENT (%)	PASSING NO. 200 SIEVE (%)	SOIL TYPE
				SWELL (%)	COMPRESSION (%)	APPLIED PRESSURE (psf)	SWELL PRESSURE (psf)	LIQUID LIMIT	PLASTICITY INDEX			
TH-1	4	4.5						24	11		42	SAND, CLAYEY (SC)
TH-1	9	4.7	111		0.7	1,100						SAND, CLAYEY (SC)
TH-2	4	10.6	113	10.0		500	12,000					WEATHERED CLAYSTONE
TH-2	9	15.2	114	1.6		1,100						WEATHERED CLAYSTONE
TH-2	14	17.6	109	2.1		1,800	7,200					CLAYSTONE
TH-2	19	17.8	111	2.8		2,400	13,000					CLAYSTONE
TH-3	9	17.3	107	3.4		1,100						WEATHERED CLAYSTONE
TH-3	14	17.0	113					50	34		92	CLAYSTONE
TH-4	9	21.1	104	3.6		1,100						WEATHERED CLAYSTONE
TH-4	14	20.3	106	1.8		1,800						WEATHERED CLAYSTONE
TH-5	4	2.2	118								23	SAND, SILTY (SM)
TH-5	14	24.4	99	0.2		1,800						CLAY, SANDY (CL)
TH-6	9	3.3	107								12	SAND, SLIGHTLY SILTY (SP-SM)
TH-6	19	18.3	110								42	INTERBEDDED CLAYSTONE/SANDSTONE
TH-7	4	12.6	97							0.19	49	SAND, CLAYEY (SC)
TH-7	14	19.3	108								32	SAND, CLAYEY (SC)
TH-8	9	19.2	108								56	CLAY, SANDY (CL)
TH-8	14	18.0	81					33	20		65	CLAY, SANDY (CL)



APPENDIX C
GUIDELINE SITE GRADING SPECIFICATIONS
Murata Farms (Muraco Subdivision)
Fort Lupton, Colorado



GUIDELINE SITE GRADING SPECIFICATIONS

Murata Farms (Muraco Subdivision)
Fort Lupton, Colorado

1. DESCRIPTION

This item shall consist of the excavation, transportation, placement and compaction of materials from locations indicated on the plans, or staked by the Engineer, as necessary to achieve preliminary street and overlot grade elevations. These specifications shall also apply to compaction of excess cut materials that may be placed outside of the development boundaries.

2. GENERAL

The Soils Representative shall be the Owner's Representative. The Soils Representative shall approve fill materials, method of placement, moisture contents and percent compaction, and shall give written approval of the completed fill.

3. CLEARING JOB SITE

The Contractor shall substantially remove all debris, vegetation, organics and other deleterious materials before excavation or fill placement. The Contractor shall dispose of the cleared material to provide the Owner with a clean, neat appearing job site. Cleared material shall not be placed in areas to receive fill or where the material will support structures of any kind.

4. AREA TO BE FILLED

Debris, vegetation, organics and other deleterious materials shall be substantially removed from the ground surface upon which fill is to be placed. The surface shall then be plowed or scarified until the surface is free from ruts, hummocks or other uneven features, which would prevent uniform compaction.

After the foundation for the fill has been cleared and scarified, it shall be disced or bladed until it is free from large clods, brought to the proper moisture content (optimum to 3 percent above optimum moisture content for clays and within 2 percent of optimum moisture content for sands) and compacted to at least 95 percent of maximum dry density as determined in accordance with ASTM D 698.

5. FILL MATERIALS

Fill soils shall be substantially free from debris, vegetation, organics and other deleterious materials, and shall not contain rocks or lumps having a diameter greater than six (6) inches. Claystone bedrock should be broken down to three (3) inches or smaller in size. Fill materials shall be obtained from cut areas shown on the plans or staked in the field by the Engineer.

On-site materials classifying as CL, CH, SC, SM, SW, SP, GP, GC and GM are acceptable.



6. MOISTURE CONTENT

Fill material classifying as CH, CL and SC shall be moisture-conditioned between optimum and 3 percent above optimum moisture content. Granular soils classifying as SM, SW, SP, GP, GC and GM shall be moisture conditioned to within 2 percent of optimum moisture content as determined from Proctor compaction tests. Sufficient laboratory compaction tests shall be made to determine the optimum moisture content for the various soils encountered in borrow areas.

The Contractor may be required to add moisture to the excavation materials in the borrow area if, in the opinion of the Soils Representative, it is not possible to obtain uniform moisture content by adding water on the fill surface. The Contractor may be required to rake or disc the fill soils to provide uniform moisture content through the soils.

The application of water to embankment materials shall be made with any type of watering equipment approved by the Soils Representative, which will give the desired results. Water jets from the spreader shall not be directed at the embankment with such force that fill materials are washed out.

Should too much water be added to any part of the fill, such that the material is too wet to permit the desired compaction from being obtained, rolling and all work on that section of the fill shall be delayed until the material has been allowed to dry to the required moisture content. The Contractor will be permitted to rework wet material in an approved manner to hasten its drying.

7. COMPACTION OF FILL AREAS

Selected fill material shall be placed and mixed in evenly spread layers. After each fill layer has been placed, it shall be uniformly compacted to not less than the specified percentage of maximum density. Fill shall be compacted to at least 95 percent of the maximum density as determined in accordance with ASTM D 698. At the option of the Soils Representative, soils classifying as SW, GP, GC, or GM may be compacted to 95 percent of maximum density as determined in accordance with ASTM D 1557 or 70 percent relative density for cohesionless sand soils. Fill materials shall be placed such that the thickness of loose materials does not exceed 10 inches and the compacted lift thickness does not exceed 6 inches.

Compaction as specified above, shall be obtained by the use of sheepfoot rollers, multiple-wheel pneumatic-tired rollers, or other equipment for soils classifying as CL, CH, or SC. Granular fill shall be compacted using vibratory equipment or other approved equipment. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over the entire area. Compaction equipment shall make sufficient trips to ensure that the required density is obtained.

8. COMPACTION OF SLOPES

Fill slopes shall be compacted by means of sheepfoot rollers or other suitable equipment. Compaction operations shall be continued until slopes are stable, but not too dense for planting, and there is no appreciable amount of loose soils on the slopes. Compaction of slopes may be done progressively in increments of three to five feet (3' to



5') in height or after the fill is brought to its total height. Permanent fill slopes shall not exceed 3:1 (horizontal to vertical).

9. PLACEMENT OF FILL ON NATURAL SLOPES

Where natural slopes are steeper than 20 percent in grade and the placement of fill is required, benches shall be cut at the rate of one bench for each 5 feet in height (minimum of two benches). Benches shall be at least 10 feet in width. Larger bench widths may be required by the Engineer. Fill shall be placed on completed benches as outlined within this specification.

10. DENSITY TESTS

Field density tests shall be made by the Soils Representative at locations and depths of his choosing. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When density tests indicate that the density or moisture content of any layer of fill or portion thereof is not within specification, the particular layer or portion shall be re-worked until the required density or moisture content has been achieved.

11. SEASONAL LIMITS

No fill material shall be placed, spread or rolled while it is frozen, thawing, or during unfavorable weather conditions. When work is interrupted by heavy precipitation, fill operations shall not be resumed until the Soils Representative indicates that the moisture content and density of previously placed materials are as specified.

12. NOTICE REGARDING START OF GRADING

The Contractor shall submit notification to the Soils Representative and Owner advising them of the start of grading operations at least three (3) days in advance of the starting date. Notification shall also be submitted at least 3 days in advance of any resumption dates when grading operations have been stopped for any reason other than adverse weather conditions.

13. REPORTING OF FIELD DENSITY TESTS

Density tests made by the Soils Representative, as specified under "Density Tests" above, shall be submitted progressively to the Owner. Dry density, moisture content, and percentage compaction shall be reported for each test taken.

14. DECLARATION REGARDING COMPLETED FILL

The Soils Engineer shall provide a written declaration stating that the site was filled with acceptable materials, and was placed in general accordance with the specifications.



APPENDIX D
GUIDELINE SUB-EXCAVATION SPECIFICATIONS
Murata Farms (Muraco Subdivision)
Fort Lupton, Colorado

Note: This guideline is intended for use with sub-excavation. If sub-excavation is not selected, the guidelines in Appendix C should be followed.



GUIDELINE SUB-EXCAVATION SPECIFICATIONS
Murata Farms (Muraco Subdivision)
Fort Lupton, Colorado

1. DESCRIPTION

This item shall consist of the excavation, transportation, placement and compaction of materials from locations indicated on the plans, or staked by the Engineer, as necessary to achieve preliminary street and overlot grade elevations. These specifications shall also apply to compaction of excess cut materials that may be placed outside of the development boundaries.

2. GENERAL

The Soils Representative shall be the Owner's Representative. The Soils Representative shall approve fill materials, method of placement, moisture contents and percent compaction, and shall give written approval of the completed fill.

3. CLEARING JOB SITE

The Contractor shall substantially remove all debris, vegetation, organics and other deleterious materials before excavation or fill placement. The Contractor shall dispose of the cleared material to provide the Owner with a clean, neat appearing job site. Cleared material shall not be placed in areas to receive fill or where the material will support structures of any kind.

4. AREA TO BE FILLED

Debris, vegetation, organics and other deleterious materials shall be substantially removed from the ground surface upon which fill is to be placed. The surface shall then be plowed or scarified until the surface is free from ruts, hummocks or other uneven features, which would prevent uniform compaction.

After the foundation for the fill has been cleared and scarified, it shall be disced or bladed until it is free from large clods, brought to the proper moisture content (between optimum and 4 percent above optimum moisture content for clays and within 2 percent of optimum moisture content for sands) and compacted to at least 95 percent of maximum dry density as determined in accordance with ASTM D 698.

5. FILL MATERIALS

Fill soils shall be substantially free from debris, vegetation, organics and other deleterious materials, and shall not contain rocks or lumps having a diameter greater than six (6) inches. Claystone bedrock should be broken down to three (3) inches or smaller in size. Fill materials shall be obtained from cut areas shown on the plans or staked in the field by the Engineer.

On-site materials classifying as CL, CH, SC, SM, SW, SP, GP, GC and GM are acceptable. Concrete, asphalt, and other deleterious materials or debris shall not be used as fill.



6. MOISTURE CONTENT

Fill materials shall be moisture-conditioned to within limits of optimum moisture content specified in "Moisture Content and Density Criteria". Sufficient laboratory compaction tests shall be made to determine the optimum moisture content for the various soils encountered in borrow areas or imported to the site.

The Contractor may be required to add moisture to the excavation materials in the borrow area if, in the opinion of the Soils Engineer, it is not possible to obtain uniform moisture content by adding water on the fill surface. The Contractor will be required to rake or disc the fill to provide uniform moisture content throughout the fill.

The application of water to embankment materials shall be made with any type of watering equipment that will give the desired results. Water jets from the spreader shall not be directed at the embankment with such force that fill materials are washed out.

Should too much water be added to any part of the fill, such that the material is too wet to permit the desired compaction from being obtained, rolling and all work on that section of the fill shall be delayed until the material has been allowed to dry to the required moisture content. The Contractor will be permitted to rework wet material in an approved manner to hasten its drying.

7. COMPACTION OF FILL MATERIALS

Selected fill material shall be placed and mixed in evenly spread layers. After each fill layer has been placed, it shall be uniformly compacted to not less than the specified percentage of maximum density given in "Moisture Content and Density Criteria". Fill materials shall be placed such that the thickness of loose material does not exceed 10 inches and the compacted lift thickness does not exceed 6 inches.

Compaction, as specified above, shall be obtained by the use of suitable equipment. Compaction shall be accomplished while the fill material is at the specified moisture content. Compaction of each layer shall be continuous over the entire area. Compaction equipment shall make sufficient trips to ensure that the required density is obtained.

8. MOISTURE CONTENT AND DENSITY CRITERIA

Fill material shall be substantially compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698, AASHTO T 99) between optimum and 4 percent above optimum moisture content for clays and within 2 percent of optimum moisture content for sands. Additional criteria for acceptance are presented in DENSITY TESTS.

9. DENSITY TESTS

Field density tests shall be made by the Soils Engineer at locations and depths of his choosing. Where sheepsfoot rollers are used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted material below the disturbed surface. When density tests indicate the density or moisture content of any layer of fill or portion thereof not within specifications, the particular layer or portion shall be reworked until the required density or moisture content has been achieved.



Allowable ranges of moisture content and density given in MOISTURE CONTENT AND DENSITY CRITERIA are based on design considerations. The moisture shall be controlled by the Contractor so that moisture content of the compacted earth fill, as determined by tests performed by the Soils Engineer, shall be within the limits given. The Soils Engineer will inform the Contractor when the placement moisture is less than or exceeds the limits specified and the Contractor shall immediately make adjustments in procedures as necessary to maintain placement moisture content within the specified limits, to satisfy the following requirements.

A. Moisture

1. The average moisture content of material tested each day shall not be less than 1 percent over optimum moisture content.
2. Material represented by samples tested having moisture lower than optimum will be rejected. Such rejected materials shall be reworked until moisture equal to or greater than optimum is achieved.

B. Density

1. The average dry density of material tested each day shall not be less than 95 percent of standard Proctor maximum dry density (ASTM D 698).
2. No more than 10 percent of the material represented by the samples tested shall be at dry densities less than 95 percent of standard Proctor maximum dry density (ASTM D 698).
3. Material represented by samples tested having dry density less than 95 percent of standard Proctor maximum dry density (ASTM D 698) will be rejected. Such rejected materials shall be reworked until a dry density equal to or greater than 95 percent of standard Proctor maximum dry density (ASTM D 698) is obtained.

10. OBSERVATION AND TESTING OF FILL

Observation by the Soils Engineer shall be sufficient during the placement of fill and compaction operations so that they can declare the fill was placed in general conformance with specifications. All observations necessary to test the placement of fill and observe compaction operations will be at the expense of the Owner.

11. SEASONAL LIMITS

No fill material shall be placed, spread or rolled while it is frozen, thawing, or during unfavorable weather conditions. When work is interrupted by heavy precipitation, fill operations shall not be resumed until the Soils Engineer indicates the moisture content and density of previously placed materials are as specified.



12. REPORTING OF FIELD DENSITY TESTS

Density tests made by the Soils Engineer, as specified under “Density Tests” above, shall be submitted progressively to the Owner. Dry density, moisture content and percentage compaction shall be reported for each test taken.

**PHASE I ENVIRONMENTAL SITE ASSESSMENT
MURATA FARMS (MURACO SUBDIVISION)
14284 STATE HIGHWAY 52
FORT LUPTON, COLORADO**

Prepared for:

**CORONADO WEST
c/o JE HOME
2696 South Colorado Boulevard
Suite 329
Denver, Colorado 80222**

Attention: Mr. Eric Eckberg

Project No. DN50,219-200-R1

September 30, 2019



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GLOSSARY OF TERMS

1,1-DCA	1,1-Dichloroethane
1,2-DCA	1,2-Dichloroethane, also DCA
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene, also DCE
AB	Abandoned Wellbore or Completion (COGCC)
AC	Active (COGCC)
AL	Abandoned Location (COGCC)
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
AUL	Activity and Use Limitation
BF	Brownfields Management System
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylene
CAP	Corrective Action Plan, also CMWP (Corrective Measures Work Plan)
CBGWQS	Colorado Basic Groundwater Quality Standards
CCOD	City and County of Denver
CDL	Clandestine Drug Laboratory Locations
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	CERCLA Information System
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CL	Closed (COGCC)
CLEANERS	Dry Cleaning Facility
COC	Chain of Custody, or Contaminants of Concern
COGCC	Colorado Oil and Gas Conservation Commission
CREC	Controlled REC
DA	Dry and Abandoned (COGCC)
DG	Drilling (COGCC)
DM	Domestic Well
DOE	Department of Energy
DPE	Dual Phase Extraction
DWR	Colorado Division of Water Resources
EISB	Enhanced In-Situ Bioremediation
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
ERNSCO	Emergency Response Notification System
ERR	Environmental Records Review
HMWMD	Hazardous Materials and Waste Management Division (CDPHE)
HREC	Historical REC
HW	Hazardous Waste
HWS	Hazardous Waste Sites
HWSCA	HWS Corrective Action
HISTSWLF	Historical Solid Waste Landfills
ISCO	In-Situ Chemical Oxidation
LQG	Large Quantity Generator
LST	Leaking Storage Tank
LUSTTRUST	LST Trust Fund Sites
MCL	Maximum Contaminant Level
MCLG	MCL Goal
MDL	Method Detection Limit
MEK	Methyl Ethyl Ketone



MS4	Municipal Separate Storm Sewer System
MTBE	Methyl Tertiary-Butyl Ether
NAD	No Action Determination
NFA	No Further Action
NMA	Natural Monitored Attenuation
NRCS	Natural Resources Conservation Service
OPS	Colorado Department of Labor and Employment, Division of Oil and Public Safety
PA	Plugged and Abandoned (COGCC)
PAH	Polychlorinated Aromatic Hydrocarbons
PCE	Perchloroethylene (also Tetrachloroethylene)
ppb	Parts per Billion
ppm	Parts per Million
PQL	Practical Quantitation Limits
PR	Producing (COGCC)
PRB	Permeable Reactive Barriers
RBSL	Risk Based Screening Level, also RSL
RC	Recompleted (COGCC)
RCRA	The Resource Conservation and Recovery Act
RCRAC	RCRA Corrective Action Facility
RCRAGR08	RCRA Generator Facility, EPA Region 8
RCRANGR08	RCRA Non-Generator Facility, EPA Region 8
REC	Recognized Environmental Condition
RL	Reporting Limit
ROD	Record of Decision
RSL	Regional Screening Level
SDWA	Safe Drinking Water Act
SF	Superfund Site
SI	Shut In (COGCC)
SQG	Small Quantity Generator
SRG	Standards Remediation Goal
SVE	Soil Vapor Extraction
SWF	Solid Waste Facility
SWMP	Storm Water Management Plan
TA	Temporarily Abandoned (COGCC)
TCA	1,1,1-Trichloroethylene
TCE	Trichloroethylene
TEPH	Total Extractable Petroleum Hydrocarbons
TPH	Total Petroleum Hydrocarbons
TSD	Treatment, Storage, and Disposal
TVPH	Total Volatile Petroleum Hydrocarbons
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UST	Underground Storage Tank
VISL	Vapor Intrusion Screening Level
VCRA	Voluntary Cleanup and Redevelopment Program, also VCP
WO	Waiting on Completion (COGCC)
WQCD	Water Quality Control Division
wrt	With Respect To
XX	Location (COGCC)



EXECUTIVE SUMMARY

This report presents the results of the Phase I Environmental Site Assessment (ESA) that was performed by CTL | Thompson, Inc. for Coronado West c/o JE Homes. The Site is located at 14284 State Highway 52 in Fort Lupton, Colorado.

The Phase I ESA was conducted in general conformance with the methods and procedures described in the American Society for Testing and Materials (ASTM) E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

The Site, approximately 70.99 acres in size, currently consists of residential and agricultural land. The Site and surrounding area appear to have been primarily agricultural land with dispersed residences since at least the early 1900s until approximately 1999, when residential development began to appear in the surrounding area. Currently, there are two residences, a storage shed, and one Quonset hut along the south-central border, and oil and gas features in the north portion of the Site.

We found evidence of recognized environmental conditions in connection with the Site, primarily in the form of the oil and gas features on-site. There are two Crestone Peak wells along the northern border (including a tank battery), and a plugged and abandoned Kerr McGee well in the northeastern portion of the Site. Releases of hydrocarbon products are common during well operation and abandonment; there is limited environmental information on these wells.

In addition, during the Site visit, it was discovered that a fuel tank was removed from the Site prior to 2010 due to potential leaking in the southern portion of the Site, and a former water well pit for a pond project presented stressed vegetation.

This executive summary does not contain all the information that is found in the full report. The report should be read in its entirety to obtain a more complete understanding of the information provided and to aid in any decisions made or actions taken based on this information.



1.0 INTRODUCTION

This report was prepared by CTL | Thompson, Inc. (CTL) for Coronado West c/o JE Homes (Coronado) and presents the results of the Phase I Environmental Site Assessment (ESA) for the property located at 14284 State Highway 52 in Fort Lupton, hereto referred to as the “Site”. The Phase I ESA was conducted in general accordance with CTL’s Service Agreement DN19-0464, dated August 23, 2019, and subsequent authorization by Mr. John Cork on August 23, 2019.

1.1 Purpose

The purpose of the Phase I ESA was to identify Recognized Environmental Conditions (REC), to the extent feasible, pursuant to the methods and procedures described in the American Society for Testing and Materials (ASTM) Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessments, E 1527-13.

A REC is defined as the presence or likely presence of hazardous substances or petroleum products on a site under conditions that indicate an existing release, a past release, or a material threat of a release of hazardous substances or petroleum products into structures on the Site or into the ground, groundwater, or surface water of the Site. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

ASTM Standard E1527-13 also has separate definitions for past conditions that would otherwise be considered a REC but have been addressed to the satisfaction of the applicable regulatory agencies and would either allow for generally unrestricted use of the Site (referred to as a Historical Recognized Environmental Condition, or HREC) or for use of the Site with various restrictions (referred to as a Controlled Recognized Environmental Condition, or CREC).

As per ASTM E1527-13, a business environmental risk is defined as a risk that may have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a property of commercial real estate, but not necessarily limited to the



environmental scope required to be investigated in this practice. Non-scope considerations that may be addressed in this type of risk are listed in Section 1.3.

1.2 Scope of Services

The scope of services for this assessment consisted of a records review, a Site reconnaissance, historical research, interviews, and documentation of findings in a report.

1.3 Limitations

This Phase I ESA was prepared in general accordance with ASTM Standard E 1527-13. There may be additional environmental issues present at the site that are outside the scope of this practice that include, but are not limited to, the following:

- Asbestos-containing materials;
- Radon;
- Lead-based paint;
- Lead in drinking water;
- Cultural and historic resources;
- Mold and fungi;
- Industrial hygiene;
- Indoor air quality;
- Health & safety;
- Ecological resources;
- Endangered species;
- Biological or infectious agents and pathogens;
- Wetlands;
- Jurisdictional waters of the U.S;
- Regulatory compliance;
- High voltage power lines; and,
- Mine subsidence.

CTL provided an opinion based upon the condition of the Site on the day it was observed and a review of existing and reasonably ascertainable regulatory records and historical information.

Our scope did not include chemical testing of soil, groundwater, air, or building materials. Sampling and analysis lead to a more reliable assessment of environmental conditions. The opinion, conclusions, and recommendations of this report are not intended to be used or relied upon by a third party to this Agreement. With the written consent of our client, CTL may be available to contract



with other parties to provide an opinion or conduct additional environmental assessment services. Due to latent conditions and other contingencies which may become evident in the future, the current assessment does not result in any guarantee the subject Site is free and clear of hazardous materials. Should additional surface, subsurface or chemical data become available, the conclusions and recommendations contained in this report shall not be considered valid unless the data is reviewed, and the conclusions of this report are modified or approved in writing by our firm.

We believe that this investigation was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the locality of the project. No warranty, express or implied, is made.

2.0 SITE DESCRIPTION AND LOCATION

TABLE I
LOCATION AND DESCRIPTION

Descriptor	Description
<i>Location</i>	14284 State Highway 52 in Fort Lupton, Weld County, Colorado 80621
<i>Township and Range</i>	North ½ of Southwest ¼ of Section 4, Township 1 North, Range 66 West of the 6th Principal Meridian
<i>USGS Quadrangle</i>	Fort Lupton
<i>Parcel Number(s)</i>	147104000069
<i>Legal Description per Assessor</i>	FTL PT N2SW4 4-1-66 (MURATA FARMS ANNEX) LOT B REC EXEMPT RE-879
<i>Current Use</i>	Agricultural; Residential
<i>Total Land Area</i>	70.99 acres
<i>Ownership</i>	Perri M-J Company

The Site location and plan are shown in the attachments on Figure 1 (Area Map) and Figure 2 (Site Map).

2.1 General Description of Site and Improvements

The Site is agricultural land with two residential buildings and two storage buildings along the south-central border. Oil and gas features are located primarily in the north-central portion. Highway 52 and Weld County Road 29 ½ form the north and east boundaries, respectively. A photographic record of our Site reconnaissance is presented in **Appendix A**.



2.2 General Uses of Adjoining Properties

The Site is located within a rural, residential and agricultural corridor of Fort Lupton along State Highway 52. The adjoining properties generally consist of agricultural land, residential developments with associated golf courses, oil and gas operations, and an educational campus. Additional details regarding our observations of adjacent properties are presented in Section 7.4 of this report.

3.0 USER PROVIDED INFORMATION

Mr. Eric Eckberg of JE Home, responded to our Client Questionnaire via email on September 20, 2019. Mr. Perry Murata, president of M-J Perri Co. (M-J Perri) responded to our Owner Questionnaire on September 20, 2019 via email. A summary of Mr. Eckberg and Mr. Murata's responses to our questionnaires are below.

3.1 Environmental Liens/Title Records

An environmental lien is a charge, security, or encumbrance upon title to a property to secure the payment of a cost, damage, debt, obligation, or duty arising out of response actions, cleanup, or other remediation of hazardous material or petroleum products upon a property. Mr. Eckberg and Mr. Murata were not aware of existing environmental liens on the Site.

CTL was provided with title records available from Land Title Guarantee Company, Order No. ABC25165205 dated May 17, 2019. Based on a cursory review of the title exceptions in Schedule B – Section 2 “Exceptions”, there were no obvious indications of environmental liens or AULs associated with environmental contamination. It should be noted that CTL's practitioners are not title professionals or attorneys, and our review of title documents does not necessarily eliminate the user's ASTM requirement to perform a search for environmental liens and AULs.

3.2 Activity and Use Limitations

Environmental AULs are legal or physical restrictions or limitations on the use of, or access to, a Site or facility to: 1) reduce or eliminate potential exposure to hazardous substances or petro-



leum products in the soil or groundwater on the property, or 2) prevent activities that could interfere with the effectiveness of a response action, in order to ensure maintenance of a condition of no significant risk to public health or the environment. These legal or physical restrictions may include engineering controls, institutional controls, or land use restrictions. Mr. Eckberg and Mr. Murata were not aware of recorded environmental AULs in relation to the Site.

3.3 Specialized Knowledge

Mr. Eckberg and Mr. Murata were not aware of nor possessed specialized knowledge or experience associated with environmental concerns on the Site.

3.4 Valuation Reduction for Environmental Issues

Mr. Eckberg and Mr. Murata were not aware of valuation reduction of the Site because of environmental issues.

3.5 Commonly Known or Reasonably Ascertainable Information

Mr. Eckberg and Mr. Murata were not aware of nor possessed commonly known or reasonably ascertainable environmental information related to the Site, other than the knowledge of two operating oil and gas wells and a septic leach field on-Site.

3.6 Owner, Site Manager, and Occupant Information

Mr. Eckberg indicated that the Site is currently brokered by Commercial Brokers Alliance NOCO, LLC and owned by M-J Perri. Mr. Perry Murata is the owner's representative and has been associated with the Site since 1985. Further owner details are presented in Section 8.1 of this report. The Site is currently agricultural land and is currently occupied by two residences.

3.7 Reason for Performing a Phase I ESA

Coronado West c/o JE Home requested a Phase I ESA prior to acquisition of the Site.



3.8 Previous Environmental Site Assessments

Mr. Eckberg and Mr. Murata were not aware of previous ESAs for the Site.

4.0 RECORDS REVIEW

CTL reviewed existing sources listed in the **References** section to assess the soils, geologic and hydrogeologic conditions of the general vicinity of the Site.

4.1 Physiography

The regional topography slopes to the southwest as presented on the topographic map (Figure 1). The Site slopes downward to the southwest. The elevation of the Site is approximately 4,957 feet above mean sea level. The predominant surface water feature(s) in the vicinity of the Site are the Coyote Creek Golf Course ponds and a private pond, located approximately 235 feet north and 0.38 miles east of the Site, respectively. Additionally, Fulton Ditch, an irrigation ditch, crosses through the north-east boundary.

4.2 Geology and Soils

A forthcoming Preliminary Geotechnical Investigation report for the Site is to be completed by CTL under Project No. DN50,219-115. Once published, the report should be read in its entirety for more details.

The U.S. Department of Agriculture NRCS “Web Soil Survey” and U.S. Geological Survey map indicates that the Site soils are primarily Olney fine sandy loam and secondarily Otero and Vona sandy loams.

4.3 Groundwater

The forthcoming Preliminary Geotechnical Investigation report for should be read in its entirety for further details.



It is our experience that shallow, unconfined groundwater is generally controlled by topography. Based on topography, we estimate the general direction of groundwater flow below the Site is to the southwest.

4.4 Water Wells

Water wells were identified through the Colorado DWR online water well permit database. The database indicated the presence of two registered wells located on the Site, and eight water wells adjacent to the Site.

TABLE II
WELL DESCRIPTION AND APPROXIMATE DISTANCE AND DIRECTION FROM THE SITE

Well Name	Permit No.	Applicant	Uses	Abandon Date	Approximate Location wrt the Site
<i>Testhole</i>	12852-TH [4/13/1988]	Lee Murata	Monitoring/ Sampling	2/13/1991	West area on-Site
N/A	159404 [2/15/1991]	M-J Perri Company	Domestic Stock	N/A	South area on-Site
N/A	55090 [4/2/1972]	Joseph & Dolores Sack	Domestic	N/A	10 ft E
N/A	157773 [7/30/1990]	Patricia L. Terry	Domestic	N/A	200 W
N/A	275964 [11/14/2007]	Patricia L. Terry	Domestic	N/A	140 W
N/A	35223-F [6/15/1989]	Delta Environmental	Other/Monitoring	N/A	425 ft W*
<i>Well #1</i>	160719 [7/22/1991]	B.T. Griffith et al	Domestic Stock	N/A	920 ft WNW
<i>Well #2</i>	160718 [7/22/1991]	B.T. Griffith et al	Domestic Stock	N/A	1,020 ft NW
N/A	218835 [7/15/1999]	Lawrence J. Tenorio	Domestic	N/A	410 ft E
N/A	88814 [3/11/1977]	Maria Arellano	Domestic Stock	N/A	660 ft E

*Actual distance likely to be over ½ mile to the west based on the DWR Permit.

We do not believe the domestic use wells present RECs to the Site due to their use.

Limited information is available for the well named “Testhole”, but it appears to have been plugged and abandoned in 1991. Files in the DWR for the off-Site monitoring well under the Permit No. 35223-F indicate that the well was for contamination extraction from a release of gasoline into the soil and groundwater from the Anderson Oil Company service station in 1989. Records indicat-



ed an expected cleanup duration of approximately two years. Further details were not available and/or could not be found. We do not believe this presents evidence of a REC to the Site, because the section-township-range information puts this well over ½-mile to the west of the Site.

4.5 Oil/Gas Wells

Oil and gas wells were identified through the COGCC online database. The database indicated the presence of two operating or abandoned oil/gas wells on the Site, and three oil/gas wells adjacent to the Site.

TABLE III
WELL DESCRIPTION AND APPROXIMATE DISTANCE AND DIRECTION FROM THE SITE

Well Name	Permit No.	Facility ID	Operator	Status	Status Date	Location wrt the Site
<i>TWOMBLY #12-4</i>	20020572	263138	Crestone Peak Resources Operating, LLC	PR	3/1/2018	North Area on-Site
<i>PERRI #11-4A</i>	20085370	263148	Kerr McGee Oil & Gas Onshore, LP	PA	5/9/2018	East Area on-Site
<i>ADDIE M. KING GAS UNIT #1</i>	19980348	240569	Kerr McGee Oil & Gas Onshore, LP	SI	2/1/2019	150 ft S
<i>HSR ATLER FEDERAL #9-5A</i>	20082843	258607	Kerr McGee Oil & Gas Onshore, LP	SI	2/1/2019	190 ft W
<i>HSR ATLER #10-5</i>	010383	259403	Kerr McGee Oil & Gas Onshore, LP	PA	10/4/2016	185 ft W

The TWOMBLY #12-4 battery and well are still active and producing as of March 2018. The east well, PERRI #11-4A, was plugged and abandoned in May 2018. Although PERRI #11-4A is no longer operational, we find this and the TWOMBLY #12-4 battery and well to present RECs to the Site due to the nature of the media that is and was produced in these wells, and based on our experience with similar properties. Limited information is available on the Kerr McGee well, but the Crestone Peak well pad is discussed in further detail in Subsection 6.1. Site reconnaissance details are presented in Section 7.0. Due to their presence on the Site, we believe these wells present RECs to the Site.



4.6 Physical Setting Analysis of Substance Migration

A hypothetical spill of a hazardous or petroleum substance on the Site would be expected to migrate along the ground surface to the southwest. Off-site surface spills on the adjoining parcels to the northeast appear to have the highest potential to migrate on-site. Sources of contamination to groundwater beneath the Site, if present, would most likely be located to the northeast.

5.0 HISTORICAL USE INFORMATION

5.1 Historical Aerial Photographs and Topographic Maps

Historical aerial photographs of the Site and surrounding area were reviewed for 1937, 1948, 1953, 1963, 1969, 1975, 1978, 1984, 1988, 1993, 1999, 2004, 2005, 2006, 2009, 2011, 2013, and 2015; these are presented in **Appendix B**. USGS topographic maps were reviewed for 1902, 1949 (1964 ed.), 1949 (1994 ed.), 1950, 1954 (1977 ed.), 1958, 1961, 1965, 1982 (1983 ed.), 2010, and 2013. An interpretation of the aerial photographs and maps is presented, as follows:

TABLE IV
AERIAL PHOTOGRAPH AND TOPOGRAPHIC MAP SUMMARY

Date Range	Land and Features Description
1902	The Site and surrounding area appear generally vacant. Approximately five homesteads are depicted adjacent to the northwest and west of the Site. A creek is shown crossing through the center of the Site, and an unimproved road (Highway 52) is presented adjacent to the north.
1937 - 1958	The Site and surrounding area appear to be in agricultural use. Two nearby homesteads are depicted in the northwest corner and along the south border of the Site. A windmill is depicted along the south-southeastern border of the Site. The creek is labelled as the Fulton Ditch, and is depicted to only cross through the upper east border of the Site. Homesteads are also depicted adjacent to the east of the Site. An unimproved road is adjacent to the east, and a small pond is depicted further east-southeast.
1961 - 1969	The Site remains generally unchanged except that the buildings to the south are no longer depicted. The surrounding area remains generally unchanged.
1975 - 1982	The installation of oil and gas features are depicted along the northern and southern boundaries of the Site. Further oil and gas development is depicted in the surrounding areas.
1984 - 1988	The Site and surrounding area remain generally unchanged. Aims Community College is depicted to the northeast.
1993 - 1999	A residence is depicted along the southern border of the Site. Residential development is depicted to the northwest.



Date Range	Land and Features Description
2004 - 2015	The Site remains generally unchanged with some residential improvements in the northwest and south residences. Land adjacent to the north and west is under residential development, and agricultural activities slow down on the Site and in the surrounding area.

5.2 Sanborn Fire Insurance Maps

Sanborn fire insurance maps were a tool used by the fire insurance industry to evaluate property risk. The maps often show details of historic dwellings, commercial buildings, and factories, indicate property uses and addresses, and show locations of items such as wells, cisterns, and fuel storage tanks. Sanborn Fire Insurance Map coverage was not available for the Site.

5.3 City Directory Listings

Due to the historically undeveloped nature of the Site, city directory listings were not reviewed.

5.4 Assessor Records

We reviewed Weld County Assessor online files for the Site. The Site is currently owned by the Perri M-J Company. There are records of buildings: two 1-story single-family homes (one modular) built in 1920 and 2005 (1,040 ft² and 2,372 ft², respectively), and a 1,200 ft² Quonset hut built in 2000.

5.5 Zoning/Land Use Records

The Site is currently classified as single-family residential and agricultural land by Weld County.



6.0 REGULATORY AGENCY RECORDS

Regulatory agency records were provided by GeoSearch. The radius report, dated September 3, 2019, is presented in **Appendix C**.

6.1 Summary of Findings

The radius report did not present unmapped listings.

This section discusses those findings which are located topographically up-gradient of the Site or which otherwise may present an environmental concern to the Site. Findings not discussed were not considered RECs due to topography, distance, and/or regulatory status.

ECHOR08 is the U.S. EPA's Enforcement and Compliance History Online database. The database stores information from facilities listed as Clean Air Act stationary sources, Clean Water Act direct dischargers, RCRA hazardous waste handlers, Safe Drinking Water Act public water systems. Additionally, the database includes Toxic Release Inventory releases. The ICIS (formerly DOCKETS) is a case activity tracking and management system for civil, judicial, and administrative federal EPA enforcement cases for the aforementioned facilities, CERCLA, the Emergency Planning and Community-Right-to-Know-Act, Toxic Substance Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, and the Marine Protection, Research, Sanctuaries Act.

The ECHO and ICIS listing for Crestone Peak TWOMBLY 12-4 Battery, located in the Northwest ¼ of the Southwest ¼ of Section 4 (Township 1 North, Range 66 West), is on the up-gradient portion of the Site. This facility received a notice of violation in March 2015 and is listed as a Civil Enforcement Case with a state/local penalty of 8,050 USD. The final order was issued, and the enforcement action was recorded in November 2015. No further information was available. Although the civil violation was corrected, the well pad is located on-site; again, we believe this oil and gas well pad/battery presents a REC to the Site.



6.2 Local Government Records

We contacted the Weld County Health and Environment Department (WCHED) regarding records related to the release of hazardous materials at the Site. Mr. Brad responded to our request for an ERR on September 20, 2019 via phone call. As per the phone call, there are no records on file at this address for closed/archived landfills, onsite water treatment systems, clandestine methamphetamine labs, spills or complaints, on or adjacent to the Site. We also contacted the City of Fort Lupton at Mr. Brad's suggestion regarding hazardous materials at or adjacent to the Site. Ms. Maria Peña, City Clerk, responded to our request for open records on September 25, 2019. As per the email response there are no records on file at this address for closed/archived landfills, onsite water treatment systems, clandestine methamphetamine labs, spills or complaints, on or adjacent to the Site.

We contacted the Fort Lupton Fire Department (FLFD) regarding records of hazardous materials at the Site. We have not yet received a response from FLFD. If we receive a response that alters the findings of this report, we will notify you in writing.

Local government responses are presented in **Appendix D**.

7.0 SITE RECONNAISSANCE

The following section discusses observations made during our Site reconnaissance.

7.1 Methodology and Limiting Conditions

Ms. Rannen Worsley conducted a Site visit on September 25, 2019. A driveway from County Road 29 ½ provided access to the Site. The majority of the Site was accessed by walking and driving. Ms. Glenice Murata accompanied us during the portion of our Site visit around the residences. A photographic record of our Site reconnaissance is presented in **Appendix A**.



7.2 Description of Site Structures and Roads

The Site is currently occupied by two residences along the south-central border of the Site, and a Quonset hut near the residences. There are oil and gas features primarily along the northern border. The northern and eastern portions of the Site are bound by Highway 52 and Weld County Road 29 ½.

7.3 Site Observations

During our reconnaissance, we specifically looked for obvious evidence of the Site features listed in Tables V and VI. Table V lists features typically observed outside of Site structures, and Table VI indicates features typically observed within the interior of structures located on the Site. An “X” located within each table indicates that the feature was readily observable. Those features which were observed on the Site are discussed in further detail within the following subsection(s).

TABLE V
EXTERIOR SITE FEATURES

X	Aboveground Storage Tanks	X	Stained Soil and/or Pavement
X	Air Emissions Sources		Stockpiles of Soil or Debris
X	Cultivated Land/Crops	X	Stressed Vegetation
X	Drains, Sumps, Pits	X	Surface Water, Streams, Ponds, Lagoons
X	Hazardous Material Storage	X	Transformers (Potential PCB)
	High Power Transmission Lines		Underground Storage Tanks
	Natural Gas Pipelines		Unidentified Piping Below Grade
	Odors		Unidentified Substance Containers
	Petroleum Pipelines	X	Vehicle Maintenance Areas
	Physical Irregularities		Waste Water Discharge
	Placed Fill or Imported Soils		Waste Treatment Processes
	Railroad Lines	X	Wells (Agricultural, Water Supply)
X	Septic Systems or Leach Fields		Wells (Monitoring)
X	Solid Waste or Disposal Areas	X	Wells (Oil or Natural Gas)



**TABLE VI
INTERIOR SITE FEATURES**

	Boilers	X	Hazardous Material Storage
	Chemical Mixing/Use Areas		Heating and Cooling Systems
X	Drains or Sumps		Hydraulic Lifts
	Elevators	X	Incineration Areas
	Emergency Generators		Odors
	Equipment Maintenance Areas		Staining or Corrosion
	Exhaust Hoods and Ducting		Unidentified Substance Containers

7.3.1 Aboveground Storage Tanks

A crude oil tank and produced water tank of approximately 300 and 100 barrels, respectively, were identified at Crestone Peak's TWOMBLY 12 Battery along the northern boundary of the Site, north of the west residence. The tanks appeared to be good condition. No obvious signs of staining or odors were observed in the surrounding area. The vegetation immediately adjacent to the west and north of the flare area appeared to be stressed.

An approximately 150-gallon capacity propane tank was identified north of the east residence and another was present to the south of the west residence. The tanks were in good condition.

An approximately 20-pound propane tank, a 45-pound propane tank, and a 20- to 30-gallon air compressor were identified inside the Quonset hut. Outside the Quonset, there was approximately one 30-pound, one 20-pound, and two 100-pound propane tanks on the west side. The majority of the tanks were old and rusty but did not appear to have severe damage.

7.3.2 Air Emissions Sources

A flare stack was identified in the west portion of the well pad in the north of the Site. The flare was not emitting at the time of the visit, but the battery does have an Air Pollution Control Division (APCDP) permit and is listed in the Regulatory Report. The listing did not appear to have air emission violations, and the flare area appeared to be in good condition with no obvious signs of staining or odors, although the vegetation bordering to the west and north was stressed.



7.3.3 Cultivated Land/Crops

Alfalfa is cultivated on approximately two-thirds of the agricultural portion of the property, primarily to the east. Ms. Murata stated that no herbicides or pesticides are used on the crops. The west field, where there are no crops, is covered in prairie dog holes. Ms. Murata did not indicate any chemicals used for prairie dog control but indicated that oil rags may be used in the future.

7.3.4 Drains, Sumps and Pits

A shallow pit was identified along the southern border, to the north of the oil and gas well pad adjacent to the south of the Site. No obvious signs of unusual odors or staining were observed; however, stressed and/or dried-out vegetation was identified within the pit. Two pipes were identified protruding into the pit approximately one foot bgs. Ms. Murata indicated that the pit is the location of an attempted water well system location for the purpose of creating an agricultural water supply pond sourced from Fulton Ditch. Ms. Murata said that the State notified them that this was not approved, so the project was abandoned. See further details about the well, “Testhole”, in Subsection 4.4.

7.3.5 Hazardous Materials Storage

7.3.5.1 Outside

Along the east side of the storage shed, there were approximately three 5-gallon buckets of hydraulic fluid and a gallon bottle of maintenance oil. One of the buckets and the bottle appeared to have some damage (melted/shrunken plastic), and there were de minimis stains on and surrounding the containers. The remaining buckets appeared to be in good condition.

Approximately 1-gallon and a 1-quart bottle of maintenance fluids were observed on the west side of the storage shed.



7.3.5.2 Storage Shed

In the storage shed, there were approximately three 1-gallon and one 1-pint paint cans and a 1-gallon maintenance oil bottle. The paint cans were rusted but did not appear to have further damage. No obvious signs of staining or unusual odors were observed.

7.3.5.3 Quonset Hut

In the Quonset hut, we observed approximately three 5-gallon fuel jerrycans and three 2.5-gallon empty fuel jerrycans, 11 gallons of maintenance/hydraulic fluid in 1- to 2.5-gallon bottles, a 2.5-gallon bucket of hydraulic cement, four 5-gallon buckets of hydraulic fluid/oil, three 1-gallon paint cans, five gallons total of insecticide and weed killer, two 1-gallon cans of mineral spirits/paint thinners, 1-gallon bottle of muriatic acid, a 14-ounce propane tank, and a can of spray paint and another of silicone lubricant. No obvious signs of staining or unusual odors were observed.

7.3.6 Septic Systems or Leach Fields

A septic leach field was identified next to the south side of the west residence. Ms. Murata stated that the leach field served both residences. She also pointed to the approximate direction of where the connections from the homes and to the leach field were based on the location of the sewer manhole to the east of the field. Also to the east of the field was a below grade pipe that rose above ground surface. Ms. Murata indicated that the pipe is the air source for the leach field. We did not observe obvious signs of staining or odors on or surrounding the leach field. Future development should take this feature into account.

7.3.7 Solid Waste or Disposal Areas

A patch of weeds to the east of the Quonset hut was identified by Ms. Murata as the possible location (she couldn't remember the exact location) of a fuel tank that used to be on-site for farming operations before 2010. Ms. Murata recounted that her father had thought that the fuel from the tank had been stolen, but police believed the tank was leaking instead. Ms. Murata's father soon thereafter had the tank removed from the property. Ms. Murata could not remember the year this happened, but she said it occurred before 2010. Now the patch is used for can and electronics



temporary placement for disposal. No obvious indications of staining or odors were observed, but this area should be disposed of properly for future development.

A disposal bin was observed on the south side of the Quonset hut. This was primarily, plastics and other trash. No obvious indications of staining or odors were observed.

A stockpile of wood and spent tires were located to the south and southwest of the Quonset, respectively. An incineration area in the form of a pit was identified between the wood stockpile and Quonset hut. Ms. Murata said this pit is used to burn unusable wood and wood scraps; she was not aware of the incineration of other materials. We did not observe unusual staining or odors coming from the pit or the stockpiles. The fire pit walls did have a wet stain appearance, but it was unclear whether this was from water for putting out the fire or from hazardous materials (no odors were observed).

7.3.8 Stained Soil and/or Pavement

The pavement outside the west side of the Quonset appeared to be used for tractor maintenance and where the tractor is parked when not in use. The concrete pavement underneath the tractor and behind the tractor presented some *de minimis* staining. *De minimis* staining was also observed around the hydraulic oil buckets on the east side of the shed and south side of the Quonset.

7.3.9 Surface Water, Streams, Ponds, or Lagoons

The Fulton Ditch crosses through the east half of the northern border. No obvious signs of staining or odors were observed along the bank, and no sheens were observed on the water. The ditch is used for irrigation for Murata Farms and other surrounding agricultural areas.

7.3.10 Transformers

Distribution power lines bordered the south, west, and north borders of the Site. Three pole-mounted transformers were identified; one south of the Quonset hut, and two dispersed along the northern boundary. The eastern most transformer appeared to be rusted and the others appeared to be in good condition. No unusual staining was observed on or near the transformers.



7.3.11 Wells (Agricultural, Water Supply)

A water well was observed north of the east residence in the southern portion of the Site. The well was attached to a single hand pump and distributed to two other hand pumps; one between the west residence and the Quonset, and another along the east side of the west residence.

7.3.12 Wells (Oil or Natural Gas)

Two wells, TWOMBLY 12-4 and 22-4 (operated by Crestone Peak) were identified along the northern border of the Site, to the north of the west residence. The wells appeared to be in good condition. No obvious signs of staining or odors were observed around the wells.

The former location of the Kerr McGee PERRI #11-4A well was found in the northeastern portion of the Site, in the east alfalfa field. The vegetation leading to the well and in the vicinity of the former well was stressed, as well as the former well location where patchy vegetation was present. No obvious indications of staining or odors were observed.

7.3.13 Drains or Sumps

A floor drain was identified in the northwest corner bathroom of the Quonset hut. No obvious signs of staining or unusual odors were observed.

7.4 Review of Adjacent Properties

General observations of properties adjacent to the Site were performed in conjunction with on-site observations made on September 25, 2019. Properties near the Site consists of single-family residences and associated golf course, gas and oil operations, and educational facilities. Properties immediately adjacent to the Site are described below, based on outdoor observations from the Site or nearby public streets.



TABLE VII
ADJACENT PROPERTY DESCRIPTIONS

Direction	Bounding Property Description
North	Highway 52, single-family residences with a golf course. A homestead is adjacent to the northwest. Aims Community College is to the northeast.
East	Weld County Road 29 ½, dispersed single-family residences, agricultural land, and oil and gas features
South	Agricultural land, dispersed single-family residences, and oil and gas features.
West	Single-family residences.

Observation of adjacent properties revealed visual indications of potential environmental concern. We did not observe evidence of landfills, lagoons, pits, or other waste treatment or disposal operations; underground storage tanks, spills, releases, or discharge of hazardous material which could negatively impact the Site, other than two oil and gas well pads located adjacent to the south and west. There were no obvious signs of staining or odors at the well pads except at the south well where there was staining observed around the well.

8.0 INTERVIEWS

8.1 Owner, Site Manager and/or Occupants

Mr. Perry Murata is the current co-landowner of the Site. Mr. Murata indicated that he has been associated with the Site since 1985 when the property was purchased. He stated that the Site is currently agricultural land with two residences and was historically agricultural land. Mr. Murata was not aware of previous ESAs. Mr. Murata was not aware of the storage of hazardous chemicals, petroleum storage tanks, or other obvious environmental concerns related to the property, other than the limited storage and use of Roundup weed control, a small quantity of fuel for the utility tractor, and the presence of two Crestone Peak tanks of approximately 6,000 to 8,000-gallon capacities on the north side of the property. He also indicated that there is a septic tank shared between the two residences, and an oil and gas battery located to the west and south of the residences on adjacent properties. Mr. Murata provided CTL with a copy of the well permit for the drinking water well on-site, see further details in Subsection 4.4.

Ms. Glenice Murata is also the current co-owner of the Site. Ms. Murata indicated that she has owned the Site since 2005. She stated that the Site is currently in use for the cultivation of



alfalfa. Ms. Murata was not aware of the storage of hazardous chemicals, petroleum storage tanks, or other obvious environmental concerns related to the property, other than the limited use of weed killer for use only around the house and the use of diesel fuel for the tractor contained within 2.5- to 5-gallon jerry cans. Both of these substances are used on an as-needed basis. She also confirmed the presence of the oil and gas well pads and the septic leach field. Ms. Murata also stated that the sump that was identified along the southern border of the Site is the location of a former attempt to create a well for the creation of a small pond sourced from the Fulton Ditch.

9.0 DEVIATIONS

9.1 Exceptions and Deletions

ASTM Standard E 1527-13 for Phase I Environmental Site Assessments, Subsection 8.3.2, states that “all obvious uses of the Site shall be identified from the present, back to the Site’s obvious first developed use, or back to 1940, whichever is earlier.” The term “developed use” includes agricultural uses (i.e., cultivated land/agricultural crops) and placement of fill. In our opinion, livestock rangeland is not a developed use.

The historical documentation for this assessment went back to 1902 on the basis of historical topographic maps, which showed the Site predominantly as vacant land. An aerial photograph from 1937 depicts a windmill along the southeast border of the Site. We were not able to ascertain the date of first development. Thus, the ASTM historical standard was not fully satisfied.

It is the opinion of CTL that obtaining earlier historical information would not be sufficiently useful, reasonably ascertainable, or change the likelihood for the presence of a REC on the Site.

9.2 Data Gaps

We have not yet received a response from the FLFD. If we receive a response that alters the findings of this report, we will notify you in writing. Based on the information presented in this report, we do not believe that this presents a significant data gap which would affect our ability to identify RECs associated with the Site.



10.0 FINDINGS AND OPINION

10.1 Summary of Site Historical Use

The Site currently consists of residential and agricultural property. The Site appears to have been primarily agricultural land with dispersed residences since at least the early 1900s until approximately 1999, when residential development began to appear in the surrounding area. Currently, there are two residences and a Quonset hut along the south-central border, and oil and gas features in the north-central portion of the Site.

Based on our understanding of the types of crops that are typically grown in Colorado, it is our belief that significant contamination from normal pesticides and herbicide application is unlikely. Application of pesticides and herbicides is more prevalent on fruits and vegetables, and less prevalent on field crops such as alfalfa, hay, and feed corn that are common in Colorado. Normal application of pesticides and herbicides is also subject to dilution and breakdown that occurs over time, due to sunlight and aeration in the upper portion of topsoil. As such, we do not believe that previous agricultural use at the Site presents a REC.

The Site was and is also used for oil and gas extraction. Hydrocarbon contamination/releases can commonly occur during well production and well abandonment. There are three wells on-Site, two producing and one abandoned. There is insufficient environmental data on these wells. We believe these present RECs to the Site on the basis of the nature of their past and current production and location, and based on our previous experience.

10.2 Nearby Environmental Concerns

There were no nearby facilities of environmental concern according to the regulatory report. However, two oil and gas well pads are located adjacent to the south and west of the Site. Although we did not find regulatory violations in relation to the wells, we believe oil and gas features present RECs to the Site based on our previous experience.



10.3 Storm Water Discharges Associated with Construction Activity

Under current Federal/state regulations, construction sites that disturb one acre, or are part of a larger development in which total disturbed area is equal to or greater than one acre, are required to apply for a General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) from the CDPHE. Some MS4s also require additional permitting for construction sites within their jurisdiction.

The General Permit application must be submitted to the CDPHE at least 10 days prior to the start of construction activities. The General Permit requires a SWMP to be developed, implemented, and modified as needed from before commencement of construction activities until final stabilization is complete and a Notice of Termination has been submitted to the CDPHE. Furthermore, the General Permit requires that site inspections be performed at least every 14 calendar days and within 24 hours following a storm event that causes significant movement of sediment on-site. The local MS4 may require more frequent inspections. Complete and current storm water management plans should be kept on-site. CTL can assist with your storm water management and compliance needs, if desired.

11.0 CONCLUSIONS

We have performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM Practice E 1527-13 of the property known as Murata Farms (Muraco Subdivision), located at 14284 State Highway 52 in Fort Lupton, Colorado. Any exceptions to, or deletions from this practice are described in Section 9.1 of this report. This assessment has revealed no evidence of environmental conditions in connection with the property other than the following:

- **TWOMBLY #12-4**, a well and battery owned by Crestone Peak are on-site in the north-central portion of the Site and are still actively producing oil and gas. The west and north borders present stressed vegetation.
- **PERRI #11-4A**, a well owned by Kerr McGee is on-site in the northeastern portion of the Site and is plugged and abandoned; however, insufficient data on the closure is available. Vegetation in the former well location appears stressed.



- **Former Farm Fuel Tank**, a fuel tank formerly located on-site, described by Ms. Murata as having been removed due to potential leaking prior to 2010. Ms. Murata could not remember the exact date or size of the tank.

12.0 QUALIFICATIONS

This Phase I ESA was reviewed and supervised by Mr. Matthew Wardlow, a registered engineer in Colorado. Mr. Wardlow has performed or reviewed over 1,000 Phase I ESAs in the State of Colorado and has been practicing within the local environmental consulting profession for at least 20 years. The resumes of the individuals conducting this Phase I ESA are included in **Appendix F**.

I, Mr. Wardlow, declare that, to the best of my professional knowledge and belief, I meet the definition of an Environmental Professional as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training and experience to assess a property of the nature, history and setting of the subject Site.

We believe that this ESA was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the locality of the project. No warranty, express or implied, is made.

If we can be of further service in discussing the contents of this report, please call.

CTL | THOMPSON, INC.

Rannen Worsley, E.I.T.
Environmental Scientist

Reviewed by:

Matthew L. Wardlow, P.E.
Environmental Department Manager – Denver Branch

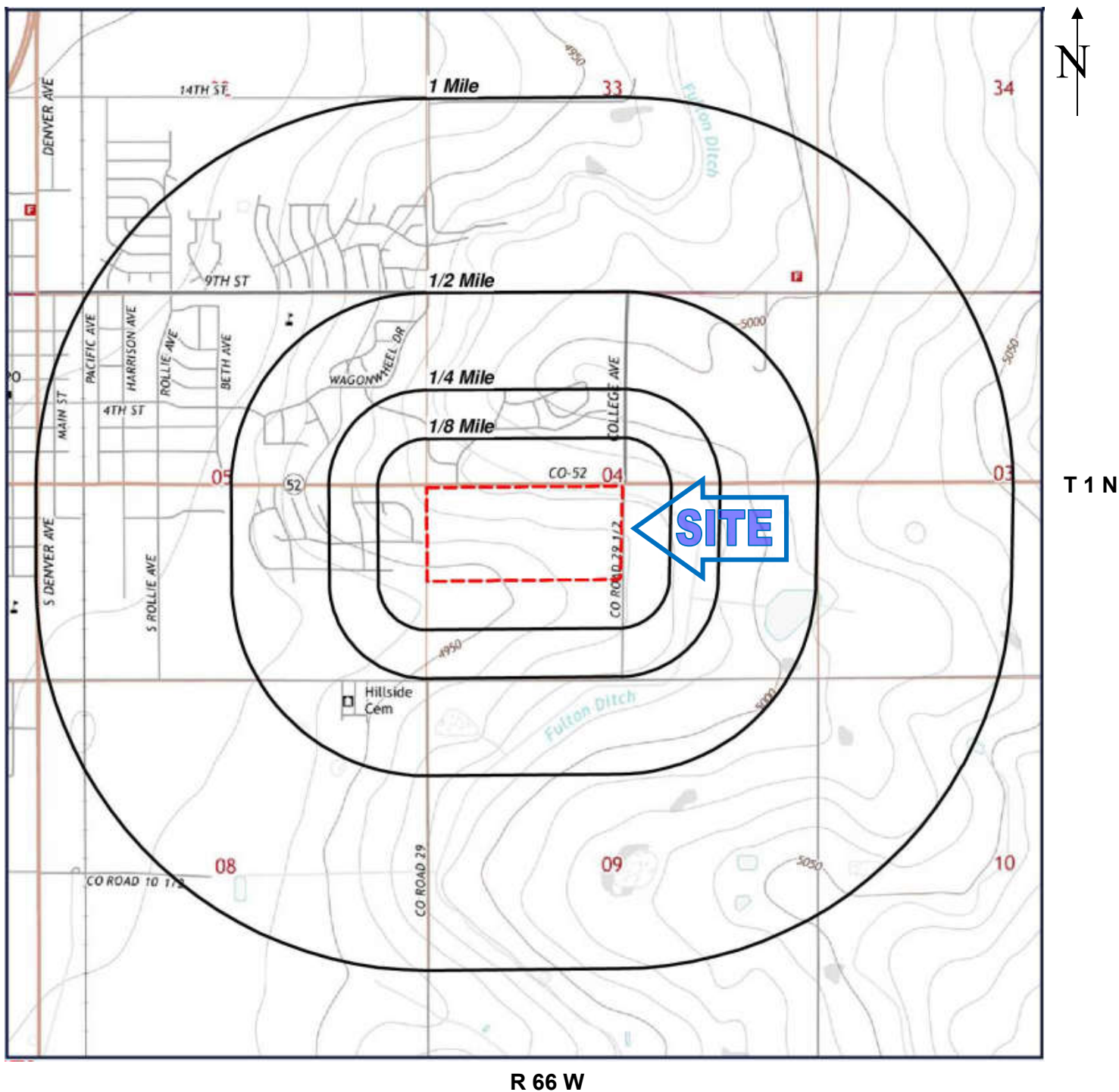
RW:MLW/nn

Via e-mail: eric@jehome.com



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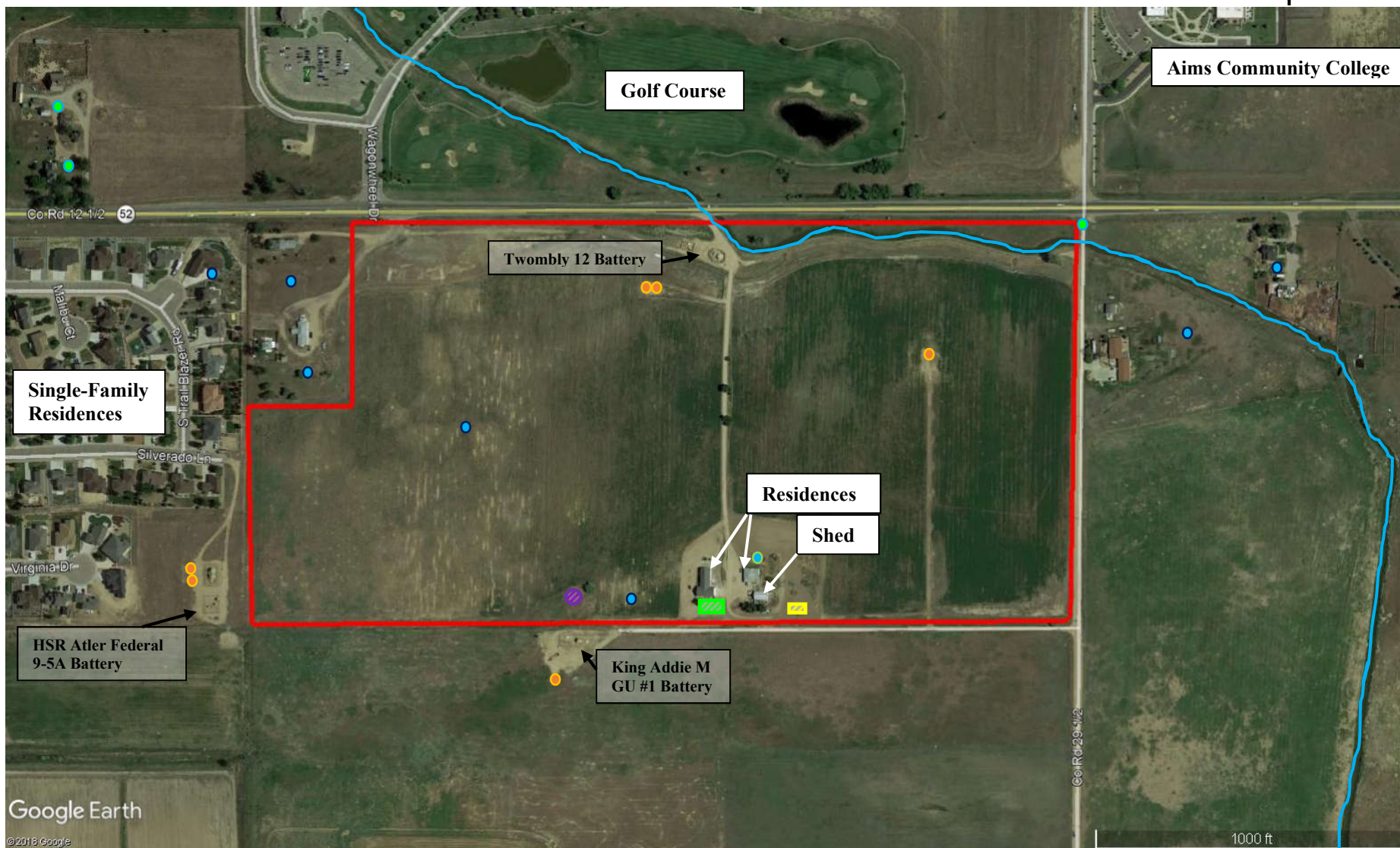
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R 66 W

Source:
 U.S.G.S. Topographic Map
 Fort Lupton Quadrangle, Colorado
 2013

Scale:
 1" $\approx$ 2,000'



- | | | | |
|------------------|-----------------------|---------------------------|---------------------------|
| Site Boundaries | Registered Water Well | Registered Oil & Gas Well | Fulton Ditch (Irrigation) |
| Former Well Sump | Current Water Well | Septic Leach Field | Possible Former Fuel Tank |



APPENDIX A

SITE PHOTOGRAPHS



Description: View to the south of Site.
Direction: South



Description: View across Site; alfalfa fields, residence, prairie dog holes.
Direction: North-northeast



Description: Kerr McGee oil and gas well pad.
Direction: West-southwest



Description: Kerr McGee oil and gas well; *de minimis* staining.
Direction: South

	
Description: Sump and piping in south-central portion of Site; dead vegetation. Direction: East-northeast	Description: Kerr McGee well pad adjacent to southwest and west of Site. Direction: West
	
Description: View across Site; single-family residences to the north. Direction: North-northwest	Description: View across Site from Crestone Peak well pad. Direction: South



Description: Crestone Peak battery and well pad.
Direction: Southeast



Description: Fulton Ditch (irrigation) and distribution lines along northeastern border of Site.
Direction: East-northeast



Description: View across Site on east side; alfalfa fields.
Direction: West



Description: View to the east of Site; residence and agricultural land.
Direction: East-northeast

	
Description: Former Kerr McGee well location; impacted vegetation. Direction: North	Description: Current water well north of east residence. Direction: North
	
Description: Propane tank on north side of and for east residence. Direction: West	Description: Probable location of former fuel tank, east of Quonset hut. Direction: East-southeast



Description: Quonset hut, shed and disposal bin.
Direction: West-northwest



Description: Quonset hut, shed, fire pit, wood debris.
Direction: West



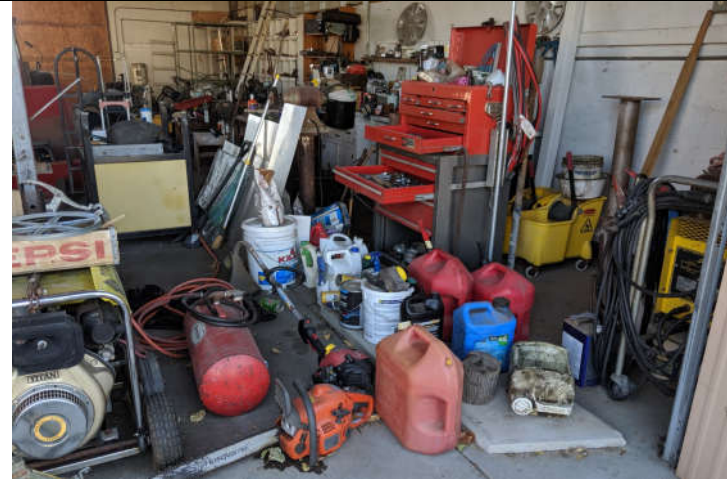
Description: Tire debris, shed, and Quonset.
Direction: Northeast



Description: Inside storage shed.
Direction: East



Description: Concrete staining west of Quonset under tractor.
Direction: Overhead/North



Description: Inside Quonset; gasoline cans, air compressors, tools, etc.
Direction: East-northeast



Description: Floor drain in bathroom of northwest corner of Quonset.
Direction: Overhead/Northwest



Description: Spent propane tanks on west side of Quonset.
Direction: North



Description: East residence.
Direction: North



Description: West residence, leach field, and propane tank.
Direction: West



Description: Cooling system on south side of west residence.
Direction: West



Description: Distribution lines on south side of Site.
Direction: Southeast



APPENDIX B

HISTORIC AERIAL PHOTOGRAPHS

Historical Aerial Photographs

[NEW: GeoLens by Geosearch](#)

Target Property:

***Murata Farms
14284 State Hwy 52
Fort Lupton, Weld, Colorado 80621***

Prepared For:

CTL Thompson- Denver

Order #: 132098

Job #: 312560

Project #: DN50219

Date: 9/5/2019

Target Property Summary

Murata Farms

14284 State Hwy 52

Fort Lupton, Weld, Colorado 80621

USGS Quadrangle: **Fort Lupton**

Target Property Geometry: **Area**

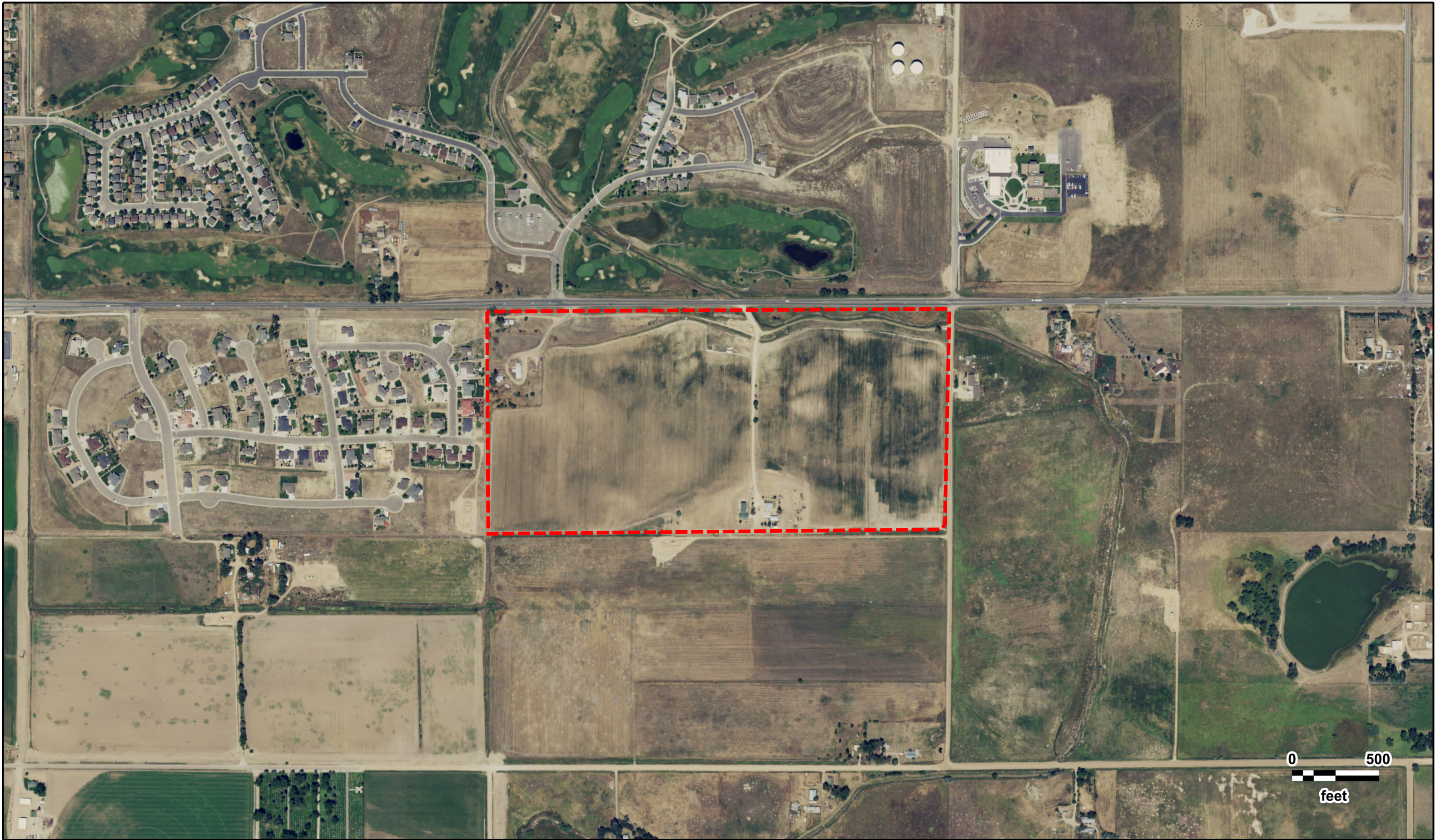
Target Property Longitude(s)/Latitude(s):

**(-104.791706387, 40.080097132), (-104.791684929, 40.076608168), (-104.782436673, 40.076673844),
(-104.782366935, 40.076690263), (-104.782313291, 40.076760044), (-104.782221104, 40.080060457),
(-104.782242561, 40.080122026), (-104.782264019, 40.080140496)**

Aerial Research Summary

<u>Date</u>	<u>Source</u>	<u>Scale</u>	<u>Frame</u>
2015	USDA	1" = 500'	N/A
2013	USDA	1" = 500'	N/A
2011	USDA	1" = 500'	N/A
2009	USDA	1" = 500'	N/A
2006	USDA	1" = 500'	N/A
2005	USDA	1" = 500'	N/A
2004	USDA	1" = 500'	N/A
09/30/1999	USGS	1" = 500'	11685-47
06/26/1993	USGS	1" = 500'	N/A
07/05/1988	USGS	1" = 500'	1032-170
10/13/1984	USGS	1" = 500'	17-167
07/05/1978	USGS	1" = 500'	1-149
06/11/1975	USGS	1" = 500'	5-103
11/28/1969	USGS	1" = 500'	1-261
07/19/1963	ASCS	1" = 1000'	PI-15
09/25/1953	AMS	1" = 500'	6721
09/23/1948	USGS	1" = 500'	4-53
06/28/1937	ASCS	1" = 500'	5-75

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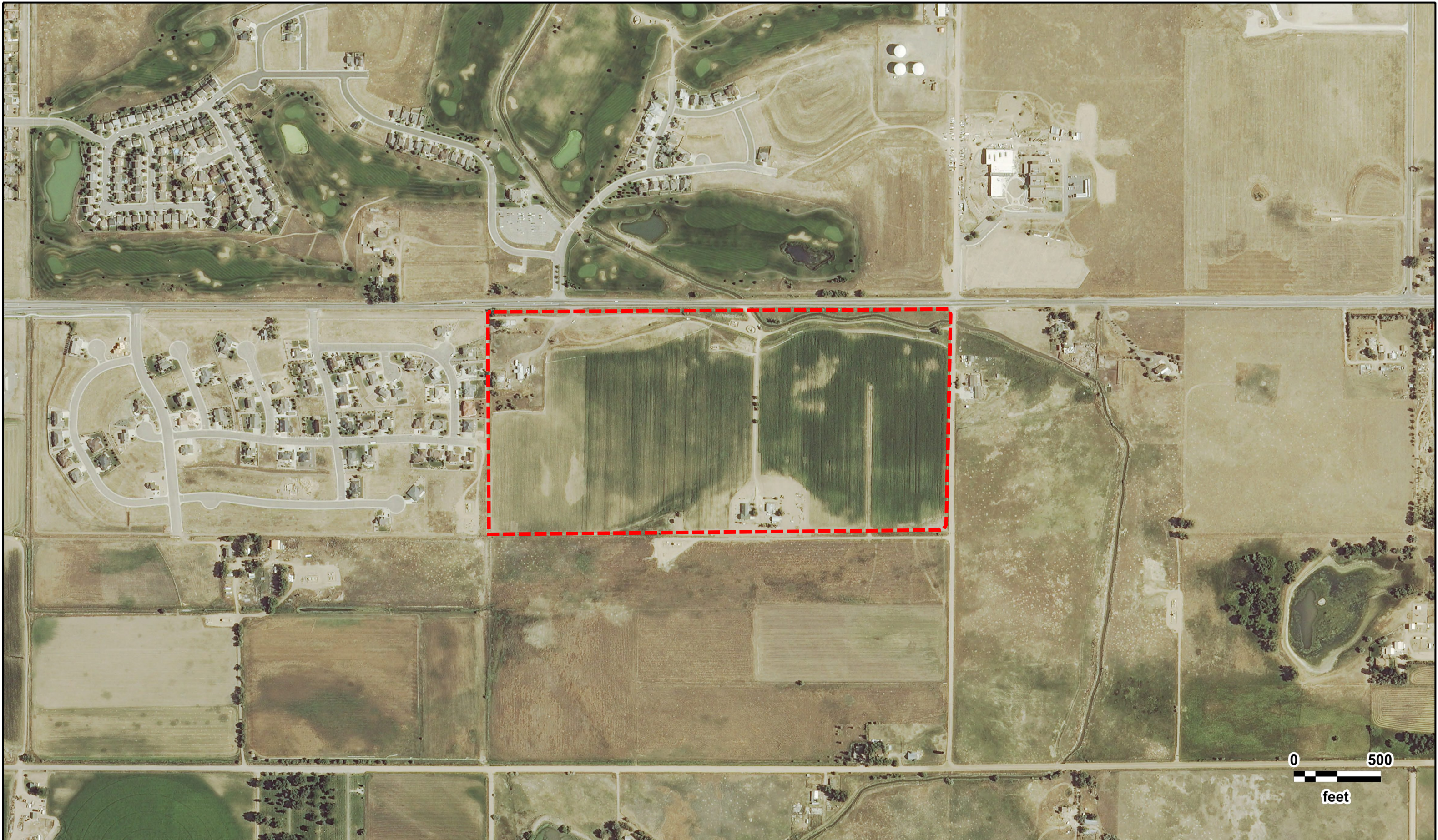


0 500
feet



Murata Farms
USDA
2015

GeoSearch

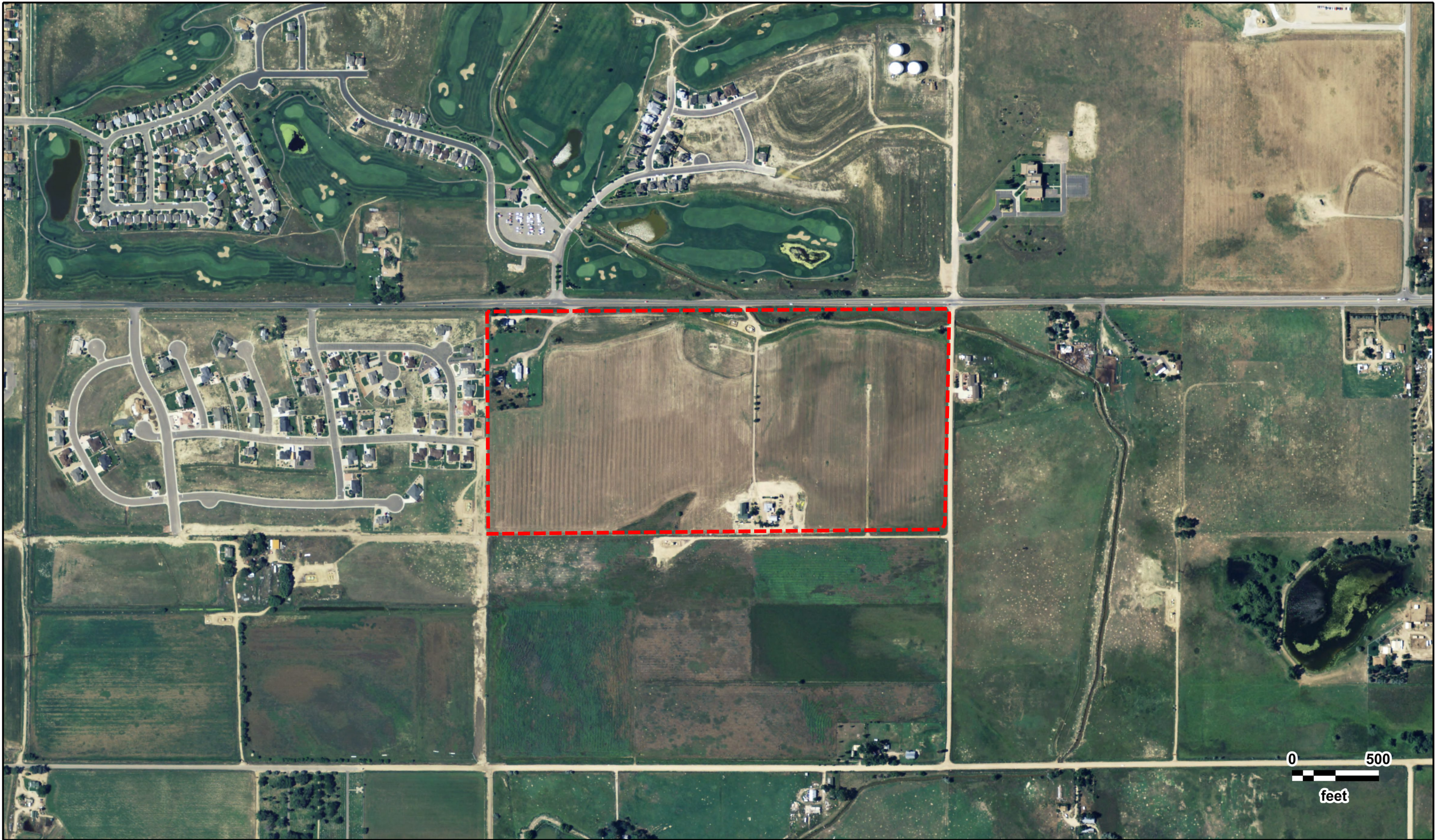


0 500
feet



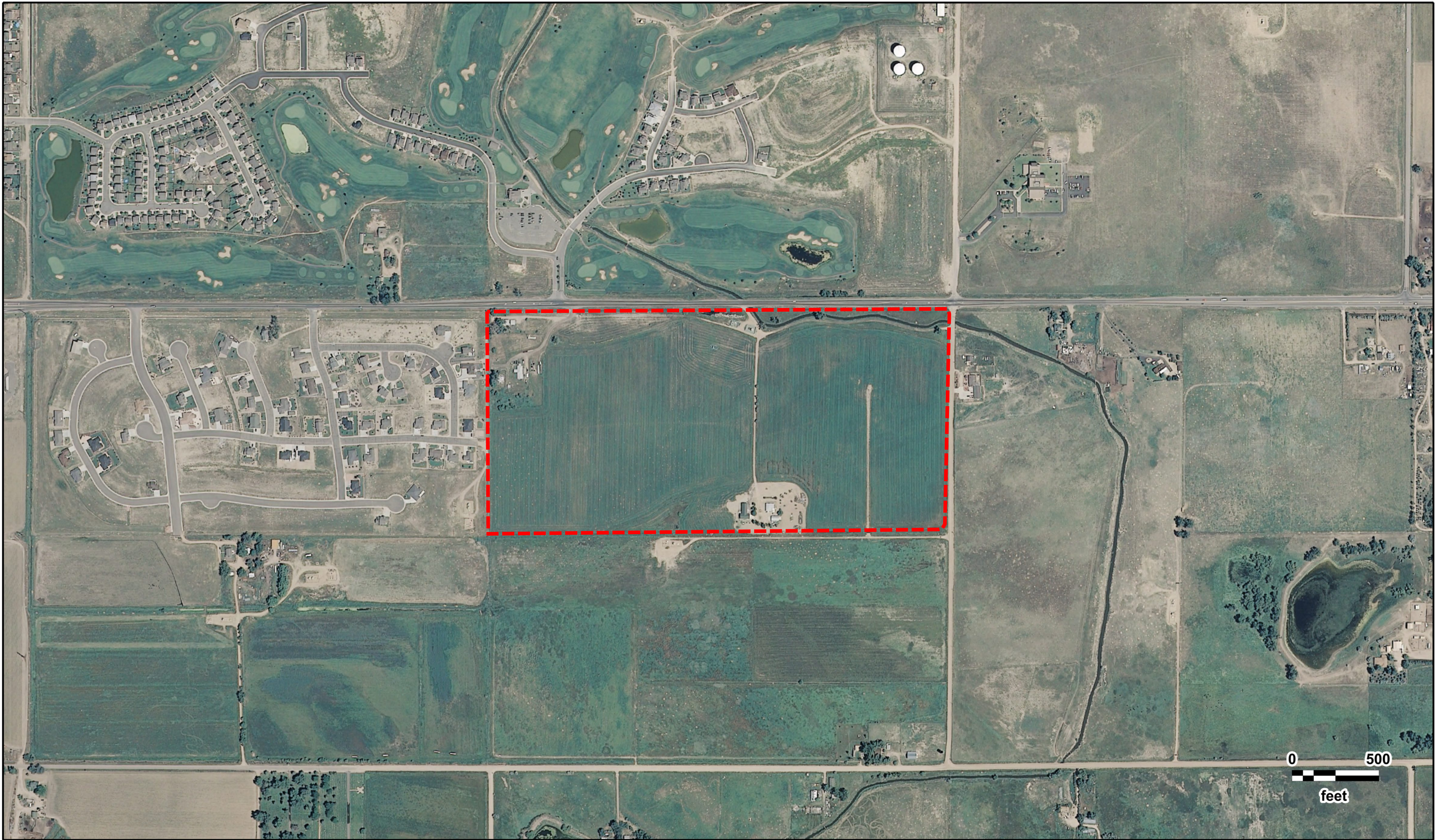
Murata Farms
USDA
2013

GeoSearch



Murata Farms
USDA
2011





Murata Farms
USDA
2009





0 500
feet



Murata Farms
USDA
2006

GeoSearch



Murata Farms
USDA
2004

GeoSearch

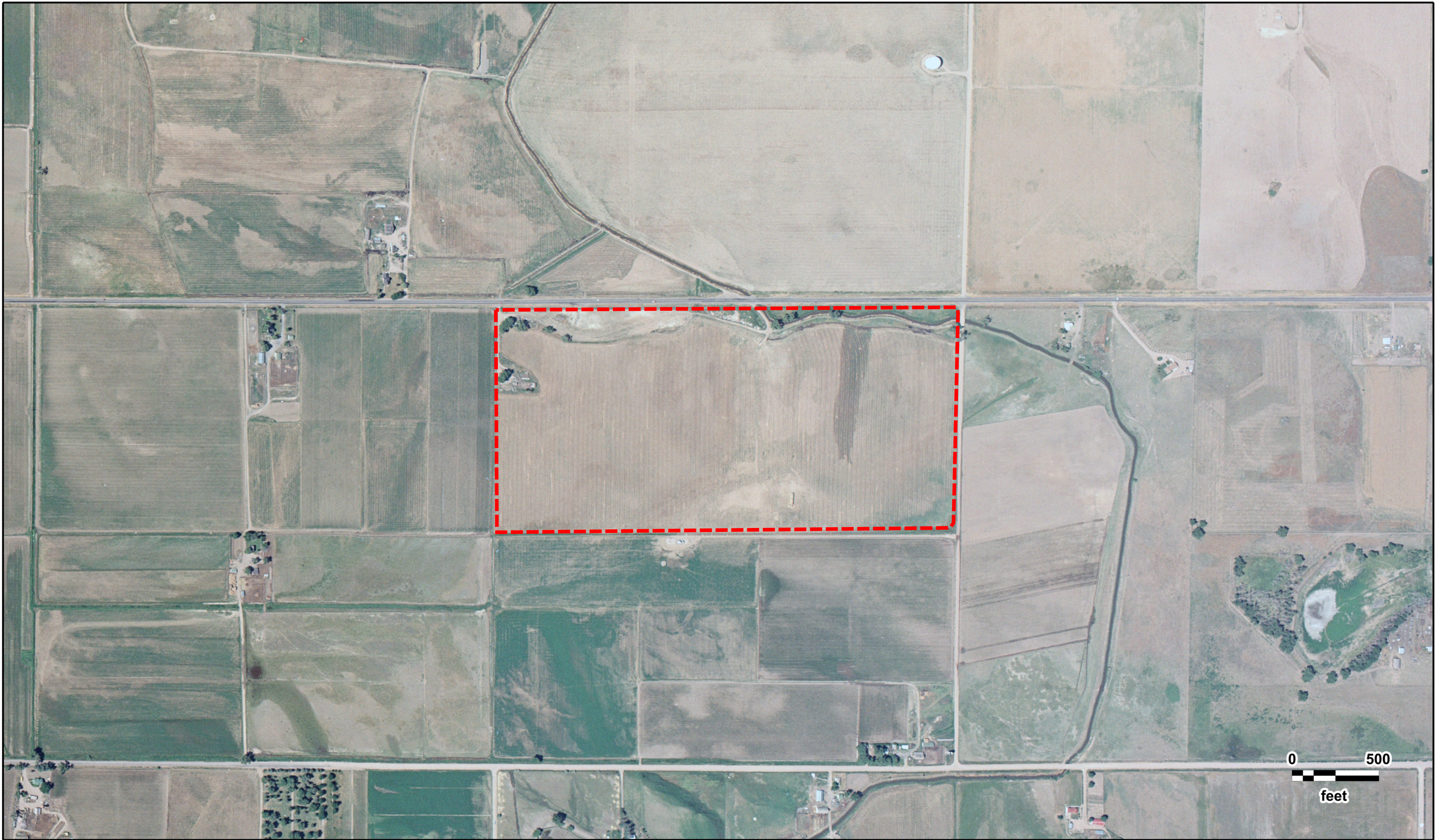


0 500
feet



Murata Farms
USGS
10/13/1984

GeoSearch



0 500
feet



Murata Farms
USGS
07/05/1978

GeoSearch



0 500
feet



Murata Farms
USGS
06/11/1975

GeoSearch



0 500
feet



Murata Farms
USGS
11/28/1969

GeoSearch



Murata Farms
ASCS
07/19/1963

GeoSearch



Murata Farms
USGS
09/23/1948

GeoSearch



APPENDIX C

GEOSEARCH REPORT(S)



On time. On target. In touch.™

Radius Report

[GeoLens by GeoSearch](#)

Target Property:

Murata Farms

14284 State Hwy 52

Fort Lupton, Weld County, Colorado 80621

Prepared For:

CTL Thompson- Denver

Order #: 132098

Job #: 312559

Project #: DN50219

Date: 09/03/2019

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<i>Environmental Records Definitions</i>	60
<i>Unlocatable Report</i>	See Attachment
<i>Zip Report</i>	See Attachment

Disclaimer

This report was designed by GeoSearch to meet or exceed the records search requirements of the All Appropriate Inquiries Rule (40 CFR Â§312.26) and the current version of the ASTM International E1527, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process or, if applicable, the custom requirements requested by the entity that ordered this report. The records and databases of records used to compile this report were collected from various federal, state and local governmental entities. It is the goal of GeoSearch to meet or exceed the 40 CFR Â§312.26 and E1527 requirements for updating records by using the best available technology. GeoSearch contacts the appropriate governmental entities on a recurring basis. Depending on the frequency with which a record source or database of records is updated by the governmental entity, the data used to prepare this report may be updated monthly, quarterly, semi-annually, or annually.

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Target Property Summary

Target Property Information

Murata Farms

14284 State Hwy 52

Fort Lupton, Colorado 80621

Coordinates

Area centroid (-104.78698, 40.0783838)

4,957 feet above sea level

USGS Quadrangle

Fort Lupton, CO

Geographic Coverage Information

County/Parish: Weld (CO)

ZipCode(s):

Fort Lupton CO: 80621

Database Summary

FEDERAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	TP/AP
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	TP/AP
RCRA SITES WITH CONTROLS	RCRASC	0	0	TP/AP
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSCO	0	0	0.1250
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR	RCRAGR08	0	0	0.2500
RESOURCE CONSERVATION & RECOVERY ACT - NON-GENERATOR	RCRANGR08	0	0	0.2500
BROWNFIELDS MANAGEMENT SYSTEM	BF	0	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - NON-CORRACTS TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM	SEMS	0	0	0.5000
SUPERFUND ENTERPRISE MANAGEMENT SYSTEM ARCHIVED SITE INVENTORY	SEMSARCH	0	0	0.5000
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	1.0000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - SUBJECT TO CORRECTIVE ACTION FACILITIES	RCRASUBC	0	0	1.0000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
CERCLIS LIENS	SFLIENS	0	0	TP/AP
EPA DOCKET DATA	DOCKETS	0	0	TP/AP
ENFORCEMENT AND COMPLIANCE HISTORY INFORMATION	ECHOR08	1	0	TP/AP
FACILITY REGISTRY SYSTEM	FRSCO	2	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	1	0	TP/AP
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	0	0	TP/AP
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	TP/AP

Database Summary

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDESR08	0	0	TP/AP
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	TP/AP
PERMIT COMPLIANCE SYSTEM	PCSR08	0	0	TP/AP
SEMS LIEN ON PROPERTY	SEMSLIENS	0	0	TP/AP
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	TP/AP
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	TP/AP
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	2	0	0.1250
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	0.1250
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRS08	0	0	0.1250
TOXICS RELEASE INVENTORY	TRI	0	0	0.1250
ALTERNATIVE FUELING STATIONS	ALTFUELS	0	0	0.2500
BIENNIAL REPORTING SYSTEM	BRS	0	0	0.2500
FEMA OWNED STORAGE TANKS	FEMAUST	0	0	0.2500
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
INTEGRATED COMPLIANCE INFORMATION SYSTEM DRYCLEANERS	ICISCLEANERS	0	0	0.2500
MINE SAFETY AND HEALTH ADMINISTRATION MASTER INDEX FILE	MSHA	0	0	0.2500
MINERAL RESOURCE DATA SYSTEM	MRDS	0	0	0.2500
OPEN DUMP INVENTORY	ODI	0	0	0.5000
SURFACE MINING CONTROL AND RECLAMATION ACT SITES	SMCRA	0	0	0.5000
URANIUM MILL TAILINGS RADIATION CONTROL ACT SITES	USUMTRCA	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMER MILITARY NIKE MISSILE SITES	NMS	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
FORMERLY UTILIZED SITES REMEDIAL ACTION PROGRAM	FUSRAP	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		6	0	

Database Summary

STATE (CO) LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ENVIRONMENTAL REAL COVENANTS LIST	COVENANTS	0	0	TP/AP
ABOVEGROUND STORAGE TANK FACILITIES	AST	0	0	0.2500
HAZARDOUS WASTE SITES- GENERATOR	HWSG	0	0	0.2500
UNDERGROUND STORAGE TANK FACILITIES	UST	0	0	0.2500
HISTORICAL SOLID WASTE LANDFILLS	HISTSWLF	0	0	0.5000
LEAKING STORAGE TANK FACILITIES	LST	0	0	0.5000
LEAKING UNDERGROUND STORAGE TANKS TRUST FUND SITES	LUSTTRUST	0	0	0.5000
SOLID WASTE FACILITIES	SWF	0	0	0.5000
VOLUNTARY CLEANUP AND REDEVELOPMENT PROGRAM SITES	VCRA	0	0	0.5000
HAZARDOUS WASTE SITES- CORRECTIVE ACTION	HWSCA	0	0	1.0000
SUPERFUND SITES	SF	0	0	1.0000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
ASBESTOS ABATEMENT AND DEMOLITION PROJECTS	ASBESTOS	0	0	TP/AP
COLORADO DISCHARGE PERMIT SYSTEM FACILITIES	CDPS	0	0	TP/AP
URANIUM MILL TAILINGS SITES	UMTS	0	0	TP/AP
AIR POLLUTION CONTROL DIVISION PERMITTED FACILITIES	APCDP	3	0	0.1250
DRY CLEANING FACILITIES	CLEANERS	0	0	0.1250
SPILLS LISTING	SPILLS	0	0	0.1250
HAZARDOUS WASTE SITES- TREATMENT, STORAGE & DISPOSAL	HWSTSD	0	0	0.5000
METHANE GAS STUDY SITES	METHANESITES	0	0	0.5000
SUB-TOTAL		3	0	

Database Summary

LOCAL LISTING

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
WELD COUNTY SOLID WASTE FACILITIES	WCSWF	0	0	0.5000
SUB-TOTAL		0	0	

Database Summary

TRIBAL LISTING

Standard Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR08	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR08	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
SUB-TOTAL		0	0	

Additional Environmental Records

Database	Acronym	Locatable	Unlocatable	Search Radius (miles)
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	
TOTAL		9	0	

Database Radius Summary

FEDERAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
DOCKETS	0.0200	0	NS	NS	NS	NS	NS	0
EC	0.0200	0	NS	NS	NS	NS	NS	0
ECHOR08	0.0200	1	NS	NS	NS	NS	NS	1
FRSCO	0.0200	2	NS	NS	NS	NS	NS	2
ICIS	0.0200	1	NS	NS	NS	NS	NS	1
ICISNPDES	0.0200	0	NS	NS	NS	NS	NS	0
LUCIS	0.0200	0	NS	NS	NS	NS	NS	0
MLTS	0.0200	0	NS	NS	NS	NS	NS	0
NPDES08	0.0200	0	NS	NS	NS	NS	NS	0
PADS	0.0200	0	NS	NS	NS	NS	NS	0
PCSR08	0.0200	0	NS	NS	NS	NS	NS	0
RCRASC	0.0200	0	NS	NS	NS	NS	NS	0
SEMSLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SFLIENS	0.0200	0	NS	NS	NS	NS	NS	0
SSTS	0.0200	0	NS	NS	NS	NS	NS	0
TSCA	0.0200	0	NS	NS	NS	NS	NS	0
AIRSAFS	0.1250	1	1	NS	NS	NS	NS	2
CDL	0.1250	0	0	NS	NS	NS	NS	0
ERNSCO	0.1250	0	0	NS	NS	NS	NS	0
HMIRSR08	0.1250	0	0	NS	NS	NS	NS	0
TRI	0.1250	0	0	NS	NS	NS	NS	0
ALTFUELS	0.2500	0	0	0	NS	NS	NS	0
BRS	0.2500	0	0	0	NS	NS	NS	0
FEMAUST	0.2500	0	0	0	NS	NS	NS	0
HISTPST	0.2500	0	0	0	NS	NS	NS	0
ICISCLEANERS	0.2500	0	0	0	NS	NS	NS	0
MRDS	0.2500	0	0	0	NS	NS	NS	0
MSHA	0.2500	0	0	0	NS	NS	NS	0
RCRAGR08	0.2500	0	0	0	NS	NS	NS	0
RCRANGR08	0.2500	0	0	0	NS	NS	NS	0
BF	0.5000	0	0	0	0	NS	NS	0
NLRRCRAT	0.5000	0	0	0	0	NS	NS	0
ODI	0.5000	0	0	0	0	NS	NS	0
RCRAT	0.5000	0	0	0	0	NS	NS	0
SEMS	0.5000	0	0	0	0	NS	NS	0

Database Radius Summary

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
SEMSARCH	0.5000	0	0	0	0	NS	NS	0
SMCRA	0.5000	0	0	0	0	NS	NS	0
USUMTRCA	0.5000	0	0	0	0	NS	NS	0
DNPL	1.0000	0	0	0	0	0	NS	0
DOD	1.0000	0	0	0	0	0	NS	0
FUDS	1.0000	0	0	0	0	0	NS	0
FUSRAP	1.0000	0	0	0	0	0	NS	0
NLRRCRAC	1.0000	0	0	0	0	0	NS	0
NMS	1.0000	0	0	0	0	0	NS	0
NPL	1.0000	0	0	0	0	0	NS	0
PNPL	1.0000	0	0	0	0	0	NS	0
RCRAC	1.0000	0	0	0	0	0	NS	0
RCRASUBC	1.0000	0	0	0	0	0	NS	0
RODS	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		5	1	0	0	0	0	6

Database Radius Summary

STATE (CO) LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
ASBESTOS	0.0200	0	NS	NS	NS	NS	NS	0
CDPS	0.0200	0	NS	NS	NS	NS	NS	0
COVENANTS	0.0200	0	NS	NS	NS	NS	NS	0
UMTS	0.0200	0	NS	NS	NS	NS	NS	0
APCDP	0.1250	2	1	NS	NS	NS	NS	3
CLEANERS	0.1250	0	0	NS	NS	NS	NS	0
SPILLS	0.1250	0	0	NS	NS	NS	NS	0
AST	0.2500	0	0	0	NS	NS	NS	0
HWSG	0.2500	0	0	0	NS	NS	NS	0
UST	0.2500	0	0	0	NS	NS	NS	0
HISTSWLF	0.5000	0	0	0	0	NS	NS	0
HWSTSD	0.5000	0	0	0	0	NS	NS	0
LST	0.5000	0	0	0	0	NS	NS	0
LUSTTRUST	0.5000	0	0	0	0	NS	NS	0
METHANESITES	0.5000	0	0	0	0	NS	NS	0
SWF	0.5000	0	0	0	0	NS	NS	0
VCRA	0.5000	0	0	0	0	NS	NS	0
HWSCA	1.0000	0	0	0	0	0	NS	0
SF	1.0000	0	0	0	0	0	NS	0
SUB-TOTAL		2	1	0	0	0	0	3

Database Radius Summary

LOCAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
WCSWF	0.5000	0	0	0	0	NS	NS	0
SUB-TOTAL		0	0	0	0	0	0	0

Database Radius Summary

TRIBAL LISTING

Standard environmental records are displayed in **bold**.

Acronym	Search Radius (miles)	TP/AP (0 - 0.02)	1/8 Mile (> TP/AP)	1/4 Mile (> 1/8)	1/2 Mile (> 1/4)	1 Mile (> 1/2)	> 1 Mile	Total
USTR08	0.2500	0	0	0	NS	NS	NS	0
LUSTR08	0.5000	0	0	0	0	NS	NS	0
ODINDIAN	0.5000	0	0	0	0	NS	NS	0
INDIANRES	1.0000	0	0	0	0	0	NS	0

SUB-TOTAL		0	0	0	0	0	0	0
-----------	--	---	---	---	---	---	---	---

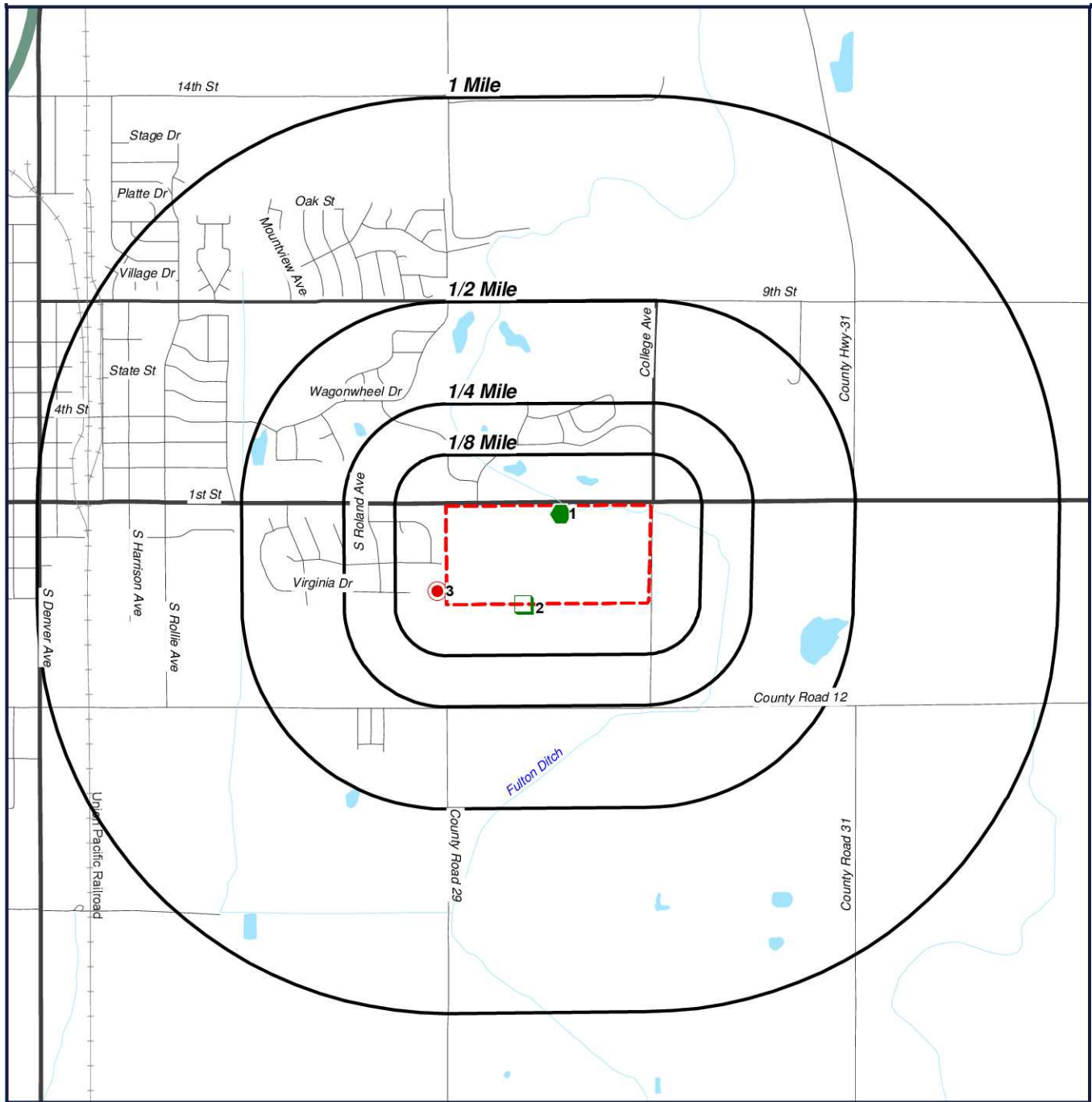
TOTAL		7	2	0	0	0	0	9
-------	--	---	---	---	---	---	---	---

NOTES:

NS = NOT SEARCHED

TP/AP = TARGET PROPERTY/ADJACENT PROPERTY

Radius Map 1



- Target Property (TP)
- ICIS
- FRSCO
- AIRSAFS

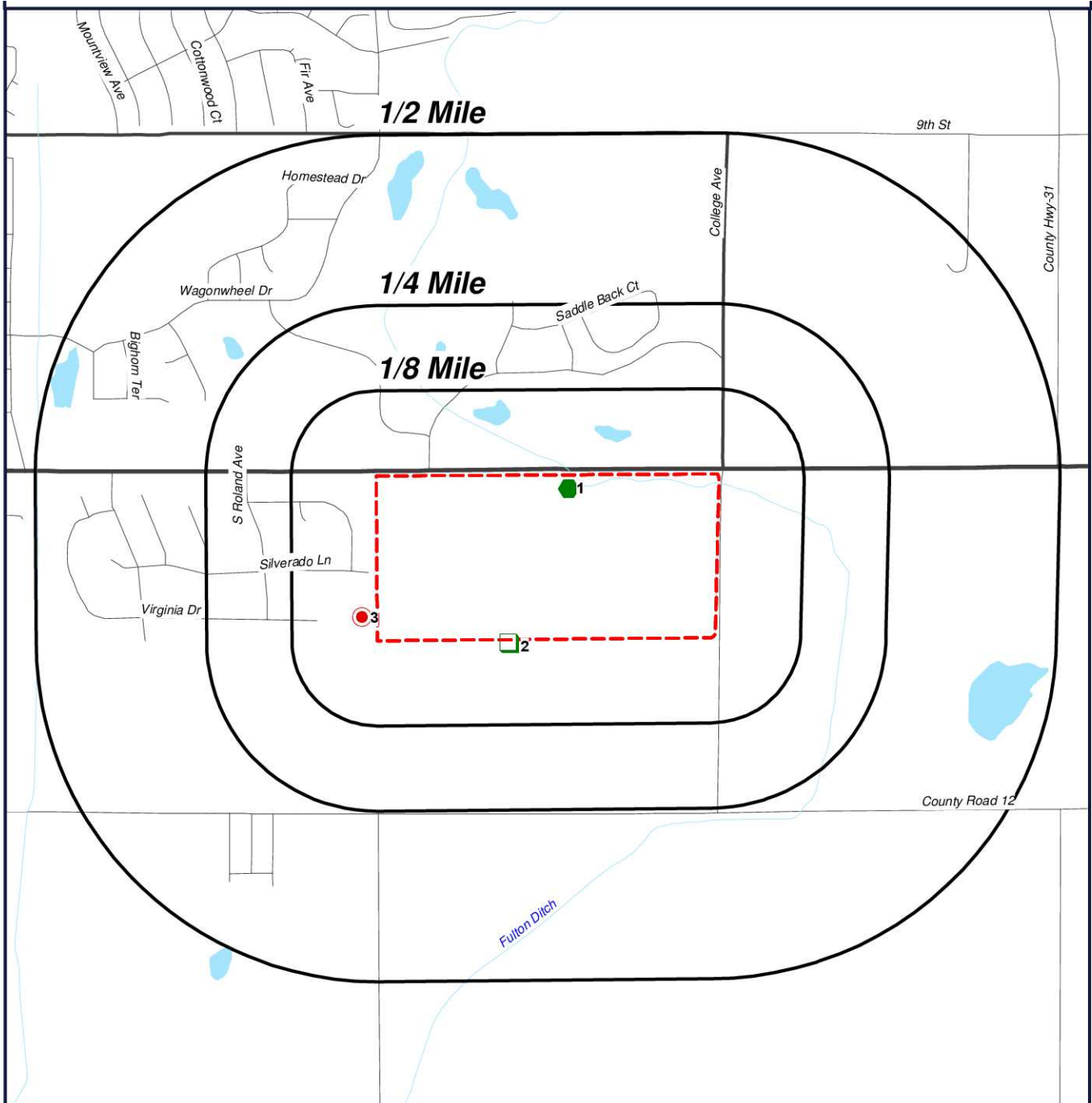
Murata Farms
14284 State Hwy 52
Fort Lupton, Colorado
80621



0' 1000' 2000' 3000'
 SCALE: 1" = 2000'

[Click here to access Satellite view](#)

Radius Map 2



- Target Property (TP)
- ◆ ICIS
- FRSCO
- AIRSAFS

Murata Farms
14284 State Hwy 52
Fort Lupton, Colorado
80621



0' 600' 1200' 1800'
 SCALE: 1" = 1200'

[Click here to access Satellite view](#)

Ortho Map



- Target Property (TP)
- ICIS
- FRSCO
- AIRSAFS

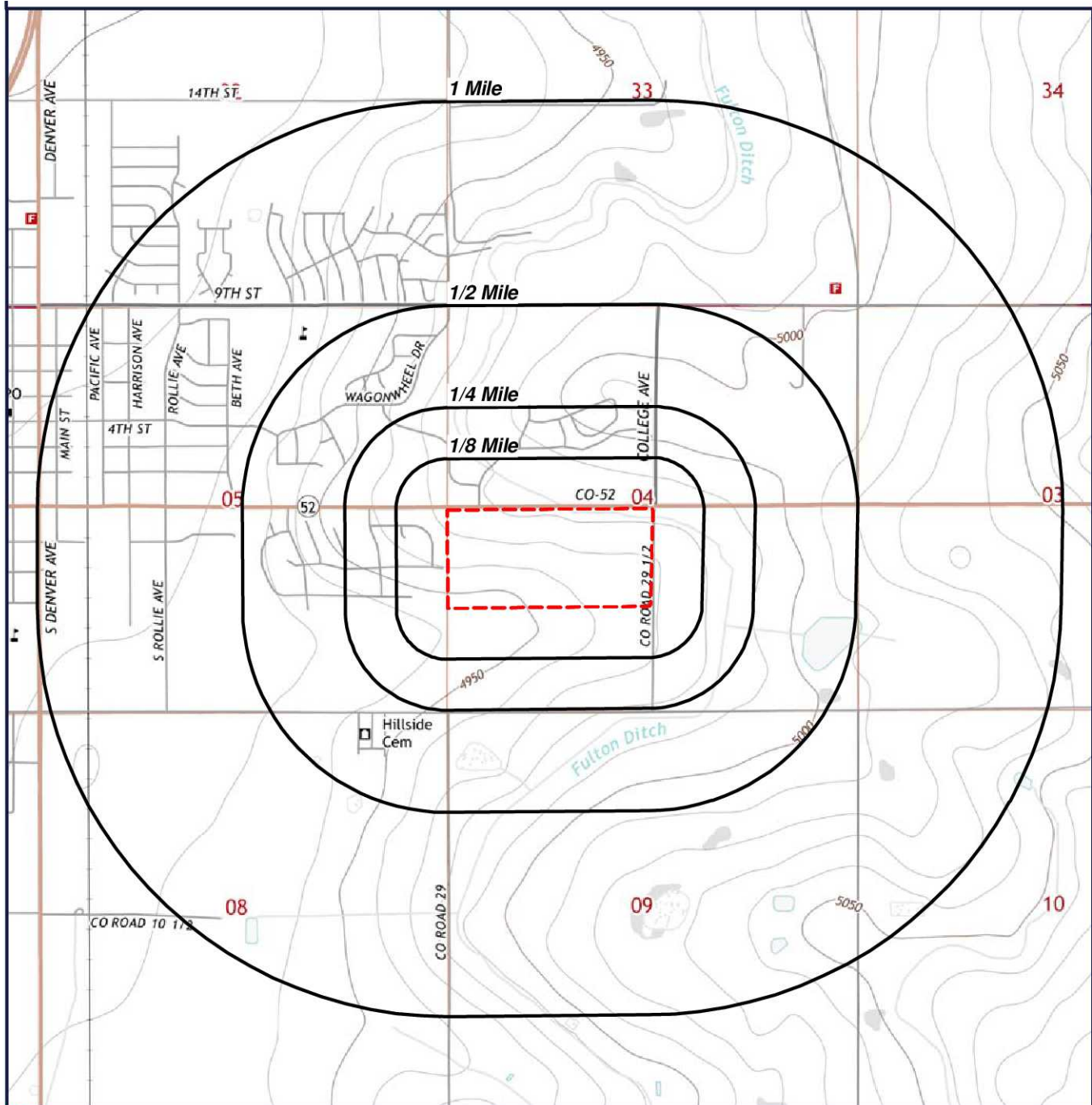
Quadrangle(s): Fort Lupton
Murata Farms
14284 State Hwy 52
Fort Lupton, Colorado
80621



0' 600' 1200' 1800'
SCALE: 1" = 1200'

[Click here to access Satellite view](#)

Topographic Map



 Target Property (TP)

Quadrangle(s): Fort Lupton
Source: USGS, 07/22/2013
Murata Farms
14284 State Hwy 52
Fort Lupton, Colorado
80621



0' 1000' 2000' 3000'
SCALE: 1" = 2000'

[Click here to access Satellite view](#)

Located Sites Summary

NOTE: Standard environmental records are displayed in **bold**.

Map ID#	Database Name	Site ID#	Relative Elevation	Distance From Site	Site Name	Address	PAGE #
1	APCDP	123-3817	Higher (4,977 ft.)	TP	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON AREA, CO 80621	18
1	ECHOR08	110021359698	Higher (4,977 ft.)	TP	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON, CO 80621	23
1	FRSCO	110021359698	Higher (4,977 ft.)	TP	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON, CO 80621	24
1	ICIS	110021359698	Higher (4,977 ft.)	TP	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON AREA, CO 80621	25
2	AIRSAFS	1022523	Lower (4,948 ft.)	0.01 mi. S (53 ft.)	KERR-MCGEE 62261	SWSW-4-1N-66W, FORT LUPTON AREA, CO 80621	26
2	APCDP	123-1986	Lower (4,948 ft.)	0.01 mi. S (53 ft.)	KERR-MCGEE - 62261	SWSW-4-1N-66W, FORT LUPTON AREA, CO 80621	30
2	FRSCO	110021342000	Lower (4,948 ft.)	0.01 mi. S (53 ft.)	KERR-MCGEE TANK BATTERY #62261	SWSE SEC 4 T1N R66W, FORT LUPTON, CO 80621	43
3	AIRSAFS	1022864	Lower (4,945 ft.)	0.022 mi. W (116 ft.)	KERR-MCGEE 11068/11074	NESE 5-1N-66W, FORT LUPTON, CO 80621	44
3	APCDP	123-2332	Lower (4,945 ft.)	0.022 mi. W (116 ft.)	KERR-MCGEE 11068/11074	NESE 5-1N-66W, FORT LUPTON, CO 80621	48

Elevation Summary

Elevations are collected from the USGS 3D Elevation Program 1/3 arc-second (approximately 10 meters) layer hosted at the NGTOC. .

Target Property Elevation: 4957 ft.

NOTE: Standard environmental records are displayed in **bold**.

EQUAL/HIGHER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
1	APCDP	4,977 ft.	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON AREA, CO 80621	18
1	ECHOR08	4,977 ft.	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON, CO 80621	23
1	FRSCO	4,977 ft.	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON, CO 80621	24
1	ICIS	4,977 ft.	CRESTONE PEAK - TWOMBLY 12-4 BATTERY	NWSW SEC 4 T1N R66W, FORT LUPTON AREA, CO 80621	25

LOWER ELEVATION

Map ID#	Database Name	Elevation	Site Name	Address	Page #
2	AIRSAFS	4,948 ft.	KERR-MCGEE 62261	SWSW-4-1N-66W, FORT LUPTON AREA, CO 80621	26
2	APCDP	4,948 ft.	KERR-MCGEE - 62261	SWSW-4-1N-66W, FORT LUPTON AREA, CO 80621	30
2	FRSCO	4,948 ft.	KERR-MCGEE TANK BATTERY #62261	SWSE SEC 4 T1N R66W, FORT LUPTON, CO 80621	43
3	AIRSAFS	4,945 ft.	KERR-MCGEE 11068/11074	NESE 5-1N-66W, FORT LUPTON, CO 80621	44
3	APCDP	4,945 ft.	KERR-MCGEE 11068/11074	NESE 5-1N-66W, FORT LUPTON, CO 80621	48

Air Pollution Control Division Permitted Facilities (APCDP)

MAP ID# 1

Distance from Property: 0 mi. (0 ft.) X
Elevation: 4,977 ft. (Higher than TP)

SITE INFORMATION

SITE ID: 123-3817
FACILITY NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY
ADDRESS: NWSW SEC 4 T1N R66W
FORT LUPTON AREA, CO 80621
PERMIT NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY
FACILITY CLASSIFICATION: 0

AIR PROGRAM

AIR PROGRAM CLASSIFICATION: 'A'=Major, 'B'=Minor, 'SM'=Synthetic Minor, 'ND'=No Major Source Threshold Defined, 'C'=Unknown, 'BLANK'= BLANK FIELD

AIR PROGRAM CLASS: MINOR

ACID PRECIPITATION: BLANK APEN EXEMPT: BLANK CFC TRACKING: BLANK
CONDENSATE STORAGE TANK: B FESOP (NON-TITLE V): BLANK MACT (SEC. 63 NESHAPS): BLANK
NESHAP: BLANK NON FEDERALLY REPORTABLE SOURCE: BLANK FEDERAL NSPS: BLANK
STATE NSPS: BLANK NSR: BLANK PSD: BLANK SIP SOURCE UNDER FEDERAL JURISDICTION: BLANK
SIP SOURCE: BLANK TITLE V PERMITS: BLANK NATIVE AMERICAN: BLANK
PLANT AIR PROGRAM: OZONE, AREA N2081
PROPERTY AREA: NOT REPORTED

COMPLIANCE MONITORING SYSTEM: NOT REPORTED

DATE COMPLIANCE MONITORING SYSTEM: 01/27/04

STANDARD INDUSTRIAL DESCRIPTION:

OIL AND GAS EXTRACTION - NATURAL GAS LIQUIDS

SITE CONTACT INFORMATION

CONTACT NAME: TARYN WEINER
CONTACT PHONE: (303)774-3908
SITE DESCRIPTION: E&P CONDENSATE STORAGE TANK BATTERY
COMMENTS:
NOT REPORTED

OWNER INFORMATION

OWNER CUSTOMER #: 9920108768
OWNER NAME: CRESTONE PEAK RESOURCES OPERATING, LLC
ADDRESS: 10188 E. I-25 FRONTAGE RD.
FIRESTONE, 08 80504
OWNER MAIL NAME: TARYN WEINER
OWNER MAIL PHONE: (303)774-3908
SITE OWNER DESCRIPTION: E&P PRODUCTION FACILITY

SITE POLLUTANT INFORMATION

EFFECTIVE YEAR OF INVENTORY: 2019
POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS
EMISSION DATA SUBMITTED YEAR: 2016
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO
POLLUTANT IS A CRITERIA POLLUTANT: YES
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

Air Pollution Control Division Permitted Facilities (APCDP)

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.12113	2.42262	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2018**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.12113	2.42262	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.12113	2.42262	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2011**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
2.60985	2.60985	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:		

Air Pollution Control Division Permitted Facilities (APCDP)

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2011**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

2.60985

2.60985

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2011**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

2.60985

2.60985

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2011**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2009**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

2.60985

2.60985

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

STACK

Air Pollution Control Division Permitted Facilities (APCDP)

EFFECTIVE YEAR OF INVENTORY: **2019**
EMISSION DATA SUBMITTED YEAR: **2016**
EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS CONTROLLED BY FLARE**
STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):
5916.00000 98.00000
STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.00000 0.00000
STACK TYPE DESCRIPTION:
A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2017**
EMISSION DATA SUBMITTED YEAR: **2011**
EMISSION RELEASE POINT (STACK): **CONDENSATE TANK FLASH EMISSIONS**
STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):
9747.00000 162.00000
STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.84000 0.00000
STACK TYPE DESCRIPTION:
A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2011**
EMISSION DATA SUBMITTED YEAR: **2009**
EMISSION RELEASE POINT (STACK): **CONDENSATE TANK FLASH EMISSIONS**
STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):
9747.00000 162.00000
STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.84000 0.00000
STACK TYPE DESCRIPTION:
A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

STACK POLLUTANT

EFFECTIVE YEAR OF INVENTORY: **2019**
POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**
EMISSION DATA SUBMITTED YEAR: **2016**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S.: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.12113 2.42262 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

Air Pollution Control Division Permitted Facilities (APCDP)

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2011**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

2.60985

2.60985

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

UNIT COMMENT

TANK NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY

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Enforcement and Compliance History Information (ECHOR08)

[MAP ID# 1](#)

Distance from Property: 0 mi. (0 ft.) X

Elevation: 4,977 ft. (Higher than TP)

FACILITY INFORMATION

UNIQUE ID: 110021359698

REGISTRY ID: 110021359698

NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY

ADDRESS: NWSW SEC 4 T1N R66W

FORT LUPTON, CO 80621

COUNTY: WELD

FACILITY LINK: [Facility Detail Report](#)

[Back to Report Summary](#)

Facility Registry System (FRSCO)

[MAP ID# 1](#)

Distance from Property: 0 mi. (0 ft.) X

Elevation: 4,977 ft. (Higher than TP)

FACILITY INFORMATION

REGISTRY ID: 110021359698

NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY

LOCATION ADDRESS: NWSW SEC 4 T1N R66W
FORT LUPTON, CO 80621

COUNTY: WELD

EPA REGION: 08

FEDERAL FACILITY: NOT REPORTED

TRIBAL LAND: NOT REPORTED

ALTERNATIVE NAME/S:

ENCANA - TWOMBLY 12-4 BATTERY

PROGRAM/S LISTED FOR THIS FACILITY

EIS - EIS

AIRS/AFS - AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIRS FACILITY SYSTEM

AIR - AIR

STANDARD INDUSTRIAL CLASSIFICATION/S (SIC)

1321 - NATURAL GAS LIQUIDS

NORTH AMERICAN INDUSTRY CLASSIFICATION/S (NAICS)

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

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Integrated Compliance Information System (formerly DOCKETS) (ICIS)

MAP ID# 1

Distance from Property: 0 mi. (0 ft.) X
Elevation: 4,977 ft. (Higher than TP)

SITE INFORMATION

GEOSEARCH ID: 110021359698

REGISTRY ID: 110021359698

NAME: CRESTONE PEAK - TWOMBLY 12-4 BATTERY

ADDRESS: NWSW SEC 4 T1N R66W

FORT LUPTON AREA CO 80621

STANDARD INDUSTRIAL CLASSIFICATION: NATURAL GAS LIQUIDS

REGIONAL DOCKETS

- NO REGIONAL DOCKETS REPORTED

RELATED ACTIVITIES

CASE NUMBER: CO000A0000081230381700004

ACTIVITY TYPE: CASE FILE

ACTIVITY STATUS DATE: NOT REPORTED

VIOLATIONS

- NO VIOLATIONS REPORTED

CASE IDENTIFIER

CASE NUMBER: CO000A0000081230381700004

FISCAL YEAR: NOT REPORTED

CASE NAME: NOT REPORTED

ACTIVITY TYPE: ADMINISTRATIVE - INFORMAL

ACTIVITY STATUS: ACHIEVED

ACTIVITY STATUS DATE: 3/30/2015

LEAD: STATE

CASE STATUS DATE: 3/30/2015

DOJ DOCKET NUMBER: NOT REPORTED

ENFORCEMENT OUTCOME: NOT REPORTED

MULTIMEDIA FLAG: NOT REPORTED

ENFORCEMENT SUMMARY:

NOT REPORTED

ENFORCEMENT TYPE

ENFORCEMENT TYPE: NOTICE OF VIOLATION

POLLUTANTS CITED

- NO POLLUTION CITED REPORTED

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Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

MAP ID# 2

Distance from Property: 0.01 mi. (53 ft.) S
Elevation: 4,948 ft. (Lower than TP)

SITE INFORMATION

UNIQUE ID: 1022523

PLANT ID: 1022523

NAME: KERR-MCGEE 62261

ADDRESS: SWSW-4-1N-66W

FORT LUPTON AREA, CO 80621

CLASSIFICATION: POTENTIAL UNCONTROLLED EMISSIONS <100 TONS/YEAR

OPERATION STATUS: OPERATING

STATE COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

FACILITY TYPE: PRIVATELY OWNED/OPERATED

CURRENT HIGH PRIORITY VIOLATOR: NOT REPORTED

SIC DESCRIPTION: ESTABLISHMENTS PRIMARILY ENGAGED IN PRODUCING LIQUID HYDROCARBONS FROM OIL AND GAS FIELD GASES.

ENFORCEMENT ACTIONS NO ENFORCEMENT ACTIONS REPORTED

AIR PROGRAM

AIR PROGRAM STATUS: OPERATING

EPA COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

POLLUTANT COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

POLLUTANT: VOLATILE ORGANIC COMPOUNDS

HISTORICAL COMPLIANCE AIR PROGRAM LEVEL

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 0904

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 1304

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 1102

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 0901

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 0802

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

COMPLIANCE DATE (YYYQ): 0703
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1003
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1301
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0701
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0804
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0704
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1101
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1103
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0903
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1403
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0803
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1001
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1303**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **0801**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **0702**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **0604**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1203**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1402**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1302**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1104**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **0902**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1002**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**
COMPLIANCE DATE (YYYQ): **1004**
HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1202**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1201**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1401**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1204**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

[Back to Report Summary](#)

Air Pollution Control Division Permitted Facilities (APCDP)

MAP ID# 2

Distance from Property: 0.01 mi. (53 ft.) S
Elevation: 4,948 ft. (Lower than TP)

SITE INFORMATION

SITE ID: 123-1986
FACILITY NAME: KERR-MCGEE - 62261
ADDRESS: SWSW-4-1N-66W
FORT LUPTON AREA, CO 80621
PERMIT NAME: KERR-MCGEE - 62261
FACILITY CLASSIFICATION: 0

AIR PROGRAM

AIR PROGRAM CLASSIFICATION: 'A'=Major, 'B'=Minor, 'SM'=Synthetic Minor, 'ND'=No Major Source Threshold Defined, 'C'=Unknown, 'BLANK'= BLANK FIELD

AIR PROGRAM CLASS: MINOR

ACID PRECIPITATION: BLANK APEN EXEMPT: BLANK CFC TRACKING: BLANK
CONDENSATE STORAGE TANK: B FESOP (NON-TITLE V): BLANK MACT (SEC. 63 NESHAPS): BLANK
NESHAP: BLANK NON FEDERALLY REPORTABLE SOURCE: BLANK FEDERAL NSPS: BLANK
STATE NSPS: BLANK NSR: BLANK PSD: BLANK SIP SOURCE UNDER FEDERAL JURISDICTION: BLANK
SIP SOURCE: BLANK TITLE V PERMITS: BLANK NATIVE AMERICAN: BLANK
PLANT AIR PROGRAM: OZONE, AREA N2081
PROPERTY AREA: NOT REPORTED

COMPLIANCE MONITORING SYSTEM: NOT REPORTED

DATE COMPLIANCE MONITORING SYSTEM: 01/27/04

STANDARD INDUSTRIAL DESCRIPTION:

OIL AND GAS EXTRACTION - NATURAL GAS LIQUIDS

SITE CONTACT INFORMATION

CONTACT NAME: CARISSA KREY
CONTACT PHONE: (720)929-6916
SITE DESCRIPTION: E&P CONDENSATE STORAGE TANK
COMMENTS:
NOT REPORTED

OWNER INFORMATION

OWNER CUSTOMER #: 9920104636
OWNER NAME: KERR-MCGEE OIL & GAS ONSHORE LP
ADDRESS: P.O. BOX 173779
DENVER, 08 80217
OWNER MAIL NAME: CARISSA KREY
OWNER MAIL PHONE: (720)929-6916
SITE OWNER DESCRIPTION: OGCC#47120 NATURAL GAS COMPRES

SITE POLLUTANT INFORMATION

EFFECTIVE YEAR OF INVENTORY: 2019
POLLUTANT NAME: CO - CARBON MONOXIDE
EMISSION DATA SUBMITTED YEAR: 2014
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO
POLLUTANT IS A CRITERIA POLLUTANT: YES
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

Air Pollution Control Division Permitted Facilities (APCDP)

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.10321	0.10321	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2019**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.91892	11.35046	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2019**

POLLUTANT NAME: **NOX - NITROGEN OXIDES**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.04062	0.04062	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2018**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.10321	0.10321	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

Air Pollution Control Division Permitted Facilities (APCDP)

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2018**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.91892

11.35046

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2018**

POLLUTANT NAME: **NOX - NITROGEN OXIDES**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.04062

0.04062

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.10321

0.10321

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.10321	0.10321	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.10321	0.10321	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **NOX - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.04062	0.04062	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **NOX - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.04062 0.04062 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2017**
POLLUTANT NAME: **NOX - NITROGEN OXIDES**
EMISSION DATA SUBMITTED YEAR: **2014**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.04062 0.04062 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**
POLLUTANT NAME: **NOX - NITROGEN OXIDES**
EMISSION DATA SUBMITTED YEAR: **2014**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.04062 0.04062 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2017**
POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**
EMISSION DATA SUBMITTED YEAR: **2014**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

Air Pollution Control Division Permitted Facilities (APCDP)

(TONS PER YEAR):

0.91892

(TONS PER YEAR):

11.35046

(TONS PER YEAR):

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:

UNCONTROLLED ESTIMATED EMISSIONS:

EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.91892

11.35046

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:

UNCONTROLLED ESTIMATED EMISSIONS:

EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.91892

11.35046

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **71432 - BENZENE**

EMISSION DATA SUBMITTED YEAR: **2010**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:

UNCONTROLLED ESTIMATED EMISSIONS:

EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.00164

0.03296

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

Air Pollution Control Division Permitted Facilities (APCDP)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2015

POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS

EMISSION DATA SUBMITTED YEAR: 2010

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.94084

18.81696

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2011

POLLUTANT NAME: 71432 - BENZENE

EMISSION DATA SUBMITTED YEAR: 2008

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: NO

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: YES

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.00576

0.02400

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2011

POLLUTANT NAME: CO - CARBON MONOXIDE

EMISSION DATA SUBMITTED YEAR: 2008

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.10302

0.10302

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2011

POLLUTANT NAME: NOX - NITROGEN DIOXIDE

Air Pollution Control Division Permitted Facilities (APCDP)

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.04055

0.04055

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2011**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

3.28800

13.70000

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

STACK

EFFECTIVE YEAR OF INVENTORY: **2019**

EMISSION DATA SUBMITTED YEAR: **2014**

EMISSION RELEASE POINT (STACK): **CONDENSATE TANK FLASH EMISSIONS**

STACK GAS FLOW RATE:	STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE):	(CUBIC FEET PER MINUTE):

9747.00000

162.00000

STACK HEIGHT:	STACK DIAMETER:	PLUME HEIGHT:
---------------	-----------------	---------------

20.00000

2.84000

0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2019**

EMISSION DATA SUBMITTED YEAR: **2014**

EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS CONTROLLED BY COMBUSTOR**

STACK GAS FLOW RATE:	STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE):	(CUBIC FEET PER MINUTE):

5916.00000

98.00000

STACK HEIGHT:	STACK DIAMETER:	PLUME HEIGHT:
---------------	-----------------	---------------

20.00000

2.00000

0.00000

STACK TYPE DESCRIPTION:

Air Pollution Control Division Permitted Facilities (APCDP)

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: 2015

EMISSION DATA SUBMITTED YEAR: 2010

EMISSION RELEASE POINT (STACK): FLASH EMISSIONS (CONTROLLED)

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

9747.00000

162.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:

20.00000

2.84000

0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: 2011

EMISSION DATA SUBMITTED YEAR: 2008

EMISSION RELEASE POINT (STACK): CONDENSATE TANK FLASH EMISSIONS

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

9747.00000

162.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:

20.00000

2.84000

0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: 2011

EMISSION DATA SUBMITTED YEAR: 2008

EMISSION RELEASE POINT (STACK): FLASH EMISSIONS CONTROLLED BY FLARE

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

5916.00000

98.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:

20.00000

2.00000

0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

STACK POLLUTANT

EFFECTIVE YEAR OF INVENTORY: 2019

POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS

EMISSION DATA SUBMITTED YEAR: 2014

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):

0.36990

0.36990

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

Air Pollution Control Division Permitted Facilities (APCDP)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2019

POLLUTANT NAME: CO - CARBON MONOXIDE

EMISSION DATA SUBMITTED YEAR: 2014

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.10321

0.10321

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2019

POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS

EMISSION DATA SUBMITTED YEAR: 2014

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.54902

10.98056

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: 2019

POLLUTANT NAME: NOX - NITROGEN OXIDES

EMISSION DATA SUBMITTED YEAR: 2014

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.04062

0.04062

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: NOT REPORTED

POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS

EMISSION DATA SUBMITTED YEAR: 2010

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.94084

18.81696

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **71432 - BENZENE**

EMISSION DATA SUBMITTED YEAR: **2010**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.00164

0.03296

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **NO2 - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2014**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.04062

0.04062

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

Air Pollution Control Division Permitted Facilities (APCDP)

0.54800 10.96000 0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: NOT REPORTED

POLLUTANT NAME: NO₂ - NITROGEN DIOXIDE

EMISSION DATA SUBMITTED YEAR: 2008

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.04055

0.04055

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: NOT REPORTED

POLLUTANT NAME: CO - CARBON MONOXIDE

EMISSION DATA SUBMITTED YEAR: 2008

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: YES

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.10302

0.10302

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: NOT REPORTED

POLLUTANT NAME: 71432 - BENZENE

EMISSION DATA SUBMITTED YEAR: 2008

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO

POLLUTANT IS A CRITERIA POLLUTANT: NO

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: YES

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.00096

0.01920

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

UNIT COMMENT

-NO COMMENTS REPORTED

Air Pollution Control Division Permitted Facilities (APCDP)

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Facility Registry System (FRSCO)

[MAP ID# 2](#)

Distance from Property: 0.01 mi. (53 ft.) S
Elevation: 4,948 ft. (Lower than TP)

FACILITY INFORMATION

REGISTRY ID: 110021342000

NAME: KERR-MCGEE TANK BATTERY #62261

LOCATION ADDRESS: SWSE SEC 4 T1N R66W
FORT LUPTON, CO 80621

COUNTY: WELD

EPA REGION: 08

FEDERAL FACILITY: NOT REPORTED

TRIBAL LAND: NOT REPORTED

ALTERNATIVE NAME/S:

KERR-MCGEE 62261

PROGRAM/S LISTED FOR THIS FACILITY

EIS - EIS

STANDARD INDUSTRIAL CLASSIFICATION/S (SIC)

1321 - NATURAL GAS LIQUIDS

NORTH AMERICAN INDUSTRY CLASSIFICATION/S (NAICS)

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

211112 - NATURAL GAS LIQUID EXTRACTION.

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Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

MAP ID# 3

Distance from Property: 0.022 mi. (116 ft.) W
Elevation: 4,945 ft. (Lower than TP)

SITE INFORMATION

UNIQUE ID: 1022864

PLANT ID: 1022864

NAME: KERR-MCGEE 11068/11074

ADDRESS: NESE 5-1N-66W

FORT LUPTON, CO 80621

CLASSIFICATION: POTENTIAL UNCONTROLLED EMISSIONS <100 TONS/YEAR

OPERATION STATUS: OPERATING

STATE COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

FACILITY TYPE: PRIVATELY OWNED/OPERATED

CURRENT HIGH PRIORITY VIOLATOR: NOT REPORTED

SIC DESCRIPTION: ESTABLISHMENTS PRIMARILY ENGAGED IN PRODUCING LIQUID HYDROCARBONS FROM OIL AND GAS FIELD GASES.

ENFORCEMENT ACTIONS NO ENFORCEMENT ACTIONS REPORTED

AIR PROGRAM

AIR PROGRAM STATUS: OPERATING

EPA COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

POLLUTANT COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

POLLUTANT: VOLATILE ORGANIC COMPOUNDS

HISTORICAL COMPLIANCE AIR PROGRAM LEVEL

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 1403

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 1202

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 1002

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 0904

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

COMPLIANCE DATE (YYYQ): 0803

HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

COMPLIANCE DATE (YYYQ): 1004
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0704
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1103
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1201
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1204
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0903
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0901
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1104
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1101
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1003
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 1304
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

AIR PROGRAM: SIP SOURCE
COMPLIANCE DATE (YYYQ): 0801
HISTORICAL COMPLIANCE STATUS: IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1402**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1301**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0804**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0902**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1001**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1203**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1401**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1102**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0702**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1303**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **1302**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

Aerometric Information Retrieval System / Air Facility Subsystem (AIRSAFS)

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0604**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0802**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0703**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

AIR PROGRAM: **SIP SOURCE**

COMPLIANCE DATE (YYYQ): **0701**

HISTORICAL COMPLIANCE STATUS: **IN COMPLIANCE WITH PROCEDURAL REQUIREMENTS**

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Air Pollution Control Division Permitted Facilities (APCDP)

MAP ID# 3

Distance from Property: 0.022 mi. (116 ft.) W
Elevation: 4,945 ft. (Lower than TP)

SITE INFORMATION

SITE ID: 123-2332
FACILITY NAME: KERR-MCGEE 11068/11074
ADDRESS: NESE 5-1N-66W
FORT LUPTON, CO 80621
PERMIT NAME: KERR-MCGEE 11068/11074
FACILITY CLASSIFICATION: 0

AIR PROGRAM

AIR PROGRAM CLASSIFICATION: 'A'=Major, 'B'=Minor, 'SM'=Synthetic Minor, 'ND'=No Major Source Threshold Defined, 'C'=Unknown, 'BLANK'= BLANK FIELD

AIR PROGRAM CLASS: MINOR
ACID PRECIPITATION: BLANK APEN EXEMPT: BLANK CFC TRACKING: BLANK
CONDENSATE STORAGE TANK: B FESOP (NON-TITLE V): BLANK MACT (SEC. 63 NESHAPS): BLANK
NESHAP: BLANK NON FEDERALLY REPORTABLE SOURCE: BLANK FEDERAL NSPS: BLANK
STATE NSPS: BLANK NSR: BLANK PSD: BLANK SIP SOURCE UNDER FEDERAL JURISDICTION: BLANK
SIP SOURCE: BLANK TITLE V PERMITS: BLANK NATIVE AMERICAN: BLANK
PLANT AIR PROGRAM: OZONE, AREA N2081
PROPERTY AREA: NOT REPORTED

COMPLIANCE MONITORING SYSTEM: NOT REPORTED
DATE COMPLIANCE MONITORING SYSTEM: 01/27/04
STANDARD INDUSTRIAL DESCRIPTION:

OIL AND GAS EXTRACTION - NATURAL GAS LIQUIDS

SITE CONTACT INFORMATION

CONTACT NAME: KATHERINE DOOLITTLE
CONTACT PHONE: (720)929-6511
SITE DESCRIPTION: E&P CONDENSATE STORAGE TANK
COMMENTS:
NOT REPORTED

OWNER INFORMATION

OWNER CUSTOMER #: 9920104636
OWNER NAME: KERR-MCGEE OIL & GAS ONSHORE LP
ADDRESS: P.O. BOX 173779
DENVER, 08 80217
OWNER MAIL NAME: CARISSA KREY
OWNER MAIL PHONE: (720)929-6916
SITE OWNER DESCRIPTION: OGCC#47120 NATURAL GAS COMPRES

SITE POLLUTANT INFORMATION

EFFECTIVE YEAR OF INVENTORY: 2019
POLLUTANT NAME: VOC - VOLATILE ORGANIC COMPOUNDS
EMISSION DATA SUBMITTED YEAR: 2016
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: NO
POLLUTANT IS A CRITERIA POLLUTANT: YES
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: NO
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: NO
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: NO

Air Pollution Control Division Permitted Facilities (APCDP)

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.16670	3.27822	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2018**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.16670	3.27822	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.16670	3.27822	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS: (TONS PER YEAR)		
0.00000		

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: (TONS PER YEAR):	UNCONTROLLED ESTIMATED EMISSIONS: (TONS PER YEAR):	EMISSIONS LIMIT: (TONS PER YEAR):
0.08164	0.08164	0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:		

Air Pollution Control Division Permitted Facilities (APCDP)

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.08164

0.08164

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.08164

0.08164

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **NOX - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.03213

0.03213

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT NAME: **NOX - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.03213	0.03213	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **NOX - NITROGEN OXIDES**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.03213	0.03213	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**

POLLUTANT NAME: **NOX - NITROGEN OXIDES**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):
0.03213	0.03213	0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2017**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.43429 8.68580 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2016**
POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**
EMISSION DATA SUBMITTED YEAR: **2012**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.43429 8.68580 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2015**
POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**
EMISSION DATA SUBMITTED YEAR: **2012**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **YES**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:
(TONS PER YEAR): (TONS PER YEAR): (TONS PER YEAR):
0.43429 8.68580 0.00000
ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)
0.00000

EFFECTIVE YEAR OF INVENTORY: **2011**
POLLUTANT NAME: **71432 - BENZENE**
EMISSION DATA SUBMITTED YEAR: **2008**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**
POLLUTANT IS A CRITERIA POLLUTANT: **NO**
POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**
POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**
POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**
ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

Air Pollution Control Division Permitted Facilities (APCDP)

(TONS PER YEAR):

0.00354

(TONS PER YEAR):

0.04800

(TONS PER YEAR):

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2011**

POLLUTANT NAME: **110543 - HEXANE,N-**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:

UNCONTROLLED ESTIMATED EMISSIONS:

EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.03097

0.42000

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2011**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:

UNCONTROLLED ESTIMATED EMISSIONS:

EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

2.02075

27.40000

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

STACK

EFFECTIVE YEAR OF INVENTORY: **2019**

EMISSION DATA SUBMITTED YEAR: **2016**

EMISSION RELEASE POINT (STACK): **CONDENSATE TANK FLASH EMISSIONS**

STACK GAS FLOW RATE:

STACK GAS FLOW RATE (NEI COMPATIBLE):

(CUBIC FEET PER MINUTE):

(CUBIC FEET PER MINUTE):

9747.00000

162.00000

STACK HEIGHT:

STACK DIAMETER:

PLUME HEIGHT:

20.00000

2.84000

0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2019**

Air Pollution Control Division Permitted Facilities (APCDP)

EMISSION DATA SUBMITTED YEAR: **2016**

EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS CONTROLLED BY COMBUSTOR**

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

5916.00000

98.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.00000 0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2017**

EMISSION DATA SUBMITTED YEAR: **2012**

EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS CONTROLLED BY FLARE**

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

5916.00000

98.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.00000 0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2011**

EMISSION DATA SUBMITTED YEAR: **2008**

EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS UNCONTROLLED**

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

9747.00000

162.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.84000 0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

EFFECTIVE YEAR OF INVENTORY: **2011**

EMISSION DATA SUBMITTED YEAR: **2008**

EMISSION RELEASE POINT (STACK): **FLASH EMISSIONS WITH FLARE**

STACK GAS FLOW RATE: STACK GAS FLOW RATE (NEI COMPATIBLE):
(CUBIC FEET PER MINUTE): (CUBIC FEET PER MINUTE):

5916.00000

98.00000

STACK HEIGHT: STACK DIAMETER: PLUME HEIGHT:
20.00000 2.00000 0.00000

STACK TYPE DESCRIPTION:

A STACK WITH AN UNOBSTRUCTED OPENING DISCHARGING IN A VERTICAL DIRECTION

STACK POLLUTANT

EFFECTIVE YEAR OF INVENTORY: **2019**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

Air Pollution Control Division Permitted Facilities (APCDP)

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.00293

0.00293

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **2019**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2016**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.16376

3.27528

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **CO - CARBON MONOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.08164

0.08164

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

Air Pollution Control Division Permitted Facilities (APCDP)

0.43429

8.68580

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **NOX - NITROGEN OXIDES**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.03213

0.03213

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **NO2 - NITROGEN DIOXIDE**

EMISSION DATA SUBMITTED YEAR: **2012**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.03213

0.03213

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **71432 - BENZENE**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS:	UNCONTROLLED ESTIMATED EMISSIONS:	EMISSIONS LIMIT:
(TONS PER YEAR):	(TONS PER YEAR):	(TONS PER YEAR):

0.00120

0.00120

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **110543 - HEXANE,N-**

Air Pollution Control Division Permitted Facilities (APCDP)

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.01050

0.01050

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **VOC - VOLATILE ORGANIC COMPOUNDS**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **YES**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **NO**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

1.33575

26.71500

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **71432 - BENZENE**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

ESTIMATED EMISSIONS: UNCONTROLLED ESTIMATED EMISSIONS: EMISSIONS LIMIT:

(TONS PER YEAR):

(TONS PER YEAR):

(TONS PER YEAR):

0.00234

0.04680

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:

(TONS PER YEAR)

0.00000

EFFECTIVE YEAR OF INVENTORY: **NOT REPORTED**

POLLUTANT NAME: **110543 - HEXANE,N-**

EMISSION DATA SUBMITTED YEAR: **2008**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT UNDER COLORADO SECTION 25-7-109.3 C.R.S: **NO**

POLLUTANT IS A CRITERIA POLLUTANT: **NO**

POLLUTANT IS REPORTABLE AS EPCRA (SARA TITLE III) COMPOUND ONLY: **NO**

POLLUTANT IS A HAZARDOUS AIR POLLUTANT LISTED UNDER THE FEDERAL CAAA SECTION 112: **YES**

POLLUTANT IS A OZONE DEPLETING COMPOUND LISTED UNDER COLORADO AQCC REGULATION 15 SECTION II.11.: **NO**

Air Pollution Control Division Permitted Facilities (APCDP)

ESTIMATED EMISSIONS:
(TONS PER YEAR):

0.02047

UNCONTROLLED ESTIMATED EMISSIONS:
(TONS PER YEAR):

0.40950

EMISSIONS LIMIT:
(TONS PER YEAR):

0.00000

ESTIMATED EMISSIONS WITH RULE EFFECTIVENESS:
(TONS PER YEAR)

0.00000

UNIT COMMENT

TANK NAME: 34001943

[Back to Report Summary](#)

Unlocated Sites Summary

This list contains sites that could not be mapped due to limited or incomplete address information.

No Records Found

Environmental Records Definitions - FEDERAL

DOCKETS

EPA Docket Data

VERSION DATE: 12/22/05

The United States Environmental Protection Agency Docket data lists Civil Case Defendants, filing dates as far back as 1971, laws broken including section, violations that occurred, pollutants involved, penalties assessed and superfund awards by facility and location. Please refer to ICIS database as source of current data.

EC

Federal Engineering Institutional Control Sites

VERSION DATE: 06/11/19

This database includes site locations where Engineering and/or Institutional Controls have been identified as part of a selected remedy for the site as defined by United States Environmental Protection Agency official remedy decision documents. The data displays remedy component information for Superfund decision documents issued in fiscal years 1982-2017, and it includes final and deleted NPL sites as well as sites with a Superfund Alternative Approach (SAA) agreement in place. A site listing does not indicate that the institutional and engineering controls are currently in place nor will be in place once the remedy is complete; it only indicates that the decision to include either of them in the remedy is documented as of the completed date of the document. Institutional controls are actions, such as legal controls, that help minimize the potential for human exposure to contamination by ensuring appropriate land or resource use. Engineering controls include caps, barriers, or other device engineering to prevent access, exposure, or continued migration of contamination.

ECHOR08

Enforcement and Compliance History Information

VERSION DATE: 03/09/19

The U.S. Environmental Protection Agency's Enforcement and Compliance History Online (ECHO) database, provides compliance and enforcement information for facilities nationwide. This database includes facilities regulated as Clean Air Act stationary sources, Clean Water Act direct dischargers, Resource Conservation and Recovery Act hazardous waste handlers, Safe Drinking Water Act public water systems along with other data, such as Toxics Release Inventory releases.

FRSCO

Facility Registry System

VERSION DATE: 04/05/19

The United States Environmental Protection Agency's Office of Environmental Information (OEI) developed the Facility Registry System (FRS) as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System or FINDS database.

ICIS

Integrated Compliance Information System (formerly DOCKETS)

VERSION DATE: 03/09/19

ICIS is a case activity tracking and management system for civil, judicial, and administrative federal

Environmental Records Definitions - FEDERAL

Environmental Protection Agency enforcement cases. ICIS contains information on federal administrative and federal judicial cases under the following environmental statutes: the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Emergency Planning and Community Right-to-Know Act - Section 313, the Toxic Substances Control Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Safe Drinking Water Act, and the Marine Protection, Research, and Sanctuaries Act.

ICISNPDES

Integrated Compliance Information System National Pollutant Discharge Elimination System

VERSION DATE: 07/09/17

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. This database is provided by the U.S. Environmental Protection Agency.

LUCIS

Land Use Control Information System

VERSION DATE: 09/01/06

The LUCIS database is maintained by the U.S. Department of the Navy and contains information for former Base Realignment and Closure (BRAC) properties across the United States.

MLTS

Material Licensing Tracking System

VERSION DATE: 06/29/17

MLTS is a list of approximately 8,100 sites which have or use radioactive materials subject to the United States Nuclear Regulatory Commission (NRC) licensing requirements. Disclaimer: Due to agency regulations and policies, this database contains applicant/licensee location information which may or may not be related to the physical location per MLTS site.

NPDESR08

National Pollutant Discharge Elimination System

VERSION DATE: 04/01/07

Authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The NPDES database was collected from the U.S. Environmental Protection Agency (EPA) from December 2002 through April 2007. Refer to the PCS and/or ICIS-NPDES database as source of current data. This database includes permitted facilities located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

PADS

PCB Activity Database System

VERSION DATE: 09/14/18

PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are

Environmental Records Definitions - FEDERAL

required to notify the U.S. Environmental Protection Agency of such activities.

PCSR08 Permit Compliance System

VERSION DATE: 08/01/12

The Permit Compliance System is used in tracking enforcement status and permit compliance of facilities controlled by the National Pollutant Discharge Elimination System (NPDES) under the Clean Water Act and is maintained by the United States Environmental Protection Agency's Office of Compliance. PCS is designed to support the NPDES program at the state, regional, and national levels. This database includes permitted facilities located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming. PCS has been modernized, and no longer exists. National Pollutant Discharge Elimination System (ICIS-NPDES) data can now be found in Integrated Compliance Information System (ICIS).

RCRASC RCRA Sites with Controls

VERSION DATE: 04/24/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with institutional controls in place.

SEMSLIENS SEMS Lien on Property

VERSION DATE: 08/13/18

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs. This is a listing of SEMS sites with a lien on the property.

SFLIENS CERCLIS Liens

VERSION DATE: 06/08/12

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which United States Environmental Protection Agency has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. This database contains those CERCLIS sites where the Lien on Property action is complete. Please refer to the SEMSLIENS database as source of current data.

Environmental Records Definitions - FEDERAL

SSTS Section Seven Tracking System

VERSION DATE: 02/01/17

The United States Environmental Protection Agency tracks information on pesticide establishments through the Section Seven Tracking System (SSTS). SSTS records the registration of new establishments and records pesticide production at each establishment. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) requires that production of pesticides or devices be conducted in a registered pesticide-producing or device-producing establishment. ("Production" includes formulation, packaging, repackaging, and relabeling.)

TSCA Toxic Substance Control Act Inventory

VERSION DATE: 12/31/12

The Toxic Substances Control Act (TSCA) was enacted in 1976 to ensure that chemicals manufactured, imported, processed, or distributed in commerce, or used or disposed of in the United States do not pose any unreasonable risks to human health or the environment. TSCA section 8(b) provides the United States Environmental Protection Agency authority to "compile, keep current, and publish a list of each chemical substance that is manufactured or processed in the United States." This TSCA Chemical Substance Inventory contains non-confidential information on the production amount of toxic chemicals from each manufacturer and importer site.

AIRSAFS Aerometric Information Retrieval System / Air Facility Subsystem

VERSION DATE: 10/20/14

The United States Environmental Protection Agency (EPA) modified the Aerometric Information Retrieval System (AIRS) to a database that exclusively tracks the compliance of stationary sources of air pollution with EPA regulations: the Air Facility Subsystem (AFS). Since this change in 2001, the management of the AIRS/AFS database was assigned to EPA's Office of Enforcement and Compliance Assurance.

CDL Clandestine Drug Laboratory Locations

VERSION DATE: 12/29/18

The U.S. Department of Justice ("the Department") provides this information as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments. The Department does not establish, implement, enforce, or certify compliance with clean-up or remediation standards for contaminated sites; the public should contact a state or local health department or environmental protection agency for that information.

Environmental Records Definitions - FEDERAL

ERNSCO Emergency Response Notification System

VERSION DATE: 04/07/19

This National Response Center database contains data on reported releases of oil, chemical, radiological, biological, and/or etiological discharges into the environment anywhere in the United States and its territories. The data comes from spill reports made to the U.S. Environmental Protection Agency, U.S. Coast Guard, the National Response Center and/or the U.S. Department of Transportation.

HMIRSR08 Hazardous Materials Incident Reporting System

VERSION DATE: 04/14/19

The HMIRS database contains unintentional hazardous materials release information reported to the U.S. Department of Transportation located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

TRI Toxics Release Inventory

VERSION DATE: 12/31/16

The Toxics Release Inventory, provided by the United States Environmental Protection Agency, includes data on toxic chemical releases and waste management activities from certain industries as well as federal and tribal facilities. This inventory contains information about the types and amounts of toxic chemicals that are released each year to the air, water, and land as well as information on the quantities of toxic chemicals sent to other facilities for further waste management.

ALTFUELS Alternative Fueling Stations

VERSION DATE: 03/01/19

Nationwide list of alternative fueling stations made available by the U.S. Department of Energy's Office of Energy Efficiency & Renewable Energy. Includes Bio-diesel stations, Ethanol (E85) stations, Liquefied Petroleum Gas (Propane) stations, Ethanol (E85) stations, Natural Gas stations, Hydrogen stations, and Electric Vehicle Supply Equipment (EVSE).

BRS Biennial Reporting System

VERSION DATE: 12/31/15

The United States Environmental Protection Agency (EPA), in cooperation with the States, biennially collects information regarding the generation, management, and final disposition of hazardous wastes regulated under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. The Biennial Report captures detailed data on the generation of hazardous waste from large quantity generators and data on waste management practices from treatment, storage and disposal facilities. Currently, the EPA states that data collected between 1991 and 1997 was originally a part of the defunct Biennial Reporting System and is now incorporated into the RCRAInfo data system.

Environmental Records Definitions - FEDERAL

FEMAUST FEMA Owned Storage Tanks

VERSION DATE: 12/01/16

This is a listing of FEMA owned underground and aboveground storage tank sites. For security reasons, address information is not released to the public according to the U.S. Department of Homeland Security.

HISTPST Historical Gas Stations

VERSION DATE: NR

This historic directory of service stations is provided by the Cities Service Company. The directory includes Cities Service filling stations that were located throughout the United States in 1930.

ICISCLEANERS Integrated Compliance Information System Drycleaners

VERSION DATE: 03/09/19

This is a listing of drycleaner facilities from the Integrated Compliance Information System (ICIS). The U.S. Environmental Protection Agency (EPA) tracks facilities that possess NAIC and SIC codes that classify businesses as drycleaner establishments.

MRDS Mineral Resource Data System

VERSION DATE: 03/15/16

MRDS (Mineral Resource Data System) is a collection of reports describing metallic and nonmetallic mineral resources throughout the world. Included are deposit name, location, commodity, deposit description, geologic characteristics, production, reserves, resources, and references. This database contains the records previously provided in the Mineral Resource Data System (MRDS) of USGS and the Mineral Availability System/Mineral Industry Locator System (MAS/MILS) originated in the U.S. Bureau of Mines, which is now part of USGS.

MSHA Mine Safety and Health Administration Master Index File

VERSION DATE: 03/15/19

The Mine dataset lists all Coal and Metal/Non-Metal mines under MSHA's jurisdiction since 1/1/1970. It includes such information as the current status of each mine (Active, Abandoned, NonProducing, etc.), the current owner and operating company, commodity codes and physical attributes of the mine. Mine ID is the unique key for this data. This information is provided by the United States Department of Labor - Mine Safety and Health Administration (MSHA).

RCRAGR08 Resource Conservation & Recovery Act - Generator

VERSION DATE: 04/01/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA)

Environmental Records Definitions - FEDERAL

the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities currently generating hazardous waste. EPA Region 8 includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

RCRANGR08

Resource Conservation & Recovery Act - Non-Generator

VERSION DATE: 04/01/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities classified as non-generators. Non-Generators do not presently generate hazardous waste. EPA Region 8 includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

BF

Brownfields Management System

VERSION DATE: 07/10/19

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. The United States Environmental Protection Agency maintains this database to track activities in the various brown field grant programs including grantee assessment, site cleanup and site redevelopment. This database included tribal brownfield sites.

NLRRCRAT

No Longer Regulated RCRA Non-CORRACTS TSD Facilities

VERSION DATE: 04/01/19

This database includes RCRA Non-Corrective Action TSD facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements. This listing includes facilities that formerly treated, stored or disposed of hazardous waste.

ODI

Open Dump Inventory

VERSION DATE: 06/01/85

The open dump inventory was published by the United States Environmental Protection Agency. An "open dump" is defined as a facility or site where solid waste is disposed of which is not a sanitary landfill which meets the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944) and which is not a facility for disposal of hazardous waste. This inventory has not been updated since June 1985.

Environmental Records Definitions - FEDERAL

RCRAT Resource Conservation & Recovery Act - Non-CORRACTS Treatment, Storage & Disposal Facilities

VERSION DATE: 04/01/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities recognized as hazardous waste treatment, storage, and disposal sites (TSD).

SEMS Superfund Enterprise Management System

VERSION DATE: 06/11/19

The U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response, Office of Superfund Remediation and Technology Innovation (OSRTI), has implemented The Superfund Enterprise Management System (SEMS), formerly known as CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) to track and report on clean-up and enforcement activities taking place at Superfund sites. SEMS represents a joint development and ongoing collaboration between Superfund's Remedial, Removal, Federal Facilities, Enforcement and Emergency Response programs.

SEMSARCH Superfund Enterprise Management System Archived Site Inventory

VERSION DATE: 06/11/19

The U.S. Environmental Protection Agency's (EPA) Superfund Enterprise Management System Archived Site Inventory (List 8R Archived) replaced the CERCLIS NFRAP reporting system in 2015. This listing reflects sites at which the EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program.

SMCRA Surface Mining Control and Reclamation Act Sites

VERSION DATE: 03/19/19

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by the Office of Surface Mining Reclamation and Enforcement (OSMRE) to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

USUMTRCA Uranium Mill Tailings Radiation Control Act Sites

VERSION DATE: 03/04/17

The Legacy Management Office of the Department of Energy (DOE) manages radioactive and chemical waste,

Environmental Records Definitions - FEDERAL

environmental contamination, and hazardous material at over 100 sites across the U.S. The L.M. Office manages this database of sites registered under the Uranium Mill Tailings Control Act (UMTRCA).

DNPL Delisted National Priorities List

VERSION DATE: 06/11/19

This database includes sites from the United States Environmental Protection Agency's Final National Priorities List (NPL) where remedies have proven to be satisfactory or sites where the original analyses were inaccurate, and the site is no longer appropriate for inclusion on the NPL, and final publication in the Federal Register has occurred.

DOD Department of Defense Sites

VERSION DATE: 12/01/14

This information originates from the National Atlas of the United States Federal Lands data, which includes lands owned or administered by the Federal government. Army DOD, Army Corps of Engineers DOD, Air Force DOD, Navy DOD and Marine DOD areas of 640 acres or more are included.

FUDS Formerly Used Defense Sites

VERSION DATE: 06/01/15

The Formerly Used Defense Sites (FUDS) inventory includes properties previously owned by or leased to the United States and under Secretary of Defense Jurisdiction, as well as Munitions Response Areas (MRAs). The remediation of these properties is the responsibility of the Department of Defense. This data is provided by the U.S. Army Corps of Engineers (USACE), the boundaries/polygon data are based on preliminary findings and not all properties currently have polygon data available. **DISCLAIMER:** This data represents the results of data collection/processing for a specific USACE activity and is in no way to be considered comprehensive or to be used in any legal or official capacity as presented on this site. While the USACE has made a reasonable effort to insure the accuracy of the maps and associated data, it should be explicitly noted that USACE makes no warranty, representation or guaranty, either expressed or implied, as to the content, sequence, accuracy, timeliness or completeness of any of the data provided herein. For additional information on Formerly Used Defense Sites please contact the USACE Public Affairs Office at (202) 528-4285.

FUSRAP Formerly Utilized Sites Remedial Action Program

VERSION DATE: 03/04/17

The U.S. Department of Energy (DOE) established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from the Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations. The DOE Office of Legacy Management (LM) established long-term surveillance and maintenance (LTS&M) requirements for remediated FUSRAP sites. DOE evaluates the final site conditions of a remediated site on the basis of risk for different future uses. DOE then confirms that LTS&M requirements will maintain protectiveness.

Environmental Records Definitions - FEDERAL

NLRRCRAC

No Longer Regulated RCRA Corrective Action Facilities

VERSION DATE: 04/01/19

This database includes RCRA Corrective Action facilities that are no longer regulated by the United States Environmental Protection Agency or do not meet other RCRA reporting requirements.

NMS

Former Military Nike Missile Sites

VERSION DATE: 12/01/84

This information was taken from report DRXTH-AS-IA-83A016 (Historical Overview of the Nike Missile System, 12/1984) which was performed by Environmental Science and Engineering, Inc. for the U.S. Army Toxic and Hazardous Materials Agency Assessment Division. The Nike system was deployed between 1954 and the mid-1970's. Among the substances used or stored on Nike sites were liquid missile fuel (JP-4); starter fluids (UDKH, aniline, and furfuryl alcohol); oxidizer (IRFNA); hydrocarbons (motor oil, hydraulic fluid, diesel fuel, gasoline, heating oil); solvents (carbon tetrachloride, trichloroethylene, trichloroethane, stoddard solvent); and battery electrolyte. The quantities of material a disposed of and procedures for disposal are not documented in published reports. Virtually all information concerning the potential for contamination at Nike sites is confined to personnel who were assigned to Nike sites. During deactivation most hardware was shipped to depot-level supply points. There were reportedly instances where excess materials were disposed of on or near the site itself at closure. There was reportedly no routine site decontamination.

NPL

National Priorities List

VERSION DATE: 06/11/19

This database includes United States Environmental Protection Agency (EPA) National Priorities List sites that fall under the EPA's Superfund program, established to fund the cleanup of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial action.

PNPL

Proposed National Priorities List

VERSION DATE: 06/11/19

This database contains sites proposed to be included on the National Priorities List (NPL) in the Federal Register. The United States Environmental Protection Agency investigates these sites to determine if they may present long-term threats to public health or the environment.

RCRAC

Resource Conservation & Recovery Act - Corrective Action Facilities

VERSION DATE: 04/01/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems

Environmental Records Definitions - FEDERAL

that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities with corrective action activity.

RCRASUBC

Resource Conservation & Recovery Act - Subject to Corrective Action Facilities

VERSION DATE: 04/01/19

The Resource Conservation and Recovery Act (RCRA) gives the U.S. Environmental Protection Agency (EPA) the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous solid wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. This listing refers to facilities subject to corrective actions.

RODS

Record of Decision System

VERSION DATE: 05/14/19

These decision documents maintained by the United States Environmental Protection Agency describe the chosen remedy for NPL (Superfund) site remediation. They also include site history, site description, site characteristics, community participation, enforcement activities, past and present activities, contaminated media, the contaminants present, and scope and role of response action.

Environmental Records Definitions - STATE (CO)

ASBESTOS

Asbestos Abatement and Demolition Projects

VERSION DATE: 12/28/17

The Colorado Department of Public Health and Environment's Air Pollution Control Division assists schools and businesses to comply with air pollution laws regulating asbestos and asbestos containing materials. The regulation that governs asbestos in Colorado is the Colorado Air Quality Control Commission's Regulation No. 8, Part B, "Emission Standards for Asbestos." Notification is required for all demolitions of all facilities and all asbestos abatement projects that exceed the trigger levels, whatever is the lesser quantity. The notification requirements apply to both friable and non-friable asbestos materials. This database contains those related projects since January 2008.

CDPS

Colorado Discharge Permit System Facilities

VERSION DATE: 02/03/19

The Colorado Department of Public Health & Environment's Water Quality Control Division regulates the Colorado Discharge Permit System. This system controls stormwater discharges from construction activities by requiring a Stormwater Construction Permit to reduce pollutants from entering streams, river, lakes and wetlands as a result of runoff from residential, commercial and industrial areas. This database also includes facilities with Industrial Stormwater Permits.

COVENANTS

Environmental Real Covenants List

VERSION DATE: 08/20/19

This list of environmental covenants is maintained by the Colorado Division of Public Health and Environment. Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. These covenants, which are recorded with the deed and run with the land, provide a mechanism to ensure that institutional controls that are part of environmental remediation projects are properly implemented and that engineered structures are protected and maintained, so that implemented remedies continue to be protective of human health and the environment for as long as any residual contamination remains a risk.

UMTS

Uranium Mill Tailings Sites

VERSION DATE: 08/09/02

There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act (UMTRA). These nine sites, known commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going. This database was provided by the Colorado Department of Public Health and Environment.

Environmental Records Definitions - STATE (CO)

APCDP Air Pollution Control Division Permitted Facilities

VERSION DATE: 07/28/19

This list of Air Pollution Control Division Permitted Facilities is maintained by the Colorado Department of Public Health and Environment. The Stationary Sources Program evaluates and develops air permits for stationary sources in Colorado. The program inspects sources to determine compliance with air regulations and permit conditions and maintains a computerized inventory of air pollution emissions throughout the state.

CLEANERS Dry Cleaning Facilities

VERSION DATE: 07/29/19

This list of dry cleaners, which have obtained an air permit through the Air Pollution Control Division, is maintained by the Colorado Department of Public Health and Environment.

SPILLS Spills Listing

VERSION DATE: 07/31/19

The Colorado Department of Public Health and Environment's Division of Emergency Preparedness and Response maintains this listing of chemical spills and/or releases.

AST Aboveground Storage Tank Facilities

VERSION DATE: 08/13/19

This list of aboveground storage tank (AST) facilities is maintained by the Colorado Department of Public Health and Environment. Types of tanks included are: currently in use, never installed/existed, never installed-permit revoked, not regulated, other, pending installation, permanently closed, temporarily out of use.

HWSG Hazardous Waste Sites- Generator

VERSION DATE: 06/30/03

The Resource Conservation and Recovery Act (RCRA) was enacted by congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. This facility listing includes RCRA sites listed as generators of hazardous waste (Small Quantity Generators and Large Quantity Generators) and was provided by the Colorado Department of Public Health and Environment.

Small Quantity Generators (SQG) generate, in any calendar month, more than 100 kg (220 lbs.) but less than 1,000 kg (2,200 lbs.) of RCRA hazardous waste; and generate, in any calendar month, or accumulate at any time, no more than 1 kg (2.2 lbs.) of acute hazardous waste and no more than 100 kg (220 lbs.) of material from the cleanup of a spill of acute hazardous waste; and accumulate on-site no more than 6000 kg (13,200 lbs) of hazardous waste at any one time; or, the site is a Small Quantity Generator if the site met all other criteria for a Conditionally Exempt Small Quantity Generator, but accumulated, at any time, more than 1,000 kg (2,200 lbs.) of RCRA hazardous waste.

Environmental Records Definitions - STATE (CO)

Large Quantity Generators (LQG) generate, in any calendar month, 1,000 kg (2,200 lbs.) or more of RCRA hazardous waste; or generate, in any calendar month, or accumulated at any time, more than 1 kg (2.2 lbs.) of RCRA acute hazardous waste; or generate, in any calendar month, or accumulated at any time, more than 100 kg (220 lbs.) of spill cleanup material contaminated with RCRA acute hazardous waste.

UST Underground Storage Tank Facilities

VERSION DATE: 08/13/19

This list of underground storage tank (UST) facilities is maintained by the Colorado Department of Public Health and Environment. Types of tanks included are: currently in use, never installed/existed, never installed-permit revoked, not regulated, other, pending installation, permanently closed, temporarily out of use.

HISTSWLF Historical Solid Waste Landfills

VERSION DATE: NR

This historical solid waste landfills database contains data from the Hazardous Materials Waste Management Division (HMWMD) of the Colorado Department of Public Health and other various state and local agencies. In the early 1980s, the HMWMD conducted a survey of staff members and local agencies to compile this listing of sites that were known or thought to have waste issues. This Solid Waste Historical Data is not considered complete or verifiable and has not been maintained since the late 1980s. The HMWMD is not responsible and shall not be liable to the used for damages of any kind arising out of the use of this data or information.

HWSTSD Hazardous Waste Sites- Treatment, Storage & Disposal

VERSION DATE: 06/30/03

The Resource Conservation and Recovery Act (RCRA) was enacted by congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. TSD facilities treat, store, dispose, or recycle hazardous waste on site in units and therefore are subject to RCRA permitting requirements. Historic TSDs are facilities that have completed closure and/or post-closure of the RCRA Subtitle C Regulated Unit(s) or the Treatment/Storage/Disposal Unit is no longer regulated. This database was provided by the Colorado Department of Public Health and Environment.

LST Leaking Storage Tank Facilities

VERSION DATE: 08/13/19

This database of aboveground and underground storage tank facilities with confirmed releases is a compilation of several lists maintained by the Colorado Department of Labor and Employment. Currently In Use, Never Installed/Existed, Never Installed-Permit Revoked, Not Regulated, Other, Pending Installation, Permanently Closed, Temporarily Out of Use tanks are included in this data. The next set of data is obtained from the Active and Closed OPS Petroleum Release Events in Colorado database. This data includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination). The Events data utilized in this database includes the following status types: Brownfield,

Environmental Records Definitions - STATE (CO)

Closed, Enforcement, LUST Trust, Open and State Lead. Please note some Events (confirmed releases) may not have a contaminant present.

LUSTTRUST Leaking Underground Storage Tanks Trust Fund Sites

VERSION DATE: 01/01/00

Suspected tank leaks have been discovered at the sites are included in this database, but the facility responsible for the leak has not been identified. The state's investigation and search for responsible parties is paid for out of the state's Leaking Underground Storage Tank (LUST) Trust Fund. This data was originally collected in 2002 from the Colorado Department of Labor & Employment, Division of Oil & Public Safety, State Fund Section by a former environmental database company known as Satisfi. Please refer to State LST database as source of current LUST Trust sites.

METHANESITES Methane Gas Study Sites

VERSION DATE: 01/01/81

This Investigation of Methane Gas Hazards report was prepared by the Denver Office of Emergency Preparedness in 1981. The purpose of this study was to assess the actual and potential generation, migration, explosive and related problems associated with specified landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. The Colorado Department of Health selected eight landfills as priorities due to population density and potential hazards to population and property.

SWF Solid Waste Facilities

VERSION DATE: 06/24/19

The Colorado Department of Public Health and Environment maintains this database of solid waste disposal facilities, transfer stations, recyclers, waste tire registrants, and waste grease registrants.

VCRA Voluntary Cleanup and Redevelopment Program Sites

VERSION DATE: 07/02/19

This list of Voluntary Cleanup and Redevelopment Program Sites is maintained by the Colorado Department of Public Health and Environment (CDPHE) and includes both voluntary cleanup and brownfield properties. The Voluntary Cleanup and Redevelopment program was created in 1994. The objective of the program is to facilitate the redevelopment and transfer of contaminated properties. Properties that sit untouched because of their real or perceived contamination can be rehabilitated using the CDPHE's Brownfields Program in conjunction with the Voluntary Cleanup Program. Cleanup decisions are based on existing standards and the proposed use of the property. The actual cleanup and verification is the owner's responsibility.

HWSCA Hazardous Waste Sites- Corrective Action

VERSION DATE: 06/30/03

Environmental Records Definitions - STATE (CO)

The Resource Conservation and Recovery Act (RCRA) was enacted by congress in 1976, followed by the promulgation of implementing regulations in 1980. In 1984, the Hazardous and Solid Waste Amendments (HSWA) were added to RCRA providing for corrective action at facilities subject to RCRA. That same year, the State was authorized by EPA to implement the RCRA program in Colorado on their behalf. Corrective action may be implemented as part of a RCRA Hazardous Waste Permit, an Order, or a Corrective Action Plan pursuant to the Colorado Hazardous Waste Regulations. Corrective action is the process by which regulated facilities investigate and remediate, as necessary, all contamination (soil, ground water, surface water, air) associated with their releases into the environment. Historic Corrective Action Sites are facilities that have completed the RCRA Subtitle C corrective Action process. This database was provided by the Colorado Department of Public Health and Environment.

SF Superfund Sites

VERSION DATE: 07/23/19

This list of superfunds is maintained by the Colorado Department of Public Health and Environment. This list contains active, deleted and proposed "Superfund" hazardous waste sites, as well as those sites identified through the Natural Resource Damages section of Superfund legislation and one Private Non-Superfund Cleanup site. A site qualifies for the National Priorities List (NPL or Superfund list) when the U.S. Environmental Protection Agency (EPA) determines there is a release or threatened release of hazardous substances that may endanger public health, welfare or the environment. In Colorado, the lead agency for Superfund remediation may be either the EPA or the Colorado Department of Public Health and Environment.

Environmental Records Definitions - LOCAL

WCSWF

Weld County Solid Waste Facilities

VERSION DATE: 01/25/18

This list of solid waste facilities is maintained by the Weld County Public Health Department. The Weld County Code (WCC), Section 23-4-380 is the only section of the WCC that pertains to solid waste operations. The siting, permitting and regulation of solid waste disposal sites is an area of dual jurisdiction between Colorado Department of Public Health and Environment and Weld County. The primary regulations that govern composting and solid waste facilities are the Colorado Regulations Pertaining to Solid Waste Disposal Sites and Facilities (6 CCR 1007-2). These regulations are implemented by the Colorado Department of Public Health & Environment. The Weld County Department of Public Health & Environment interacts with compost and solid waste facilities through the receipt of complaints, the land use planning process for facilities having a Use by Special Review (USR) Permit, site inspections, and investigations.

Environmental Records Definitions - TRIBAL

USTR08 Underground Storage Tanks On Tribal Lands

VERSION DATE: 10/16/18

This database, provided by the United States Environmental Protection Agency (EPA), contains underground storage tanks on Tribal lands located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

LUSTR08 Leaking Underground Storage Tanks On Tribal Lands

VERSION DATE: 05/02/19

This database, provided by the United States Environmental Protection Agency (EPA), contains leaking underground storage tanks on Tribal lands located in EPA Region 8. This region includes the following states: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming.

ODINDIAN Open Dump Inventory on Tribal Lands

VERSION DATE: 11/08/06

This Indian Health Service database contains information about facilities and sites on tribal lands where solid waste is disposed of, which are not sanitary landfills or hazardous waste disposal facilities, and which meet the criteria promulgated under section 4004 of the Solid Waste Disposal Act (42 U.S.C. 6944).

INDIANRES Indian Reservations

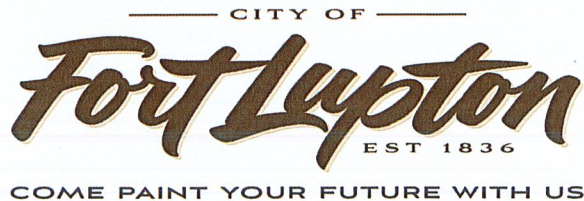
VERSION DATE: 01/01/00

The Department of Interior and Bureau of Indian Affairs maintains this database that includes American Indian Reservations, off-reservation trust lands, public domain allotments, Alaska Native Regional Corporations and Recognized State Reservations.



APPENDIX D

LOCAL GOVERNMENT RESPONSE



City Clerk

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694

Fax: 303.857.0351

www.fortlupton.org

September 25, 2019

Via E-mail

Rannen Worsley
1971 W 12th Ave.
Denver, CO 80204

Dear Rannen,

This letter is in response to your Open Records Request dated September 20, 2019.

Request: Documents on the release of hazardous wastes/materials such as closed/archived landfills, onsite water treatment systems, clandestine methamphetamine labs, spills or complains, on or adjacent to the site 14284 Hwy 52.

Response: The City has no documents on file pertaining to any hazardous wastes/materials such as closed/archived landfills, onsite water treatment systems, clandestine methamphetamine labs, spills or complains, on or adjacent to the site 14284 Hwy 52.

If you have any questions or comments, please free to contact me at 720.466.6101.

Sincerely,

Mari Peña
City Clerk



APPENDIX E

DWR PERMITS

RECEIVED

FEB 17 1989

WATER RESOURCES
STATE ENGINEER
DEPT.

**Delta
Environmental
Consultants, Inc.**

2637 Midpoint Drive, Suite F
Fort Collins, CO 80525
303 493-0800

Best Copy Available

February 15, 1989

State of Colorado
Office of the State Engineer
Division of Water Resources
1313 Sherman Street, Room 823
Denver, Colorado 80203

Attention: Mr. Kris Murthy

Subject: Information Exchange Regarding Well Permit
Anderson Oil Site
Fort Lupton, Colorado
Delta No. 30-88-106

Dear Mr. Murthy:

Enclosed please find the corrected permit to construct well application form. The well is to be used to recover contaminated ground water and product associated with a release of gasoline to the soil and ground water at the Anderson Oil Company service station in Fort Lupton. The duration of cleanup is expected to be approximately two years.

The treated ground water is to be discharged to the City of Fort Lupton sanitary sewer system. All of the tributary ground water diverted to the sanitary treatment plant will be discharged to the South Platte River.

The Colorado State Engineer's office has records of two registered wells within 1/4 mile of the site. The records do not give the precise locations and we have been unable to contact the owners. Injury to water rights between the pumping point and discharge point to the stream may occur, but it is important that we remediate the ground water so that the water does not become unfit for domestic use.

If you have any questions regarding this permit or project in general, please feel free to call me or Mr. Kenneth Napp at (303)493-0800.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Chester A. Hitchens

Chester A. Hitchens
Its Staff Professional

CAH/njl

cc: Mr. Ken Napp
Delta Environmental Consultants, Inc.

COLORADO DIVISION OF WATER RESOURCES
818 Centennial Bldg., 1313 Sherman St., Denver, Colorado 80203

RECEIVED

FEB 08 1989

PERMIT APPLICATION FORM

Application must be complete where applicable. Type or print in **BLACK INK**. No overstrikes or erasures unless initialed.

(X) A PERMIT TO USE GROUND WATER
(X) A PERMIT TO CONSTRUCT A WELL
FOR: (X) A PERMIT TO INSTALL A PUMP

() REPLACEMENT FOR NO. _____

() OTHER _____

WATER COURT CASE NO. _____

02-08-89 2:30 P

032477 40.00

NNX00R P0007

TTI 40.00

CH2 0.00

TTM 1

CHIEF

40.00

(1) APPLICANT - mailing addressNAME Delta Environmental Consultants, Inc.STREET 2637 Midpoint Drive, Suite FCITY Fort Collins, Colorado 80525

(State)

(Zip)

TELEPHONE NO. (303)493-0800**(2) LOCATION OF PROPOSED WELL**County Weld✓ SW % of the NW %, Section 5Twp. 1 N, Rng. 66 W, _____ P.M.
(N.S) (E.W)**(3) WATER USE AND WELL DATA**Proposed maximum pumping rate (gpm) 10Average annual amount of ground water to be appropriated (acre-feet): 16.13Number of acres to be irrigated: N/AProposed total depth (feet): 35.0

Aquifer ground water is to be obtained from:

South Platte Alluvium

Owner's well designation _____

GROUND WATER TO BE USED FOR:

() HOUSEHOLD USE ONLY - no irrigation (0)

() DOMESTIC (1)

() INDUSTRIAL (5)

() LIVESTOCK (2)

() IRRIGATION (6)

() COMMERCIAL (4)

() MUNICIPAL (8)

(X) OTHER (9) Ground Water ContaminationDETAIL THE USE ON BACK IN (11) Recovery**(4) DRILLER**Name R & R Well & Pump, Inc.Street 145 16th Street P.O.Box 577City Greeley, Colorado 80631

(State)

(Zip)

Telephone No. (303)353-3118 Lic. No. 857

FOR OFFICE USE ONLY: DO NOT WRITE IN THIS COLUMN

Receipt No. 96902 / _____

Basin _____

Dist. _____

CONDITIONS OF APPROVAL

This well shall be used in such a way as to cause no material injury to existing water rights. The issuance of the permit does not assure the applicant that no injury will occur to another vested water right or preclude another owner of a vested water right from seeking relief in a civil court action.

*Au 2/10/89***APPLICATION APPROVED**

PERMIT NUMBER _____

DATE ISSUED _____

EXPIRATION DATE _____

(STATE ENGINEER)

BY _____



TO: WELL PERMIT APPLICANT
RE: APPLICATION RECEIPT NO: 96902

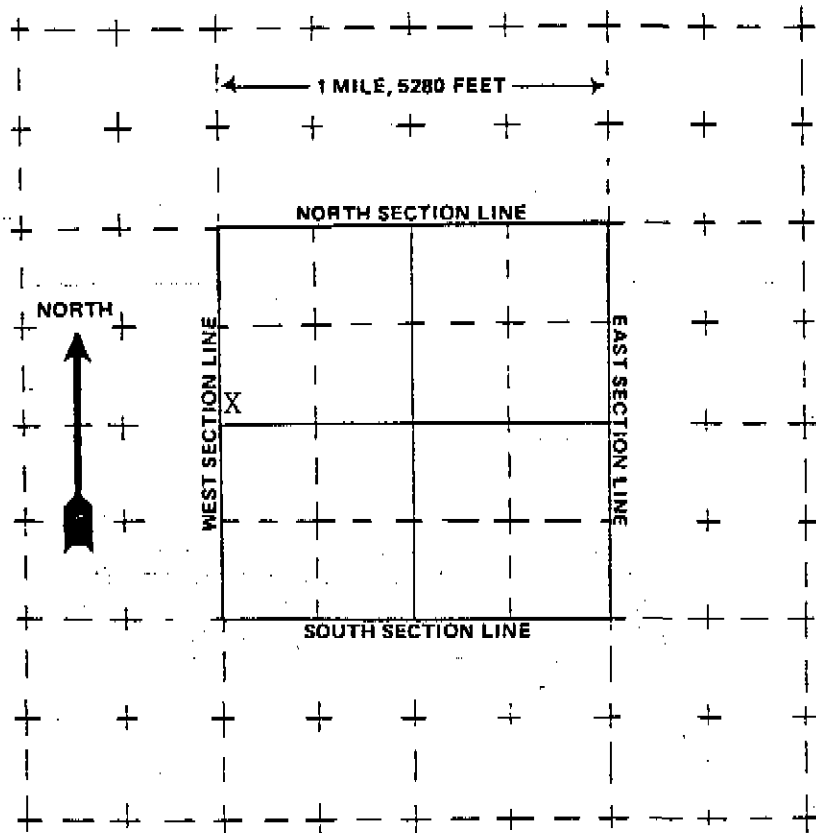
Your application for a permit to construct a well is being returned for the reasons indicated below. The corrections and/or information we are requesting is required for evaluation of the application. The application, including all corrections, must be typed or neatly printed in BLACK INK. Please initial and date in the margin adjoining and changes or additions to the application. Do not alter or change any questions on the application.

- ① The location in item no. 2 does not agree with the footage distances in item no. 6. The distances will place the well in NW 1/4 of SW 1/4.
- ② Please let us know what type of Contamination will be removed?
- ③ Where will the effluent from sanitary sewer system of City of Fort Lupton be discharged to the South Platte River? Do you have an agreement with the City so that the city will discharge all the ground water into the stream?
- ④ What about the injury to other water rights between the pumping point and the discharge point to the stream?
- ⑤ Please let us know the duration of this decontamination process.

Mr. Kris Murthy

DATE. 2/10/89

(5) THE LOCATION OF THE PROPOSED WELL and the area on which the water will be used must be indicated on the diagram below. Use the CENTER SECTION (1 section, 640 acres) for the well location.



The scale of the diagram is 2 inches = 1 mile
Each small square represents 40 acres.

WATER EQUIVALENTS TABLE (Rounded Figures)

An acre-foot covers 1 acre of land 1 foot deep
1 cubic foot per second (cfs) ... 449 gallons per minute (gpm)
A family of 5 will require approximately 1 acre-foot of water per year.
1 acre-foot ... 43,560 cubic feet ... 325,900 gallons.
1,000 gpm pumped continuously for one day produces 4.42 acre-feet.

(6) THE WELL MUST BE LOCATED BELOW by distances from section lines.

✓ 2500 ft. from South sec. line
(north or south)
100 ft. from East sec. line
(east or west)

LOT _____ BLOCK _____ FILING # _____

SUBDIVISION _____

(7) TRACT ON WHICH WELL WILL BE LOCATED Owner: Masonic Lodge

No. of acres N/A Will this be the only well on this tract? Yes

(8) PROPOSED CASING PROGRAM

Plain Casing

12 in. from 0 ft. to 15 ft.

_____ in. from _____ ft. to _____ ft.

Perforated casing

12 in. from 15 ft. to 35 ft.

_____ in. from _____ ft. to _____ ft.

(9) FOR REPLACEMENT WELLS give distance and direction from old well and plans for plugging it:

N/A

(10) LAND ON WHICH GROUND WATER WILL BE USED:

Owner(s): N/A No. of acres: _____

Legal description: _____

(11) DETAILED DESCRIPTION of the use of ground water: Household use and domestic wells must indicate type of disposal system to be used.

Well is for removal of contaminated ground water for treatment. Treated water to be discharged to City of Fort Lupton sanitary sewer system.

(12) OTHER WATER RIGHTS used on this land, including wells. Give Registration and Water Court Case Numbers.

Type or right

Used for (purpose)

Description of land on which used

(13) THE APPLICANT(S) STATE(S) THAT THE INFORMATION SET FORTH HEREON IS TRUE TO THE BEST OF HIS KNOWLEDGE.

Chester A. Pittman

SIGNATURE OF APPLICANT(S)



Delta
Environmental
Consultants, Inc.

2637 Midpoint Drive, Suite F
Fort Collins, CO 80525
303/493-0800
FAX: 303/493-0395

RECEIVED

OCT 20 1989

WATER RESOURCES
ENGINEERING
DIVISION

October 18, 1989

State of Colorado
Office of the State Engineer
Division of Water Resources
1313 Sherman Street, Room 823
Denver, Colorado 80203

Attention: Mr. Kris Murthy
Subject: Well Permit No. 035223-F
Anderson Oil Site
Fort Lupton, Colorado
Delta No. 30-88-106

Dear Mr. Murthy:

The purpose of this letter is to request permission to have the above-referenced well permit amended. We are permitted to discharge 10 gallons per minute (gpm) as part of a gasoline plume recovery project. We need to discharge at least 80 gpm to obtain adequate hydraulic containment and free product recovery at the site. On October 2, 1989, I talked to Mr. Allen Berryman, division engineer in Greeley, Colorado, about increasing the discharge. He informed me that it would not be a problem, but to contact you to have the permit amended.

When discharging at 17 gpm, we have measured approximately 0.36 feet of drawdown in the recovery well. Using appropriate well hydraulic equations, we estimated the transmissivity to range from 7600 to 9400 ft²/day. If we increased the discharge to 80 gpm, then the drawdown in the recovery well would range from 1.3 to 1.7 feet. The nearest water well which could be effected is at least 600 feet to the west. The well is owned by the City of Fort Lupton and they are concerned if we don't increase our discharge their well may be impacted by the contamination.

If you have any questions, please contact me at (303)493-0800.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Chester A. Hitchens

Chester A. Hitchens
Project Manager

CAH/crl

cc: Myra Imhoff - Anderson Oil



APPENDIX F

RESUMES



Education

- BS in Environmental Engineering / Graduated: May '18
Colorado School of Mines / Golden, CO
Major in Environmental Engineering // Minor in Energy
Major Specific GPA: 3.30



Work Experience

- Environmental Scientist / May '18 - Present
CTL | Thompson / Denver, CO
Conduct and assist in the completion of Phase I & II Environmental Site Assessments
Perform stormwater inspections for residential development and construction
- Environmental Engineering Intern / Jun '17 - Aug '17
Phillips & Jordan / Franklin, TX
Performed erosion control inspections for a large scale transmission line project
Assisted in soil and soil amendment research and sampling for land reclamation
- Environmental Health & Safety Intern / May '16 - Aug '16
Imerys Filtration / Lompoc, CA
Performed hazardous waste & Method 22 emissions inspections
Revised and condensed company wide safety data sheets
Created compliance calendars for each U.S. site
Revised the facility's chemical hygiene plan
- Assistant Manager & Senior Advisor / Jun '14 - Mar '16
Vector Marketing / Aurora, CO
Assisted in administration and advisement of East Denver District Office
Sales and marketing of CUTCO products
- Ranch Assistant & Animal Husbandry / Aug '13 - May '16
Violet Moon Ranch / Franktown, CO
Worked with Icelandic sheep and alpaca
Skirted wool and sheared animals
- International Student Office Receptionist / Aug '14 - May '18
Colorado School of Mines / Golden, CO
Assisted in everyday clerical work such as emails, file management, etc.
Handled both telephone and in-person requests for information



Community Service

- Say Cheese, Nicaraguan Mission Fundraiser / Oct '16 - Sep '17
Mines Without Borders Bridge and Water Project
- Media & Sound Production Technician / Aug '10 - Jun '15
Centro Cristiano Casa de Oracion & New Covenant Fellowship Church



Extracurricular Activities

- Senior Design: Water Re-Use for Artisan Workshops / Sep '17 - May '18
Project Manager for the design of a replicable water re-use system for Dym Textiles
- Mines Without Borders / Jan '15 - May '18
Engineers Without Borders Mines Chapter - Media and Logistics Team
- EPICS II: Mines Innovation Competition / Jan '16 - Apr '16
One of top ten project teams sponsored by Newmont Mining Corporation

Software Skills



Personal Skills



Languages

English

Spanish



Interests



Climbing



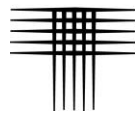
Reading



Traveling



Painting



Matthew L. Wardlow, P.E.

Environmental Department Manager**Office Location**

Denver, Colorado

Years of Experience

20 Years

Professional**Registration**

Registered Professional
Engineer: Colorado

Education

B.S. Engineering and Policy,
Washington University,
St. Louis, MO, 1993

Training & Certifications

40 Hour OSHA Training

Confined Space Training

Mold Remediation
Technician

Training Principals of Forced
Air Remediation

Asbestos Inspector
Air Monitoring Specialist
Designer

Professional Affiliations

American Society of Civil
Engineers

American Society of
Foundation Engineers

Colorado Environmental
Management Society

Urban Land Institute

Mr. Wardlow has a variety of technical expertise in Phase I and II Environmental Site Assessments, CDPHE Voluntary Cleanup (VCP) applications, asbestos consultation, underground storage tank removals, site characterizations, and assessments under the National Environmental Policy Act. Mr. Wardlow reviews all environmental deliverables, making sure that the latest practices are followed. He has developed a reputation as a consistent and reliable consultant for his clients, which include the City & County of Denver, Auraria Campus and its colleges, and Boulder County. He encompasses a variety of project experience including brownfields, historical mine sites, medical facilities, and wastewater treatment plants.

Project ExperienceRegency Athletic Complex at MSU Denver, Denver Colorado**2016 ACEC CO GRAND CONCEPTOR AWARD – Highest Engineering Honor**

This former brownfield, located at the southern end of Auraria Campus, was the site of geotechnical and environmental issues from past industrial use. There was also the potential for settlement due to undocumented fill. Mr. Wardlow devised an idea using Deep Dynamic Compaction (DDC), which is a ground improvement technique that densifies the majority of soils and fills in-place by using a drop weight. CTL then provided on-site geotechnical and environmental inspection services, management of contaminants excavated, and also successfully entered the client into the State of Colorado Voluntary Cleanup Program. Measures were also taken to monitor air quality and vibrations from the impact. The solution was about 25% of the removal and replacement costs, and there has been no noticeable settlement.

Other Redevelopment/Voluntary Cleanup Projects:

Prepared Overall 2016 Auraria Campus Materials Management Plan
New Breckenridge Brewery – VCP – Remediation of Pesticides
Community College of Denver Confluence Building
Metro State Hotel and Hospitality Learning Center
Metro State Student Success Building
AHEC 5th Street Parking Garage – VCP – Coal Ash and Asbestos
Gold Hill Mesa - VCP - Subdivision Constructed on Mine Tailings
4th and Santa Fe – VCP Remediation of Chrome Plating Site
ConocoPhillips - Purchase/Redevelopment of 400-acre StorageTek

Other Major Projects and Clients

Denver Department of Environmental Health - 20+ P1 and P2 ESAs
CDOT - Over 30 Asbestos Surveys, Air Clearances of Buildings
Land Developers - Due Diligence Studies and SWMP Consultation
Urban Land Conservancy - P1 and P2 ESAs, IAQ Concerns
CU Boulder - Asbestos Consultant - Ketchum Hall, Hallett Hall
Homebuilders - Due Diligence, Mold and Moisture Consultation
Boulder County Risk Management - On-Call Industrial Hygienist
Boulder Valley School District - On-Call Asbestos Consultant
Regis University - P1 ESA of 7 Parcels of Campus

December 3, 2019

Coronado West c/o JE Home
2696 South Colorado Boulevard
Suite 329
Denver, Colorado 80222

Attention: Mr. Eric Eckberg

Subject: Limited Phase II Environmental Site Assessment
Murata Farms – Muraco Subdivision
Fort Lupton, Weld County, Colorado
Project No. DN50,219-205-L1

This letter was prepared by CTL | Thompson, Inc. (CTL) for Coronado West c/o JE Home (JE Home), and presents the final results of the Limited Phase II Environmental Site Assessment (ESA) that we conducted on the approximately 70.99-acre property located at 14284 Highway 52, southwest of the intersection of State Highway 52 and County Road 29 ½, in the City of Fort Lupton, Weld County, Colorado (the Site, Figure 1).

INTRODUCTION

We previously conducted a Phase I ESA for the Site, with report dated September 30, 2019, under our Project Number DN50,219-200-R1. In our report, we identified three recognized environmental conditions (RECs):

- **Crestone Peak Battery and Wells** – Oil and gas battery tank and wells are located along the north-central border of the Site, just southwest of the northern driveway into the property. These wells were installed circa 2002 and are currently active.
- **Abandoned Kerr McGee Well** – Abandoned oil and gas well located just north of approximately the center of the eastern alfalfa field, installed circa 2002 and abandoned in May 2018. Limited environmental documentation is available.
- **Former Farm Fuel Tank** – Approximate location of a previous fuel tank for farm vehicles, mainly the tractor. The Site resident, Ms. Glenice Murata, pointed out the general location of the former tank based on memory. The tank was removed prior to 2010 after finding that the tank was possibly leaking. As Ms. Murata recounts, the fuel levels in the tank were dropping and the fuel was thought to have been stolen. However, after a police investigation, it appeared that it was likely a tank leak based on wet soils a



policeman observed near the tank. The tank was removed soon thereafter. Neither the amount of fuel leaked, nor the date of release are known.

The purpose of our Limited Phase II ESA investigation was to evaluate possible environmental concerns on the Site associated with the RECs. The concern exists that soil and/or groundwater may be contaminated with Volatile Organic Compounds (VOCs) and/or Total Petroleum Hydrocarbons (TPH), from present and historic oil and gas activities that exist or took place at the Site from approximately 2002 to present.

Based on the potential for soil and/or groundwater contamination related to current and historic oil and gas and fueling activities on the Site, CTL drilled 10 test holes (TH-1 through TH-10) via four-inch solid-stem auger in select locations along the north- and south-central property boundaries of the Site and near the center of the eastern half of the Site on November 8, 2019.

During drilling of the 10 test holes, CTL screened soils to determine whether soil samples should be collected. After the test holes were completed and finished as temporary groundwater monitoring wells, CTL checked the test holes several days later for the presence of groundwater. If groundwater was present, a sample was collected. This report describes the methodology and results of our limited subsurface investigation.

SITE DESCRIPTION

The Site consists of approximately 70.99 acres of agricultural land occupied by a homestead, located at 14284 Highway 52, or southwest of the intersection of State Highway 52 and County Road 29 ½, in Fort Lupton, Weld County, Colorado. The Site is identified by the legal description *FTL PT N2SW4 1-4-66 (MURATA FARMS ANNEX) LOT B REC EXEMPT RE-879*, and is bordered to the north by State Highway 52, to the east by County Road 29 ½, to the south by agricultural land, and to the west by single-family residences. The Site contains gently sloping cropland and is vegetated with alfalfa and various grasses. Two residences, a small shed, and a Quonset hut lie in the west-central portion of the Site. The Site lies within the North half of the Southwest quarter of Section 4, Township 1 North, Range 66 West of the Sixth Principal Meridian in Fort Lupton, Weld County, Colorado. The Site is shown on Figure 1 (Site Map and Test Holes), Figure 2 (Groundwater Flow Map) shows the approximate groundwater flow direction, Figure 3 (Groundwater Results) shows the analytical results from groundwater samples, and Figure 4 (Soil Results) shows the analytical results from the soil samples.

LOCATION OF TEST HOLES

CTL chose test hole locations for this investigation based on locations presumed to be in the vicinity of and down-gradient to the abandoned Kerr McGee well and the former farm fuel tank location in the east half of the Site, and around the present Crestone Peak wells and battery tank located along the center of the northern border.



Although CTL was unable to verify the exact location of the former farm fuel tank, the tenant, Ms. Glenice Murata, had a recollection of the approximate location. Based on this and our observation of vegetation and land irregularities, we estimated the tank was likely located either near or on top of a small vegetated mound along the south-central border of the Site, or on the east-adjacent property. Therefore, CTL placed the 10 test holes along the north-central border (TH-1 through TH-5), in the center of the eastern half of the Site (TH-6 through TH-8), and along the south-central border of the property line (TH-9 and TH-10).

FIELD INVESTIGATION

Prior to mobilizing to the Site, CTL contacted Colorado 811 to locate public underground utilities, who contacted Tier 1 Member Facilities, to complete utility locates. A utility meet was scheduled for the investigation, and took place on Monday, November 4, 2019.

On Friday, November 8, 2019, CTL mobilized to the Site to observe sub-surface conditions from the drilling of 10 test holes (TH-1 through TH-10). Dakota Drilling, Inc. (Dakota) drilled the test holes to depths of approximately 20 feet below ground surface (bgs), which we believed would be within the groundwater table. The test holes were advanced using a four-inch diameter solid stem auger.

We used a MiniRAE 2000 Portable Photoionization Detector (PID), and our visual and olfactory observations to field-screen soils observed during drilling. The PID was calibrated to isobutylene. We screened soil samples from varying depths in the boreholes. During field screening, samples were placed in glass jars and resealable plastic bags for testing with the PID. The bagged samples were warmed and the vapor headspace inside the bags was then field-screened. The PID detects total vapor volatile organic compounds with the ionization potential of less than or equal to 10.6 eV. The PID does not provide a direct measure of compounds in the samples and it does not identify specific compounds, therefore, the results of field-screening are identified in units of parts per million volume (in air) (ppmv).

Based on field observations, soils beneath the Site generally consisted of silt with fine-grain sand from the ground surface to approximately eight to 10 feet bgs. Underlying the fill materials are silty sandy clays, silty fine sand, silty clays, and clay. Soils were screened in the field with a PID, and CTL made visual and olfactory observations to assess for indicators of potential contamination. Soil samples were collected when soils exhibited an elevated PID reading, visual and/or olfactory indicators, or both.

PID readings measured during the drilling event on November 8, 2019 ranged from 0.0 ppmv in TH-1 to 180 ppmv in TH-9. During drilling, we observed hydrocarbon-like odors primarily between depths of five and 15 feet bgs in all of the test holes except in TH-10 where a chemical, slightly sweet smell was observed; often, the intensity of these odors would increase with depth. TH-9 and TH-5 also exhibited slightly sweet odors intermixed with the observed hydrocarbon odors. We did not observe visual



indicators of contamination in the test holes except in TH-9 where the soil exhibited a gray color between 15 and 20 feet bgs. During the field investigation, we collected one soil sample each from TH-3, TH-4, TH-7, TH-8, and TH-9 at depths ranging between five to 15 feet bgs. During drilling, groundwater was encountered at depths ranging between 17 and 20 feet bgs in TH-2, TH-9, and TH-10.

Environmental protocol was used by CTL during drilling and field screening activities. Gloves and plastic bags were used by CTL to obtain and screen subsurface soils, and new gloves and bags were used after each test hole.

LABORATORY ANALYTICAL RESULTS

The laboratory results identified detectable amounts of TPH in soil and acetone in groundwater samples, further discussed below. Laboratory analytical results are presented in Attachment A.

SOILS

The soil samples were analyzed for VOCs by EPA Method 8260 and for TPH by Method 8015. TPH was detected at elevated concentrations in one of the five soil samples submitted for laboratory analysis as part of this investigation. No VOCs were detected in the soil samples submitted for laboratory analysis, except for total xylenes and trace hydrocarbon compounds commonly found in petroleum, or TPH, products. Soil sample analytical results are summarized in Table I (below).

TABLE I
SUMMARY OF SOIL SAMPLE RESULTS

Test Hole and Sample Depth (feet bgs)	Benzene	Toluene	Ethylbenzene	Xylenes (total)	GRO	DRO
TH-3 (5')	ND	ND	ND	ND	ND	ND
TH-4 (15')	ND	ND	ND	ND	ND	ND
TH-7 (10')	ND	ND	ND	ND	ND	ND
TH-8 (10')	ND	ND	ND	ND	ND	ND
TH-9 (15')	ND	ND	ND	0.0241	141	1,780
EPA RSL	1.2	4,900	5.8	580	NS	NS
CDPHE	0.17	50	100	75	250*	250*

All concentrations in milligrams per kilogram (mg/kg)

GRO – Gasoline Range Organics (C6 – C10)

DRO – Diesel Range Organics (C10 – C28)

ND – Non-Detect

NS – No Standard

RED – Exceeds EPA Regional Screening Level for Residential Soil

BOLD – Exceeds accepted residential soil standard, or Groundwater Protection Value of the Colorado Department of Public Health & Environment (CDPHE)

Note I: All remaining soil samples were below laboratory detection limits or are trace hydrocarbons from GROs and DROs, and are not included in Table I

(*) Note II: There is no established standard for TPH in soils; a commonly accepted standard is 250 mg/kg for residential use



GROUNDWATER

Seven groundwater samples were collected across the Site. After the groundwater wells were installed, they were allowed to stabilize before they were developed and sampled on November 14. After stabilization, depth to groundwater ranged from 3.22 feet bgs in TH-1 to 16.42 feet bgs in TH-6. TH-3, TH-4, and TH-7 were dry. Samples were analyzed for VOCs and TPH via EPA Methods 8260 and 8015, respectively. Acetone was detected in three of the groundwater samples submitted for laboratory analysis ranging in concentrations from 9.8 micrograms per liter (µg/L) in TH-8 to 12.4 µg/L in TH-6. Note that acetone is a common laboratory contaminant. All acetone concentrations are well below the CDPHE groundwater standard of 6,300 µg/L. Groundwater sample analytical results are summarized in Table II (below) and on Figure 3.

TABLE II
SUMMARIZED GROUNDWATER RESULTS

Test Hole	Groundwater Depths (ft bgs)	Acetone	BTEX	GRO	DRO
TH-1	3.22	ND	ND	ND	ND
TH-2	6.07	11.1	ND	ND	ND
TH-3	DRY	NS	NS	NS	NS
TH-4	DRY	NS	NS	NS	NS
TH-5	6.93	ND	ND	ND	ND
TH-6	16.42	12.4	ND	ND	ND
TH-7	DRY	NS	NS	NS	NS
TH-8	8.04	9.8	ND	ND	ND
TH-9	10.79	ND	ND	ND	ND
TH-10	10.03	ND	ND	ND	ND

All concentrations in micrograms per liter (µg/L)

GRO – Gasoline Range Organics (C6 – C10)

DRO – Diesel Range Organics (C10 – C28)

BTEX – Benzene, toluene, ethylbenzene, xylenes (total)

ND – Non-Detect

NS – Not Sampled (Dry Well)

RED – Exceeds EPA Regional Screening Level for Tap Water of 14,000 µg/L acetone, or EPA MCLs

BOLD – Exceeds CDPHE groundwater standard of 6,300 µg/L acetone

Note I: All remaining VOC results were below laboratory detection limits and not included in Table II

Note II: There is no groundwater or drinking water standard for TPH (GRO and DRO)

METHANE SCREENING

The three sampling wells surrounding the former Kerr McGee well in the eastern portion of the Site (TH-6 through TH-8) were screened for methane. The wells were capped and sealed with two-inch J-plugs with vapor screening valves. CTL allowed the wells to stabilize for a period of over 24 hours from time of drilling on November 14, 2019.



The wells were screened with a QRAE 3 PGM-2500 four-gas meter, which was calibrated to methane gas. The meter was connected to the J-plug valve and allowed to stabilize for about a minute. Methane was not detected in the screened wells.

SEARCH OF DOWN-GRADIENT WATER WELLS

CTL performed a desktop search of down-gradient water wells located on or to the southeast, south, and west-southwest of the Site using the Colorado Division of Water Resources (DWR) online water well permit database. According to the database, there are two wells located on the Site; one is a domestic water supply well (Permit No. 159404), with no well name, located in the south-central area of the Site. The database does not have record of the well's depth. The well was registered to the M-J Perri Company and was permitted in February 1991; the well is still active. The second on-site well is discussed after Table III.

Four other domestic-use wells were identified on the DWR database within 500 feet of the Site. Two of these wells are located to the east, approximately cross-gradient to the Site. The other two wells are located generally to the west of the Site. Both of these wells (Permit No. 157773 and 275964) are registered to Patricia L. Terry and were permitted in July 1990 and November 2007, respectively. The first is located approximately 200 feet to the west and the newest well is located approximately 140 feet west of the Site. According to the database, these are approximately 720 feet and 780 feet deep, respectively. These have not yet been abandoned.

Two groundwater monitoring wells are located on or within approximately 500 feet of the Site. These wells are listed below, on Table III.

TABLE III
GROUNDWATER MONITORING WELLS NEAR THE SITE

Well Name	Permit Number and Date	Well Owner	Well Depth	Distance from Site
<i>Testhole</i>	12852-TH [4/13/1988]	Lee Murata	42 feet bgs	West area on-Site
<i>N/A</i>	35223-F [6/15/1989]	Delta Environmental	41 feet bgs	425 feet west*

*Actual distance likely to be over ½ mile to the west based on the DWR Permit.

Limited information is available for the well named “Testhole”, but it appears to have been plugged and abandoned in 1991. Ms. Murata was able to provide us with further details: She stated that the “Testhole” was an attempt to draw water from Fulton Ditch in the northeastern portion of the property for the purpose of an irrigation pond on-site; however, the State did not allow further construction of this feature.

Files in the DWR for the off-Site monitoring well under the Permit No. 35223-F indicate that the well was for contamination extraction from a release of gasoline into



the soil and groundwater from the Anderson Oil Company service station in 1989. Records indicated an expected cleanup duration of approximately two years. This well may be over ½ mile to the west. Further details were not available and/or could not be found.

CONCLUSIONS AND DISCUSSION

Groundwater samples were collected from seven of 10 temporary groundwater monitoring wells that were installed across the Site on November 8, 2019. Groundwater results and our observations indicate that the groundwater at the Site does not appear to have been significantly impacted by historic and current oil and gas activities located on the Site. Groundwater was encountered during drilling at depths ranging from 17 to 20 feet bgs. After the temporary groundwater monitoring wells were installed and groundwater was allowed to stabilize, depth to groundwater ranged from approximately 3.22 to 16.42 feet bgs.

Detectable levels of TPH including GROs were identified in one of the five soil samples that were submitted for laboratory analysis (TH-9 at 15 feet bgs). The concentration of DROs detected in the soil sample were above the soil standard of 500 mg/kg TPH (includes GROs), at 1,780 mg/kg DRO. The total (TPH) concentration, including GROs, in the soil sample was 1,921 mg/kg. Based on the results of the limited sampling and evaluation at the Site, laboratory analysis and our observations indicate that soils at the Site have not been significantly impacted by the historic oil and gas activities on-site, but has been impacted in the small area we believe was impacted by historic fuel storage for farm uses along the south-central border of the Site, to the east of the Site residences.

We believe that our investigation has provided a preliminary location of the TPH contamination in soil near or in the area previously used to store a fuel tank for farm use at the Site. We recommend excavation and proper disposal of impacted soil in this area. The Department of Oil and Public Safety (OPS) could then be contacted to obtain “courtesy closure” for this former, unregulated farm fuel tank.

LIMITATIONS

This letter was prepared for the use of Coronado West c/o JE Home in evaluating the subsurface at selected on-site locations at the property located southwest of the intersection of U.S. Highway 52 and County Road 29 ½ in Fort Lupton, Weld County, Colorado. Our sampling and analytical plan was designed using previously obtained environmental background information and our judgment and resulted in limited subsurface soil and groundwater evaluation. Chemical analyses were performed by Origins Laboratory in Denver, Colorado for specific parameters during this investigation. The accuracy and reliability of environmental studies are a reflection of the number and type of samples taken and extent of the analyses conducted. This investigation does not result in any guarantee that the Site is free and clear of hazardous materials other than those that may be indicated by CTL in this report.



We believe our environmental site evaluation was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of the project. No warranty, express or implied, is made by CTL.

If you have any questions, or need additional information, please call.

Sincerely,

CTL | THOMPSON, INC.

Rannen Worsley, E.I.T.
Environmental Scientist

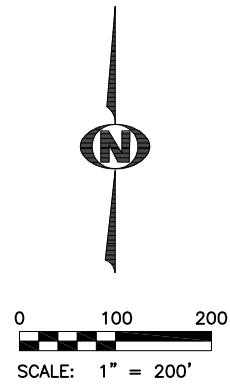
Reviewed by:

Matthew L. Wardlow, P.E.
Environmental Department Manager

Attachments: Figure 1 – Site Plan
 Figure 2 – Groundwater Results
 Figure 3 – Soil Results
 Attachment A – Laboratory Analytical Report

RW:MLW/nn

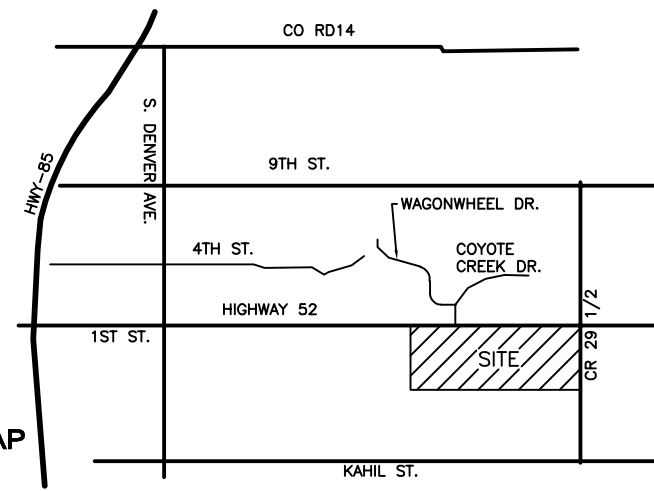
Via e-mail: eric@jehome.com

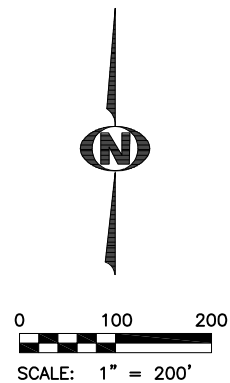


LEGEND:

- TH-1 APPROXIMATE LOCATION OF EXPLORATORY BORING
-
- INDICATES SITE BOUNDARY

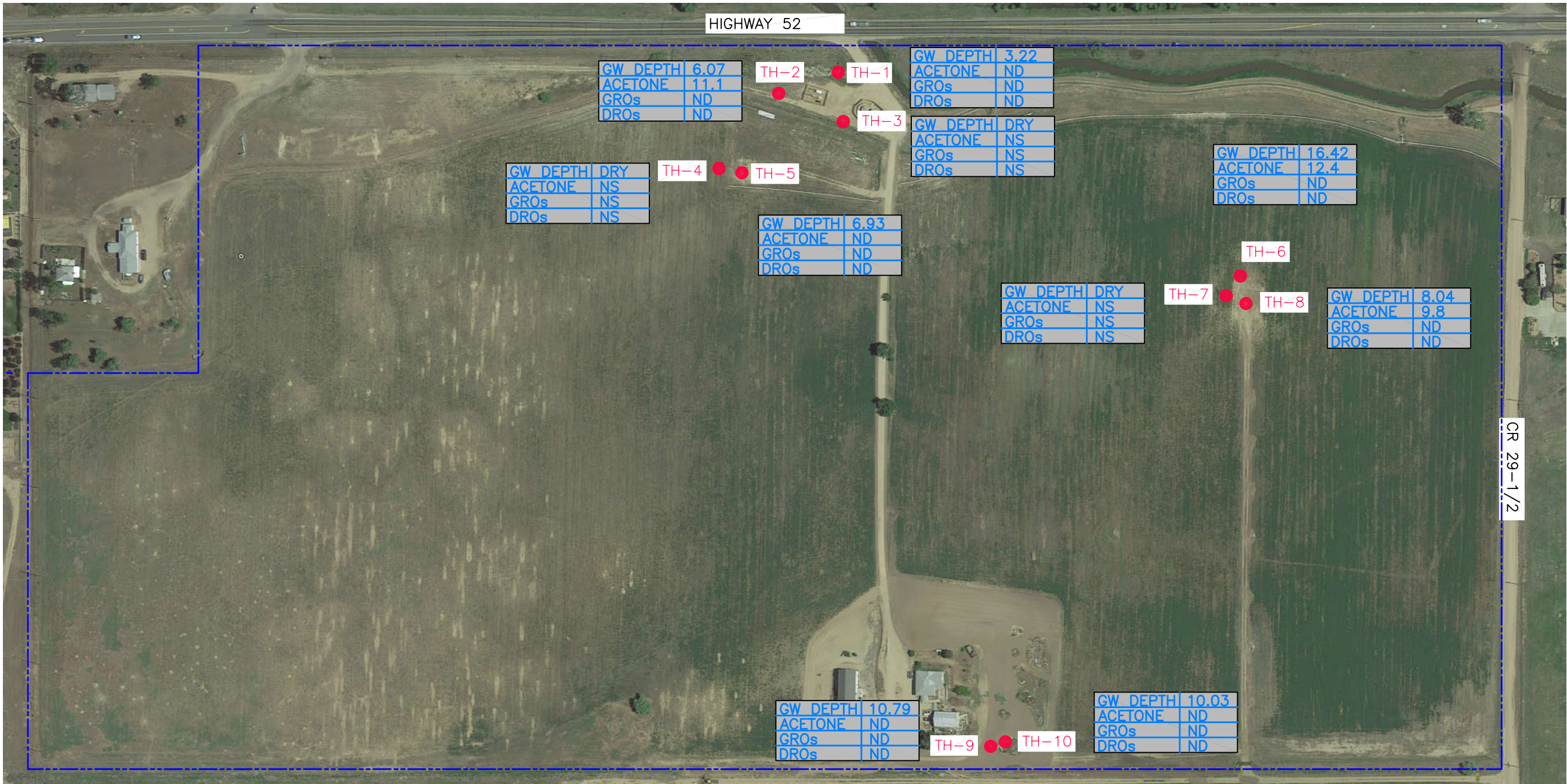
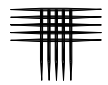
VICINITY MAP
NOT TO SCALE





LEGEND:

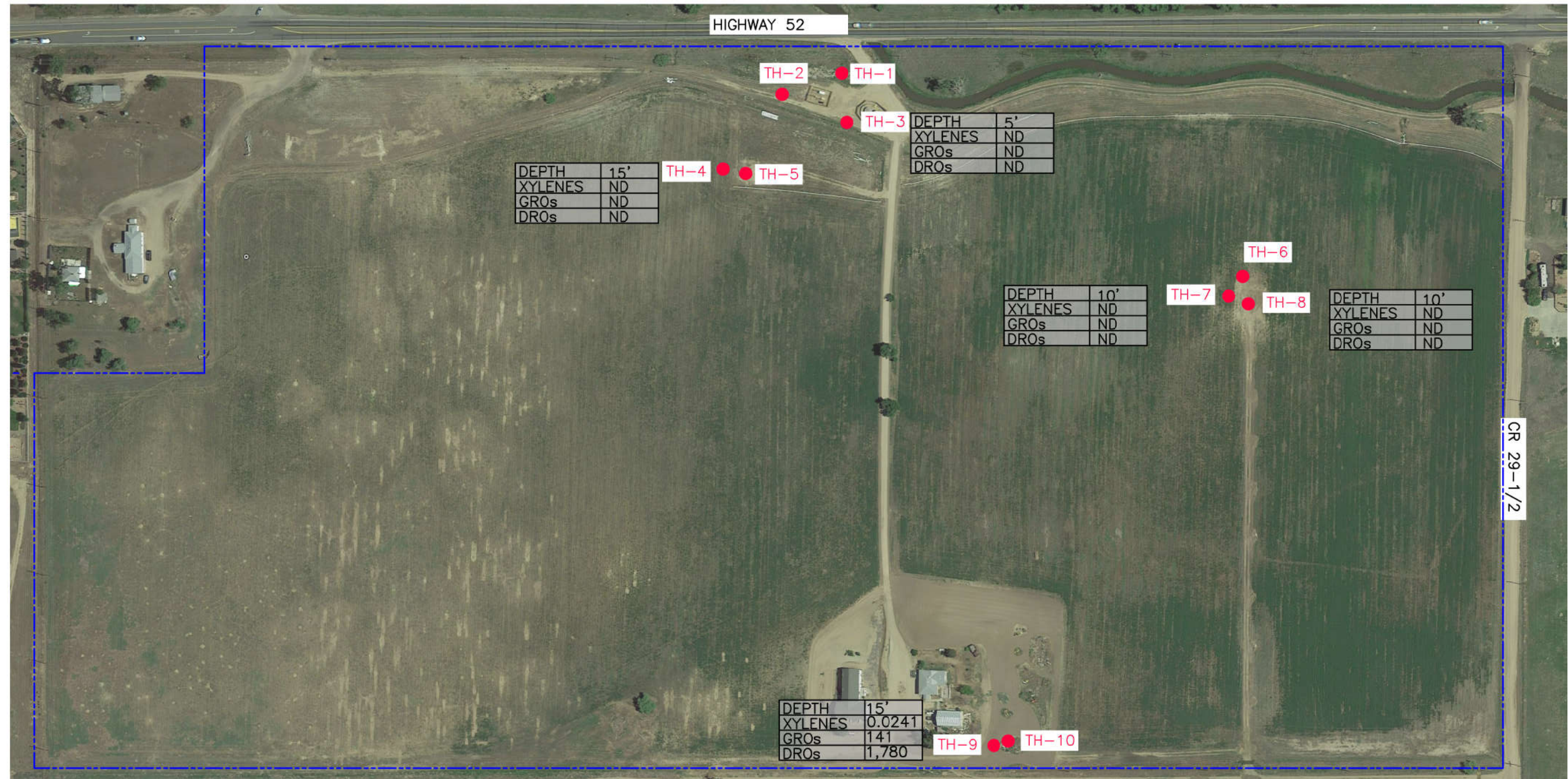
- TH-1 (red dot) APPROXIMATE LOCATION OF EXPLORATORY BORING
- (blue dashed line) INDICATES SITE BOUNDARY





LEGEND:

- TH-1
● APPROXIMATE LOCATION OF EXPLORATORY BORING
- INDICATES SITE BOUNDARY





ATTACHMENT A

LABORATORY ANALYTICAL REPORTS

November 20, 2019

CTL Thompson, Inc.

Rannen Worsley

1971 West 12th Avenue

Denver

CO 80204

Project Name - Murata Farms

Project Number - DN50219.000-205

Attached are your analytical results for Murata Farms received by Origins Laboratory, Inc. November 08, 2019. This project is associated with Origins project number Y911151-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TH-3 (5')	Y911151-01	Soil	November 8, 2019 8:37	11/08/2019 15:58
TH-4 (15')	Y911151-02	Soil	November 8, 2019 9:56	11/08/2019 15:58
TH-7 (10')	Y911151-03	Soil	November 8, 2019 13:24	11/08/2019 15:58
TH-8 (10')	Y911151-04	Soil	November 8, 2019 12:34	11/08/2019 15:58
TH-9 (15')	Y911151-05	Soil	November 8, 2019 14:16	11/08/2019 15:58

Per the email from Rannen on 11/13/19, GRO by 8015 was added to all samples.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

www.originslaboratory.com

Y11151

page 1 of 1

ORIGINS
LABORATORY, INC

Client: CTL Thompson
Address: 1971 W. 12th Ave
Denver, CO 80204
Telephone Number:
Email Address: r.worsley@ctlthompson.com

Project Manager: Rannen Worsley
Project Name: Murata Farms
Project Number: DN 50219.000-205
Samples Collected By: RW

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis		Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #	Other	Time	
TH-3 (5')	11/8/19	837	1	X				X				X	1
TH-4 (15')		966	1	X				X				X	2
TH-7 (10')		1324	X					X				X	3
TH-8 (10')		1234	X					X				X	4
TH-9 (15')		1416	✓	X				X				X	5
													6
													7
													8
													9
													10

Relinquished By: Rannen Worsley	Date: 11/8/19	Time: 1558	Received By: [Signature]	Date: 11-8-19	Time: 1558
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Turnaround Time: Same Day ☐ 24 Hr ☐ 48 Hr ☐ 72 Hr ☒ Standard

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Date Results Needed

Temp Received- 11.1

Origins Laboratory, Inc.

Jen Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: 491151

Client: CTL Thompson

Client Project ID: Murata Farms

Checklist Completed by: JG

Shipped Via: HD
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11 / 8 / 2019

Airbill #: N/A

Matrix(s) Received: (Check all that apply): ☒ Soil/Solid ☐ Water ☐ Other: _____

Cooler Number/Temperature: 1 / 11.1 °C _____ / _____ °C _____ / _____ °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?		☒		<i>Sampled same day</i>
Is there ice present (document if blue ice is used)	☒			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		☒		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		☒		
Were all samples received intact ⁽¹⁾ ?	☒			
Was adequate sample volume provided ⁽¹⁾ ?	☒			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?		☒		
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	☒			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	☒			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	☒			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	☒			
For volatiles in water — is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			☒	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity) (pH < 2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄) / (pH > 10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			☒	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to be taken in the additional comments (above) and the case narrative.

Reviewed by: (Signature) (Project Manager)

Date/Time Reviewed: 11/11/19

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-3 (5')

11/8/2019 8:37:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

Origins Laboratory, Inc. Y911151-01 (Soil)

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	ND	50.0	mg/kg	1	B9K1104	KDK	11/11/2019	11/12/2019	U
Diesel (C10-C28)	ND	50.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 74.1 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,1,1-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-3 (5')

11/8/2019 8:37:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911151-01 (Soil)

VOC by EPA 8260D

1,2-Dichloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
2-Butanone	ND	0.0100	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
2-Hexanone	ND	0.0100	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	0.0100	"	"	"	KDK	"	"	U
Acetone	ND	0.0200	"	"	"	KDK	"	"	U
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromoform	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-3 (5')

11/8/2019 8:37:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
---------	--------	-----------------	-------	----------	-------	---------	----------	----------	-------

Origins Laboratory, Inc. Y911151-01 (Soil)

VOC by EPA 8260D

Bromomethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
Carbon disulfide	ND	0.00500	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	0.00200	"	"	"	KDK	"	"	U
Chlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Chloroethane	ND	0.00500	"	"	"	KDK	"	"	U
Chloroform	ND	0.00200	"	"	"	KDK	"	"	U
Chloromethane	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Dibromomethane	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	0.00500	"	"	"	KDK	"	"	U
Iodomethane	ND	0.0150	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
m,p-Xylene	ND	0.00400	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	0.00200	"	"	"	KDK	"	"	U
Methylene Chloride	ND	0.0200	"	"	"	KDK	"	"	U
Naphthalene	ND	0.0100	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-3 (5')

11/8/2019 8:37:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911151-01 (Soil)

VOC by EPA 8260D

n-Butylbenzene	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
n-Propylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
o-Xylene	ND	0.00200	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Styrene	ND	0.00200	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Trichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	0.00300	"	"	"	KDK	"	"	U
Vinyl chloride	ND	0.00200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	115 %	70-130	"	"	"
Surrogate: Toluene-d8	98.0 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	101 %	70-130	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-4 (15')
11/8/2019 9:56:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-02 (Soil)

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	ND	50.0	mg/kg	1	B9K1104	KDK	11/11/2019	11/12/2019	U
Diesel (C10-C28)	ND	50.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 88.3 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,1,1-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-4 (15')
11/8/2019 9:56:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-02 (Soil)

VOC by EPA 8260D

1,2-Dichloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
2-Butanone	ND	0.0100	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
2-Hexanone	ND	0.0100	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	0.0100	"	"	"	KDK	"	"	U
Acetone	ND	0.0200	"	"	"	KDK	"	"	U
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromoform	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-4 (15')
11/8/2019 9:56:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-02 (Soil)

VOC by EPA 8260D

Bromomethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
Carbon disulfide	ND	0.00500	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	0.00200	"	"	"	KDK	"	"	U
Chlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Chloroethane	ND	0.00500	"	"	"	KDK	"	"	U
Chloroform	ND	0.00200	"	"	"	KDK	"	"	U
Chloromethane	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Dibromomethane	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	0.00500	"	"	"	KDK	"	"	U
Iodomethane	ND	0.0150	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
m,p-Xylene	ND	0.00400	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	0.00200	"	"	"	KDK	"	"	U
Methylene Chloride	ND	0.0200	"	"	"	KDK	"	"	U
Naphthalene	ND	0.0100	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-4 (15')
11/8/2019 9:56:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-02 (Soil)

VOC by EPA 8260D

n-Butylbenzene	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
n-Propylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
o-Xylene	ND	0.00200	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Styrene	ND	0.00200	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Trichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	0.00300	"	"	"	KDK	"	"	U
Vinyl chloride	ND	0.00200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	120 %	70-130	"	"	"
Surrogate: Toluene-d8	95.7 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	99.6 %	70-130	"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-7 (10')
11/8/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-03 (Soil)

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	ND	50.0	mg/kg	1	B9K1104	KDK	11/11/2019	11/12/2019	U
Diesel (C10-C28)	ND	50.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 75.6 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,1,1-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-7 (10')
11/8/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-03 (Soil)

VOC by EPA 8260D

1,2-Dichloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
2-Butanone	ND	0.0100	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
2-Hexanone	ND	0.0100	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	0.0100	"	"	"	KDK	"	"	U
Acetone	ND	0.0200	"	"	"	KDK	"	"	U
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromoform	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-7 (10')
11/8/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-03 (Soil)

VOC by EPA 8260D

Bromomethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
Carbon disulfide	ND	0.00500	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	0.00200	"	"	"	KDK	"	"	U
Chlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Chloroethane	ND	0.00500	"	"	"	KDK	"	"	U
Chloroform	ND	0.00200	"	"	"	KDK	"	"	U
Chloromethane	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Dibromomethane	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	0.00500	"	"	"	KDK	"	"	U
Iodomethane	ND	0.0150	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
m,p-Xylene	ND	0.00400	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	0.00200	"	"	"	KDK	"	"	U
Methylene Chloride	ND	0.0200	"	"	"	KDK	"	"	U
Naphthalene	ND	0.0100	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-7 (10')
11/8/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-03 (Soil)

VOC by EPA 8260D

n-Butylbenzene	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
n-Propylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
o-Xylene	ND	0.00200	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Styrene	ND	0.00200	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Trichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	0.00300	"	"	"	KDK	"	"	U
Vinyl chloride	ND	0.00200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	119 %	70-130	"	"	"
Surrogate: Toluene-d8	98.6 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	70-130	"	"	"

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8 (10')
11/8/2019 12:34:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-04 (Soil)

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	ND	50.0	mg/kg	1	B9K1104	KDK	11/11/2019	11/12/2019	U
Diesel (C10-C28)	ND	50.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 76.4 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/13/2019	U
1,1,1-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8 (10')

11/8/2019 12:34:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-04 (Soil)

VOC by EPA 8260D

1,2-Dichloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/13/2019	U
1,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
2-Butanone	ND	0.0100	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
2-Hexanone	ND	0.0100	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	0.0100	"	"	"	KDK	"	"	U
Acetone	ND	0.0200	"	"	"	KDK	"	"	U
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromoform	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8 (10')
11/8/2019 12:34:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-04 (Soil)

VOC by EPA 8260D

Bromomethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/13/2019	U
Carbon disulfide	ND	0.00500	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	0.00200	"	"	"	KDK	"	"	U
Chlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Chloroethane	ND	0.00500	"	"	"	KDK	"	"	U
Chloroform	ND	0.00200	"	"	"	KDK	"	"	U
Chloromethane	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Dibromomethane	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	0.00500	"	"	"	KDK	"	"	U
Iodomethane	ND	0.0150	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
m,p-Xylene	ND	0.00400	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	0.00200	"	"	"	KDK	"	"	U
Methylene Chloride	ND	0.0200	"	"	"	KDK	"	"	U
Naphthalene	ND	0.0100	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8 (10')

11/8/2019 12:34:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-04 (Soil)

VOC by EPA 8260D

n-Butylbenzene	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/13/2019	U
n-Propylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
o-Xylene	ND	0.00200	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Styrene	ND	0.00200	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Trichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	0.00300	"	"	"	KDK	"	"	U
Vinyl chloride	ND	0.00200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	110 %	70-130	"	"	"
Surrogate: Toluene-d8	95.7 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	100 %	70-130	"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9 (15')
11/8/2019 2:16:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-05 (Soil)

GRO (TVPH)/DRO (TEPH) by EPA 8015D

Gasoline (C6-C10)	141	50.0	mg/kg	1	B9K1104	KDK	11/11/2019	11/12/2019	
Diesel (C10-C28)	1780	50.0	"	"	"	KDK	"	"	

Surrogate: o-Terphenyl 127 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,1,1-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	0.00500	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	0.122	0.00200	"	"	"	KDK	"	"	
1,2-Dibromo-3-chloropropane	ND	0.00500	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	0.00200	"	"	"	KDK	"	"	U
1,2-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9 (15')
11/8/2019 2:16:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-05 (Soil)

VOC by EPA 8260D

1,2-Dichloroethane	ND	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
1,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	0.0553	0.00200	"	"	"	KDK	"	"	
1,3-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	0.00200	"	"	"	KDK	"	"	U
2-Butanone	ND	0.0100	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
2-Hexanone	ND	0.0100	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	0.00200	"	"	"	KDK	"	"	U
4-Isopropyltoluene	0.0982	0.00200	"	"	"	KDK	"	"	
4-Methyl-2-pentanone	ND	0.0100	"	"	"	KDK	"	"	U
Acetone	ND	0.0200	"	"	"	KDK	"	"	U
Benzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Bromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Bromoform	ND	0.00200	"	"	"	KDK	"	"	U
Bromomethane	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9 (15')
11/8/2019 2:16:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-05 (Soil)

VOC by EPA 8260D

Carbon disulfide	ND	0.00500	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	U
Carbon tetrachloride	ND	0.00200	"	"	"	KDK	"	"	U
Chlorobenzene	ND	0.00200	"	"	"	KDK	"	"	U
Chloroethane	ND	0.00500	"	"	"	KDK	"	"	U
Chloroform	ND	0.00200	"	"	"	KDK	"	"	U
Chloromethane	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	0.00200	"	"	"	KDK	"	"	U
Dibromomethane	ND	0.00200	"	"	"	KDK	"	"	U
Ethylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	0.00500	"	"	"	KDK	"	"	U
Iodomethane	ND	0.0150	"	"	"	KDK	"	"	U
Isopropylbenzene	0.0272	0.00200	"	"	"	KDK	"	"	
m,p-Xylene	0.0192	0.00400	"	"	"	KDK	"	"	
Methyl tert-Butyl Ether	ND	0.00200	"	"	"	KDK	"	"	U
Methylene Chloride	ND	0.0200	"	"	"	KDK	"	"	U
Naphthalene	ND	0.0100	"	"	"	KDK	"	"	U
n-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	0.00200	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9 (15')
11/8/2019 2:16:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911151-05 (Soil)

VOC by EPA 8260D

o-Xylene	0.00488	0.00200	mg/kg	1	B9K1202	KDK	11/12/2019	11/12/2019	
sec-Butylbenzene	0.138	0.00200	"	"	"	KDK	"	"	
Styrene	ND	0.00200	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	0.00200	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Toluene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	0.00200	"	"	"	KDK	"	"	U
Trichloroethene	ND	0.00200	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	0.00300	"	"	"	KDK	"	"	U
Vinyl chloride	ND	0.00200	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	119 %	70-130			"	"	"
Surrogate: Toluene-d8	97.5 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	103 %	70-130			"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1104 - EPA 3580										
Blank (B9K1104-BLK1)					Prepared: 11/11/2019 Analyzed: 11/12/2019					
Gasoline (C6-C10)	ND	50.0	mg/kg							U
Diesel (C10-C28)	ND	50.0	"							U
Surrogate: o-Terphenyl	50		"	50.0		101	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1104 - EPA 3580

LCS (B9K1104-BS1)

Prepared: 11/11/2019 Analyzed: 11/12/2019

Gasoline (C6-C10)	969	50.0	mg/kg	1000		96.9	70-130			
Diesel (C10-C28)	958	50.0	"	1000		95.8	70-130			
Surrogate: o-Terphenyl	53		"	50.0		105	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1104 - EPA 3580

Matrix Spike (B9K1104-MS1)		Source: Y911155-01			Prepared: 11/11/2019 Analyzed: 11/12/2019					
Gasoline (C6-C10)	998	50.0	mg/kg	1000	ND	99.8	70-130			
Diesel (C10-C28)	981	50.0	"	1000	18.3	96.2	70-130			
Surrogate: o-Terphenyl	53		"	50.0		105	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1104 - EPA 3580

Matrix Spike Dup (B9K1104-MSD1)		Source: Y911155-01			Prepared: 11/11/2019 Analyzed: 11/12/2019					
Gasoline (C6-C10)	830	50.0	mg/kg	1000	ND	83.0	70-130	18.3	35	
Diesel (C10-C28)	824	50.0	"	1000	18.3	80.6	70-130	17.3	35	
Surrogate: o-Terphenyl	41		"	50.0		82.6	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

Blank (B9K1202-BLK1)

Prepared: 11/12/2019 Analyzed: 11/12/2019

1,1,1,2-Tetrachloroethane	ND	0.00200	mg/kg							U
1,1,1-Trichloroethane	ND	0.00200	"							U
1,1,2,2-Tetrachloroethane	ND	0.00200	"							U
1,1,2-Trichloroethane	ND	0.00200	"							U
1,1-Dichloroethane	ND	0.00200	"							U
1,1-Dichloroethene	ND	0.00200	"							U
1,1-Dichloropropene	ND	0.00200	"							U
1,2,3-Trichlorobenzene	ND	0.00500	"							U
1,2,3-Trichloropropane	ND	0.00500	"							U
1,2,4-Trichlorobenzene	ND	0.00500	"							U
1,2,4-Trimethylbenzene	ND	0.00200	"							U
1,2-Dibromo-3-chloropropane	ND	0.00500	"							U
1,2-Dibromoethane (EDB)	ND	0.00200	"							U
1,2-Dichlorobenzene	ND	0.00200	"							U
1,2-Dichloroethane	ND	0.00200	"							U
1,2-Dichloropropane	ND	0.00200	"							U
1,3,5-Trimethylbenzene	ND	0.00200	"							U
1,3-Dichlorobenzene	ND	0.00200	"							U
1,3-Dichloropropane	ND	0.00200	"							U
1,4-Dichlorobenzene	ND	0.00200	"							U
2,2-Dichloropropane	ND	0.00200	"							U
2-Butanone	ND	0.0100	"							U
2-Chlorotoluene	ND	0.00200	"							U
2-Hexanone	ND	0.0100	"							U
4-Chlorotoluene	ND	0.00200	"							U
4-Isopropyltoluene	ND	0.00200	"							U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

Blank (B9K1202-BLK1)

Prepared: 11/12/2019 Analyzed: 11/12/2019

4-Methyl-2-pentanone	ND	0.0100	mg/kg							U
Acetone	ND	0.0200	"							U
Benzene	ND	0.00200	"							U
Bromobenzene	ND	0.00200	"							U
Bromochloromethane	ND	0.00200	"							U
Bromodichloromethane	ND	0.00200	"							U
Bromoform	ND	0.00200	"							U
Bromomethane	ND	0.00200	"							U
Carbon disulfide	ND	0.00500	"							U
Carbon tetrachloride	ND	0.00200	"							U
Chlorobenzene	ND	0.00200	"							U
Chloroethane	ND	0.00500	"							U
Chloroform	ND	0.00200	"							U
Chloromethane	ND	0.00200	"							U
cis-1,2-Dichloroethene	ND	0.00200	"							U
cis-1,3-Dichloropropene	ND	0.00200	"							U
Dibromochloromethane	ND	0.00200	"							U
Dibromomethane	ND	0.00200	"							U
Ethylbenzene	ND	0.00200	"							U
Hexachlorobutadiene	ND	0.00500	"							U
Iodomethane	ND	0.0150	"							U
Isopropylbenzene	ND	0.00200	"							U
m,p-Xylene	ND	0.00400	"							U
Methyl tert-Butyl Ether	ND	0.00200	"							U
Methylene Chloride	ND	0.0200	"							U
Naphthalene	ND	0.0100	"							U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1202 - EPA 5030 (soil)										
Blank (B9K1202-BLK1)					Prepared: 11/12/2019 Analyzed: 11/12/2019					
n-Butylbenzene	ND	0.00200	mg/kg							U
n-Propylbenzene	ND	0.00200	"							U
o-Xylene	ND	0.00200	"							U
sec-Butylbenzene	ND	0.00200	"							U
Styrene	ND	0.00200	"							U
tert-Butylbenzene	ND	0.00200	"							U
Tetrachloroethene	ND	0.00200	"							U
Toluene	ND	0.00200	"							U
trans-1,2-Dichloroethene	ND	0.00200	"							U
trans-1,3-Dichloropropene	ND	0.00200	"							U
Trichloroethene	ND	0.00200	"							U
Trichlorofluoromethane	ND	0.00300	"							U
Vinyl chloride	ND	0.00200	"							U
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		114	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		97.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		99.7	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

LCS (B9K1202-BS1)

Prepared: 11/12/2019 Analyzed: 11/12/2019

1,1,1,2-Tetrachloroethane	0.0995	0.00200	mg/kg	0.100		99.5	70-130			
1,1,1-Trichloroethane	0.105	0.00200	"	0.100		105	70-130			
1,1,2,2-Tetrachloroethane	0.109	0.00200	"	0.100		109	70-130			
1,1,2-Trichloroethane	0.107	0.00200	"	0.100		107	70-130			
1,1-Dichloroethane	0.107	0.00200	"	0.100		107	70-130			
1,1-Dichloroethene	0.104	0.00200	"	0.100		104	70-130			
1,1-Dichloropropene	0.102	0.00200	"	0.100		102	70-130			
1,2,3-Trichlorobenzene	0.105	0.00500	"	0.100		105	70-130			
1,2,3-Trichloropropane	0.107	0.00500	"	0.100		107	70-130			
1,2,4-Trichlorobenzene	0.110	0.00500	"	0.100		110	70-130			
1,2,4-Trimethylbenzene	0.100	0.00200	"	0.100		100	70-130			
1,2-Dibromo-3-chloropropane	0.109	0.00500	"	0.100		109	70-130			
1,2-Dibromoethane (EDB)	0.107	0.00200	"	0.100		107	70-130			
1,2-Dichlorobenzene	0.0993	0.00200	"	0.100		99.3	70-130			
1,2-Dichloroethane	0.104	0.00200	"	0.100		104	70-130			
1,2-Dichloropropane	0.103	0.00200	"	0.100		103	70-130			
1,3,5-Trimethylbenzene	0.0991	0.00200	"	0.100		99.1	70-130			
1,3-Dichlorobenzene	0.101	0.00200	"	0.100		101	70-130			
1,3-Dichloropropane	0.107	0.00200	"	0.100		107	70-130			
1,4-Dichlorobenzene	0.101	0.00200	"	0.100		101	70-130			
2,2-Dichloropropane	0.107	0.00200	"	0.100		107	70-130			
2-Butanone	0.588	0.0100	"	0.500		118	70-130			
2-Chlorotoluene	0.105	0.00200	"	0.100		105	70-130			
2-Hexanone	0.603	0.0100	"	0.500		121	70-130			
4-Chlorotoluene	0.0990	0.00200	"	0.100		99.0	70-130			
4-Isopropyltoluene	0.0990	0.00200	"	0.100		99.0	70-130			

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CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

LCS (B9K1202-BS1)

Prepared: 11/12/2019 Analyzed: 11/12/2019

4-Methyl-2-pentanone	0.603	0.0100	mg/kg	0.500		121	70-130			
Acetone	0.577	0.0200	"	0.500		115	70-130			
Benzene	0.0960	0.00200	"	0.100		96.0	70-130			
Bromobenzene	0.103	0.00200	"	0.100		103	70-130			
Bromochloromethane	0.102	0.00200	"	0.100		102	70-130			
Bromodichloromethane	0.108	0.00200	"	0.100		108	70-130			
Bromoform	0.111	0.00200	"	0.100		111	70-130			
Bromomethane	0.103	0.00200	"	0.100		103	70-130			
Carbon disulfide	0.106	0.00500	"	0.100		106	70-130			
Carbon tetrachloride	0.104	0.00200	"	0.100		104	70-130			
Chlorobenzene	0.102	0.00200	"	0.100		102	70-130			
Chloroethane	0.0969	0.00500	"	0.100		96.9	70-130			
Chloroform	0.104	0.00200	"	0.100		104	70-130			
Chloromethane	0.114	0.00200	"	0.100		114	70-130			
cis-1,2-Dichloroethene	0.105	0.00200	"	0.100		105	70-130			
cis-1,3-Dichloropropene	0.106	0.00200	"	0.100		106	70-130			
Dibromochloromethane	0.112	0.00200	"	0.100		112	70-130			
Dibromomethane	0.104	0.00200	"	0.100		104	70-130			
Ethylbenzene	0.100	0.00200	"	0.100		100	70-130			
Hexachlorobutadiene	0.103	0.00500	"	0.100		103	70-130			
Iodomethane	0.0968	0.0150	"	0.100		96.8	70-130			
Isopropylbenzene	0.0989	0.00200	"	0.100		98.9	70-130			
m,p-Xylene	0.200	0.00400	"	0.200		100	70-130			
Methyl tert-Butyl Ether	0.105	0.00200	"	0.100		105	70-130			
Methylene Chloride	0.108	0.0200	"	0.100		108	70-130			
Naphthalene	0.107	0.0100	"	0.100		107	70-130			

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

LCS (B9K1202-BS1)

Prepared: 11/12/2019 Analyzed: 11/12/2019

n-Butylbenzene	0.102	0.00200	mg/kg	0.100		102	70-130			
n-Propylbenzene	0.100	0.00200	"	0.100		100	70-130			
o-Xylene	0.0992	0.00200	"	0.100		99.2	70-130			
sec-Butylbenzene	0.0989	0.00200	"	0.100		98.9	70-130			
Styrene	0.101	0.00200	"	0.100		101	70-130			
tert-Butylbenzene	0.0972	0.00200	"	0.100		97.2	70-130			
Tetrachloroethene	0.102	0.00200	"	0.100		102	70-130			
Toluene	0.102	0.00200	"	0.100		102	70-130			
trans-1,2-Dichloroethene	0.103	0.00200	"	0.100		103	70-130			
trans-1,3-Dichloropropene	0.110	0.00200	"	0.100		110	70-130			
Trichloroethene	0.0997	0.00200	"	0.100		99.7	70-130			
Trichlorofluoromethane	0.100	0.00300	"	0.100		100	70-130			
Vinyl chloride	0.104	0.00200	"	0.100		104	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		109	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		100	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		103	70-130			

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
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Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

Matrix Spike (B9K1202-MS1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
1,1,1,2-Tetrachloroethane	0.103	0.00200	mg/kg	0.100	ND	103	70-130			
1,1,1-Trichloroethane	0.105	0.00200	"	0.100	ND	105	70-130			
1,1,2,2-Tetrachloroethane	0.114	0.00200	"	0.100	ND	114	70-130			
1,1,2-Trichloroethane	0.111	0.00200	"	0.100	ND	111	70-130			
1,1-Dichloroethane	0.106	0.00200	"	0.100	ND	106	70-130			
1,1-Dichloroethene	0.102	0.00200	"	0.100	ND	102	70-130			
1,1-Dichloropropene	0.0996	0.00200	"	0.100	ND	99.6	70-130			
1,2,3-Trichlorobenzene	0.106	0.00500	"	0.100	ND	106	70-130			
1,2,3-Trichloropropane	0.113	0.00500	"	0.100	ND	113	70-130			
1,2,4-Trichlorobenzene	0.109	0.00500	"	0.100	ND	109	70-130			
1,2,4-Trimethylbenzene	0.100	0.00200	"	0.100	ND	100	70-130			
1,2-Dibromo-3-chloropropane	0.117	0.00500	"	0.100	ND	117	70-130			
1,2-Dibromoethane (EDB)	0.109	0.00200	"	0.100	ND	109	70-130			
1,2-Dichlorobenzene	0.100	0.00200	"	0.100	ND	100	70-130			
1,2-Dichloroethane	0.110	0.00200	"	0.100	ND	110	70-130			
1,2-Dichloropropane	0.103	0.00200	"	0.100	ND	103	70-130			
1,3,5-Trimethylbenzene	0.0986	0.00200	"	0.100	ND	98.6	70-130			
1,3-Dichlorobenzene	0.0988	0.00200	"	0.100	ND	98.8	70-130			
1,3-Dichloropropane	0.111	0.00200	"	0.100	ND	111	70-130			
1,4-Dichlorobenzene	0.101	0.00200	"	0.100	ND	101	70-130			
2,2-Dichloropropane	0.105	0.00200	"	0.100	ND	105	70-130			
2-Butanone	0.616	0.0100	"	0.500	ND	123	70-130			
2-Chlorotoluene	0.102	0.00200	"	0.100	ND	102	70-130			
2-Hexanone	0.633	0.0100	"	0.500	ND	127	70-130			
4-Chlorotoluene	0.0988	0.00200	"	0.100	ND	98.8	70-130			
4-Isopropyltoluene	0.0963	0.00200	"	0.100	ND	96.3	70-130			

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1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

Matrix Spike (B9K1202-MS1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
4-Methyl-2-pentanone	0.636	0.0100	mg/kg	0.500	0.00764	126	70-130			
Acetone	0.598	0.0200	"	0.500	ND	120	70-130			
Benzene	0.0943	0.00200	"	0.100	ND	94.3	70-130			
Bromobenzene	0.102	0.00200	"	0.100	ND	102	70-130			
Bromochloromethane	0.104	0.00200	"	0.100	ND	104	70-130			
Bromodichloromethane	0.114	0.00200	"	0.100	ND	114	70-130			
Bromoform	0.118	0.00200	"	0.100	ND	118	70-130			
Bromomethane	0.104	0.00200	"	0.100	ND	104	70-130			
Carbon disulfide	0.102	0.00500	"	0.100	ND	102	70-130			
Carbon tetrachloride	0.103	0.00200	"	0.100	ND	103	70-130			
Chlorobenzene	0.0998	0.00200	"	0.100	ND	99.8	70-130			
Chloroethane	0.0974	0.00500	"	0.100	ND	97.4	70-130			
Chloroform	0.107	0.00200	"	0.100	ND	107	70-130			
Chloromethane	0.112	0.00200	"	0.100	ND	112	70-130			
cis-1,2-Dichloroethene	0.105	0.00200	"	0.100	ND	105	70-130			
cis-1,3-Dichloropropene	0.107	0.00200	"	0.100	ND	107	70-130			
Dibromochloromethane	0.116	0.00200	"	0.100	ND	116	70-130			
Dibromomethane	0.110	0.00200	"	0.100	ND	110	70-130			
Ethylbenzene	0.0974	0.00200	"	0.100	ND	97.4	70-130			
Hexachlorobutadiene	0.100	0.00500	"	0.100	ND	100	70-130			
Iodomethane	0.0954	0.0150	"	0.100	ND	95.4	70-130			
Isopropylbenzene	0.0975	0.00200	"	0.100	ND	97.5	70-130			
m,p-Xylene	0.193	0.00400	"	0.200	ND	96.7	70-130			
Methyl tert-Butyl Ether	0.112	0.00200	"	0.100	ND	112	70-130			
Methylene Chloride	0.113	0.0200	"	0.100	0.00482	109	70-130			
Naphthalene	0.112	0.0100	"	0.100	ND	112	70-130			

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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1202 - EPA 5030 (soil)

Matrix Spike (B9K1202-MS1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
n-Butylbenzene	0.0995	0.00200	mg/kg	0.100	ND	99.5	70-130			
n-Propylbenzene	0.0973	0.00200	"	0.100	ND	97.3	70-130			
o-Xylene	0.0995	0.00200	"	0.100	ND	99.5	70-130			
sec-Butylbenzene	0.0973	0.00200	"	0.100	ND	97.3	70-130			
Styrene	0.0996	0.00200	"	0.100	ND	99.6	70-130			
tert-Butylbenzene	0.0970	0.00200	"	0.100	ND	97.0	70-130			
Tetrachloroethene	0.100	0.00200	"	0.100	ND	100	70-130			
Toluene	0.101	0.00200	"	0.100	ND	101	70-130			
trans-1,2-Dichloroethene	0.101	0.00200	"	0.100	ND	101	70-130			
trans-1,3-Dichloropropene	0.111	0.00200	"	0.100	ND	111	70-130			
Trichloroethene	0.0980	0.00200	"	0.100	ND	98.0	70-130			
Trichlorofluoromethane	0.100	0.00300	"	0.100	ND	100	70-130			
Vinyl chloride	0.101	0.00200	"	0.100	ND	101	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		114	70-130			
Surrogate: Toluene-d8	0.12		"	0.125		99.2	70-130			
Surrogate: 4-Bromofluorobenzene	0.13		"	0.125		100	70-130			

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Jen Pellegrini, Project Manager

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Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1202 - EPA 5030 (soil)										
Matrix Spike Dup (B9K1202-MSD1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
1,1,1,2-Tetrachloroethane	0.100	0.00200	mg/kg	0.100	ND	100	70-130	2.97	20	
1,1,1-Trichloroethane	0.103	0.00200	"	0.100	ND	103	70-130	2.37	20	
1,1,2,2-Tetrachloroethane	0.111	0.00200	"	0.100	ND	111	70-130	2.35	20	
1,1,2-Trichloroethane	0.111	0.00200	"	0.100	ND	111	70-130	0.0900	20	
1,1-Dichloroethane	0.106	0.00200	"	0.100	ND	106	70-130	0.339	20	
1,1-Dichloroethene	0.101	0.00200	"	0.100	ND	101	70-130	0.911	20	
1,1-Dichloropropene	0.0982	0.00200	"	0.100	ND	98.2	70-130	1.39	20	
1,2,3-Trichlorobenzene	0.107	0.00500	"	0.100	ND	107	70-130	0.263	20	
1,2,3-Trichloropropane	0.108	0.00500	"	0.100	ND	108	70-130	4.82	20	
1,2,4-Trichlorobenzene	0.107	0.00500	"	0.100	ND	107	70-130	1.85	20	
1,2,4-Trimethylbenzene	0.0970	0.00200	"	0.100	ND	97.0	70-130	3.09	20	
1,2-Dibromo-3-chloropropane	0.113	0.00500	"	0.100	ND	113	70-130	3.63	20	
1,2-Dibromoethane (EDB)	0.109	0.00200	"	0.100	ND	109	70-130	0.256	20	
1,2-Dichlorobenzene	0.0986	0.00200	"	0.100	ND	98.6	70-130	1.55	20	
1,2-Dichloroethane	0.105	0.00200	"	0.100	ND	105	70-130	3.76	20	
1,2-Dichloropropane	0.104	0.00200	"	0.100	ND	104	70-130	0.714	20	
1,3,5-Trimethylbenzene	0.0959	0.00200	"	0.100	ND	95.9	70-130	2.80	20	
1,3-Dichlorobenzene	0.0976	0.00200	"	0.100	ND	97.6	70-130	1.18	20	
1,3-Dichloropropane	0.110	0.00200	"	0.100	ND	110	70-130	0.776	20	
1,4-Dichlorobenzene	0.100	0.00200	"	0.100	ND	100	70-130	0.835	20	
2,2-Dichloropropane	0.103	0.00200	"	0.100	ND	103	70-130	1.69	20	
2-Butanone	0.599	0.0100	"	0.500	ND	120	70-130	2.74	20	
2-Chlorotoluene	0.0994	0.00200	"	0.100	ND	99.4	70-130	2.91	20	
2-Hexanone	0.609	0.0100	"	0.500	ND	122	70-130	3.84	20	
4-Chlorotoluene	0.0951	0.00200	"	0.100	ND	95.1	70-130	3.78	20	
4-Isopropyltoluene	0.0949	0.00200	"	0.100	ND	94.9	70-130	1.47	20	

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Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1202 - EPA 5030 (soil)										
Matrix Spike Dup (B9K1202-MSD1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
4-Methyl-2-pentanone	0.615	0.0100	mg/kg	0.500	0.00764	121	70-130	3.39	20	
Acetone	0.592	0.0200	"	0.500	ND	118	70-130	0.958	20	
Benzene	0.0944	0.00200	"	0.100	ND	94.4	70-130	0.127	20	
Bromobenzene	0.0989	0.00200	"	0.100	ND	98.9	70-130	2.85	20	
Bromochloromethane	0.106	0.00200	"	0.100	ND	106	70-130	1.80	20	
Bromodichloromethane	0.110	0.00200	"	0.100	ND	110	70-130	3.29	20	
Bromoform	0.114	0.00200	"	0.100	ND	114	70-130	3.64	20	
Bromomethane	0.111	0.00200	"	0.100	ND	111	70-130	6.61	20	
Carbon disulfide	0.102	0.00500	"	0.100	ND	102	70-130	0.393	20	
Carbon tetrachloride	0.102	0.00200	"	0.100	ND	102	70-130	0.941	20	
Chlorobenzene	0.101	0.00200	"	0.100	ND	101	70-130	1.45	20	
Chloroethane	0.104	0.00500	"	0.100	ND	104	70-130	6.63	20	
Chloroform	0.104	0.00200	"	0.100	ND	104	70-130	2.26	20	
Chloromethane	0.111	0.00200	"	0.100	ND	111	70-130	0.287	20	
cis-1,2-Dichloroethene	0.104	0.00200	"	0.100	ND	104	70-130	1.40	20	
cis-1,3-Dichloropropene	0.107	0.00200	"	0.100	ND	107	70-130	0.505	20	
Dibromochloromethane	0.116	0.00200	"	0.100	ND	116	70-130	0.189	20	
Dibromomethane	0.110	0.00200	"	0.100	ND	110	70-130	0.728	20	
Ethylbenzene	0.0946	0.00200	"	0.100	ND	94.6	70-130	2.94	20	
Hexachlorobutadiene	0.0965	0.00500	"	0.100	ND	96.5	70-130	3.76	20	
Iodomethane	0.0968	0.0150	"	0.100	ND	96.8	70-130	1.41	20	
Isopropylbenzene	0.0959	0.00200	"	0.100	ND	95.9	70-130	1.65	20	
m,p-Xylene	0.190	0.00400	"	0.200	ND	94.8	70-130	1.95	20	
Methyl tert-Butyl Ether	0.112	0.00200	"	0.100	ND	112	70-130	0.322	20	
Methylene Chloride	0.114	0.0200	"	0.100	0.00482	109	70-130	0.773	20	
Naphthalene	0.111	0.0100	"	0.100	ND	111	70-130	1.06	20	

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1202 - EPA 5030 (soil)										
Matrix Spike Dup (B9K1202-MSD1)		Source: Y911159-01			Prepared: 11/12/2019 Analyzed: 11/12/2019					
n-Butylbenzene	0.0966	0.00200	mg/kg	0.100	ND	96.6	70-130	3.00	20	
n-Propylbenzene	0.0945	0.00200	"	0.100	ND	94.5	70-130	2.96	20	
o-Xylene	0.0965	0.00200	"	0.100	ND	96.5	70-130	3.14	20	
sec-Butylbenzene	0.0950	0.00200	"	0.100	ND	95.0	70-130	2.37	20	
Styrene	0.0985	0.00200	"	0.100	ND	98.5	70-130	1.11	20	
tert-Butylbenzene	0.0957	0.00200	"	0.100	ND	95.7	70-130	1.39	20	
Tetrachloroethene	0.0998	0.00200	"	0.100	ND	99.8	70-130	0.160	20	
Toluene	0.101	0.00200	"	0.100	ND	101	70-130	0.0993	20	
trans-1,2-Dichloroethene	0.100	0.00200	"	0.100	ND	100	70-130	0.437	20	
trans-1,3-Dichloropropene	0.111	0.00200	"	0.100	ND	111	70-130	0.234	20	
Trichloroethene	0.0976	0.00200	"	0.100	ND	97.6	70-130	0.368	20	
Trichlorofluoromethane	0.104	0.00300	"	0.100	ND	104	70-130	4.03	20	
Vinyl chloride	0.108	0.00200	"	0.100	ND	108	70-130	5.82	20	
Surrogate: 1,2-Dichloroethane-d4	0.14		"	0.125		109	70-130			
Surrogate: Toluene-d8	0.13		"	0.125		101	70-130			
Surrogate: 4-Bromofluorobenzene	0.12		"	0.125		98.2	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Notes and Definitions

U Sample is Non-Detect.

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

November 19, 2019

CTL Thompson, Inc.

Rannen Worsley

1971 West 12th Avenue

Denver

CO 80204

Project Name - Murata Farms

Project Number - DN50219.000-205

Attached are your analytical results for Murata Farms received by Origins Laboratory, Inc. November 14, 2019. This project is associated with Origins project number Y911247-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TH-1	Y911247-01	Water	November 14, 2019 9:31	11/14/2019 14:25
TH-2	Y911247-02	Water	November 14, 2019 9:50	11/14/2019 14:25
TH-5	Y911247-03	Water	November 14, 2019 9:47	11/14/2019 14:25
TH-6	Y911247-04	Water	November 14, 2019 13:24	11/14/2019 14:25
TH-8	Y911247-05	Water	November 14, 2019 12:50	11/14/2019 14:25
TH-9	Y911247-06	Water	November 14, 2019 11:15	11/14/2019 14:25
TH-10	Y911247-07	Water	November 14, 2019 11:15	11/14/2019 14:25

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

www.originslaboratory.com

9911247

page 1 of 1

ORIGINS
LABORATORY, INC

Client: CTL Thompson
Address: 1971 W 12th Ave
Denver, CO 80204
Telephone Number:
Email Address: Rannen.Worsley@ctlthompson.com

Project Manager: Rannen Worsley
Project Name: Murata Farms
Project Number: DN50219.000-205
Samples Collected By: R/W/SC

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix				Analysis	Sample Instructions
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa	Other		
TH-1	11/14/19	931	3	X	X	X		X				TH-1	
TH-2		950		X	X	X		X				TH-2	
TH-3				X	X	X		X				TH-3	
TH-4				X	X	X		X				TH-4	
TH-5		947		X	X	X		X				TH-5	
TH-6		1324	2	X	X	X		X				TH-6	
TH-7				X	X	X		X				TH-7	
TH-8		1250	3	X	X	X		X				TH-8	
TH-9		1115		X	X	X		X				TH-9	
TH-10		1115		X	X	X		X				TH-10	
Relinquished By: Rannen Worsley	Date: 11/14/19	Time: 1425		Received By: [Signature]				Date: 11/14/19				Time: 1425	Turnaround Time: Same Day ☐ 24 Hr ☐ 48 Hr ☐ 72 Hr ☒ Standard
Relinquished By:	Date:	Time:		Received By:				Date:				Time:	

Date Results Needed

Temp Received: 2.6

Origins Laboratory, Inc.

Jefe Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: 4911247

Client: CTL Thompson

Client Project ID: Murata Farms

Checklist Completed by: JB

Shipped Via: 4D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 11/14/19

Airbill #: NA

Matrix(s) Received: (Check all that apply): Soil/Solid ☒ Water ☐ Other: ☐

Cooler Number/Temperature: 1 / 2.6 °C 1 / 1 °C 1 / 1 °C 1 / 1 °C (Describe)

Thermometer ID: TC03

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	☒	☐	☐	
Is there ice present (document if blue ice is used)	☒	☐	☐	
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)	☒	☒	☐	
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)	☒	☒	☐	
Were all samples received intact ⁽¹⁾ ?	☒	☐	☐	
Was adequate sample volume provided ⁽¹⁾ ?	☒	☐	☐	
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	☐	☒	☐	
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	☒	☐	☐	
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	☒	☐	☐	
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	☒	☐	☐	
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	☒	☐	☐	
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.	☐	☒	☐	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH >10 for samples preserved with NaAsO ₂ +NaOH, 2NaAc+NaOH)	☒	☐	☐	<u>HC</u>
Additional Comments (if any):				

⁽¹⁾If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager) [Signature]

Date/Time Reviewed 11/18/19

Origins Laboratory, Inc.

Jen Pellegrini

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

TH-1

11/14/2019 9:31:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-01 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 107 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-1

11/14/2019 9:31:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-01 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	ND	8.00	"	"	"	KDK	"	"	U
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-1

11/14/2019 9:31:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-01 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-1

11/14/2019 9:31:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-01 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4
Surrogate: Toluene-d8
Surrogate: 4-Bromofluorobenzene

127 %
94.7 %
100 %

70-130
70-130
70-130

"
"
"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-2

11/14/2019 9:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-02 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 96.2 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-2

11/14/2019 9:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-02 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	11.1	8.00	"	"	"	KDK	"	"	
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-2

11/14/2019 9:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-02 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

TH-2

11/14/2019 9:50:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-02 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4

123 %

70-130

"

"

"

Surrogate: Toluene-d8

95.7 %

70-130

"

"

"

Surrogate: 4-Bromofluorobenzene

102 %

70-130

"

"

"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-5

11/14/2019 9:47:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-03 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 105 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-5

11/14/2019 9:47:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-03 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	ND	8.00	"	"	"	KDK	"	"	U
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-5

11/14/2019 9:47:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-03 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-5

11/14/2019 9:47:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-03 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4
Surrogate: Toluene-d8
Surrogate: 4-Bromofluorobenzene

113 %
98.9 %
103 %

70-130
70-130
70-130

"
"
"

"
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"
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"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-6

11/14/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-04 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 100 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-6

11/14/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-04 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	12.4	8.00	"	"	"	KDK	"	"	
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-6

11/14/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-04 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-6

11/14/2019 1:24:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-04 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	132 %	70-130	"	"	"	S-07
Surrogate: Toluene-d8	95.6 %	70-130	"	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	70-130	"	"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8

11/14/2019 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-05 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 95.6 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8

11/14/2019 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-05 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	9.80	8.00	"	"	"	KDK	"	"	
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8

11/14/2019 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-05 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-8

11/14/2019 12:50:00PM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-05 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	118 %	70-130	"	"	"
Surrogate: Toluene-d8	97.6 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	99.6 %	70-130	"	"	"

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-06 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 98.1 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-06 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	ND	8.00	"	"	"	KDK	"	"	U
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-06 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-9

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-06 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4
Surrogate: Toluene-d8
Surrogate: 4-Bromofluorobenzene

118 %
97.5 %
102 %

70-130
70-130
70-130

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Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-10

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc. Y911247-07 (Water)

TPH-Carbon Chain by EPA 8015D

Gasoline (C6-C10)	ND	5.00	mg/L	1	B9K1811	KDK	11/18/2019	11/19/2019	U
Diesel (C10-C28)	ND	5.00	"	"	"	KDK	"	"	U
Residual Range Organics (C28-C40)	ND	20.0	"	"	"	KDK	"	"	U

Surrogate: o-Terphenyl 97.0 % 50-150 " " "

VOC by EPA 8260D

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,1,1-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2,2-Tetrachloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1,2-Trichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
1,1-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
1,2,3-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,3-Trichloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trichlorobenzene	ND	5.00	"	"	"	KDK	"	"	U
1,2,4-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dibromo-3-chloropropane	ND	5.00	"	"	"	KDK	"	"	U
1,2-Dibromoethane (EDB)	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-10

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-07 (Water)

VOC by EPA 8260D

1,2-Dichlorobenzene	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
1,2-Dichloroethane	ND	1.00	"	"	"	KDK	"	"	U
1,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,3,5-Trimethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
1,3-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
1,4-Dichlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
2,2-Dichloropropane	ND	1.00	"	"	"	KDK	"	"	U
2-Butanone	ND	5.00	"	"	"	KDK	"	"	U
2-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
2-Hexanone	ND	5.00	"	"	"	KDK	"	"	U
4-Chlorotoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Isopropyltoluene	ND	1.00	"	"	"	KDK	"	"	U
4-Methyl-2-pentanone	ND	5.00	"	"	"	KDK	"	"	U
Acetone	ND	8.00	"	"	"	KDK	"	"	U
Benzene	ND	1.00	"	"	"	KDK	"	"	U
Bromobenzene	ND	1.00	"	"	"	KDK	"	"	U
Bromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Bromodichloromethane	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-10

11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-07 (Water)

VOC by EPA 8260D

Bromoform	ND	1.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
Bromomethane	ND	1.00	"	"	"	KDK	"	"	U
Carbon disulfide	ND	5.00	"	"	"	KDK	"	"	U
Carbon tetrachloride	ND	1.00	"	"	"	KDK	"	"	U
Chlorobenzene	ND	1.00	"	"	"	KDK	"	"	U
Chloroethane	ND	1.00	"	"	"	KDK	"	"	U
Chloroform	ND	1.00	"	"	"	KDK	"	"	U
Chloromethane	ND	1.00	"	"	"	KDK	"	"	U
cis-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
cis-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Dibromochloromethane	ND	1.00	"	"	"	KDK	"	"	U
Dibromomethane	ND	1.00	"	"	"	KDK	"	"	U
Ethylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Hexachlorobutadiene	ND	5.00	"	"	"	KDK	"	"	U
Iodomethane	ND	10.0	"	"	"	KDK	"	"	U
Isopropylbenzene	ND	1.00	"	"	"	KDK	"	"	U
m,p-Xylene	ND	2.00	"	"	"	KDK	"	"	U
Methylene Chloride	ND	5.00	"	"	"	KDK	"	"	U
Methyl tert-Butyl Ether	ND	1.00	"	"	"	KDK	"	"	U

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

TH-10
11/14/2019 11:15:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
Y911247-07 (Water)

VOC by EPA 8260D

Naphthalene	ND	4.00	ug/L	1	B9K1402	KDK	11/14/2019	11/15/2019	U
n-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
n-Propylbenzene	ND	1.00	"	"	"	KDK	"	"	U
o-Xylene	ND	1.00	"	"	"	KDK	"	"	U
sec-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Styrene	ND	1.00	"	"	"	KDK	"	"	U
tert-Butylbenzene	ND	1.00	"	"	"	KDK	"	"	U
Tetrachloroethene	ND	1.00	"	"	"	KDK	"	"	U
Toluene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,2-Dichloroethene	ND	1.00	"	"	"	KDK	"	"	U
trans-1,3-Dichloropropene	ND	1.00	"	"	"	KDK	"	"	U
Trichloroethene	ND	1.00	"	"	"	KDK	"	"	U
Trichlorofluoromethane	ND	1.00	"	"	"	KDK	"	"	U
Vinyl chloride	ND	1.00	"	"	"	KDK	"	"	U

Surrogate: 1,2-Dichloroethane-d4	119 %	70-130	"	"	"
Surrogate: Toluene-d8	97.8 %	70-130	"	"	"
Surrogate: 4-Bromofluorobenzene	102 %	70-130	"	"	"

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Blank (B9K1402-BLK1)

Prepared: 11/14/2019 Analyzed: 11/14/2019

1,1,1,2-Tetrachloroethane	ND	1.00	ug/L							U
1,1,1-Trichloroethane	ND	1.00	"							U
1,1,2,2-Tetrachloroethane	ND	1.00	"							U
1,1,2-Trichloroethane	ND	1.00	"							U
1,1-Dichloroethane	ND	1.00	"							U
1,1-Dichloroethene	ND	1.00	"							U
1,1-Dichloropropene	ND	1.00	"							U
1,2,3-Trichlorobenzene	ND	5.00	"							U
1,2,3-Trichloropropane	ND	5.00	"							U
1,2,4-Trichlorobenzene	ND	5.00	"							U
1,2,4-Trimethylbenzene	ND	1.00	"							U
1,2-Dibromo-3-chloropropane	ND	5.00	"							U
1,2-Dibromoethane (EDB)	ND	1.00	"							U
1,2-Dichlorobenzene	ND	1.00	"							U
1,2-Dichloroethane	ND	1.00	"							U
1,2-Dichloropropane	ND	1.00	"							U
1,3,5-Trimethylbenzene	ND	1.00	"							U
1,3-Dichlorobenzene	ND	1.00	"							U
1,3-Dichloropropane	ND	1.00	"							U
1,4-Dichlorobenzene	ND	1.00	"							U
2,2-Dichloropropane	ND	1.00	"							U
2-Butanone	ND	5.00	"							U
2-Chlorotoluene	ND	1.00	"							U
2-Hexanone	ND	5.00	"							U
4-Chlorotoluene	ND	1.00	"							U
4-Isopropyltoluene	ND	1.00	"							U

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Blank (B9K1402-BLK1)

Prepared: 11/14/2019 Analyzed: 11/14/2019

4-Methyl-2-pentanone	ND	5.00	ug/L							U
Acetone	ND	8.00	"							U
Benzene	ND	1.00	"							U
Bromobenzene	ND	1.00	"							U
Bromochloromethane	ND	1.00	"							U
Bromodichloromethane	ND	1.00	"							U
Bromoform	ND	1.00	"							U
Bromomethane	ND	1.00	"							U
Carbon disulfide	ND	5.00	"							U
Carbon tetrachloride	ND	1.00	"							U
Chlorobenzene	ND	1.00	"							U
Chloroethane	ND	1.00	"							U
Chloroform	ND	1.00	"							U
Chloromethane	ND	1.00	"							U
cis-1,2-Dichloroethene	ND	1.00	"							U
cis-1,3-Dichloropropene	ND	1.00	"							U
Dibromochloromethane	ND	1.00	"							U
Dibromomethane	ND	1.00	"							U
Ethylbenzene	ND	1.00	"							U
Hexachlorobutadiene	ND	5.00	"							U
Iodomethane	ND	10.0	"							U
Isopropylbenzene	ND	1.00	"							U
m,p-Xylene	ND	2.00	"							U
Methylene Chloride	ND	5.00	"							U
Methyl tert-Butyl Ether	ND	1.00	"							U
Naphthalene	ND	4.00	"							U

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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1402 - EPA 5030B (Water)										
Blank (B9K1402-BLK1)					Prepared: 11/14/2019 Analyzed: 11/14/2019					
n-Butylbenzene	ND	1.00	ug/L							U
n-Propylbenzene	ND	1.00	"							U
o-Xylene	ND	1.00	"							U
sec-Butylbenzene	ND	1.00	"							U
Styrene	ND	1.00	"							U
tert-Butylbenzene	ND	1.00	"							U
Tetrachloroethene	ND	1.00	"							U
Toluene	ND	1.00	"							U
trans-1,2-Dichloroethene	ND	1.00	"							U
trans-1,3-Dichloropropene	ND	1.00	"							U
Trichloroethene	ND	1.00	"							U
Trichlorofluoromethane	ND	1.00	"							U
Vinyl chloride	ND	1.00	"							U
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		107	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.2	70-130			
Surrogate: 4-Bromofluorobenzene	64		"	62.5		102	70-130			

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

LCS (B9K1402-BS1)

Prepared: 11/14/2019 Analyzed: 11/14/2019

1,1,1,2-Tetrachloroethane	48.5	1.00	ug/L	50.0		97.0	70-130			
1,1,1-Trichloroethane	54.2	1.00	"	50.0		108	70-130			
1,1,2,2-Tetrachloroethane	49.2	1.00	"	50.0		98.3	70-130			
1,1,2-Trichloroethane	49.9	1.00	"	50.0		99.8	70-130			
1,1-Dichloroethane	52.7	1.00	"	50.0		105	70-130			
1,1-Dichloroethene	52.3	1.00	"	50.0		105	70-130			
1,1-Dichloropropene	49.9	1.00	"	50.0		99.7	70-130			
1,2,3-Trichlorobenzene	50.1	5.00	"	50.0		100	70-130			
1,2,3-Trichloropropane	47.6	5.00	"	50.0		95.2	70-130			
1,2,4-Trichlorobenzene	52.2	5.00	"	50.0		104	70-130			
1,2,4-Trimethylbenzene	49.2	1.00	"	50.0		98.4	70-130			
1,2-Dibromo-3-chloropropane	48.6	5.00	"	50.0		97.2	70-130			
1,2-Dibromoethane (EDB)	48.5	1.00	"	50.0		97.0	70-130			
1,2-Dichlorobenzene	47.8	1.00	"	50.0		95.7	70-130			
1,2-Dichloroethane	48.8	1.00	"	50.0		97.6	70-130			
1,2-Dichloropropane	47.9	1.00	"	50.0		95.8	70-130			
1,3,5-Trimethylbenzene	49.1	1.00	"	50.0		98.2	70-130			
1,3-Dichlorobenzene	48.0	1.00	"	50.0		96.0	70-130			
1,3-Dichloropropane	49.1	1.00	"	50.0		98.3	70-130			
1,4-Dichlorobenzene	48.7	1.00	"	50.0		97.4	70-130			
2,2-Dichloropropane	53.1	1.00	"	50.0		106	70-130			
2-Butanone	256	5.00	"	250		103	70-130			
2-Chlorotoluene	49.1	1.00	"	50.0		98.2	70-130			
2-Hexanone	257	5.00	"	250		103	70-130			
4-Chlorotoluene	47.8	1.00	"	50.0		95.6	70-130			
4-Isopropyltoluene	48.7	1.00	"	50.0		97.5	70-130			

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1402 - EPA 5030B (Water)										
LCS (B9K1402-BS1)					Prepared: 11/14/2019 Analyzed: 11/14/2019					
4-Methyl-2-pentanone	260	5.00	ug/L	250		104	70-130			
Acetone	263	8.00	"	250		105	70-130			
Benzene	46.2	1.00	"	50.0		92.4	70-130			
Bromobenzene	47.4	1.00	"	50.0		94.8	70-130			
Bromochloromethane	48.8	1.00	"	50.0		97.5	70-130			
Bromodichloromethane	50.9	1.00	"	50.0		102	70-130			
Bromoform	50.6	1.00	"	50.0		101	70-130			
Bromomethane	58.6	1.00	"	50.0		117	70-130			
Carbon disulfide	52.5	5.00	"	50.0		105	70-130			
Carbon tetrachloride	53.1	1.00	"	50.0		106	70-130			
Chlorobenzene	48.7	1.00	"	50.0		97.4	70-130			
Chloroethane	53.7	1.00	"	50.0		107	70-130			
Chloroform	52.0	1.00	"	50.0		104	70-130			
Chloromethane	61.4	1.00	"	50.0		123	70-130			
cis-1,2-Dichloroethene	52.1	1.00	"	50.0		104	70-130			
cis-1,3-Dichloropropene	48.4	1.00	"	50.0		96.8	70-130			
Dibromochloromethane	51.5	1.00	"	50.0		103	70-130			
Dibromomethane	48.2	1.00	"	50.0		96.5	70-130			
Ethylbenzene	48.2	1.00	"	50.0		96.3	70-130			
Hexachlorobutadiene	52.0	5.00	"	50.0		104	70-130			
Iodomethane	48.6	10.0	"	50.0		97.3	70-130			
Isopropylbenzene	49.3	1.00	"	50.0		98.7	70-130			
m,p-Xylene	96.8	2.00	"	100		96.8	70-130			
Methylene Chloride	55.0	5.00	"	50.0		110	70-130			
Methyl tert-Butyl Ether	50.6	1.00	"	50.0		101	70-130			
Naphthalene	49.7	4.00	"	50.0		99.4	70-130			

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1402 - EPA 5030B (Water)										
LCS (B9K1402-BS1)					Prepared: 11/14/2019 Analyzed: 11/14/2019					
n-Butylbenzene	50.5	1.00	ug/L	50.0		101	70-130			
n-Propylbenzene	48.6	1.00	"	50.0		97.2	70-130			
o-Xylene	48.2	1.00	"	50.0		96.4	70-130			
sec-Butylbenzene	49.2	1.00	"	50.0		98.4	70-130			
Styrene	47.7	1.00	"	50.0		95.3	70-130			
tert-Butylbenzene	48.7	1.00	"	50.0		97.5	70-130			
Tetrachloroethene	50.1	1.00	"	50.0		100	70-130			
Toluene	49.7	1.00	"	50.0		99.4	70-130			
trans-1,2-Dichloroethene	51.6	1.00	"	50.0		103	70-130			
trans-1,3-Dichloropropene	49.6	1.00	"	50.0		99.2	70-130			
Trichloroethene	47.8	1.00	"	50.0		95.6	70-130			
Trichlorofluoromethane	55.9	1.00	"	50.0		112	70-130			
Vinyl chloride	59.3	1.00	"	50.0		119	70-130			
Surrogate: 1,2-Dichloroethane-d4	67		"	62.5		107	70-130			
Surrogate: Toluene-d8	64		"	62.5		102	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		98.5	70-130			

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Jen Pellegrini, Project Manager

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Matrix Spike (B9K1402-MS1)		Source: Y911184-01			Prepared: 11/14/2019 Analyzed: 11/14/2019					
1,1,1,2-Tetrachloroethane	51.3	1.00	ug/L	50.0	ND	103	70-130			
1,1,1-Trichloroethane	51.2	1.00	"	50.0	ND	102	70-130			
1,1,2,2-Tetrachloroethane	54.0	1.00	"	50.0	ND	108	70-130			
1,1,2-Trichloroethane	42.6	1.00	"	50.0	ND	85.2	70-130			
1,1-Dichloroethane	52.3	1.00	"	50.0	ND	105	70-130			
1,1-Dichloroethene	50.6	1.00	"	50.0	0.680	99.7	70-130			
1,1-Dichloropropene	48.8	1.00	"	50.0	ND	97.7	70-130			
1,2,3-Trichlorobenzene	53.4	5.00	"	50.0	0.320	106	70-130			
1,2,3-Trichloropropane	52.8	5.00	"	50.0	ND	106	70-130			
1,2,4-Trichlorobenzene	54.4	5.00	"	50.0	ND	109	70-130			
1,2,4-Trimethylbenzene	49.9	1.00	"	50.0	ND	99.7	70-130			
1,2-Dibromo-3-chloropropane	55.9	5.00	"	50.0	ND	112	70-130			
1,2-Dibromoethane (EDB)	52.2	1.00	"	50.0	ND	104	70-130			
1,2-Dichlorobenzene	49.6	1.00	"	50.0	ND	99.3	70-130			
1,2-Dichloroethane	50.6	1.00	"	50.0	ND	101	70-130			
1,2-Dichloropropane	51.0	1.00	"	50.0	ND	102	70-130			
1,3,5-Trimethylbenzene	48.5	1.00	"	50.0	ND	97.1	70-130			
1,3-Dichlorobenzene	49.2	1.00	"	50.0	ND	98.4	70-130			
1,3-Dichloropropane	52.1	1.00	"	50.0	ND	104	70-130			
1,4-Dichlorobenzene	49.5	1.00	"	50.0	ND	99.1	70-130			
2,2-Dichloropropane	48.4	1.00	"	50.0	ND	96.9	70-130			
2-Butanone	280	5.00	"	250	ND	112	70-130			
2-Chlorotoluene	49.7	1.00	"	50.0	ND	99.4	70-130			
2-Hexanone	289	5.00	"	250	ND	115	70-130			
4-Chlorotoluene	48.5	1.00	"	50.0	ND	96.9	70-130			
4-Isopropyltoluene	48.3	1.00	"	50.0	ND	96.5	70-130			

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CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Matrix Spike (B9K1402-MS1)		Source: Y911184-01			Prepared: 11/14/2019 Analyzed: 11/14/2019					
4-Methyl-2-pentanone	290	5.00	ug/L	250	3.92	114	70-130			
Acetone	281	8.00	"	250	ND	112	70-130			
Benzene	46.8	1.00	"	50.0	ND	93.6	70-130			
Bromobenzene	49.6	1.00	"	50.0	ND	99.2	70-130			
Bromochloromethane	51.4	1.00	"	50.0	ND	103	70-130			
Bromodichloromethane	54.6	1.00	"	50.0	ND	109	70-130			
Bromoform	55.8	1.00	"	50.0	ND	112	70-130			
Bromomethane	55.2	1.00	"	50.0	ND	110	70-130			
Carbon disulfide	50.8	5.00	"	50.0	ND	102	70-130			
Carbon tetrachloride	50.3	1.00	"	50.0	ND	101	70-130			
Chlorobenzene	49.1	1.00	"	50.0	ND	98.2	70-130			
Chloroethane	50.3	1.00	"	50.0	ND	101	70-130			
Chloroform	51.8	1.00	"	50.0	ND	104	70-130			
Chloromethane	56.3	1.00	"	50.0	ND	113	70-130			
cis-1,3-Dichloropropene	49.4	1.00	"	50.0	ND	98.9	70-130			
Dibromochloromethane	55.9	1.00	"	50.0	ND	112	70-130			
Dibromomethane	52.8	1.00	"	50.0	ND	106	70-130			
Ethylbenzene	48.0	1.00	"	50.0	ND	95.9	70-130			
Hexachlorobutadiene	50.9	5.00	"	50.0	ND	102	70-130			
Iodomethane	47.9	10.0	"	50.0	ND	95.8	70-130			
Isopropylbenzene	48.7	1.00	"	50.0	ND	97.4	70-130			
m,p-Xylene	96.1	2.00	"	100	ND	96.1	70-130			
Methylene Chloride	58.7	5.00	"	50.0	2.65	112	70-130			
Methyl tert-Butyl Ether	53.0	1.00	"	50.0	ND	106	70-130			
Naphthalene	55.5	4.00	"	50.0	ND	111	70-130			
n-Butylbenzene	50.4	1.00	"	50.0	ND	101	70-130			

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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1402 - EPA 5030B (Water)										
Matrix Spike (B9K1402-MS1)	Source: Y911184-01				Prepared: 11/14/2019 Analyzed: 11/14/2019					
n-Propylbenzene	48.6	1.00	ug/L	50.0	ND	97.3	70-130			
o-Xylene	48.7	1.00	"	50.0	ND	97.4	70-130			
sec-Butylbenzene	49.0	1.00	"	50.0	ND	98.0	70-130			
Styrene	48.8	1.00	"	50.0	ND	97.6	70-130			
tert-Butylbenzene	48.1	1.00	"	50.0	ND	96.2	70-130			
Tetrachloroethene	898	1.00	"	50.0	660	476	70-130			QM-07
Toluene	49.6	1.00	"	50.0	ND	99.2	70-130			
trans-1,2-Dichloroethene	50.5	1.00	"	50.0	0.830	99.4	70-130			
trans-1,3-Dichloropropene	51.4	1.00	"	50.0	ND	103	70-130			
Trichloroethene	388	1.00	"	50.0	348	80.4	70-130			
Trichlorofluoromethane	51.0	1.00	"	50.0	ND	102	70-130			
Vinyl chloride	142	1.00	"	50.0	102	80.6	70-130			
Surrogate: 1,2-Dichloroethane-d4	66		"	62.5		105	70-130			
Surrogate: Toluene-d8	63		"	62.5		100	70-130			
Surrogate: 4-Bromofluorobenzene	62		"	62.5		99.8	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Matrix Spike Dup (B9K1402-MSD1)		Source: Y911184-01			Prepared: 11/14/2019 Analyzed: 11/14/2019					
1,1,1,2-Tetrachloroethane	49.7	1.00	ug/L	50.0	ND	99.5	70-130	3.13	20	
1,1,1-Trichloroethane	50.9	1.00	"	50.0	ND	102	70-130	0.509	20	
1,1,2,2-Tetrachloroethane	52.6	1.00	"	50.0	ND	105	70-130	2.53	20	
1,1,2-Trichloroethane	43.4	1.00	"	50.0	ND	86.8	70-130	1.84	20	
1,1-Dichloroethane	53.0	1.00	"	50.0	ND	106	70-130	1.35	20	
1,1-Dichloroethene	50.3	1.00	"	50.0	0.680	99.2	70-130	0.516	20	
1,1-Dichloropropene	49.4	1.00	"	50.0	ND	98.8	70-130	1.18	20	
1,2,3-Trichlorobenzene	51.5	5.00	"	50.0	0.320	102	70-130	3.68	20	
1,2,3-Trichloropropane	51.6	5.00	"	50.0	ND	103	70-130	2.28	20	
1,2,4-Trichlorobenzene	53.1	5.00	"	50.0	ND	106	70-130	2.29	20	
1,2,4-Trimethylbenzene	48.7	1.00	"	50.0	ND	97.5	70-130	2.29	20	
1,2-Dibromo-3-chloropropane	54.1	5.00	"	50.0	ND	108	70-130	3.24	20	
1,2-Dibromoethane (EDB)	51.7	1.00	"	50.0	ND	103	70-130	1.10	20	
1,2-Dichlorobenzene	49.1	1.00	"	50.0	ND	98.3	70-130	1.03	20	
1,2-Dichloroethane	49.7	1.00	"	50.0	ND	99.4	70-130	1.85	20	
1,2-Dichloropropane	50.2	1.00	"	50.0	ND	100	70-130	1.48	20	
1,3,5-Trimethylbenzene	47.7	1.00	"	50.0	ND	95.5	70-130	1.66	20	
1,3-Dichlorobenzene	48.6	1.00	"	50.0	ND	97.1	70-130	1.33	20	
1,3-Dichloropropane	51.8	1.00	"	50.0	ND	104	70-130	0.712	20	
1,4-Dichlorobenzene	49.2	1.00	"	50.0	ND	98.3	70-130	0.790	20	
2,2-Dichloropropane	47.6	1.00	"	50.0	ND	95.3	70-130	1.67	20	
2-Butanone	273	5.00	"	250	ND	109	70-130	2.32	20	
2-Chlorotoluene	50.0	1.00	"	50.0	ND	99.9	70-130	0.562	20	
2-Hexanone	291	5.00	"	250	ND	116	70-130	0.759	20	
4-Chlorotoluene	47.7	1.00	"	50.0	ND	95.5	70-130	1.52	20	
4-Isopropyltoluene	47.8	1.00	"	50.0	ND	95.6	70-130	0.978	20	

Origins Laboratory, Inc.



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CTL Thompson, Inc.

1971 West 12th Avenue

Denver CO 80204

Rannen Worsley

Project Number: DN50219.000-205

Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1402 - EPA 5030B (Water)

Matrix Spike Dup (B9K1402-MSD1)		Source: Y911184-01			Prepared: 11/14/2019 Analyzed: 11/14/2019					
4-Methyl-2-pentanone	290	5.00	ug/L	250	3.92	114	70-130	0.0276	20	
Acetone	271	8.00	"	250	ND	108	70-130	3.68	20	
Benzene	46.7	1.00	"	50.0	ND	93.4	70-130	0.214	20	
Bromobenzene	48.6	1.00	"	50.0	ND	97.3	70-130	1.93	20	
Bromochloromethane	51.2	1.00	"	50.0	ND	102	70-130	0.409	20	
Bromodichloromethane	53.2	1.00	"	50.0	ND	106	70-130	2.52	20	
Bromoform	54.6	1.00	"	50.0	ND	109	70-130	2.08	20	
Bromomethane	56.2	1.00	"	50.0	ND	112	70-130	1.76	20	
Carbon disulfide	50.3	5.00	"	50.0	ND	101	70-130	1.07	20	
Carbon tetrachloride	50.5	1.00	"	50.0	ND	101	70-130	0.278	20	
Chlorobenzene	49.6	1.00	"	50.0	ND	99.3	70-130	1.13	20	
Chloroethane	51.6	1.00	"	50.0	ND	103	70-130	2.53	20	
Chloroform	51.3	1.00	"	50.0	ND	103	70-130	1.01	20	
Chloromethane	59.2	1.00	"	50.0	ND	118	70-130	5.07	20	
cis-1,3-Dichloropropene	50.3	1.00	"	50.0	ND	101	70-130	1.74	20	
Dibromochloromethane	55.8	1.00	"	50.0	ND	112	70-130	0.215	20	
Dibromomethane	52.1	1.00	"	50.0	ND	104	70-130	1.39	20	
Ethylbenzene	47.7	1.00	"	50.0	ND	95.4	70-130	0.502	20	
Hexachlorobutadiene	50.0	5.00	"	50.0	ND	100	70-130	1.74	20	
Iodomethane	47.6	10.0	"	50.0	ND	95.3	70-130	0.544	20	
Isopropylbenzene	48.3	1.00	"	50.0	ND	96.6	70-130	0.804	20	
m,p-Xylene	94.7	2.00	"	100	ND	94.7	70-130	1.45	20	
Methylene Chloride	55.3	5.00	"	50.0	2.65	105	70-130	5.96	20	
Methyl tert-Butyl Ether	51.6	1.00	"	50.0	ND	103	70-130	2.68	20	
Naphthalene	54.0	4.00	"	50.0	ND	108	70-130	2.63	20	
n-Butylbenzene	49.1	1.00	"	50.0	ND	98.2	70-130	2.57	20	

Origins Laboratory, Inc.



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CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B9K1402 - EPA 5030B (Water)										
Matrix Spike Dup (B9K1402-MSD1)	Source: Y911184-01				Prepared: 11/14/2019 Analyzed: 11/14/2019					
n-Propylbenzene	48.1	1.00	ug/L	50.0	ND	96.2	70-130	1.12	20	
o-Xylene	49.1	1.00	"	50.0	ND	98.3	70-130	0.859	20	
sec-Butylbenzene	48.0	1.00	"	50.0	ND	96.0	70-130	2.10	20	
Styrene	49.1	1.00	"	50.0	ND	98.2	70-130	0.613	20	
tert-Butylbenzene	47.7	1.00	"	50.0	ND	95.5	70-130	0.751	20	
Tetrachloroethene	886	1.00	"	50.0	660	451	70-130	1.41	20	QM-07
Toluene	50.0	1.00	"	50.0	ND	100	70-130	0.883	20	
trans-1,2-Dichloroethene	50.4	1.00	"	50.0	0.830	99.2	70-130	0.218	20	
trans-1,3-Dichloropropene	51.9	1.00	"	50.0	ND	104	70-130	0.910	20	
Trichloroethene	379	1.00	"	50.0	348	63.1	70-130	2.26	20	QM-07
Trichlorofluoromethane	51.7	1.00	"	50.0	ND	103	70-130	1.32	20	
Vinyl chloride	143	1.00	"	50.0	102	82.9	70-130	0.821	20	
Surrogate: 1,2-Dichloroethane-d4	68		"	62.5		108	70-130			
Surrogate: Toluene-d8	63		"	62.5		101	70-130			
Surrogate: 4-Bromofluorobenzene	61		"	62.5		98.0	70-130			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Volatile Organic Compounds by GC/MS SW846 8260D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1811 - EPA 3511 Mod.

Blank (B9K1811-BLK1)

Prepared: 11/18/2019 Analyzed: 11/19/2019

Gasoline (C6-C10)	ND	5.00	mg/L							U
Diesel (C10-C28)	ND	5.00	"							U
Residual Range Organics (C28-C40)	ND	20.0	"							U
Surrogate: o-Terphenyl	4.9		"	5.00		97.1	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1811 - EPA 3511 Mod.

LCS (B9K1811-BS1)

Prepared: 11/18/2019 Analyzed: 11/19/2019

Gasoline (C6-C10)	109	5.00	mg/L	100	109	70-130
Diesel (C10-C28)	107	5.00	"	100	107	70-130
Residual Range Organics (C28-C40)	112	20.0	"	100	112	70-130
Surrogate: o-Terphenyl	5.7		"	5.00	115	50-150

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1811 - EPA 3511 Mod.

Matrix Spike (B9K1811-MS1)		Source: Y911296-01			Prepared: 11/18/2019 Analyzed: 11/19/2019					
Gasoline (C6-C10)	104	5.00	mg/L	100	ND	104	70-130			
Diesel (C10-C28)	104	5.00	"	100	1.80	102	70-130			
Residual Range Organics (C28-C40)	110	20.0	"	100	ND	110	70-130			
Surrogate: o-Terphenyl	5.6		"	5.00		112	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Extractable Petroleum Hydrocarbons by 8015D - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B9K1811 - EPA 3511 Mod.

Matrix Spike Dup (B9K1811-MSD1)		Source: Y911296-01			Prepared: 11/18/2019 Analyzed: 11/19/2019					
Gasoline (C6-C10)	105	5.00	mg/L	100	ND	105	70-130	1.15	20	
Diesel (C10-C28)	103	5.00	"	100	1.80	101	70-130	0.856	20	
Residual Range Organics (C28-C40)	107	20.0	"	100	ND	107	70-130	2.17	20	
Surrogate: o-Terphenyl	5.6		"	5.00		112	50-150			

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager

CTL Thompson, Inc.
1971 West 12th Avenue
Denver CO 80204

Rannen Worsley
Project Number: DN50219.000-205
Project: Murata Farms

Notes and Definitions

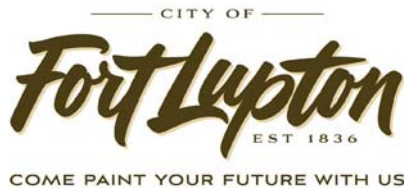
- U Sample is Non-Detect.
- S-07 High surrogate in sample, however sample is non-detect. High surrogate indicates result values are biased high.
- QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- All soil results are reported at a wet weight basis.

Origins Laboratory, Inc.



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Jen Pellegrini, Project Manager



CERTIFICATE OF MAILING

I, the undersigned, hereby certify that on the 25th day of May 2021, a true and correct copy of the foregoing Notice of Public Hearings for the Murata Farms Preliminary PUD Plat was sent via United States Mail, postage pre-paid, to the following addresses:

AIMS COMMUNITY COLLEGE
PO BOX
GREELEY, CO 80632

PERRI M-J COMPANY
14286 HWY 52
FORT LUPTON, CO 80621

ROWLEY DOWNS LAND COMPANY
260 KRAMERIA ST
DENVER, CO 80220

MELODY HOMES INC
9555 S KINGSTON CT
STE 200
DENVER, CO 80220

JUSTIN D BRUNICK
2441 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

MICHAEL JEROME PILLA
2425 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

SANDRA BAINES GARLAND
2401 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

VANG LONG
LOR YING
2349 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

KATHLEEN L TENORIO
LAWRENCE J TENORIO
5380 COUNTY ROAD 29 1/2
FORT LUPTON, CO 80621

VIRGINIA J RATERINK
GEORGE V RATERINK
13877 HIGHWAY 52
FORT LUPTON, CO 80621

PATRICIA L TERRY TRUST
1312 DENVER AVE
FORT LUPTON, CO 80621

MARIA R ARELLANO
JOSE JUAN ORNELAS-ARELLANO
14606 HWY 52
FORT LUPTON, CO 80621

FL MOUNTAIN SKY LLC
500 FAIRFAX ST
DENVER, CO 80220

ANNETTE LOUISE KOKOSZKA
2449 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

JORGE VARGAS
PATRICIA QUIROZ
2433 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

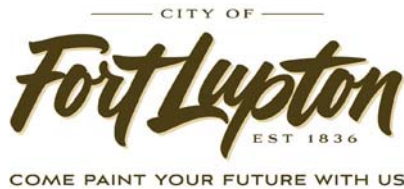
PABLO ANTONIO GUADARRAMA
2409 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

ALMA E DIAZ
JOSE LUIS DIAZ
2373 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

ERICA LINDA SILVA
FABIAN SILVA
2341 MOUNTAIN SKY DR
FORT LUPTON, CO 80621

GEORGE PAUL II TAYLOR
ANNA MARIE TAYLOR
1308 7TH ST
FORT LUPTON, CO 80621

V BAR S EIGHTY ACRES LLC
12032 HIGHWAY 52
FORT LUPTON, CO 80621



LI CAIRI
1937 TRAIL BLAZER RD
FORT LUPTON, CO 80621

SUSAN L DENNY
VAUNOLD D DENNY
116 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

JESSICA WEBB
JEREMY WEBB
156 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

AMELIA M SAENZ
216 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

DONNA RUTH BROOKS
DAVID MICHAEL BROOKS
1998 SILVERADO LN
FORT LUPTON, CO 80621

ANITA DELANEY
ROBERT A DELANEY
1982 SILVERADO LN
FORT LUPTON, CO 80621

JULIE GAMBERG
REID GAMBERG
1942 SILVERADO LN
FORT LUPTON, CO 80621

JACQUELINE M MOLLENDOR
138 SAN CHERRY ST
FORT LUPTON, CO 80621

GERARDO MANRIQUEZ
165 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

KATHRYN MARIE KING
1872 MALIBU CT
FORT LUPTON, CO 80621

BONNIE M LAMONTAGNE
CHARLES D LAMONTAGNE
1868 MALIBU CT
FORT LUPTON, CO 80621

LISA M GEIGER
BRYAN M WEIGEL
1957 TRAIL BLAZER RD
FORT LUPTON, CO 80621

HPA US1 LLC
120 S RIVERSIDE PLZ
STE 2000
CHICAGO, IL 60606

SUSAN E CHAVEZ
DEAN A CHAVEZ
166 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

CECILIA A FERNANDEZ
JOHNNY B FERNANDEZ
226 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

KAREN L MEALY
ROBERT L MEALY
1992 SILVERADO LN
FORT LUPTON, CO 80621

SHUMAKER LIVING TRUST
1962 SILVERADO LN
FORT LUPTON, CO 80621

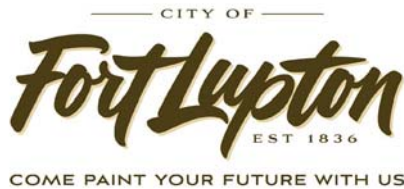
KAREN HUFF
JONATHAN R ROBERTS
1941 SILVERADO LN
FORT LUPTON, CO 80621

JETTY J WHITE
KENNETH C WHITE
1981 SILVERADO LN
FORT LUPTON, CO 80621

JENNIFER CAROL MARTINEZ
RONALD CHAD MARTINEZ
155 S TRAIL BLAZER RD
FORT LUPTON, CO 80621

STACEY A BEAN
MICHAEL J BEAN
1870 MALIBU CT
FORT LUPTON, CO 80621

APPEL FARMS HOMEOWNERS ASSOC INC
PO BOX 30
FREDERICK, CO 80530



EDWARD LEE CROWE
1858 VIRGINIA DR
FORT LUPTON, CO 80621

PERRY D OLSON
1865 VIRGINIA DR
FORT LUPTON, CO 80621

PATRICIA DALE APEL
PHILIP T. APEL & PATRICIA DALE APEL TRUST
151 QUARTZ LANE
FLORENCE, SC 29056

VIRGINIA K EGGLESTON TRUST
VIRGINIA K EGGLESTON
4 TIMOTHY CT
NOVATO, CA 94949

ROBERT T EGGLESTON
PO BOX 4174
PAGOSA SPRINGS, CO 80117

KAREN Y. PETERS, AKA KAREN G. PETERS
4260 PEACH WAY
BOULDER, CO 80301

THE PETRAM GROUP, LLC
999 18th ST
#1650 S
DENVER, CO 80202

CRESTONE PEAK RESOURCES OPERATING
LLC
1801 CALIFORNIA ST
STE 2500
DENVER, CO 80202

SUSAN FRANCIS
HOWARD FRANCIS
1875 VIRGINIA DR
FORT LUPTON, CO 80621

MORIAH TURNEY
BRANDON NGUYEN
1855 VIRGINIA DR
FORT LUPTON, CO 80621

GRIFFITH PROPERTIES
ROBERT C GRIFFITH
340 CENTURY ROAD
#239
DURANGO, CO 81301

BARBARA J. CONN REVOCABLE TRUST
BARBARA J. CONN
135 RIVERVIEW DR
DURANGE, CO 80301

RONALD K GRIFFITH
1836 WEST LAKE AVE
LITTLETON, CO 80120

RUSSELL E STEELE
2704 NE 87th ST
SEATTLE, WA 98115

KERR MCGEE OIL & GAS ONSHORE LP
C/O WILL VAUGHAN
1099 18th ST
#1800
DENVER, CO 80217

City Official



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694

Fax: 303.857.0351

www.fortluptonco.gov

CITY OF FORT LUPTON NOTICE OF PUBLIC HEARING

Notice is hereby given that the City of Fort Lupton is in receipt of an application for a preliminary PUD plat referred to as the Murata Farms PUD Preliminary Plat, located at 14284 Highway 52 in Fort Lupton, Colorado, pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on June 10, 2021, at 6:00 P.M., and before the City Council on July 6, 2021, at 7:00 P.M. or as soon as possible thereafter.

The public hearings shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that the City Hall is closed to the public at the time of the hearings due to COVID-19, the public hearings will be held remotely, accessible to the public by phone and internet. Information on how to attend the hearings will be provided in the agenda as posted on the City's website, www.fortluptonco.gov.

Further information is available through the City Planning and Building Department at (303) 857-6694.

**ADDITIONAL INFORMATION AND DOCUMENTS ON THIS APPLICATION CAN BE FOUND AT
BIT.LY/FLDEVELOPMENT AND SCROLLING DOWN TO THE ROW TITLED: MURATA FARMS
PRELIMINARY PUD PLAT**

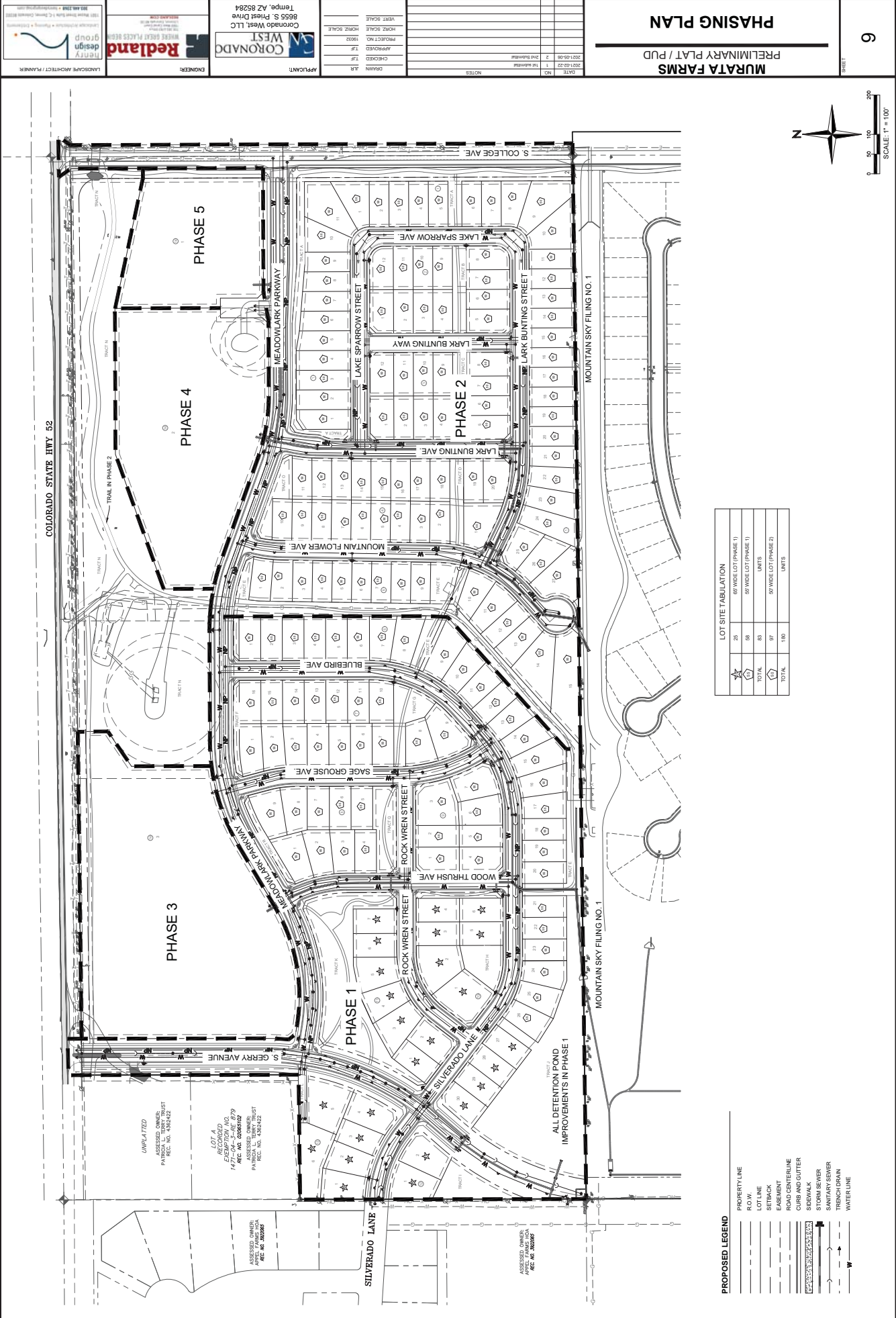
ALL INTERESTED PERSONS MAY ATTEND.

LEGAL DESCRIPTION

LOT B OF RECORDED EXEMPTION NUMBER 1471-04-3-RE 879 RECORDED AUGUST 14, 1986 UNDER RECEPTION NUMBER NO. 2065102, BEING A PORTION OF THE FOLLOWING DESCRIBED PROPERTY:

THE NORTH ONE-HALF OF THE SOUTHWEST ONE-QUARTER OF SECTION 4, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, WELD COUNTY, COLORADO,

EXCEPT THOSE PORTIONS CONVEYED IN DEED RECORDED DECEMBER 4, 1989 UNDER RECEPTION NO. 02199253 AND EXCEPT THE NORTH 50.00 FEET AND THE EAST 30.00 FEET THEREOF, RESERVED FOR STATE AND COUNTY ROW.



Sign Posting Affidavit

Murata Farms Preliminary PUD Plat

Project No. LUP2021-0012 / Plan No. PPL2021-0002



Facing Hwy 52



Facing CR 29 1/2

I, Alec Reutzel hereby acknowledge that the aforementioned property was posted in accordance with City Codes. Said public hearing notice was posted on this 26th day of May, 2021.

Signature of Owner or Owner's Representative, Sign Posted by Timberline Graphics

The foregoing instrument was acknowledged before me by Alec Reutzel, this 2nd day of June, 2021. Witness my hand and seal.

My commission expires 9/20/2021

Notary Public

KAREN Z. HENRY
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19974016463
MY COMMISSION EXPIRES SEPTEMBER 20, 2021

Colorado Community Media
750 W. Hampden Ave. Suite 225
Englewood, CO 80110

City of Ft Lupton Legals
130 S McKinley Avenue
Fort Lupton CO 80621

Description: No. FLP222311 HEARING Murata Farms PUD

AFFIDAVIT OF PUBLICATION

State of Colorado }
County of Weld } ss

This Affidavit of Publication for the Fort Lupton Press, a weekly newspaper, printed and published for the County of Weld, State of Colorado, hereby certifies that the attached legal notice was published in said newspaper once in each week, for 1 successive week(s), the last of which publication was made 5/26/2021, and that copies of each number of said paper in which said Public Notice was published were delivered by carriers or transmitted by mail to each of the subscribers of said paper, according to their accustomed mode of business in this office.



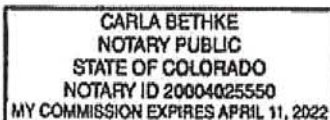
For the Fort Lupton Press

State of Colorado }
County of Weld } ss

The above Affidavit and Certificate of Publication was subscribed and sworn to before by the above named Gerard Healey, publisher of said newspaper, who is personally known to me to be the identical person in the above certificate on 5/26/2021. Gerard Healey has verified to me that he has adopted an electronic signature to function as his signature on this document.

20004025550-155501

Carla Bethke
Notary Public
My commission ends April 11, 2022



Public Notice

CITY OF FORT LUPTON NOTICE OF PUBLIC HEARING

Notice is hereby given that the City of Fort Lupton is in receipt of an application for a preliminary PUD plat referred to as the Murata Farms PUD Preliminary Plat, located at 14284 Highway 52 in Fort Lupton, Colorado, pursuant to the City of Fort Lupton Municipal Code Notice Requirements.

The public hearings are to be held before the Planning Commission on June 10, 2021, at 6:00 P.M., and before the City Council on July 6, 2021, at 7:00 P.M. or as soon as possible thereafter.

The public hearings shall be held at the Fort Lupton City Hall, 130 S. McKinley Avenue in Fort Lupton, Colorado. In the event that the City Hall is closed to the public at the time of the hearings due to COVID-19, the public hearings will be held remotely, accessible to the public by phone and internet. Information on how to attend the hearings will be provided in the agenda as posted on the City's website, www.fortluptonco.gov.

Further information is available through the City Planning and Building Department at (303) 857-6694.

ALL INTERESTED PERSONS MAY ATTEND.

LEGAL DESCRIPTION

LOT B OF RECORDED EXEMPTION NUMBER 1471-04-3-RE 879 RECORDED AUGUST 14, 1986 UNDER RECEPTION NUMBER NO. 2065102, BEING A PORTION OF THE FOLLOWING DESCRIBED PROPERTY: THE NORTH ONE-HALF OF THE SOUTHWEST ONE-QUARTER OF SECTION 4, TOWNSHIP 1 NORTH, RANGE 66 WEST OF THE 6TH PRINCIPAL MERIDIAN, WELD COUNTY, COLORADO, EXCEPT THOSE PORTIONS CONVEYED IN DEED RECORDED DECEMBER 4, 1989 UNDER RECEPTION NO. 02199253 AND EXCEPT THE NORTH 50.00 FEET AND THE EAST 30.00 FEET THEREOF, RESERVED FOR STATE AND COUNTY ROW.

Legal Notice No. FLP222311
First Publication: May 26, 2021
Last Publication: May 26, 2021
Publisher: Fort Lupton Press



Planning & Building

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694

Fax: 303.857.0351

www.fortlupton.org

May 7, 2021

Via U.S. Mail

U.S. Army Corp of Engineers
Denver Regulatory Office
9307 S. Wadsworth Blvd.
Littleton, CO 80128-6901

Re: Murata Farms Preliminary PUD Plat; Project No. LUP2021-0012; Plan No.
PPL2021-0002

To Whom It May Concern,

The City of Fort Lupton is currently reviewing a land use application submitted for a preliminary PUD plat. I am enclosing application materials that were submitted by the applicant. Additional application documents can be found online at bit.ly/FLDevelopment. You will then need to scroll to the row that addresses the Murata Farms Preliminary PUD Plat.

Any comments relevant to this request would be appreciated. Please reply by **May 28, 2021**, so that we may give full consideration to your recommendation. The public hearings for this matter are scheduled for:

- Planning Commission: Thursday, June 10 at 6:00 PM; and
- City Council: Tuesday, July 6 at 7:00 PM

If you would like to have future referral requests sent via email, please forward me the contact information for the person I should forward them to at aknutson@fortluptonco.gov or call 303.857.6694.

Please do not hesitate to contact me with questions or concerns.

Sincerely,

Magaly Morales-Tejada

Magaly Morales-Tejada
City of Fort Lupton

Enclosures

Magaly Morales-Tejada

From: Hice-Idler - CDOT, Gloria <gloria.hice-idler@state.co.us>
Sent: Monday, May 10, 2021 4:55 PM
To: Magaly Morales-Tejada; Alyssa Knutson; Todd Hodges; Maria Lancto
Cc: Timothy Bilobran - CDOT; Allyson Mattson - CDOT
Subject: Murata Farms/City of Fort Lupton/SH 52

The TIS indicates that the developer is wanting a 3/4 access across from Coyote Creek Drive and a full movement access at WCR 29.5. The draft CO 52 ACP will allow a full movement at both locations. Before commenting further, the developer should confirm that they only want a 3/4 at Coyote Creek.

Gloria Hice-Idler
Rocksol Consulting

(970) 381-8629



10601 W. 10th Street, Greeley, CO 80634

gloria.hice-idler@state.co.us | www.codot.gov | www.cotrip.org



Magaly Morales-Tejada

From: Mettenbrink - DNR, Chris <chris.mettenbrink@state.co.us>
Sent: Thursday, May 20, 2021 11:31 AM
To: Magaly Morales-Tejada
Subject: Re: Referral Response Request: Murata Farms Preliminary PUD Plat LUP2021-0012

Magaly,

CPW commented on this project last March. We have no further comments beyond what we commented on then.

Thank you.

Chris

On Fri, May 7, 2021 at 4:18 PM Magaly Morales-Tejada <MMTejada@fortluptonco.gov> wrote:

Good Afternoon,

The documentation located at the following link is submitted to you for review and recommendation for a site plan being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: <https://www.fortlupton.org/DocumentCenter/Index/594>.

Any comments you consider relevant to this request would be appreciated. Please reply by **May 28 2021**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, June 10, 2021 at 6:00 PM; and
- City Council: Tuesday, July 6, 2021 at 7:00 PM

Your time in this matter is greatly appreciated!

Magaly Morales-Tejada

Planning assistant

130 S. McKinley Ave.

Fort Lupton, CO 80621

Direct: 720-466-6111



The information transmitted is intended only for the person or entity to which it is addressed and may contain CONFIDENTIAL material. If you receive this information in error, please delete or destroy the information.

--

Chris Mettenbrink

District Wildlife Manager- Wildlife Officer

Area 2- Fort Lupton



**LIVE LIFE
OUTSIDE**

P 970.472.4405 | C 303.906.1979

4207 W. CR 16E, Loveland, CO 80537

Chris.Mettenbrink@state.co.us | www.cpw.state.co.us





May 18, 2021

Alyssa Knutson, Planning Assistant
City of Fort Lupton Planning Commission
Transmission via email: planningdept@fortluptonco.gov

Re: Murata Farms Preliminary PUD Plat
Case Nos. LUP2021-0012 and PPL2021-0002
Part of the N ½ SW ¼ of Sec. 4, T 2N, R 66W, 6th P.M.
Water Division 1, Water District 2, Weld County

Dear Alyssa Knutson:

We have received the May 7, 2021 above-referenced proposal for the Murata Farms Preliminary PUD Plat. Pursuant to section 30-28-136, C.R.S. the State Engineer's Office will provide an opinion on water supply plans for new subdivisions regarding material injury to existing water rights or the adequacy of the proposed plan if a referral is submitted to this office by the board of county commissioners. This referral was submitted to this office by the City of Fort Lupton ("City"); therefore, pursuant to the State Engineer's March 4, 2005 and March 11, 2011 memorandums to the county planning directors, this office will only perform a cursory review of the referral information and provide comments. The comments do not address the adequacy of the water supply plan for this project or the ability of the water supply plan to satisfy any County regulations or requirements. In addition, **the comments provided herein cannot be used to guarantee a viable water supply plan or infrastructure, the issuance of a well permit, or the physical availability of water.**

The proposal is for the rezoning and preliminary plat of a planned unit development on a 72.71-acre property located in the N ½ SW ¼ of Sec. 4, T 2N, R 66W, 6th P.M. The proposed uses on the subject property includes single-family detached residential, paired homes, townhomes, parks, trails, open space and commercial and office uses. The PUD will consist of 180 single-family detached homes, 58 paired homes, 61 townhomes, a commercial site, and parks and open space corridors, to be completed in phases. Phase 1 will create 95 single-family lots, Phase 2 will create 85 single-family lots, Phase 3 will create paired and townhome lots, and Phase 4 will create the commercial lot. The total number of lots in the subdivision was not specified.

The estimated water demand and proposed uses for the subdivision were not provided. The proposed water supply source is service provided by the City of Fort Lupton.

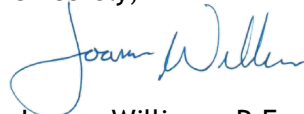
A review of our records shows well permit no. 159404 located on the subject property. Well permit no. 159404 was issued February 15, 1991 pursuant to section 37-92-602(3)(b)(II)(A), C.R.S. as the only well on a tract of land of 35.27 acres described as a portion of N ½ SW ¼ of Sec. 4, T 1N, R 66W, 6th P.M. The well is permitted to produce from the not-nontributary Lower Arapahoe aquifer and to be used for ordinary household purposes inside one (1) single-family dwelling, the watering of poultry, domestic animals, and livestock on a farm or ranch, and the irrigation of not over one (1) acre of home gardens and lawns. It is unclear if the well is a proposed water source for one or more lots in the subdivision. If well no. 159404 is a proposed water source for the subdivision, the applicant should clarify whether the well will continue to operate under the presumption of non-injury after the subdivision subject to the provisions of section 37-90-602(3)(b)(IV), C.R.S., if the well will be covered by a court-approved augmentation plan, or if the well will be plugged and abandoned prior to subdivision approval.



According to the submitted material, the Mountain Sky detention and water quality pond will be expanded to collect stormwater runoff. The applicant should be aware that unless the pond meets the requirements of a "storm water detention and infiltration facility" as defined in section 37-92-602(8), C.R.S., the pond may be subject to administration by this office. The applicant should review [DWR's Administrative Statement Regarding the Management of Storm Water Detention Facilities and Post-Wildland Fire Facilities in Colorado](#), to ensure that the notification, construction and operation of the pond meet statutory and administrative requirements. The applicant is encouraged to use [Colorado Stormwater Detention and Infiltration Facility Notification Portal](#) to meet the notification requirements.

If you or the applicant have any questions, please contact Wenli Dickinson at 303-866-3581 x8206 or at Wenli.Dickinson@state.co.us.

Sincerely,

A handwritten signature in blue ink that reads "Joanna Williams". The signature is fluid and cursive, with the first name "Joanna" and last name "Williams" clearly distinguishable.

Joanna Williams, P.E.
Water Resource Engineer

Ec: Referral no. 27697
Well permit no. 159404 file
Applicants (plmurata@comcast.net and glenicetani7@gmail.com)



May 10, 2021

VIA E-MAIL

City of Fort Lupton Planning and Building Department
130 S. McKinley Ave
Fort Lupton, Colorado 80621
planningdept@fortlupton.org

**NOTICE OF RIGHT-OF-WAY GRANT OWNED BY KERR-McGEE GATHERING
LLC**

Re: Murata Farms
M-J Perri Company– Property Owner
Township 1 North, Range 66 West, 6th P.M.
A portion of the N2SW4 of Section 4
Weld County, Colorado

City of Fort Lupton Planning and Building Department:

This letter is being sent by Kerr-McGee Gathering LLC (“KMGG”) to inform you KMGG is the owner of a valid easement and pipeline located in the N2SW4 of Section 4, Township 1 North, Range 66 West for which the City of Fort Lupton Planning and Building Department (“Town”) is reviewing Murata Farms. KMGG is submitting this comment timely, in accordance with the Town’s procedural requirements.

The following are comments in support of this Notice:

1. KMGG is the owner of a valid Right-of-Way Grant that was executed on June 4, 2002 and recorded on November 4, 2002 with the Weld County Clerk and Recorder at reception number 3002202. Referenced Right-of-Way Grant contains pipeline number 16-02-311-3-EXT.

KMGG does not object to the proposed Murata Farms provided the applicant does not encroach on KMGG’s pipelines and conforms to the terms of the Right-of-Way Grant identified above.

Please contact me at 970-515-1846 if you have any questions or comments about this matter.

Sincerely,

KERR-McGEE GATHERING LLC

Paul Gerrish
Senior Landman

cc: Murph Shelby, Senior Counsel
Sherry Bursey, Senior Counsel
Brett Cavanagh
Jake Billadeau
Heather Bennett
Kelly Reyos

Magaly Morales-Tejada

From: Kristen Thompson <kthompson@northernwater.org>
Sent: Friday, May 21, 2021 10:07 AM
To: Magaly Morales-Tejada
Cc: Alyssa Knutson; Todd Hodges; Maria Lancto
Subject: RE: Referral Response Request: Murata Farms Preliminary PUD Plat LUP2021-0012

Magaly,

We do not have a comment on this referral.

Thank you
Kris



Kristen Thompson | Inclusion Specialist
220 Water Ave | Berthoud, CO 80513
Direct: 970-622-2237
Main: 800-369-RAIN (7246)

www.northernwater.org

[Facebook](#) | [Twitter](#) | [Instagram](#) | [LinkedIn](#)

Disclaimer Notice: An allotment of Colorado-Big Thompson water is subject to the Water Conservancy Act, C.R.S 37-45-101 et seq, the authority of the Board of Directors of the Northern Colorado Water Conservancy District, and other relevant laws and regulations. The information provided in this email is not binding on Northern Water because the legal rights to Colorado-Big Thompson Project Allotments are subject to the continuing discretion of the Board of Directors of Northern Water and other legal limitations and requirements. Northern Water staff and counsel cannot provide you with legal advice, and you are advised to seek legal counsel with respect to the subject matter of this email. You also have an independent obligation to review and confirm the accuracy and completeness of any information provided to you by Northern Water, and to supplement or correct the records of Northern Water with respect to any errors or omissions.

From: Magaly Morales-Tejada <MMTejada@Fortluptonco.gov>
Sent: Friday, May 7, 2021 4:19 PM
Cc: Alyssa Knutson <AKnutson@Fortluptonco.gov>; Todd Hodges <thodges@Fortluptonco.gov>; Maria Lancto <MLancto@Fortluptonco.gov>
Subject: Referral Response Request: Murata Farms Preliminary PUD Plat LUP2021-0012

External Message - Please be cautious when replying or opening links or attachments in this email

Good Afternoon,

The documentation located at the following link is submitted to you for review and recommendation for a site plan being reviewed by the City of Fort Lupton. The application documents can be reviewed at the following link: <https://www.fortlupton.org/DocumentCenter/Index/594>.

Any comments you consider relevant to this request would be appreciated. Please reply by **May 28 2021**, so that we may give full consideration to your recommendation. Any response not received before or on this date may be deemed to be a favorable response to the Planning & Building Department.

The Public Hearings for this matter are scheduled for:

- Planning Commission: Thursday, June 10, 2021 at 6:00 PM; and
- City Council: Tuesday, July 6, 2021 at 7:00 PM

Your time in this matter is greatly appreciated!

Magaly Morales-Tejada

Planning assistant

130 S. McKinley Ave.

Fort Lupton, CO 80621

Direct: 720-466-6111





Public Works

130 S. McKinley Avenue
Fort Lupton, CO 80621

Phone: 303.857.6694

Fax: 303.857.0351

www.fortluptonco.gov

MEMO

To: Todd Hodges
Alyssa Knutson

From: Roy Vestal

Date: May 19, 2021

Subject: Murata Farms Preliminary PUD Plat LUP2021-0012
Public Works Review

Public Works has reviewed the submitted documents for the above referenced development project with the following comments for inclusion with the Final Plat submittal.

1. Drainage

- a. The Preliminary Drainage Study is acceptable. A Final Drainage Study is required with the Final Plat.
- b. Pg 16, fourth paragraph - the pond and outlet structure will be owned and maintained by the City as a regional detention facility.

2. Transportation

- a. Additional ROW dedications are acceptable.
- b. Hwy 52 ROW and required ROW needs to be coordinated with CDOT.
- c. Access from S. Coyote Creek Drive requires coordination and cooperation with the 2 lots located in the northwest corner of the property. The north property should be pushed further south. Would prefer to combine one common access point for both properties.

3. Landscape / Grading - Chapter 2 Design Standards

- a. A SWMP and Stormwater Discharge permit must be acquired from CDPH&E. Please submit proof of prior to receiving construction permits. Please provide copy of permit from CDPH&E.

4. Utilities

a. Water - Chapter 3

- i. *Section 3.12.01 Water System Utility Study* required.
- ii. Please include a network hydraulic modeling of the proposed development. We need to ensure the distribution system proposed will be adequate for future city growth.

- iii. For final design of utilities, be attentive to water main separation from other utilities. Potable water main will require 10-feet separation from all other utilities. The nonpotable main may be closer than 10-feet to sanitary and storm. Likewise, services to lots - the potable water service must maintain 10-feet separation from other services.
- iv. Silverado Lane is the looped connection to the water system.
- v. The extension of the water main north along S Coyote Creek Dr may not be needed, if the hydraulic model is valid without the 3rd connection across Hwy 52.

b. Non Potable Irrigation

- i. The nonpotable water main is located in S College Avenue.
- ii. The nonpotable main extension up S Coyote Creek Dr should not be needed.

c. Sanitary Sewer - Chapter 4

- i. *Section 4.12.00* A utility study is required.
- ii. Sewer connection is in Silverado Lane.

d. Storm Sewer - Chapter 5

- i. The proposed connection to the regional detention pond may need evaluation in light of the discovery of an oil pipeline located along the existing channel north bank. We could look at hydraulically connecting with culverts under the or over the pipe.

e. Roadway - Chapter 6

- i. *Section 6.33.00* A Pavement Design Report is required prior to roadway paving. City preferred pavement section is a composite section of asphalt surface with Class VI base. (contrary to statement on page 2 paragraph 5.
- ii. *Section 6.18.02* At the intersection of two public streets or a private driveway and a public street, sight distance shall be evaluated across a "sight distance triangle" where obstructions are restricted according to the following criteria. The site triangle needs to be pulled back to the ultimate roadway section.
- iii. The sidewalk/trail along S College Ave does not have to meander so drastically. Separation from roadway is important.
- iv. Participation with Hwy 52 / S College intersection improvements will be required.

f. Traffic Control - Chapter 8

- i. The Traffic Study as submitted is acceptable.

5. **Public Improvement Agreement** – A Subdivision Improvements Agreement will be required for the construction of roadways, water, sewer and nonpotable water systems. See attached template.
6. **Mountain Sky Reimbursement Agreement** - The reimbursement agreement with Mountain Sky is being finalized with the completion of water main, nonpotable water main extensions and S College paving.
 - a. **Amount of cost share are:**
 - i. Water main - Additional tap fee per unit =\$563.17
 - ii. Non Potable water - Additional tap fee per unit =\$214.12
 - iii. South College Ave paving = \$277,273.79
 - iv. S College Ave Hwy 52 Improvements - Unknown



May 28, 2021

Fort Lupton Planning Department
130 S. McKinley Avenue
Fort Lupton, CO 80621
www.fortlupton.org

Re: Murata Farms Preliminary PUD Plat Project - No. LUP2021-0012; Plan No. PPL2021-0002

Dear Mr. Hodges and Ms. Knutson:

On behalf of United Power, Inc., thank you for inviting us to review and comment on the Murata Farms Preliminary PUD Plat Project - No. LUP2021-0012; Plan No. PPL2021-0002. After review of the information, we have the following comments:

- **Front or Rear Lot Distribution** – United Power requires continuous dry utility easements for reliable electric facility installation. This allows us to install electric facilities in a continuous manner for our loop feed which provides reliability. We prefer the separation of gas and electric. Typically, with electric in the rear of the subdivision lots. **We will need at least 8' wide dry utility easements, instead of the 6' wide utility easements shown on the plat.**
- **Tracts/Open Space/Parks** – United Power prefers dedicated blanket utility easement use within tracts as this gives us the opportunity to set above ground equipment, coordinated with the developer, and limit the impact to home lots. If Blanket utility easement(s) cannot be given, we will need an 8' to 10' wide dry utility easements along the perimeter of all tracts, along perimeter of tracts abutting roads, and through tracts between lots.
- **Streetlights** – When streetlight locations are identified in a subdivision, we need a 5' wide dry utility easement along one side of the lot closest to the streetlight location. All streetlight locations must be approved and signed off by the city/town, etc. Please note, if we do not get these through the platting process, we will have to get individual ones during the design which will slow United Power's ability to start construction significantly.

Please note, the property owner/developer/contractor must submit an application along with CAD data for new electric service via <https://www.unitedpower.com/construction>. United Power would like to work with these persons early in the construction process on getting an electric design prepared so that we can request any additional easements needed and hopefully have those easements dedicated on the plat rather than obtaining separate document(s). Obtaining easements via a separate document can be time consuming and could cause delays.

As a Reminder: No permanent structures are acceptable within the dry utility easement(s); such as, window wells, wing walls, retaining walls, basement walls, roof overhang, anything affixed to the house like decks, etc. United Power considers any structure that impedes the access, maintenance, and safety of our facilities a permanent structure. No exceptions will be allowed, and any encroachments could result in penalties.

Service will be provided according to the rules, regulations, and policies in effect by United Power at the time service is requested. We look forward to safely and efficiently providing reliable electric power and outstanding service.

Thank you,

Amber Mendoza

Amber Mendoza, RWA
ROW Agent
720.249.9315 | platreferral@unitedpower.com



Right of Way & Permits

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.571.3306**
Facsimile: 303. 571. 3284
donna.l.george@xcelenergy.com

May 28, 2021

City of Fort Lupton Planning Department
130 South McKinley Avenue
Fort Lupton, CO 80621

Attn: Alyssa Knutson and Todd Hodges

Re: Murata Farms, Case # LUP2021-0012

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the preliminary PUD plat for **Murata Farms** and requests that the following language is added to the final plat:

Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility easements and the utility providers, as grantees, may remove any Interfering Objects at no cost to such grantees, including, without limitation, vegetation. Public Service Company of Colorado (PSCo) and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.

Please be aware PSCo owns and operates existing natural gas distribution facilities along County Road 29-1/2. The property owner/developer/contractor must complete the application process for any new natural gas service via [xcelenergy.com/InstallAndConnect](https://www.xcelenergy.com/InstallAndConnect). It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.

Additional easements may need to be acquired by separate document – be sure to ask the Designer to contact a Right-of-Way & Permits Agent in this event.

As a safety precaution, PSCo would like to remind the developer to call the Utility Notification Center by dialing 811 for utility locates prior to construction.

Donna George
Right of Way and Permits
Public Service Company of Colorado / Xcel Energy
Office: 303-571-3306 – Email: donna.l.george@xcelenergy.com